PRODUCING THE MAGNUM OPUS:
THE ACQUISITION AND EXERCISE OF NEPHROLOGY
NURSING EXPERTISE

Ann Jeanette Bonner

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University of Western Sydney
School of Nursing, Family and Community Health

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PLEASE NOTE

The greatest amount of care has been taken while scanning this thesis,

and the best possible result has been obtained.
Declaration

I certify that this thesis has not already been submitted for any degree and is not being submitted as part of a candidature for any other degree.

I also certify that the thesis has been written by me and that any help I have received in preparing this thesis, and all the sources used, have been acknowledged in this thesis.
ABSTRACT

It has been recognised for a number of decades that experts, compared to other practitioners in a number of professions and occupations, are the most knowledgeable and effective, in terms of both the quantity and quality of output. It is important, therefore, for health care professionals which are striving assiduously to improve their cost-effectiveness, to understand, facilitate and expedite the acquisition of expertise.

Nursing is one such profession and nurses’ interests in the nature and acquisition of expertise has been gaining momentum since Benner (1984) first applied the Dreyfus’ model of expertise to clinical nursing. Studies relating to expertise have been undertaken in a range of nursing contexts and specialties; to date, however, none have been undertaken, in Australia or elsewhere, which focus on nephrology nursing. This study is the first to do so. Using grounded theory methodology it examined the acquisition and exercise of nephrology nursing expertise. Specifically, it sought to answer the following questions: 1) what constitutes expertise in nephrology nursing? 2) how does expertise develop in nephrology nursing? and 3) do expert nephrology nurses practice differently from non-expert nephrology nurses and, if so, how?

The study took place in one renal unit in New South Wales. Selection criteria were developed from the existing literature in order to identify non-expert and expert nurses in the renal unit. Sampling was purposive then theoretical; it consisted of 6 non-expert nurses and 11 expert nurses. Data were obtained from participant observation of nephrology nurses while they practiced in the renal unit. Nursing documentation was also reviewed during that time. Following each observation episode, semi-structured
interviews were conducted using questions generated from field notes to clarify the focus of their nursing actions and the rationale underpinning them. Data were managed using NUD*IST and analysed using the constant comparative method. This resulted in the generation of a substantive theory which utilised an orchestral metaphor to explain the skills-acquisitive/exercise process.

The findings of this study revealed a three stage skills-acquisitive process; non-expert, experienced non-expert and expert stages. Each stage was typified by four characteristics which altered during the acquisitive process; these were knowledge, experience, skill and focus. The first stage in the acquisition and exercise of nephrology nursing expertise was the non-expert stage which was conceptualised as LEARNING TO PLAY IN THE ORCHESTRA. Non-expert nurses demonstrated superficial nephrology nursing knowledge and limited experience; they were acquiring basic nephrology nursing skills and possessed a narrow focus of practice. The second or experienced non-expert stage was conceptualised as PLAYING BETTER, LEARNING TO CONDUCT AND COMPOSE MUSIC. Experienced non-experts demonstrated sufficient nephrology nursing knowledge and adequate experience while they exercised routine nephrology nursing skills; they possess a changing focus of practice. The third and final stage of the acquisition and exercise of nephrology nursing expertise was conceptualised as PRODUCING THE MAGNUM OPUS. Expert nurses demonstrated extensive nephrology nursing knowledge and vast experience; they exercised advanced nephrology nursing skills and were patient focused.
The findings of this study both support and add to nursing’s existing body of knowledge with respect to expertise. Many of the findings corroborate findings from previous studies; however, the findings also identify features of the skill-acquisitive/exercise process not previously reported and make explicit what previous studies have left implicit. The former include, inter alia, the centrality of recognition of expertise and blurring the boundaries to expert practice and, the latter, the role of motivation, enjoyment and commitment to the acquisition of expertise.
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CHAPTER ONE

Introduction to the Study

Introduction

Contemporary nursing practice\(^1\) is a large and complex field, too large and too complex for any one person to master the full range of knowledge and skills it encompasses. Specialisation in one field has become the norm, enabling nurses to focus, in much greater depth, on the requisite knowledge and skills for providing patients with the best possible care. Nephrology nursing is one such area where specialisation has evolved.

This short chapter highlights nephrology nursing practice and discusses renal replacement therapies. It provides an introduction to the context in which this study took place, as well as a brief review of expertise within a nursing context. This will be followed by a brief review of grounded theory, the study's methodology, an outline of the study's purpose, research questions, objectives and significance. Lastly, an overview of the thesis is presented.

Overview of Nephrology Nursing

The specialty of nephrology nursing has evolved in response to increasingly complex knowledge, technology, and clinical expertise required in the care of people with

\(^1\) Although the convention is to use "practice" as a noun and "practise" as a verb, according to the Macquarie Dictionary (Delbridge, Bernard, Blair, Peters & Butler, 1991) and to avoid confusion throughout this thesis, "practice" will be used as both a noun and verb.
impaired renal function (J. Parker\textsuperscript{1}, 1998). The growth of the specialty has paralleled that of an expanding and clearly defined patient population. In Australia during 1999 (latest report) there was a six percent (6\%) increase in the total number of people requiring renal replacement therapy; 5,949 people required haemodialysis or peritoneal dialysis and 4,865 people had a functioning kidney transplant (Disney et al., 2001). The depth to which individual nephrology nurses engage in the scope of nephrology nursing practice is dependent upon their educational preparation, experience, role, health care setting, and the nature of the patient group(s) they serve (Schardin, 1995).

Nephrology nurses practice\textsuperscript{2} in primary, secondary and tertiary care settings and in the home (Schardin, 1995). They are both practical and versatile and practice within and across a broad range of subspecialties such as general nephrology, haemodialysis, peritoneal dialysis and renal transplantation units, including paediatrics (Stewart, 1997; Stewart & Bonner, 2000). In Australia, the term "acute areas" refers to renal units which exist within major metropolitan or regional hospitals. These hospitals will typically have an in-patient ward for people with newly diagnosed acute or chronic renal failure, an in-centre haemodialysis unit and occasionally, a renal transplant unit. Community or satellite (out-patient) dialysis centres tend to be situated away from these hospitals, and frequently exist as free-standing units, offering services for stable, chronic patients needing either haemodialysis or peritoneal dialysis treatment.

\textsuperscript{1} According to the American Psychological Association (1994) publication (style) manual, if a reference list includes publications by two or more authors with the same surname, include the authors' initials in all citations to avoid confusion.

\textsuperscript{2} This is the first occasion that "practice" is used as verb.

\textit{Chapter 1: Introduction to the study}
Due to the vast distances between major cities or even between regional and rural towns in Australia, numerous satellite haemodialysis units have been established in isolated and remote areas, specifically designed to provide renal health care services to people in a location closer to their homes. Patients in all satellite centres differ in their needs: they range from requiring minimal assistance to perform their haemodialysis to needing full nursing support. The majority of nurses working in haemodialysis units are registered nurses, although some units also employ enrolled nurses and/or dialysis technicians who can perform restricted tasks. Peritoneal dialysis areas tend to be home training and support units, staffed by registered nurses who provide continuing education, monitoring, assessment and treatment to patients undergoing this alternate form of renal replacement therapy. This study took place in a renal unit which accommodates general nephrology, transplant, peritoneal and haemodialysis and care of acutely and chronically ill people with renal disease. This unit is solely staffed by registered nurses. The term “nurse/nurses” is used throughout this thesis, unless otherwise indicated, as an abbreviation for registered nurse/s.

Nephrology nursing focuses on the health needs of individuals and their families who are experiencing a progressive decline in renal function or who have lost function completely. Nephrology nursing necessitates that the nurse focus on the provision of renal replacement therapy (see below, p. 5), teaching self-care, assisting individuals to make informed choices regarding the type and proposed location of therapy, and the prevention of related illnesses or complications associated with renal disease (J. Parker, 1998). Furthermore, nephrology nurses function in a variety of roles: those of direct
caregiver, educator, advocate, mentor, facilitator, coordinator, administrator, consultant and/or researcher (Butera & Gallagher, 1998; Jung Ran & Hyde, 1999).

One unique aspect of nephrology nursing is that these nurses have access to and provide nursing care for people over much longer periods of time than most other nurses (J. Parker, 1998; Schardin, 1995). For instance, haemodialysis nursing care can be provided to the same patient for four to six hours, three times per week for as long as the patient remains on haemodialysis. For some nephrology nurses and patients, this can be for many years and, in some cases, greater than twenty years. While renal physicians (nephrologists) would also provide medical care for patients for similarly long periods, it is nephrology nurses who have much more frequent (thrice weekly versus monthly, quarterly or annually) and prolonged contact with the same patient. In comparison to all other areas where nursing care is provided to people with chronic illnesses such as psychiatric disorders, diabetes, asthma or permanently disabling conditions such as spinal cord injury, only a few other nursing specialties such as nursing the intellectually disabled or long-term residential care, has a similar amount and degree of constant contact with the same patient as does nephrology nursing. This prolonged contact with the same patient over many years (or even decades) has the advantage of enabling the establishment of long-term relationships and enables nurses to know their patients and families well. Nephrology nurses strive to form a caring relationship with patients that is built on trust and knowledge (Bevan, 1998; Molzahn, 1998b; Pinkney, 1996).
Patient education is also a significant component of nephrology nursing practice (Bevan, 2000; Pinkney, 1996; Wick & Robbins, 1998). Patient teaching is ongoing and primarily involves assisting patients to understand their illness and its complexities. Treatments such as medications, dietary and fluid restrictions, vascular access and/or peritoneal catheter care are particularly important topics for all nephrology nurses first to understand, then to teach patients and carers. In addition, nurses may also be responsible for intensive teaching sessions for patients learning either haemodialysis or peritoneal dialysis techniques. This patient education is typically provided in a specific dialysis home-training centre where patients are taught to provide dialysis self-care at home. Similarly, nurses also educate renal transplant recipients. Specific transplant education commences when the patient is initially entered onto the waiting list and continues pre- and post-operatively. Patients are encouraged to take an active role in their own care (e.g., maintaining own fluid balance charts, self-medicating under supervision of a nurse). Transplant patient education is aimed at ensuring compliance with immuno-suppressive and other medication therapies following renal transplantation (Giuliano, Molzahn & Warren-Sims, 1998) as well as other long-term care requirements to maintain the health of the patient with a new kidney (J. Parker, 1998).

The following section will briefly describe normal renal function and renal disease. It will then provide an overview of renal replacement therapies including the specific and, in some instances, unique nursing activities that are required.
Renal Disease and Renal Replacement Therapy

The kidneys perform vital regulatory, secretory and excretory functions to regulate the body's composition of water, electrolytes and waste by-products of normal metabolism (Preisig et al., 1998). Microscopic structures, called nephrons, perform these functions. The kidneys are also responsible for regulating blood pressure and acid-base balance. In addition, renal tissue is primarily responsible for the production of erythropoietin, a glycoprotein, which directly effects the production of red blood cells (Macdougall, 1992) and for the final activation of Vitamin D into its most active form 1,25 dihydroxycholecalciferol, that is, calcitriol (Brunier, 1994; Yucha, 1993). If sufficient renal tissue, including nephrons, is damaged, renal failure ensues and the body's homeostatic mechanisms are interrupted leading to potentially life-threatening consequences.

Renal failure can affect each body system (Baer, 1993) and is broadly classified as either acute or chronic. Acute renal failure (ARF) is a generic term and refers to the sudden impairment of kidney function without regard to a specific cause or mechanism (K. Parker, 1998). ARF develops rapidly and it is a potentially fatal complication of critical illness; however, ARF is frequently reversible and rarely progresses to chronic renal failure. ARF may develop from reduced renal blood flow (pre-renal ARF); from a sudden, severe renal parenchymal injury (intra-renal ARF); or from obstruction to the outflow of urine (post-renal ARF) (K. Parker, 1998).

Chronic renal failure (CRF), by comparison, is characterised by the progressive, irreversible loss of renal function. The degree of renal functional loss is usually
described in terms of glomerular filtration rate (GFR). Normal GFR is 125 ml/min. CRF begins when GFR is approximately 10-30% of normal and end-stage renal failure (ESRF) when GFR is less than 10% of normal (K. Parker, 1998). The management of ARF and CRF are relatively similar with conservative management strategies (i.e., medications, dietary and fluid restrictions) employed to control the symptoms of renal failure and to prevent further damage to the kidneys. When these strategies are not effective in controlling severe water, electrolyte, acid-base, urea and/or creatinine disturbances, then renal replacement therapies (e.g., haemodialysis, peritoneal dialysis) are instituted (Russell, 1998). ESRF, however, necessitates the introduction of renal replacement therapies (RRT) in order to sustain life. In Australia, the major causes of ESRF are glomerulonephritis (30%), diabetic nephropathy (25%), hypertension (11%), polycystic kidney disease (7%), and analgesic nephropathy (6%) (Disney et al., 2001).

Renal replacement therapy is a common term used to indicate a variety of treatments available to replace lost renal function. For the purposes of this study, RRT includes haemodialysis, peritoneal dialysis and renal transplantation; each will be briefly described below. In addition, a glossary of terms commonly used in nephrology nursing practice has been provided in this thesis (see Appendix 1, p. 342). Lastly, footnotes have been provided, at appropriate junctures, where a more detailed explanation of a nephrology issue is required.

*Haemodialysis*

Dialysis is a process through which the composition of two solutions is changed when they are exposed to each other through a semi-permeable membrane (Van Stone &
Daugirdas, 1994). During haemodialysis (HD), a dialyser or artificial kidney separates the two solutions (i.e., the patient’s blood and the dialysate). The dialyser is a semi-permeable membrane containing microscopic pores which allow water and small molecular weight molecules to pass through using the processes of diffusion and ultrafiltration. Large solutes such as blood cells and proteins cannot pass through the small openings and are retained in the blood compartment (Van Stone & Daugirdas, 1994). During HD, the solute composition (e.g., electrolytes, urea, creatinine) as well as the water content of a person’s blood can be altered depending on the composition of the dialysate solution and the net hydrostatic pressure induced across the dialyser membrane (Baltz-Salai, 1998). HD cannot replace all of the functions performed normally by nephrons but it can sustain life. In Australia during 1999, 1636 people received HD in an acute, in-centre facility, 1983 in a satellite unit with 681 people performing their own treatment at home (Disney et al., 2001). Typically, a patient with ESRF will receive a minimum of four hours of treatment on three occasions each week (Disney et al., 2001).

Access to the person’s circulatory system is required in order to perform HD and nursing care of this access is one of the most important components in the management of people with renal failure (Baltz-Salai, 1998; Thomas-Hawkins, 1996). Vascular access can be provided temporarily through the insertion of central venous catheters into either the internal jugular, subclavian or femoral veins. Temporary vascular access is commonly needed in patients with ARF or for patients with ESRF who require HD prior to maturation of an arteriovenous (AV) fistula. Permanent vascular access is primarily achieved by the anastomosis of an artery with a vein, thus forming an AV fistula (Raja,
1994). During the next six to eight weeks, the AV fistula goes through a maturation process in which the vein dilates and the vessel wall thickens. This allows for the repeated insertion of large bore needles for HD (Thomas-Hawkins, 1996). When an adequate AV fistula cannot be created or maintained, grafting a tube made from either the saphenous vein or synthetic material is used to establish a fistula (Raja, 1994). Routine assessment of and implementation of nursing interventions aimed at preventing complications are crucial in prolonging all forms of vascular access function and, as a consequence, patient survival (Thomas-Hawkins, 1996).

Nursing care of the person receiving HD therapy requires thorough assessment skills which are used in evaluating the patient’s physical, psychosocial and emotional needs, in addition to specific effects of HD on the individual (Corea, 1998). Nurses are required to practice with flexibility and autonomy in relation to assessing, monitoring and performing the HD regimen. The term dialysis prescription is used to describe the components of the HD treatment, and is determined prior to each treatment. The HD treatment prescription consists of determining the length of time on dialysis, choice of dialyser, cannula size and location, blood flow rate, composition of dialysate, volume of ultrafiltrate (i.e., water) to be removed and heparin requirements. It is the experienced nurse who routinely “prescribes” an individualised treatment plan for each patient. Changes to the HD prescription, in consultation with nephrologists, are based on several factors (e.g., physical assessment, calculation of Kt/V) which determine the adequacy (see glossary) of treatment (Baltz-Salai, 1998).
**Peritoneal Dialysis**

Peritoneal dialysis (PD) is performed by introducing 1-3 litres of a sterile dextrose-containing salt solution (dialysate) into the peritoneal cavity. The peritoneal membrane acts as a semi-permeable membrane which allows diffusion and osmotic ultrafiltration to remove excess waste products, water and electrolytes from the blood stream (Sorkin & Diaz-Buxo, 1994). Similarly with HD, PD cannot replace all of the functions of the kidney and, although PD can be used to treat ARF, it is most commonly used for ESRF (Burrows & Prowant, 1998). In Australia during 1999, 1664 patients were receiving some form of peritoneal dialysis (Disney et al., 2001). Table 1 compares the basic characteristics of PD and HD.

**Table 1  Comparison of Peritoneal Dialysis to Haemodialysis**

<table>
<thead>
<tr>
<th></th>
<th>PD</th>
<th>HD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access</strong></td>
<td>PD catheter</td>
<td>Vascular catheter, fistula or graft</td>
</tr>
<tr>
<td><strong>Blood flow rates</strong></td>
<td>Capillary blood flow</td>
<td>300-500 ml/min</td>
</tr>
<tr>
<td><strong>Blood propulsion</strong></td>
<td>Heart</td>
<td>Mechanical blood pump</td>
</tr>
<tr>
<td><strong>Dialysis solution</strong></td>
<td>Sterile</td>
<td>Non-sterile</td>
</tr>
<tr>
<td><strong>Dialysis solution delivery system</strong></td>
<td>2-3 litres per exchange</td>
<td>Continuous flow</td>
</tr>
<tr>
<td><strong>Dialysis solution volume</strong></td>
<td>8-15 litres per day; duration 3-5 hours</td>
<td>500-700 ml/min during treatment</td>
</tr>
<tr>
<td><strong>Dialysing membrane</strong></td>
<td>Peritoneal membrane; biocompatible</td>
<td>Synthetic fibre; not totally biocompatible</td>
</tr>
<tr>
<td><strong>Membrane characteristics</strong></td>
<td>Predetermined for each individual</td>
<td>Many choices available</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>Low</td>
<td>Moderate to high</td>
</tr>
<tr>
<td><strong>Time Required</strong></td>
<td>24 hours/continuous or &gt; 10 hours overnight 7 days/week</td>
<td>3-5 hours/treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 treatments/week</td>
</tr>
</tbody>
</table>

(Adapted from: Burrows & Prowant, 1998).

A surgically implanted peritoneal catheter, commonly a Tenckhoff catheter, achieves access to the peritoneal cavity (Ash & Daugirdas, 1994). This allows inflow and outflow of dialysate. There are several forms of PD; the most common is continuous
ambulatory peritoneal dialysis (CAPD). In CAPD, dialysis solution is constantly present in the abdomen but it is changed 3-5 times per day, every day of the year (Sorkin, 1994). That is, the patient is required to connect to a dialysate bag, infuse the solution, allow it to dwell for several hours and then drain the fluid, which contains diffused solutes and ultrafiltrated fluid, from the abdomen. CAPD is a manual technique performed by the patient during waking hours. Other PD techniques involve the use of a machine, called a cycler, which automates the infusion and drain phases of the exchange. Most often, cycler exchanges are done at night while the patient sleeps, a reverse of the CAPD pattern (Burrows & Prowant, 1998).

Nephrology nursing involvement with the person receiving PD is similar to HD nursing where the nurse is commonly the primary health care provider and is required to assess, monitor and perform the PD therapy. Once the PD catheter is inserted, the patient is typically discharged home within 24-48 hours and the dialysis begun in the outpatient home training unit 7-14 days later (Burrows & Prowant, 1998). In some renal units, such as the unit used in this study, nurses, having completed theoretical and practical learning and assessment of PD skills, are able to perform the PD exchange, “prescribe” an in-patient’s daily PD treatment regimen (e.g., dextrose concentration of dialysate) and add medications (e.g., antibiotics, insulin) to the PD bag. Nursing management of the PD patient, however, primarily occurs in an outpatient setting, and consists of three phases: 1) initial education and training, 2) ongoing monitoring and support, and 3) problem solving interventions if complications arise (Burrows & Prowant, 1998). In addition, experienced nephrology nurses, determine (i.e., “prescribe”) the number, volume and timing of exchanges, monitor PD catheter exit-sites for healing and
infection, change the tubing (i.e., transfer set) which is attached to the catheter, and
determine the most appropriate delivery system for each person. Experienced nurses
also monitor peritoneal membrane characteristics (i.e., PET) and PD adequacy (i.e.,
Kt/V) [see glossary] as these influence the PD prescription (Burrows & Prowant, 1998;
CANUSA Peritoneal Dialysis Group, 1996; Diaz-Buxo, 1994; Prowant & Schmidt,

**Renal Transplantation**

Renal replacement therapy also includes renal transplantation. Renal transplantation is
a viable treatment option for most patients with CRF, either before or after the initiation
of dialysis (Allen & Chapman, 1994). All potential kidney recipients are evaluated for
medical suitability (e.g., age, recurrence of renal disease, cardiovascular disease) and
psychosocial status prior to entry on the transplant waiting list (Mudge, Carlson &
Brennan, 1998). Once on the transplant waiting list, some recipients may be
transplanted within two years and others may not be transplanted for three to five years
(i.e., some recipients have rare tissue types). Donor kidneys are procured from three
sources. Cadaveric donor kidneys accounted for 284 (63%) of all transplant operations
performed in Australia during 1999, 124 kidneys were from living related donors (e.g.,
mother, father, sibling) and 44 were from living unrelated donors (Disney, et al., 2001).

Once donor and recipient suitability has been confirmed (i.e., blood group
compatibility, negative crossmatch and human leukocyte antigen [HLA]), the
transplantation procedure is performed. The donor kidney is placed in either the left or
right iliac fossa, with vascular anastomoses to the recipient iliac vessels and ureter
anastomosed to the bladder (Allen & Chapman, 1994). The native kidneys are not

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removed. The recipient is returned to the ward where intensive assessment and
management of fluid and electrolyte status, kidney function (i.e., for rejection) and any
post-operative complications are performed. Immunosuppression (e.g., prednisone,
azathioprine and cyclosporin) is commenced pre-operatively and continues typically for
the rest of the recipient’s life (or until the kidney is removed). The recipient is typically
discharged home within seven days but is followed up as an outpatient on a daily basis
for approximately one month and thereafter less frequently (Allen & Chapman, 1994).

Nurses have an important role to play in the transplantation process (Allen & Chapman,
1994; Corea, 1998). Nursing involvement commences pre-transplant with recipient
evaluation (e.g., nursing assessment, education, ward visits) and then when the recipient
is admitted prior to surgery (e.g., dialysis, administration of immunosuppressives,
antiseptic shower, ward admission). After renal transplantation occurs, the nurse
closely evaluates the response of the patient to the transplant and related therapy on a
24-hour basis until discharge is possible. The immediate post-operative nursing care,
although similar to other major surgical procedures, requires nurses to pay particular
attention to fluid status (e.g., measurement of central venous pressure and urine output
hourly), renal function, pain relief, the impact of immunosuppressive therapy,
complications of uraemia, fistula patency and the patient's psychological adjustment to
the transplant process (Mudge, Carlson & Brennan, 1998). Nursing care also continues
following discharge in the outpatient setting.
Research into the Practice of Nephrology Nurses

Research into nephrology nursing has been influenced by many of the factors which have affected all nursing research. These include the number of nurses qualified to engage in research, trends in nursing practice and health care, and the availability of funding (Molzahn, 1998a). The volume of research in this specialty has increased (Hoffart, 1992; Molzahn, 1993) and covers a wide range of topic areas such as quality of life, psychologic adaptation, coping, renal replacement therapies, attitudes, compliance, psychological stress and patient education (Hoffart, 1995). However, in many of these studies, nephrology nurses were neither principal nor co-investigators but rather research assistants, project co-ordinators or data collectors (Hoffart, 1995). Hoffart (1995) also found that 61% of renal nursing research findings remained unpublished.

There has, in addition, been relatively little research into the essence of nephrology nursing and the outcomes of nursing interventions (Hoffart, 1995; Molzahn, 1998a) although the level of nursing competence and the effect on patient outcomes is considered a research priority by nephrology nurses (Lewis et al., 1999). Following an extensive search of the literature, only five published studies focusing on nephrology nurses were found (Lewis et al., 1992; Renal Society of Australasia, 1999; Stewart & Bonner, 2000; Wellard, 1992; Woodcock, 1999). In a practice-oriented specialty such as nephrology nursing, it is important to understand how nurses practice and, more importantly, because experts achieve the best patient outcomes (Benner, 1984), how expertise is acquired. Expertise in nephrology nursing has never been studied in Australia or elsewhere. This qualitative study, therefore, using grounded theory

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method, will be the first which seeks to understand the acquisition and exercise of nephrology nursing expertise.

**Brief Literature Review and Rationale for the Study**

**Expertise in Nursing**

The term "expert nurse" is freely used in the nursing profession (e.g., Benner, 1984) but the term has not been sufficiently defined (Adams et al., 1997; Edwards, 1998; Jasper, 1994). Some nurses possess attributes which make their practice superior; they have the ability to do more and achieve more, think laterally and provide a service of care that exceeds their nursing job description (Patterson, 1991). Such individuals are frequently referred to as expert nurses and, whilst their education and training may be similar to that of their counterparts, their performance is superior.

The existence and acceptance of expert nurse practice have been evident by the increasing amount of literature that has become available over the last decade (see for example Adams, et al., 1997; Brown & Tiavale, 1996; Edwards, 1998; Jasper, 1994). Since Benner (1982, 1984) first applied the Dreyfus and Dreyfus model to nursing, the interest in expertise has been gaining momentum. Expert practice has been described in the literature; Adams et al. (1997) believed, however, that the description is incomplete and that a clear picture of the practice of expert nurses is necessary.

The notion of expertise, combined with an era which Goodwin (1982) views as tending toward specialisation, has resulted in a great deal of attention being directed towards describing what expert nurses "do" differently. Benner (1984), Macleod (1993) and

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McClosekey and Grace (1990) agree that expertise is dependent upon the acquisition of a number of skills and attributes.

Benner (1984) identified five levels of competence in clinical nursing practice based on the Dreyfus model of skill acquisition (see Chapter 2, p. 47). According to Benner, nurses move through the five stages as they develop in their clinical practice, and English (1993) suggests that progression through the stages is related to exposure of the nurse to a range of clinical experiences. Exposure to similar clinical situations, according to Edwards (1998), enables experienced nurses to grasp the salient features of these situations quickly.

An expert nurse is a person who displays advanced levels of skill and knowledge (Jasper, 1994) gained through experience (Benner, 1984) with the ability not only to apply but also to move beyond theoretical principles. This ability distinguishes experts from non-experts, and many nurses see the pinnacle of achievement as the attainment of expertise (Jasper, 1994). An expert nurse is also able to use appropriate nursing knowledge and skilled judgements to deliver a high level of nursing care (Paul & Heaslip, 1995).

Although experience is essential for the acquisition of expertise (Benner, 1984; Jasper, 1994), experience alone does not produce an expert (Coulon & Mok, 1994; Adams et al., 1997). According to Thiele, Holloway, Murphy, Penarvis and Stucky (1991), an expert can only function as an expert within their field of specialisation. Expertise, therefore, must be acknowledged as being contextual (Benner, 1984; White, Nativio,
Kobert & Engberg, 1992). In order to develop expertise, a nurse needs to build up experiences in a distinct environment (Jasper, 1994). Thompson, Ryan and Kitzman (1990) add that the characteristics of expert practice also include clinical specialisation, knowledge, intuition, quality decision-making, and adept psychomotor skills. Jasper (1994) continues to explain that experience is inextricably linked to a nurse's knowledge and infers that clinical experts possess extensive practical and theoretical knowledge. The relationship of Jasper's findings to this study suggests that expert nephrology nurses draw upon their knowledge and extensive practical experience in order to assess, interpret and respond appropriately to patients' needs.

Jasper (1994) believes that expertise is founded on experience. According to Thompson et al. (1990), individuals who have reached the pinnacle of performance in their discipline are generally considered to have expertise in that discipline. Thompson et al. go further to suggest that an expert can be defined as one who demonstrates expertise, and that "the essence of expertise is an ability, the ability to accurately perform the required mental or physical activity rapidly and with the fewest number of cues" (p. 3).

Noyes (1995) asserts that experts think laterally. For example, a nurse who is new to the haemodialysis unit may decide that a patient who is complaining of nausea is unwell and likely to vomit. An expert nurse with extensive experience with haemodialysis patients, however, will recognise this nausea as a symptom of another problem (e.g., impending hypotension). This example illustrates that an expert nurse will not concentrate merely on the obvious. Clinical expertise, therefore, requires a combination of theory and experience (Field, 1987).
Benner (1984) notes that expert critical care nurses were more efficient with problem-solving in comparison to non-experts. Expert critical care nurses were able to achieve better patient outcomes than non-experts. This characteristic of expert nurses was supported in a study conducted by Hanneman (1996) who found that when problem-solving, expert medical intensive care nurses tended to focus on the patient with the aim of achieving a purposeful recovery, whilst at the same time working to prevent complications. Non-expert medical intensive care nurses, by way of contrast, focused less on the patient and more on treating complications. This difference in problem-solving ability between expert and non-expert critical care nurses, according to Kaufman and Patel (1991, cited in Cholowski & Chan, 1995), is related to the efficient way in which experts process and then act upon clinical information.

In the light of this, and according to Sutton and Smith (1995), expertise requires further exploration and debate within nursing. The debate, they assert, should focus on whether expertise derives from personal qualities of the nurse which are made evident in practice or whether expertise is dependent on practicing within specific clinical settings.

**Grounded Theory and Nursing Expertise**

In recent years grounded theory method has been used by a number of nurse researchers. Benoliel (1996) records its use in over one hundred nursing research studies. These studies have focused on such areas of nursing as: processes and practices of nurses, interventions and interactional processes used by nurses, individual and family adaptations in chronic illness, infertility, health seeking practices, passages and processes of vulnerable people, and position papers related to grounded theory.
According to Benoliel (1996) grounded theory "...studies [in nursing] focused on the social psychological processes of people undergoing major life changes and, to a variable extent, on the environmental circumstances influencing the course of events" (p. 413).

Although nursing expertise has been studied in Australia (e.g., Aitken, 1997; Cioffi & Markham, 1997; Greenwood & King, 1995; McMurray, 1992) and elsewhere (e.g., Benner, 1984; Benner, Tanner & Chesla, 1992; Fisher & Fonteyn, 1994; Edwards, 1998), very few studies of nursing expertise have used grounded theory methods. These studies focused on either a particular aspect of expert practice such as clinical judgement (Loving, 1993) and "do not resuscitate orders" (Grossman & Wheeler, 1997) or the expert nurse working in a specialist area such as psychiatry (Cutchiffe, 1997) and medical intensive care (Hanneman, 1996).

In nephrology nursing there have been numerous studies concerning people with renal failure using grounded theory methods (see for example, Weems & Patterson, 1989; Hilton & Starzomski, 1994; Whittaker & Albee, 1996) but only one has focused specifically on nurses or nursing practice (Woodcock, 1999). To date, however, neither in Australia nor elsewhere, have there been studies using grounded theory methods to investigate the acquisition and exercise of nephrology nursing expertise.

**Purpose of the Study**

The primary purpose of this study was to understand the characteristics of nephrology nursing expertise and the process through which it was acquired. Secondly, the study
sought to explain how expert nephrology nurse practice was different from that of non-expert nephrology nurses. Using grounded theory methodology, incorporating participant observation, semi-formal interviews and the limited use of nursing documentation, an examination of practice differences between nephrology nurses was undertaken. The study, therefore, sought to investigate the acquisition and exercise of nephrology nursing expertise and to describe the factors which both enhance and impede this acquisition.

Research Questions

This study was guided by the following questions:

1. What constitutes expertise in nephrology nursing practice?
2. How does expertise develop in nephrology nursing?
3. How do expert nephrology nurses practice differently from non-expert nephrology nurses?

Study Objectives

The study objectives were to:

1. Determine and describe the characteristics of expertise in nephrology nursing practice.
2. Examine, through observation, the practice of expert and non-expert nephrology nurses in order to understand how these nurses practice.
3. Explore and describe, through interview, how nephrology nurses perceive their practice.
4. Examine the similarities or differences of nursing documentation between expert and non-expert nephrology nurses in order to understand the focus of their nursing care.
5. Identify the factors that assist or hinder the process of expertise acquisition.
6. Develop a substantive theory which explains the process of expertise acquisition in nephrology nursing within a renal unit located in metropolitan New South Wales.

Significance of the Study

This study is significant for nursing practice and education since it seeks to examine the influence of experience, specialist nephrology education, personal attributes and other pertinent factors, if any, on the acquisition of nephrology nursing expertise. The effect of these factors on expertise is not well understood in nursing and has never been studied previously in nephrology nursing. The results of this study could influence how nursing career paths will be developed and the role (if any) of clinically focused education courses. In addition, this study has significance for developing a theory of nursing expertise, and for furthering research into nursing expertise.

Overview of the Thesis

This thesis is presented in eight chapters. Chapter One has provided an overview of contemporary nephrology nursing and a review of renal replacement therapies. The paucity of nursing research into the practice of nephrology nurses has been highlighted. A brief review of current nursing expertise literature followed which established that no previous studies of nephrology nursing expertise have been conducted in Australia or elsewhere. Finally, the aims, research questions and study objectives were presented.

Chapter Two will review ideas central to cognitive psychology such as concepts, schemata, scripts and knowledge. This will be followed by a discussion of the
contemporary theories of cognition. Lastly, the theoretical perspectives of expertise and a critical analysis of contemporary theories of expertise acquisition will be addressed.

Chapter Three will outline grounded theory methodology, its historical background and essential features. The relevance for this study of symbolic interactionism, the theoretical framework supporting grounded theory research, will then be addressed. An examination of the use of metaphors within the interpretative paradigm will follow. Finally, the role of the researcher's membership of the group being studied will be acknowledged.

The specific application of grounded theory methods employed during this study is presented in Chapter Four. The use of data triangulation through participant observation, informal interviewing and review of nursing documentation is explored. The utility of computer assisted data management programs and their importance to this study are examined. Finally, issues of credibility and trustworthiness are also presented.

Chapter Five presents the substantive grounded theory. A three-staged theory of the acquisition and exercise of nephrology nursing expertise is proposed which is explicated through the application of an orchestral metaphor. Chapters Six and Seven will present the study's findings, illustrated by interview and observation data.

The final chapter will discuss the findings of this study in the context of contemporary nursing literature. Additionally, it will discuss limitations of this study. Lastly, the

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implications of the study's findings and recommendations for nursing practice, education and research will be presented.
CHAPTER TWO

Literature Review of Skill and Cognition

Introduction

This study of expertise seeks to understand and account for the processes through which nurses acquire and exercise expertise in nephrology nursing. In their day-to-day practice nephrology nurses are faced with many situations that require decisions about such things as fluid loss during dialysis or choice of dialysis equipment. It seems apparent that some nurses perform at a higher level of decision making and stand out from other nurses. Such nurses are frequently referred to as expert nurses and, whilst their education and training may be similar to that of their counterparts, their performance is superior.

The chapter will explore and critically analyse theoretical perspectives associated with the development of expertise and discuss the dominant contemporary theories of expertise acquisition. The chapter will focus on concepts such as propositional and procedural knowledge, schemata and scripts which are central to cognition. This will be followed by a discussion of contemporary cognitive theories which underpin much of the current research surrounding expertise acquisition. The chapter will conclude with an examination of the nature of skill and current perspectives on the acquisition of skill.

Cognition

Cognitive psychology involves understanding how people acquire knowledge and skills and how they perform feats of intelligence or skillfulness. Anderson (1995) suggests that human cognition is purposeful and directed towards achieving goals. In order to
achieve these goals through cognitive processing, the individual has the ability to sense, attend to, process, store and transmit information. According to Eysenck (1993), these cognitive processes involve attention, perception, learning, memory, language, problem solving and thinking in order to make sense of the environment in which a person finds her/himself. A person’s ability to function in the world, therefore, is governed by knowledge about things (propositional knowledge) and knowledge about how to do things (procedural knowledge).

Concepts, Schema and Scripts

In order to make sense of the environment, individuals group together or categorise objects, entities and events into manageable chunks of information which are stored in memory. According to Roth and Frisby (1986) and Smyth (1987), although these objects, entities and events are individually different, they are treated in thought and language as members of the same conceptual category. The concept “dialysis”, for example, is a mental grouping of objects which are individually different (e.g., peritoneal dialysis, haemodialysis), but which also share similar characteristics (i.e., dialysate, semi-permeable membrane). If individuals did not have the ability to categorise the world around them, they would be constantly bombarded with new information. They would be unable to recognise or make sense of objects, entities or events because they would not have a category to attach to them (Roth & Frisby, 1986). The construction of concepts or conceptual categories is the means whereby individuals impose order on the world; they are mental representations of objects, entities, events, and so forth, which enable agents to understand them, remember them, communicate about them and know what to do with them (Baddeley, 1990; Howard, 1987; Roth &
Frisby, 1986). Conceptual categorisation, therefore, is central to all cognitive abilities (Roth & Frisby, 1986) and concepts are the building blocks of thought (Garnham & Oakhill, 1994).

The concepts a person constructs as a result of exposure to objects, entities and events may be clear-cut and/or fuzzy. Clear-cut concepts are typically constructed carefully, consciously and effortfully and, because of this, what they include is precisely delineated; they are also constructed serially from reading, research, lectures, and so on, and stored semantically, that is, as meanings. Fuzzy concepts, in contrast, are ill defined, that is, what they include is not precisely delineated, because they tend to be relatively unconsciously and incidentally acquired. They are constructed holistically as a result of repeated everyday experience and are stored, typically, both pictorially and semantically (Howard, 1987). It is not uncommon for a person to possess both clear-cut and fuzzy representations of the same category for use in different situations (Howard, 1987). For example, a zoologist would use a clear-cut concept of a dog when used for scientific work and a fuzzy representation of “dog” when talking to children (Greenwood, 1993).

According to Anderson (1995), concepts are not sufficient to represent all of an individual’s propositional knowledge about objects, entities and events; the memory tends to organise these concepts into larger, well-integrated chunks of knowledge called schemata. Like a concept, a schema is a mental representation from an individual’s experience, which is used to understand the world and deal with it (Eysenck, 1993;
Howard, 1987). Schemata, however, go further than concepts because schemata are designed to organise knowledge into larger patterned structures.

A haemodialysis schema, for instance, would consist of, at least, slots for “machine”, “extracorporeal circuit [blood tubing]”, and “dialyser [artificial kidney]” arranged in a sequence with the extracorporeal circuit attached to the dialyser and the machine. These typical attributes of haemodialysis represent the “default values” or expected schema of haemodialysis (Baltz-Salia, 1998). Finally, schemata are often linked to each other to create a hierarchy of concepts (see diagram 1 below), as information is far more easily remembered if it is structured and stored in the memory in an organised way (Smyth, 1987).

**Diagram 1   Schema for Renal Replacement Therapies (RRT)**

```
TET
```

Haemodialysis  Peritoneal dialysis  Renal Transplantation

Schemata are required for perception, comprehension, learning, remembering and pattern recognition (Howard, 1987; Smyth, 1987). Schemata provide a means to, firstly, filter, analyse and interpret the large amount of information coming through the senses by assisting individuals to recognise patterns. Secondly, they enable understanding or comprehension of experiential objects/events by allowing individuals to assimilate them into their existing conceptual structures. Thirdly, schemata assist
with recalling the gist, or the main idea, of some event rather than the event itself, that is, the data relevant to a schema is taken in and remembered and extraneous data is forgotten. Lastly, schemata can affect how much individuals can remember; having well-developed schemata for a specific domain allows them to take in and recall much more information.

Although individuals categorise and chunk together information into conceptual schemata, it is important to understand how they can then be translated into some type of action in order to have an effect on the world (Smyth, 1987). Procedural knowledge (see below, p. 28) of what to do is typically represented as action schemata or scripts (Anderson, 1995; Greenwood, 2000; Schanck & Abelson, 1977). Scripts prescribe what to do in specific circumstances, with many situations evoking stereotypic sequences of actions (Schanck & Abelson, 1977). Finally “schemata or scripts exist because they encode the predominant sequence of events in a particular kind of situation, they can serve as valuable bases for predicting missing information and for correcting errors in information” (Anderson, 1995, p. 164).

Each script contains “slots” that provide the sequence for a particular action. For instance, a nephrology nurse would have a script that tells the nurse how to perform a haemodialysis treatment. This script would contain slots for “selecting the appropriate equipment (e.g., dialyser, dialysate)”; “setting-up and priming a machine”; “patient assessment”; “establishing access to the vascular system (i.e., cannulation, accessing a vas cath)”; and “patient disconnection from dialysis circuit.” According to Greenwood (2000), each slot occurs in a particular order and can be filled with a variety of stimuli.
for example, while a different dialyser could be chosen, in general terms, the script would be the same. All human skills and activities are based, therefore, on scripts or action schemata.

Metaphors

Lastly, some concepts may be understood through the use of metaphors (Howard, 1987). Metaphors are frequently used to create new concepts and schemata in order to understand the world. In essence, a metaphor is a kind of comparison between two concepts in which some aspects of one are transferred to the other to highlight or assist in understanding its components (Ortony, 1993). They assist to bridge the gap between the known and unknown. For example, patients will have a better appreciation of the function of white blood cells when these are likened to soldiers of the body, defending against invading foreign organisms. As will be discussed in Chapter Three (see p. 88) and elsewhere in this thesis, an orchestral metaphor has been used as a conceptual label to explain the acquisition and exercise of nephrology nursing expertise.

Propositional and Procedural Knowledge

An individual's ability to function in the world is governed by knowledge about things (propositional knowledge) and knowledge about how to do things (procedural knowledge). Knowledge consists of facts and values (beliefs about the world) which are acquired through direct experiences of the world, and also through comprehension of verbal and written information. This form of knowledge is termed declarative (Anderson, 1995) or propositional knowledge (Ryle, 1949). Propositional knowledge is "knowledge-that." For example, that this is the thing to do, that this is the way to do it,
that this a good person, that we should be kind, and so on. Propositional knowledge is declarative knowledge because it can, in principle, be articulated, that is, individuals may be consciously aware that they have this knowledge and can (typically) verbalise this knowledge when providing explanations or justifications (Bereiter & Scardamalia, 1993). For example, in nephrology nursing, propositional knowledge includes the specific factual knowledge that a nurse has learnt about renal disease and its management (i.e., renal replacement therapies) and the appropriate values related to persons, nursing service, and so on. Propositional knowledge, once abstracted, resides in mental structures called semantic networks which organise, process and store ideas and their relationships in a person's memory using concepts, schemata and scripts (Cust, 1995).

Procedural knowledge is knowledge of how to do things, that is “know-how” (Anderson, 1995; Ryle, 1949) which is acquired through practice and the proceduralisation of propositional knowledge. Procedural knowledge manifests itself in performance (Bereiter & Scardamalia, 1993); it enables individuals to manage the world around them and to perform various cognitive and psychomotor activities such as solving a problem, writing an essay or driving a car. This form of knowledge, however, also includes elements which are, in principle, unarticulatable in that individuals are unable to describe explicitly the cognitive processes underpinning professional judgements and the activation of the requisite musculature (i.e., psychomotor component) to execute an action (Anderson, 1995; Greenwood, 1998; Polanyi, 1967). In nephrology nursing, for example, procedural knowledge informs the nurse how to cannulate a fistula correctly and the “feel” of correct cannulation.
Procedural knowledge resides in memory in the form of production rules which specify what actions should be taken when certain conditions are present (Cust, 1995). Production rules assist in problem solving and are expressed in a uniform way as sets of “if-then” statements (Anderson, 1995) in which “if” certain conditions or goals are present, “then” a certain action is performed (Greenwood, 2000).

For instance, to cannulate a fistula, a production rule might be:

\[
\text{If the goal is to cannulate a fistula} \\
\text{Then push the cannula (needle) into the fistula}
\]

Production rules, however, are not as simple as the example given above. Production rules can only become operationalised when there is an understanding of the planning required in exercising a particular skill (Greenwood, 1993). For instance, when the goal is to “cannulate a fistula”, this goal can only be achieved when other sub-goals such as “determine what equipment is needed,” “find this equipment,” “prepare this equipment,” and so on are operationalised. That is, each goal consists of layers or stacks of other goals which each need to be operationalised in turn until the action sequence, in this case, “push the cannula into the fistula” can be achieved. It is, according to Sloboda (1986), such goal stacks which give direction and structure to skilled behaviour.

Proceduralisation refers to the process through which an individual switches from explicit use of propositional knowledge to the direct application of procedural knowledge (Anderson, 1995). Studies undertaken by Anderson (1982) and Sweller,
Mawer and Ward (1983) revealed that, over time, individuals were able to convert declarative knowledge into procedural knowledge. Subjects in these studies were asked to either verbalise as they solved geometry problems (Anderson) or to solve kinematic problems on paper (Sweller, Mawer & Ward). In both studies novice students perfected skills to shorten or speed up the process to solve problems as they became more experienced with using these skills. We can draw from these studies that the progressive proceduralisation of typical or familiar actions frees up an individual's limited attentional resources to enable greater concentration to be focused on more difficult activities or the performance of several activities simultaneously (Bereiter & Scardamalia, 1993) or on dealing with unfamiliar situations (Greenwood, 2000; Tomlinson, 1995). Progressive proceduralisation, according to Anderson (1995), occurs during the associative stage of skill acquisition (see later, p. 44) and is characteristic of a person who has considerable experience with a task.

Theories of Cognition

Two theories of cognition provide some insights into how an individual normally processes information, the role of long-term memory in assisting cognitive functions and the differences between analytical and intuitive information processing. These theories¹ are, respectively, information processing and Hammond's (1996) cognitive continuum model.

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¹ Another theory of cognition, that of connectionism or parallel distributive processing has recently been postulated; see, for example, Bechtel and Abrahamsen (1991). It has not been included in this thesis, however, because its implications have not yet been fully assessed.

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These models can assist in understanding how individuals process information in order to perform an action and they form a basis for understanding how expertise is acquired.

**Information Processing Theory**

The information processing model described by Newell and Simon (1972) views the human as a system in which cognitive processing of information takes place through a central processor (Jones, 1989). According to Anderson (1995), this model is the dominant theory associated with the understanding of human cognitive functions and is concerned with the way in which people collect, store, modify, interpret, understand and use internally and externally generated information. The central processor receives input from the various sensory receptors with respect to objects, actions and events; this input is compared with what already exists in memory; a response to the input is chosen; and, finally, an appropriate plan is executed (Anderson, 1995; Jones, 1989).

Information is processed through short and long term memory structures. Short-term memory (STM) functions to provide rapid access to a limited amount of stored information that is readily available to the individual. The STM has been demonstrated to hold seven (7), plus or minus two (2), chunks of information at a time (Anderson, 1995; Miller, 1956). More recently, however, there appears to be evidence against a separate STM system as a halfway point to long-term memory, rather that information currently in use is controlled by the working memory (Anderson, 1995; Fisher & Fonteyn, 1994; Smyth, 1987). The working memory still contains a limited capacity to hold information while a central executive controls two support systems. These Baddeley (1986) termed the articulatory loop and the visuospatial sketchpad. The
articulatory loop is a storage device available to the central executive and is used to rehearse verbal chunks of information, and the visuospatial sketchpad is used for rehearsing visual images. Both of these systems are auxiliary systems for keeping information available to the working memory (Anderson, 1995).

The other component of memory is the long-term memory (LTM) which is thought to have an infinite storage capacity. However, information stored as schemata and scripts in the LTM may take longer to access.

The information processing model of cognition incorporates anticipatory, selective and constructive operations (Greenwood, 1998, 2000; Tomlinson, 1995). According to Tomlinson (1995), cognition is anticipatory in that it is directed by motives, plans, and goals; it is selective in perceiving what is relevant to these plans, motives and goals; and it is constructive in that what is perceived and stored is a function of both incoming stimuli and what the individual already has stored (i.e., capable of remembering and using appropriately).

Nephrology nurses need to be able to take in enough information to make sense of what is occurring around them but also they need to be able to respond to events as they happen. Existing knowledge structures within the LTM, therefore, are activated concurrently with what the nephrology nurse perceives or experiences, that is, current input triggers retrieval of relevant cues (Greenwood, 1998). For example, when nurses are exposed to environmental cues such as a haemodialysis machine conductivity alarm,
they will recognise that this alarm sounds different to other alarms and will automatically reach for the replacement bicarbonate dialysate cartridge.

Hammond’s Cognitive Continuum Theory

Kenneth Hammond, a psychologist, developed a framework for describing the many tasks that people are capable of performing, and the different types of thinking (cognitive operations) that they can use on these tasks. The elements of this framework are a range of kinds of cognition, a range of task conditions, and a range of modes of practice (Hammond, 1996). Kinds of cognition range from intuitive response through to analytical thought (Hamm, 1988). Intuition and analysis are at the opposite ends of a continuum, in which intuition involves “rapid, unconscious data processing that combines the available information by “averaging it” (p. 81). According to Hammond (1996), intuitive thought has low consistency and is only moderately accurate. At the opposite end of the continuum, analysis involves a “slow, conscious and consistent thought which is usually mostly accurate but can produce large errors” (Hamm, 1988, p. 81). The task a person is required to perform will influence which mode of cognition, intuitive or analytical, will be activated. The more structured a task, the more likely that the analytical mode of cognition will be dominant; the less well structured a task, the more an intuitive way of thinking will be adopted (Hamm, 1988; Thompson, 1999).

While analytical and intuitive thinking are extremes on either end of the continuum, most thinking, according to Hammond (1996), lies somewhere in between, that is, most thinking is neither purely analytical nor purely intuitive. However, the Cognitive Continuum Theory (CCT) can suggest the position on the continuum a particular task is

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more likely to occupy. Particular features of the task influence this position such as its complexity, its content, and the way in which the task has been presented (Hamm, 1988). Intuitive thought will more likely be stimulated when the following are present: 1) a large number of cues presented simultaneously; 2) the absence of a familiar principle to organise the task; and 3) a short time in which to make a judgement (Hammond, 1996; Hamm, 1988).

For example, a nephrology nurse is confronted by a patient receiving a haemodialysis treatment who vomits when they start to eat and complains of feeling light-headed, and then suddenly becomes unresponsive. The nurse must intuitively know how to respond to correct this life-threatening situation by reducing the dialysis fluid losses, turning down the blood flow rate, administering saline, and altering the patient’s position by elevating their legs. In this situation, an analytical mode of thinking would most likely result in the patient’s death due to its slow, deliberative nature. According to Hamm (1988), therefore, intuitive thinking is more dominant in clinical practice settings.

The CCT provides a formalisation of the age-old distinction between intuition and analysis (Hamm, 1988). The theory can assist the health care professional to:

(a) recognise the kinds of cognition, and the kinds of task that typically elicit them; (b) adjust his or her cognition so that it corresponds to the task, in the hope of increasing its accuracy; (c) change the task characteristics for a given patient to facilitate the form of cognition that is most likely to produce accurate answers for the patient; and finally (d) select appropriate techniques for applying a normative perspective to the case (p. 93).
The utility of Hammond's (1996) CCT for the present study is that nephrology nurses function within an environment that rests largely on: observation of patients; working within limited time frames; and, recognising and understanding multiple cues or information received from patients or from the nurse's own senses. According to Hammond and Hamm (1988), these functions will require nephrology nurses to utilise increasingly more intuitive cognitive processes to cope with the situations typically encountered in every-day practice. The views of Hamm and Hammond are apparently consistent in this respect with models of skills acquisition (i.e. Fitts and Posner, 1967; Dreyfus and Dreyfus, 1986, 1996; Benner, 1984) which are described in the following section.

The Nature of Skill

Skill has been defined as an ability or expertness that comes from training and practice (Delbridge et al., 1991). A skill in its narrowest sense involves the use of the hands or body and requires knowledge, understanding or judgement. Each individual has the capacity to develop a wide range of skills. The range includes those skills which require the organisation of sequences of movement as well as those that require the organisation and integration of information. Skills are organised with a purpose and are goal-directed (Tomlinson, 1995). In addition, skilled action relies on feedback from both sensory and motor input (Fitts & Posner, 1967) of both a corrective and/or validating nature. In summary, most skills are learned sequences of activities.

Tomlinson (1995) suggests that all skills can be classified broadly into either closed or open skills. Closed skills are those activities which are definable and predictable, for
instance, the skill required to turn on a light switch is definable in that the switch is moved into the “on” position or it is not. This skill is relatively predictable in that the light will come on when the switch is moved into the “on” position (providing, of course, that there is an electricity supply and the light bulb is not broken). The purpose of performing the skill “turning on the light switch” is to illuminate a dark room. Open skills, in contrast, are complex and unpredictable, for instance, the skill involved in driving a car is an open skill. Driving a car requires knowledge and understanding of the road rules, the ability to sequence activities (e.g., steering, accelerating, braking) and the ability to deal with unpredictable situations (e.g., pedestrians, other cars on the road). Nursing, according to Tomlinson’s classification of skill, is a complex, open skill; it requires the performance of numerous intricate actions which are interrelated with knowledge and values in somewhat unpredictable situations with the goal of providing safe and effective nursing care to patients.

Characteristics of Skilful Performance

Concepts central to cognitive psychology such as memory, problem solving, and reasoning have assisted in the study of expertise. Since the mid-1970s a great deal of research interest has generated data about skilful performance in such domains as chess (Chase & Simon, 1973; Gobet & Simon, 1998), mathematics (Anderson, 1995), medicine (Patel & Groen, 1991; Patel, Kaufman & Magder, 1996), physics (Chi, Feltovich & Glaser, 1981), music (Sloboda, 1976; 1996), and nursing (Benner, 1984; Benner, Tanner & Chesla, 1996). Research has primarily focused on comparing people at differing levels of skilfulness or expertise. Key characteristics of expert (i.e., skilful)
performance, generated from research undertaken since the 1970s, have been summarised by Glaser and Chi (1988).

Experts:

- excel mainly in their own domain due to the acquisition of highly specialised knowledge and skills relevant to that specific domain;
- perceive broad meaningful patterns in their particular domains;
- are fast; they are faster than novices at performing the domain skills; they recognise and correct problems with little error;
- have superior short-term and long-term memory;
- see and represent a problem in their domain at a deeper (i.e., more principled) level than novices; novices tend to represent a problem at a superficial level;
- spend time analysing a problem qualitatively; and
- have strong self-monitoring abilities.

In an apparent paradox, a person’s expertise (i.e., skilful performance) is often typified by a process in which there is an increase in their speed of action, with a progressive decrease in ability to articulate the reason why they perform in such a way. According to Anderson (1995), expertise is related first, to the way, or the extent to which, the individual proceduralises their knowledge; second, to the way the individual is able to learn tactically and strategically; third, to the way the individual develops problem representational and pattern learning skills; and, finally, to the way the individual utilises their long-term memory. The acquisition of expertise equates, therefore, with the development of a high level of comprehensive skilfulness.
Proceduralisation (see also above, p. 29) refers to the process by which a person's performance at a particular skill has become easier, faster, more fluent and increasingly and consistently effective (Anderson, 1995; Tomlinson, 1995). This is due to less reliance on propositional knowledge or knowledge that and greater ability to utilise procedural knowledge or knowledge how. Proceduralisation is central to expert performance in two ways: 1) proceduralisation enables the automatic triggering of skilled action for familiar or relatively simple mental and physical tasks, thus freeing up memory capacity for processing other less familiar or more complex aspects of skill (Glaser & Chi, 1988), and 2) experts recognise patterns which evoke straightforward condition-action (i.e., production) rules (see above, p. 31) which trigger a sequence of moves. For example, in examining taxi drivers' knowledge of routes, Chase (1983 cited in Glaser & Chi, 1988) found that expert drivers could generate a far greater number of secondary routes (i.e., lesser known streets or "short cuts") than novice drivers. Expert taxi drivers would recognise a shorter route while travelling to their destinations (i.e., when in the cab), even though they may not have generated this shorter route in the laboratory. Skilful performance (i.e., the acquisition of expertise), therefore, is a function of progressive proceduralisation of factual knowledge into skilled know-how in a specific domain; the extent of proceduralisation can be observed in the real-world setting where speed, fluidity, effort and accuracy can be noted.

When a skill is to be performed repeatedly, as in nephrology nursing, priming an extracorporeal haemodialysis circuit, a nurse will learn the sequence of actions that are required to do this task. In doing so, the nurse will develop production rules ("if-then" rules) to assist with problem solving when performing the skill. This is the way a nurse
will learn the sequences of actions or moves required to solve a problem (e.g., “how do I prime the extracorporeal circuit?”). Anderson (1995) termed this “tactical learning” in which a method or tactic, once it is employed, will accomplish a particular goal. Once learned, skilful performance is characterised by an ability to recall these tactics quickly without a need to search for other tactics. In more complex domains such as nursing, problems are not replicated exactly but components of problems do re-present and expert nurses remember the solutions to these components (Anderson, 1995).

Strategic learning, on the other hand, may be seen in the way an individual organises their solutions to a problem. For example, Patel and Groen (1991) found that medical experts generate their medical diagnoses by reasoning forward from a patient’s symptoms in order to generate a diagnosis, whereas less experienced medical students tend to check the correctness of a diagnosis by inspecting relevant symptoms. The different reasoning strategies employed by expert and novice medical doctors suggest that experts have acquired a way of organising and strategically learning a method of problem-solving that optimises the expert’s resources (Anderson, 1995). In this case, expert doctors have developed forward-reasoning strategies (i.e., the ability to diagnose a problem from the symptoms presented). They are able to do this because expert doctors have acquired extensive domain knowledge which provides them with built-in checks by which to legitimate their inferences (Patel & Groen, 1991). In contrast, novice medical doctors used backward-reasoning strategies because they have inadequate domain knowledge, and this prompts them to use a problem-solving tactic where they attempt to match a diagnosis to a known list of symptoms (Patel & Groen, 1991).
Experts also have the ability to represent in their cognitive structures key aspects of a problem in order to solve it more effectively. Anderson (1995) suggests that experts are able to identify problems through the recognition of intricate or deeper features rather than simple or superficial ones. This dimension of expertise is termed problem representation (Anderson, 1995).

During the 1960s, de Groot (1965, 1966 cited in Anderson, 1995) conducted research into novice and expert chess players. These studies identified that expert chess players were able to recall chess positions more quickly than novices. Chase and Simon’s (1973) study of chess players additionally revealed that expert chess players grouped or "chunked" information together in such a way as to increase the amount of information stored in the memory. A chunk is a package of information stored within a single structure, or schema (see above, p. 25). Chunking is a method of maximising information-processing capabilities, is developed from previous exposure to the object or event and is organised in the memory. This method of storage is more economical in terms of memory and processing resources. Chunking accounts for the finding that musicians (Sloboda, 1976) and by inference, experienced nurses, have increased amounts of information available in their short-term memories when compared with novices.

The last characteristic of skilful performance or expertise is the ability of experts to remember not only familiar patterns but also to remember larger patterns (Anderson, 1995). That is, experts are able to encode into their long-term memory more information concerning their domain of expertise. Gobet (1998) explains that an
expert’s apparently extensive long-term memory is due to: (a) the encoding of information with numerous and elaborated cues; (b) the increasing speed of information encoding and retrieval due to practice; and (c) the development of specific retrieval strategies which ensure that learned information is efficiently used.

Acquisition of Skill

Contemporary models of skill acquisition focus on the incremental or phasic nature of skills development (Fitts & Posner, 1967), the characteristics of different levels of expertise (Dreyfus & Dreyfus, 1996) and, the process of skill acquisition and the characteristics of relative skilfulness (Schmidt, Norman & Boshuizen, 1990)

The Phasic Acquisition of Skill

The earliest theory explaining the acquisition of expertise was described by Fitts and Posner (1967) and involves three progressive phases of skill development, namely, cognitive, associative and autonomous phases. Expertise acquisition is organised hierarchically and sequentially and involves both knowledge acquisition and practical performance. In order to demonstrate how information is organised hierarchically and sequentially, Fitts and Posner suggest that skill acquisition is similar to the way computers process data in that the operation of data processing systems is:

* governed by a program or sequence of instructions. Parts of the program may be repeated over and over again. These short, fixed sequences of operations are written as subroutines which may be called into play as units by the overall program. Such subroutines may be repeated over and over again until interrupted by the overall program. These fixed sequences are under the control of a higher level or*
executive program which provides the overall logical or decision framework that gives the system its flexible and adaptive characteristics (p. 10-11).

Fitts and Posner (1967) are suggesting therefore, that human activity relies on fixed units of information that can be incorporated into many different activities through various sequencings and timings. According to them, learning new skills involves integrating these new skills with those already learned, so that over time an extensive data bank of skills are available to an individual. This integration of new skills with old ones occurs in three phases, and each phase merges gradually into another until the individual can perform each new skill automatically.

These three phases in the Fitts and Posner theory of skills acquisition provide both a description of each phase of development and its characteristics:

1. Cognitive Phase

A beginner, when faced with a new situation, will attempt to understand the task and what it demands. This, according to Fitts and Posner (1967), is the first step in the development of an “executive program”, and has been termed the cognitive phase. During this phase an individual will acquire propositional knowledge (i.e., principles, rules) related to the task in hand. In this phase, knowledge has not been proceduralised (i.e., knowing “how,” without conscious recollection to guide performance). The beginner or novice in a skill-learning situation uses declarative or propositional knowledge in attempting to understand the skill and what is required to perform that
skill (Anderson; 1995; Fitts & Posner, 1967). This early phase is characterised by the learner focusing on (attending to) all attributes, cues and responses that are required to perform that skill; in later phases of skill learning these cues go unnoticed.

The propositional (i.e., declarative) knowledge is encoded and committed to memory where it can be combined with previously learned skills. This phase is characterised, therefore, by a blend of old ways of doing things, skills put together into new patterns and which can also be supplemented by newly acquired skills.

In nephrology nursing, for example, the cognitive phase of skill acquisition can be seen when a nurse, new to the haemodialysis unit, learns to set-up and prime a dialysis circuit for the first time. Generally the novice nurse will bring to the setting knowledge and routines associated with priming intravenous giving sets and the necessity to remove all in-line air. A more experienced haemodialysis nurse will demonstrate the technique of priming the dialysis circuit to the novice nurse who will then perform the skill under supervision. The novice haemodialysis nurse will memorise the placement of various portions of tubing and will follow the priming sequence demonstrated by the more experienced nurse. The performance by novice nurses is slower, less fluid and they are less able to problem-solve when something unexpected occurs, for example, when a clamp has been left in place inadvertently. In this phase of skill acquisition the novice haemodialysis nurse is unable to correct for errors that occur such as when the circuit will not prime, because they have not yet learned to identify errors in their sequences of action. Correction of these errors is typically seen in the next phase of skill acquisition, the associative phase (Anderson, 1995; Fitts & Posner, 1967).
2. Associative Phase

The associative phase is described as the second phase of skill acquisition (Anderson, 1995; Fitts & Posner, 1967). During this phase, the individual skill sequences which have been learned in the cognitive phase are integrated and practiced, and a successful plan for performing the skill emerges (Anderson, 1995). In this stage, according to Ericsson and Smith (1991), the individual develops efficient cognitive processes which allow for rapid cue identification and retrieval of information. In addition, over time, new sub-routines are completely integrated with older ones, so that the performance of a skill is fluid and faster than when initially introduced. Furthermore, according to Anderson (1995), this phase is characterised by the proceduralisation of propositional knowledge, that is, theoretical insight is progressively embedded in appropriate sub-routines and actions.

The associative phase may last for varying lengths of time and its length is dependent on the complexity of the skill, the intellectual capacity of the learner and the opportunity to practice (Fitts & Posner, 1967). In addition, errors, such as incorrect sequences of actions that were frequently seen in the cognitive phase are gradually eliminated as a result of practice and feedback (Fitts & Posner, 1967). In the associative phase, therefore, the novice haemodialysis nurse learns to prime the dialysis circuit successfully and to prevent, recognise and deal with problems such as clamped lines with greater speed and efficiency.
3. **Autonomous Phase**

The final phase of skill acquisition is the autonomous phase in which the procedure becomes more automatic, rapid and less subject to interference from other ongoing activities or other distractions (Anderson, 1995; Fitts & Posner, 1967). What this means is that the individual is required to use less conscious cognitive processing to perform an activity, thereby freeing up attentional resources to perform other activities (Ericsson & Smith, 1991). The more frequently and consistently a skill is practiced, the less conscious attention is required (Bargh & Barndollar, 1996; Smyth, 1987).

In nephrology nursing there are some skills that are performed routinely, such as setting up and priming a haemodialysis machine. Once nurses have performed this procedure many times and have perfected the skills required, they will be able to divert cognitive attention elsewhere whilst the machine is priming. For example, they might cannulate the patient’s fistula so that the patient and machine are ready simultaneously. The steps involved in priming the machine, therefore, have become proceduralised and the skill is automatically performed. Nurses with less experience will stand and watch the machine until it finishes its priming sequence. Practice and experience at performing a particular procedure, therefore, leads to the development of automaticity in which skilled action is performed effortlessly and unconsciously (Anderson, 1995).

From this model of learning, it is clear that repeated practice plays an important role in the acquisition of improved performance (Ericsson & Smith, 1991). According to Bereiter and Scardamalia (1993), the Fitts and Posner phases of skill acquisition characterise all forms of learning. They suggest that pattern learning and
proceduralisation constitutes a process through which the novice and experienced non-expert as well as the expert will progress. If an individual practices (i.e. exercises) an activity for long enough, the patterns and procedures will form by themselves. "This is the normal course of learning [and] consequently, if we are to discover anything distinctive about expertise as a process, it must consist of something that goes on over and above this normal course of learning" (Bereiter & Scardamalia, 1993, p. 91).

The Dreyfus and Dreyfus Model of Skill Acquisition

Benner's (1984) seminal research on nursing expertise applied and adapted the Dreyfus brothers' model of skill acquisition which argued that a person usually passes through at least five levels of relative skilfulness (Dreyfus & Dreyfus, 1986; 1996). The Dreyfus brothers believe theory and practice are intertwined and that skill acquisition moves from a reliance on abstract principles such as a theory to the use of particular concrete cases to which an individual can refer to when making decisions (Dreyfus & Dreyfus, 1996).

The Dreyfus' model is unique in that it emphasises the situationally specific nature of knowledge used in practice and that this knowledge is gained from experience (Macleod, 1993). In addition, Macleod (1993) suggests that the development of expertise in the Dreyfus model is a three-dimensional process that involves:

1. A change from employing abstract principles to observe and interpret predicaments, to relying on past experiences as a foundation for judgement.

2. A transformation from partial understanding in the way a situation is understood to one which reflects an immediate grasp of the event.
3. A change of focus that sees the individual move from being an observer to an active participant in the situation.

The Dreyfus model of skill acquisition was initially developed from a study of airline pilots and chess players (Dreyfus & Dreyfus, 1996) in which an individual passes through a learning process of five levels. These levels were novice, advanced beginner, competent, proficient and expert. In applying the Dreyfus model of skill acquisition to nursing, Benner (1984) was able to identify the key features of a nurse who was practicing at a particular level within the model. These key features have been summarised below.

Level 1: Novice

At this level, according to Benner (1984), the nurse has no prior knowledge of, or experience in, the situation in which they are expected to perform. The novice’s actions are guided by context-free rules which are theoretical and principle-based, reflecting the objective attributes of a situation. The utilisation of such rule-governed behaviour is seen in the novice’s limited and inflexible practice (Dreyfus & Dreyfus, 1996). This can be attributed to their lack of personal experience in such situations, impelling them to rely on rules to govern their practice. Considerable effort is required to concentrate on the task at hand, with the result that they ignore other cues presented to them. For example, the novice haemodialysis nurse will focus on getting the cannula into the fistula correctly and will ignore the patient’s discomfort (e.g., facial expression, muscle tension in limb surrounding the fistula) which suggests that the fistula has not been successfully cannulated, or was unnecessarily painful.
Level 2: Advanced Beginner

At this level, the individual has coped with enough real situations to recognise familiar cues in certain clinical situations. Unlike the novice nurse who calls up rules or context-free attributes, the advanced beginner is able to recognise broad or global characteristics of a situation with which they have had prior experience. The novice nurse is unable to differentiate between the relative importance of certain events. By contrast, the advanced beginner has learned through previous actual nursing experiences to recognise particular situations (Dreyfus & Dreyfus, 1996). Nurses who practice at the advanced beginner level can demonstrate marginally acceptable performances while still requiring assistance with priority setting and managing complex situations (Benner, 1984).

Level 3: Competent

This level is typified by nurses who have had the same clinical position for two to three years and can see their actions as a means of achieving long range therapeutic goals or plans (Benner, 1984). Nursing care is planned, deliberate, and based on a conscious, analytical contemplation of the problem at hand. The nurse is now capable of seeing beyond the immediate task to its broader situational context. This is different from the earlier levels where the nurse focused on performing the task. The competent nurse is efficient, organised and is able to master and cope with most aspects of clinical nursing practice. The competent nurse, however, lacks the speed and flexibility of the proficient nurse.
Level 4: Proficient

According to Benner (1984), at this level the nurse visualises situations as wholes. Maxims or precepts guide their practice. Maxims reflect typical exemplars of a situation and require a deeper understanding of the situation than a competent nurse would exhibit. Based on this deeper understanding, the nurse’s perception of a situation has altered. Greater experience and exposure to particular situations assists the nurse to focus on the whole problem. The nurse is able to home in on a particular problem and deliver nursing care in terms of long-term goals for the patient. The proficient nurse will increasingly rely on [using Benner’s term] “intuition” to deal with problems, and this intuitive ability has developed from prolonged exposure to similar situations. Benner suggests that nurses typically will function at the proficient level when they have been providing nursing care for the same or similar patient populations for three to five years.

Level 5: Expert

Benner (1984) suggested that nurses at this level no longer employ analytical principles to provide a connection between situational understanding and action. Expert nurses possess extensive experience which enhances their ability to appreciate a situation intuitively and to focus on the problem comprehensively without wasting time. The expert operates from a deep understanding of the total situation. This comprehensive grasp of the multiple factors impinging on a given situation can make describing the essence of their performance difficult.
The strength of the Dreyfus model is that it provides strong arguments for tacit knowledge and intuition as critical features of professional expertise (Eraut, 1994; Thompson, 1999). The model also accounts for the greater complexity of professional nursing work and the longer time, by comparison with less skilled nurses, needed to develop expertise.

Eraut (1994) cautions, however, that the Dreyfus model has several problems. The main problem is that it only allows for the process of learning from experience. As someone gains more experience, their memory is filled with cases or examples upon which to draw to solve problems. According to Bereiter and Scardamalia (1993), when it comes to explaining the development of expertise, this does not lead anywhere “except back to the familiar standbys of time and experience” (p. 17). As an individual spends more time doing something they gain experience doing it, and this is what the Dreyfus model suggests is the path to expertise. However, as argued previously by Bereiter and Scardamalia in relation to Fitts and Posner’s phases of skill acquisition (see above, p. 42), the Dreyfus model is also unable to account for the difference between experts and experienced non-experts.

**Model of Medical Expertise**

Schmidt, Norman and Boshuizen (1990) proposed a four-stage theory of medical expertise development in which the contents of an individual’s memory explain the difference between non-expert and expert physicians. The theory rests on three assumptions: first, that medical students progress through several transitory stages that are characterised by the development of different knowledge structures (memory
networks); next, that knowledge gained over time is available for future use when the situation demands its activation; and, finally, that experienced physicians rely on knowledge structures called “illness scripts.” These illness scripts develop through continuous exposure to patients and result from extended practice (Schmidt, et al., 1990). Schmidt et al. believe that medical staff move through four stages of knowledge development of which the first two stages are reached during training (university education). Each stage of the theory of the development of medical expertise is summarised below.

Stage 1: The Development of Elaborated Causal Networks

During medical training, students rapidly develop richly elaborated causal networks that explain the causes and consequences of disease in terms of general underlying pathophysiological processes. This knowledge has largely been derived from lectures and books and represents propositional knowledge (Eraut, 1994). The causal networks become increasingly complex and elaborated as a result of continued theoretical input, but there is limited understanding of the variability with which disease manifests in reality (Schmidt et al., 1990).

Stage 2: The Compilation of Elaborated Networks into Abridged Ones

The elaborated causal networks formed during stage one are compressed into high-level, simplified models. Extensive exposure to the clinical setting and repeated application of networks allows senior medical students to take shortcuts in their reasoning. Schmidt et al. (1990) suggests that an elaborate knowledge base has been compiled and then organised into a cluster of higher-level concepts known as schemata.
Stage 3: Emergence of Illness Scripts

Schmidt et al. (1990) suggested that as experience becomes more extensive the abridged causal networks emerge as templates or illness scripts. The concept of illness scripts was derived from Feltovich and Barrows (1984) who suggested that physicians reorganise their knowledge of pathology, clinical manifestations of disease, variability in signs and symptoms, and the constraints under which certain diseases may occur into scripts that are linked together by their causal relationships. An illness script implies a scenario of events that occurs in a certain order. Schmidt et al. state that in this stage “problem solving in routine cases is a process of script search, script selection, and script verification” (p. 615).

Stage 4: Storing Patient Encounters as Illness Scripts

In this final stage, it is suggested that generic illness scripts, with exemplars of previous patients are retained as individual items in the memory, and that expert practice is based on the similarities between one patient and another (Schmidt et al., 1990). In like manner, it is hypothesised that the expert nephrology nurse will recognise a patient problem simply on the basis of its similarity to one previously encountered. The recollections of prior patients are stored in long-term memory which makes them easily accessible.

In this present study of nephrology nurses, the advantage of the theory of medical expertise, presented by Schmidt et al. (1990), is that it confirms not only that expertise is domain-specific but that nurses in the same domain will differ according to their accumulated store of illness scripts (Eraut, 1994). Schmidt et al. are suggesting that
"expertise is associated with the availability of knowledge representations in various forms, derived from both experience and formal education" (p. 618). It is the relationship of experience (informal or on-the-job knowledge), formal education in nephrology nursing practice, and other personal characteristics that will be examined in this present study of expertise acquisition in nephrology nursing.

**Comparison of Three Models of Skill Acquisition**

The three models of skills acquisition described above have areas of commonality to assist the understanding of expertise acquisition; see Table Two. There are, however, interesting dissimilarities between them.

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**Table 2  Typology of Expertise Acquisition**

<table>
<thead>
<tr>
<th>Fitts &amp; Posner</th>
<th>Dreyfus &amp; Dreyfus/ Benner</th>
<th>Schmidt, Norman &amp; Boshuizen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive phase ▼</td>
<td>Novice level ▼</td>
<td>Development of Causal Networks ▼</td>
</tr>
<tr>
<td>Associative phase ▼</td>
<td>Advanced Beginner to Competent level ▼</td>
<td>Elaborated Causal Networks and Emergence of Illness Scripts ▼</td>
</tr>
<tr>
<td>Autonomous phase</td>
<td>Proficient to Expert level</td>
<td>Patient Encounters Stored as Illness Scripts</td>
</tr>
</tbody>
</table>

Firstly, the initial phase of the skills acquisition model (Fitts & Posner, 1967) suggests that learning is predominantly of propositional or declarative knowledge, that is, information gained from textbooks or presented at lectures. Beginners are taught about the task at hand (Benner, 1984; Schmidt, et al., 1990), and the beginner attempts to understand the task and what it demands (Fitts & Posner, 1967). This feature is also
seen in the novice level of the Dreyfus model and the first stage of the Schmidt et al. model in which the beginner will develop causal networks.

Secondly, as learning continues, each of the models suggests that skilfulness (expertise) is acquired systematically over time due to additional experience and practice at the particular activity. The amount of time an individual may take to develop expertise at a particular activity is related to its complexity, the amount of exposure to the activity and repeated practice of it (Fitts & Posner, 1967; Schmidt et al., 1990). However, Benner (1984) in applying the Dreyfus model to nursing disagrees. She suggests that the time taken to progress from being a novice to a competent nurse is “typified by the nurse who has been on the job in the same or similar situations [for] two to three years” (p. 25). That progress to proficient performance takes three to five years. Expert level performance takes, according to Benner, greater than five years as the expert nurse needs to gather an enormous amount of background experience in dealing with particular situations.

Clearly there is commonality between the first levels of all these models. The need to rely on previously learned sub-routines is apparent. Other common characteristics at this level include: firstly, the individual is attempting to grasp the situation and forge links between what has been taught and what is seen or experienced in practice; secondly the individual lacks speed and flexibility to deal with varying situations and events because opportunities for experience and practice with a particular skill or in a particular field are only just beginning; and, lastly, cognitive processing occurs in a
stepwise fashion because information has not been grouped or chunked together. Proceduralisation of knowledge has not yet occurred.

At the second level, all models describe the individual learner as being able to link knowledge of what to do (propositional knowledge) with how to do it (procedural knowledge). This has been achieved through repeated practice (and feedback) in particular task situations. In addition, information has been organised into manageable chunks that enable faster and smoother access to what must be done. Shortcuts for action (Schmidt, et al., 1990), production rules (Anderson, 1995), scripts (Schmidt et al.) or sets (Benner, 1984) start to develop. In addition, errors in judgement and action diminish (Fitts & Posner, 1967).

At the last level, practice has become automatic (Fitts & Posner, 1967) as the individual has a deeper understanding of the event based on extensive previous experience (Benner, 1984; Schmidt, et al., 1990). Individuals at this level in any of the models can draw on their previous experiences in order to understand and do what is required in a particular situation, with greater speed and efficiency of thought and action than at any other level.

Interestingly, all three models explicitly recognise that repeated practice is required for the development of expertise yet they fail to elucidate further on the relationship of skill acquisition and skills exercise.
Practice is also usefully construable as exercise, that is, the opportunity to perform a skill in a given task situation and acquire feedback. Expertise or skill is acquired incrementally through exercise and, by implication, is maintained through exercise. Experts do not first acquire skills and then exercise them; rather, they acquire skills and continue to refine them through repeated exercise. Repeated exercise provides opportunities to acquire and proceduralise additional propositional knowledge related to the task in hand. This additional propositional knowledge is acquired, either implicitly or explicitly, through feedback.

Of course, it is the case that the more expert practitioners are, the less they can potentially learn in each “new” task situation in which their skills are deployed. This is because they have encountered (very) similar situations, containing (very) similar aspects, cues and results frequently before. Nevertheless, each “new” task situation has the potential to provide additional propositional knowledge to progressively refine the situationally relevant skills. (The nature of the relationship of skills acquisition and exercise is reflected in the title of this thesis).

There are, however, as indicated above, differences between the three models. Firstly, Fitts and Posner (1967) and Schmidt et al. (1990) recognise that previously acquired knowledge remains available to use in new situations. Prior learning from previous courses or exposure assists in acquiring skilfulness (Greenwood, 2000), and it is these previously learned experiences which can be reactivated when needed to solve a new problem. The Dreyfus model (1986) and Benner’s application to nursing (1984) both seem to ignore prior learning. This is problematic in that novices do bring some

*Chapter 2: Literature review of cognition and skill*
knowledge to a situation before any further learning takes place (e.g., undergraduate nursing classes, first-aid certificate). For instance, novice haemodialysis nurses will bring knowledge of intravenous therapy and priming giving sets to the new situation when they are learning to prime a dialysis circuit. Prior knowledge is aggregated when learning a new procedure. For example, novice haemodialysis nurses have already learnt the principles of maintaining asepsis (not allowing the tubing to lay on the floor, not contaminating the ends of uncapped tubing), and principles of preventing air embolism (the need to remove all air pockets and fill the tubing completely with sterile solution). Prior learning, therefore, is an important aspect of skills acquisition and the development of expertise.

The second important difference between the models is that the Schmidt model relies explicitly on the structure and function of human memory. In this model, memory is the basis of the differences seen between students and practicing professionals (Schmidt, et al., 1990). Memory, in terms of proceduralising information, is implicit in Fitts and Posner’s model in that previously acquired knowledge or routines are blended with new ones. This is not the case with the Dreyfus model and Benner’s application of it to nursing. The Dreyfus model suggests that individuals rely increasingly on intuition as expertise develops (Thompson, 1999). The information processing system (see above, p. 32), however, suggests that intuition is really a function of expert information processing, that is, information processing at level five which, in turn, is a function of (relatively) complete proceduralisation (Gobet, 1998). This point seems to have been ignored or overlooked by the Dreyfuses and Benner.
The last apparent difference between the models is the way each explains the movement from one level to the next. Fitts and Posner (1967) and Schmidt et al. (1990) hypothesise the mode of this transition. They all suggest that significant progression from one level to the next is due to the development and emergence of particular knowledge structures. These structures involve the formation of schemata and scripts which include both propositional and procedural knowledge. In contrast, Dreyfus and Dreyfus (1986) and Benner (1984), suggest only that more experience in a specific area assists with this transition process; they do not explain, however, how learning from experience qualitatively assists in the process of moving from one level to the next.

Chapter Summary

Human cognition is purposeful and goal-directed; it involves a range of processes directed towards rendering incoming stimulation (experience) meaningful and executing the appropriate, adaptive response. The construction of concepts and schemata enable human beings to render their experiences meaningful and manageable. They are internal knowledge structures which categorise information relating to objects, events, actions into manageable chunks; they are constructed both consciously and relatively unconsciously in response to experiential stimulations. Concepts and schemata represent both propositional and procedural knowledge; propositional knowledge is progressively proceduralised in skills acquisition.

Human information processing, that is, the construction, selection and deployment of appropriate, adaptive concepts and schemata, involves sensory receptors; short term (or working) memory; articulatory loop and audio-visual scratch pad; and, long term
memory. It is also anticipatory, selective and constructive. In addition, it involves a range of cognitive modalities, from analytic to intuitive thought. How individuals processes information is a function of the complexity of the task situation and the concepts and schemata they possess.

Skills are learned capacities or competencies which are developed through practice; they may be open or closed. Nursing is a complex, open skill; it requires the performance of numerous actions, informed by propositional and procedural knowledge (including values) in unpredictable clinical situations.

The acquisition of skill is phasic in nature. Initially it is conscious, effortful and error-prone and involves the reconfiguration of existing actions and subroutines. Through feedback-governed practice it becomes less conscious, effortful and error-prone until the appropriate deployment of the acquired skill becomes automatic. The phases of skills acquisition have been characterised as cognitive, associative and autonomous.

It has been suggested that individuals progress through five levels of relative skilfulness in the acquisition of expertise; these are novice, advanced beginner, competent, proficient and expert. It has also been suggested, with particular respect to medical practitioners, that expertise develops through four stages. These are: the development of elaborated causal networks; the compilation of elaborated causal networks into abridged ones; the emergence of illness scripts; and, the storing of patient encounters in scripts.
All of these models either explicitly or implicitly recognise that the acquisition of skilfulness is a function of the acquisition and progressive proceduralisation of propositional knowledge into complex action schemata or scripts. In addition, they all explicitly recognise that skills acquisition is phasic or processual in nature.

What this implies is that the meaningful investigation of expertise acquisition requires a methodology which is sensitive to this processual nature. Grounded theory methodology was developed to investigate processes; accordingly, it was selected as an appropriate methodology with which to study the acquisition and exercise of nephrology nursing expertise.

Chapter Three focuses on grounded theory methodology.
CHAPTER THREE

Grounded Theory Methodology

Introduction

The chapter will focus on literature relevant to grounded theory, its historical background and essential features. This will include the identification of important differences in the views of Glaser (1978, 1992, 1996) and Strauss and Corbin (1990, 1998), particularly as these relate to the roles and timing of literature review, coding and memoing. Symbolic interactionism, the theoretical framework supporting grounded theory research, its connection to grounded theory, and its relevance for this study will also be addressed. This will be followed by an examination of the use of metaphor within the interpretative paradigm as a means of adding depth and explanatory power to the research findings.

Chapter four will provide a detailed description of how grounded theory method was applied to this study. There will, however, be some discussion of application in this present chapter, at appropriate junctures, to ease exposition. In addition, this chapter will discuss the place of the researcher’s pre-existing theoretical sensitivity as a member of the group being studied. The advantages and disadvantages of being an “insider” are discussed and a full account of the strategies implemented by the researcher to minimise researcher bias in this study will be addressed.
Grounded Theory Method

Grounded Theory – a definition

Grounded theory methods are used to investigate social and psychological phenomena (Glaser, 1978; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990) in which the objective is to develop a theory, generated from a highly systematic research process, capable of explaining basic patterns of common interaction in particular contexts (Chenitz and Swanson, 1986; Strauss, 1987). Using this method, the researcher attempts to understand the meaning of concepts, things, events and situations as they interact in natural settings [the field] (Glaser, 1992; Glaser & Strauss, 1967; Strauss & Corbin, 1990). Grounded theory is a member of the interpretive (qualitative) family of research methods (Glaser, 1992; Strauss, 1987; Strauss & Corbin, 1998) or paradigm, whose ontological, epistemological and methodological focus is different from traditional, social science research (Annells, 1996; Noerager Stern, 1994).

A paradigm, according to Guba and Lincoln (1994), represents a particular view of the nature of reality, how it should be studied and what methods can be used to study it. A paradigm provides the lens of the researcher (Phillips, 1990); that is, the researcher’s beliefs about reality, how to understand it, and how to capture (research) it. According to Denzin (1994), there are four major paradigms in research, that is, positivism, post-positivism, constructivism and critical theory. These paradigms denote the particular ontological, epistemological and methodological beliefs of the researcher and guide research methods. Researchers posit themselves in one of these paradigms by addressing self-reflective questions related to their ontological (reality), epistemological
(understanding) and methodological (research) perspectives (Denzin, 1994). These self-reflective questions, according to Guba (1990) are:

1. **Ontological:** What is the form and nature of reality? What can be known about reality?
2. **Epistemological:** What is the nature of the relationship between the researcher and knowledge?
3. **Methodological:** How should the researcher go about finding out whatever she or he believes can be known?

Table three (p. 66) summarises the answers to the above questions in order to distinguish between the four major research paradigms.

Grounded theory has been reported to fulfil the ontological, epistemological and methodological requirements of the postpositivist paradigm (Annells, 1996; Annells, 1997a; Denzin, 1994; Guba & Lincoln, 1994). According to Annells (1996), the ontological position of critical realism is prominent in both symbolic interactionism and grounded theory. Annells suggests that the social and natural worlds both have forms of reality that are probably apprehendable, where the “true meaning” (Glaser, 1992, p. 55) of a social process is grounded in the data. Furthermore, Strauss and Corbin (1990) state, “in developing a grounded theory we are trying to capture as much of the complexity and movement in the real world that is possible, while knowing that we are never able to grasp all of it [my emphasis]” (p. 111).
Table 3  Four Major Research Paradigms

<table>
<thead>
<tr>
<th><strong>Positivism</strong></th>
<th><strong>Postpositivism</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontological Position - Realism</strong></td>
<td><strong>Ontological Position – Critical Realism</strong></td>
</tr>
<tr>
<td>- A belief that there exists a reality “out there” independent of human observation which is law governed, predictable and controllable.</td>
<td>- Reality does exist but cannot be fully (perfectly) apprehended.</td>
</tr>
<tr>
<td><strong>Epistemological Position - Objectivist</strong></td>
<td><strong>Epistemological Position – Modified Objectivist</strong></td>
</tr>
<tr>
<td>- The researcher holds an objective (independent) position to avoid influencing or affecting reality</td>
<td>- Objectivity is an ideal but difficult to achieve; researcher therefore “comes clean” about her/his own predispositions.</td>
</tr>
<tr>
<td><strong>Methodological Position - Experimental</strong></td>
<td><strong>Methodological Position – Modified Experimental</strong></td>
</tr>
<tr>
<td>- Variables are manipulated to establish law-like relationships between phenomena.</td>
<td>- Aims to redress the problems of positivism by doing research in natural settings, using more qualitative methods to collect situational information.</td>
</tr>
<tr>
<td>- Numerical data is generated.</td>
<td>- Can generate either numerical or non-numerical data.</td>
</tr>
<tr>
<td></td>
<td><strong>NB: Grounded theory method is consistent with this position.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Critical theory</strong></th>
<th><strong>Constructivism</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontological Position – Historical Realism</strong></td>
<td><strong>Ontological Position - Relativism</strong></td>
</tr>
<tr>
<td>- There is a virtual and apprehendable reality which has been shaped by numerous values over time.</td>
<td>- Realities are apprehendable as multiple, mental or social constructions.</td>
</tr>
<tr>
<td><strong>Epistemological Position – Transactional and Subjectivist</strong></td>
<td><strong>Epistemological Position – Transactional and Subjectivist</strong></td>
</tr>
<tr>
<td>- The researcher and the researched are interactively linked, with the values of the researcher influencing the inquiry.</td>
<td>- The researcher is subjectively and interactively linked in relationship to what can be known (similar to critical theory position).</td>
</tr>
<tr>
<td><strong>Methodological Position – Dialogic and Dialectical</strong></td>
<td><strong>Methodological Position – Hermeneutical and Dialectical</strong></td>
</tr>
<tr>
<td>- Requires a dialogue between the researcher and the researched with the aim of uncovering experiences.</td>
<td>- Individual constructions are elicited through an interaction between and among the researcher and the researched until a consensus construction emerges.</td>
</tr>
<tr>
<td>- Non-numerical data are generated.</td>
<td>- Non-numerical data are generated.</td>
</tr>
</tbody>
</table>

(Adapted from: Annells, 1996; Clark, 1998; Denzin, 1994; Guba, 1990; Guba & Lincoln, 1994; Norton, 1999; Schwandt, 1994).
Lastly, grounded theory methodology dictates that research is undertaken in the natural or real world setting, using data collection methods such as participant observation and interviewing, to reveal the social processes that are occurring (Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990, 1998).

The Purposes of Grounded Theory

One of the major uses of grounded theory has been in preliminary, exploratory, and descriptive studies (Glaser & Strauss, 1967; Glaser, 1978, 1992, Strauss, 1987; Strauss & Corbin, 1990, 1998). Grounded theory method is a systematic way to derive theories which can account for human behaviour. Glaser and Strauss (1967) developed grounded theory as a way of arriving at a theory suited to its supposed uses; that is, the theory has meaning, is relevant and is useful for practice. By developing theory, the researcher seeks to explain the basic social process experienced by a group of participants interacting in a particular context or setting.

According to Miller and Fredericks (1999), the grounded theory approach has become the paradigm of choice in much of the interpretative orientated research in education (see for example Buckham, 1998; Martinez-Pons, 1998), nursing (see for example Hutchinson, 1990; Pyles & Stern, 1983; St John, 1998; Whittaker & Albee, 1996; Woodcock, 1999) and other disciplines (see for example Beech, 2000; Jensen, Gwyer & Shepard, 2000). Research using grounded theory methodology can also be found in medicine, which, typically, staunchly advocates quantitative methods (see for example Featherstone & Donovan, 1998; Thom & Campbell, 1997).
Relevance of Grounded Theory to this Study

Grounded theory was the method of choice for this study for several reasons. Firstly, grounded theory is of most use when little research in the subject area has been completed (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Whilst most quantitative approaches to research may be appropriate to test theories, theory testing cannot be attempted when there is no theory to test (Smith & Biley, 1997), when variables relevant to the concepts have not yet been identified (Chenitz & Swanson, 1986), or when existing theory fails to answer research questions (Glaser & Strauss, 1967). As stated in chapter one (p. 19), relatively few studies of the acquisition and exercise of nursing expertise have been undertaken and none have focused on nephrology nursing. The intention of this study, therefore, was to examine an area of nursing that had not previously been studied (nephrology nursing) in order to add to the incomplete body of knowledge of expertise acquisition in nursing.

Secondly, grounded theory is also particularly useful when “real-life” situations need to be explored. According to Glaser and Strauss (1967) “firsthand immersion in a sphere of life and action …yields important dividends” (p. 226). This study sought to examine nephrology nursing as it occurred in the “real-life” clinical world with the purpose of capturing observational evidence of expert practice and of the manner in which expert practice differs from non-expert practice. It sought, therefore, to develop a substantive theory of nephrology nursing expertise and advance the nursing profession’s knowledge of nursing expertise acquisition and its exercise from a description of what is happening, to understanding the process by which it happens, and to theorise about it. Grounded theory, therefore, provides a means of researching, through careful and systematic
investigation in the real world, nephrology nursing practice, its purposes and meanings, in order to facilitate a portrayal of the reality of nursing expertise acquisition and its exercise.

**Historical Overview of Grounded Theory**

Two Chicago sociologists, Barney Glaser and Anselm Strauss, while undertaking research into health professionals’ interactions with dying patients during the 1960s (1965, 1968), first described the method of grounded theory as it developed from a combination of sociological and nursing perspectives (Thorne, 1991). According to Glaser (1992) and Strauss and Corbin (1998), Strauss was influenced by the University of Chicago’s history of qualitative research, symbolic interactionism (see below, p. 71) and pragmatism. Glaser himself, however, was influenced by Lazarsfeld’s analytical techniques as they were applied to both qualitative and quantitative analysis. Glaser and Strauss (1967) deliberately sought to develop a research methodology to challenge the dominant positivist (quantitative) research paradigm of theory verification. Both Glaser and Strauss believed that the need “to stick to the data, to be in the field, and generate theory that respects and reveals the perspective of the subjects in the substantive area under study” (Glaser, 1992, p. 17) was paramount. Grounded theory became for both Glaser and Strauss a method designed primarily to generate theory from data (i.e., grounded in empirical data) rather than to validate existing theory through theory testing (Bowers, 1988; Glaser & Strauss, 1967; Lincoln & Guba, 1985; Strauss, 1987).

Grounded theory method, therefore, relies primarily on the process of induction rather than deduction and verification. In grounded theory, induction requires the researcher
to constantly compare data to every other piece of data, until a theory emerges that explains the social phenomenon under investigation (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1998). During the inductive process, hypotheses are generated from the data which the researcher then verifies through either a meticulous review of field notes/interview transcripts or by revisiting the field (Strauss & Corbin, 1990). Typically, grounded theory requires the researcher to move continuously from inductive to deductive to inductive thinking during data analysis.

During the 1970s many researchers employed grounded theory methods (Benoliel, 1996) despite experiencing some difficulty in identifying the core category, understanding the intention of theoretical sampling and presenting basic social processes (Glaser, 1996; Robrecht, 1995). In order to address these difficulties and to explicate the grounded theory method, additional publications by Glaser (1978, 1992, 1994, 1995, 1996), Strauss (1978) and Strauss and Corbin (1990, 1998) were written. Whilst these publications achieved their desired effect of clarifying the “how to do a grounded theory study”, the later publications (Glaser, 1992; Strauss & Corbin, 1990, 1998) reflected a methodological warfare (see below, p. 75). This related to a purported deviation on the part of Strauss and Corbin from “classical” grounded theory to a mere “full conceptual description” (see, for example, Annells, 1996; Glaser, 1992; Morse, 1994; Robrecht, 1995). Regardless of this debate, grounded theory as a research method has gained recognition and acceptance by nurses, because the method takes account of the social context of nursing (Benoliel, 1996; Corbin, 1986a; Lowenberg, 1993). Holloway and Wheeler (1996) believe, furthermore, that nurses, who normally

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practice in an orderly and systematic manner, find the processes of grounded theory appealing.

**Symbolic Interactionism**

Symbolic interactionism, a theoretical perspective of human behaviour, originated at the University of Chicago during the 1920’s in the School of Sociology where it influenced the teaching of George Herbert Mead and, later, research by Herbert Blumer (Bowers, 1988; de Laine, 1997). Symbolic interactionism is a theory about individual human behaviour which focuses on the meaning of events to people in natural, everyday settings (Benzies & Allen, 2001; Blumer, 1969; Chenitz & Swanson, 1986), in which individuals attempt to fit their lines of action to those of others. They achieve this by taking the role of the other (Mead, 1934) or seeing the world from the perspective of other people (Charon, 1995), interpreting this world and then reorganising their own behaviour (de Laine, 1997; Holloway & Wheeler, 1996).

The central concepts of symbolic interactionism are the self, the world and social action (Charon, 1995). The self comprises two components, the “I” and the “Me” (Mead, 1934). The “I” is the individual and personal dimension of the self (de Laine, 1997) which interprets signs from the world in which I live and tells the “Me’s” how to act in certain situations (Bowers, 1988). The “Me” is the social dimension of the self “that can be identified and talked about. It is who I am ...” (Bowers, 1988, p. 37). For symbolic interactionists, the self is composed of many types of “Me” which can exist simultaneously or consecutively and change over time. From birth and continuing over an entire lifetime, a person develops multiple “Me’s” through a process of receiving and

Chapter 3: Grounded theory methodology 71
interpreting social cues from the world around her/him. The “I” synthesises the cues received by “Me” and then tells “Me” how to act (Benzies & Allen, 2001; Bowers, 1988; de Laine, 1997; Mead, 1934). A person, for example, could be a nephrology nurse, parent or student depending on the context (i.e., renal unit, home, university) in which s/he finds her/himself and will act according to that role. The self develops, therefore, through a process of interaction between the “I” and “Me’s” (Mead, 1934).

For symbolic interactionists the world in which we live is the social world (Bowers, 1988) or object world (Blumer, 1969). This world exists as physical objects (for example chairs, trees or bicycles), social objects (students, nurses, or patients) and abstract objects (moral principles or emotions) but these “objects have no inherent meaning” (Bowers, 1988, p.38). The meaning given to an object is not consistent; it will vary between individuals, from one situation to another and over time (Bowers, 1988). By allowing for multiple meanings of objects, symbolic interactionism diverges from “traditional” ideas of a single or universal reality. Multiple realities do exist and these are socially constructed. It is in this respect that symbolic interactionism is also useful as a perspective in empirical social science and not only as a theoretical framework (Blumer, 1969).

The meaning ascribed to each object is not intrinsic to the object but arises from the way the individual designates it. An individual, however, does not just label an object, for example, a nurse, arbitrarily. The meaning of anything is learned through a social process of human interaction or group life (Blumer, 1969). These processes involve designating and interpreting the meaning of each other’s actions toward that object.

Chapter 3: Grounded theory methodology
(Blumer, 1969). For example, the labels given to objects called “nurse” arise from the manner in which others act toward or treat “nurses” (Bowers, 1988); others such as patients, doctors, other nurses, and so on, act as “designators,” that is, they determine (designate) what a nurse is. This meaning is then passed, via social interaction, to (i.e., learned by) other people who will, in turn, use it to designate similar objects of experience (“nurses”) when encountered. Consequently symbolic interactionists can only study social life where it occurs (Benzies & Allen, 2001; Blumer, 1969; Bowers, 1988), that is, in the field where nurses will behave according to the way others, and they, have designated them to behave.

The final concept of symbolic interactionism explains that people continually try to determine how others are interpreting their actions by picking up on cues that others around them give, that is, through their interaction with each other in society (Blumer, 1969). Individuals will also attempt to predict others’ responses to their actions and will refine their initial course of action to meet that prediction. In order to achieve this concept, individuals require “…a determination about which self is the salient self (who I am), the nature of the object world for the self (what is my social world), the nature of the object world for others (how others perceive me and a prediction of how they will act) and, consequently, a decision about how to act” (Bowers, 1988, pp. 41-42). Symbolic interactionism, therefore, accounts for the action or behaviour of an individual in the real world and the ability of individuals to make choices about their responses to the objects they encounter.
By having a symbolic interactionist perspective it is not possible to study the actions of individuals or groups outside of their social context within which they were created and have meaning (Bowers, 1988). To study social life, the researcher is required to actively enter the real world of people being studied in order to see how the designators designate objects. That is to “see the situation as it is seen by the actor, observing what the actor takes into account, observing how he (sic) interprets what is taken into account, noting the alternative kinds of acts that are mapped out in advance, and seeking to follow the interpretations that led to the selection and execution of one of these prefigured sets” (Blumer, 1969, p. 56).

For symbolic interactionists, two processes, exploration and inspection, assist in the study of social life (Blumer, 1969). Exploration involves flexibly responding to the empirical world by adapting different modes of inquiry, data collection and analysis. These procedures enable the researcher to construct a comprehensive and intimate description of that social world (Blumer, 1969). Whilst description of the social world might be sufficient for some research, inspection goes further and requires researchers to conceptualise their data and then undertake a careful examination of the data for evidence of empirical instances of their conceptualisations about that social life.

**Symbolic Interactionism and Grounded Theory**

Research using the theoretical framework of symbolic interactionism does not begin with a grand theory and attempt to validate it empirically in the social world, but rather begins in the empirical world with the acting individuals and builds up to a theory from there (Bowers, 1988). This is exactly the process used by grounded theory in which a
theory is predominantly induced from the data which aims to discover patterns or social processes of people present in human social interactions (Cutcliffe, 2000; Hutchinson, 1993; Stern, Allen & Moxley, 1982).

A grounded theory study involves theoretical sampling, concurrent data collection and analysis and the development of codes, categories and theories (see below for further discussion, p. 78). These processes are consistent with Blumer’s dual research processes of exploration and inspection, although this has not been explicitly stated by Glaser (1978, 1992), Glaser and Strauss (1967), Strauss (1987) or Strauss and Corbin (1990, 1998).

Relevance of Symbolic Interactionism to this Study

The principles of symbolic interactionism have several implications for this study. Firstly, as discussed above, to understand human behaviour it must be examined in the natural setting (Blumer, 1969). Studying the actions of nephrology nurses in the social context which shaped them, that is, a real world clinical renal unit will result in a substantive theory describing the social process of expertise acquisition and its exercise.

Secondly, the researcher must understand the world from the participant’s perspective; that is “taking the role of the other” [research participant]. This requires the researcher to be both a participant in the world and an observer of the participants in that world (Blumer, 1969; Chenitz & Swanson, 1986) and “to discover what that world is like, how it is constructed and experienced” (Bowers, 1998, p. 43). This principle of being
“inside” the world of nephrology nurses is particularly important to this study and will be examined further in this chapter (see below, p. 93).

Finally, this study explicates the link between symbolic interactionism and grounded theory. The categories, properties (characteristics) and dimensions which emerged from observing nephrology nurses while they practiced in the renal unit, revealed the extent to which others (e.g., patients, other nurses, doctors) designated their level of expertise (see Chapter 6, p. 184 and Chapter 7, p. 232).

The Grounded Theory Debate

Grounded theory as a research method was developed during the 1960’s (see earlier) to study social phenomena from the perspective of symbolic interactionism (Bowers, 1988). According to Stern (1994), “students of Glaser and Strauss in the 1960’s and 1970’s knew that the two had quite different modus operandi, but Glaser only found out when Strauss and Corbin’s Basics of Qualitative Research came out in 1990” (p. 212). This then led to the development of two schools of grounded theory, the Glaserian School after Barney Glaser, and the Straussian School after Anselm Strauss (Annells, 1997a; Melia, 1996; Robrecht, 1995; Stern, 1994).

Glaser (1992) wrote the book “Emergence versus forcing: Basics of Grounded Theory Analysis” as a rebuttal of Strauss and Corbin’s (1990) book. For Glaser, the main difference between the two schools of thought lies in the intended purpose of the research. Glaser believes that his school aims to generate an inductively derived theory, whereas he argues that Strauss and Corbin are intent merely on developing a full
conceptual description of the substantive area. Strauss and Corbin (1998) do not explicitly refute Glaser’s critique; indeed, they go so far as to state, “building theory is not the only goal of doing research...[and that] high-level description and ... conceptual ordering [is] also...important to the generation of knowledge and can make a valuable contribution to a discipline” (p. x). This would seem to indicate that Strauss and Corbin do agree that the purpose of grounded theory has been expanded to include full conceptual description. The basic features of grounded theory, however, such as theoretical sampling, concurrent data collection and analysis, theoretical sensitivity, memo writing, identification of a core category and theoretical saturation, remain common to both schools (Annells, 1997b; Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990, 1998). These basic features of grounded theory research are discussed in more detail later in this chapter (see below, pp. 78 - 89).

**Classical Grounded Theory**

Annells (1997b) suggests that it is possible, and even permissible, to adapt grounded theory method, from either school’s perspective, provided the study encompasses a social process, social structure and/or social interaction. Furthermore, Annells (1997b) goes on to describe five broad options for using grounded theory method. These are to use:

Option 1. The Glaserian or classical mode within the postpositivist paradigm (see above, p. 66).

Option 2. The Straussian mode within a constructivist paradigm (see p. 66).

Option 3. Either school with modifications to ensure it is consistent with the chosen paradigm.

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Various combinations of both schools that maintains consistency with philosophical perspectives.

A new approach that is consistent with the essential features of grounded theory but is tangential to the approaches of either the Glaserian school or the Straussian school.

In this study of nephrology nursing expertise, Annells’ option three was chosen; that is, the classical type of grounded theory (i.e., Glaserian school) was modified to include one specific aspect of the Straussian school. Specifically, the grounded theory tenet of theoretical sensitivity in the classical type needed to be modified to incorporate the role of professional experience held by the researcher (as explained later, see p. 93). Strauss and Corbin assert that professional experience is a quality that the researcher brings to the study and as such it cannot be ignored (1990, 1998). The type of grounded theory applied in this study, therefore, by and large subscribed to the classical grounded theory methods described by Glaser (1978, 1992) and Glaser and Strauss (1967) with only minor inclusions of later Straussian approaches.

**Basic Features of Grounded Theory**

In this section the basic features of grounded theory will be discussed in relation to the grounded theory literature and, where appropriate, the differences between the two schools of grounded theory will be highlighted. The basic features are literature review, theoretical sensitivity, theoretical sampling, concurrent data collection and analysis, memo writing, theoretical saturation, identification of a core category and basic social process. In the following chapter, each of these features will be revisited with specific application to this study.
Literature Review

In grounded theory studies, in contrast to positivist research where literature reviews are undertaken prior to the commencement of the study, the timing and purpose of a literature review is different (Hickey, 1997; Norton, 1999). The primary purpose of the literature review in a grounded theory study is to integrate the substantive theory which the study has developed with other literature to show its contribution to the expansion of knowledge in that area (Glaser, 1992; Strauss & Corbin, 1998). Nevertheless, there is disagreement between the two schools of grounded theory regarding the timing of a literature review. The dictum, according to Glaser (1978, 1992), is not to undertake any literature review prior to the commencement of data collection as the review will stifle or inhibit the ability to generate codes which truly fit the data. Strauss and Corbin (1998), in contrast, argue that all researchers will bring to the study a considerable background in professional and disciplinary literature, but that this knowledge of the literature assists in developing sensitivity towards the features of the phenomenon understudy (Strauss, 1987). There is, however, only a need for a modest literature review at the beginning of a grounded theory study to understand the philosophical writings and existing theories in the substantive area of study, and to formulate questions which act as a starting point during initial observations and interviews (Strauss & Corbin, 1998). It was primarily for these reasons that Strauss and Corbin’s timing and purposes of a literature review were incorporated into the present study.

Theoretical Sensitivity

Grounded theory requires the researcher to understand and practice theoretical sensitivity. The two grounded theory schools share similar views relating to theoretical
sensitivity. For instance, Glaser (1978, 1992), Strauss (1987) and Strauss and Corbin (1990, 1998) agree that theoretical sensitivity refers to the qualities that the researcher brings to the study which assists the researcher to generate concepts from data. These qualities are typically gained from past personal and professional experiences. The researcher is able to draw on these experiences and insights when attempting to research the nuances of events, actions, actors, procedures and techniques peculiar to that field. These qualities of the researcher assist with data analysis, as the researcher already possesses insight or awareness of the subtleties of meaning in the data. Strauss and Corbin (1990, 1998), however, go further to suggest that professional experience is an important source of knowing what to observe in fieldwork and how to interpret such observation. Furthermore, Strauss and Corbin (1990) state that through:

> years of practice in a field, one acquires an understanding of how things work in that field, and why, and what will happen there under certain conditions. This knowledge, even if implicit, is taken into the research situation and helps you to understand events and actions seen and heard, and to do so more quickly than if you did not bring this background into the research. The more professional experience, the richer the knowledge base and insight available to draw upon in the research (p. 42).

By being theoretically sensitive to the field of study the researcher becomes intimately involved with the data (Glaser, 1978) and this immersion in the data assists with the interchange between the researcher and the data (Strauss & Corbin, 1998). Furthermore, Strauss (1987) suggests that being sensitive to the data enables the researcher to interrogate the data with increased effectiveness and logic, which in turn assists the researcher to identify when, where, how and with whom to collect more data.

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(i.e., theoretical sampling). Theoretical sensitivity and theoretical sampling are, therefore, interwoven and integral components of any study using grounded theory methods (Glaser, 1978).

However, in order to utilise her/his theoretical sensitivity effectively, the researcher also has to be alert to the possibility of over-immersion with the substantive focus of the study or the data and being unable to see what is really occurring (Glaser & Strauss, 1967, Strauss & Corbin, 1990). The researcher, therefore, needs to be sceptical about the data, as well as constantly checking her/his own biases to see that they are not being imposed on data collection or analysis (Strauss & Corbin, 1990).

Briefly, the importance of theoretical sensitivity to this study is that, firstly, it offers a framework in which to recognise my professional experience as a nephrology nurse and the insights that my experiences offer. Secondly, I am constantly reminded by this sensitivity of the roles and practices of nephrology nurses, and guided by this to examine the data for what is actually there rather than what I could assume is there. Because of my “insider’s” perspective, this issue warrants further attention later in this chapter (see p. 93). Lastly, and most importantly, theoretical sensitivity assists me to move from merely describing what I have seen to thinking conceptually about the data; that is, to theorise about nephrology nursing expertise.

Theoretical Sampling

In grounded theory the identification of and sampling of research participants is different from “traditional” positivistic (quantitative) methods of research. Quantitative
research relies primarily on random sampling to test hypotheses and to modify or verify existing theory. Random sampling attempts to provide the assurance that concepts, properties, and relationships are representative of some larger group (Borg & Gall, 1989). In grounded theory the process of sampling is termed theoretical sampling because the researcher decides who, where, when and what to sample based on the emerging theory (Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990, 1998). Theoretical sampling, therefore, provides flexibility for the researcher who is unconstrained by a prescribed or pre-planned sample, to pursue the development of theory as new concepts and propositions emerge (Glaser and Strauss, 1967; Kozma, 1985). This sampling technique enhances the likelihood that these will emerge from the data and can be integrated into a theory (Chenitz and Swanson, 1986).

Grounded theory uses a different sampling technique in which research participants are not chosen on the basis of their representativeness but because they have knowledge of the phenomenon under scrutiny (Smith & Biley, 1997). The process of deciding whom to sample begins not with a preconceived problem or hypothesis but with a partial framework of “local” concepts such as those derived from professional experience, that is, from an existing theoretical sensitivity to the substantive area (Cutcliffe, 2000). By being aware of these concepts the researcher has a beginning point for sampling in a grounded theory study (Glaser & Strauss, 1967). Initially, sampling involves purposefully selecting participants who can provide a relevant source of data and collecting data where the phenomenon occurs. A grounded theorist, therefore, will commence data collection through a process of purposive sampling (Coyne, 1997) which is then
superseded by theoretical sampling as the researcher begins to analyse the data and the theory develops (Cutcliffe, 2000).

The purpose of theoretical sampling is to maximise the range of information uncovered and develop insights about what is important and relevant to study. Chapter Four describes in detail the sampling procedure used in this study.

The process of data collection, coding, and analysis associated with grounded theory drives the sampling process and focus. Later, when core variables are discovered, the sampling process becomes even more directed by the central issues of the emerging theory. Categories develop from the grouping of codes during the process of data analysis. In grounded theory, the process of data analysis is through constant comparison of incidents, events and actions and this technique is explained in the subsequent section. The process of theoretical sampling ceases when each category is saturated and no new evidence is found in the data to alter the category (Glaser, 1992).

**Constant Comparative Data Analysis**

There are differing views relating to the technique of data analysis described in the grounded theory literature. For instance, Glaser (1978, 1992) and Glaser and Strauss (1967) argue that the constant comparison analysis technique involves the generation of two types of codes, substantive and theoretical codes. Strauss (1987) and Strauss and Corbin (1990, 1998), however, suggest that a third coding technique, axial coding, is also required during the data analysis process. According to Strauss and Corbin (1990), axial coding occurs after substantive coding but prior to theoretical coding, and involves
the use of a coding paradigm. The purpose of axial coding is to put back together or recontextualise (Tesch, 1990) the data by relating the codes generated during the substantive process to a coding paradigm (“conditional matrix”). This difference in coding techniques and the use of only one coding paradigm became the catalyst for the grounded theory debate (see earlier) in which Glaser (1992) refutes the necessity of axial coding. Glaser goes further to suggest that axial coding and the coding paradigm are dangerous to the generation of grounded theory, as they will force data into something that it is not. He believes that locking the analytical process to only one theoretical coding paradigm through the use of axial coding will result in a complete conceptual description of the area under study rather than a grounded theory of the area (Glaser, 1992).

Glaser’s, rather than Strauss’ technique was selected for this study; the reasons were twofold. Firstly, due to my “insider” perspective, the risks of having predetermined ideas or codes were extremely high. Secondly, and more importantly, the risk of applying potentially predetermined codes early in the research following Strauss’ coding paradigm, would have risked producing a full conceptual description of nephrology nursing practice rather than a substantive theory. What follows, therefore, is a description of the Glaserian constant comparative analysis technique; this includes three stages.

The first stage of analysis is frequently termed “substantive” or “open” coding and requires the researcher to ask questions of the data such as “what is going on here.” According to de Laine (1997), in open coding, the words, sentences, paragraphs or

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actions of participants are clustered together on the basis of similarities or differences. The first attempt at coding the data typically follows a careful line-by-line analysis of the data in order to code different incidents into as many areas as possible (Glaser, 1978). This raw coding maximises the number of workable codes, thereby facilitating the emergence of categories.

According to Glaser (1978) there are several rules to open coding. The researcher should:

- Always ask questions of the data to identify what category or property of a category a particular incident represents;
- Code each sentence of the data;
- Code their own data;
- Interrupt coding to memo any ideas that have been stimulated during coding (this will be described later);
- Stay within the substantive area of the study; and
- Not assume the relevance of any variables such as age, sex, etc, are relevant until they emerge.

In this study, open coding commenced immediately following a data collection episode. The specific techniques of coding employed in this study will be described in the following chapter.

Stage two of the analysis involves integrating the substantive codes into larger clusters or categories. Each substantive code is compared to another code and assigned to clusters or categories according to similarities or differences (Glaser, 1978, 1992; Streubert & Carpenter, 1995). This is facilitated by asking questions of the data such as who, what, where, when, and how. Categories, therefore, are groups of many similar

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incidents (codes) that are then allocated a conceptual name. Codes that are dissimilar are described as characteristics (properties) of a category and these help to establish boundaries within categories. A conceptual code, along with its characteristics, is a condensed abstracted view of the data. The name given to the conceptual code should be more abstract than that given to the concepts grouped under it (Strauss & Corbin, 1990). The full range (variation) and extremes of each category are identified from the data by focusing on it, through memoing, to guide further data collection and theoretical sampling (Glaser, 1978). Categories are considered saturated when further data collection yields no further information or insights into them.

Lastly, in this stage, the categories are compared with each other to ensure that they are mutually exclusive. This can result in some categories collapsing together which has the benefit of developing a category with a broader focus (Glaser, 1978). Categories, therefore, describe an essential relationship between data and theory (Swanson, 1986).

In the final stage of the constant comparison analysis technique, coding occurs in order to determine the relationship or linkages between categories. Stage three coding involves generating theoretical codes. Theoretical codes show how categories relate to each in order to enhance their abstraction (Glaser, 1978, 1992). Theoretical codes generated in the third stage assist the emerging theory by delimiting the theory at two levels. First, theoretical codes cause the theory to solidify because the original set of categories become uniform and less modifiable by the entry of new data. Second, theoretical codes integrate similar categories under the one name with the result that the total number of categories is reduced (Glaser & Strauss, 1967). The linking of
categories through the use of theoretical codes results in one core category (Corbin, 1986; Glaser, 1978) which may also be a basic social process (Glaser, 1978, 1992).

**Memo Writing**

Grounded theorists in both schools hold similar views in general regarding memo writing and diagramming. For instance, Glaser (1978, 1992), Strauss (1987), and Strauss and Corbin (1990, 1998) agree that memoing and/or diagramming are compulsory elements of the analytical process. They are tools that are used to capture ideas about categories, their properties (characteristics) and the relationships between them. Memos are also used to illuminate the research process by allowing the researcher to reflect on their experiences in both an analytical and personal sense (Norton, 1999). These authors also agree that various types of memos and diagrams (i.e., personal, research and theoretical) are developed depending on the stage of the analysis. Nevertheless, Glaser (1992) and Strauss and Corbin (1990) differ in some particulars with respect to memoing and diagramming. For instance, Glaser (1992) criticises Strauss and Corbin (1990) because they are too prescriptive in the type, form and purpose of memo writing and diagramming. For Glaser (1978), the form and type of memo or diagram will evolve with each stage of the analytical process until eventually a final memo pulls together all previous thoughts as the core category becomes the focus of the theory.

In contrast, Corbin (1986b) suggests that memos and diagrams are analytical tools which assist in developing theory in four phases. Firstly, these tools aid in discovering categories as substantive codes are compared with each other. Secondly, the tools

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enable the building of categories through the comparison of similar or dissimilar categories, thereby adding depth to categories. Thirdly, memoing and diagramming establishes relationships between two (or more) categories until, finally, memoing and diagramming assist with the identification of the core category.

Core Category and Basic Social Process

There is agreement between the two proponents (i.e., Glaser and Strauss) of grounded theory that the process of linking categories through the use of theoretical codes results in a core category which accounts for most of the variation in the data (Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990, 1998). According to Glaser (1978), the generation of theory occurs around a central/dominant core category that links all categories and properties together and that all grounded theory studies have at least one core category.

There are, however, differing views relating to the concept of basic social processes (BSPs). For instance, Glaser (1978, 1992) argues that some core categories indicate change that is occurring over time; that is a BSP. In contrast, Strauss (1987) does not identify the possibility of basic social processes as a type of core category until he co-authors “Basics of Qualitative Research” with Juliet Corbin in 1990. It is in that text that Strauss, together with Corbin, explains how a core category can vary over time. Nevertheless it is clear from Strauss and Corbin’s writing (1990, 1998) that Glaser (1978) originally conceived the notion of the BSP. A BSP, according to Glaser (1978), is presented as a gerund which suggests movement, change or process over time. Examples of gerunds are “becoming” or “limiting.”
Glaser (1978) explains that all BSP are core categories but that not all core categories are basic social processes. A core category, which could also be a BSP, discovered through constant comparative analysis and theoretical sampling has greater applicability than the mere description of a property or category because the generated theory fits the substantive area of study, and the theory is understandable to others in similar contexts (Glaser & Strauss, 1967; Glaser, 1978; Fagerhaugh, 1986).

**Theoretical Saturation**

The last important feature of grounded theory research is theoretical saturation. According to Glaser and Strauss (1967) theoretical saturation is the criterion used to judge when to stop sampling which, according to Strauss and Corbin (1990), can occur at three junctures in the research. Firstly, when no new data reveals new categories; secondly, when each category is richly and densely described and all of its properties (characteristics) have been revealed; and, thirdly, when the relationships between categories are well established and validated by data. Eventually the researcher is confident that no new data will yield new information (Glaser, 1978).

**Metaphors in Research**

A metaphor is a figure of speech in which a word or phrase ordinarily used for one thing is applied to something to which it is not literally applicable, in order to suggest a resemblance or to imply a comparison (Delbridge et al., 1991). Metaphors provide a lens as “...a window through which...meaning can be viewed and interpreted” (Kangas, Warren & Byrne, 1998, p. 190) to enable us to see a likeness between initially different events (Czechmeister, 1994; Fine, Pollio & Simpkinson, 1973) or to imply equivalence.
between terms taken from separate domains (Sapir, 1977). A metaphor does not add facts to a description; rather, it adds depth to the meaning of the phenomenon (Kangas, Warren & Byrne, 1998). In addition, Czechmeister (1994) suggests that metaphors have both an expressive and instrumental function. The expressive function is invested with feeling and attitudes, adding of meaning. The instrumental function permits the description of a phenomenon and its context.

Metaphors, as an aspect of communication, are pervasive throughout everyday life (Richardson, 1994). They occur not just in language but also in our thoughts and actions (Lakoff & Johnson, 1980) and they are “the backbone of social science writing” (Richardson, 1994, p. 519). In fact, Sandelowski (1998) goes further to suggest that metaphors are also integral to and pervasive throughout the “pure” sciences because they reflect or reinforce particular views or values. Metaphors provide a strong image and meaning to communication that go far beyond that conveyed by words alone and they function in the following ways:

- They provide novel ways of looking at behaviour.
- They simplify events as schemata that emphasise particular properties of that event.
- They give communications an intimate quality because of the concrete referents of metaphorical imagery.

(Lakoff & Johnson, 1980).

The use of metaphors is a means by which people can think about and interpret their world. Metaphorical language used by research participants within the interpretative or qualitative paradigm to describe their experiences has been widely studied. In nursing,
for example, Jairath (1999) and Jenny and Logan (1996) examined the use of patients’ metaphorical language to deal with life-threatening events in critical care settings. Others, including Froggatt (1998), who explored the importance of metaphors used by nurses in palliative care settings and McAllister and McLaughlin (1996), who sought to understand the metaphors undergraduate student nurses’ use, found metaphorical language was a common tool used by nurses to grasp difficult concepts or situations.

According to Miles and Huberman (1994) and Richardson (1994), however, it is also qualitative researchers who should think and write metaphorically. In the analytical processes undertaken during qualitative research (i.e., constant comparative technique of grounded theory), metaphors provide assistance in several ways (Burns & Grove, 2001; Miles & Huberman, 1994). Firstly, metaphors can assist in moving from raw data to more generalised concepts, thereby reducing the amount of data. Secondly, metaphors assist in identifying patterns in data by placing them into larger contexts and, thirdly, the use of metaphors stimulates researchers to connect the findings to a theory. Richardson (1994) also adds that metaphors are a means to make research findings predictable; that is, “to make sense” of the massive amount of data generated in a qualitative study and provide an external focus to the substantive area of the study. Metaphors, therefore, can portend a “truth-value” symbol because they belong to another domain (Richardson, 1994).

However, Miles and Huberman (1994) and Richardson (1994) also warn of the possible problems of relying too heavily on metaphors in qualitative research analysis and recommend several strategies to avoid forcing metaphors on data analysis. These
strategies include not looking for overarching metaphors too early in the study and not
trying to force a metaphor on the data. They cite the metaphor of an oasis as an
example which now includes camels, camel drivers, a bazaar and a howling storm
(Miles & Huberman, 1994). Sandelowski (1998) also provides a cautionary note to the
use of metaphors by qualitative researchers. She recommends avoiding incomplete,
fixed or mixed metaphors that do not adequately fit the data. Instead, metaphors once
explained should readily fit the data and illuminate the study (Sandelowski, 1998).

The use of metaphors as an analytical strategy by nurse researchers in qualitative or
interpretative studies is limited (see, for example, Daugherty, 1992; Hanneman, 1996;
Montgomery, 1994; Nystrom & Segesten, 1996; Smith, 1992). In all of these studies, a
metaphor facilitated emergence of the core category or major theme. The use of a
metaphor by these researchers provided, in a few words, not only a summary of the
study but also gave additional meaning and explanation to the findings.

In this study of nephrology nursing expertise, the properties (characteristics) of the core
category emerged in the early stages of analysis. However, labelling of the core
category was difficult to grasp, as ordinary language was insufficient to describe it (cf.
Lewis, 1961). Eventually, several months later, during a grounded theory supervision
group meeting, an orchestral metaphor of expertise acquisition and exercise emerged
which compared the process of expertise acquisition and exercise to an orchestral
metaphor in which the expert is the composer, conductor and player of a major piece of
music, the magnum opus (see Czechmeister, 1994; Fine, Pollio & Simpkinson, 1973;
Kangas, Warren & Byrne, 1998; Sapir, 1977). The core category of PRODUCING THE
MAGNUM OPUS\(^1\) reduced all of the data into one overarching theory to explain the process of expertise acquisition and exercise. The orchestral metaphor encapsulated and accounted for most of the data and was both exciting and a relief to discover. The substantive grounded theory of this study, PRODUCING THE MAGNUM OPUS, is explained in detail later in this thesis (see Chapter Five).

**Being an Insider**

In this section the blending of the researcher's roles as "researcher" and "peer" will be explored. Aspects of subjectivity, researcher bias, being an "insider", and the benefits and difficulties associated with these dual roles will also be clarified. I currently practice as a nephrology nurse for eight hours per week within the setting in which this study took place and, both the participants and I view me as a complete member of that renal unit. I will argue that a relationship between myself and the research participants, in terms of the shared membership of a group, was vital in achieving an understanding of the development of expertise in nephrology nurses, and that considerable benefits can occur in qualitative studies when the researcher is a part of the group being studied. In addition to my clinical practice, I am also a nurse academic with significant interest in the delivery of nephrology nursing education. I was aware of the possibility of having preconceptions in relation to the education of nephrology nurses. The following chapters will demonstrate, through a clear audit trail, that the centrality or otherwise of these preconception have been addressed.

\(^1\) Small capitals have been used throughout this thesis to denote categories.
Subjectivity and Researcher Bias

Subjectivity is embraced in qualitative research because human beings are situated in a real world affected by subjectively interpreted experiences (Denzin & Lincoln, 1994; Lofland & Lofland, 1995; Streubert & Carpenter; 1995). In particular, naturalistic (qualitative) research revolves around two basic principles. These are, according to Lofland and Lofland (1995), that the researcher must access the mind of each participant and that face-to-face interaction is required to do this fully. The closer the researcher is to the field, the richer the data that is available to be collected.

In qualitative research researchers typically need to remain cognisant that research is neither value-free nor bias-free and that they bring their own biases into the study. Janesick (1994) suggests that the researcher should strive to identify what these biases are in order that their potential negative impact on the research can be minimised.

Benefits of and Problems with Being an Insider

In qualitative studies it is becoming increasingly common for researchers to be part of the social group they wish to study resulting in the researcher being a native or “insider” before the study commences (Adler & Adler, 1987, 1994; Kennedy, 1999; Lofland and Lofland, 1995; Pugh, Mitchell & Brooks, 2000; Tom-Orme, 1991). There are a number of benefits to being an “insider”. These include: having a greater understanding of the culture being studied (Pugh et al., 2000; Reed & Proctor, 1995; Tom-Orme, 1991); not altering the flow of social interaction unnaturally (Adler & Adler, 1994; Kennedy, 1999); and having an established (yet professional) intimacy between the researcher and
participants which promotes both the telling and the judging of truth (Leininger, 1985; Robinson and Thorne, 1988; Ryan, 1993).

"Insider" research allows the process, rather than the outcome, of practice to be explored (Holloway & Wheeler, 1996; Pugh et al., 2000; Stevenson, 1996), and, for nursing in particular, the benefits of "insider" research contribute to the body of nursing knowledge rather than the knowledge bases of other disciplines, for example, sociology (Reed & Proctor, 1995). In addition, being an "insider" can reduce many problems associated with researching in the real world of clinical nursing practice; these include gaining access (Kidd, 1992; Pugh et al., 2000), establishing rapport with subjects (Gerrish, 1997; Kennedy, 1999; Platzer & James, 1997) and dealing with ethical concerns (Platzer & James, 1997; Ryan, 1993).

My position was one of "insider", that is, a nephrology nurse exploring the world of nephrology nursing. Through practicing as a nephrology nurse, I gained valuable insights into how it feels to do the work and what it is like to practice in that specialised field of nursing. Had I been an "outsider," such as mental health nurse, I would have expended time and energy trying to understand the basics of what was going on, in particular the interaction between patient, dialysis equipment and normal nursing roles and functions. In short, being an "insider" made me theoretically sensitive. By being an "insider", I was accepted as one of the group. I did not have to establish rapport with the participants because I was already on very good terms with each of them, although I needed to establish my researcher role whilst ensuring that the participants did not view

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this research as threatening to them. Trust, through knowledge of our existing relationship, developed more quickly than if I had been a total stranger.

As an insider, I already understood when and where to gather data and I was familiar with the routine practices on the unit. This prior knowledge enabled me to gather richer and more focused data as well as to more easily determine when and why changes to those routine practices occurred. Insider knowledge also allowed me to identify subtle differences between the practice of expert and non-expert nurses and to develop hypotheses related to those differences.

One other benefit of being a part of the group being studied was that I was able to recognise when a participant changed their normal pattern of practice. I had the advantage of understanding the way many of the participants usually practiced. This knowledge came from having an understanding of someone’s broad practicing abilities or through having an intimate knowledge of specific aspects of their practice. For example, I was aware of who was able to provide nursing care to acutely ill patients or those requiring advanced nursing procedures as well as the way some nurses perform particular procedures.

There are, however, problems associated with being an “insider”. Lipson (1984) suggests that recognition of patterns of practice may be difficult to identify because the behaviour is so familiar and that it is taken for granted. Routine practice (because it is understood) can be ignored or given superficial attention. Gerrish (1987) warns “there was the risk that over-familiarisation with the setting might lead me to make
assumptions about what I was observing without necessarily seeking clarification for the rationale underpinning particular actions” (p. 27).

In this study it could have been very easy to go “native” and to relax my focus of study. Hammersley and Atkinson (1995) highlight this dilemma of living simultaneously in two worlds and warn of the dangers of excessive rapport with research participants. Being so enmeshed in the study environment I was cognisant of the possibility of completely joining the group and loosing my research perspective. I was in danger of becoming a non-observing participant (Miles & Huberman, 1994), where I would practice as a nephrology nurse rather than be a nephrology nursing researcher.

The following table (Table 4, p. 98) summarises the advantages and disadvantages which accrue from being either an “insider” or “outsider” when undertaking studies in the real world environment of the research participants.

In grounded theory methodology, the researcher intentionally becomes immersed (however transiently) in the participant’s world (Glaser & Strauss, 1967; Chenitz & Swanson, 1986). According to Bowers (1988), the grounded theory researcher attempts to take the role of the research subjects (the “other”) in order to discover what that world is like, how it is constructed and experienced; the researcher constantly attempts to be an “insider”. Bowers, however, cautions that this “insider” perspective must be tempered with the ability to step back and ask questions about the data. The researcher strives, therefore, to maintain a position that is marginal, which allows the researcher “to see both worlds simultaneously, to make comparisons between them, discover how

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they are similar, and how they are different” (Bowers, 1988, p. 44). Strategies that were employed during this present study are described below.

| **Table 4** Advantages and Disadvantages of Insider/Outsider Researchers |
|---------------------------------|---------------------------------|
| **INSIDER**                     | **OUTSIDER**                    |
| **Advantages**                  | **Disadvantages**               |
| • Not seen as “strangers” but members of group. | • Experience “culture” shock which may delay or interfere with research. |
| • Incorporate traditionally ignored or unrecognised perspectives into theory. | • Takes time to establish trust or may never be seen as trustworthy. |
| • More economical – know the culture, language (jargon), familiar with local conditions. | • “Cultural” or linguistic (jargon) distance may desensitise researcher to group’s needs/meanings. |
| • Less inclined to construct stereotypes. | • May receive “expected” responses rather than true attitudes or knowledge. |
| • Easier to gain acceptance, trust and cooperation. | • Lengthy time required understanding the “culture” and language (jargon). |
| • No decision needed whether to go native or not; question of understanding the group is minimised. | • Less economical – may need to hire and train “experts from the field.” |
| • No lengthy preparation necessary as already in “field” or study setting. | |
| **Disadvantages**               | **Advantages**                  |
| • Not seen as researchers but advocates by some. | • Free of commitment to the group. |
| • May be biased towards interpretation/findings. | • Seen as objective observer. |
| • May initially have difficulty re-establishing ties with local “culture.” | • May be more privy to some sensitive information because of temporary stay. |
| • Unknown researcher qualities. | |
| • Reliance on participants with whom the researcher feels comfortable. | |
| • Focusing on the dramatic events rather than the routine. | |
| • Experiencing role conflicts. | |

(Adapted from: Gerrish, 1997; Lipson, 1994; Miles & Huberman, 1994; Tom-Orme, 1991).
Strategies used to minimise the Effect of Being an Insider

Several strategies were included in this study to overcome both researcher effect and participant response to the researcher. Firstly, a recognition of the relationship that already existed between the participants and myself overcame some of the potential problems of being an “insider”. Through being reflexive and by critically examining my assumptions and actions in relation to both data collection and analysis, I was able to minimise the potential for researcher effect. Reflection, through personal memoing, included providing details of the context of the study, reflecting about my reactions to people and events in the setting, reflecting on my relationship with the participants, examining the way I felt when undertaking participant observation and interviews and, finally, providing reasons for my decision making (Lipson, 1984; Miles & Huberman, 1994; Gerrish, 1997).

Secondly, I included several practical strategies to avoid becoming a non-observing participant and going completely native. These strategies included: collecting data during “off-duty” hours and where possible at least three to five days either side of a shift on which I was rostered; not wearing a nurse’s uniform whilst collecting data; trying to avoid active participation in nursing clinical discussions or problem-solving during data collection periods; and not performing any “hands on” nursing care. On many occasions during an observation period, other nurses on the ward shared patient information with me and treated me as a colleague but, unlike Kidd (1992), I was not asked to perform routine nursing activities. Only once was I required to help in an emergency when a patient, who was receiving haemodialysis treatment during an observation period, stated that he was starting to feel faint and I took that patient’s blood
pressure, while the nurse, the research participant, reduced his blood flow rate and transmembrane pressure in order to reverse the effects of sudden hypotension. I did notice on several occasions, however, that nurses tended to “sound me out” or asked for my professional opinion about what I would do in a particular situation. This briefly altered my stance of being an observer; however, it did not detract from the goal of data collection.

Lastly, I employed the following data collection strategies suggested by Miles and Huberman (1994): prolonged observation and immersion in the setting so that participants became accustomed to my researcher role; looking for outliers, that is, negative or extreme examples of expertise; sampling by time, event and at random times to increase the richness of data; collection of data from different sources, locations and methods; constantly comparing the new data with existing data; and, working with supervisors at grounded theory group meetings, who kept asking “where’s the data?”

In summary, it would be difficult for researchers who were not an “insider” to obtain the same depth and richness of data because they would not have been recognised as a peer (Lipson, 1984). The position of nurse researcher as both peer and investigator provides a unique opportunity to gain insight into aspects of nephrology nursing practice that would otherwise be difficult to access and to analyse. Finally, as Lee (1991) suggests, the answer to some of the potential difficulties encountered with the dual role of researcher and peer lies in linking the clear and accurate meanings and interpretations of the participants to my own interpretations of those meanings.

Chapter 3: Grounded theory methodology
Chapter Summary

In this chapter the literature on a number of methodological, theoretical and researcher perspectives have been provided. The methodological framework of this study is guided by the principles of "classical" grounded theory as espoused by Glaser and Strauss (1967) and Glaser (1978, 1992, 1996). Typically, grounded theory research is conducted in areas where there are no formal theories in which to test hypotheses and where there has been little other research. The acquisition and exercise of nephrology nursing expertise is such an area. A grounded theorist is required to develop theoretical sensitivity in order to generate conceptual insight, understanding and meaning about the data (Glaser, 1992). Other important features of grounded theory research are the timing of the literature review, theoretical sampling, concurrent data collection and analysis, identification of a basic social process, memoing and diagramming and these have also been explored in this chapter with reference to the present study.

The theoretical framework of symbolic interactionism supports this study. Its theoretical perspective of human behaviour focuses on the meaning of events to people in natural, everyday settings (Blumer, 1969; Chenitz & Swanson, 1986), in which individuals attempt to fit their lines of action to those of others. This theoretical perspective, therefore, requires the researcher to focus on individuals in their normal setting (Blumer, 1969), to understand what that world is like for them, and how they experience it (Bowers, 1988). Symbolic interactionism is also an empirical perspective which values research methods of exploration and inspection. Grounded theory research methods are analogous with these, namely theoretical sampling and concurrent data collection and analysis (exploration) and theorising (inspection).
This chapter has argued that a metaphor is a useful strategy in conceptualising the data. It is possible and, in some instances, preferable, to use the power of metaphorical language to provide an analytic link between the findings and the substantive theory. The metaphor generated in this present study, PRODUCING THE MAGNUM OPUS, provided in a few words, not only a summary of the study but also gave additional meaning and explanation to the findings. Chapters Five, Six and Seven will explain this metaphor in more detail with particular reference to the data in Chapters Six and Seven.

Lastly, from a researcher perspective, it was important to acknowledge that I am a part of the group being studied; that is, I bring an “insider’s” intimate view both to the understanding of typical nephrology nursing practice and to the actual nursing practice within this specific renal unit. Having an “insider’s” perspective enabled me to understand the culture being studied more quickly, to judge the relative skilfulness of the nurse’s practice, and to collect richer data.

The following chapter presents grounded theory methods as they were applied in this study and examines the trustworthiness of this study.
CHAPTER FOUR

The Application of Grounded Theory Method

Introduction

This chapter will discuss the research design and procedures utilised in this study of nephrology nursing expertise acquisition. Specifically, it will describe in detail how the grounded theory methods discussed in Chapter Three were applied in the study. The general approach taken was consistent with “classical” grounded theory (Glaser, 1978, 1992, 1996) and was informed by a critical realist (postpositivist) ontological perspective.

Details of the research setting, the sample, participant selection and data collection techniques will be discussed. Participant observation, discursive and focused semi-structured interviews and document analysis were incorporated into the design and these will be discussed in the context of data triangulation. The chapter will then provide a detailed description of the data analysis and the development of the substantive theory. This will include substantive and theoretical coding, details of the identification of the core category and how saturation was achieved and verified. The application of metaphor to data analysis and theory development will also be discussed.

The chapter will also describe how computer-assisted data management facilitated analysis and theory development, and provide evidence to establish the trustworthiness of the findings. It terminates in a discussion of the study’s important ethical considerations.
Research Design

Setting

This study was conducted in a renal unit spread across an Area Health Service in New South Wales, Australia. The renal unit consisted of several in-patient and out-patient areas (i.e., clinics and satellite dialysis unit); acute and chronic renal replacement services including renal transplantation; and home training facilities for haemodialysis and peritoneal dialysis patients. It is important to note that both acute and chronic renal services were provided in this unit; it is sometimes assumed that renal nursing is essentially “chronic” rather than encompassing both acute and chronic services. The renal unit resourced the health care required by people with a serious kidney disorder, both acute and chronic. Nephrology nurses who worked permanently in each of these areas were invited to participate in this study and, where possible, both expert and non-expert nurses were studied from each ward area. Due to the limited number of renal units in New South Wales a more detailed description of the setting is not possible owing to ease of identification of the unit and potentially, several of the participants.

Sample

Research participants were all registered nurses currently working in this renal unit on either a permanent full or part-time basis. For the purposes of this study, the title Registered Nurse was shortened to “nurse.” Other nursing classifications such as Nursing Unit Manager are used to denote a specific position held by a [registered] nurse. The identification of research participants was directed by three sampling methods. Firstly, participant selection criteria were developed which assisted in classifying all nurses working permanently in the renal unit into either an expert or a

Chapter 4: The application of grounded theory method

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non-expert group (see below for further explanation). Secondly, purposive sampling, which is designed to maximise access to key participants who are able to provide information that addressed the study aims (Coyne, 1997; Llewellyn, Sullivan & Minichello, 1999; Sandelowski, 1995), directed the initial selection of participants and where they were located. Specifically, following ethics approval from the Area Health Service and informed consent (see Appendix 3, p. 352), three expert nephrology nurses who worked in three different areas within the renal unit (haemodialysis, peritoneal dialysis and transplant areas) were observed whilst performing renal nursing practice in the field and then subsequently interviewed. Immediately following each data collection episode, data analysis commenced and from this preliminary analysis, theoretical sampling procedures, as described in Chapter Three (p. 81), directed subsequent sampling of participants.

**Participant Selection**

Previous nursing research (see, for example, Benner, 1984) suggested that expertise tends to be acquired across five stages beginning at novice and progressing through other stages culminating at the expert stage. Participants’ selection criteria were devised from early research conducted by Benner (1984) and the competency standards research project of the Confederation of Australian Critical Care Nurses [CACCN] (1996; Dunn et al., 2000). In addition, several authors (see for example Aitken, 1997; Benner, 1984; Edwards, 1998; Jasper, 1994) recommended peer identification of expert performance over self-identification. These authors believe that recognition of expertise by peers from the same field is a reliable means of identifying those nurses who practice
at an expert level. The selection criteria included two classifications - expert and non-expert (Table 5).

<table>
<thead>
<tr>
<th>ATTRIBUTE</th>
<th>EXPERT NEPHROLOGY NURSES</th>
<th>NON-EXPERT NEPHROLOGY NURSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurse</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Postgraduate Nephrology Nursing Qualification</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Length of Nephrology Nursing Experience</td>
<td>&gt; 5 years in a nephrology area and working permanently in the nephrology unit for at least two days per week.</td>
<td>&lt; 3 years in a nephrology area and working permanently in the nephrology unit for at least two days per week.</td>
</tr>
<tr>
<td>Level of Practice</td>
<td>Rapidly and effectively copes with multiple complex patient care demands. Works independently accepting accountability and responsibility for practice.</td>
<td>Needs assistance with complex patient care. Follows rules and needs guidance from other nurses to perform.</td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>Respected by peers and others. Role model. Supports less experienced staff. Aware of the needs of the whole unit. Professionally active. Effective communication skills. High level of assessment skills. Accurately and efficiently performs nursing activities.</td>
<td>Unable to meet all of the expert personal characteristics.</td>
</tr>
<tr>
<td>Peer Rating</td>
<td>Considered an expert nephrology nurse</td>
<td>NOT considered an expert in nephrology nurse</td>
</tr>
</tbody>
</table>

(Adapted from: Aitken, 1997; Benner, 1984; CACCN, 1996; Dunn et al., 2000; Jasper, 1994).

In addition, and as suggested by grounded theory methodology (Glaser, 1978; Glaser & Strauss, 1967), the participant selection criteria were designed to distinguish two
groups, which could be compared for similarities and differences in practice, to facilitate the identification of expert characteristics and specific features of their practice. A nurse participant was classified as an expert if s/he fulfilled all the criteria and non-expert if any criterion was not met (see below, for further details of this procedure). All participants were informed about which classification they had been assigned.

Following ethics approval (see below, p. 133), I was assisted by a panel of senior nephrology nurses to classify every nurse currently employed within the renal unit into either the expert or non-expert classification. This panel consisted of a Senior Nurse Manager, Clinical Nurse Consultants, Nursing Unit Manager, Renal Nurse Educator and myself. A panel was established at each site for the study and utilised the same participant selection criteria. I advised each panel member that the selection criteria were: 1) only for the purposes of this research; 2) not to be used for or associated with any employment appraisal or disciplinary action; 3) not to be discussed with any staff member; and 4) strictly confidential. At our first meeting, the panel decided to classify every nurse currently working in the unit in order to reduce the need to meet numerous times when each nurse consented to participate in the study. If a new nurse were to join the unit following the “classification” meeting, the panel would have reconvened to discuss her/his classification. This, however, was not necessary as no new staff members joined the units during the data collection period. Each panel (one at each site), therefore, met once for approximately one hour.
The process of classifying each nurse was similar at both sites. Firstly, the panel identified all of those nurses who had not undertaken additional post-graduate or post-initial nurse registration course in nephrology nursing. This group comprised the majority of nurses in the renal unit; these were automatically classified as non-expert nephrology nurses because they were unable to satisfy all of the criteria as outlined previously. The panel then discussed each nurse who had a nephrology nursing qualification. It became apparent during these discussions that my selection criteria were too rigid and did not allow for individual differences in people. The main difficulty was with "being professionally active." The panel members wanted to know how much, in terms of hours, was considered "being professionally active." At the time, I believed that there was no precise number of hours but rather that nurses did participate in additional specialty (nephrology) nursing activities such as conferences, seminars or attendance at education meetings provided by specific nephrology-related groups such as the Renal Society of Australasia (RSA) or trade companies (suppliers of dialysis equipment or drug companies). Due to my answer, the panel then proceeded to classify the remaining nurses who also had post-graduate or post-registration nephrology nursing qualifications into either the expert or non-expert category. All of these nurses were classified as expert except two; one did not attend or participate in professional activities and the other was not perceived as an effective communicator or role model for other nurses. Both of these nurses were classified as non-expert by the panel.

The panel discussion about "being professionally active" and my response was of concern to me. In the previous chapter, the usefulness of memo writing was explored
and the following research memo captures my thoughts and decision-making regarding the criterion of “being professional active.”

Research Memo – Being Professional Active (10/6/99)

After doing the categorisation of nurses for the expert and non-expert groups, I have been thinking quite a few times about the criterion “Being Professionally Active.” The reason is, whilst I believe it is an important facet for an expert nurse, perhaps not all expert nurses have to meet this criterion. Fran is an example of this possibility.

Fran is a very experienced nephrology nurse and she is not professionally active and she is the first one to admit this. When I spoke to her after the classification meeting, she could see the panel’s point of view. She does not attend RSA or TNA [Transplant Nurses’ Association] meetings, conferences or seminars. She does not give in-services - although she told me she would if she was asked. But she doesn’t offer!! However she does relieve the Clinical Nurse Consultant or Nursing Unit Manager regularly. Even without this, I believe her practice shows expertise (“insider” knowledge). She can problem-solve quickly, focus on broader issues, she is flexible and adapts her practice quite readily. She has had loads of experience and has specialty knowledge but yet she is not professionally active.

After much thought, I have decided to re-classify her as an expert because on thinking back to the other “experts,” Fran, in comparison, is also an expert. Some of the experts at the other unit are not professionally active either, yet their peers rated them as experts. I suppose time will tell if I have made a mistake and have put her in the wrong category. Even if it is wrong, it may help me decide whether being professionally active or not is an important part of developing expertise.

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Following this reflection, Fran was classified as an expert nephrology nurse and became the first participant in this study. Only one nurse with an additional nursing qualification (Leonie) was classified as non-expert. The importance or otherwise of "being professionally active," as a significant aspect of expert practice, will be discussed later in this thesis.

**Participant Recruitment**

Once all of the permanent nursing staff in the unit had been classified into either the expert or non-expert category, a series of ward based in-services with the purpose of explaining the research and seeking interested nurses were conducted. At the conclusion of each in-service several nurses expressed an interest in the study. I provided them with a Participant Information Sheet (see Appendix 2, p. 349) and arranged to meet with them individually, on another occasion, at a time convenient with them. At this meeting, I restated the purpose of the study and the commitment required by them, addressed any questions or concerns and obtained voluntary written consent (see Appendix 3, p. 354). Data collection then commenced at a mutually convenient day and time.

A total of seventeen nurses were studied, consisting of eleven experts (including Fran) and six non-expert nurses (one of whom was simultaneously undertaking the post-graduate nephrology nursing course). Sixteen nurses were female and, to preserve the anonymity of the sole male participant, only “female” pseudonyms were chosen by each participant. Additional demographic data of each participant was gathered during the
first interview (Table 6). No demographic information of patients and other health-care staff was recorded.

<table>
<thead>
<tr>
<th>Table 6</th>
<th>Participant Demographic Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXPERT (n=11)</td>
</tr>
<tr>
<td><strong>Nursing Experience (all)</strong></td>
<td>8 – &gt;25 years</td>
</tr>
<tr>
<td><strong>Nephrology Nursing Experience</strong></td>
<td>8 – 25 years</td>
</tr>
<tr>
<td><strong>Qualifications</strong></td>
<td></td>
</tr>
<tr>
<td>• Initial RN Preparation (Hospital)</td>
<td>9/11</td>
</tr>
<tr>
<td>• Initial RN Preparation (Tertiary)</td>
<td>2/11</td>
</tr>
<tr>
<td>• Nephrology Qualification</td>
<td>11/11</td>
</tr>
<tr>
<td>• Other</td>
<td>5/11</td>
</tr>
<tr>
<td><strong>Hours worked</strong></td>
<td></td>
</tr>
<tr>
<td>• Part-time</td>
<td>2/11 (20 – 24 hrs/wk)</td>
</tr>
<tr>
<td>• Full-time</td>
<td>9/11 (38 hrs/wk)</td>
</tr>
</tbody>
</table>

**Literature Review**

Prior to the commencement of data collection, a brief literature review was undertaken relating to expertise and its acquisition, the purpose of which was to see how much research had already been undertaken in the substantive area of expertise. It was also required (in the research proposal submitted to the Human Research Ethics Committee) to justify the need for this study. In addition, because the seminal nursing literature on expertise acquisition by Benner (1984) was well known by the researcher, the existing discipline (nursing) knowledge could not be ignored. Nevertheless, the literature review undertaken before data collection commenced did not pre-empt emerging concepts.

*Chapter 4: The application of grounded theory method*
A detailed literature review was undertaken only after the substantive theory, its characteristics and domains and their relationships had emerged. Chapter Eight integrates the substantive theory with other literature to confirm the study's findings, to illustrate where the literature only partially explains the exercise of expertise and to reveal the contribution of the theory to the knowledge of nursing expertise.

**Data Collection**

In keeping with grounded theory methodology, concurrent data collection and analysis as described previously (see Chapter 3, p. 83), was employed in this study, however, for ease of explanation, data collection and analysis are reported separately. Three data collection methods were used, namely, participant observation, informal, open-ended interviewing and analysis of nursing documentation. After approval had been granted from the University’s Human Ethics Review Committee and the Area Health Service's Human Research Ethics Committee and nephrology nurses had consented to participate in the study, data collection commenced. Data was collected over a nine-month period (June 1999 – March 2000), and consisted of a total 32 episodes (103 hours) of participant observations, 37 (24 hours) interviews, and ten episodes of nursing documentation (report writing rather than merely charting).

**Participant Observation**

Participant observation represents an excellent source of qualitative data (Davis, 1986; Morse & Field, 1996; Polit & Hungler, 1991) when combined with interviews, and is a typical data collection method used in grounded theory (Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss & Corbin, 1990, 1998). Data is collected in the natural setting.
(Adler & Adler, 1994) where the participants are located and requires the researcher to gather impressions of the participants' behaviour and involves looking, listening and asking (Lofland, 1971).

The research literature describes different methods of participant observation (Adler & Adler, 1987, 1994; Burns & Grove, 2001; Gold, 1958; Russell, 1999). However, Gold's (1958) typology is still cited as the clearest explanation of the different levels of involvement (participation) or detachment (observation) played by the researcher (Burns & Grove, 2001; Russell, 1999). The role of the researcher, according to Gold, can vary from having:

- No involvement with participants or the setting, that is, they are a "complete observer;"
- Brief involvement with participants ("the observer as participant");
- An active role in the setting while concurrently and openly collecting data ("the participant as observer"); and lastly,
- "Complete participation" in the setting where the researcher's purpose is totally hidden.

These different researcher roles while appearing distinct from each other were blurred during this present study. The role I predominantly undertook was that of "observer as participant" because I did not undertake concurrent nursing practice; I merely observed participants while they were working and I engaged in only brief interactions with them. I did, however, have another role in the renal unit (see also Chapter 3, p. 93) which afforded me greater familiarity and involvement, that is, I was not as detached from the participants or the setting as Gold or others (e.g. Russell, 1999) suggests. It was for this reason that, throughout this thesis, the term, "participant observation" was used to describe the data collection method of field observations.

Chapter 4: The application of grounded theory method
Morse and Field (1996) suggest that participant observation allows the researcher to view nurses as they practice nursing, and that this feature assists with validation and interpretation of information provided by participants during interviews. In participant observation, the participants are aware of the researcher's purpose and are encouraged to interact with the researcher (Davis, 1986; Morse & Field, 1996). In addition, Morse and Field (1996) state, "observation adds breadth to the interview and provides answers to contextual questions that cannot be answered by interview alone" (p. 99). Specifically, participant observation allowed me to observe nurses' actions and interactions together with their antecedent and consequent conditions. The inferences that I made with respect to these behaviours were later confirmed or disconfirmed during personal interviews and document review.

In this study observational strategies used to increase the richness of data included sampling by both time and by event. Observations occurred during morning and afternoon shifts and were spread across the entire week. Some observations were undertaken out of hours when there was minimal medical support. Observations also occurred at strategic points during a shift. Particular events such as shift handover, initiation of haemodialysis, and immediate post-operative care of transplant recipients were observed. Observations were also undertaken when the participant went to the intensive care unit to dialyse a person who could not be transferred to the dialysis unit. Observations occurred during busy and quiet periods so that the full range of nephrology nursing activities such as time management, problem solving and patient or peer teaching were able to be described.
Eleven expert nephrology nurses were observed for periods ranging from 1.5 hours to 4 hours with a total of 51.5 hours of observational data collected. Similarly, there were 51.5 hours of observations on non-expert nurses. Table Seven summarises the number of occasions and the total number of hours of observational data collected relative to each participant.

<table>
<thead>
<tr>
<th>Participant (E = expert, NE = non-expert)</th>
<th>Number of Occasions Observed</th>
<th>Number of Observational Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agatha (E)</td>
<td>2</td>
<td>7.25</td>
</tr>
<tr>
<td>Alexis (NE)</td>
<td>1</td>
<td>3.00</td>
</tr>
<tr>
<td>Alice (E)</td>
<td>1</td>
<td>1.75</td>
</tr>
<tr>
<td>Celena (E)</td>
<td>1</td>
<td>3.00</td>
</tr>
<tr>
<td>Fran (E)</td>
<td>2</td>
<td>7.00</td>
</tr>
<tr>
<td>Helen (NE)</td>
<td>6</td>
<td>19.35</td>
</tr>
<tr>
<td>Judy (NE)</td>
<td>4</td>
<td>14.00</td>
</tr>
<tr>
<td>Kim (E)</td>
<td>1</td>
<td>3.00</td>
</tr>
<tr>
<td>Leonie (NE)</td>
<td>3</td>
<td>8.55</td>
</tr>
<tr>
<td>Mary (E)</td>
<td>2</td>
<td>6.50</td>
</tr>
<tr>
<td>Norma (E)</td>
<td>1</td>
<td>2.50</td>
</tr>
<tr>
<td>Prue (E)</td>
<td>2</td>
<td>6.50</td>
</tr>
<tr>
<td>Rose (NE)</td>
<td>1</td>
<td>3.50</td>
</tr>
<tr>
<td>Sam (E)</td>
<td>1</td>
<td>3.50</td>
</tr>
<tr>
<td>Sandra (E)</td>
<td>1</td>
<td>4.00</td>
</tr>
<tr>
<td>Stacey (NE)</td>
<td>1</td>
<td>3.25</td>
</tr>
<tr>
<td>Theresa (E)</td>
<td>2</td>
<td>6.50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>32</strong></td>
<td><strong>103.15 hrs</strong></td>
</tr>
</tbody>
</table>

Initial observations were negotiated with participants. With participants’ permission, subsequent observations occurred randomly and were undertaken to increase the credibility (validity) of data (Guba, 1981; Jorgensen, 1989; Morse & Field, 1996). Other issues pertaining to this study’s trustworthiness will be discussed in this chapter on page 128.
Chenitz (1986) suggests that observation cannot occur in isolation from participant-researcher interaction. She recommends that "informal" interviewing is an acceptable "backbone of observation" in which the researcher moves "from a passive observer ... into an active researcher role... to deliberately engage in conversation" (p. 82). Short, on the spot interviews were conducted as events occurred during an observation episode, and they were timed so as not to interfere with care planning or nursing activities. These conversations ("informal" interviews) consisted of short questions such as "I noticed that you did ... could you tell me why you did that?" or "did you do this because of ...?" Answers were written within the field notes which were taken during an observation period. These conversations also had the added benefit of alleviating any anxiety participants may have been experiencing while being "watched" because they occasionally believed that we could not talk/interact while I observed them.

Field notes were recorded during all observational episodes. A separate notebook for each episode was used and the majority of field notes were written at the time they occurred in the presence of the participant. Recording field notes in a dialysis unit is easier than on a ward as the nurse is usually dealing with one patient and one activity at a time. In one of the dialysis units it was possible to sit at the nurses’ desk, observe the nurse at close proximity and record notes. Typically, most participants became accustomed to my presence and to me writing notes after approximately ten to twenty minutes. Only one nurse expressed a discomfort with being observed after this length of time, at which point I repeatedly offered to abandon the data collection. She refused.
each invitation, however, and wanted to continue with the study. Subsequent observations of this nurse were uneventful.

In this study, any information about nurses volunteered by patients, such as “she is a very good nurse,” was not recorded. Patients were not the objects of concern in this study, merely the recipients of nursing interventions and, therefore, only direct interaction between nurses and patients was recorded. Patients, who came in contact with a nurse during an observational episode, however, were given an explanation of the study and gave verbal consent to my presence. No patients refused permission for me to observe a nurse while s/he performed clinical activities.

Following each observation episode, field notes were transcribed into a computer file suitable for importation into a software program that was used to manage the data (see below p. 126 for further details). Participant observational data was analysed, preliminary codes were identified and hypotheses were constructed. Subsequent observations followed the principles of theoretical sampling and were focused on addressing these hypotheses to develop more detailed concepts and to identify properties of expertise acquisition. Increasingly more specific and selected observations were needed and, in the final stages of analysis, expert and non-expert nurses were observed in order to saturate the developed concepts.

**Open-Ended Interviews**

Although there are various types of interview which are broadly classified into structured, semi-structured and unstructured (Minichiello, Madison, Hays, Courtney &
St. John, 1999; Morse & Field, 1996; Oppenheim, 1996), grounded theory studies typically utilise focused, open-ended interviewing (Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss & Corbin, 1990, 1998) for the purpose of collecting in-depth information concerning a participant’s perspective about an experience. In this study, accordingly, interviews followed every observational episode and information was sought from participants to clarify the focus of their nursing actions and, more importantly, their rationales for these actions.

Ashworth (1995) states, “where members share in a stock of knowledge, communication is easy and participation can occur. Where they do not, communication and participation are flawed” (p. 374). As I was a registered nurse with significant nephrology nursing knowledge and experience, I knew what the participants should have been doing, how, when and why during their normal day to day nursing practice. Because of this understanding, I was able to generate open-ended questions during each observation which reflected what I had seen or heard at that time. These questions frequently probed a participant’s underpinning nursing knowledge (or lack thereof) that supported the basis of their practice, as well as the relationship of this knowledge to their actions.

The timing of each interview was arranged to suit the participants and ward routine; they lasted for no longer than one hour and were conducted in a private office located near the ward. Interviews were also audiotaped for subsequent verbatim transcription. A wealth of data was generated from each interview and was subsequently analysed using the procedures described later in this chapter on page 121. As the study
progressed, both participant observational notes and analytical questions about the
developing categories guided subsequent interview questions (Strauss, 1987). Once the
major categories had been developed, theoretical sampling directed further interviews
on five experts. These last interviews were conducted utilising a more structured
approach (Wimpeony & Gass, 2000) than previous interviews in order to saturate
categories, establish relationships between the categories and to verify the emerging
theory. These interviews provided an opportunity to establish trustworthiness via
member checks (see p. 129) on the emerging theory. In this study, a total of 37
interviews were conducted.

*Nursing Documentation*

The analysis of documentary sources, such as patient's health records, is a common
method of data collection used by qualitative researchers (Janesick, 1994; Morse &
Field, 1996), the purpose of which is to enhance data collected by way of observation
and interviewing (Jorgensen, 1989; Mason, 1996). In this study, it was anticipated that
nursing documentation on bed charts and progress notes would provide additional
qualitative data on particular themes such as: 1) focus of nursing practice; and 2)
support for nursing actions. Patients' notes and charts were reviewed only during an
observation period. Due to specific contextual factors, however, only a limited amount
of data was collected by this method. This was because, in the chronic dialysis unit and
home training areas, nurses undertook limited report writing. Typically, patients in
these areas are stable and most nursing interventions are consistent with a nursing care
plan or standard practice protocol. Only deviations from normal dialysis treatments are
recorded. In addition, on the acute wards, the hospitals expected progressive report
writing on patients throughout a shift, but nurses mostly wrote these reports at the end of a shift. This frequently did not coincide with an observational period. Only a limited amount of usable data, therefore, was generated from patients’ hospital records.

**Triangulation of Data**

Although triangulation has its origins in naval, military or surveying contexts (Nolan & Behi, 1995) it has also been used in qualitative research contexts (Denzin, 1989; Janesick, 1994; Jick, 1979). According to Denzin and Lincoln (1994), “qualitative research is multi-method in focus ...[and] qualitative researchers deploy a wide range of interconnected methods, hoping always to get a better fix on the subject matter in hand” (p. 2). It is through these ideas of “getting a better fix” or trying to converge on a single construct (Breitmayer, Ayres & Knafl, 1993) that the concept, rather than the literal meaning of triangulation (Janesick, 1994), in qualitative studies has evolved to become a research trend (Burns & Grove, 2001).

Denzin (1989) identifies four basic types of triangulation:

- Data triangulation – the use of a variety of data sources in a study.
- Investigator triangulation – the use of several different researchers or evaluators.
- Theory triangulation – the use of multiple perspectives to interpret a single set of data.
- Methodological triangulation – the use of multiple methods to study a single problem.

The principle of data triangulation was used in this study of nephrology nurses and was achieved by using a combination of data sources (observation, interviews and document review) collected from different nurses at different times and in differing locations with
a goal of achieving “a more complete, holistic, and contextual portrayal of the [area] under study” (Jick, 1979, p. 138). Triangulation of data involved comparing information gained during observations with that obtained from interviews and nursing documentation. Interviews, which immediately followed each observation, were used to confirm the intention or rationale of actions seen during the observational period. Nursing documentation was used to support, albeit in a limited way, the focus of nursing actions undertaken during a observation period. Subsequent observations and interviews were, used not only for the purpose of generating more data, but also to confirm data analysis by providing further evidence for the emerging theoretical concepts. Each data source in this study, therefore, contributed collectively to both confirmation (content validity) and to the completeness of findings (Breitmayer, Ayers & Knafl, 1993; Shih, 1998; Sim & Sharp, 1998).

Data Analysis

In grounded theory research (Glaser, 1978, 1992; Glaser & Strauss, 1967) data collection and analysis proceed simultaneously using the processes of substantive and theoretical coding (see chapter 3, pp. 83 - 87). Accordingly, in this study, a line by line analysis of the data was undertaken initially and this resulted in many codes, some of which were “in-vivo” codes; that is, codes that reflected the actual words or actions of the participants. At this stage of data analysis it was difficult to combine codes into (preliminary) categories because of the differences seen in the practice of expert and non-expert nephrology nurses. Gradually, as more data were collected and analysed, it become apparent that there were similarities in the practice of expert nurses and these codes then became categories. Properties (characteristics) of each expert category

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began to emerge as concurrent data collection and analysis proceeded. Immersion in the data assisted with this process.

Simultaneously with the emergence of expert categories and their properties, data collection from non-expert nephrology nurses also occurred with the intention of elucidating categories specific to that group of nurses. At first, at a superficial level, non-expert nurses were generally carrying out the same nursing actions as expert nephrology nurses. It became clear, however, during continued open coding of the non-expert data that their level of abilities and depth of knowledge were different and could be contrasted with those of experts. This had the additional benefit of confirming the shape or dimension for each expert category.

Questions about the similarities and dissimilarities between expert and non-expert nephrology nursing practice were developed and explored in subsequent data collection episodes with both groups. The answers, however, were not as “clear-cut” as anticipated. Although it became clearer that expert and non-expert nurses do practice differently and that this difference is due to varying amounts of experience and depth of specialised nephrology nursing knowledge, there were nurses who did not fit neatly into either group. These nurses became the “experienced non-expert” group (see chapter 6, p. 148).

The preliminary categories developed during the open coding phase of the data analysis were simple clusters of several similar codes; these tended to be at the descriptive level.

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Examples of these codes included: *gloves*\(^1\) and *keeping a close eye on*. Further analysis or the second stage of the analytical process was needed to identify common and conceptualised categories which were more inclusive and explained more of the data. According to Glaser (1978), several questions need to be asked of the data in order to refine categories, their properties and their linkages. Some of the questions that were of asked of the data in this study were: To what broader category does this group relate? What is actually happening in the data? What label can I give this broader category? For example, the early clusters of codes given above now merged with other codes to become: *blurring the boundaries* and *being patient-focused*. The large cluster of codes, *blurring the boundaries*, describes the level of skill of expert nurses. *Blurring the boundaries* does not, however, describe either experienced non-expert or non-expert nurses' level of skill; these nurses were respectively *still playing within the boundaries* and *playing within the boundaries*. The three groupings of nephrology nursing practice, in this instance, fleshed out the shape (dimension) of the larger category of skill. This technique of questioning the data was consistently applied to the remaining codes and clusters until eventually all of the data was condensed into higher and higher levels of conceptualised categories that had broader explanatory power than lower level categories.

\(^1\) Throughout this thesis all sub-categories or codes (i.e., characteristics and dimensions) will be italicised. Categories, as footnoted earlier (p. 92) are identified by small capitals.

*Chapter 4: The application of grounded theory method*
Theoretical sampling also occurred during the first and second stages of data analysis and continued until saturation of the categories occurred, no new categories emerged and a sense of closure of data collection was achieved (Glaser & Strauss, 1967; Strauss & Corbin, 1990). The second stage also revealed the contents of the core category, but did not generate its conceptual label. This occurred during the third stage.

The third and final stage of the analytical process involved generating theoretical codes to integrate similar categories under one conceptual name which was mutually exclusive of other categories could be linked by explanation. For example, exercising advanced nephrology nursing skills, a characteristic of expert nursing practice, integrated the codes blurring the boundaries and recognition of expertise. Blurring the boundaries and recognition of expertise, therefore, became two of the dimensions of this characteristic. At this point, four interviews remained to be coded; no new categories were identified and the remaining “free” codes were easily subsumed into categories. Theoretical saturation of categories had been achieved.

Diagramming during this stage helped to summarise and display the relationship between categories, but the name of the core category remained elusive. During a grounded theory seminar discussion the idea that an expert nephrology nurse conducts others (other nurses, doctors and patients) in order to produce quality outcomes for patients led to the naming of the core category. The orchestral metaphor developed from this seminar assisted in defining all categories, the relationships between them and integrating them into the substantive grounded theory, PRODUCING THE MAGNUM OPUS: THE ACQUISITION AND EXERCISE OF NEPHROLOGY NURSING EXPERTISE.

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The core category in this study was also a basic social process (BSP) because it had three stages or phases that accounted for the variation in the data (Glaser, 1978, 1992). The first stage of expertise acquisition and exercise was LEARNING TO PLAY IN THE ORCHESTRA. This is the non-expert nephrology nursing stage of development. The second stage or experienced non-expert stage of development was PLAYING BETTER, LEARNING TO CONDUCT AND COMPOSE MUSIC. PRODUCING THE MAGNUM OPUS described the final stage of nephrology nursing expertise acquisition and exercise. Each of the three stages contained four characteristics, namely, knowledge, experience, skill and focus. At this point, an extensive literature review was commenced in order to integrate the stages and characteristics with existing knowledge. Chapter Five presents the substantive theory and Chapter Eight discusses the findings of the study with respect to current literature.

Data Management

Data management in this study involved two separate activities. The first activity was related to the practicalities of data management and, the second, to the specific, computer support for the management of the large volume of data generated during this study.

Practical Considerations of Data Management

During participant observation episodes other nursing and health staff were aware that I was observing particular nurses, so although confidentiality of who was participating in the study could not be ensured, anonymity was maintained as only I was aware of participants’ pseudonyms. In addition, if other staff came in contact with participants
while they were being observed, I did not record their identity in my field notes. These staff were identified by their position designation such as registered nurse, intern (junior medical staff), pharmacist, and so on.

Following each initial participant observational episode an interview was conducted. During this interview, each participant selected a pseudonym to maintain anonymity and this was subsequently used throughout the interview. In the privacy of my office the pseudonym was also attached to field notes. Only the individual participant and myself was aware of who the pseudonym pertained to. The peer panel was not informed of this pseudonym and this name was not used during later participant observations. In addition, field notes taken during participant observation episodes did not identify any patients. Patients were identified as Patient 1, Patient 2, and so on. Additional, specific ethical considerations employed during this study are discussed below on page 133.

*Computers in Qualitative Research*

Huberman and Miles (1994) suggest that it is imperative that qualitative researchers use a systematic process to collect, store and retrieve data due to the large volume of data generated. They further state that an inability to achieve this has the potential to result in data being miscoded, mislabelled, mislinked, and mislaid. Much of the analysis in qualitative research relies on cutting, sorting and pasting pieces of paper and these tasks can now be performed by computer (Holloway & Wheeler, 1996), thereby facilitating and expediting the clerical tasks associated with data handling (Morison & Moir, 1998), freeing up the researcher’s time (Tesch, 1990; St John & Johnson, 2000) to discover theory creatively in the way that Glaser and Strauss (1967) originally conceived it.
Other advantages of computer-assisted qualitative data analysis include increased flexibility and thoroughness in handling data, assistance with establishing trustworthiness and the provision of a more visible audit trail (St John & Johnson, 2000). In this study, textual data derived from field notes and transcripts of interviews were managed through the use of Non-numerical Unstructured Data Indexing Searching and Theorising (NUD*IST) software program (Richards & Richards, 1997).

According to Richards and Richards (1994), NUD*IST’s indexing system is similar to a library index which enables the researcher to store and locate data very easily. It allows textual data to be stored in a form that can be coded line by line, with the flexibility to change and recode data at any phase throughout the analytic process. NUD*IST also provides other functions that enable texts to be searched for words or phrases that are linked to the project. For example, in this study, text searches for particular phrases such as “easier,” “obligated” or “automatic” could be easily identified, examined and compared between expert and non-expert nephrology nurses. This program also allows the researcher to memo during the analysis process and to generate reports on emerging codes and categories (Richards & Richard, 1994, 1997). The principle advantage of using a program such as NUD*IST according to Tesch (1991) is that it does not prevent:

the thinking, judging, deciding, interpreting, etc...done by the researcher. The computer does not make conceptual decisions, such as which words or themes are important to focus on, or which analytical step to take next. These analytical tasks are still left entirely to the researcher (pp. 25-26).
Following the techniques described by Richards and Richards (1997) and Stroh (2000), transcripts of field notes from participant observation episodes and interviews were entered into NUD*IST. Line by line analysis was conducted using the principles of open coding generating codes or what NUD*IST terms “free nodes.” Once several observations and interviews had been coded, reports (print outs) were made of all codes with the purpose of assisting in determining areas of overlap. Several codes were collapsed and clustered together in this manner and became “tree nodes” or (preliminary) categories.

This process continued as more data were generated and analysed. As the stages of the analysis progressed, NUD*IST provided an easy reminder of the contents coded at each cluster and then at each category as they were developed. Tracking of smaller categories as they were moved into and/or out of larger categories (“tree nodes”) was also maintained by NUD*IST as the theory evolved. Eventually all of the data was contained within several major categories and no “free nodes” remained. The use of NUD*IST as a data management system easily provided the “evidence” that theoretical saturation had been reached as no new data altered the “tree nodes” and no data was left unattached as “free nodes.” Diagramming, which was done by hand, assisted the last stage of analysis and led to the emergence of the orchestral metaphor and the substantive theory of nephrology nursing expertise acquisition and exercise. NUD*IST then assisted with moving all of the categories, sub-categories and their properties into place. Appendix Four (p. 352) provides an example of a NUD*IST print out of the final version of categories and codes.
St John and Johnson (2000), however, caution that software programs, such as NUD*IST, should not be accepted uncritically. They warn that researchers may focus on obtaining large amounts of data rather than examining the data for meaning. This could lead to researchers homogenising data. In addition, they suggest that programs are time consuming to learn and may also result in distancing the researcher from the data.

On a personal note, I believe that NUD*IST primarily, and importantly, assisted me with “opening up” the data because each line or paragraph could be coded in many different ways. Thinking about the data and what was happening there was not stifled by having a limited number of coloured pencils, copies of transcripts or folders for storage. In addition, the program freed up time because ideas or hunches could be quickly and thoroughly examined while diagramming. This assisted with establishing relationships between categories, their characteristics (properties) and dimensions as they emerged in the theory.

**Trustworthiness Issues**

Traditionally, research has been evaluated in a positivist manner using the “scientific canons” of objectivity, validity, reliability and generalisability (Strauss & Corbin, 1990). However, qualitative researchers argue that such criteria are inappropriate (Cutcliffe & McKenna, 1999; Emden & Sandelowski, 1998; Lincoln, 1995; and Seale, 1999); objectivity is impossible and even undesirable, validity needs to be modified for qualitative research, and reliability and generalisability are unlikely when the emphasis is placed on the perceptions of the participant in relation to certain social processes,
situations and phenomena. The criteria to judge the quality of qualitative research are difficult to resolve due to the different philosophical perspectives (i.e., postpositivist, constructivist and critical theorist) as well as their collective difference from quantitative research (see Chapter 3, p. 66). Assessment of research findings, therefore, involving the usual cannons of validity and reliability are inappropriate for research conducted in a different paradigm.

According to Engel and Kuzel (1992) and Koch (1996), a qualitative researcher should, in order to determine the credibility or accuracy of their findings, select or develop the most appropriate criteria that suit their study. The determination of rigour, employed in this study of nephrology nursing expertise, was through two interconnected techniques, the application of grounded theory techniques and the four criteria of trustworthiness developed by Guba (1981). The constant comparative analysis procedure typically used in grounded theory studies requires continued validation of data by triangulating the information obtained from interviews, field notes obtained during observation and review of nursing documentation. This procedure also provides evidence in establishing the credibility of the study. In addition, inherent in theoretical sampling is the flexibility to verify information from multiple participants as well as finding negative cases to add different dimensions of knowledge to inform the emerging theory.

The goal of trustworthiness in any qualitative research is to accurately represent what those who have been studied experience and is demonstrated through the researcher's attention to and confirmation of data and categories. Guba (1981) and Lincoln and Guba (1985) suggest four criteria to describe operational techniques which support the
trustworthiness of this study. These criteria are credibility, dependability, confirmability and transferability; each of which can be compared to those criteria found in traditional, scientific (positivist) research (Table 8).

Table 8  Scientific and Naturalistic Terms Appropriate to the Four Aspects of Trustworthiness

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Scientific Term</th>
<th>Naturalistic Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truth Value</td>
<td>Internal Validity</td>
<td>Credibility</td>
</tr>
<tr>
<td>Applicability</td>
<td>External Validity/ Generalisability</td>
<td>Transferability</td>
</tr>
<tr>
<td>Consistency</td>
<td>Reliability</td>
<td>Dependability</td>
</tr>
<tr>
<td>Neutrality</td>
<td>Objectivity</td>
<td>Confirmability</td>
</tr>
</tbody>
</table>

(Taken from: Guba, 1981, p. 80).

According to Guba (1981) and Lincoln and Guba (1985) qualitative research methods can demonstrate trustworthiness through the integration of several measures into both the data collection and analysis stages of the research process. A brief description of the four criteria of trustworthiness and the specific measures employed in this study are presented below.

In a qualitative study, faithful descriptions or interpretations of a human experience represent the credibility (truth value) of a study (Guba, 1981). This is achieved when a number of research strategies are used which seek to understand the situation of the participants. In addition, others, including the research participants, can also see a study’s credibility if they immediately recognise the experience presented in the findings. In this study credibility was achieved through: 1) triangulation of data
collection methods (participant observation, individual interviews and review of
documentation); 2) prolonged collection of data; 3) the grounded theory feature of
checking incidents from the data against one another repeatedly (i.e., constant
comparative analysis method); and 4) going back to some of the research participants
and asking them to see if they can recognise the truth of the findings to their practice of
nephrology nursing (member checks). In addition, other researchers and doctoral
students examined some sections of the data and coding and questioned issues that
seemed unclear. This prompted further verification with the data.

In a positivist study, generalisability or external validity represent how applicable or
relevant the results are to the sample’s population. This is not possible or even a
necessary requirement for qualitative studies that are “intimately tied to the times and
the contexts in which they are found” (Guba, 1981, p. 80). Nevertheless, it is possible
to establish a study’s applicability if its findings are seen as being potentially
transferable to similar contexts. In order to establish transferability, this study
integrated the following strategies. Firstly, purposive and theoretical sampling
procedures were used with the intention of maximising the range of information
uncovered during the study. Secondly, as will be evident in subsequent chapters, there
is presentation of adequate evidence from the data to substantiate the generated theory
(i.e., PRODUCING THE MAGNUM OPUS) so that other nurses can see its “fit.”

Reliability in a quantitative study is concerned with providing consistency or stability of
results from the instruments employed to measure particular variables. Guba (1981)
also argues that consistency is also important for qualitative studies, a concept he
termed dependability. The strategies employed in this study to meet the criterion of dependability were: 1) triangulation of data in which similar evidence for the evolving substantive theory were found in data collected by different methods, from different sources at different times; and 2) an audit trail in which documentary evidence, such as field notes, interview transcriptions, and memos, provided proof of the processes used.

The final criterion suggested by Guba (1981) for establishing trustworthiness in a qualitative study is confirmability. In a quantitative study this final criterion is bound firmly to the idea that the researcher must not influence or bias the findings (be objective); this is not possible or even desirable in qualitative studies. Here Guba (1981) shifts the burden of objectivity from the researcher to the data in which the “data exists in support of every interpretation and that the interpretations have been made in ways consistent with the available data” (p. 88). In this study, confirmability of results was assisted once again by triangulation of data collection methods and sources and an audit trail.

Ethical Considerations

Permission was sought from the University’s Ethics Committee, and the Area Health Service Scientific Advisory Committee and Human Research Ethics Committee prior to commencing the study. Participant information sheets (see Appendix 2, p. 349) explaining the aims of the study, an overview of participants’ rights, details of the procedures involved and measures to be taken to ensure anonymity and confidentiality of data were distributed to interested nurses. Verbal information and any questions/concerns of the participants were addressed prior to consent being obtained.
Assurance was given to participants that their participation in the study would in no way influence their employment status or yearly performance appraisal review procedure. Participants were also advised of the voluntary nature of the study and given the option to withdraw from the study at any stage without being subject to penalty. Voluntary, informed, written consent (see Appendix 3, p. 352) was then obtained from each participant prior to commencing the study. This consent also gave permission for the interviews to be tape-recorded and for the dissemination of the study's findings provided participants’ anonymity was maintained. No participants withdrew consent once the study commenced and a copy of the consent form was given to each participant. Confidentiality was maintained using pseudonyms. Only the researcher knew to whom the pseudonym related.

Patients did not contribute directly to this study; they were merely informal "onlookers." Each patient a participant came in contact with during an observation period, nevertheless, was approached so that I could explain the study and obtain permission to allow me to observe the nurse performing nursing actions for that patient. No patients refused permission. No information was recorded about the patient and they were identified as patient 1, patient 2, and so on in my field notes. Also, if a participant identified a patient by name during an interview, their name was deleted from the verbatim transcript of the tape and substituted with Patient 1, and so on. If the nurse (participant), patient or myself believed that the patient’s well being or nursing care was being compromised in any way during the observation period, data collection would cease immediately. This occurred only once during the study (see p. 99) when I

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ceased observing and recording field notes to assist a patient who was experiencing a hypotensive (low blood pressure) episode during haemodialysis treatment.

A similar procedure was undertaken when a participant was interacting with other nursing and health staff. No staff member refused permission for me to observe an interaction between a participant and themselves. Hospital staff were identified in field notes as RN (Registered Nurse), intern, pharmacist, and so on. In addition, if a participant identified another staff member by name during an interview, their name was deleted from the verbatim transcript and substituted with their position title (e.g., RN, intern).

Chapter Summary

The primary focus of this chapter has been the research design and analytical procedures used in this study. This study was undertaken in a renal unit located in New South Wales and comprised 17 nurses permanently working in that unit who were classified by their peers as either expert (n=11) or non-expert (n=6) nephrology nurses. Expert nephrology nurses all had at least eight years experience in the specialty and had obtained a nephrology qualification. Non-expert nurses had a diverse length of experience ranging from three months to 21 years. Only one non-expert nurse had additional qualifications in the specialty.

Following the acquisition of ethics approval and informed consent from participants, data was generated from participant observations, formal semi-structured interviews and nursing documentation. Data comprised 103 hours of observations, 24 hours of

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interviews which were tape-recorded and transcribed verbatim, and a limited amount of usable nursing documentation data. Data triangulation was utilised as one method of ensuring credibility and trustworthiness of the findings. Other methods of ensuring the study’s credibility were purposive and theoretical sampling, providing an audit trail, and presentation of adequate evidence (i.e. findings) to substantiate the generated theory. A computer program, NUD*IST, assisted with data management, and data analysis which proceeded according to the procedures described by Glaser (1978; 1992). This resulted in a three-stage process of the acquisition and exercise of nephrology nursing expertise.

The subsequent three chapters will present the findings of this study by firstly examining the basic social process and substantive theory of expertise acquisition and exercise (Chapter 5). This will then be followed by a detailed description of the characteristics and practices of non-expert and experienced non-expert nephrology nurses (Chapter 6) and expert nurses (Chapter 7). Lastly, chapter eight will discuss the findings of this study in the context of current literature and will explicate the implications of these findings for nursing practice, theory, research and education.
CHAPTER FIVE

A Grounded Theory of the Acquisition and Exercise of Nephrology Nursing Expertise

Introduction

The purpose of this study was to discover the structure and process of expertise acquisition and its exercise by nephrology nurses. It also sought to reveal the characteristics of expert nephrology nursing practice as well as the differences between expert practice and less expert practice. This chapter presents and explains the substantive grounded theory of the acquisition and exercise of nephrology nursing expertise. The data revealed a three stage process of expertise acquisition, namely, non-expert, experienced non-expert and expert stages. Each stage consists of four characteristics which describe how the nurse practices. These characteristics are knowledge, experience, skill and focus, outlined early in the chapter. Diagram two (p. 138) depicts the acquisition and exercise of nephrology nursing expertise.

During the analysis phase of this study, difficulty arose in providing a conceptual label for each of these stages which sufficiently explained not only their relationship to each other but also which satisfactorily captured the data coded at each stage. An orchestral metaphor was selected to assist in explaining and linking the findings. It, too, is presented in this chapter. The metaphor includes three movements which describe the different stages that nephrology nurses pass through as they acquire expertise and the characteristics of their practice at each stage. These movements were called: firstly, LEARNING TO PLAY IN THE ORCHESTRA; secondly, PLAYING BETTER, LEARNING TO COMPOSE AND CONDUCT MUSIC; and thirdly, PRODUCING THE MAGNUM OPUS.
DIAGRAM 2: ACQUISITION AND EXERCISE OF NEPHROLOGY NURSING EXPERTISE

Chapter 5: A grounded theory of the acquisition and exercise of nephrology nursing expertise

LEGEND:

--- Indicates continuing domain

--- Factors influencing movement into next stage

138
Defining the Characteristics

Knowledge

In this study, a nurse’s knowledge was conceptually defined as an understanding of the facts, values, and procedures related to the context and practice of nephrology nursing. The level of domain-specific knowledge possessed by a nephrology nurse ranged from superficial (i.e., non-expert nurse) through to extensive (i.e., expert nurse). A nurse’s level of knowledge informed her or him about what to do, when to do it, with whom, when, why and how, and the likely consequences of their actions. Knowledge acquired, therefore, was both propositional and procedural.

Experience

Experience, the second characteristic of nephrology nurses, was conceptually defined as the number, frequency and types of encounters a nurse had with a person with a renal disorder and its associated treatment. A nurse’s experience was on a continuum ranging from limited (for a non-expert) through to vast (for an expert). Experience specifically provided the nurse with opportunities to observe and practice what to do, with what, why, to whom, when, where and how. Observation of another nurse’s practice was a source of both instruction and supervision. It provided propositional and procedural knowledge which could then be incorporated into a nurse’s practice repertoire during subsequent patient care activities. During practice nurses would also acquire feedback from themselves, patients, other nurses, equipment, and so on, regarding their performance and this feedback would be processed implicitly or explicitly into concepts, schemata or scripts (see p. 25) to be accessed at a later time when the procedure was performed again. Increased encounters with similar or related events,
therefore, would evoke and elaborate the necessary scripts until their access and deployment became automatic.

**Skill**

In this study, skill was conceptualised as the demonstration or actual performance of nursing actions. Skills were influenced by knowledge, experience and to a lesser degree, focus. Skills were acquired through continued practice (i.e., exercise) and from feedback (i.e., explicit and implicit) for a given task situation. In particular, skills were a reflection of practical ability, motivation, intellect and the ability to process, store and retrieve information as scripts (or action schemata) by the nurses. Skill levels ranged from non-expert nurses who practiced in a restricted, limited and rule-bound manner through to expert nurses who clearly demonstrated autonomous, self-directing and flexible nursing actions.

**Focus**

The fourth characteristic of nephrology nurses' practice was termed focus. This was conceptualised as nurses' centre of attention or concentration while they were undertaking nursing activities. The focus ranged from inexperienced non-expert nurses concentrating predominantly on the task at hand (e.g., cannulation of a fistula) to viewing actions (and their possible consequences) more broadly, globally and holistically (i.e., expert nurses). Expert nurses, therefore, considered the patient, but also other staff (e.g., nurses and doctors), the unit and the hospital.
First Movement:  

LEARNING TO PLAY IN THE ORCHESTRA  
(or Non-Expert Nephrology Nursing Practice)

When an individual begins to learn to play, for instance, a violin, the early lessons consist of learning how to play some basic notes (e.g., “C” and other nearby notes – “A,” “B,” and so on) and how to read these simple notes printed on paper (i.e., staves). As the violin lessons progress, students will learn more notes, how to link them together, play simple tunes and understand that notes have different lengths (e.g., quavers, crotchets). After each lesson, students are required to practice what they have learnt through ongoing rehearsal. Students will practice drawing the bow across the strings in order to produce a cleaner sound. Other purposes of practicing are to increase their ability to play more fluently and to read the music with greater ease. Within a short period of time, following several lessons, practice and feedback from the teacher including verbal feedback such as “that’s good” or demonstration such as “hold it this way,” the violin student is able to play a short, simple piece of music. During this first stage, students need to concentrate on mastering individual notes then on short sequences of notes. The attention of students is on reading the music. They are unable at this stage to compose their own score. Often during this first stage, for example, violin students will join with other students in the school band to perform at school concerts. Some violin students will eventually, after many years of education and practice, join an orchestra.

In nursing a similar sequence occurs. Non-expert nurses (cf. violinists), when they become members of the nephrology ward, are joining a health care team which
comprises other nurses, doctors, allied health staff (e.g., pharmacist, dietitian, social worker) and patients. This is the nephrology “orchestra.”

Non-expert nephrology nurses are not proficient in this specialised area of nursing when first joining the health care team: that is, their understanding of what it is to be a nephrology nurse and how to practice nephrology nursing is limited. In effect, non-expert nephrology nurses are playing someone else’s score (musical composition) as they are frequently guided, prompted or instructed by more experienced nurses in how they should provide nursing care. It is during this stage that non-expert nephrology nurses learn the ward routines, begin to understand typical patient issues or problems that arise, and what nursing actions to implement, and can start to identify the rationales underpinning those actions. They are LEARNING to practice as a nephrology nurse by acquiring both propositional and procedural knowledge: that is, they are learning what to do, when to do it, with what, with whom, where and how to do it by observing other, more experienced nurses and by practicing.

During the first movement of expertise acquisition, several sub-categories or characteristics of non-expert nephrology nursing practice were revealed. These characteristics are superficial nephrology nursing knowledge, limited experience, acquiring basic nephrology nursing skills and narrow focus of practice (see diagram 2 above, p. 138). Each of these will be explained in relation to the metaphorical sub-process of LEARNING TO PLAY IN THE ORCHESTRA.

Chapter 5: A grounded theory of the acquisition and exercise of nephrology nursing expertise
Superficial Nephrology Nursing Knowledge

In this first movement of expertise acquisition, non-expert violinists rely predominantly on propositional knowledge such as being familiar with written musical notes and their meanings (e.g., quavers, crotchets) when they first join the orchestra. When learning to play unfamiliar musical scores, for example, the non-expert violinist can at least read the score before actually playing it.

When nurses begin to practice in the specialty field of nephrology nursing, they also bring with them varying degrees of knowledge. All nurses during their initial preparation for nursing (e.g., in either a hospital or university setting) do have some educational input (cf. music lessons) related to nephrology nursing. This provides them with superficial background knowledge on kidney diseases and its medical and nursing management, including a brief introduction to renal replacement therapies (i.e., haemodialysis, peritoneal dialysis and kidney transplantation). Nurses will also have some nursing experience (cf. violin practice) prior to joining the nephrology ward gained during either their initial nursing preparation (e.g., through clinical practicum placements) or when working as a nurse in any another area of nursing (e.g., a surgical or medical ward). That is, non-expert nurses have some propositional knowledge which is applicable to nephrology nursing (e.g., what renal failure is) as well as some procedural knowledge of how to perform nursing activities that are readily transferable to this specific domain (e.g., how to take and interpret a blood pressure measurement).

Initially on joining the nephrology orchestra, non-expert nurses predominantly rely on general nursing knowledge acquired during their initial nursing course and some procedural knowledge. Non-expert nurses, during the first stage of nephrology nursing

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expertise acquisition, therefore, need to learn to play the score that the other members, particularly other more experienced nephrology nurses, are playing in the orchestra (i.e., renal unit).

**Limited Experience**

During the first movement of expertise acquisition, the metaphorical non-expert violinist has only a very limited experience with playing the violin in the orchestra. In order to increase their experience, violinists are encouraged to practice and rehearse formal knowledge gained during previous lessons. Practice provides both implicit and explicit feedback to non-expert violinists about the quality of the sound produced and the effort needed to produce it. Feedback will also provide motivation to continue to practice. If there is insufficient practice of individual notes and simple scores, non-expert violinists will be unable to progress to more difficult pieces and are likely to give up playing (see also Sloboda, 1996).

Non-expert nephrology nurses typically have only a minimal number of encounters with people who have a renal disorder or who require renal replacement therapy. This has provided them with limited opportunities to observe and practice what to do, why, with what, to whom, when, where and how. Time management skills of non-expert nephrology nurses are also limited. Time management is a difficult strategy to learn from purely propositional knowledge; it needs to be observed and practiced. At this stage of expertise acquisition, non-expert nurses demonstrated their limited nephrology nursing experience by moving backwards and forwards, backwards and forwards between tasks, resulting in unnecessary action and activity. In addition, non-expert
nurses also stayed (i.e., played) within the boundaries of expected nursing practice, that is, their practice was governed by the general rules or principles of nursing. Furthermore, non-expert nurses felt insufficiently competent to perform many of the specialised nursing tasks.

Lastly, inexperience in dealing with context- and practice-related issues associated with nephrology nursing was also recognised by others, particularly more experienced nephrology nurses and patients. Several strategies such as preventing or shielding non-expert nurses from undertaking certain clinical skills (e.g., cannulation of a difficult fistula or providing immediate post-transplant nursing care) were employed by more experienced nurses in order to protect both the non-expert nurse and the patient from getting into difficulties.

**Acquiring Basic Nephrology Nursing Skills**

Following the orchestral metaphor, during the first movement, non-expert violinists need to focus on (or attend to) finger placement along the fingerboard as well as bow technique. The performance of the non-expert violinist will be slower and less fluid because they are relying on existing propositional knowledge and limited practice. Their skills, therefore, are restricted to what they already know.

Non-expert nephrology nurses in this study were in the process of acquiring basic (or routine) nephrology nursing skills. They were learning, from observation and feedback, how to apply existing and newly acquired propositional and procedural knowledge in a nephrology nursing context. In order to compensate for this limited experience, non-

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expert nurses relied on strategies such as *seeking confirmation or help or being told what to do* by another (more experienced) nurse. They also needed to *mentally rehearse skills* before undertaking them. Finally, as a result of having *limited experience, needing help and being told what to do*, the non-expert nephrology nurse commonly felt *incompetent*.

**Narrow Focus of Practice**

Returning to the orchestral metaphor, non-expert violinists’ focus of attention is predominantly on playing the notes correctly and keeping in time with the rest of the orchestra. The focus of attention is, therefore, on playing correctly.

Although non-expert nephrology nurses believed that the focus of their attention was on the patient, it became apparent during observational data collection that their focus was clearly on trying to complete essential nursing tasks. In addition, their focus was narrow in relation to continuity of care. In contrast to other more experienced and expert nephrology nurses, non-expert nurses tended to concentrate only on a patient’s current admission or problem and to view their nursing activities in terms of short-term goals or plans (e.g., completing the haemodialysis treatment for that particular day).

**Progressing to Next Stage: Influencing Factors**

Over time, non-expert violinists begin to play more fluently in the orchestra as their knowledge of common scores and their experience of playing them increase. Non-expert violinists have acquired knowledge, experience and skills in playing these scores which have been played frequently, but are unable to predict in what order the different
scores will be played. Once the music has commenced the violinist can readily identify the tune and join in the playing with more experienced orchestra members.

The length of time spent in the first stage of expertise acquisition was dependent on a range of factors such as the richness of knowledge and experience, intellectual ability, motivation and attitude to nephrology nursing. These factors tended to influence the transition or movement of the nurse into the next stage. Each of these influencing factors will be discussed below.

The first factor which enabled non-expert nurses to progress into the next stage of expertise acquisition was the possession of a greater depth of specialised knowledge to underpin nephrology nursing actions. There are several methods of acquiring this knowledge such as on-the-job learning, informal education (e.g., worksheets, inservice) but the most important source of knowledge was further formal education. When asked at interview, non-expert nurses identified that undertaking further specialised education would help them better understand what they were doing. Similarly, expert nurses also recognised the importance and value of completing formal post-graduate nephrology nursing courses.

The second factor is related to the length of time (i.e., experience) spent in this field of nursing. The longer nurses spend providing nursing care to patients with renal dysfunction, the easier and more fluently they are able to perform the necessary psychomotor skills. Repeated practice of routines (e.g., fistula cannulation) also provides non-expert nephrology nurses with a mechanism for eliciting increasing
amounts of explicit and implicit feedback from their actions/inactions, patients, other nurses, equipment, and so on, which, in turn, facilitates the development of increasingly refined schemata or scripts. Routines, therefore, become easier because of increased proceduralisation of knowledge. Repeated practice and increased time spent “doing” the daily routine activities of nephrology nursing invariably assisted most non-expert nurses into the next stage of expertise acquisition.

While non-expert nephrology nurses are learning to play in the orchestra, expert nurses invariably notice their aptitude, intelligence and motivation to succeed in nephrology nursing. Expert nurses recognise this potential to become experts and respond by providing more opportunities to learn from increased exposure to, or encounters with, increasingly more complex clinical situations and skills.

These influencing factors enable non-expert nephrology nurses to progress into the next stage in which their practice reflects a nurse who has become accustomed to the routine requirements of nephrology nursing. Non-expert nurses have gradually acquired the necessary knowledge and skills which will enable them to develop their own nursing style. This is the beginning of them being able to compose their own musical score and the beginning of the next stage (i.e., second movement) of expertise acquisition.
Second Movement:  
PLAYING BETTER, LEARNING TO CONDUCT  
AND COMPOSE MUSIC  
(or Experienced Non-Expert Nephrology Nursing Practice)

During the second movement, violinists have gained experience as orchestral members, playing many different composers’ music (e.g., Mozart, Beethoven) and following several conductors (e.g., de Waart). The increased number, variety and complexity of performances given by experienced violinists have, over time, strengthened their position within the orchestra; that is, non-expert violinists are “playing better.”

In the second stage of the acquisition of nephrology nursing expertise, the non-expert nurse has acquired sufficient knowledge through practice (i.e., experience) and feedback relating to most of the basic or routine nursing skills required of this specialty area. The nephrology nurse is now identified as the experienced non-expert nurse.

Experienced non-experts’ routine nursing practice has now become fluid, rapid and automatic. Routine nursing care has become easier because most tasks are very familiar, demanding less concentration to perform. Proceduralisation of underpinning knowledge has occurred and, at times, it is more difficult to distinguish between the practice of an experienced non-expert and that of an expert. Diagram three (p. 150) depicts the shift in knowledge, experience, skill and focus seen in experienced non-expert nephrology nurses.
DIAGRAM 3: SECOND MOVEMENT OF NEPHROLOGY NURSING EXPERTISE

Knowledge

Extensive

Governed/Restricted

Minimal

Superficial

EXPERIENCE

Self-directing/Autonomous

Vast

Task

Patient

Focus

LEGEND:

--- Indicates continuing domain

Factors influencing movement into next stage

Non-expert Nephrology Nurse (Learning to play in the orchestra)

Experienced Nephrology Nurse (Profiling and conducting the orchestra)

Expert Nephrology Nurse (Producing the magnum opus)
Returning to the orchestral metaphor, in the second movement (or stage of expertise acquisition), experienced violinists may begin to compose their own score. They will have had enough theoretical and practical knowledge to be able to orchestrate short pieces mainly for stringed instruments. The violinist would not yet have enough knowledge about the other instruments in the orchestra to be able to compose larger pieces of work involving the entire orchestra.

It was during the second stage of expertise acquisition that experienced non-expert nurses were clearly demonstrating personal preferences in the manner in which they practiced. Nurses were able to recognise that they were developing their own style of nephrology nursing (cf. learning to compose).

During the second movement of expertise acquisition, several sub-categories or characteristics of experienced non-expert nephrology nursing practice were revealed. These characteristics were sufficient nephrology nursing knowledge, adequate experience, exercising routine nursing skills and changing focus of practice. Each of these will be explained in relation to the metaphorical sub-process of PLAYING BETTER, LEARNING TO COMPOSE AND CONDUCT MUSIC.

Sufficient Nephrology Nursing Knowledge

Violinists, during the second movement of the magnum opus, have increased their propositional and procedural knowledge of music due to increased experience with playing in the orchestra.

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During the first stage of expertise acquisition, non-expert nurses had only a superficial domain-specific (i.e., nephrology nursing) knowledge (see above, p. 143). In the second stage, it was evident that experienced non-expert nurses had gained more specialised nephrology nursing knowledge. This knowledge had come from a number of sources including formal post-graduate nephrology nursing courses and informal, on-the-job learning. Experienced non-expert nurses were able, in more obvious ways, to integrate the routine skills with more sophisticated theoretical knowledge. These nurses also recognised the importance of increased theoretical knowledge to underpin clinical practice.

By comparison with non-expert nurses, experienced non-expert nurses were able to provide better rationales for their practice. This superior ability to justify their nursing practice was clearly a function of the greater amount of propositional and procedural knowledge which was stored and accessible in the memories of experienced non-expert nephrology nurses.

**Adequate Experience**

In the second movement, violinists have been members of the orchestra for some time. This has provided greater opportunities to observe expert violinists (e.g., first violinist), practice playing increasingly more complex scores and to gain feedback from themselves, others (e.g., conductor) and their own violin (i.e., its capabilities and responses to being played). As a result of increasing their experience at performing at this level of expertise (i.e., second violinist), experienced non-expert violinists will have
a greater repertoire of abilities (due to increased proceduralisation of knowledge) and increasingly more complex scripts to utilise.

Similarly, experienced non-expert nurses have gained greater exposure to the day-to-day practice routines of nephrology nursing, and they frequently described this as making it easier for them to be organised and to cope with the usual stresses of providing specialist nursing care (cf. non-expert nurses).

**Exercising Routine Nephrology Nursing Skills**

During practice sessions and rehearsals for the violin section, experienced non-expert violinists are taught how to conduct and lead these sessions. This would be learnt from other violinists (e.g., 1st violinists) who are role models for less experienced members of the orchestra. The violinist at this stage of expertise acquisition is beginning to take a leading role within the orchestra by learning to conduct music.

Experienced non-expert nurses' skills development was conceptualised by the subcategories *beginning to take a leading role* and *still playing within the boundaries*. By this stage of the acquisition of nephrology nursing expertise, such nurses have developed very good clinical skills. Experienced non-expert nurses were very good at the "doing side" or performing the many practical skills required of nephrology nurses; the actions of these nurses were always purposeful and fluid with little energy or effort expended.
Experienced non-expert nephrology nurses will often be among the most experienced nurses on a shift and, in the absence of an expert nurse, will have responsibility, as team leader, for large groups of patients and other nurses on the ward. The nurse at this stage of expertise acquisition has sufficient knowledge and experiences to be able to guide and direct less experienced nurses in routine nephrology nursing care activities and to cope with most of the patient issues that arise. Experienced non-expert nurses are beginning to take a leading role in the nephrology health care team (i.e., orchestra).

However, the performance of these nurses was still characterised by nursing practice which remained within the traditional boundaries expected of a registered nurse (e.g., administering medications strictly according to hospital protocols). Expert nurses, in contrast, occasionally strayed outside these normal boundaries (see below, p. 165).

**Changing Focus of Practice**

The conscious attention of experienced non-expert violinists on individual notes and familiar scores has diminished in the second movement of the magnum opus. These violinists rely increasingly less on propositional knowledge; routine musical pieces have become proceduralised to such an extent that they can be performed automatically (i.e., relatively unconsciously). Due to the freeing up of cognitive attention, violinists are beginning to take note of other members of the orchestra and their roles. Experienced non-expert violinists are also more aware of what they are playing, when and how it should be performed.
Similarly, experienced non-expert nurse have progressively proceduralised most of the routine knowledge and practices required of a nephrology nurse during the second stage of expertise acquisition. This has resulted in the progressive freeing up of their cognitive attention; experienced non-experts’ focus is devoted less on performing individual tasks and shifts toward making things easier for themselves while undertaking these tasks. In addition, the focus of experienced non-expert nurses has shifted from a short-term focus (i.e., haemodialysis session) to a longer-term view of care. This view, however, is not as long term or as holistic as that of expert nurses.

Progression to Next Stage: Prerequisites

Not all violinists move into the third and final stage of expertise acquisition; it is only those violinists demonstrating extraordinary talent at playing who get promoted to first violinist or soloist. Talent is a function of a number of preconditions or factors. These are: being recognised (i.e. designated) by others as an expert; demonstrating intelligent and extremely capable violin playing; having developed a professional obligation towards other members of the orchestra; being positively motivated to continue to improve; and, having a constant desire to succeed.

In this study, prerequisites had a different meaning to influencing factors described above (see p. 146). These were needed to exercise expert nephrology nursing practice. Prerequisites were conceptualised as recognition of expertise, having an obligation and commitment and motivation for and enjoyment of nephrology nursing. Influencing factors, on the other hand, were factors or events which encouraged movement of the

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nurse from the first to the second stage of expertise acquisition. Below, each prerequisite for expert practice is briefly described.

**Recognition of Expertise**

The **MAGNUM OPUS** was only produced when nurses were both recognised and designated (see Symbolic Interactionism, p. 71) by others (e.g. patients, other nurses, doctors) as having expertise in nephrology nursing. Expert nurses, by being recognised as having expertise, were trusted by others to undertake a number of functions not afforded experienced non-expert or non-expert nurses. These functions included extending the scope of normal nephrology nursing practice, being a role model, a teacher and one who was allowed to take charge of particular situations.

**Motivation for and Enjoyment of Nephrology Nursing**

The conceptual category *motivation for and enjoyment of nephrology nursing* was also a necessary precondition for the development of expert practice. Observing and listening to the participants in this study revealed that several nurses expressed an enjoyment for what they were doing. All of these nurses were recognised by others as having nephrology nursing expertise. Motivation for nephrology nursing incorporates other personal attributes such as taking a great interest in and pleasure from their nursing practice as well as having a desire to continue to learn, to improve their practice and to succeed at what they were doing. Motivation, therefore, became a necessary prerequisite for the development and exercise of expertise.
Having an Obligation and Commitment

Finally, all expert nurses were committed to and focused on providing the best nursing care for nephrology patients, but this commitment was stronger than that seen in either experienced non-expert and non-expert nurses. Expert nurses had developed an internal sense of obligation or moral responsibility towards the patients with whom they had come in contact and also for less experienced nursing staff. This obligation was manifested by features such as blurring the boundaries, managing the unit workload and being there.

Being recognised as having expertise, motivation for and enjoyment of nephrology nursing, and having an obligation and commitment were features identified in all expert nurses in this study. These features, however, were only seen occasionally in experienced non-expert nurses and never in non-expert nurses. Lastly, it was evident during this study that is was not possible for experienced non-expert nurses to progress into the third and final stage of expertise acquisition without having completed additional studies specifically related to nephrology nursing. Four preconditions (i.e., recognition of expertise, motivation for and enjoyment of nephrology nursing, having an obligation and commitment and completion of a formal post-registration nephrology nursing course), therefore, were all necessary for the progression into the third and final stage of expertise acquisition.

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Third Movement:

PRODUCING THE MAGNUM OPUS
(or Expert Nephrology Nursing Practice)

The third and final stage in the acquisition and exercise of nephrology nursing expertise was conceptualised as PRODUCING THE MAGNUM OPUS. The entire focus of nurses in this stage was on achieving high quality patient care for people with renal failure. Expert nurses possessed extensive knowledge and experience which enable them to be self-directing (i.e., self-determining) in their practice.

Expert nurses utilised a number of strategies and resources as they composed their magnum opus. During the final movement of expertise acquisition, several sub-categories or characteristics of expert nephrology nursing practice became apparent. These characteristics were extensive nephrology nursing knowledge, vast experience, exercising advanced nephrology nursing skills and being patient-focused. Diagram four (p. 159) schematically represents the characteristics of expert nephrology nursing practice.

Returning to the orchestral metaphor, the magnum opus is only produced when the violinist has mastered the triple roles of: 1) primary or key orchestra member, 2) conductor and 3) composer of a major piece of work. Only a very gifted and talented violin player is able to produce the quality of sound needed to do justice to a composer’s major work. These violinists have frequently been promoted to the position of first violinist which is the primary position within an orchestra, that is, they are in the highest violinist position/role in an orchestra.

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Diagram 4: Third Movement of Nephrology Nursing Expertise

- **Skill**
  - Self-directing/Autonomous

- **Knowledge**
  - Experienced Non-Expert Nephrology Nurse
    - (Playing better, learning to conduct & compose music)
  - Non-Expert Nephrology Nurse
    - (Learning to play in the orchestra)

- **Experience**
  - Minimal
  - Extensive

- **Focus**
  - Patient
  - Task

- **Vast**

**Legend:**
- Indicates continuing domain
- Factors influencing movement into next stage
The second role of the expert violinist is that of leader and coordinator of others around them. According to the Macquarie dictionary, conducting is the art of directing instrumentalists or singers in the performance of a musical work (Delbridge et al., 1991). Conductors normally employ silent manual gestures, using the right hand to indicate the meter (number of beats per measure) and tempo, and the left hand both to signal entries of the different instruments and to communicate aspects of musical interpretation such as increases in volume.

The modern conductor is a professional responsible for total musical interpretation and in earlier times, the conductor was often one of the performers. In opera orchestras, in particular, the first violinist (cf. expert nurse), or concertmaster, assumes the function of director, tapping the violin bow or using hand signals as necessary (Morehead & MacNeil, 1992). Strength of personality, as well as musical knowledge and technical skill, are all ingredients in a conductor's effectiveness. Conducting provides invaluable experience with effective instrumental combinations which, in addition, can be augmented by careful analysis of musical scores (Morehead & MacNeil, 1992).

Orchestration (i.e., composing in this study) is the art of combining musical instruments in orchestral compositions. Composers require knowledge of the ranges and idiosyncrasies of the instruments to be used. Although such information can be obtained from books, it is most thoroughly learned by working closely with players. There are many people who are able to compose good music but few who can produce a great musical score (i.e., magnum opus). For instance Antonio Salieri, a teacher of Beethoven, Schubert and Listz, was considered to be a good composer (Morehead &
MacNeil, 1992). Mozart, by comparison, was and still is considered to be a genius. Mozart not only produced a wide variation of scores (e.g., piano concertos, symphonies, operas) but he also orchestrated (i.e., conducted and played) many of them as well.

In nephrology nursing, expert nurses also have these three interwoven roles. They make a major “hands-on” contribution in the health care team. Similarly, expert nurses are able to demonstrate exemplary practical nursing abilities (cf. first violinist); they are the most skilful nurses in the nephrology health care team (cf. orchestra). Expert nurses are also clinical leaders who provide direction and guidance (cf. conductor) to all members, including patients, of the health care team. The outcome of the conductor's ability to drive the orchestra is the quality of the music that is produced, that is, the quality of health care provided to people with renal dysfunction.

In addition, conducting is related to the other two expert roles of playing and composing the magnum opus. In order for expert nephrology nurses to conduct the orchestra (i.e., lead the nephrology nursing team) they must be recognised as having expertise by the orchestra members; other nurses, patients and doctors must trust their judgements. As conductor, the expert nurse gets the orchestra to play cohesively, so a major part of the conductor role is to act as a conduit between members of the health care team and patients, passing on information in order that the quality of the production, that is renal health care, is maintained. As a conductor, the expert nephrology nurse is also able to understand and deal with more challenging or complex situations or patients (cf. musical scores). The conductor is also able to recognise their own abilities in conducting because they fully accept responsibility for their actions, by recognising
their own and others’ limitations. They are able to produce results of quality nursing care for people with renal disorders.

Lastly, the way expert nurses have composed (i.e., developed) their own score makes it easier for the entire orchestra to play that score and to manage the workload. In other words, expert nurses make things easier for themselves, for other nurses, for medical staff and, of course, for patients. This is achieved by blurring the boundaries of accepted nursing practice.

In addition, the composer has a far greater responsibility than any other member of the orchestra. The composer must know and understand the role and capabilities of all instruments and their players in the orchestra; similarly, expert nurses must know who can do what in the team to enable them to coordinate nursing care. Expert nurses have also developed their own standard of care which is focused on the patient. Their style of nursing care also directly and indirectly influences other members, particularly nurses, within the health care team.

Nephrology nurses can only produce a magnum opus when they play an integral role in its production. In nursing, it is crucial that expert nurses are not merely directing other nurses but that they are also maestros of nephrology nursing practice. Expert nephrology nurses, therefore, are composers, conductors and players of nursing activities, the production of which results in the magnum opus (i.e., quality health care for people with renal dysfunction).
Extensive Nephrology Nursing Knowledge

Expert nephrology nurses have developed a large number of schemata and scripts with which to store both propositional and procedural knowledge. This large knowledge resource has been built up from both formal courses (e.g., post-graduate courses) and through attendance at continuing education programs (e.g., conferences, workshops). Knowledge gained from these sources has provided significant knowledge to support their practice (i.e., rationales) and allowed them to be at the forefront of nephrology nursing. Secondly, experiential learning from the many years spent performing nephrology nursing skills has provided them with knowledge about what to do, when to do it, with what and how to do it. Lastly, the acquisition of experts’ propositional and procedural knowledge was enhanced and facilitated by their own intrinsic motivation and enjoyment of their work.

The result of having extensive nephrology nursing knowledge was that expert nurses utilised many sources of knowledge to support their practice and they were more adept than either experienced non-expert or non-expert nurses at linking from different sources of knowledge in a more meaningful way. Finally, expert nurses were able to provide accurate and precise rationales for their practice; they knew more than other nurses when to perform an activity; they also knew why it needed to be done and what would be the consequences of their actions. By having extensive domain knowledge the relative level of skilfulness of expert nurses was different from that of other nurses. Expert nurses’ level of performance was noticeably more autonomous and self-directed. In addition, the knowledge of expert nurses was greatly proceduralised and, hence,

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mostly automatic, allowing them to divert their attention beyond the task at hand. The focus of the expert nurse was habitually on the patient.

**Vast Experience**

In comparison to the other nurses in this study, expert nurses had spent a longer time working in nephrology wards. The amount of their nephrology nursing experience was conceptualised as vast. Longer experience has provided the expert nurses with greater opportunity to practice and obtain feedback to develop scripts and to develop confidence. Experience also leads expert nurses to understand the consequences of certain situations if they were allowed to occur or continue (e.g., continuing potassium supplements when the patient’s potassium was elevated).

Expert nurses utilised their *vast experience* to know both *what to do and when to act*. These nurses had experienced most situations in the past, and this provided them with confidence to know what to do, when, where, how and why. Lastly, by having *vast experience*, expert nurses identified that *not a lot was new*, that is, they had already experienced the same or similar situations, events or issues during the much longer period of time they had spent undertaking nephrology nursing practice. Having both knowledge of and experience in these situations provided the bases for expert nurses to *exercise advanced nephrology nursing skills*.

**Exercising Advanced Nephrology Nursing Skills**

Expert violinists would not be satisfied with playing in conventional styles. They would enjoy experimenting with techniques to extend the boundaries of traditional violin

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playing. Similarly, expert nurses in this study were exercising advanced (or extended) nephrology nursing skills. In order to perform skills at this advanced level, expert nurses needed to be recognised by others as expert. Other members of the orchestra (e.g., nurses, doctors, patients) have designated some players (i.e., nurses) as experts. Recognition of expertise privileged expert nurses to extend the boundaries of nursing practice. Expert nurses would blur both formal and informal boundaries of normal nursing practice. Formal boundaries included aspects of nursing practice which are governed by rules (e.g., legislation and policies) such as prescribing and dispensing medications and occupational, health and safety rules governing exposure to hazardous body fluids (e.g., wearing gloves when coming in contact with body fluids). Informal boundaries between administration and clinical responsibilities and between work and home situations were also blurred. In contrast, non-expert and experienced non-expert nurses never engaged in practice which could have been considered outside accepted limits and protocols. This characteristic of expertise was a significant component which enabled expert nurses to produce the magnum opus.

Managing the unit's workload was another dimension of how expert nephrology nurses were able to exercise advanced skills. These nurses, by comparison to non-expert and experienced non-expert nurses, were better able to effectively manage the workload because their practice consisted of flexible skills which avoided problems and allowed them to take pre-emptive action. Expert nurses frequently used the word "easier" to describe their actions. This was in contrast to non-expert nurses' whose actions were typified by inefficient activity (see backwards and forwards, backwards and forwards above, p. 144).

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Being Patient-Focused

The focus of expert nurses’ attention was the patient; their practice was directed towards achieving safe and optimal outcomes for patients within the constraints of the health care system. Expert nurses demonstrated being patient-focused by being there for patients and other nurses, keeping a close eye on situations, and by protecting patients. These nurses also viewed patient care over a much longer-term. This was over years rather than months (i.e., experienced non-expert nurses) or days (i.e., non-expert nurses). Expert nephrology nurses could only produce the magnum opus (i.e., quality nephrology nursing care) if they were patient-focused. By having extensive domain knowledge, vast experience and autonomous practice (skills), expert nurses could devote more attention to the patient, the impact of their nursing activities and the (potential) consequences of their actions.

Chapter Summary

This chapter has presented the substantive grounded theory of the acquisition and exercise of nephrology nursing expertise. A three stage process was developed which identified the four common characteristics of nurses at each stage in terms of their knowledge, experience, skill and focus. An orchestral metaphor was utilised to conceptualise all of the data at each stage. The first stage describes the nephrology nurse as learning to play in the orchestra. These nurses were non-expert nurses who were characterised by superficial nephrology nursing knowledge, limited experience, acquiring basic nephrology nursing skills and a narrow focus of practice. Nurses at the second stage were playing better, learning to conduct and compose music. They were described as experienced non-expert nurses who were characterised
by sufficient nephrology nursing knowledge, adequate experience, exercising routine nephrology nursing skills and a changing focus of practice. The third and final stage was conceptualised as PRODUCING THE MAGNUM OPUS. In this stage, nurses were described as expert nurses and were characterised by: extensive nephrology nursing knowledge, vast experience, exercising advanced nephrology nursing skill and being patient-focused.

Chapters Six and Seven which follow present the findings, respectively, for the non-expert and experienced non-expert stages and for the expert stage. In addition, both chapters explicate the various characteristics and dimensions which support each stage.
CHAPTER SIX

Characteristics and Practices of Non-Expert and Experienced Non-Expert Nephrology Nurses

Introduction

The substantive grounded theory PRODUCING THE MAGNUM OPUS: THE ACQUISITION AND EXERCISE OF NEPHROLOGY NURSING EXPERTISE, a three stage process, was described in the previous chapter. Each stage of expertise acquisition comprises several categories and each category has its own characteristics and dimensions [i.e., the range along which characteristics of a category vary] (Strauss & Corbin, 1998). This Chapter will explain the first two stages of this process; that is, that non-expert nephrology nursing practice was conceptualised as LEARNING TO PLAY IN THE ORCHESTRA and experienced non-expert practice as PLAYING BETTER, LEARNING TO CONDUCT AND COMPOSE MUSIC. Both of these stages were major sub-categories of the basic social process PRODUCING THE MAGNUM OPUS with each consisting of several properties and dimensions.

Non-Expert Nephrology Nurses

In this study, the first stage of expertise acquisition and exercise was conceptualised as the category, LEARNING TO PLAY IN THE ORCHESTRA. This category explains the conceptualisation of non-expert nephrology nursing practice and includes four sub-categories superficial nephrology nursing knowledge, limited experience, acquiring basic nephrology nursing skills and narrow focus of practice. The ability of non-expert nurses to practice nephrology nursing was restricted by their lack of nephrology nursing knowledge and their limited experience. Table nine (p. 169) identifies each of the characteristics and their dimensions.
Table 9: First Stage of the Acquisition and Exercise of Nephrology Nursing Expertise

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Superficial Nephrology Nursing Knowledge

The first characteristic of non-expert nurses was that they possessed superficial knowledge about nephrology nursing practice. Depth of knowledge, in this study, relates specifically to domain or specialised nephrology nursing knowledge used by nurses to support their practice. *Superficial nephrology nursing knowledge* was further explained by two dimensions related to non-expert nurses’ knowledge base. These dimensions were that non-expert nurses *relied on* [their] *general nursing knowledge* and, as a consequence of *having superficial nephrology nursing knowledge*, could provide only *sketchy rationales for practice*. Each of these knowledge-related features of non-expert nursing practice is explained below.
Relying on General Nursing Knowledge

Non-expert nurses possessed relatively little domain nursing knowledge; they tended to rely on general nursing knowledge. The extent of domain-specific (nephrology) knowledge of non-expert nurses was apparent during observation episodes and then in the subsequent interviews, in which questions were asked directly relating to what was observed. Many of these questions probed for underlying nephrology knowledge bases for practice and this revealed that non-expert nurses repeatedly relied on general or non-specialised nursing knowledge to support their practice. This was evident, for example, when one participant was asked about a nephrostomy tube.

It’s a catheter that’s used for a patient who’s had anything to do with their kidneys really basically and (ah) used as (um), it’s to actually drain fluid from the kidneys. Is that right? Oh hang on. They’re used for nephrectomies and things like that, is that – yeah, I don’t know what it actually is, it’s a tube that allows for drainage.

(I) Where is it located?

No, I’m not sure if it’s in the medulla or in the nephrons - no I’m guessing. We had an inservice on it, I can’t remember how now...I’d have to have a bit of a refresher before taking it out (Helen, 6th interview).†

† A nephrostomy tube is typically used as a urinary diversion device to bypass an obstructed ureter to allow urine to drain freely from a kidney. The tube is frequently a Foley indwelling urinary catheter which has been inserted into the pelvis of the kidney – a macroscopic region of the kidney that funnels urine toward the ureter. The medulla is an anatomical landmark of the inner portion the kidney and is composed of microscopic structures. The nephron is the microscopic functional unit of the kidney. A nephrostomy tube is clearly too large to be inserted into either the medulla or the nephron.
Non-expert nurses strove to put general nursing knowledge gained from formal education courses into what they actually saw and did in their practice on the renal wards.

[I was] actually comparing it to the last ECG, it was a little bit abnormal and she was slightly tachycardic. But [her pulse rate] wasn't too bad, it was 109, [and the other nurses] said that she did have some ectopics on her ECG. I have studied at university, but I can't remember exactly what they mean (Helen, 2nd interview).

Non-expert nurses also relied strongly on general nursing knowledge because they did not have the specialist knowledge to support their practice. Non-expert nurses tended to apply general principles in order to understand something specific to the nephrology context. For instance, Helen, who had the least amount of both general nursing experience and specific nephrology nursing experience, relied on the general principal that "Pethidine was a no-no with renal patients because it takes a very, very long time for the body to get rid of it and it's toxic, it is toxic to the kidneys." She then applied this thinking to morphine, believing that no opiates could be given to a person with renal failure. In a subsequent interview, Helen revealed that she needed to rely on her general nursing knowledge in order to practice as a nephrology nurse. In Helen's situation, she also recognised that there were "so many [general nursing] things that I don't know, it doesn't only have to be a renal problem it can be anything...you have some concepts but they're not always very clear in your mind maybe or...you might know just A & B of it" (Helen, 6th interview). Helen's knowledge base, as previously mentioned, is related to her minimal experience in nursing. Experience, which will be

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discussed below, clearly influences the acquisition of both propositional and procedural knowledge.

Specialised knowledge about nephrology nursing taught during initial nursing preparation courses may not make much sense when learned in the classroom, but when seen being applied in the real clinical world of the renal unit, it often does. Non-expert nurses attempt to apply any general or nephrology nursing knowledge that they have when relevant clinical situations arise. They also begin to see the relevance of theory to practice, that is, theory renders practice meaningful and manageable. For instance, Helen reflected on learning about nephrology nursing during her undergraduate nursing course, and noted that she did not really understand the concepts taught until after she had observed and attempted their application to practice when she began to work in the renal unit.

The principles behind peritoneal dialysis and just putting all of the theory that I learned at University into practice makes much more sense and using [it]. When I go back to my notes on PD, on peritoneal dialysis, I did learn about the dextrose infusions and the different bags but, even though I had actually done a presentation on that for my 3rd year at Uni, it did not register that time whereas now it does and it’s clear in my mind and it’s clear as to how the different percentages work, it’s clearer I should say (Helen, 6th interview).

Similarly, in relation to medications commonly prescribed for people with renal failure, non-expert nurses relied on knowledge that they had obtained from previous experience or from their initial nursing education course. Helen, a non-expert nurse, revealed that
she knew that a particular drug was toxic to the kidneys but she lacked specific knowledge of this drug when applied in a nephrology nursing context.

*I wasn’t … sure what my position was on giving Gentamicin [an antibiotic] at all. Like whether you give it in a reduced dose, or don’t give it at all, whether it was a no, no…*(Helen, 1st interview).

Another medication, Caltrate (calcium carbonate), is typically used as a calcium supplement for most patients but, for people with renal failure, it is used to lower blood phosphate levels (Warren-Sims, Molzahn & McGory, 1998). Helen knew broadly the action of it (general knowledge) but didn’t “know how it actually work[ed]”; a more experienced nephrology nurse in the study would know that Caltrate could be used for both purposes.

In nephrology nursing, a major component of nursing care is teaching patients about their disease and its management. This also includes teaching patients how to perform their own dialysis at home. Consequently nephrology nurses must have a thorough knowledge of dialysis treatment. Non-expert nurses “feel a bit restricted” by their “lack of [nephrology nursing] knowledge” (Helen, 2nd interview) to be able to teach patients adequately. In particular, nephrology nurses are instrumental in teaching patients about their dialysis treatment, medications and dietary restrictions. Non-expert nurses found this aspect of care extremely difficult as they lacked sufficient knowledge to be able to teach with authority.
The knowledge in my head was not, is just not there, to be quite honest, and because I'm going through the learning process myself, it's not something that you can really teach confidently 'cause it does take a long time to gain all of that [specialist] information, to make sure that you understand it and to also to be prepared for questions that the patient may ask...I'd rather a more senior person go and talk to [patients] and me listen on to it, because I just needed to reinforce that in my own head myself (Helen, 6th interview).

Non-expert nurses frequently found themselves in situations where they had difficulty answering a patient's question. An inability to adequately answer patient's questions was a direct reflection of their superficial nephrology nursing knowledge base.

My CAPD knowledge is minimal. I do explain [to the patient] what I know and what I've been taught just so that they can get a better understanding [but] one of their questions was, how long does the [PD] catheter actually stay in the patient. And I wasn't sure if it was a life long thing with the catheter or if it needed to be changed so I asked [the patient] to ask the CNS [nurse with specialist nephrology knowledge and experience] (Helen, 4th interview).

**Sketchy Rationales for Practice**

A result of possessing only superficial nephrology nursing knowledge, the non-expert nurses frequently provided sketchy or insufficient rationales for their practice. During interviews, following each observation episode, nurses were asked about their actions. Non-expert nurses attempted to provide a sound explanation for their actions but these answers invariably were wrong or revealed knowledge gaps. For instance, one nurse, who although she had many years of experience as a nurse, had only a few months nephrology nursing experience and, for her, patients with renal failure became anaemic...
as a complication of blood loss during haemodialysis. As a result, she saw the purpose for testing urea and creatinine levels for a haemodialysis patient was to see “how much kidney function remained” (Alexis, 1st interview).¹

For instance, Rose, while providing nursing care for a patient who had had a renal biopsy, followed the protocol for monitoring vital signs. On being questioned, Rose stated that vital signs were taken to monitor for haemorrhaging. However, she did not know why she needed to take the vital signs so frequently or why, in particular, a patient could haemorrhage following a renal biopsy. Later in the interview Rose stated that:

...the other [things] they asked [me] to watch out for was nausea or vomiting. I'm not sure why [the doctor] said that, I guess for abdominal discomfort. Is that because of the position of the biopsy I guess, and the other thing was just ... to observe the [biopsy] site for any ooze, swelling, tenderness, pain at the actual site itself, and basically that the patient could roll from side to side. I don't know the logic behind not sitting them up immediately post op though (Rose, 1st interview).²

1. The reality is that while people with chronic renal failure on haemodialysis do lose a small amount of blood during a treatment session, the cause of anaemia in these people is due to the kidney's inability to produce and secrete enough erythropoietin, a hormone used by the body to stimulate bone marrow production of red blood cells. The reason why an individual receives haemodialysis treatment is to maintain life in the face of irreversible organ failure. While urea and creatinine can reflect kidney function in the normal person, these blood tests are routinely required to determine the adequacy of the dialysis treatment. This example clearly demonstrates a superficial knowledge typically seen in non-expert nephrology nurses.

2. A percutaneous renal biopsy is used to diagnose the existence, extent or origin of renal diseases. It is an extremely dangerous procedure which could result in the patient haemorrhaging to death. Frequent and diligent recording of vital signs and observation of the biopsy site is imperative to detect any signs of haemorrhage. Nausea and vomiting may indicate haemorrhage. The patient is kept prone for at least 60 minutes so that the biopsy site can be readily observed, a pressure sandbag can be kept in place and the patient can be kept still so that haemostasis can be achieved. Once allowed to roll over, the patient is kept on bed rest for up to 24 hours to minimise clot disruption and further haemorrhaging.

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Lastly, and of interest, non-expert nurses' *superficial nephrology nursing knowledge* was also recognised by other nurses, particularly expert nurses, who were in position to judge (i.e., designate) other nurses' knowledge of their specialty. Sam, an expert nurse, for instance, emphasised the importance of knowing what to do, when to do it, with what, for whom, how and why. Sam then stated that non-expert nurses “know only A to B of something and [they don’t] really understand what they’re doing and what the consequences would be if they didn’t do it correctly” (Sam, 2nd interview).

**Limited Experience**

*Limited experience* was the second characteristic identified in the practice of non-expert nurses. In this study, experience was defined as the number, frequency and types of encounters a nurse had with a person with a renal disorder and its associated treatment (e.g., haemodialysis, peritoneal dialysis).

The non-expert nephrology nurses in this study (i.e., Alexis, Helen, Judy and Rose) had been working in this specialty area of nursing for between a few months to two years and, in comparison to expert nurses, their experience was significantly shorter (see table 6, p. 111). These nurses recognised that their short length of experience in nephrology nursing limited their ability to practice. The length of experience tended to dictate the type of nursing activities non-expert nephrology nurses could undertake and, generally, these included ordinary, routine nursing activities on these specialist wards. For example, non-expert nurses would prepare (“set up”) a dialysis machine, cannulate vascular access, administer a dialysis prescription and disconnect patients from the dialysis machine.
Non-expert nurses were, however, continually faced with situations in which they did not have any experience and were unfamiliar with what was required of them. Cannulation of a fistula was a typical example of a situation in which non-expert nurses needed to gain significantly more experience. They were only allowed (by expert nurses) to cannulate “easier” fistulae before moving onto cannulating increasingly more difficult ones. Judy remarked during an observation period that she would not cannulate the next patient as he has a new fistula and “no one has been allowed to cannulate him except Prue [an expert nurse]” (Judy, 2nd observation). Later, during the subsequent interview, Judy explained the reason why she was not allowed to cannulate that patient’s fistula. “I haven’t cannulated a brand new fistula as I don’t have enough experience” (Judy, 2nd interview).

In comparison to most other nurses, and with the exception of critical care or perioperative areas, nephrology nurses use a significant amount of technology. Non-expert nurses entering a haemodialysis unit, for instance, will need to learn quickly how to perform the dialysis procedure. This invariably involves gaining knowledge and skills with haemodialysis machines. As suggested by Benner (1984), non-expert nurses’ actions are governed by the rules they have learnt; if there is a deviation from these rules, they will experience difficulties solving any problems encountered with the haemodialysis machine. For instance, Judy found it difficult to use a haemodialysis machine which another nurse had prepared. She did not recognise that the nurse had left a clamp on the venous line as she began to prime the dialysis circuit. The circuit then became full of air bubbles and the air detector would not become activated. This would have been an extremely dangerous situation had the patient been connected to the
machine. Judy did not connect the patient as she recognised that air bubbles in the circuit were dangerous, but it took her a long time to problem-solve this situation.

Not being able to problem-solve easily or quickly was also linked to a non-expert nurse’s *superficial knowledge*. They did not understand how to use the specialised machines because they had had *limited experience* with them, so they struggled with correcting any problems and this in turn, necessitated more experienced nurses telling them what to do.

In addition, four dimensions further explained limited experience and these were *backwards and forwards, backwards and forwards, playing within the boundaries*, *feeling incompetent* and *others recognise inexperience*. Below, each of these experience-related features of non-expert nursing practice will be explained.

*Backwards and Forwards, Backwards and Forwards*

Expert nursing practice was characterised by smooth and efficient time management skills with the ultimate purpose of *managing the unit’s workload* (see p. 253). Non-expert nursing practice was completely the opposite and was characterised by unnecessary action and activity; as a result, non-expert nurses recognised that there was not enough time to complete routine activities on a shift.

Non-expert nurses were unable to manage their workload effectively due to poor time management. Helen, for instance, commented (4th interview) that she noticed how often she went back and forth to complete tasks. It was readily apparent when observing
these nurses that they seemed flustered and disorganised. During interviews, which immediately followed each period of observation, questions relating to how non-expert nurses organised their workload invariably evoked responses such as that they felt “rushed,” “not organised” and that providing nursing care in busy periods was difficult.

*I just sometimes feel like people going around their work so peacefully and comfortably and doing things, you know, relatively fine and then I think, oh I just seem to be running around in circles sometimes, and I keep thinking I’ve got to do that whereas I think I’d like to be a little bit more calm...* (Helen, 6th interview).

Non-expert nurses were easily distracted from what they were doing. In the middle of completing a task, they would stop what they were doing and rush off to do something else only having to come back to finish the first activity. The following excerpt from field notes taken during an observation episode reveal how easily distracted non-expert nurses were when the workload required numerous activities to be completed in a short space of time.

1800 hours. Gets equipment to assess BSL [blood sugar level] for the patient in bed 12. She grabs several pairs of gloves and puts them into her pockets. Another RN asks what time she wants to go to tea. Jokes that it will be about 11 pm! Then rushes off to get IV fluids checked by other RN and records on fluid balance chart. Writes on whiteboard for doctor to order more IV fluids and pain relief for patient in bed 13. She has not completed the BSL – it was due by 1730 hours (i.e., before the evening meal). Easily distracted by other RN and IV fluids (Helen, 1st observation).

As a result of being distracted or not of being able to manage their workloads effectively, non-expert nurses were frequently attempting to catch up on nursing tasks.
Not having enough time, being behind time, wasting time and being slow were all characteristic of non-experts.

Helen is very methodical, diligent and caring towards her patients. She is, however, quite slow. She only has four patients and has been doing medications for about 1 hr now (Helen, 2nd observation).

Nephrology nurses have more experience than non-expert nurses and are able to perform the same task (e.g., administer medications to patients) more quickly, using less time and energy in doing so. Non-expert nurses were very much aware that they performed these tasks much more slowly than other nurses working around them. Non-expert nurses, therefore, self-designated (see symbolic interactionism, p. 71) themselves as being less capable in comparison to other, more organised nurses.

*I don't know just [work] load wise you know, I feel compared to [a more experienced nurse], I feel that, well, maybe she's quicker than I* [am]...(Rose, 1st interview).

Being able to manage time efficiently is particularly important for nurses due to the demands of an ever increasing workload and, although on most occasions non-expert nurses were allocated a workload commensurate with their knowledge and experience levels, efficient time management still eluded them. It was not uncommon, therefore, to witness other, more experienced nurses helping non-expert nurses manage their workload, that is, experienced nurses provided nursing care not only to the patients they were directly responsible for but also assisted non-expert nurses complete some of their nursing care.
...for them doing those things for me oh that was lovely. It was just like one less thing to do and that was really nice of them, very nice of them. It's just a load off your workload and one less thing you have to worry about (Rose, 1st interview).

Playing within the Boundaries

Non-expert nurses, due to their limited experience as a nephrology nurse, would always observe nursing practice boundaries. This is consistent with Benner's (1984) description of nurses who are in the novice stage of expertise development and are "rule-bound." One of the significant findings in this study of the acquisition and exercise of nephrology nursing expertise was that expert nurses blur traditional nursing boundaries (see p. 241). In the context of this study, "boundaries" were both formal and informal. Rules, in this context, refer to formal boundaries which incorporate legal or institutional prescribed policies (e.g., Poisons Act which underpins hospital medication administration policies) as well as those "rules" guiding or determining nursing practice (e.g., procedures for opening sterile supplies). Informal boundaries were associated with distinguishing different nursing functions (e.g., clinical or administrative) or location (e.g., work and home).

Non-expert nurses felt comfortable playing within the boundaries. This was particularly evident when there were legal imperatives such as administering medications. Non-expert nurses, during this study, administered medications at all times only when they had been properly (i.e., legally) prescribed by medical staff:

Because basically it wasn't ordered, there wasn't anybody who was qualified to order it and I can't give it legally (Helen, 2nd interview).

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All nurses are required by the New South Wales Health Department to wear gloves when undertaking nursing care when there is the possibility of the nurse coming into contact with body fluids (e.g., blood) from a patient. The Standard Precaution policy was developed to protect all health care workers from contracting infectious diseases from body fluids, particularly blood-borne diseases such as Hepatitis B, Hepatitis C or Human Immunodeficiency Virus. The policy requires nurses to wear gloves and other protective devices (e.g., goggles, masks) in situations which pose a risk of coming in contact with potentially infected body fluids. It is an expectation, therefore, that nurses will follow the “glove-wearing rule.” In this study, non-expert nurses strictly followed the rules about wearing gloves.

Well, first of all, to protect myself because I mean universal precautions and all that sort of thing...No, I would never [cannulate a fistula without gloves on] (Judy, 2nd interview).

Non-expert nurses did, however, demonstrate an understanding of the “glove-wearing rule.” They were able to recognise situations when wearing gloves was not required. This demonstrated that they knew the rationale for glove-wearing and when to wear them (cf expert nurses, p. 242). For instance, Helen identifies some situations where she could safely not wear gloves.

If I was weighing somebody, if I was giving out medications it would be a clean technique, no need for gloves because you're not at risk of any bodily fluids splashing, particularly if you're just giving it to the patient, handing it to them to take (Helen, 3rd interview).

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**Feeling Incompetent**

Another property of the category *limited experience* was that non-expert nurses *felt incompetent* when they were confronted by situations with which they had no prior experience. In one situation, a patient was transferred from the haemodialysis unit onto the ward, late at night, with a triple-lumen “vas cath,” a temporary dialysis access device that allows for dialysis to be undertaken through two lumens, leaving the third lumen for intravenous therapy. The nurses in the haemodialysis unit had commenced a vancomycin [antibiotic] infusion into the third lumen and Helen stated that she “felt very incompetent because I didn’t know what I was doing”. For Helen, this situation was compounded by her lack of nursing knowledge in the specialty of nephrology nursing. For non-expert nurses, dealing with situations in which they have little or no previous experience, together with a lack of specialised knowledge, makes working in nephrology nursing stressful and at times frustrating.

[I am] *thinking oh my god. Am I supposed to...I knew that he had to have the other antibiotics and things but just not knowing can I actually give the drugs faster or slower and I didn’t know what his fluid restriction was and things like...it was quite stressful (Helen, 3rd interview).*

Helen, once again, identified a situation were she felt frustrated:

[A patient] *was saying she was feeling unwell but she couldn’t actually pinpoint the problem, she wasn’t sure if she was feeling dizzy or feeling light headed, she was just wasn’t sure, and I felt a bit frustrated at that time in a sense...because I didn’t know what questions, what other questions do I ask, [or] how else could I find out what the problem was (Helen, 2nd interview).*

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Helen went on to deal with this situation correctly and safely. She followed correct procedures while being observed; Helen notified the nursing team-leader and medical staff. The patient’s problem, which was, fortunately, innocuous, was resolved swiftly. This example, nevertheless, reveals the effect limited nephrology nursing experience had on both the non-expert nurses and patients under their care.

Others Recognise Inexperience

During this study, expert nurses actively prevented non-expert nurses from performing certain activities, most commonly cannulation of new or difficult fistulae. Expert nurses, when asked about this all provided similar justification for this practice. Mary, for example, stated that “because if there is a problem with a new fistula, which is very easy to have when they’re very soft at that early stage, then that can mean the fistula won’t be able to be used for a further couple of weeks until that initial haematoma damage has resolved … which [then] increases the risk of developing [other problems], so if it’s a brand new fistula that’s very fragile, then most of the time it would be [a very experienced nurse] who cannulated it” (Mary, 3rd interview) and “never a novice dialysis nurse” (Prue, 3rd interview). Whilst some may regard this a gate-keeping activity by expert nurses as reinforcing inexperience, it is in fact absolutely crucial to a patient’s long-term survival that nurses maintain a viable vascular access. It is in this respect that expert nurses recognised or designated (see symbolic interactionism, p. 71) non-expert nurses as being inexperienced in performing certain skills and, therefore, prevented them from attempting to provide advanced/complex care until they had gained more experience. Expert nurses’ gate-keeping was protective of patients.
When a patient received a kidney transplant, for instance, a more experienced or expert nurse would supervise a non-expert nurse because they had not yet acquired sufficient experience to be able to nurse these patients adequately. Typically, this occurred for the first two or three occasions until they had developed the ability to recognise some of the more common problems early, since these can occur quickly.

*It's ... only experience with the transplant that tells you* [there is a problem], [and] *it might be the best [non-expert nurse] we've ever had and they're great at all the steps, at picking things up, but they haven't got that [experience] to pick up any problems... [and] *if I've got any qualms about their clinical skills then I don't step back* (Norma, expert nurse, 2nd interview).

Patients also designated some nurses as non-expert nurses. Patients would quickly suggest to a non-expert nurse, for example, an area where it was easier to cannulate their fistula. During the observation sessions in the dialysis unit, it became apparent that patients mostly gave assistance to less experienced nurses, presumably because they did not want the cannulation to be painful or inappropriately located to achieve an adequate dialysis. Although patients did not expressly state this, as patients were not interviewed, poor cannulation technique would, nevertheless, result in the patient having to be cannulated again.

**Acquiring Basic Nephrology Nursing Skills**

*Acquiring basic nephrology nursing skills* was the third characteristic of non-expert nursing practice. In this stage of the acquisition and exercise of expertise, the non-expert nurse was developing and refining specialised nursing skills. Skills development
of nurses was influenced by both the extent of knowledge and experience which non-expert nurses possessed. In order to acquire basic nephrology nursing skills, non-expert nurses needed to develop psychomotor skills which had not been present previously. Examples of new psychomotor skills were cannulation of fistulae, performing haemodialysis or peritoneal dialysis treatment and providing nursing care to renal transplant recipients.

*Acquiring basic nephrology nursing skills* was further explained by three dimensions: first, non-expert nephrology nurses' skilfulness was developed as they mentally rehearsed procedures before undertaking them; second, these nurses needed to *seek(ing) confirmation and support* from more experienced nurses when undertaking unfamiliar nephrology nursing skills; and third, they were frequently *being told what to do* by more experienced or expert nurses.

*Mentally Rehearsing Skills*

A strategy used by non-expert nurses to acquire basic nephrology nursing skills was the way they thought about the procedure they were about to perform. For instance, non-expert nurses would utilise the time during hand washing to think about their next nursing activity. They would rehearse the procedure in their mind, so that they were primed and ready to perform that procedure. Expert and experienced non-expert nurses did not use this strategy because most nursing skills had been proceduralised to such an extent that they were performed automatically (see pp. 204 & 229).
I was sort of thinking - I really don't want to do her needles at the moment or I just felt really funny about it and sort of going into a bit of a dream world. You know, you're thinking [about putting] the needles in, now which one do I have to hold steady and which one goes in nicer and just sort of thinking about what I was going to do (Judy, 3rd interview).

Thinking out aloud was also another strategy non-expert nurses used before they undertook an activity or while they were preparing equipment needed during that activity. Verbalising their thoughts may also have been a mechanism to confirm to themselves what they were thinking about or going to do.

I think sometimes I do it [think out loud]. I don't know, yeah, well, sometimes if I'm just writing something, [I say] oh I've got to do that... maybe it's because, I don't know, I just do it... I don't know what [might] be the logic behind it (Helen, 6th interview).

**Seeking Confirmation and Needing Support**

Another strategy to assist with the acquisition of basic nephrology nursing skills was that non-expert nurses would seek out more experienced nurses to supervise them performing certain procedures or to confirm what they were doing was correct.

Well, maybe a lot of the time I find that I will go to another nurse and say I'm doing this and I'm doing this, do you think that's okay? [I do this] to confirm with the others around that I'm on the right path ...and something that I might overlook or someone else will pick [it] up (Judy, 3rd interview).

Non-expert nurses would do this until they had gained more experience with a procedure and felt more comfortable about performing the procedure without either direct or indirect supervision.

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I will ask somebody to observe me until I get a bit more experience with [removing central lines], just so that I know that I'm doing everything correctly...confirming that I'm on the right track and especially with things that you are not very sure of, you know, you want to always double check just to make sure that you are on the right track (Helen, 6th interview).

Non-expert nurses valued this strategy because they needed confirmation (i.e., feedback) that they were doing it correctly. It should also be noted at this stage that, due to limited experience, non-expert nurses were more focused on performing the procedure correctly rather than the patient who was the recipient of care. This focus will be explored later in this chapter (see below, p. 190).

**Being Told What to Do**

Due to their limited nephrology nursing skills and previous experience, non-expert nurses were frequently being told what to do by more experienced nurses. This was a strategy typically employed by more experienced nurses as a means to reduce the stress felt by non-expert nurses but also to supervise their practice to ensure patient safety.

*It's totally a new experience especially up here [in the haemodialysis unit]. Everyone's sort of watches you ... I had a lot of help and support which is really good* (Judy, 1st interview).

*Being told what to do* was frequently detected during observation episodes of non-expert nurses. For example, when to record an electrocardiograph (ECG), how a particular medical condition related to the nursing care required by a patient, how to prepare medications (e.g., how much diluent to use with an antibiotic), how fast to
administer the medication or when it should be administered (e.g., before or after another medication).

Prue [an expert nurse] is setting up a machine and she hears a machine alarm and goes to assist Judy [a non-expert nurse]. She then explains what has happened to Judy and what to do to correct the problem (Prue, 2nd observation).

Non-expert nurses, generally, when they were being told what to do by more experienced nurses, accepted this practice in a positive way. They believed that being told what to do was both helpful and supportive during a shift.

A lot of the time, especially when I first started, I was working a lot with [a senior nurse]. She told me what to do, guided me and that helped a lot (Helen, 1st interview).

Narrow Focus of Practice

The focus of a nurse’s practice, in this study, was defined as her/his centre of attention or concentration while s/he was undertaking nursing activities. Non-expert nursing practice was characterised by a focus on performing the task at hand, that is, non-experts were focused on getting the job done rather than on the person at the receiving end of the task (i.e., the patient with a renal disorder).

Well here [in the haemodialysis unit] it's more, interacting more with machines as well you've got that interaction with the patient but its a minimum, you know a minimum, putting the patient on, taking the patient off, you know it's more with the machine and things like that (Alexis, 1st interview).

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Getting the Job Done

In order to get the work of a shift completed, the non-expert nurse is focused on completing each individual task which a nurse ought to do for the patient. These tasks included performing the dialysis treatment (e.g., setting up the machine, cannulation), administering medications, assessing and recording observations, performing wound dressings and completing fluid balance charts. All nurses in this study were questioned about the focus of nursing care which they had provided during an observation episode. Non-expert nurses typically described their focus of attention as being devoted to completing tasks and managing their workload (i.e., time management). This was in contrast to expert nurses, whose focus of nursing care was always the patient (see p. 259).

My focus was basically to try and get the medications done and maintain all the proper charts and, you know, do fistula obs[ervations], also BSL’s [blood sugar levels] and giving insulin, and complete the fluid balances (Helen, 1st interview).

In nephrology nursing, the majority of patients a nurse will come into contact with will have end-stage renal failure, an irreversible condition, which necessitates life-sustaining renal replacement therapy for the rest of a patient’s life. As a consequence, it is not uncommon for a nephrology nurse to provide nursing care to a patient for many years, for possibly as much as twenty years. By having a narrow focus of practice, the non-expert nurse’s view of the concept of continuity of care was different from that of both experienced non-expert nurses (see below, p. 211) and expert nurses (see Chapter 7, p. 261). During this study, non-expert nurses focused solely on the tasks related to the patient, as described above. When questioned about their understanding about

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continuity of care and what it meant for their nursing practice, they invariably suggested that continuity of care lasted for a few days or for that admission to the renal unit. Even when prompted to consider that patients with renal failure often have a chronic illness requiring life-long treatment, non-expert nurses consistently described their focus of attention in terms of the present rather than the future.

With dialysis you can’t look too far, you know, and it’s day by day but with some of them that are a little bit more difficult to dialyse you probably look at them in the future, well okay say today’s Tuesday and then you think...will I leave his weight till [his next dialysis on] Thursday. But the focus is mainly a day to day basis (Alexis, 1st interview).

Progressing to Next Stage: Influencing Factors

The length of time spent in the first stage of expertise acquisition was dependent on a number of influencing factors such as breadth and depth of domain knowledge, number and frequency of encounters with people with renal disorders, and aptitude for nephrology nursing. These influencing factors were conceptualised as increasing domain knowledge, repeated practice and recognition of aptitude for nephrology nursing as they explain the progression of non-expert nurses to experienced non-expert nurses. These factors contributed to experienced non-expert nurses playing better, learning to compose and conduct nephrology nursing practice. The experienced non-expert characteristics of knowledge and experience are closely related to increased domain knowledge and repeated practice; it was more appropriate, therefore, to discuss these factors later. However, being recognised by expert nurses as having an aptitude
for nephrology nursing was necessary for the progression of the nurse to the next stage, it will be discussed at this point.

Recognition of Aptitude for Nephrology Nursing

Being in the right place at the right time for some nurses fostered their development of expertise. For instance, Norma reflects on expert nephrology nurses and others who recognised (i.e., designated) her potential to develop into an expert nurse early in her career and who provided her with learning opportunities.

_Luck’s the main [thing and] timing, I started off with a good nurse educator, a good CNC and a brilliant NUM of dialysis who all in some way or other, have taken me under their wings and sort of shaped me... and I’ve also had excellent support from the medical staff I’ve worked with and that’s been important_" (Norma, 2nd interview).

Several expert nurses believed that having other expert nurses around them when they first joined the nephrology team (cf “orchestra”) was crucial to their acquisition of expertise (see also being a role model for others, p. 235). Having expert nurses in the unit, therefore, was conducive for non-expert nurses to develop expertise and progress to the next stage.

Experienced Non-Expert Nephrology Nurses

In this study, experienced non-expert nursing practice was the second stage in the acquisition and exercise of nephrology nursing expertise. This stage was conceptualised as playing better, learning to conduct and compose music. The ability of experienced non-expert nurses to practice (i.e., play better) nephrology nursing was

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characterised by their *sufficient nephrology nursing knowledge, adequate experience, exercising routine nephrology nursing skills* and a *changing focus of practice*. *Learning to Conduct Music* represents several dimensions of these characteristics, namely, *sharing knowledge with others, beginning to take a leading role* and *having an obligation* to nephrology nursing. The final component, *Learning to Compose Music* encapsulates the dimensions of *using several sources of knowledge* (cf. a composer who utilises her/his knowledge of the capabilities of many instruments) and *recognition of expertise*. The main category for this stage, its properties (characteristics) and their dimensions are presented in Table ten and then subsequently explained.

**Table 10:** Second Stage of the Acquisition and Exercise of Nephrology Nursing Expertise

<table>
<thead>
<tr>
<th>Category</th>
<th>PLAYING BETTER, LEARNING TO CONDUCT AND COMPOSE MUSIC: Experienced Non-Expert Nephrology Nursing</th>
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<tbody>
<tr>
<td><strong>Characteristics</strong></td>
<td><strong>Sufficient Nephrology Nursing Knowledge</strong></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>• Increasing domain knowledge</td>
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<tr>
<td></td>
<td>• Using several sources of knowledge</td>
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<td></td>
<td>• Relatively sufficient rationales for practice</td>
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<td></td>
<td>• Sharing knowledge with others</td>
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Sufficient Nephrology Nursing Knowledge

Domain-specific knowledge of experienced non-expert nurses was revealed during observation episodes and the subsequent interviews, when they were invited to focus on what had been observed with regard to their actions. Experienced non-expert nurses were characterised as having increased domain knowledge to guide their practice. This characteristic was evident in the manner in which these nurses used several sources of knowledge to provide them with information about what to do for a patient. They also demonstrated a satisfactory nephrology nursing knowledge base; they were able, in most situations, to provide relatively sufficient rationales for practice. Lastly, experienced non-expert nurses revealed the extent of their nephrology nursing knowledge by sharing [their] knowledge with others during bedside teaching sessions with others (i.e., patients and less experienced nursing staff). Each of these knowledge-related features of experienced non-expert nursing practice are explained below.

Increasing Domain Knowledge

A major factor, which influenced the progression of non-expert nurses into this stage of expertise acquisition, was postgraduate nephrology nursing education. Undertaking a formal nursing course in the specialised domain of nephrology nursing, while not a necessary criterion for moving into the experienced non-expert stage, fast-tracked those nurses who completed it. A nephrology nursing course provides a greater depth of theoretical information while being simultaneously linked to guided clinical nephrology nursing practice. A nurse, who has completed such a course, would have been exposed to all areas of nephrology nursing which would not necessarily have been the case if the nurse only worked on one ward. These courses obviously supply specialised theoretical
underpinnings for practice which could not be provided through either undergraduate, in-service or continuing education. When questioned during interviews, all nurses recognised the importance of undertaking a formal course of study in nephrology nursing; non-experts believed the course would contribute to their ability to understand what they were doing, and experienced non-expert and expert nurses believed that it actually had done so. In particular, expert nurses, reflecting back on the value of having completed a nephrology nursing course, all agreed that the course influenced their nephrology nursing abilities to a great extent.

_I think it gives you the ground work, yes I think it's certainly helped. I know before I did the certificate I worked in the renal unit so you think, oh compared to some of the [staff] you're reasonably experienced, what you would class as an experienced nurse, but I did learn a lot on the course and I think doing the course you realise how little you do know. You believe you did have the knowledge before but it's more grounded when you've done the course_ (Sam, 2nd interview).

Using Several Sources of Knowledge

During the second stage of expertise acquisition and exercise, experienced non-expert nurses utilised several sources of knowledge to enable them to provide safe and appropriate nursing care to people with renal disorders. Experienced non-expert nurses had a greater store of theoretical and practical knowledge to draw on compared with non-expert nurses. This knowledge had been gained via formal nephrology nursing courses and via informal, experiential learning derived from longer experience in working within the renal unit. In the following example, Leonie unmistakably demonstrates both propositional (i.e., that the water pressure has caused the
haemodialysis machine to malfunction) and procedural knowledge (i.e., how to fix the
problem). Clearly this knowledge has been informed by her experience, gained over
more than 10 years, of problem-solving with equipment.

*I'd say* [the haemodialysis machine] *went into* [an] *unconditional
technical error, but often you just don't go and ring up the technician,
you have a go at it yourself and that's why I worked it out* (Leonie, 1st
interview).

Knowing the patient, a concept seen more frequently in expert nursing practice (see p.
219), was also becoming increasingly more important for the experienced non-expert as
a source of knowledge. Knowing the patient involved understanding particular patients
and their responses to either their disease process or dialysis treatment, which they then
linked with their other sources of knowledge in order to provide better nursing care.
These different sources of knowledge (i.e., domain and patient) assist experienced non-
expert nurses to know some patients extremely well.

*With haemodialysis you get to know your patients really well ... when I
worked on the surgical ward even though I was there for a little while,
they just come and go come and go like that was it, but with renal you get
to know your patients* (Leonie, 1st interview).

Later during the interview, Leonie reveals why knowing the patient was an important
source of knowledge for her practice. By quickly recognising that the patient was not as
well as he normally was (e.g., breathless), she linked this to her understanding of how
patients normally cope with an admission to hospital (i.e., lose weight) which then
enabled her to plan and implement a course of action (i.e., an individual haemodialysis
treatment).

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As soon as I saw [patient’s name] was breathless and he’s not normally like that. I did see him on Friday [3 days ago], I didn’t have much to do with him on Friday but I could just tell he was breathless, and plus he was only a little bit up on his weight. They [most patients] normally lose weight cause they don’t eat properly. He doesn’t feel well, so they don’t eat properly anyway, so just those sort of things, so it seemed like he hadn’t put on much, like I said in between his dialysis, I thought he needs to lose a bit more fluid” (Leonie, 1st interview).

Experienced non-expert nurses possessed sufficient nephrology nursing knowledge which had been gained from domain-specific theoretical insights (e.g., from formal nursing courses) that have then been applied to particular patients’ care. Different sources of knowledge (i.e., domain and patient) were found to assist experienced non-expert and expert nurses to plan, implement and evaluate nursing care. For instance, while observing Leonie cannulating and prescribing haemodialysis treatment, I asked why she believed she knew a particular patient. She replied:

*I guess because I’ve known [patient’s name] since I’ve been here [five years] and ... I just know that Sustagen [a supplement drink] does have a high potassium and like I was saying before, knowing [patient’s name], she does tend to be a high potassium person and that can be quite dangerous...she’s been very unwell and been in hospital for a long time. If patients don’t eat properly and they don’t eat ’cause they feel unwell, so that’s an indication too that she’s not eating, so she’s dropped her weight again...So I probably wouldn’t mind if she drank the Sustagen while she was on the machine but in between dialysis it would be a bit dangerous for her potassium level”* (Leonie, 2nd interview).

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In this situation it was obvious that Leonie was able to rely on patient knowledge to provide effective nursing care to her patient. She demonstrated how she linked theoretical knowledge about normal potassium requirements for a particular patient and its removal via haemodialysis; practical knowledge about how to perform this task; previous experience with patients who become unwell; and the effect of this on their nutritional states, together with specific knowledge of the patient. The flexible use of this level of both propositional and procedural knowledge was not evident in non-expert nursing practice, while expert nurses tended to use these “knowledges” more extensively in their practice.

Knowing the patient had the additional benefit of allowing both experienced non-expert and expert nurses to predict, identify and avoid potential problems. For instance, Leonie, once again, knew that this particular patient would quickly develop severe hypotension, a life-threatening situation, so she explained to me why she had moved this patient closer to the nurses’ desk. “Patients can go down the gurgler very easily and she just goes flat without any notice and we just find her like it” (Leonie, 3rd observation). She explained to me that they normally try to have her near the corner, close to the desk, where everyone walks past, so that she can be closely observed.

Relatively Sufficient Rationales for Practice

The methods of data collection, participant observation in the real clinical world, followed immediately by an interview in which questions were triggered by what had been observed, provided the opportunity to uncover the knowledge underpinning each nurse’s nephrology nursing practice. The advantage of an “insider’s” perspective (i.e.,

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having a significant knowledge and current clinical practice in nephrology nursing), as discussed in Chapter Three (p. 93), enabled an accurate differentiation of a nurse’s ability into one of three stages of expertise acquisition.

In this study, non-expert nurses frequently did not understand precisely what they were doing and why it needed to be done and, on many occasions, their knowledge was incorrect or sketchy. Experienced non-expert nurses, by comparison, provided rationales for intervention with some confidence. This confidence, however, created the mistaken impression among other nurse researchers during doctoral seminars (who did not have any experience or knowledge in nephrology nursing), that the knowledge apparent in the actions and explanations of experienced non-expert nurses was indicative of expert practice.

When placed “on the spot” to provide rationales for their actions, experienced non-expert nurses, typically, provided superficial explanations and when encouraged to explain further, found it very difficult or were unable to do so. An example:

*Like I guess because I've needed, I've cannulated [Patient’s name] quite a fair bit but I know on his venous side of his goortex [a synthetic material used to create a fistula], if you cannulate up too high you get a really high venous pressure so that was a choice on his venous side. On his arterial side he had a little bit of bruising up higher so, I've gone away from that bruising, I've gone lower* (Leonie, 1st interview).

In this patient’s situation, the problems with a high venous pressure had been previously investigated and diagnosed. Leonie was asked during an interview immediately
following the cannulation episode why she had chosen to cannulate a patient's fistula where she had. Her answer revealed that, while she knew this patient's fistula, its problem areas (i.e., stenosis), she did not elaborate on why having a high venous pressure was a problem and what were the most likely cause(s) of this problem.

What this property of sufficient nephrology nursing knowledge revealed was that, while some nurses can very skilfully perform the required nursing care, they did not fully understand the reasons why they were doing it or what were the consequences of their action. That is, experienced non-expert nurses had sufficient procedural knowledge to undertake routine tasks fluently, but inadequate propositional knowledge to provide detailed rationales.

Similarly, Judy, who had approximately two years nephrology nursing experience and was undertaking the nephrology course during the study, also revealed knowledge deficits regarding medications that were frequently administered by nurses to patients with renal failure. For example, Desferrioxamine (DFO) is a drug used to enhance the excretion of excess iron or aluminium in patients receiving either haemodialysis or peritoneal dialysis (Galbraith, Bullock & Manias, 2001). When questioned about what was DFO and what was it used for, Judy revealed the following:

*DFO is a drug that, now I always get this mixed up, DFO is a drug that helps with aluminium. I've got to get it right in my head. DFO helps with the synthesis, is that the right word, of aluminium in the blood and it helps the body absorb it. Isn't that right or does it helps the body get rid of it? I can't remember* (Judy, 3rd interview).

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Sharing Knowledge with Others

This dimension of sufficient nephrology nursing knowledge explained what the experienced non-expert nurses were able to do with their greater knowledge and, invariably, this was related to teaching others. The nurses in this second stage were teaching patients and other nursing staff; they were teaching more frequently and more easily than non-expert nurses. All of the teaching was at the bedside or chair-side. It was informal, spontaneous and usually of a short duration, that is, for a few minutes. Topic areas taught to either patients or other nursing staff were usually related to routine procedures such as measuring blood pressures, setting up dialysis equipment, brief explanations of medications or dietary restrictions.

Leonie tells a patient that his potassium is 6.2 [normal 3.5 – 5.5]. She then asks him what is he eating in his diet. The patient reveals he has eaten some bananas and chocolate lately. Leonie asks him how much and how often he ate it. She does this while removing the dialyser. Patient reveals amount and frequency. Leonie says 'I think you'd better cut back on those bananas in a big way and also the chocolates'. She then explains why it is important to minimise the intake of these foods (Leonie, 3rd observation).

Adequate Experience

Experienced non-expert nurses have been exposed to many and varied nephrology nursing situations, patients and practices; they have been working in this field of nursing for longer, gaining greater experience than non-experts and increasing the depth of their specialised knowledge. By having had increased opportunities to observe, practice and receive feedback, experienced non-expert nurses were able to recognise situations familiar to them and use this information to make it to easier for them to manage most situations, hence providing quality nursing care (i.e., in terms of the metaphor, they
were PLAYING BETTER). The dimensions of repeated practice and routines are easier explain this characteristic of adequate experience observed in experienced non-expert nurses.

Repeated Practice

Completion of a nephrology nursing course was not the sole determinant of the acquisition and exercise of expertise. Nevertheless, in this study it was a contributory factor. For some experienced non-expert nurses it was through longer experience in nephrology nursing rather than through formal education courses that they progressed into the second stage of expertise acquisition. That is, the nurse has had a greater opportunity to practice and, therefore, to proceduralise a skill. For example, one experienced non-expert nurse suggested that it was longer experience with cannulation that was more helpful in improving her practice than a nephrology nursing course.

Repetition or increased practice with performing the same activities over a long period of time has assisted in developing an experienced non-expert’s skill level. This has enabled them to “visualise” what needs to be done and how to do it. For instance, when cannulating a fistula, the experienced non-expert nurse can visualise internally what the tip of her needle is doing.

*I guess it does come down to experience too, I’ve been doing [cannulation] a long time...Because like I said ‘cause I’ve needled [this patient] and a lot of the others so many times like you do know their access and you just get this instant visual that you know what’s going on inside there* (Leonie, 2nd interview).

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Repeated practice in similar situations also allowed the experienced non-expert nurse to develop practice strategies to avoid problems for patients. For instance, when an experienced non-expert nurse is putting haemodialysis equipment out behind the dialysis machines in preparation for the next shift, she has developed a strategy to check visually and verbally with patients that they are all right. This ability to avoid problems and to take pre-emptive measures was frequently observed in experienced non-expert and expert nurses; it was not, however, seen in non-expert nurses.

Repeated practice, while having the advantage of freeing up cognitive function, did have some potential dangers associated with automatic functioning. The following excerpt from field notes taken during an observation episode with Stacey (an experienced non-expert nurse) reveals that she deliberately avoids situations which may interfere with her ability to focus on her practice.

Stacey is doing an activity that she is less familiar with. A patient calls out to her and she goes over to him saying that she is unable to chat with him as she's trying to concentrate as she's putting out the dialysate fluid (Stacey, 1st observation).

Routines are Easier

As nurses gain more experience in the day-to-day practice of nephrology nursing, they find it easier to perform routine psychomotor skills. Longer experience tells them what to do and how to do it. These nurses required little conscious thought to be able to perform routine nephrology nursing skills. Routines became easier because they were able to perform them automatically (cf Fitts & Posner’s final phase of skill acquisition, see Chapter 2, p. 46). Setting up the dialysis machine, for example, has become routine;
the experienced non-expert nurse, therefore, needs to concentrate less on that task or to think less about what they are doing. Developing automaticity in a particular task has freed up cognitive function for other aspects of their work, such as which patient needs should be attended to first, visually assessing other patients in the unit or something totally unrelated to what they are doing (e.g., what sort of day it is outside).

*Oh that's because I could do that [setting up dialysis machines] blind folded...'cause I've done it that many times...[and] you don't have to think too much [when doing it] (Leonie, 1st interview).*

In addition, due to an increased depth of specialised knowledge and a longer length of experience in dealing with equipment such as haemodialysis machines, the experienced non-expert nephrology nurse can recognise problems with equipment and quickly problem-solve. Frequently, the experienced non-expert nurse just needs to glance at the machine or hear an alarm to recognise a problem (e.g., sound of an alarm) from a distance, and s/he can easily provide direction for less experienced nurses. The ability to be able to recognise problems with technology was a typical indicator of how having increased experience influenced their ability to practice.

Prepares local anaesthetic, stops and glances at machine then kneels on floor and injects the local as Alexis [non-expert nurse] asks her a question, as her machine is alarming constantly. She stops injecting the local and stands up straight to see what is happening. Tells Alexis to heat disinfect another machine, as the first machine will require significant attention (Leonie, 3rd observation).

The experienced non-expert nurse knows the routine of the ward very well and so on most occasions it was not difficult to organise other nursing staff and ensure that a shift
ran smoothly. Time management was more effective than that of the non-expert nurse and the routine activities encountered by the experienced non-expert nurse became easier.

_No, well I suppose there's certain routine that I try...and make things easier...Every shift would have routine things that we do ... you've got a certain routine and you find things would flow along a lot quicker, a lot better_ (Stacey, 1st interview).

Nursing care became easier because longer experience and repeated practice at delivering the same type of nursing care allowed the experienced non-expert nurse to function automatically. The more routine the performance of a task, the easier it became:

_It is very routine sometimes [working in the haemodialysis unit]. I think when you are in automatic pilot mode I don't realise I'm doing it..._ (Leonie, 3rd interview).

In contrast to expert nurses who saw _managing the unit's workload_ primarily in terms of the patient's interests, experienced non-expert nurses typically saw routines becoming easier in terms of their own interests rather than those of the patients. Their practice focus was frequently directed towards making nursing work easier for themselves.

_Okay [I make things easier] for myself by looking at [the] organisation for the day, as soon as you come on in the morning you know in your own mind what machine to set up first so that they're already set up for those patients that are coming in earlier. You try and get say a couple of machines [done] before you go and put on patients and you normally set up while some of the patients are setting up themselves. They all have_
their own packs and that's much easier- you're not running back and forth...what makes it easier too is that each patient normally would go on that same machine which makes it easier too in your mind that you know such and such is going on that machine. Like today's little hiccup with a patient that maybe should be a little bit... closer to the desk and...that sort of thing makes it easier is you've got a sicker patient closer to you or where you're walking past all the time you're not having to walk further down the end of the room to check the patient out (Leonie, 3rd interview).

The experienced non-expert nurse, however, does not have enough experience to be able to manage everything. The nurse still needs to utilise the advice, knowledge or skills of an expert when the need arises. For instance, Leonie who has greater than ten years experience in nephrology nursing recognises that "sometimes it's easier to accept that maybe you're having problems, go and get someone else [to help]" (Leonie, 3rd interview).

**Exercising Routine Nephrology Nursing Skills**

Experienced non-expert nephrology nurses had developed very good clinical skills to deal with routine situations, events or issues. They had become very good at doing the "doing side" or practical skills required of these nurses. That is, experienced non-expert nurses did not reveal any difficulties with exercising routine nephrology nursing skills. This was particularly evident during observational periods when these nurses were able to prepare a haemodialysis machine quickly and cannulate the patient much more easily than non-expert nurses. Exercising routine nephrology nursing skills was clearly related to both the increased domain knowledge and experience which these nurses possessed.
Experienced non-expert nurses’ practice was always purposeful and fluid, with little energy or effort expended.

*I cannulate where it's more comfortable for the patient and you know you can get the cannula in first time* (Stacey, 1st interview).

The dimensions of *beginning to take a leading role* and *still playing within the boundaries* further explain the experienced non-expert characteristic of *exercising routine nephrology nursing skill*.

**Beginning to take a Leading Role**

*Beginning to take a leading role* was a dimension of the characteristic *exercising routine nephrology nursing skills*. This dimension reflected far more than being a shift team-leader, which was commonly performed by nurses in all three stages; it was a leadership role in terms of being a resource for other nurses as well as being a valuable and reliable team-member. Occasionally this could have meant relieving in a higher position when, for instance, an expert nurse went on holidays. Experienced non-expert nurses were designated by others and by themselves as ready for a leadership role. This was as a result of being able to perform skills quickly, safely and easily (i.e., automatically) freeing up cognitive attention to allow them to take on additional tasks requiring leadership. For instance, Leonie, who on this occasion was not the team-leader, prioritised not only her own workload but also that of the entire dialysis unit. She did this by being able to focus her thoughts and actions on a wider range of activities so that the unit was able to function optimally.

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Well you just prioritise, like this morning...in the back of your head
you've got this man up in the hospital that you need to dialysis cause he
hasn't dialysed yet today, but he definitely needs dialysis and he's a
priority, and so you know that you put all the other patients on first [i.e.,
get their haemodialysis treatment started] and make sure your team
leader has rung up [the ward to get the man transferred to the unit],
'cause often your team leader may have been on days off and then come
on, so...just be prepared, organised and put him on the most appropriate
machine” (Leonie, 2nd interview).

A person with end stage renal failure relies entirely on receiving dialysis treatment to
stay alive. The patient’s life, therefore, literally depends to a great extent on the nurse’s
cannulation abilities. The nurse must be skilful enough to cannulate a person’s fistula
so as to avoid irretrievably damaging the precious vascular access needed for
haemodialysis treatment. In some instances, an experienced non-expert’s nursing skills
were recognised (i.e., designated) as superior to those of other (non-expert) nurses.
Expert nurses, in rare instances, allowed them to cannulate extremely difficult fistula.
That is, expert nurses encouraged particular experienced non-expert nurses to take a
leading role in the care of fragile vascular accesses.

For instance, Stacey, although designated by her peers using the participant selection
criteria as a non-expert nurse, was particularly skilful at cannulation. She had greater
than twenty years cannulation experience and had developed an extensive network of
schemata to support her cannulation skills (i.e., how to manipulate the cannula to get it
into the correct position). For this particular task, expert nurses had designated her as
an “expert cannulator” and allowed her to cannulate difficult or new fistulae. Stacey

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was observed cannulating vascular accesses that another experienced non-expert nurse (i.e., Leonie) and all non-expert nurses were prevented from doing. When asked during her interview, Stacey was unable to explain, other than revealing her lengthy haemodialysis experience, why she was allowed to cannulate particular fistulae and others were not.

*Still Playing within the Boundaries*

The final dimension of the characteristic *exercising routine nephrology nursing skills* was that experienced non-expert nurses, in this study, still followed the normal nursing practice boundaries expected of Registered Nurses in New South Wales, that is, they *still played within the boundaries*. For instance, these nurses practiced glove wearing similarly to non-expert nurses. During observation periods, at all times non-expert and experienced non-expert nurses appropriately wore gloves to protect themselves from body fluids. Experienced non-experts invariably stated, when asked, that they would wear gloves except in an absolute emergency.

* I'd have to say 99.9% I do [wear gloves]. *It will always be a habit for me to set up the machine, dressing tray, wash my hands, go and put on a pair of gloves.*” (Leonie, 2nd interview).

Similarly with medication administration, experienced non-expert nurses stayed within the legal boundaries of practice, as they knew all registered nurses were expected to. As will be discussed in the next chapter, expert nurses, in contrast, occasionally but deliberately strayed outside of the normal boundaries to protect a patient's well-being or safety.
Changing Focus of Practice

By comparison with non-expert nurses, the focus of experienced non-expert nephrology nurses had gradually changed. Their nursing practice had shifted from predominantly focusing on the task and getting the job done to an increased patient-focus (i.e., developing a patient focus). While the patient’s well being was a focus of attention, experienced non-expert nurses were observed to be only briefly patient-focused in comparison to expert nurses. Generally, experienced non-expert nurses described their actions during interviews as being directed towards the patient but, during observation episodes, the observer’s impressions were that the primary focus was on making the job easier for themselves.

I suppose [I make things easier as] I’ve got a bad back and I use the stool for cannulating rather than stooping over patients. I find it a lot easier. What else? I don’t know I must do things that I don’t even realise that make it easier easy for me to do... (Stacey, 1st interview).

Cannulation was a common task performed by most participants in this study, and participants were asked about their focus of attention when cannulating. Non-experts were clearly concentrating on performing the task and getting the cannula in successfully, that is, they could not converse with patients during cannulation or when connecting up to the haemodialysis machine. It was only when these tasks were completed did non-expert nurses acknowledge the patient or respond to their requests. Experienced non-experts still needed to concentrate on performing the task of cannulation but could also consider how it was affecting the patient. These nurses had acquired sufficient procedural knowledge to enable them, albeit briefly, to engage in conversations with patients or respond to their requests. This is in contrast to expert...
nurses who did not need to concentrate on performing the cannulation and could devote their attention elsewhere (e.g., talking to the patient to calm them down) while cannulating.

The view taken by experienced non-expert nurses regarding the concept of continuity of care also explains the characteristic changing focus of practice. Continuity of care is a particularly important aspect of nephrology nursing practice. In the second stage of expertise acquisition, experienced non-expert nurse has broadened their previously narrow concept of continuity of care. This focus, although not as broad as that of expert nurses, was certainly wider than, for example, a patient’s dialysis treatment session over one to two days (see above, p. 190). For experienced non-expert nurses, the concept of continuity of care spans a period of a few weeks to a few months. Once again, when reminded during an interview that they had provided nursing care for some patients over several years, experienced non-expert nurses described continuity of care as being over a much shorter time frame (i.e., months rather than years).

\[ \text{If you know they're having an op[eration] soon, or in a few weeks, you know they need to [be] prepared for that. So mainly [I focus on the] day to day but I [also]... think ahead (Leonie, 2\textsuperscript{rd} interview).} \]

**Progressing to Next Stage: Prerequisites**

Progression to the final stage of expertise acquisition, in this study, could only be achieved when several prerequisites had been satisfied. These were conceptualised as recognition of expertise [by others], having an obligation and commitment and motivation for and enjoyment of nephrology nursing. The non-expert nursing data did not demonstrate any of these prerequisites, that is, it could not be coded into any of

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these categories. Expert nursing data, in contrast, could be readily coded into all of these categories. There were three other nurses whose observational and interview data had a limited fit to these expert categories. These nurses were subsequently identified as the experienced non-expert nephrology nurses.

The prerequisites, recognition of expertise, having an obligation and commitment and motivation for and enjoyment of nephrology nursing, were necessary for the exercise of expert practice. They did not occur spasmodically in expert practice; rather, they were seen frequently during observation episodes and were referred to frequently during interviews. This indicates that the categories were important not only for the exercise of expertise but also for its maintenance. Each of these prerequisites categories, because they were imbedded within the characteristics of nephrology nursing expertise, are dealt with in the next chapter.

Chapter Summary

This chapter has explicated the various properties and dimensions which support the first two stages of the acquisition and exercise of nephrology nursing expertise. The nurses in the first stage have been described as non-expert nephrology nurses because they are learning to play in the orchestra, that is, non-expert nurses need to learn both the ward routines and the specialised skills required of nephrology nurses. Non-expert nurses could be characterised by their superficial nephrology nursing knowledge, limited experience, the need to acquire basic nephrology nursing skills and a narrow focus of attention (i.e., on performing tasks). Non-expert data also revealed various dimensions of each characteristic which provided further details of how the nurses at

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this stage exercised their level of skill. The data also suggested that there were several factors which influenced a non-expert nurse’s ability to move through into the next stage. These factors were completion of a postgraduate course in nephrology nursing or by having repeated practice of working in the same domain of nursing. Either of these factors was sufficient to progress a nurse into the second stage of the acquisition and exercise of nephrology nursing skill.

Similarly, the second stage consisted of nurses who could be classified as experienced non-expert nurses because they were playing better, learning to conduct and compose music. They were able to perform most of the specialised skills required of a nephrology nurse and they had learnt the routine of the ward well. Their level of skillfulness was such that they could begin to take on additional roles or functions such as nurse-teacher and nurse-leader, and they were beginning to develop their own style of nursing. Experienced non-expert nurses were characterised by their sufficient nephrology nursing knowledge, their adequate experience in the domain, their exercise of routine nephrology nursing skills and a changing focus [of their] practice. In addition, the study also revealed the range (i.e., dimensions) of each characteristic, and this provided further evidence for the existence of the category playing better, learning to conduct and compose music. Finally, the data also revealed three prerequisites for the progression of experienced non-expert nurses to the last stage. In the following chapter, the findings in the data which revealed expert nephrology nursing characteristics are explained.
CHAPTER SEVEN

The Characteristics and Practices of Experts

Introduction

This chapter will explain the third and final stage of the acquisition and exercise of nephrology nursing expertise. It is only through exercise (practice) that expertise is acquired and maintained. The expert stage was conceptualised as PRODUCING THE MAGNUM OPUS. The magnum opus is the product of the expert nurse’s work; it is high quality nursing care purposefully focused on the patient. In order to produce this “great work” expert nurses have three interconnected roles. They are the best practitioners (performers) of nursing care (cf. first violinists), leaders of nursing within the renal unit (cf. conductors) and developers of their own high standards of nursing care (cf. composers). The category, PRODUCING THE MAGNUM OPUS consisted of four characteristics which describe how the expert nurse practices. These characteristics were extensive nephrology nursing knowledge, vast experience, exercising advanced nephrology nursing skills, and being patient-focused. The data also revealed several dimensions of each characteristic (see Table 11 below, p. 215).

Extensive Nephrology Nursing Knowledge

Having an extensive nephrology nursing knowledge was a striking characteristic of a nursing expert. Expert nurses clearly relied on and utilised extensive nephrology nursing knowledge to practice. In comparison to both non-expert and experienced non-expert nurses, this characteristic was revealed in the manner in which these nurses utilised their domain-specific knowledge. Firstly, expert nurses use multiple sources of
knowledge to guide their practice and, lastly, when questioned about their practice, expert nurses were better able to provide precise rationales for [their] practice.

Table 11: Third Stage of the Acquisition and Exercise of Nephrology Nursing Expertise

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<tr>
<th>Category</th>
<th>PRODUCING THE MAGNUM OPUS: Expert Nephrology Nursing Practice</th>
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<td>Characteristics</td>
<td>Extensive Nephrology Nursing Knowledge</td>
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<tr>
<td>Dimensions</td>
<td>• Using multiple sources of knowledge</td>
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<td>• Precise rationales for practice</td>
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Using Multiple Sources of Knowledge

Expert nurses had extensive domain-specific (nephrology) nursing knowledge in comparison with nurses in other stages of expertise acquisition. During data collection, the interviewer probed for underlying knowledge for practice and, unlike non-expert or experienced non-expert nurses who knew only what and when to do something, experts revealed a wealth of knowledge that was closely linked with their actions; they knew both what to do, why to do it and what were the consequences of their actions. Expert nurses were able to draw on a much wider variety of sources of knowledge in comparison to experienced non-expert nurses. Their extensive domain-specific or
specialised knowledge was gained from multiple sources such as formal education courses, reading the literature, informal and experiential learning, doctors, other nurses and pharmacists.

For instance, during the study, the satellite haemodialysis unit was trialling a new Vitamin E impregnated dialyser on selected patients. Non-expert nurses knew only that these were different dialysers; experienced non-expert nurses revealed a partial understanding of how the dialysers differed from the usual ones and why these dialysers were being trialled. By comparison, expert nurses knew precisely why the dialysers were being trialled, on whom, why and what were the results. This also clearly demonstrates understanding of research, and participation in and evaluation of new products.

_It's considered to be bioactive in that Vitamin E is an antioxidant, it mops up free radicals and because one of the big problems with dialysis patients is they get a lot of atherosclerosis etc, it is supposed to inhibit or to partially inhibit the progression of those diseases. Whether or not it does I don't know, I mean you need an awful long study to see whether or not it is but there's some anecdotal evidence that it clears Beta 2 [microglobulin] a bit better than the other membranes, that you can decrease the amount of EPO [Erythropoietin], [the patients] maintain their haemoglobin a little better and that some of the symptoms, the intradialytic symptoms that they get, are sometimes improved. So [a renal physician and I selected] three people [to use this dialyser] one who isn't holding his haemoglobin very well, one who gets heaps of headaches on dialysis and one who's got real bad amyloid joint pain and as far as I can see it's not doing anything for any of them so that's the story with that_ (Prue, 2nd interview).

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For expert nurses, the theoretical and practical knowledge which they had acquired during a postgraduate nephrology nursing course had been proceduralised into their routine practice to the extent that it was difficult for them to identify where they had learnt something. When probed during interviews, all experts acknowledged the importance of this education but recognised that it often lay dormant until needed. For instance, Sam was asked to think back to the time when she had not undertaken the nephrology course and compare what her knowledge was like then and now. Sam stated:

*I think [the renal course] gives you the groundwork, yes I think it certainly helped. I know before I did the certificate I worked in the renal unit, so you think oh compared to some of the unit you’re reasonably experienced, what I would class as an experienced nurse but I did learn a lot on the course and I think doing the course you realise how little you do know. You believe you did have the knowledge before but it’s more grounded when you’ve done the course…I think during the course you realise there is other ways of doing things, not just the one way you’ve been taught, it opens your eyes to other areas, other renal units, and renal is a big area so there’s more than just PD [peritoneal dialysis], there’s more than just haemodialysis and I think when you do the course you realise that…you’ve got to understand everything regarding the patient not just the dialysis aspect (Sam, 2nd interview).*

Expert nurses utilised a number of resources such as professional seminars, conferences, reading journals or learning from medical staff to add to this knowledge; nurses in the earlier stages of expertise acquisition, by comparison, did not identify these as sources of knowledge. Another significant source of knowledge for expert nurses was the vastness of experience they possessed. Experience had provided them with a wealth of

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opportunity to observe others, to practice and to obtain feedback. These factors had enabled expert nurses to develop superior propositional and procedural knowledge in comparison to other nurses and this, in turn, allowed them to practice nephrology nursing with ease.

Working here in an area that I have the knowledge and the background where so many things are very familiar and I think that's a lot of it too, it's familiarity with what you're doing (Fran, 2nd interview).

For expert nurses there were other sources of knowledge which additionally supported their ability to practice nephrology nursing at an expert level. For instance, other nurses or doctors provided information which expert nurses incorporated effortlessly into decisions about what needed to be done for particular patients. Kim, for example, received information about a patient's condition and ability to learn peritoneal dialysis from another nurse. Kim used this information to plan the patient's training sessions including whether the patient was able to travel to the training unit but, more importantly for this patient, whether her son would be present to translate the instructions to his mother. The following is a verbatim transcript of a phone call Kim received while being observed:

"She is an elderly lady - isn't she? Is she still on oxygen? Last time I saw her she was on oxygen. Is she up and about and mobile?"

Discusses with caller [a nurse at the renal ward] whether her son will come for a couple of hours to see the PD unit and what it involves, and whether the son was also willing to learn how to perform the dialysis (Kim, 1st observation).
Finally, expert nurses utilised information from the patient’s hospital records and cues from the equipment they were using, to a much greater extent than either non-expert or experienced non-expert nurses, to guide their practice. For instance, a dialysis circuit, which is discarded after each patient, had provided Agatha with information about the amount of heparin a particular patient would require during their subsequent haemodialysis treatment.

...the first patient’s [dialysis] circuit had a streaky dialyser and I also examine the venous bubble trap to see if there’s any clots because that’s an indication of the amount of heparin we need to increase or decrease it (Agatha, 1st interview).

In addition, a further source of knowledge for expert nurses was information gained from knowing the patient. Knowing the patient was significant to this study and deserves particular attention in these findings as a sub-category of using multiple sources of knowledge because of the unique longevity of the relationship between expert nurse and people with renal failure.

**Knowing the Patient**

Patients were also another source of knowledge for expert nurses. For most patients, renal failure is a chronic, life-long disease which they have to manage for many years. It is common for patients to have some insight into their disease, the signs and symptoms they experience and what treatment to expect. Patients, therefore, provide nurses with information about what has been happening to them recently, in terms of their health. It was only expert nurses, during observation episodes, who fully recognised what the patient was telling them, and thus enabled them to question (i.e.,

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assess) in a more purposeful manner to establish what the problems were. For instance, the medical staff had told Fran that a particular patient, who had recently been discharged following a renal transplant, had been to the emergency department the night before with haematuria but the medical staff did not know how severe the haematuria had been. While the researcher observed, Fran questioned the patient about the colour, consistency and amount of haematuria he had had the previous night compared with now. During the subsequent interview, she was questioned about why she asked the patient about the haematuria when she had already been informed by the medical staff, she stated that:

*I like to know from the patient what's been happening because what we see in their urine now isn't necessarily what has been happening outside, and he actually did have a lot worse haematuria than his urine sample would have indicated when I looked at it this morning* (Fran, 1st interview).

This information from the patient allowed Fran to decide which blood and urine tests she would need to collect. The ordering of laboratory tests is outside the domain of nursing practice and this issue will be examined later in this chapter. A consequence of having knowledge from the patient together with specialised knowledge about transplant rejection enabled Fran to provide appropriate and timely nursing interventions.

In addition, some expert nurses in this study had continued contact over prolonged periods of time, even over several decades, with the same patient, and this provided them with additional knowledge. *Knowing the patient* was a concept which clearly

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distinguished expert from non-expert practice. Expert nurses knew what the patient had been through in the past, what their initial entry onto dialysis was related to, what types of renal replacement therapy (i.e., haemodialysis, peritoneal dialysis, renal transplantation) they had received in the past, what current medications they were on, what sort of responses they got from their medications, how compliant with treatment they were, whether or not they had any understanding of their disease, medications or other treatment requirements. Non-expert nurses, by comparison, knew only minimal details about patients. Patients are so well known by expert nurses that “they don’t have to say anything, you can just look at a person that you’ve known and pick it [identify a problem]” (Sandra, 2nd interview).

Knowing the patient made it easier for expert nurses to “simply avoid problems and avoiding problems is what a dialysis [unit] is all about basically” (Prue, 2nd interview).

Having knowledge of what the patient is like meant that expert nurses could:

more or less judge if [they] saw them sick [or] well, what they’re like when they’re in the in-between phase...and it is easier sometimes if someone does know the patient to say ‘oh they are always like that or they’re not like that or this is unusual with them this is out of character

(Agatha, 2nd interview).

Expert nurses, because of their extensive theoretical and patient-specific knowledge and depth and breadth of their experience in nephrology nursing, were able to recognise clinical and other cues coming from patients. These signs and cues were not apparent to non-expert nurses who were concentrating on getting the task done. Expert nurses were, as well, cued to probe for further information and knew how to utilise this in the

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interests of the patient, demonstrating firm links between expert knowledge and expert nursing interventions.

**Precise Rationale for Practice**

Expert nurses were consistently able to provide thorough and precise explanations for their actions. Interview questions were derived from observations of a nurse’s actions including verbal “actions” throughout observation episodes. These questions were designed specifically to probe action rationales.

For example, Sam was observed performing peritoneal equilibrium tests\(^1\) (PET) for several patients. During the subsequent interview, questions were asked about what was a PET and why and when was it done. Sam provided accurate answers for each of these questions and went on to explain the nursing actions required once the results of the PET were known.

> *Oh it depends on what [type of peritoneal] membrane you’ve got. You might increase the volume, maybe change them round to different percentage of glucose, maybe change the times of the exchanges, maybe shorter dwells or longer dwells, maybe they might be more suitable to CCPD [Continuous Cycling Peritoneal Dialysis]. At least you know what you’re dealing with and how you can change what your options are* (Sam, 1\(^{st}\) interview).

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\(^1\) A peritoneal equilibration test (PET) is a standardised test to determine the characteristics of the peritoneal membrane (Burrows & Prowant, 1998). Specimens of used peritoneal dialysis fluid and blood are collected at predetermined intervals during the dwell cycle to determine dialysate and plasma urea and creatinine levels. Results of each specimen are calculated into specific formulae. This enables the peritoneal membrane to be classified into one of four categories of permeability (low, low average, high average, high) which correlate with the ability of the patient’s membrane to transport solutes. Adjustments to the peritoneal dialysis prescription can then be made.
In this unit, the expert nurses were able to alter a patient’s peritoneal dialysis prescription based on a PET result without necessarily consulting a renal physician because some of the physicians “may not fully understand or interpret the results” (Sam, 1st interview).

Expert nurses could also provide a sound rationale for why they had decided to perform their nursing interventions in a particular way. Each rationale was supported by their extensive specialised knowledge and previous experience. In particular, haemodialysis nursing requires the nurse to prescribe a patient’s dialysis treatment within unit guidelines. In the following interview excerpt, Agatha explained how the expert nurse determines the haemodialysis treatment for patients.

Yes, dialysis, haemodialysis is [an] individual prescription for each person and you cannot make a blanket statement for each patient. It’s individually tailored, you have guidelines and this is what you can do but each person will be different and therefore you adjust accordingly...

(Agatha, 1st interview).

A nurse, in this unit, will determine how much heparin a patient requires, what type and size dialyser to use, how fast to set the blood pump speed and other dialysis parameters for each patient. When questioned about the decisions nurses had made for a haemodialysis treatment session, expert nurses provided more than a description of what they did, they supported their actions based on knowledge of the patient, knowledge of haemodialysis and the relationship between the two.
This gentleman has a bowel obstruction and [I] added potassium to his dialysate bath because he has got such large volumes of nasogastric aspirate, he's loosing large volumes of potassium and [I] don't want to give this gentleman hypokalaemia so [I] was doing that. [I] also check him to see the parameters of what his blood results are like, they're not going to be normal, perfect for a fit and healthy person they are going to be abnormal, but normal for him (Agatha, 1st interview).

Vast Experience

Analysis of data from observations and interviews revealed that, by comparison with other nurses in this study, expert nurses had considerably more experience. There were two dimensions of this characteristic: first they practiced with great confidence (i.e., confident practice), and second, for expert nurses not a lot was new to them. That is, they had experienced most events, situations, issues, previously.

Confident Practice

For expert nurses, the more experienced they became the more confidence they developed. This fed into a positive feedback loop in which the more confident they became the more advanced nephrology nursing they undertook (and were allowed to undertake) which lead to increased practice and feedback.

During several observational periods it became apparent that other nurses relied on expert nurses for their nephrology nursing expertise; that is, other nurses designated them as expert nurses. Expert nurses were valued for possessing not only their extensive nephrology nursing knowledge or for their vast experience but also for their practical, hands-on abilities. These practical abilities were apparent during observation
periods because of the skilful manner in which expert nurses were able to perform clinical tasks with no time or energy wastage. These were evident when it came to cannulating extremely difficult fistulae, some of which were even difficult for experienced non-expert nurses. For instance, Stacey, who while designated by expert nurses as an “expert-cannulator” within the renal unit, experienced difficulties when cannulating an extremely problematic fistula.

Initially with [Patient's name] her fistula's brand new very, very soft Ok and nowhere else to go, so I guess it's better to have the person who's been here the longest, most experienced because if there is a problem she's gonna have to go to a vas cath. I went away for five days...[and] I got Stacey [an experienced non-expert nurse] to look after her and Stacey's very senior [experienced] and she had problems, so if one of my senior staff like that has problems then I know that it's better to leave [that particular patient to me] and I'll do [the cannulation] and then I will hand [the patient] back over to them [when the fistula becomes easier] (Mary, 1st interview).

Expert nurses would also, on occasion, reorganise the usual patient dialysis schedule so that one of them was present to perform a patient’s cannulation. They would, if necessary, come into the dialysis unit from home to ensure that a patient’s fistula could be non-traumatically cannulated. Confident practice, which was acquired from vast experience, was also related to why expert nurses could blur the boundaries.

Not a Lot is New

The last dimension of the characteristic vast experience was conceptualised as not a lot is new. During observational episodes in the study, it became apparent that expert
nurses could identify potential or real problems much faster than other nurses. Expert nurses were then asked about this during interviews. Prue noted that, “expert nurses tend to have seen it all and once [they’ve] dealt with it for a while [they’ve] pretty much seen everything over time, [so] pretty much [they] don’t see a lot [they] don’t know” (Prue, 3rd interview). Prue goes onto suggest that:

*A lot of the time [it’s not new]. I mean usually its things you’ve seen and [non-expert nurses] haven’t...so it’s that and experience and, you know, you sort of think along the right lines while you’re working, whereas they are not thinking...[It] sort of automatically [comes to me, I] don’t think about it, ...so that is really experience together with a little bit of theoretical knowledge I suppose...*(Prue, 3rd interview).

The dimension, *not a lot is new*, is clearly linked to expert nurses having vast experience. Expert nurses have observed and practiced nephrology nursing for much longer periods than other nurses (see table 6, p. 111). The feedback which they have obtained during this time has, therefore, provided them with larger, more inclusive schemata to inform their actions. This dimension also consisted of a sub-category *knowing what to do and when to act*.

**Knowing What to Do and When to Act**

Expert nurses were able to draw on their vast experience to know what to do for people with renal failure. For instance, expert nurses were able to recognise from prior experience when a fistula had matured sufficiently to begin cannulation or when a newly inserted peritoneal dialysis catheter had healed completely to allow a patient to commence showering. When expert nurses were questioned, however, about how they
knew about these aspects of nursing care, they frequently stated that they "didn't know" why they knew things but that "it's probably cause [they have] done it [dialysis nursing] for years" and that they "know the procedure" (Prue, 3\textsuperscript{rd} interview).

Knowing when to act was related to how an expert nurse would know what to do at the appropriate time. For instance, Prue revealed how she would not rely on the typical parameters of a patient's weight, blood pressure and general well being to assess a patient's fluid status. Nephrology nurses in this unit, however, did not routinely perform an assessment of a patient's jugular venous pressure (JVP) but Prue did because she knew that the patient had been unwell recently and decided that a thorough fluid assessment was required today.

...but if they been well and stable I wouldn't do [a fluid assessment] to that extent, but it was really just a quick look to check...She quite often loses weight between dialysis but she has also had the 'flu quite badly" (Prue, 1\textsuperscript{st} interview).

Expert nurses demonstrated on many occasions that they were able to combine their knowledge and experience to know when to act in patient's best interests. In this particular situation, no other nurse had been insistent that a patient's hypertension be pharmacologically managed. This patient did not understand the necessity to take his medications regularly and, as a result, the physician had increased his medications. He was now on the maximum dose of four different antihypertensive agents to control his blood pressure. Prue knew that (she needed to act on this patient's behalf) because he was going to suffer adverse effects such as severe hypotension and subsequent clotting of his fistula if something was not done about his medications. Prue combined her

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knowledge about this particular patient, her knowledge of antihypertensive medications and their effects, with her vast experience of patients “going flat” at home after dialysis treatment, to intervene on his behalf.

One guy at the moment that we’ve got on dosette medications whose ... just hasn’t been taking his medications [and] he’s got no understanding, he’s blind. I mean [he is on] multiple medications. He’s been discharged from hospital twice without dosetting [medication organiser box] as I have asked and nobody believes me but you know, I knew perfectly well that guy was not managing. Now I’ve got him put on a dosette and he’s on reduced medications. I mean he was on 4 [different] antihypertensives according to his chart, according to me he was probably taking 1 all [of] the time and 2-3 sometimes, never 4, so we put him on a dosette and I actually even went to his home to do his blood pressure at home because I knew full well his blood pressure was going to drop. So I mean, I’ve reasonable insight about things [patients] do, the way they can manage, more so than the physicians at times (Prue, 2nd interview).

Prue, during this interview excerpt, also reveals that knowing what to do and when to act was clearly linked to blurring the boundaries between work and home (see below, p. 251). That is, by having vast experience, Prue knew that this patient could experience a life-threatening event once he had left the dialysis unit as a result of not being able to comply with his antihypertensive regimen. No doctors had reviewed this regimen to see if the patient no longer required all of the antihypertensive agents. Prue, subsequently, visited the patient on her way home to check on him and measure his blood pressure.
Knowing what to do and when to act also typified the automatic action of expert nursing practice. Nursing routines and procedures were well known from repeated practice performing the same procedures to the same patients. Expert nurses had proceduralised the knowledge gained from both formal learning and experience to such a great extent that all routine action was much quicker and easier to perform in comparison to other nurses.

Vast experience made it easier for the nurse to be able to perform procedures and as it became easier for the nurse, it was also easier for the patient because “you’re not consciously thinking of what you’re doing, well you are thinking but you’re not having to analyse everything you’re doing because you’re so familiar with it and when the patients come with their problems the solutions come easier because you’re more experienced” (Sam, 2nd interview). The reason was experience has made it easier for expert nurses was:

*It's probably 'cause I've cannulated most of these people over and over again and cannulation really doesn't bother me, it's not something that I don't know. It's just very much a hand-feel type thing. I mean your assessment starts with the brain but to actually cannulate is a very physical procedure, so you don't need amazing concentration* (Prue, 2nd interview).

However, unlike experienced non-expert nurses who performed some tasks on “automatic pilot,” experts also recognised that functioning automatically can have its problems. One expert nurse revealed great insight into how easy it was to slip into
automatic mode and the steps she took to avoid not recognising errors in her routine practice.

_Sometimes you have to really sort of stop and think did I do that and you've done it all wrong, so you've got to be a little bit careful cause I've been caught out. I got caught out years ago at [another hospital], I won't tell you what it was, but it was, I mean it could have been life-threatening and I was convinced that I'd seen something different to what it was and then there was a thing in the paper about an airline crash in Mauritius I think it was, the Canary Islands, and they were talking about familiarity and how programmed you are to see what's familiar and it made me feel better because I understood what I'd done but it also made me realise that you can't go completely onto automatic pilot, that you have to do a double check on yourself every so often, you know, I have a check on myself._

_I know what I've done but I go back and check that what I think I've done, I have actually done because you can get so familiar and so automatic that its imprinted but in actual fact, it's different. That's well documented, apparently that familiarity- programming thing but I think you need to be aware of it...You see I never knew it existed, now I'm aware of it at least you can double check yourself. I didn't quite know when I first did it cause I thought why, why and then when I saw [in the paper] that I felt so much better about it cause I didn't know why (Prue, 3rd interview)._ 

By recognising that automatic practice derived from continuous experience with performing certain procedures could be dangerous to patient safety, expert nurses have recognised along with Fitts and Posner (1967) that autonomous expertise is not error-free. Expert nurses, in contrast to experienced non-expert nurses, who also described

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automatic practice, deliberately acquire feedback from their actions (i.e., "I have a check on myself") in order to moderate the impact of automaticity.

**Exercising Advanced Nephrology Nursing Skills**

In the third and final stage of expertise acquisition and exercise, expert nurses had developed and refined their nursing skills to such an extent that they practiced nephrology nursing very differently from other nurses in the renal unit. Expert nurse practice was characterised by the *exercise of advanced nephrology nursing skills*. These nurses practiced autonomously and were self-directing. That is, through continuous exercise (i.e., practice) they had acquired and maintained their nursing expertise; they were the only nurses in this study who demonstrated advanced nephrology nursing skills.

Antecedent behaviour, which was necessary for the acquisition and exercise of expert skilfulness was: firstly, being recognised as an expert, secondly, the moral and professional obligation and commitment nurses had developed towards others (patients, nurses) and, lastly, their motivation for and enjoyment of the practice of nephrology nursing. The characteristic of *exercising advanced nephrology nursing skills* consisted of five dimensions. These dimensions were *recognition of expertise, having an obligation and commitment, having motivation for and enjoyment of nephrology nursing, blurring the boundaries* and managing the workload.

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Recognition of Expertise

The magnum opus can only be produced when nurses are recognised by others (e.g., patients, other nurses, doctors) as having a high level of expertise in nephrology nursing. This finding is consistent with the theoretical framework of symbolic interactionism in which others designate some nurses as experts and privilege them accordingly (see p. 71).

All nurses were asked during an interview who they believed was the “most expert” nurse within the entire renal unit in order to gauge peer evaluation of the level of expertise of other nurses. Several nurses suggested some of the qualities necessary to be recognised as experts. These qualities included having:

- A wealth of up-to-date knowledge and experience which continues to increase;
- Extensive clinical skills;
- Capacity to deal with patients better than other nurses;
- An ability to teach other nurses (cf. teaching “master classes”);
- An ability to move into a renal area and succeed without faltering;
- An enquiring mind;
- A capacity to put more effort into their work in comparison to other nurses; and
- Ability to takes on more responsibility than other nurses.

Consistently two nurses, Prue and Norma, were identified by all nurses, even other expert nurses, as possessing these qualities and, therefore, in their opinion, as having the most expertise within the renal unit.

Recognition of expertise was a necessary precondition for the exercise of expert nursing skilfulness; however, it was also necessary for the maintenance of such expertise (i.e.,
the acquisition of even more knowledge and skill) because experts were provided with additional opportunities to learn and practice (e.g., case conferences). Others such as patient and doctors, recognised some nurses as expert, and this afforded those nurses a greater opportunity to practice autonomously. Recognition of expertise consisted of three sub-categories; namely, being trusted, role models for others and teaching others.

**Being Trusted**

Being recognised as comprehensively expert meant others increasingly trusted these nurses. The sub-category, being trusted, began development during the second stage of the acquisition and exercise of expertise. Expert nurses gradually developed trust in experienced non-expert nurses as their knowledge, experience and skilfulness increased. Being trusted not only assists in developing expert practice but is also one of the conditions under which it is maintained, that is, patients, other nurses and doctors need to trust what the expert nurse is doing, when, how and why.

Patients, for example, know that nurses who have longer experience with cannulation are better at performing this task. Further, patients have developed a rapport and trust with nurses who can demonstrate greater knowledge about their renal disease and its management.

*Patients feel that it’s you who has made a difference rather than any other nurse, I mean you build up a rapport and people get to trust you so that it does become your expertise that makes the difference* (Prue, 1st interview).

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Similarly, less experienced nurses clearly recognise expert nurses by seeking their guidance and assistance with their practice. Less experienced nurses designated some nurses as experts because these nurses knew a greater deal more about nephrology nursing and could also practice it. Judy, for example, recognised Prue’s expertise in cannulating a particular patient because his fistula was new and not matured enough for less skilled hands.

“I’m not really sure [why I am not allowed to cannulate this fistula] cause I haven’t really asked Prue but I think that he might have a very fragile fistula...it’s still...not a real well developed fistula yet and I think that because she’s the ‘Grand Poo Bah’ of cannulating she’s actually taking over for a while” (Judy, 2nd interview).

Doctors, in particular, trusted only those nurses who had been designated (cf. symbolic interactionism) by them as expert. According to expert nurses, doctors trust their practices and judgements. Doctors did so because they designated these nurses as experts with extensive knowledge and experience in managing patients on either haemodialysis or peritoneal dialysis treatment. Expert nurses “develop a trusting relationship with all of the consultants and some of them will let you do a little bit more than others” (Kim, 1st interview) and the doctors “realise that, that if [an expert nurse] refers something there is a genuine problem” (Prue, 3rd interview). Sandra suggests why renal physicians trusted the expert nurses in this study.

“I think we have a very good renal unit compared to a lot of other renal units, and I think our renal physicians allow us to do a lot more than renal nurses in other units. They recognise that we are the experts in our field, whereas in other units the doctors think they’re the experts and not the nurses. I’m sure there are some nurses in other units who may feel
down-trodden by physicians because they’re always overridden, whereas most of the renal physicians in our unit don’t do that; they know what we’re talking about (Sandra, 2\textsuperscript{nd} interview).

By being recognised as an expert and, consequently, being trusted by doctors enabled expert nurses to practice differently to other nephrology nurses in this study. Being trusted was a sub-category of recognition of expertise which gave expert nurses greater scope to practice. Although patients and other nurses trusted expert nurses, renal physicians, in particular, trusted these nurses to a larger extent to work in (informal) extended roles. Renal physicians trusted them “to change medication, to cease medications if [an expert nurse] thought it was appropriate especially when people are new to dialysis and you have to wean them off certain tablets when they start” (Sandra, 2\textsuperscript{nd} interview). These medications included “phosphate binders, some [anti]-hypertensives, to initiate perhaps doing blood tests so that [the doctors] have a base line to start on EPO [Erythropoietin] and...Lasix you have to stop and sodi-bic and that sort of stuff when [a patient] starts dialysis” (Sandra, 2\textsuperscript{nd} interview). Being trusted by doctors, and being recognised as an expert, gave a nurse implicit permission to step over or around the traditional nursing boundaries and extend their scope of practice under particular circumstances (see blurring the boundaries, p. 241).

Role Model for Others

Other nurses recognised that expert nurses were role models who were trusted with leadership functions (cf. CONDUCTING) in the renal unit. Expert nurses dictated what was acceptable practice and set a good example from which other nurses across the
entire renal unit learnt. During observations of expert nephrology nursing practice, these nurses were incidentally engaged in role modelling. That is, other nurses tended to emulate the practice of expert nurses or seek them out for clinical assistance, supervision or advice during the course of a shift. On other occasions, expert nurses were observed preceptoring new staff members to the haemodialysis unit. Expert nurses were resource people who knew what to do, why to do it, how to do it, when and how often. In this study, the sub-category of being a role model for others was broad as it also encompassed preceptor and mentor functions.

Expert nurses could quickly deal with all issues and, in some instances, could simultaneously teach other nurses how to solve problems. For instance, Prue described how other nurses would come to her to learn how to improve a patient's dialysis treatment.

...they discuss [dialysis prescription changes] with me but they [ultimately] make the decision and often they're not sure, then I give them the option to choose. Like if someone's under adequacy [see glossary] I might say 'what do you want to do about it?' and they might say change the dialyser to a bigger one and if I can see a reason why they shouldn't do that, like the [blood] flow rate can obviously go up before we change the dialyser, I'd suggest that... (Prue, 1st interview).

Teaching Others

Teaching patients, families, other nurses and medical staff (cf. conducting “master classes”) is a significant component of nephrology nursing practice (see p. 4) and, most nurses would agree, is the main focus of concern for patient care in a renal unit. During
this study, it became apparent that expert nurses were performing most of the teaching compared to non-expert and experienced non-expert nurses. Expert nurses also worked in areas with a pre-dominant patient teaching load; for example, teaching patients to manage either haemodialysis or peritoneal dialysis at home or to understand about kidney transplant rejection. They used a variety of teaching strategies such as explaining, demonstrating, guiding, prompting and reinforcing to facilitate patient learning.

Expert nurses could spend a significant amount of time teaching other nurses. Most of the teaching was informal, on-the-job, practical explanations about how to do something; they taught much more frequently than experienced non-expert nurses. Expert nurses also performed formal, classroom style teaching (e.g., during the formal postgraduate renal course).

Expert nurses also spent a considerable amount of time teaching doctors. For instance, in the haemodialysis unit, expert nurses taught medical students, interns, residents and registrars how to perform haemodialysis. Most levels of medical staff know the principles of haemodialysis (i.e., diffusion and ultrafiltration) but they do not know how to perform the actual dialysis treatment, how a haemodialysis machine works, its alarms and what they indicate and how to prepare a machine and patient. Teaching medical staff was undertaken primarily to improve their clinical abilities in the best interests of patient care.

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I think [teaching doctors] goes back to my patient focused role [and] running a unit smoothly, and if you’ve got a medical person who’s not doing it the right way then it not only impacts on the medical team but it impacts on the patient and impacts on the nurses looking after the patients cause they’re delayed in their care, and it also means that the unit is delayed because you know we’re cancelling things because they’re not up to scratch, so it’s often easier to get in and show them how to do a thing or tell them how to do a thing or give them the resources to do it, than it is to let them fumble around and make idiots of themselves and ‘stuff’ the patient up (Norma, 2nd interview).

Motivation for and Enjoyment of Nephrology Nursing

All expert nurses in this study revealed a positive attitude towards their nursing work. They enjoyed being skilful and this led them to exercise their skills more frequently. Each “exercise” ensured further refinement and proceduralisation of the skill, and thereby, (potentially) leading to further acquisition of expertise. By having a motivation for and enjoyment of nephrology nursing, expert nurses were able to develop an obligation and commitment to people with renal failure. For one expert nurse “attitude [was] a big thing [and] if you’ve got a bad attitude you can’t be an expert really, cause you haven’t got that insight” (Sandra, 1st interview).

A major component of this positive attitude was related to how expert nurses enjoyed the work they were doing; it gave them a lot of job satisfaction.

You’ve got to enjoy what you’re doing, enjoy your job, enjoy dealing with the types of patients you’ve got, and good peers, professional peers, who you can observe, and you can ask for help, guidance and I think we’ve got quite some good peers (Sam, 3rd interview).

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Expert nurses recognised that there were several people who assisted in their acquisition of expertise and provided them with the motivation to stay within nephrology nursing. These nurses valued the input of other experts and utilised their abilities in order to develop their own.

Picking peoples brains over the years, knowledge being given to me by people, who had more experience than myself, who had a lot more knowledge than I did. Doing a specialty renal course has given me a lot of knowledge and you know the doctors you, get good doctors that will impart knowledge...and help you understand why they do something or why they're not going to do something and that's all a way of learning (Fran, 2nd interview).

Having an Obligation and Commitment

In order for expert nurses to PRODUCE THE MAGNUM OPUS, they needed to be committed and focused on providing the best nursing care for nephrology patients. In order to achieve quality nursing care, expert nurses have developed an internal obligation or commitment towards the patient with whom they come in contact. In this example, Prue, an expert nurse, recognises that she has an obligation to ensure that the patient's calcium level is being monitored following his parathyroidectomy. The renal physician had instructed all nurses not to take any more blood tests; Prue, however, knew from past experience that the calcium level could become abnormally high or low which, in either situation, would have serious consequences for the patient.
It's just like the idea of somebody's calcium getting away from you. You've got to understand that you cannot leave somebody for that long and not check their calcium regardless of what order you've been given because you're seeing that patient three times a week, the doctors see them once a month. If they've overlooked the fact that they really should do a blood test in that time when they're not seeing them, it's up to you to think about stuff, now you won't unless you're prepared to understand and think (Prue, 2nd interview).

Having an obligation to patients was frequently expressed in the responsibility expert nurses felt for patients, even when the patients were at home, when they should have been responsible for their own self-care. Expert nurses demonstrated this obligation by blurring the boundaries between work and home (see below, p. 251) and wanting to be there for the patients.

It's part of the responsibility I've got because of the job I've got. 'Cause I believe that these people have got to live with their disease. Really they don't want to do their living in hospital, they should be doing their living at home...so I think it's part of what [I] take on... (Prue, 3rd interview).

Having an obligation also extended to other nurses in the renal unit, as the expert nurse felt responsible for making it easier for other nurses at work. This obligation was commonly seen when an expert nurse “protected” less experienced nurses from being in a situation in which they could not cope. A typical example was not allowing non-expert nurses to cannulate new or difficult fistulae. The expert nurse would tell them which patients they could cannulate and, as their experience with cannulation increased, they would allow them to tackle increasingly more difficult fistulae.
Because initially with [Patient’s name] her fistula’s brand new, very, very soft Ok and nowhere else to go [cannulate], so I guess it’s better to have the person whose been here the longest, most experienced because if there is a problem she’s gonna have to go to a vas cath[eter] (Mary, 1st interview).

Having an obligation to less experienced nurses was linked to how expert nurses were able to make care easier for others. The expert nurse felt responsible for managing the overall unit workload so that all nurses would have the time to provide quality nursing care for patients.

Judy's relatively new, its only her second dialysis [shift], so you can't expect her to be really quick and there's a couple of machines she's not really familiar with, so you want to get a certain amount of the work done to take the pressure off someone like her, so there's not so many for her to do...That [cannulation] was probably really the only one I really had to do in there, but it's more because we're short staffed, the rest of the staff were getting a little bit jack of the constant sort of go all the time, so you just try to take the pressure off a little bit by taking on some of the workload yourself ...(Prue, 1st interview).

Blurring the Boundaries

Expert nurses were frequently noted to blur the boundaries of normal nursing practice. In this study nursing boundaries are defined by rules which, either formally or informally, govern practice. Formal boundaries are set down by legislation such as the Nurse’s Registration Act, Poisons and Therapeutic Goods Act (Staunton & Whyburn, 1997). For instance, nurses are not authorised (i.e., formal practice boundary) to prescribe medications; they administer, monitor and titrate under formal protocols.
Informal boundaries, by contrast, tend to restrict nursing practice because of convention or tradition. Informal boundaries would, for instance, separate nurses who were allowed to cannulate fistulae from those who were not. In the previous chapter, both non-expert and experienced non-expert nurses stayed within the boundaries of nursing practice. Expert nurses, however, occasionally chose to circumvent or ignore these boundaries when it was in the best interests of patients to do so. Formal boundaries have been conceptualised as not wearing gloves, and nursing and medicine; informal boundaries as administration and clinical roles and work and home roles.

**Not Wearing Gloves**

During observation periods it was noticed that all expert nurses, (but only in very specific situations), would not wear gloves required by Health Department regulations to protect themselves from being exposed to potentially contaminated body fluids. This was in obvious contrast to non-expert and experienced non-expert nurses who would (correctly) wear them on all such occasions. Expert nurses created their own boundaries.

> I suppose you do develop that experience and you do know how things are done and I suppose you know how far, if you want to...you can push an issue without crossing a line would probably be the best way to describe it (Fran, 2nd interview).

Expert nurses were both observed and reported that they would not wear gloves when cannulating new fistulae, which are soft and easy to damage, or when cannulating an extremely difficult fistula or vein. People with renal failure require frequent blood tests or, if they are receiving haemodialysis treatment, numerous cannulations for dialysis. A
typical patient on haemodialysis, for example, would receive four needle sticks for each
dialysis; one injection of local anaesthetic and one cannulation for the “arterial” site
which are then repeated for the “venous” site. Haemodialysis treatments typically take
place three times per week, 52 weeks of the year, for life. This amounts to 624 needle-
sticks just for haemodialysis and does not include any additional procedures such as
blood tests, intravenous cannulation, and so forth. Expert nurses rationalised that by not
wearing gloves when cannulating a difficult fistula or vein they can feel the vein more
easily and, hence, cannulate successfully; then the patient will have fewer needle sticks,
resulting in less pain and less damage to the blood vessel.

*I don’t always wear gloves I must admit that’s...because they’ve got such
lousy veins, you’ve got to use your fingertips...so if you can feel where
you’re going you put gloves on but then you could lose your blood vessel
in that time...I don’t like too many needles...and I don’t think it’s fair for
the patients to have numerous needle sticks. You’ve got more chance of
cannulating successfully so you only have one needle stick rather than
fiddle your way round and giving this poor person a couple of needle
sticks...and I wouldn’t like it if it was me and I thought if I don’t like it, I
can’t go round stabbing Mr or Mrs Smith twenty times. I think it’s wrong
(Agatha, 1st interview).

Expert nurses argued that they know the infectious status of all patients whom they are
cannulating as the patients are tested for Hepatitis B (HBV), Hepatitis C (HCV) and
Human Immunodeficiency Virus (HIV) on a regular basis (i.e., when commencing renal
replacement therapy and thereafter annually). Even when the patient is known to be
HBV, HCV or HIV positive, expert nurses still would not wear gloves for new or
difficult fistulae, although they took steps to protect themselves.
You have a better feel without gloves. I had a difficult cannulation this morning and I took the glove off it was my feeling hand and kept the glove on that was my doing hand. The gloves just mask the finer feeling that you have in your fingers and you’ve got to be able to feel things and certainly with a new fistula, I would never wear gloves with a new fistula as long as I knew the [HBV, HCV or HIV] status of the patient...If [the patient was positive] I’d hope for the best, that it was an easy cannulation, and if it wasn’t, I would again keep one glove on and take one glove off (Sandra, 2nd interview).

**Nursing and Medicine**

In this study, expert nurses frequently failed to observe the formal boundaries of nursing practice and moved, again in very specific situations, into the traditional domains of medical practice. In New South Wales, at the time of this study, nurses were not routinely allowed to order diagnostic tests or to prescribe most medications; a doctor’s signature was required to authorise these. Expert nurses were the only nurses in this study who ordered diagnostic tests such as blood tests or x-rays or who prescribed and dispensed medications. In addition, although nurses were legally allowed to initiate a limited range of medications that were “over the counter” (OTC) preparations such as Paracetamol, in this study, expert nurses told patients when to start or stop taking non-OTC medications (i.e., they prescribed) and very occasionally, dispensed non-OTC medications. Prescribing and dispensing medications are legally restricted to medical practitioners, dentists and veterinarians. Pharmacists dispense but do not prescribe medications. When prescribing or dispensing medications, therefore, the expert nurse has clearly exceeded the boundaries of nursing practice.

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Although expert nurses "prescribed" medications, they did so only for medications that needed to be adjusted frequently. In the following interview excerpt, Prue identifies some of the categories of medications which expert nurses typically tend to prescribe.

_Oh things like [tell the patient to] omit your antihypertensives before dialysis. I mean it's charted, so I tell them not to take it. I guess that's manipulating [prescribing] medication. It would be more neglectful not to than to do. I mean you tell the physician what you're doing; he may just say fine go ahead, probably. If you see somebody's phosphate is lower than normal than you tell them to stop the phosphate binders and you notice someone's iron studies have overshoot the mark I just put 'cease' across the chart because you know you're not going to see the physician, you know the next person it going to come around and give it because it's charted so I write cease [prescribing] (Prue, 3rd interview).

Other medications prescribed by these expert nurses included Erythropoietin, Sodium Bicarbonate and diuretics (see glossary). Renal physicians routinely prescribe these medications to treat the symptoms of renal failure. Unusual medications, analgesics or drugs prescribed to patients for non-renal related reasons were given as prescribed and not adjusted by any nurse, including experts.

Expert nurses blurred the boundaries between nursing and medicine in these instances to protect the patient's safety and well-being and, indeed, their survival. Prior to needing renal replacement therapy, the patient's health is managed by medications and dietary and fluid restrictions. People with renal failure suffer with severe hypertension which often requires large doses of several different types of antihypertensive medications (see also excerpt on p. 228). When a patient commences dialysis, their
blood pressure generally becomes easier to control and they normally require fewer medications. Expert nurses are also aware that haemodialysis, in particular, will lower a person's blood pressure, and will have a significant and possibly life-threatening hypoxic impact on major organs (e.g., myocardial or cerebral events). Expert nurses, therefore, take pre-emptive action to avoid this complication and this frequently requires them to operate outside of normal nursing boundaries by stopping some antihypertensive agents once the patient begins dialysis. Other complications can arise if a patient’s calcium and phosphate levels are abnormal, so the expert nurse manipulates “phosphate binders;” similarly the nurse intervenes in anaemia and hyperkalaemia which are common features of renal failure (see glossary, under electrolyte imbalances).

_I give out [dispense] resonium [medication], uncharted, sometimes not even with a phone call [to a doctor]. [I do this] because to let [a patient] go without the resonium is no more negligent than to give it to them, so I'm on a Friday afternoon when I've suspected someone's got access recirculation and I think maybe the potassium's up and the result comes through at five o'clock that their potassium's up and there's no physicians around and nobody to ask, I give them 15 grams of resonium for Saturday and Sunday and take that decision... [And if the patient has gone home] I'd either go by their place if it's not too far away or I'd ring them up and say come back in_ (Prue, 3rd interview).

Another dimension of _blurring the boundaries_ was that expert nurses were able to suggest medical treatment. Suggesting treatment was directly related to their knowledge and experience of the renal replacement therapies they were providing. Expert nurses suggested treatment to less experienced doctors; in the following excerpt
an expert nurse has suggested treatment for peritonitis, and the doctor was convinced by
the expert nurse to prescribe the correct antibiotic so that it could be obtained from the
pharmacy department.

[Junior doctors] *just follow our instructions. It's like peritonitis, I mean
I know patients who come in with peritonitis and we've got the doctor
down to write them up for something and he said 'how do you know
they've got peritonitis' and I say 'I know they've got peritonitis, they've
got signs and symptoms and they've got cloudy effluent' and they said
'but how do you know they've got peritonitis (laughs) have you got a
culture?' And a lot of the time we're initiating that treatment or we just
getting a doctor who would just do basically what we tell them to do and
they just write down whatever we ask* (Sam, 2nd interview).

Length of time on haemodialysis, dialyser clearance rates for urea, creatinine and other
substances, and adequate blood flow rate are the most important determinants of the
amount of dialysis a patient requires. These factors are taken into consideration when
prescribing a dialysis treatment and can be adjusted to achieve the desired results
(Baltz-Salai, 1998). Nephrology professionals use the term “adequacy” to indicate the
effect of renal replacement therapy to overcome uraemic symptoms and as a predictor
of morbidity and mortality (Burrows-Hudson, 1995). It is accepted routine practice, in
most haemodialysis units in New South Wales, for all experienced nurses to “prescribe”
the haemodialysis parameters for chronic, long-term patients except in occasional
instances. In some situations experienced nurses may also determine the haemodialysis
“prescription” for acutely ill patients (e.g., who are in intensive care). All nephrology
nurses have a crucial role in ensuring that haemodialysis patients received an
“adequate” haemodialysis treatment.
In addition to this routine practice of “prescribing” the dialysis treatment, expert nurses, during this study, also blurred the boundaries by disagreeing with doctors when they prescribed the haemodialysis treatment. Expert nurses knew better, at times, than even consultant renal physicians that a particular treatment (i.e., haemodialysis prescription) was not suitable for a patient. Expert nurses were also assertive; they would speak up if they disagreed with a patient’s treatment. For instance, Prue disagreed with a renal physician’s decision to reduce a patient’s haemodialysis treatment hours from four and half hours each dialysis session to 4 hours, thereby reducing the dialysis adequacy to potentially unacceptable levels. Prue argues, quite correctly, that it is far easier to under dialyse patients rather than over dialyse them (see for example Baltz-Salai, 1998; Burrows-Hudson, 1995).

You can’t to that degree, you cannot over dialyse but it is incredibly easy to under dialyse, so if you’re going on the minimum for the lowest acceptable adequacy, it means they’ve got one problem they’re under but it’s much better to have a safety margin and I can tell you now there are very few patients who need less than 4 hours three times a week. Now he is on 41/2 three times a week, he’s got no residual renal function, he’s quite a big man, with quite a lot of risk factors, why in God’s name would you reduce the time...I shall ask the physician why [he’s] done it and if [he] can give me a better reason than I’ve got for keeping him at 41/2 hours three times a week, than I’ll go along with it but I cannot see a reason to reduce the hours (Prue, 1st interview).

Recognition of expertise and being trusted by doctors afforded a wider scope of practice for expert nurse in comparison to other nurses. This meant that expert nurses knew they could extend their scope of practice or blur the boundaries of nursing safely as the renal physicians “really don’t want to be rung every five minutes about [for example]
phosphate binders and [the physicians] just need to be told at [the patient’s next] clinic visit that the adjustments that have been made” (Prue, 2nd interview). This “permission” to extend their scope of practice, for one expert nurse, meant that she could “prescribe” treatment even when the physician was absent from the renal unit.

*Cause the renal physician’s in Melbourne and he pretty much lets [me]. I mean if you know why, she’s a recent parathyroidectomy [and her calcium was very high] and you know they do need to juggle their medications and as long as you’ve got a rationale for doing what you do you can’t really do any harm and what I do is usually ring him when he comes back and say this is what I’ve done. If he doesn’t like it he says but I mean she obviously doesn’t need much binders so we back off the Caltrate [phosphate binder] and also reduce the calcitriol [used to elevate calcium levels] and just to get it down a bit and just changed her dialysate [to a lower calcium level] just for today* (Prue, 2nd interview).

Having specialised knowledge makes it easier for expert nurses to “go to the doctors and say look, you know if their not coming to see the patient for another hour and [the expert nurse has] got a patient that [they are] concerned about, [she] can go [to the doctor] and say this is yesterday’s [result] and this is today’s [and that] we need to do something and most of the doctors will listen to what [the expert nurse has] got to say” (Fran, 1st interview) and act upon their advice.

To summarise, being recognised as having expertise in nephrology nursing was a major component of being able to **produce the magnum opus**. Recognition allowed expert nurses to extend their scope of practice and practice in a manner that was entirely focused on the patient without being constrained by normal nursing boundaries. Other
aspects of blurring the boundaries are discussed in the following paragraphs relating to 
administration and clinical roles and work and home roles.

Administration and Clinical Roles

Many expert nurses in this study had administrative or management responsibilities as 
part of their role. Several of the expert nurses, in addition to clinical responsibilities, 
were required to undertake administrative tasks such as rostering, interviewing new staff 
members, maintaining quality management statistics and even examining tender 
applications for unit equipment (e.g., dialysers, cannulae). The role of the expert 
nephrology nurse required them to perform in a wider capacity than non-expert nurses 
and, for some, this was reflected in their business plan. Norma, for instance described 
her management, education and clinical responsibilities.

Well, my business plan probably has, as much in the management, 
education and clinical sections of it - they all seem to be a couple of 
pages long, each of them. Research is only a page, so I think a lot of my 
role is management and a lot of it is education, as well as the clinical, so 
to me they're not separate (Norma, 2nd interview).

The boundaries between their various responsibilities became blurred as experts 
attempted to accommodate this range of roles; however, the clinical or the day-to-day 
hands on nursing practice always took precedence.

It's much easier to have this excuse of not enough time where it comes to 
paperwork than where it does to clinical work, you can make that excuse 
with paper...I'm very good at clinical planning, etc and not so good at 
things where I have to sit down [and write]. I think I'm a physically 
active person and I'm not good at sitting down and I think that comes

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from years and years of just doing, so I'm not really a good manager in terms of sitting down management (Prue, 3rd interview).

**Work and Home Roles**

Expert nurses, like all nurses, needed to combine the responsibilities of work with home life. For expert nurses there was an added dimension; they were often the nurses called at home to work extra shifts when there was a shortage of nurses. For some expert nurses this could be problematic; they knew they were only called in when patients required highly specialised nursing care (e.g., such as immediately following a kidney transplant) but that, at times, their responsibilities at home needed to take precedence.

*If I could get my children looked after yes, so that's my biggest thing that's what prevents me from coming in a lot of times when I am called is the fact its getting children looked after. That is a problem* (Fran, 2nd interview).

Juggling work and home responsibilities, however, was not always problematic. Several expert nurses whose home environments were more flexible allowed them to **blur the boundaries** between normal working hours and out of hours work that was unpaid and unrecognised by hospital management. For instance, several expert nurses in the renal unit revealed that, when needed, they would go to a patient’s home either before or after work or at weekends to provide assistance. Typically this was for patients who had been trained to manage either peritoneal dialysis or haemodialysis in their home.
When they go home initially the crisis that they have is maybe not being able to get a cannula in and then I negotiate with them a time where I can finish my work here and go to their place after I’ve finished here so whether its at 3 o’clock in the afternoon or whether its at 5 o’clock in the afternoon, I would go to their place until such time that they would feel confident to put cannulae in. I did that with a couple of patients just lately, I was going there every dialysis [even over the weekend] to help (Sandra, 1st interview).

Even when the patients are at home, expert nurses were still thinking about them and feeling responsible for them. Expert nurses would even “leave a party” to ensure the patient was well. Sam describes how far she would travel from home, unpaid, to assist patients. “if it was someone within a reasonable distance [from my home] and I’ve got [the supplies they need], I do sometimes have things at home and they’re in the car, I’d go [to their home]” (Sam, 2nd interview).

The reason an expert nurse would go to a patient’s home, out of normal working hours was:

When I go home I’m still basically responsible for the patients at home, so if they ring me for anything, anything, anytime of the day or night, I’ll be there. If it’s a cannula problem, if it’s really, really late at night and I feel it might be better to leave it till tomorrow, well then, I’ll do that, but certainly if it’s within a reasonable time, I’ll go and help them. I mean that’s part of being a [nephrology nurse] that’s what you’re there for (Sandra, 1st interview).
The category *blurring the boundaries* clearly reflected one way in which the expert nephrology nurse produced the magnum opus and was an explicit demonstration of how expert nurses actualised an obligation towards patients not seen in other nurses. The main reason expert nurses blurred the boundaries of normal nursing practice was to try to ensure patients’ well-being. Expert nurses deliberately practiced nursing (cf. played) in a manner that was solely focused on providing optimal health-care to patients and, to do this, they adjusted the boundaries (or composed variations on the theme of their practice) appropriately. By blurring the boundaries, expert nursing practice truly reflected patient-centred care.

Managing the Unit’s Workload

Managing the unit’s workload was the last dimension of the characteristic exercising advanced nephrology nursing skills. Expert nurses had better time-management skills which included not only being able to prioritise their own workload but also the workload of other nurses and, occasionally, doctors. Expert nurses were observed to be more efficient by comparison to other nurses (for example, see backwards and forwards, backwards and forwards, p. 178). Managing the unit’s workload with greater efficiency ensured that expert nurses were able to deliver quality patient-focused nephrology nursing care. When asked, Fran provided the following explanation of why she was able to manage the unit’s workload.

*I think it [makes it easier], probably because you understand a little bit better, you know what’s going on, and I suppose like anything over a period of time you get to know the routines of the doctors and the way they like things done and that all helps too, to help you organise and structure your day* (Fran, 2nd interview).

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Firstly, expert nurses managed the unit’s workload for patients. The way that they performed nursing interventions was quick, efficient and with minimal distress to the patient. Expert nurses would assist patients to learn how to manage their disease by getting them involved in their health care. Patients’ treatment plans were organised by expert nurses so that the patient could be discharged from hospital sooner or so that the patient could manage their own treatment at home much easier.

In this example, Norma was explaining to a patient that he had endocarditis (infection on the heart valves) and that he would require long-term antibiotic treatment. The patient did not want to be in hospital for that length of time; Norma explained, therefore, how she could make it easier for the patient to self-administer his antibiotics into his peritoneal dialysis bag at home.

Norma speaks to the patient about his temperature and the need for antibiotics. She says he will need them for a bit longer this time. She explains that ‘bugs grew in the blood culture’. She explains to the patient the reason for antibiotics and that he will need them for six weeks. She explains that the patient could do the antibiotics himself in his night-time peritoneal dialysis bag, as it will be easier for him to manage it once per day (Norma, 1st observation).

Secondly, expert nurses made it easier for other nurses to manage their workload. This was achieved through organising the workload, ensuring that there were an adequate number of nurses on duty, supervising and teaching less experienced nursing staff and taking on some of the workload to lessen the burden on other nurses.

Thirdly, the expert nurse also devised and incorporated techniques into her nursing care to deal with the workload. In particular, the expert nurse made it easier to cannulate

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difficult veins or fistulae by not wearing gloves. One reason for not wearing gloves was that it made it easier for them to successfully cannulate in a shorter, less stressful period of time, and with the additional benefit of reducing the number of needle-sticks inflicted on the patient (see Agatha, p. 243). This is turn ensured that the workload could be achieved efficiently.

Managing the unit’s workload was the earliest cluster of codes identified in this study and expert nurses, throughout the study, frequently used the word “easier” to describe their actions. Managing the unit’s workload emerged from several sub-categories; that is, the expert nurse made care easier for the patient, other nurses and themselves by avoiding problems and taking pre-emptive action, and through being skilfully flexible.

**Avoiding Problems/Taking Pre-emptive Action**

Expert nurses were more focused on preventing problems than having to deal with problems at a later stage. Overall, expert nurses took pre-emptive rather than reactive action. Expert nurses, because of their expertise in cannulation, could avoid long-term complications for patients who had very difficult fistulae to cannulate. One technique was to create “buttonholes” which are permanent fibrous sites in a patient’s arm where cannulae are threaded.

Mary slowly inserts the venous cannula. She explains to the patient that she is trying to make ‘buttonholes’ as cannulation sites on her fistula so that it will be easier for the dialysis nurses to cannulate her and it will also be less painful for her (Mary, 1st observation).
In another situation, Prue describes how she ensures that fistula or access problems are dealt with promptly as these could lead to potentially serious and/or life-threatening complications (e.g., hyperkalaemia).

*I guess it's just to make sure people get treated in a way that you avoid as many problems as possible, anticipate them early and try to do something about them and follow things up so that you can plan treatment. If you know somebody's having fistula or access problems then you make sure they've been seen by the right people, when something's going to be done about it, things like knowing how much of a problem they've got, therefore whether they should be on resnonium so they don't end up with hyperkalaemia, things like that.* (Prue, 3\textsuperscript{rd} interview).

At other times an expert nurse needed to take action without a medical order to avoid problems. This aspect of managing the unit's workload by taking pre-emptive actions provided a link with another category (i.e., blurring the boundaries) as expert nurses ignored the formal boundary between nursing and medical responsibilities by prescribing medications. In particular, expert nurses would take pre-emptive action with medications to avoid complications and inform the doctor afterwards.

*Well if we were really concerned with a patient's blood pressure then we would actually ring say Dr [name] up and say you know they're on such and such and, we would suggest what we could do or if say they're on EPO [erythropoietin] as well and if we took someone's full blood count and [the haemoglobin] was high then we would ring the patient and tell them not to take further EPO and then consult the doctor and [tell them] this is what we've done.* (Sam, 2\textsuperscript{nd} interview).

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**Being Skilfully Flexible**

*Being skilfully flexible,* in this study, was defined as those strategies expert nurses implemented in their practice to save time or effort without compromising patient care and safety. This sub-category demonstrated how these nurses were able to manage the workload. *Being skilfully flexible* ensured that patients received appropriate and timely nursing interventions. Expert nurses did not need to follow the “rules” or typical ways of performing procedures slavishly because they had developed their own. Unlike non-expert nurses, who needed to complete every single step and in order when performing certain task, expert nurses adjusted these steps, selecting those to follow and in what sequence. These nurses could respond quickly, efficiently and flexibly to patients’ needs, thus making care easier for the patient, and being better able to manage the workload.

This sub-category captured how quickly and skilfully expert nurses could perform nursing care. Expert nurses knew the routine of the unit extremely well and, because they had proceduralised much of the knowledge associated with task performance, their practice was much faster and required less effort than the practice of other nurses. This, in turn, made it easier for them to provide nursing care.

*I think the more experience you get the more confidence you develop and as you get more confidence you tend to be, whether you should or not is another story, but you do tend to deviate from what is set down as being policy and protocol, to a point that is not going to endanger the patient or is not going to cause problems, but you look at rationalising things, I suppose is the way to describe it. You rationalise what you do, you look at the way you do things. I suppose you think laterally, you haven’t got*
tunnel vision and I suppose [non-expert nurses] use this check, check, check, follow everything to the letter as a security blanket and I think as you get more experience you don't need, you do need a security blanket but it becomes a much broader thing, you know where to go if there's a problem, you know who to contact if there's a problem, you don't sort of need to follow every single little step that's been set down (Fran, 2nd interview).

Expert nurses, in addition, recognised that flexibility was a requirement in their practice and, because they did not need to follow the rules rigidly, their nursing practice was characterised by a powerful patient focus. In the following excerpt, Kim was observed to have altered the normal routine (as outlined in the hospital procedure manual) associated with performing a peritoneal dialysis bag exchange and, when questioned during the subsequent interview about why she did this, she explained that it was important to adapt the routine and to be flexible for this patient.

You have to adapt to how the patients [are going to] perform that exchange at home safely and, yes, you have to be flexible and you can't be too rigid in your exchange procedure you have to adapt it from patient to patient, and so [patient’s name] it took a while to work out, because being in a wheelchair having to use his hands to get back and forth, [and] his bathroom's a fair way from where he's actually doing the exchange, so what I ended up doing [describes the revised procedure]... so it's just being flexible (Kim, 1st interview).

Other evidence which demonstrated that expert nurses were being skilfully flexible was the way they treated all patients as individuals rather than as a collection of people receiving the same nursing care. For instance, Agatha describes how she would look at each patient individually and, even though there was the (unwritten) rule that a patient
should not take off more than three (3) litres during each haemodialysis treatment, she knew that "some patients can tolerate a little bit more" (Agatha, 2nd interview). Agatha went on to describe how she would assess each patient individually, check his or her fluid status and what he or she could tolerate (i.e., knowing the patient and their response to fluid removal) and then “prescribe” the necessary dialyser. Similarly, Fran would:

...look at the patients as individuals and if a patient doesn't need to have blood [tests] done, you don't ask them to come in until maybe 10 o'clock in the morning, if they're only coming in for a dressing or antibiotics or something like that, and that's got to make it easier for the patient...(Fran, 2nd interview).

Practicing with speed and minimal effort, expert nurses demonstrated the ability to be flexible, and this, in turn, enabled them to manage the unit's workload. All of the sub-categories of managing the unit's workload were directed towards providing optimal patient-focused nursing care and expert nurses did this by the way they practiced (cf. played) their nursing.

**Being Patient-Focused**

The fourth and final characteristic of expert nephrology nursing practice was being patient-focused. Expert nurses’ centre of attention, by comparison with other nurses in this study, was consistently on the patient as the recipient of nursing activities. Patients, according to expert nurses, were the raison d'être of a renal unit. In order to be patient-focused, to consider their well-being, comfort and safety, expert nurses also believed that they needed to pay attention to other staff, particularly nursing staff, in order that

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they too could provide quality nursing care. *Being patient-focused* for expert nurses also included regarding the needs of the unit as a whole, as well as considering the needs for individual patients (cf. CONDUCTOR who takes into account the musicians, the score and the harmonious participation of the entire orchestra).

*I mean basically it all centres around the patient, without the patient you've got no unit, no staff, no anything, so yes, it is I mean, central to your nursing has to be the patient and everything you do for in terms of planning and staffing and managing, everything basically in the end comes back to patient centred practice and some things are less direct than others, I mean you do things for your staff but in the end you do things for your staff to keep them happy, educated and whatever so they're still there to look after the patients* ([Prue], 3rd interview).

Expert nurses did not need to devote considerable cognitive attention to performing tasks, and this allowed them to focus on patients. Their practice was solely directed towards providing quality nursing care to people with renal dysfunction. *Being patient-focused* consisted of three dimensions. These were *being there, keeping a close eye on,* and *protecting the patient.*

**Being There**

*Being there* was a strategy employed by expert nurses which demonstrated just how focused they were on patients and the unit:

*I suppose my example has to be of some use somewhere along the line in that I work hard and I try to work so that things are better for the patients and I'd rather make them good for the staff as well...I don't know but I suppose there's strengths in being reliable and being there*
which are awfully important for both staff and patients (Prue, 3rd interview).

Expert nurses also see themselves as being there for patients over protracted periods of time. In contrast to either non-expert or experienced non-expert nurses, expert nurses viewed continuity of care over a much longer period (i.e., years rather than months or weeks); for some nurses, they could provide nursing care for the same patient for many years.

*With these patients I think it is because they are chronic patients and they are part of our unit for however long they live in the area or live themselves and I think we have a responsibility for their care right throughout that time* (Fran, 2nd interview).

Continuity of care can be provided for “some of the patients [because] I’ve known them for 25 years and you’re still caring for them” (Sandra, 2nd interview). People with end stage renal failure require renal replacement therapy for the remainder of their lives, that is, they require long-term treatment, and this is typically either haemo or peritoneal dialysis. While a person is receiving dialysis therapy, they need on-going medical and nursing care. One expert nurse described it as pointless to put a person on dialysis and then forget about them “…so the care doesn’t stop when the patient goes home, the care must continue for the long term, years” (Fran, 2nd interview).

**Keeping A Close Eye On**

Non-expert nurses revealed during interviews that they needed to concentrate on performing the task rather than on the patient’s response to that task. Expert nurses, by

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comparison, described their practice as *keeping a close eye on* the patient as a strategy for preventing problems during dialysis treatment sessions. For instance, Theresa, an expert nurse, described how she monitored a patient’s response to an altered dialysis prescription.

*I tend to do turn the [dialysate] temperature down and the [dialysate] sodium up a little bit and just keep an eye on them...so they don’t drop their blood pressure while I’m taking fluid off* (Theresa, 1st interview).

**Protecting the Patient**

With patients as the central focus of expert nurses’ practice, these participants initiated several strategies to protect vulnerable patients from receiving nursing care from inexperienced nurses. All nurses in the haemodialysis units in the study repeatedly identified particular patients who they were, or were not, permitted to cannulate. Similarly, in the transplant unit, inexperienced nurses were not permitted to provide immediate post-renal transplant nursing care (i.e., for the first 24 hours) without direct supervision from a more experienced nurse. In both situations, expert nurses allocated inexperienced nurses to patients who were “at the appropriate level” for their clinical abilities. This, clearly, was a strategy used to protect patients to ensure that they received the best available nursing care.

**Chapter Summary**

This chapter provided evidence for the third and final stage of the acquisition and exercise of nephrology nursing expertise. This stage was conceptualised as PRODUCING THE MAGNUM OPUS. The magnum opus can only be performed when nephrology nurses...
have incorporated three interconnected roles into their practice. The first role was that of expert clinician; expert nurses had the best practical, hands-on abilities in the unit. In this respect, their role is similar to that of first violinist, who is considered the most experienced and proficient violinist in an orchestra. The second role was that of nursing leader; expert nurses guide and direct other members of the health care team. In this respect, the expert nurse was similar to an orchestral conductor who ensures that all members of the orchestra are able to perform at their best possible level and in harmony with each other. Finally, the third role of expert nephrology nurses was to mandate and model the standards of nursing practice expected in the renal unit. In this respect, the expert nurse’s role was similar to that of a composer of a major work (i.e., magnum opus).

Producing the magnum opus was a function of four characteristics which described how the expert nurse practices. These characteristics were *extensive nephrology nursing knowledge, vast experience, exercising advanced nephrology nursing skills, and being patient-focused*. Expert nurses possessed extensive domain-specific knowledge which they used effectively to guide and support their practice. They were able to draw on a widely diverse range of knowledge sources by comparison with other nurses and, of significance, knowledge was also gained from *knowing the patient*. Expert nurses were able to utilise their extensive knowledge to provide *precise rationales for their practice*. Having *vast experience* in nephrology nursing was another characteristic of expert nurses. Experience afforded these nurses the ability to *know what to do and when to act*. Having more experience also provided expert nurses with a positive feedback loop in which experience increased confidence in the practice of nephrology nursing; as they

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developed more confidence, the more advanced nursing they undertook (and were allowed to undertake). Eventually, as experience in dealing with multiple patients and situations increased, expert nurses come across relatively few situations which they had not experienced previously. That is, for these nurses, not a lot was new to them.

**Exercising advanced nephrology nursing skills**, the third characteristic, was a function of: firstly, the recognition of expertise by patients, other nurses and medical staff; secondly, having motivation for and enjoyment of nephrology nursing; and thirdly, having an obligation and commitment. Expert nurses were the only nurses in this study who consistently demonstrated these features which enable them to blur the boundaries of nursing and optimally manage the workload in the renal unit.

The final characteristic revealed the difference focus of attention of expert nephrology nurses by comparison to other nurses in this study. Expert nurses were patient-focused in their practice. They regarded that being there and keeping a close eye on were important strategies within their practice to protect patients and to provide quality nursing care.

In summary, Chapter Five described the substantive theory of the acquisition and exercise of nephrology nursing expertise. Chapters Six and Seven revealed the characteristics of and differences between non-expert, experienced non-expert and expert nephrology nurses. The last chapter in this thesis, Chapter Eight, will discuss the findings of this study in the context of current literature and will explicate the implications of these findings for nursing practice, theory, research and education.

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CHAPTER EIGHT

Discussion, Recommendations and Conclusion

Introduction
The purpose of this study was to discover the process of expertise acquisition and exercise in nephrology nursing. Specifically, using grounded theory, the study sought to develop a substantive theory which explained expertise acquisition and how nurses practice. Producing the Magnum Opus: The Acquisition and Exercise of Nephrology Nursing Expertise was a three stage process through which expert nephrology nurses progressed. The first stage was the non-expert stage where the nurses were Learning to Play in the Orchestra. This was followed by the experienced non-expert stage because the nurses were Playing Better, and Learning to Conduct and Compose Music. The expert stage was the third and final stage in this process. These nurses were Producing the Magnum Opus. The theory also identified four common characteristics of nurses at each stage: knowledge, experience, skill and focus.

This chapter will examine the findings of this study in light of the current skills acquisition literature, comparing the findings to the theories presented in Chapter Two. This will be followed by a discussion of the study’s findings with respect to the four characteristics in the context of current literature relating to nursing and nursing expertise. The utility of using metaphors in qualitative research will also be reviewed. Lastly, the chapter will identify the limitations of the present study, explicate the implications of the findings and make recommendations for nursing practice, education and research.
Skills Acquisition

This thesis has defined and used the term "skill" in its broadest sense. A skill is more than a sequence of actions; it also requires the organisation and integration of knowledge, understanding and judgement. In addition, repeated practice, strategic and tactical learning, and feedback aid in improving the performance of a skill (Anderson, 1995). Skilful (i.e., expert) performance in different domains, although expressed behaviourally in a variety of ways, is acquired in remarkably similar styles across domains (Glaser & Chi, 1988; Ericsson & Smith, 1991). Three models of skills acquisition have been posited in the literature (see chapter two, pp. 43-54). The first model, developed by Fitts and Posner (1967), suggests that skills acquisition occurs in three progressive phases, namely, cognitive, associative and autonomous phases. The second model suggests that there are five different levels of skilled performance (i.e., novice, advanced beginner, competent, proficient and expert) which reveal the characteristics of individuals as they progress through each level (Dreyfus & Dreyfus, 1986). The third model explains a four-stage development of knowledge structures (memory networks) which can be activated by certain clinical situations (Schmidt et al., 1990).

These models, either explicitly or implicitly, suggest common characteristics of skilful (i.e., expert) performers. Experts have highly specialised domain-specific knowledge and skills, that is, they have vast amounts of domain-specific propositional knowledge which they have proceduralised; they have developed extensive memory structures such as pattern-recognition capabilities; and, they have spent extensive periods of time developing/exercising domain-specific skills. Experts have also become faster and
more fluid at the performance of those skills, and have engaged in deliberate and
effortful practice to improve their performance in their chosen domain.

**Relationship to Nephrology Nursing**

Experts, in this study, typified these same characteristics; nephrology nursing expertise
was acquired through access to both propositional and procedural knowledge,
opportunities to practice and proceduralise that knowledge and to obtain feedback. Data
analysis revealed a three-staged process of nephrology nursing expertise (i.e., skills)
acquisition. These stages were described as the non-expert, experienced non-expert and
expert stages. In addition, data analysis discovered four characteristics which
simultaneously influenced the level at which the nurse practiced and demonstrated the
process of expertise acquisition. These characteristics were *knowledge, experience, skill*
and *focus*. Many of the findings are similar to those of previous studies; however, the
findings add to nursing’s existing body of knowledge regarding the acquisition of
expertise in several respects. Some of these findings have not been reported previously,
whereas others make explicit what previous studies left implicit. These will be
highlighted below, at the appropriate juncture in the discussion.

**Non-Expert Nephrology Nurses**

During the first stage of expertise acquisition, nephrology nurses were conceptualised as
LEARNING TO PLAY IN THE ORCHESTRA, that is, non-expert nurses had a limited
understanding of and ability to practice in this specialised area of nursing. They were
consistently *being told what to do* by more experienced nurses and their practice was
not fluent or efficient; they went *backwards and forwards, backwards and forwards*
when trying to complete activities. Non-expert nurses revealed sketchy rationales for practice and they felt incompetent while working on the renal unit. They were also strictly task-focused. In summary, non-expert nephrology nurses' revealed superficial domain-specific knowledge, limited experience in this area of nursing, they needed to acquire basic specialist skills and had a narrow focus of practice.

Non-expert nursing practice was consistent with the descriptions of individuals who are in the cognitive phase of skills acquisition (Fitts & Posner, 1967). These nurses had not had previous opportunities to acquire either domain-specific propositional knowledge or to proceduralise that knowledge. They relied on nursing knowledge and experience which they had acquired from elsewhere (e.g., undergraduate preparation, working on other wards) to apply in the context of nephrology nursing. Non-expert nurses were being told what to do by other nurses and deliberately sought out more experienced nurses to confirm that what they were doing was correct. This is also consistent with the novice stage of the Dreyfus model and the Schmidt et al. model (Benner, 1984; Dreyfus & Dreyfus, 1986; Schmidt et al., 1990).

Benner (1984), for instance, describes novice nurses as using context-free rules to guide action, the action being extremely limited and inflexible. During the present study, it was apparent that non-expert nephrology nurses consistently followed the rules (i.e., played within the boundaries) because they had been taught that it was safer to do so and because they lacked sufficient domain-specific knowledge to deviate from them. Non-expert nurses demonstrated this, for example, by (correctly) wearing gloves to prevent exposure to potentially contaminated body fluids.

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Experienced Non-Expert Nephrology Nurses

The second stage of the acquisition and exercise of nephrology nursing expertise was described conceptually as PLAYING BETTER, LEARNING TO CONDUCT AND COMPOSE MUSIC. Experienced non-expert nurses were characterised by their sufficient nephrology nursing knowledge, adequate experience, ability to exercise routine nephrology nursing skills and a changing focus of practice. In particular, they had repeatedly practiced most of the routine skills and this had made it easier for them to perform those skills. They also recognised that much of their routine care could be performed automatically.

The experienced non-expert nursing stage was consistent with components of all three models. Clearly, experienced non-expert nurses had learned, integrated and practiced individual skills described in both the associative and autonomous phases of the Fitts and Posner’s (1967) skills acquisition model. Similarly, and related to this, experienced non-expert nursing practice demonstrated that repeated performance (exercise) of a skill expedites its proceduralisation (e.g., fistulae cannulation). Greater knowledge and experience also freed up cognitive structures to enable experienced non-expert nurses to take on additional responsibilities (e.g., leadership tasks) and to focus their attention away from the performance of individual tasks.

Experienced non-expert nephrology nurses had clearly developed sufficient scripts and schemata to enable them to cope with routine nursing situations. This is consistent with the third stage of the Schmidt et al. model (1990) where physicians had acquired more illness scripts by having more experience with particular diseases. Lastly, experienced non-expert nursing practice was also consistent with the competent stage identified by
Benner (1984) and Dreyfus and Dreyfus (1986, 1996) where the nurse was capable of seeing beyond the immediate task to its broader situational context. In addition, findings from the second stage provide evidence that both additional formal learning through postgraduate (i.e., post-registration) courses and continued exposure to the practice of nephrology nursing assists in the process of expertise acquisition. Data revealed that formal postgraduate nephrology nursing education furnished participants with additional domain-specific propositional knowledge (both facts and values) and continued exposure to clinical renal nursing provided them with opportunities to proceduralise it.

**Expert Nephrology Nurses**

The third and final stage of the acquisition and exercise of nephrology nursing expertise was conceptualised as **producing the magnum opus**. Expert nurses were characterised by *extensive nephrology nursing knowledge, vast experience, ability to exercise advanced nephrology nursing skills and being patient-focused.*

Consistent with the Fitts and Posner (1967) model of skills acquisition, expert nephrology nurses could practice at an autonomous, automatic level; their *vast experience* had provided many more opportunities to proceduralise their knowledge. This knowledge allowed them access to subtle cues or signs which were not apparent to other nurses, and enabled them to access and further elaborate appropriate scripts and/or schemata. This is also consistent with the fourth stage of the Schmidt et al. (1990) model of medical expertise. By having *extensive domain-specific knowledge*, expert nurses knew what to do, why, where, when, how, and to whom. In addition, expert...
nephrology nursing practice was also consistent with Benner's (1984) expert stage of skills acquisition. These nurses tended not to come across completely new situations, issues or events; most clinical situations or aspects of situations have been experienced previously (i.e., *not a lot [was] new*).

The present study's third and expert stage adds to nursing's knowledge of expert performance in two respects. Firstly, in order to practice at an advanced or expert level (i.e., exercise their advanced skills), expert nephrology nurses had to be recognised by others as having expertise. Doctors, in particular, designated some nurses as experts and privileged them accordingly. No other skills acquisition model (i.e., Fitts & Posner, 1967; Dreyfus & Dreyfus, 1986; Schmidt et al., 1990) has suggested either explicitly or implicitly that *recognition of expertise* and the extension which it grants to an individual's scope of practice or level of performance is necessary for the exercise of expertise. Secondly, *blurring the boundaries* was a significant feature of expert nephrology nursing practice and, again, this was not recognised in any of the above models. Nurses in the present study frequently *blurred the boundaries* in the best interests of patient care. (*Blurring the boundaries* has been reported in other studies of nursing expertise; this study's findings, however, provide more precise detail on which boundaries are blurred, when and to what purpose. These are discussed fully below, p. 286).

**The Role of Knowledge**

The role of knowledge in this study was interesting in two respects, namely, the importance of domain-specific knowledge and the role of intuitive knowledge.

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Although the concept of knowledge is complex, for the purposes of this study knowledge was defined as an understanding of the facts, values and procedures, that is, propositional and procedural knowledge, related to the context and practice of nephrology nursing. This knowledge informed the nurses about what to do, why, when, with whom, how and the likely consequences of their actions.

Findings of the present study are consistent with existing literature of domain specific (nephrology nursing) knowledge. The nature of expert knowledge is such that it is very specific to the domain in which the expert practices, that is, it is context- or content-specific (Norman, Tugwell, Feightner, Muzzin & Jacoby, 1985; Edwards, 1998) and that having both domain knowledge and relevant experience is essential for any expert (Naylor, 1987). Domain knowledge, according to existing literature, informs practice and practice, in turn, shapes knowledge.

Domain-specific knowledge (with concurrent experience) was clearly necessary for the acquisition and exercise of nephrology nursing expertise. The data revealed differences in practice between expert nurses and non-expert nurses with respect to the presence and degree of specialised knowledge. Numerous examples of the differences between nephrology nursing practices as a result of the level of domain-specific knowledge of these nurses were identified during the study. For instance, new practice developments such as single siting, a cannulation technique, revealed the differences between the three stages of expertise acquisition and exercise. Non-experts had limited knowledge of single siting; experienced non-experts could explain why it was being done and who was most likely to need it; expert nurses chose the patients who needed single siting and
established the sites. Nonetheless, nephrology nursing knowledge in isolation was not sufficient to develop expertise.

The findings of this study also add to the discourse on the nature of intuitive knowledge as a characteristic of expert nephrology nursing practice. When asked during interviews, which immediately followed an episode of observation, expert nurses identified that most of the routine aspects of nephrology nursing were practiced with little conscious thought or effort (i.e., knowing what to do and when to act). Clearly, these nurses had progressively proceduralised a large amount of domain-specific knowledge into action schemata or scripts which are, by nature, relatively unarticulatable. This finding concurs with criticisms within the nursing literature (see for example, Cash, 1995; English, 1993; Paley, 1996) that intuition, as an important characteristic of expert practice, is ill understood.

**Multiple Sources of Knowledge**

In the present study the use of *multiple sources of knowledge* by expert nurses was consistent with existing literature. Expert nephrology nurses used knowledge gained from a wide variety of sources in comparison to other nurses. It has already been noted that their extensive domain-specific knowledge had developed from formal (i.e., postgraduate nephrology nursing course), augmented by informal and experiential learning. They also utilised other sources of knowledge more frequently and in greater depth than other nurses; these sources included doctors, other nurses, other health care workers and patients. It was particularly evident in the way in which expert nurses

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interacted with patients that they gained important clinically relevant knowledge from patients.

Other nurse researchers have noted the use of multiple sources of knowledge by expert nurses. For instance, Pyles and Stern (1983) suggest that a matrix or nursing gestalt is operating in the decision making of expert nurses whereby they link together nursing knowledge, past clinical experiences, identifying cues presented by patients, and sensory clues (e.g., observation and assessment). Similarly, Conway (1996) agrees that expert nurses have the ability to integrate multiple sources of knowledge which she termed “simultaneous complex reasoning” (p. 58). In addition, four distinct types of expert nurse practitioners, who draw on different types of knowledge, also emerged from Conway’s (1996; 1998) study. Technologists use a wide range of knowledge including anticipatory, diagnostic, technical (“know-how”) and monitoring knowledge. Traditionalists are concerned with getting the work done, managing care in an environment of scarce resources, and relying on more medical knowledge than any of the other experts. Specialists use knowledge of assessment, diagnosis, quality of life and transformative ability to extend their role by prescribing treatments and medications. They define their expertise in terms of a specific field of practice and/or techniques associated with nursing care. Humanist existentialists, the fourth type, viewed patients holistically, were passionate about nursing practice and were able to use a combination of theoretical knowledge, values, and experience to inform their practice.

In the present study, expert nephrology nurses function, according to Conway’s (1996, 1998) typology, as a combination of all four types. Expert nephrology nurses were
simultaneously technologists, traditionalists, specialists and existentialists. During this study, these nurses utilised a wide range of knowledge which incorporated significant diagnostic, technical and monitoring knowledge. Their practice was supported by a large component of medical knowledge which, at times, was more highly specialised than that of some medical staff. Expert nephrology nurses were clearly specialists who practiced in a discrete specialty area of nursing and were unquestionably involved in assessing, diagnosing and prescribing nursing and medical health care to people with renal failure. Lastly, the expert nurses in this study were also unmistakably humanist existentialists; they were unmistakably patient-focused and needed to practice with optimal flexibility for any given task situation. This clearly required them to use a combination of “knowledges” to inform their practice.

**Knowing the Patient**

The importance of knowing the patient as a concept has emerged from various nursing studies conducted in different nurse/patient settings (Evans, 1996; Henderson, 1997; Jenny & Logan, 1992, 1994; Luker, Austin, Caress & Hallett, 2000; Radwin, 1995; Tanner, Benner, Chesla & Gordon, 1993). In these studies, getting to know the patient emerged as an essential antecedent for clinical decision-making and the provision of good quality nursing care.

Knowing the patient was central to the practice of expert nephrology nurses; it was used as a strategy by them to access, elaborate and apply domain-specific knowledge. In many instances, expert nurses had provided nursing interventions to the same patients for long periods of time, even over two decades. This allowed them to know the

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patients' responses to particular situations such as the ability to cope with ultrafiltration of fluid during dialysis treatment. It also helped them to interpret subtle cues or recognise problems patients were experiencing. Expert nurses used the knowledge gained in this way when planning and prescribing individual dialysis treatment sessions for patients, and to intervene early to manage problems. They also used patient-specific knowledge to explain to less experienced nurses what to do for patients.

The findings from this study are consistent with both the general nursing literature and, in particular, the nursing expertise literature with respect to knowing the patient. Previous general nursing literature has suggested that knowledge about a patient and their experiences, behaviours, feelings and or perceptions of a situation, problem or issue assists nurses to interpret concerns or anticipate needs (Luker, Austin, Caress & Hallett, 2000). Knowing the patient, according to Radwin (1996), provides a unique contribution to the delivery of quality patient care as it ensures patients are treated as individuals. In terms of the nursing expertise literature, knowing the patient is considered characteristic of expert nursing practice (Jenny & Logan, 1992; Manley & Garbett, 2000; Radwin, 1995; Tanner, Benner, Chesla & Gordon, 1993; Tofias, 1989). According to Benner, Tanner and Chesla (1992), having an understanding of what the patient needs is what claims expert nurses' attention. Expert nurses have the ability to assess a patient's condition by recognising a patient's state or an impending crisis without the patient explicitly reporting her or his symptoms or needs (Morse, Miles, Clark & Doberneck, 1994). Knowing the patient, therefore, enhances the nurse's ability to recognise subtle cues and to respond much earlier to problems (Borbasi, 1999).
In addition, the nursing literature suggests that the nurse learns from experience patients’ common issues and expectations (Tanner, Benner, Chesla & Gordon, 1993), and of the antecedents and consequences of specific patient situations (Radwin, 1995). This enables the construction of generalisable knowledge about patients with similar problems (Jenny & Logan, 1992; MacLeod, 1993). Knowing the patient may facilitate astute assessment of, recognition of or evaluation of specific patient problems which in turn may enhance the development of expertise in some nurses (Radwin, 1996).

Finally, the present study found that knowing the patient had the additional benefit by increasing work satisfaction. Expert nephrology nurses enjoyed what they were doing, they were motivated and they had a commitment to patients and other nurses. This finding was also consistent with the existing literature which suggests that knowing the patient develops from continuity of contact and a sense of closeness between the nurse and the patient (Radwin, 1996). Forming a positive working relationship with patients has also been linked to nurses deriving more satisfaction from work (Luker, Austin, Caress & Hallett, 2000).

The Role of Experience

The present study’s findings expanded the understanding of the differences with respect to experience seen in nurses. Data analysis revealed that the level at which nephrology nurses’ practice was influenced by the number, frequency and type of encounter they had with a person with a renal disorder and its associated treatment but that the time spent in nephrology nursing was not sufficient in isolation from other factors to guarantee expert practice. Although experience in the participant selection criteria was

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related to the amount of time spent in nephrology nursing, this study confirmed that having greater than five years experience in nephrology nursing was not the sole determinant in the development of expertise. Finally, this study found that the increased level of experience of expert nephrology nurses led to greater confidence in providing nursing care to people with renal failure requiring complex interventions.

*Experience* is a term widely used in nursing but its use has several meanings. Watson (1991) suggests that *experience* in the nursing literature has been used in four ways to reflect: 1) exposure to a particular event or situation, 2) time spent in nursing, 3) the amount of knowledge gained and 4) an event, situation or emotion which affects an individual. *Experience* is not the number of years of practice but, rather, the application of learning from previous practice encounters (Fairweather & Gardner, 2000; Radwin, 1995). *Experience* has also been used in previous nursing studies as an objective measure (e.g., time spent in nursing) or subjectively as "knowledge gained" (Radwin, 1998). Benner (1984) has described nursing experience as being "greater than the mere passage of time or longevity, rather it is the refinement of preconceived notions and theory through encounters with many actual practical situations that add nuances or shades of difference to [knowledge]" (p. 36). In addition, Radwin (1998) expanded the understanding of nursing *experience* from the number of years in practice to include knowledge which is conferred by experience and the application of this knowledge in subsequent similar or related situations. Nursing *experience*, which has been determined by the number of years as a nurse, however, does not necessarily equate with being knowledgeable if what is practiced is out of date.

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To date, confidence as a characteristic of expert practice has been suggested in only a limited number of studies; for instance, social worker expertise (Fook, Ryan & Hawkins, 1997), cardiology (Radwin, 1998) and accident and emergency nursing (Edwards, 1998). Similarly, Conway (1996, p. 53) found that expert nurses have confidence in their own abilities and that confidence develops over time. By having increased confidence, expert nurses are more likely to focus on the patient rather than on equipment (Radwin, 1998) and are more likely to question medical staff decision making (Edwards, 1998).

In the present study, expert nurses’ greater experience gave them confidence in knowing what to do, when, where, to whom and why. Having confidence afforded expert nurses a greater freedom in their scope of practice; confidence in what and why they were doing things enabled expert nurses to blur the boundaries of nursing practice.

In addition, the vast experience of expert nurses in this study gave them knowledge about what to expect so that not a lot was new; they had experienced most events, issues or situation previously. For experienced non-expert nurses, a longer experience in nephrology nursing made the routines of practice easier (i.e., routines are easier). This was primarily due to the same tasks being repeatedly performed on the same patients. As exposure to and experience with patients with renal failure increased, both expert and experienced non-expert nurses found it easier to know what to do. This is consistent with other literature of expertise development. For instance, Ericsson, Krampe and Tesch-Romer (1993) suggest that deliberate practice involving repetition and feedback has provided compelling evidence that the level of expertise is a direct

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function of the amount of effortful practice at an activity undertaken by an individual. In various domains such as chess (Charness, Krampe & Mayr, 1996), music (Sloboda, 1996) and sport (Starkes, Deakin, Allard, Hodges & Hayes, 1996; Thomas & Thomas, 1999) it has been found that deliberate and repeated practice have influenced the development of expertise. Repeated practice, however, as an important component of expert nursing practice, has only been implicitly identified in the past (e.g., Benner, 1984).

Non-expert nurses, in contrast, had limited [nephrology nursing] experience. This led them to be disorganised and inefficient. They expended more energy as they went backwards and forwards, backwards and forwards between tasks and felt incompetent in the way they practiced. These features of non-expert practice have not been explicitly identified in previous literature, although Benner, Tanner and Chesla (1996) describe advanced beginner nurses as anxious and concerned about their level of competence when dealing with complex situations. Finally, this study demonstrated that inexperience always resulted in non-expert nephrology nurses staying (i.e., playing) within the boundaries governing nephrology nursing practice. This was consistent with Benner’s (1984) description of novice nurses who depend heavily on rules and procedures.

Recognition of Inexperience

Another finding of this study which has not been noted explicitly in the literature was that of others recognising inexperience in non-expert nurses. Other nephrology nurses, particularly expert nurses, recognised that non-expert nurses did not have enough
experience to be able to perform certain procedures skilfully enough. This situation resulted in non-expert nurses not being allowed to cannulate the fistulae of particular patients. Analysis of the findings of this study revealed that by recognising inexperience in other nurses in respect of fistula cannulation, expert nurses protected each individual’s fistula from harm and possible irreversible damage. They effectively acted as gatekeepers for patients’ well being by designating which fistulae each nurse could cannulate.

The Role of Skills

The present study has extended the discipline’s understanding of skilfulness by revealing that skills are a more generalised ability or expertness which comes from, or was learned, from practice and experience. This definition diverges from existing literature in which skills tend to be narrowly defined as the performance of tasks. To date, the nursing literature is replete with studies of novice-expert differences in the performance of particular nursing skills such as pressure sore treatment (Lamond & Farnell, 1998), pain assessment and administration of analgesia (Hamers, van den Hout, Halfens, Abu-Saad & Heijltjes, 1997; Noyes, 1995) and why an infant is crying (Holden & Klinger, 1988). Nephrology nursing, however, takes place in situations of uncertainty and is more complex than the ability to perform individual tasks. Expert nurses, in particular, exercised advanced levels of flexible skilfulness which allowed them to deal with a range of clinical/management situations simultaneously.
Recognition of Expertise

The goal of the present study was to gain an understanding of the acquisition and exercise of nephrology nursing expertise; given this, recognition of expertise was a significant finding. In order to practice as an expert, a nurse must be first recognised as one. During this study, nursing peers were able to identify who, in their opinion, were expert nephrology nurses. Initially peer recognition occurred during the participant selection criteria (see Chapter 4, p. 106). Nurses were also in the best position to judge others' practice because they frequently witnessed it in action or had to manage the consequences of that practice. In addition, peer designation of expertise was explicitly gauged during the study. All nurses were asked during an interview who they believed was the most expert nurse within the entire unit. There was consistency in their answers; two nurses were identified as possessing significant nephrology nursing expertise. Finally, less experienced nurses recognised some nurses as having expertise by seeking their guidance, advice or assistance with managing patient issues or problems. In particular, it was observed on several occasions that less experienced nurses recognised other nurses as expert cannulators, and would approach these nurses for assistance when they had difficulties in cannulating a patient's fistula.

While there is a wealth of evidence to suggest that knowledge and experience are important requisites in the development of expertise, there is very little literature which suggests that in order to practice as experts, that is, exercise their advanced nursing skills, nurses must be recognised by others as having expertise. Jasper (1994), however, in her analysis of the concept of nursing expertise, suggests that there is a need to "prove" a nurse is an expert. Recognition of expertise should be undertaken by people.

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who are qualified to do so, that is by peers, or by other experts in similar or related fields (Jasper, 1994).

To date, recognition of expertise has been used explicitly in sampling to identify (potential) nursing experts by nursing peers in some studies (see e.g., Benner & Tanner, 1987; Jenny & Logan, 1994; McClement & Degner, 1995). Recognition of expertise by others is, however, implied in several studies of expert nursing practice (Benner, Tanner & Chesla, 1996; Conway, 1996; Walker, 1996).

This is the first study to identify explicitly that doctors recognised some nurses as experts. This was evident in the way these nurses interacted with all levels of medical staff, in particular, registrars and consultant renal physicians. According to expert nurses, they were recognised as having expertise and their judgements, therefore, were respected and trusted by doctors; as a consequence some doctors trusted them to extend their scope of practice.

**Being Trusted**

Trust is an integral component of nursing practice which applies primarily to patient-related and work-related trust (Johns, 1996). Trust, according to Delbridge et al. (1991) is a quality or attribute of a person who can be relied on for their integrity, confidence or authority. Trust is spontaneously accorded to individuals who are known to be competent, respected, trustworthy, reliable, effective communicators and negotiators (Johns, 1996; Lynn-McHale & Deatrick, 2000). Respect and trust between nurses and
doctors have been identified as necessary antecedents to collaborative health care practices (Henneman, 1995), and as a requirement for expert practice (Ball, 1999).

This study, while concurring with previous literature, has extended the concept of being trusted in two respects. Firstly, the findings suggest that nephrology nurses gain the trust of their nursing peers, medical staff and patients when their performance was recognised as expert. Secondly, by being trusted, expert nephrology nurses were given permission to move beyond traditional nursing boundaries and extend their scope of practice.

To date, there has been limited research which identifies trust as a factor in expert nursing practice; only two previous studies were found to do so. The first, by Conway (1996), suggested that medical staff trusted some nurses’ advice or input providing that the doctor knew them, their level of knowledge and experience and abilities. The second, by Snelgrove and Hughes (2000), suggested that when doctors recognise nurses as being experienced, they tended to trust the judgement and decision-making of these nurses.

Similarly, the concept of trust has not been extensively examined from a nurse-patient perspective (Morse, 1991; Johns, 1996), although trust is an important factor in successful nurse-patient interactions (Bricher, 1999; Simpson, 1997; Thorne & Robinson, 1988) and patient compliance (Semmes, 1991). Trust between nurses and patients does not happen instantly, it evolves over time (Lynn-Mchale & Deatrick, 2000). Being trusted by patients would seem particularly important for nurses who

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engage in providing potentially life-threatening procedures (Jenny & Logan, 1994) and for patients who are care recipients (Reynolds & Scott, 2000; Wellard, 1992).

**Role Models**

Although the literature provides a variety of definitions surrounding the meaning and function of nursing preceptors, nursing mentors and role models (e.g., Andrews & Wallis, 1999; Madison, Watson & Knight, 1994), Kinley (1995) suggests that it is more important to examine the performance of the preceptor, mentor or role model. In the context of the present study of nephrology nursing expertise, the term “role model” was chosen to describe those functions of clinical practice which combined direct and indirect teaching (e.g., demonstration, supervision, guidance, and so on). This is consistent with Peutz’s (1985) continuum where role modelling commences as preceptorship and develops into mentorship.

This study’s findings are consistent with other literature concerning role models. Researchers have found that expert nurses are frequently seen as role models by less experienced nurses (Pyles & Stern, 1983; Edwards, 1998; Johnson, Cohen & Hull, 1994); they act as teachers, advisors, counsellors and sponsors to develop skill and professional commitment during the professional socialisation of less experienced nurses (Coulon, Mok, Krause & Anderson, 1996; Davies, 1993; Madison, Watson & Knight, 1994; Pyles & Stern, 1983). The expert nurse as role model assists less experienced nurses to acquire specialty knowledge, professional values and confidence, as well as assessment, decision-making, problem-solving and technical skills (Ecklund, 1998).

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Nursing Boundaries

The concept of blurring the boundaries of traditional nursing practice constructed in this study not only supports aspects of earlier studies of expert nursing practice but has expanded it in a number of ways. Firstly, the study revealed that only expert nephrology nurses blurred the boundaries of professional nursing practice whereas non-expert and experienced non-expert nurses stayed within these boundaries. Secondly, nursing boundaries were conceptualised into two categories as distinct from one. These were formal boundaries which are determined by legislation governing nursing practice, and informal boundaries which by convention or tradition limit nursing practice. Thirdly, experts blur the boundaries between nursing and medicine, administrative and clinical responsibilities and, between work and home. Fourthly, the study showed that expert nurses only ever blurred both these formal and informal boundaries to improve the quality of care patients’ received.

Previous nursing literature suggests that professional boundaries are lines which are drawn to help define nursing or limit its sphere of activity (Leurquin-Hallett, 1999; St John, 1998) and to help nurses make sense of the world of nursing by separating it from those of other health care professions (Walsh, 2000). In Australia, individual state and federal bodies such as the Australian Nursing Council and state-based Nursing Boards regulate the boundaries or scope of nursing practice. In addition, a code of professional conduct, registered nurse competency standards and a code of ethics exist to articulate the professional domains and responsibilities of Australian nursing practice. These professional bodies, organisations and documents have provided a broad definition of nursing in an attempt to stabilise the boundaries of nursing practice (Lillibridge, Axford

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& Rowley, 2000). However, as indicated above, experts in this study blurred the boundaries of professional nursing practice in three distinct aspects.

**Nursing and Medicine**

The findings of this study concur with current literature with respect to the evidence that not all nurses will extend their boundaries of practice into other discipline areas. Non-expert and experienced non-expert nephrology nurses, during this study, stayed [played] within the boundaries of expected nursing practice; they administered medications only when medications had been legally prescribed and they also wore gloves at appropriate times. Expert nurses, by contrast, blurred the boundaries between nursing and medical practice.

To date, the literature suggests that some nurses will maintain their practice within a traditional or “comfort zone” expected of nurses, other nurses recognise an overlap between disciplines or a “grey zone” and yet others will deliberately “step over the line” into the domain of another discipline (Benner, 1984; Lillibridge et al., 2000; Perry, 1997). The findings of this study are therefore consistent with those previous studies; however, this study is the first to identify explicitly which nurses blur boundaries and which do not.

The study is also consistent with existing literature with respect to nurses prescribing medications. The practice of prescribing and dispensing medications by expert nephrology nurses was limited to those drugs specifically used to treat the symptoms of renal failure such as electrolyte imbalances, anaemia and hypertension, and it

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predominantly involved a reduction or cessation of a drug. Only infrequently did nurses increase or add another drug.

Hospital protocols authorising this practice did not exist, but expert nephrology nurses clearly had both the knowledge and experience to know that patients would suffer adverse effects or events if they did not act promptly. From this study, it is apparent that in some situations it would seem appropriate for expert nurses to be able to prescribe from a limited "specialty-specific" nurses’ formulary. Provisions for this type of formulary have been made in the Poisons and Therapeutic Goods Act (Parliament of NSW, 1998a) following the introduction of the Nurse Practitioner legislation in New South Wales (Parliament of NSW, 1998b; Reid, 2001). A limited nephrology nurses’ formulary would give legitimacy to existing practice rather than expanding it; it would also reduce the dilemmas of practicing at an expert level in a renal unit (Wellard, 1992).

To date, existing literature has identified the increasingly complex nature of acute hospital care which has already seen overlap between the clinical work of nurses and doctors (Autar, 1996; Lillibridge et al., 2000) particularly in some specialist areas (Allen, 1997; Davis, 1992; Dowling, Barrett & West, 1995; Doyle, 1998; King, Lancaster, Pierce & Norman, 1996; Snelgrove & Hughes, 2000; Tye, 1997; Tye & Ross, 2000). The role of nephrology nurses has followed this pattern; nephrology nurses have extended their practice boundaries in response to increases in patient numbers and advances in technology (Bevan, 1998; Corea, 1998; Keogh, 1995; Schardin, 1995). The scope of practice for nephrology nurses includes providing direct patient care, education, coordination, administration, consultation and research.
(Schardin, 1995). The opinions of expert nephrology nurses are highly sought after by other health care professionals and by equipment manufacturers especially in the practical use and development of dialysis machines (Bevan, 1998).

In addition, several recent studies of expert nursing practice have found that expert nurses do not regard traditional roles and responsibilities as a barrier to practice; they circumvent hospital policies, medical orders and regularly cross boundaries during their practice (Allen, 1997; Benner, 1984; Conway, 1996, 1998; Hanneman, 1996; Hutchinson, 1990; McCann, 1999; McElroy, 1996; Tye & Ross, 2000). This is consistent with a definition of advanced or expert nursing practice proposed by the United Kingdom Central Council for Nursing, Midwifery and Health Visiting [UKCC]. The UKCC states that:

*Advanced practice is concerned with adjusting the boundaries for the development of future practice, pioneering and developing new roles responsive to changing needs and with advancing clinical practice, research and education to enrich professional [nursing] practice as a whole* (UKCC, 1994, p. 3).

During this study, expert nephrology nurses exceeded, on a limited basis and at appropriate times, the formal boundaries of nursing practice by prescribing (medical domain) and dispensing (pharmacy domain). This finding concurs with those of Conway (1996) and Hutchinson (1990). Conway found that nurses in a medical ward would adjust the boundaries of practice by administering some medications to patients without first obtaining a medical prescription. Hutchinson described such behaviour as “responsible subversion” because these nurses had “judged what rules to bend, and when and how to do it” (p. 7).
Nurses have long been involved indirectly in the prescription of drugs. It has not been uncommon for junior doctors to be guided by experienced nurses in prescribing drugs (McCartney, Tyre, Brazier & Prayle, 1999). This is especially true in specialised areas of health care. In New South Wales, where this study took place, the Poisons and Therapeutic Goods Act governs the prescription, supply, possession and administration of all drugs (Parliament of New South Wales, 1996). Nurses are not authorised to prescribe medications; they administer, monitor and titrate. Hospital organisations, however, within the guidelines of the Act, may develop local policies and procedures in which nurses are authorised to implement specific drug protocols for specific situations such as Anginine (for chest pain), Heparin (for haemodialysis), and so forth. These prescriptions (and subsequent administration) are sanctioned by hospital policies and do not constitute blurring the boundaries of practice (Lillibridge et al., 2000).

There is a fear that allowing nurses to perform delegated, medically technical tasks such as diagnosing and prescribing will result in the loss of a nursing focus and the continued dominance of a biomedical model of health care (Jones & Gough, 1997; MacAlister & Chiam, 1995; Robinson, 1993; Tye, 1997). Expert nephrology nurses argued that the goal of undertaking these tasks was that it was incorporated within a holistic framework of their practice (e.g., as a component of each pre-dialysis assessment) rather than as another task to be incorporated into an already over-onerous workload. It could also be argued that nurse prescribing can be seen as threat to medical power in health care (McCartney et al., 1999). However, expert nurse participants in the present study believed that individual nephrologists were supportive of nurses altering medications
when a trusting relationship already existed, when only a limited range of medications was involved and when nurses informed them as soon as possible of any changes.

**Gloves**

It is interesting to note that, in this study, all expert nurses, without exception, admitted that they did not wear gloves when performing certain procedures, even when such procedures could expose them to serious, life-threatening blood borne diseases. Expert nurses in the study were observed on several occasions *not wearing gloves* when cannulating vascular accesses or puncturing veins, these procedures clearly involve direct access to the bloodstream using sharp instruments. All of these nurses, however, justified their decisions. Firstly, they reasoned that cannulation and venepuncture are less dangerous than other procedures because essentially it is a non-touch technique where the nurse's hands/fingers are not directly touching any body fluid. Secondly, they argued that they had developed precise psychomotor skills and perfected the non-touch technique through extensive experience. Thirdly, expert nurses justified not wearing gloves because they knew the Hepatitis B (HBV) and Hepatitis C (HCV) and Human Immunodeficiency Virus (HIV) status of patients.

People receiving renal replacement therapies have a compromised immune system and co-morbidities which make them more susceptible to infectious diseases such as HBV, HCV and HIV (Parker, Dickenson, Wiseman, Alexander & Peacock, 1998). In addition, until recently when synthetic erythropoietin was introduced to maintain haemoglobin levels, people with chronic and end-stage renal failure relied on blood transfusions to control the symptoms of chronic anaemia. Prior to testing for HBV and,
more recently, HIV and HCV, people with renal failure contracted these viruses in significant numbers from infected blood products (Favero, Alter & Bland, 1996).

It is worth noting that in the late 1960s two epidemics of HBV infection occurred in British renal units with fatal results for patients and staff (Gabriel, 1985; Knight et al., 1970; Polakoff, Cossart & Tillett, 1972). This resulted in over 30 HBV infections in dialysis nurses with at least six of these nurses in Manchester and Edinburgh dying as a direct result of contracting HBV from infected patients (Anonymous, 1972; Hawe, Goldsmith & Jones, 1971). HCV and HIV have also been reported in dialysis nurses (Petrosillo, Puro, Jagger & Ippolito, 1995). Many of these infections have been as a result of a needle stick injury.

Since the late 1960s, dialysis units around the world have instituted stringent procedures for preventing and managing HBV infections and, subsequently, HCV and HIV. These procedures include routinely testing all patients for hepatitis B surface antigen (HbsAg), HCV and HIV, dialyzing HbsAg-positive and HIV-positive patients in separate areas or rooms in the dialysis unit, using dedicated dialysis machines and the use of strictly applied universal precautions (Favero et al., 1996). All dialysis patients in the renal unit involved in this study are tested for HBV, HCV and HIV on entry into the program and, thereafter, annually.

In 1983, when a vaccine against HBV became available, all people receiving dialysis treatment were routinely vaccinated; it also became mandatory for nursing staff to be vaccinated when working in a renal unit. At this point, there is no vaccination against

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HCV or HIV. While the risks of acquiring these infections have been greatly reduced for dialysis-dependent patients following the screening of blood products and the availability of synthetic erythropoietin, blood-borne viruses may still be transmitted from infected patients to other patients and staff through surface contamination, needle stick injury, contact with infected blood or from body fluids (e.g., peritoneal dialysis effluent). Nurses working in dialysis units, as a consequence, remain at a high risk of contracting these diseases and must be diligent in their application of infection control practices (Parker et al., 1998). Wearing of gloves and other protective clothing (gowns, aprons) and facial protection (masks, goggles) when performing procedures, such as cannulation of fistulae, and connection/disconnection of patient to the dialysis circuit, which are likely to result in the nurse coming into contact with body fluid, are considered mandatory practice (May, 2000; McCulloch, 1998).

*Not wearing gloves* during high risk procedures has not been reported elsewhere in the nursing or medical literature, although Kim et al. (1999) found that “double gloving,” a technique highly recommended during trauma resuscitations, was underused by emergency department staff members. Nursing staff in the dialysis unit, it could be argued, are more likely to know the infectious status of their patients than nursing staff in other areas such as the emergency department (Kim, et al., 1999).

**Clinical and Administration**

The present study sample consisted of registered nurses, Clinical Nurse Specialists (CNSs), Clinical Nurse Consultants (CNCs) and nurse managers who also had clinical duties. Nurses were not classified as expert because of the position they held, rather
because they met the comprehensive criteria described earlier (see Chapter 4, p. 106). It is interesting to note, however, that following data analysis, the expert nursing data was generated from CNSs, CNCs, nurse managers and one registered nurse who had decided, for personal reasons, not to apply for reclassification as a CNS. No experienced non-expert and non-expert nurse had been appointed into these senior clinical positions. Briefly, a CNS is a registered nurse with 12 months experience and a post basic [post-graduate] qualification, or four years post initial registration experience including three years working in the relevant specialist field (NSW Department of Health, 1987), who has been granted CNS status. A CNC is a registered nurse who has at least five years post registration experience and who has, in addition, an approved post basic qualification in the relevant field in which they are appointed, or such other qualifications or experience which are deemed appropriate (NSW Nurses’ Association, 1990).

Expert nephrology nurses, in this study, were required to fulfil administrative, clinical, teaching and research roles, role weightings being a function of their primary responsibilities, that is, unit administration or clinical practice. The experts who blurred the boundaries most obviously between administrative and clinical responsibilities were those whose primary responsibility was unit administration. Despite this primary responsibility for unit administration, clinical care was invariably given precedence over administration by these experts.

Expert nephrology nurses were profoundly patient-focused; they always found enough time for their clinical role. Administrative tasks were undertaken during quieter
periods, at the end of a long day (e.g., several expert nurses began their shift before 7.00 am and frequently left the unit after 5.00 pm) or, occasionally, were taken home. Administrative tasks, because of their lower priority, were performed hurriedly, at the last minute and occasionally were overdue.

The findings of the present study are consistent with previous literature with respect to the variety of roles undertaken by nurses in senior clinical positions. Australian literature (see, for example, Anderson & Hicks, 1986; Appel, Malcolm & Nahas, 1996; Bull & Hart, 1995; Silver, 1986) as well as international literature (see, for example, Hickey, Ouimette, & Venegoni, 1996; Kai-Cheung Chuk, 1997; Topham, 1987) have identified these roles as direct patient care provider, coordinator of care, role modelling, patient and staff education, consultation, liaison and research. These senior positions are complicated by inadequately delineated role functions, unrealistic expectations and limited recognition of expertise (Bull & Hart, 1995). To date, however, no previous studies have found that unit managers are as “care-focused” as expert nephrology nurses.

Work and Home

There is a considerable literature describing and evaluating nursing care provided to patients in their own homes by community nurses (see, for example, Hibberd, 1998); this is the first study, however, to describe home care provided by hospital-based nurses. Expert nurses, in the present study, undertook nursing work during normal working hours in the renal unit and they also left their homes, when off-duty, to assist patients
who were at home. Expert nurses, therefore, blurred the boundaries between what traditionally constitutes work commitments and home commitments.

When off-duty, expert nurses in this study demonstrated a commitment to patients which has not been previously reported. Clearly this work goes unrecognised and unrewarded by hospital administrators and, possibly, by renal physicians in terms of nursing input and patient outcomes.

To date, there is a paucity of nursing literature and research on the issue of overlapping work and home commitments although the issue of work and parenting/family commitments has been explored elsewhere (see, for example, Bielby & Bielby, 1989; Geurts, Rutte & Peeters, 1999; Greenberger & O’Neil, 1993). In nursing, much of the research has sought to examine why part-time or night duty nurses are less likely to engage in continuing education (Barriball & While, 1996) or what effect adding the role of student to that of practicing registered nurse is likely to have on personal commitments (Dowswell, Hewison & Hinds, 1998).

**Managing the Unit’s Workload**

Expert nurses in this study were able to manage and to influence effectively the provision of nursing care to the extent that were able to prioritise not only their own workload but that of other nurses and, occasionally, that of doctors. Expert nurses also enabled other nurses to cope with their own workloads to ensure that patients received timely and appropriate nursing care.
Expert nephrology nurses worked efficiently and smoothly to provide patient care. Non-expert nursing practice, by contrast, was characterised by unnecessary action and activity. These nurses were frequently observed going backwards and forwards, backwards and forwards while providing nursing care. This resulted in non-expert nurses being unable to manage the workload effectively due to poor time management. When non-expert nurses worked in an environment supported by expert nurses (i.e., an expert nurse was “on duty” and available to assist other nurses) they were able to complete all of the necessary nursing activities, to take meal-breaks and to finish the shift on time.

Managing the unit’s workload as an ability of expert nephrology nurses was a major finding of this study. Although several studies have examined issues of nurses’ workload and time management (see for example, Hendrickson, Daddato & Kovner, 1990; O’Brien-Pallas, 1988), no studies to date have suggested that experts are better able to manage the total workload of a clinical unit.

Avoiding Problems and Taking Pre-emptive Actions

In comparison to non-expert and experienced non-expert nurses who were more focused on getting the job done, expert nephrology nurses were more focused on preventing problems. They took a pre-emptive rather than a reactive approach to care. Managing dialysis access either through permanent vascular access or using a peritoneal dialysis catheter, for example, typically revealed the pre-emptive action of expert nurses.

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The findings from this study are consistent with other research with respect to the way in which expert nurses are able to look ahead, foresee problems and to prioritise tasks more effectively than other nurses (Borbasi, 1999; Minick, 1995). Nurses in highly technical environments are frequently required to make rapid decisions resulting from a change in a patient's status. Minick (1995) describes this as early recognition of problems which has been brought about through caring. Nurses with more experience are able to make connections between their existing knowledge sources and bring these to bear in the care of individual patients. The knowledge of expert nephrology nurses was extensive; it was gained from domain-specific knowledge, knowing the patients, the routine and the equipment. This allowed them to recognise potential problems and to manage them pre-emptively.

**The Role of Focus**

This study has increased understanding of what a nurse, at various stages of expertise acquisition, focuses on when giving nursing care. Specifically, it provided evidence of a nurse's focus of attention and how this changed as the nurse acquired expertise in nephrology nursing. Non-expert nurses were task-focused because they had not yet learnt or developed adequate procedural knowledge to assist them to perform new tasks, or similar tasks in a new environment. Experienced non-expert nurses had proceduralised much of the routine practice required of a nephrology nurse and this had freed up some of their attention for deployment to other, less familiar task situations. This provided them with additional time to think about and plan their actions; typically, their planning focused on making things easier for themselves. Expert nurses, by comparison, were entirely focused on the provision of optimal nursing care to people.
with renal disorders. Their focus of attention was the patient but this did not exclude attention to other nurses. Expert nurses simultaneously devoted attention to the ways other nurses practiced in order to guide and support them to ensure that all nurses in the renal unit provided optimal nursing care.

There is considerable literature which suggests that novice nurses are predominantly task-focused. For instance, Coulon et al. (1996) identified that a characteristic of undergraduate (i.e., pre-registration) nursing students is task-oriented nursing care. Little (2000) also found that nurses with one to three years experience in nursing who were undertaking a critical care course were task-focused, that is, they were not expert nurses, and they all needed to focus on the equipment which they were required to use (Little, 2000). Nurses with less experience in critical care nursing directed their attention to the performance of tasks or on equipment, rather than the patient. This study’s findings on non-expert nephrology nursing practice concur with Little’s study. Non-expert nurses, when specifically asked about their focus of nursing, invariably indicated that completing the tasks and interacting with the dialysis machinery were central to their practice. This is in contrast to expert critical care nurses who seamlessly integrate technology into everyday practice (Cooper, 1993; Walters, 1995). Similarly, Radwin (1998) found that expert cardiology nurses are more likely to focus on the patient in a given situation rather than on equipment, technical factors or tasks.

**Being Patient-Focused**

*Being patient-focused* required the nurse to move beyond a limited concept of individualised care, where the nurse provides choices concerning, for example, hygiene
and wake-up times. Being patient-focused means the nurse strives to provide nursing care and services which are compatible with a patient’s needs, values and beliefs (Ford & McCormack, 2000). The essential elements of patient-focused care, according to Kitson (1999) are essential care, technological care, psychosocial/emotional care, information and education, continuity and coordination.

Although the nursing literature contains evidence of the concept of patient-focused or patient-centred nursing care (see for example Bradshaw, 1996; Ford & McCormack, 2000; Lutz & Bower, 2000), only three previous articles were found which either implicitly or explicitly suggested that expert nurses delivered patient-focused nursing care to individual patients (Benner, 1984; Brown, 1992; Brown & Tiavale, 1996; Edwards, 1998). In addition, Kitwood and Bredin (1992) suggest that patient-focused practice can be achieved if the nurse places at the centre of all decisions/ actions the desire to maintain/improve patient wellbeing. Expert nephrology nurses, in the present study, did exactly that. The concept of being patient-focused meant that expert nurses viewed the person with renal failure as central to their practice in a desire to provide quality, continuing nursing care (see for example work and home boundaries above, p. 295). Non-expert nurses, by comparison, were more focused on getting the job done and completing all necessary tasks.

Being There

The present study elaborates our understanding of the concept being there as an important component in the provision of quality nursing care. Being there was a strategy expert nephrology nurses employed to be patient-focused. By having a reliable

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presence in the renal unit, these nurses believed that, through their expertise, events, issues or situations would be managed so that patients received quality nursing care. *Being there* was also related to the way expert nurses provided support and health care to patients after the nurse’s normal working hours. Many expert nephrology nurses considered the care they provided for patients did not end when they finished their shift. Expert nurses felt responsible for patients not only when the patient was in the renal unit but after they had gone home; these nurses believed it was important to make themselves available to patients, particularly when the patient was performing dialysis at home. *Being there*, in addition, was related to expert nurses’ provision of continuity of care to patients.

The concept of *being there*, as a feature of expert nursing practice, has been previously described (Cohen, Hausner & Johnson, 1994; Gilje, 1992). In a phenomenological study of the patient’s experience of nursing, Wallace and Appleton (1995) found that *being there* was attributed by patients when the nurse had a willingness to connect and become involved with them. Strategies nurses used to demonstrate *being there* were commitment, compassion and competent practice. Wallace and Appleton further suggest that by *being there*, nurses came to know their patients (i.e., *knowing the patient*), respected and valued them as individuals (i.e., treating patients as individuals) in order to assist patients’ to restore or manage their well-being. Bevan (1998), in an analysis of caring in dialysis units, suggests that dialysis nurses identify *being there* as an element of caring. Swanson (1993) had previously suggested that *being there* included not just the physical presence of the nurse but that it also conveyed the message of availability and emotional presence. Swanson described strategies nurses
would use to validate being there such as giving assurances of immediate access to patients and permission to call.

Continuity of Care

The present study describes an alternate construct of continuity of care with respect to recent literature. Nephrology nurses variously construed continuity of care as the short, intermediate and long-term goals or needs of people with renal failure. At best, the present literature suggests that the concept of continuity of care could be described as a process over time which requires coordination and transfer of information between numerous people and across several settings (Sparbel & Anderson, 2000a, b). This concept of continuity of care has developed due to the increase in both patient acuity and chronic illness. In an integrated literature review of research on continuity of care between 1990 and 1995, Sparbel and Anderson (2000a, b) found that continuity of care was not defined consistently in the literature and in many instances was described as discharge planning and case management. Continuity of care is an evolving concept which is not well understood (Sparbel & Anderson, 2000b) but it does involve a range of issues such as effective communication, patient and community factors (Sparbel & Anderson, 2000a).

In this study, nephrology nurses viewed continuity of care differently. Depending on their stage of expertise acquisition, non-expert nurses viewed it as the immediate needs of the patient, spanning a few days. Experienced non-expert nurses considered continuity of care in terms of a few weeks to months. Expert nurses, in contrast, viewed it over many years. Expert nurses had acquired more knowledge and experience in

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nursing people with renal disorders; they recognised that not only that these people required long-term renal replacement therapy (RRT) but also that RRT has long-term consequences. Expert nurses, because they had developed a patient-focused approach to their nursing care, were able to assess for and institute management strategies to reduce the effects of long-term RRT complications. One strategy these nurses used in the provision of continuity of care was to act as a conduit of information between the patient, other nurses, medical staff and other health care workers (e.g., dietitian, social worker) in an attempt to ensure that issues were managed appropriately and in a timely way for the patient. The aim of expert nurses was to ensure that patients could be kept in the best possible health for the longest period of time.

**The Role of Motivation and Enjoyment**

To date, the literature suggests that the term "work excitement" describes the motivation and enjoyment some nurses have for nursing (Simms, Erbrin-Roesemann, Darga & Coeling, 1990). Simms et al. (1990) suggest that some nurses demonstrate personal enthusiasm and commitment for work by seeing the opportunity to learn in everyday situations. The availability of learning experiences, stimulating and motivating work environments, and working with other motivated nurses is important in creating an exciting working environment (Lickman, Simms and Greene, 1993). Similarly, Coulon et al. (1996) showed that nurses who enjoyed doing nursing work tend to provide excellent nursing care.

This study extends the current literature with respect to the appeal of work in two ways. Firstly, the findings revealed that expert nurses working in this highly specialised area
of nursing clearly gained *motivation and enjoyment* from their work. Secondly, and more importantly, *motivation and enjoyment* were significantly correlated with the acquisition of expertise. That is, in their absence, nephrology nurses may be unable to develop either the necessary level of patient focus or to demonstrate the highly autonomous skills of expert nurses.

**The Role of Obligation and Commitment**

This study has also elaborated and extended the literature regarding nurses’ *obligation and commitment* to nursing. In particular, the findings reveal that in order to acquire expertise, nurses needed to develop a significant and sustained obligation or commitment towards the practice of nephrology nursing. This commitment was not only to their own practice and to patients but was also directed towards ensuring other nurses were given the resources to provide quality nursing care. Expert nurses ensure this by *being there* and offering support and guidance to less experienced nurses.

Obligation implies a binding promise, duty to act and a commitment from the individual to execute that promise or duty (Delbridge et al., 1991). Nurses are bound by multiple commitments including organisational, professional, occupational, work, job, patient, and personal. To date, research related to a nurse’s obligation or commitment has been limited to patient, professional and organisational commitment (Corley & Mauksch, 1993; Johnson, Cohen & Hull, 1994; Marsden, 1990; Wellard, 1992). Although commitment to nephrology nursing as such has not been explicitly studied, it has been examined implicitly in a study of work stress and burnout among dialysis nurses by Lewis et al. (1992). They found that dialysis nurses who perceive themselves as being
committed to their job and in control of their nursing practice experienced less burnout and powerlessness compared with other nurses who were not committed to their job.

Of significance to the present study, Morse (1991) found that there are four main types of nurse-patient relationships in which the relative involvement and intensity of the relationship varies. These relationships Morse termed as clinical relationships, therapeutic nurse-patient relationships, connected relationships and over-involved relationships. The present study concurs with these findings from Morse in that expert nephrology nurse participants had developed a relationship which was similar to Morse’s connected relationship. A connected relationship suggests that the nurse and the patient have been together over a long enough period for the patient to learn to trust the nurse. The nurse in a connected relationship will bend and break rules for the patient (cf. blurring the boundaries) and intercede with medical staff on behalf of the patient (cf. suggesting or disagreeing with medical treatment); they also believe that their care has made a difference to the patient. Similarly, the patient in a connected relationship will consult this particular nurse and will respect that nurse’s judgement. [Having a connected relationship, therefore, may explain why some nephrology nurses “went the extra mile” to provide quality nursing care to people with renal failure by blurring the boundaries between work and home].

Metaphor and Qualitative Research

Metaphors create images and can give added depth to meanings and, if used appropriately in qualitative research, can capture data at its most conceptual levels as well as explain the relationship between findings in a clearer and more coherent manner.
This was the case in the present study. An orchestral metaphor was used to illuminate the differences between the practices of non-expert, experienced non-expert and expert nephrology nurses. The metaphor compared the renal unit to that of an orchestra in which the different instruments represented the components (i.e., nurses, doctors, other health-care professionals, patients, dialysis equipment) found within the unit. Nephrology nurses were compared initially to violinists who were learning to play in the orchestra (i.e., non-expert nurses) and then playing better, learning to conduct and compose music (i.e., experienced non-expert nurses). Expert nephrology nurses were compared simultaneously to the first violinist, the conductor and the composer, and were able to produce the magnum opus. These nurses were the most skilful clinicians, leaders and developers of nephrology nursing practice within the renal unit.

To date, metaphorical images to illuminate findings have only been used on a limited basis in previous nursing studies (see for example, Goodman, 2001; Hanneman, 1996; Montgomery, 1994; Nystrom & Segesten, 1996; Smith, 1992). Interestingly, an orchestral metaphor has also been useful in two previous qualitative studies. Firstly, Cook, Giacomini, Johnson and Willms (1999) compared the many instruments (i.e., life-support equipment) in the intensive care unit which are coordinated by "composers" and "conductors" (health-care professionals) to provide health care to critically ill people. Secondly, Fryer-Keene and Simpson (1997) compared the new roles of nurses in a dialysis unit to that of members of an orchestra in which the nurse manager became the conductor of the team.
Limitations Of The Study

This study was designed to be exploratory, descriptive, and theory-generating, and to result in the development of a substantive theory of the acquisition and exercise of nephrology nursing expertise. It has achieved this; the theory describes and relates the nurses and nursing practice from a renal unit in New South Wales. The sample size, however, was small and the context confined to one renal unit which implies that the findings may not be fully applicable to other nephrology nurses, other renal units or more widely in other fields of nursing (Strauss & Corbin, 1990). However, it has already been noted (see above, p. 132) that member checks of, in particular, the characteristics of knowledge and experience and the dimension of blurring the boundaries have been undertaken in seminars with both nephrology and non-nephrology nurses who readily recognised these findings in their own or other nurses' practice. Nevertheless, further exploration of the substantive theory and its characteristics (i.e., knowledge, experience, skill and focus) in other specialist nursing areas (e.g., intensive care, diabetes centres, mental health areas) as well as more widely (e.g., other health-care disciplines, teaching) is warranted to examine the credibility of the theory.

Recommendations

The findings of this study have several implications for nursing practice, education and research.
Practice

The findings of this study revealed that the acquisition and exercise of nephrology nursing expertise occurred in three distinct stages. Four broad characteristics, namely, knowledge, experience, skill and focus were reflected in each stage; however, they differed in each stage. This has several implications for nursing practice. Firstly, the acquisition of domain-specific knowledge from both formal educational programs and from experience in renal units was clearly required to practice as a nephrology nurse, for without it non-expert nurses were disorganised, frustrated and felt incompetent. In light of this finding, it is necessary to recognise the limited domain-specific knowledge of these nurses and to incorporate practice strategies to minimise the effects on both non-expert nurses and patients. Such strategies might include: more extensive orientation periods, particularly in highly specialised and/or technological ward environments; more effective utilisation of more experienced and/or expert nurses as role models and mentors for a longer period of time (e.g., some nurses in some specialty areas may need up to twelve months of mentoring); and, ensuring that experienced and/or expert nurses are rostered onto every shift to provide constant support and guidance for inexperienced nurses. These strategies, while not new, clearly need increased recognition, support and a more vigilant implementation by senior nurse managers. In addition, making these supportive strategies available, non-expert nurses’ stress, disorganised practice (i.e., going backwards and forwards, backwards and forwards) and feelings of incompetence would be reduced and, potentially, their motivation, enjoyment and commitment to nephrology nursing would increase. These strategies, it is suggested, could improve the retention of nursing staff in renal units as well as attracting new staff into the specialty.

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Secondly, experts were the most effective and patient-focused nurses. This implies that it is important to have experienced and expert nurses in specialised areas and to keep them in clinical positions which have direct patient contact and responsibility. An attempt was made in NSW in the late 1980s to do this; a clinical career pathway with the introduction of clinical nurse specialist and clinical nurse consultant positions was implemented (Appel, Malcolm & Nahas, 1996; NSW Department of Health, 1987). This career pathway, however, has not been applied consistently throughout NSW, nor has it maintained sufficient numbers of experienced and expert nurses at “the bedside.” The increasing demands of these positions in conjunction with a lack of professional recognition, status and reward have seen many experienced and expert nurses move into more prestigious and better remunerated positions in administration or education or to move out of the profession altogether. New strategies are now needed to supplement the clinical career pathway in NSW which capture and value the acquisition of clinical knowledge and skills and aimed specifically to keep these nurses at the bedside. Some of these strategies may include: the opportunity to attend relevant conferences or courses which are funded by the clinical unit; the provision of “patient-free time” to encourage and engage in clinically related nursing research; the formal recognition by the nursing hierarchy of the important contribution these nurses make; and, salaries which compare favourably with those of senior nurse educators and administrators.

In addition, knowing the patient and blurring the boundaries have important implications for nursing practice. Knowing the patient was particularly important in the acquisition and exercise of nephrology nursing expertise. This implies that staffing patterns and nurse allocation in appropriate acute and long-term care units, which allow
nurses to have prolonged contact with patients to enable the establishment of trusting relationships, would be particularly helpful in improving nursing practice.

Finally, blurring the boundaries between what is traditionally construed as medicine and nursing work was also a significant and consistent characteristic of experts' practice. Experts consistently prescribed medications, diagnosed problems and ordered diagnostic investigations but always in the best interests of patient care. This extended role should be formally acknowledged by the nursing and medical professions and enshrined legally in amendments to the Nurse's Registration Act.

Education

The findings of this study indicate clearly that the acquisition of propositional and procedural domain-specific knowledge is particularly important to the development of expertise but undergraduate nursing courses cannot realistically provide this knowledge. Currently these curriculae quite properly provide a broad introduction to the major areas of nursing such as medical/surgical, mental health, paediatric, rehabilitation, developmental and community health nursing. The intent of these curriculae is to provide general (i.e., generic) nursing skills; consequently newly registered nurses lack domain-specific skills. Hospitals which employ newly registered nurses, therefore, should be responsive to such unavoidable knowledge deficits in specialist areas and institute additional educational input during orientation and mentorship programs. Assisting new registered nurses to increase their domain-specific knowledge would ease their transition into specialised nursing environments.

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In addition, post-graduate specialist renal education is required to facilitate the acquisition of expertise in nephrology nursing. This study clearly indicates that postgraduate renal courses require a combination of theoretical and experiential learning, and that having clinical role models facilitated the acquisition of expertise. Although there are postgraduate renal courses available throughout Australia (see for example Bonner, 1999; Tolhurst & Bonner, 2000), nurses are not undertaking these courses in sufficient numbers. Senior levels of the nursing profession should do more than encourage nurses to undertake specialised post-graduate courses; they need to provide incentives for nurses to undertake such courses. Financial support to cover the costs associated with these courses and increased availability of study leave would provide tangible evidence of their support.

Research

The findings from this study suggest several areas which potentially warrant further investigation. This study developed a grounded theory of the acquisition and exercise of nephrology nursing expertise which was specific to the context of the renal unit where participants were recruited. It would be useful, therefore, to conduct further research at other sites or with other specialist groups of nurses to test and further develop the substantive theory into a formal middle-range theory. In addition, this study identified the characteristics of nurses at each stage of a three-staged skill-acquisitive/exercise process; further research is warranted to investigate what interventional strategies are effective in expediting this process.

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In particular, this study found that *knowing the patient*, and *blurring the boundaries* were important in expert nephrology nursing practice; it would be interesting, therefore, to examine these aspects in other nursing specialties. In addition, *blurring the boundaries* was a function of being recognised as an expert. *Recognition of expertise* warrants further investigation in several respects. Firstly, additional investigations could establish what precisely, in terms of expert practice, does *recognition of expertise* additionally allow nurses to undertake and under what sorts of conditions. Secondly, what types of socio-political, economic or other factors influence such recognition? Finally, can a relationship between *recognition of expertise* and *motivation and enjoyment* as a nurse be established?

**Conclusion**

This study explicated a substantive theory of the way in which expertise is acquired and exercised by nephrology nurses in New South Wales. This theory is underpinned by a three stage process conceptually linked by an orchestral metaphor which refines and elaborates the previous literature on nursing expertise. In addition, the substantive theory challenges assumptions that only knowledge and experience are sufficient factors in the acquisition and exercise of expertise.

Of significance to nursing, this study uncovered new aspects not documented in the literature and it also made explicit other areas which had only been previously implied. With respect to the unique findings of this study, it identified expertise as a function of four interconnected characteristics, namely, *knowledge, experience, skill and focus*, each of which alters during the acquisition process. Secondly, two features of expert nursing

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practice were revealed during this study which have not been reported in the literature. These were blurring the boundaries and recognition of expertise. Blurring the boundaries was a practice demonstrated only by expert nephrology nurses for the deliberate purpose of patient safety and welfare. Similarly recognition of expertise by other nurses, doctors and patients held by expert nurses was important for nephrology nursing to both acquire and then to exercise expertise. This recognition of expertise afforded expert nurses the opportunity to practice in a totally patient-focused manner by allowing them to expand their scope of practice (i.e., blur the boundaries) and to break the accepted rules of practice. Finally, the substantive theory, PRODUCING THE MAGNUM OPUS, revealed, for the first time, the significant and important roles which expert nephrology nurses hold within a renal unit in New South Wales. These nurses were expert clinicians, role models and leaders.

Many of the findings in this study also made explicit what previous studies have left implicit. Firstly, this study clearly demonstrated that non-expert nephrology nurses went backwards and forwards, backwards and forwards and felt incompetent while they practiced. Secondly, it also made explicit the link between the exercise of advanced levels of skill seen in expert nephrology nurses with the establishment of trusting relationships. Finally, this study revealed the importance of motivation, enjoyment and commitment to nephrology nursing to the acquisition of expertise.

Furthermore, the findings of this study also have important implications for nursing practice, education and research. The limited domain-specific knowledge of nurses with limited nephrology nursing experience highlights the need for effective orientation
programs which combine both theoretical and practice components to support non-expert nurses. These programs also need to foster willingness in nephrology nurses to continue learning in formal post-graduate courses. In addition, the study also recognised the contribution of expert nurses as both role models for non-expert nurses and for the provision of quality patient-focused care. Formally recognising both the extended role and rewarding expert nursing practice needs to be urgently undertaken to keep these nurses at the bedside in clinical nursing practice positions. Finally, this study has suggested several areas which warrant further nursing research, in particular the concepts of blurring the boundaries and recognition of expertise.
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GLOSSARY OF TERMS

APPENDIX 1

A

Adequacy
Refers to the amount of dialysis required to avoid untoward outcomes. Inadequate dialysis has been associated with increased morbidity and mortality. See also Kt/V & URR.

Anaemia
A reduction in the quantity of oxygen carrying haemoglobin in the blood. It is a common complication of chronic renal failure patients. In patients receiving Erythropoietin (EPO), iron infusions are required to restore iron levels in order to form new red blood cells.

Anticoagulant
An agent such as heparin which prevents the clotting of blood.

Arterial and venous blood tubing
Tubing that carries blood to the dialyzer (arterial) and back to the body (venous).

Arterial monitor
A monitor on the haemodialysis machine which measures arterial pressure (in the dialysis circuit).

B

Beta-blocker
A drug that prevents stimulation of the beta adrenergic receptors of the sympathetic nervous system and, therefore, decreases the activity of the heart; used to control blood pressure, control cardiac arrhythmias, and to treat angina.

BFR (blood flow rate)
The rate at which blood flows, for example, through an extracorporeal circuit, measured in ml/minute.

Bicarbonate
A salt resulting from the incomplete neutralisation of carbonic acid; an alkali needed to maintain acid-base balance in the body.

Biocompatibility
The extent to which there is compatibility as measured between blood and the membrane in a dialyser.

Blood circuit
The extracorporeal path of blood held in the tubing for haemodialysis therapy.
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>Blood pump</td>
<td>A pump on a dialysis machine that moves the blood through the extracorporeal circuit at a set rate.</td>
</tr>
<tr>
<td>Bruit</td>
<td>A noise, heard on auscultation, over an artery or over the anastomosis site of an AV fistula; it is an indication of patency of the fistula.</td>
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<tr>
<td>Calcium</td>
<td>An element that is essential for the normal development and functioning of the body, particularly the bones and teeth.</td>
</tr>
<tr>
<td>Cellulose</td>
<td>The most commonly used semi-permeable membrane used in dialysers.</td>
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<tr>
<td>Cellulose acetate</td>
<td>A membrane used in artificial kidneys.</td>
</tr>
<tr>
<td>Central line catheter</td>
<td>A small tubing or catheter, with two or three paths or lumens, which is inserted into a major central vein in the body. Two of the lumens can be used to remove and return blood during extracorporeal therapies; often used as a temporary vascular access device until a fistula has matured.</td>
</tr>
<tr>
<td>Creatinine</td>
<td>A substance excreted in the urine, which is derived from creatinine and creatine phosphate in muscle.</td>
</tr>
<tr>
<td>CVVH (Continuous Venovenous Haemofiltration)</td>
<td>An extracorporeal continuous renal replacement therapy with vascular access from one vein to another, involving the use of a highly permeable haemofilter; more commonly performed in the intensive care setting.</td>
</tr>
<tr>
<td>D</td>
<td></td>
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<tr>
<td>Desferrioxamine (DFO)</td>
<td>An iron and aluminium chelating agent used to treat high levels/overload of iron or aluminium.</td>
</tr>
<tr>
<td>Dialysate</td>
<td>The fluid used in either haemo or peritoneal dialysis, typically with lower solute concentration than the blood, into which wastes and excess electrolytes diffuse.</td>
</tr>
<tr>
<td>Dialyser</td>
<td>An artificial kidney or semi-permeable membrane used to separate components of a liquid mixture such as blood for the process of dialysis.</td>
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<tr>
<td>Dry weight</td>
<td>The ideal body weight, without excess fluid volume.</td>
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</table>
E

Electrolyte imbalance
Deviation from the normal levels of electrolytes or ions in the body. Renal failure severely impairs the body’s ability to maintain electrolyte homeostasis; calcium levels tend to lower, while potassium and phosphate become elevated. Phosphate binders such as Caltrate, bind phosphate ingested at meal times for excretion through the intestinal tract. By lowering phosphate levels, calcium levels generally increase. Resonium exchanges sodium ions for potassium ions in the gut, and it is used to lower potassium levels typically in non-dialysis patients. Once dialysis is commenced, resonium is not routinely required unless the dialysis treatment is compromised (e.g. poor vascular access).

Erythropoietin (EPO)
A hormone secreted mainly by the kidney to stimulate red blood cell production; also available as a synthetically derived drug.

Extracorporeal circuit
The circuit outside the body through which the blood is carried, as in dialysis circuit.

F

Fistulogram
An x-ray/diagnostic procedure involving injection of a dye to check the patency of an AV fistula or graft.

G

Glomerulonephritis
Inflammatory disease of the glomerulus; most common cause of end stage renal failure seen in Australia.

H

Heparin pump
A medication pump that infuses heparin, an anticoagulant on a regular basis; used in most haemodialysis treatments.

Hypercalcaemia
Higher than normal levels of calcium in the blood.

Hyperkalaemia
High levels of potassium in the blood; a potentially life-threatening situation.

Hyperparathyroidism
Excessive production of parathyroid hormone by the parathyroid gland, often stimulated by excessive phosphate levels as a direct result of renal failure; causing hypercalcaemia.
<table>
<thead>
<tr>
<th>K</th>
<th><strong>Kt/V</strong></th>
<th>A measure of adequacy of dialysis reflecting clearances (K) of urea from the patient's total body water (V) over a period of time (t). A value over 1.0 results in lower morbidity rates, although many suggest that Kt/V $\leq 1.2$. See also adequacy and URR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td><strong>Membrane surface area</strong></td>
<td>The total area or space for exposure of blood or other fluids to a semi-permeable membrane. Surface is related to clearance.</td>
</tr>
<tr>
<td>N</td>
<td><strong>Negative pressure</strong></td>
<td>A suction pressure applied to a dialyser membrane by a dialysis machine for the purpose of removal of fluid.</td>
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<tr>
<td>O</td>
<td><strong>Oliguric</strong></td>
<td>Pertaining to low levels of urine output; less than 400 mls of urine per day.</td>
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<tr>
<td></td>
<td><strong>Osmolality</strong></td>
<td>The osmotic concentration that is the characteristic of a solution determined by the ionic concentration of the dissolved substance per unit of solvent.</td>
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<tr>
<td>P</td>
<td><strong>Parathyroid hormone (PTH)</strong></td>
<td>A peptide hormone secreted by parathyroid glands which regulates calcium and phosphate concentrations within the body.</td>
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<tr>
<td></td>
<td><strong>Phosphate binders</strong></td>
<td>A group of medications which bind phosphate, commonly given to people with renal failure to prevent bone disease.</td>
</tr>
<tr>
<td></td>
<td><strong>Phosphorous</strong></td>
<td>A non-metallic element mostly concentrated in the bone.</td>
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<tr>
<td></td>
<td><strong>Polytetrafluoroethylene (PTFE)</strong></td>
<td>A Teflon-like material used to create internal arteriovenous grafts for vascular access for dialysis; also called ‘gortex’.</td>
</tr>
<tr>
<td></td>
<td><strong>Polyuria</strong></td>
<td>Passing large volumes of urine; $&gt; 2,500$ mls per day.</td>
</tr>
<tr>
<td></td>
<td><strong>Pressure monitor</strong></td>
<td>A monitor on the haemodialysis machine which is used to assess the pressure of the circulating blood.</td>
</tr>
</tbody>
</table>
**Pruritus**

Itching.

**Pulmonary oedema**

An accumulation of fluid in the lungs caused by fluid overload.

**R**

**Rejection**

A reaction which occurs after transplantation of an organ. Antibody, complement, clotting factors and platelets are involved in the failure of the graft to survive.

**Reverse osmosis (RO)**

A system of water treatment which selectively removes ions and organic material by use of membrane and pressure. RO treated water is used in conjunction with dialysate at a ratio of 34:1 for haemodialysis treatment.

**S**

**Shunt**

An external vascular access device consisting of silastic tubing which shunts blood between an artery and vein; not commonly used these days.

**Solute**

Any substance which dissolves in a solvent (liquid) to form a solution.

**Solvent**

The fluid in which a solute is dissolved.

**Steal syndrome**

The shunting of blood from the artery to the vein in AV fistulae, resulting in arterial insufficiency and ischaemia of the hand.

**Subclavian catheter**

A catheter inserted into the subclavian vein for the purpose of dialysis; also called a central line catheter.

**T**

**Thrill**

The vibrating sensation felt at the site of anastomosis between an artery and a vein for creation of an AV fistula; it is an indication of patency of the fistula.

**Transmembrane pressure (TMP)**

The total pressure across the dialyser membrane including both negative pressure created by the machine and positive pressure of the blood; the level of TMP, in conjunction with dialyser clearance rates, determines the amount of fluid removed during haemodialysis treatment.
U

Ultrafiltrate  Plasma water removed during dialysis which is free of formed cells and protein.

Ultrafiltration  Filtration under pressure. In haemodialysis, ultrafiltration refers to the removal of fluid using pressure.

Ultrafiltration coefficient  The indicator of permeability of a dialyser to water. This coefficient can be used to calculate fluid removal during dialysis.

Ultrafiltration (UF) controller  A device on a haemodialysis machine used to regulate fluid removal.

URR  Urea Reduction Ratio indicates the amount of urea removed during a specific haemodialysis session. It is used to monitor adequacy and predict Kt/V as well as assist in determining a suitable dialysis prescription for each individual person. A URR of 65% is approximately equal to a Kt/V of 1.2 in an average sized adult. URR is more commonly used in Australia than Kt/V.

V

Variable sodium  A haemodialysis machine which provides the opportunity to adjust the proportioning rate so that the dialysate solution can have varying levels of sodium depending on patient requirements at different times of the dialysis treatment.

Vascular access  The devices used to gain access to the circulation on a repeated basis for dialysis. The term is inclusive of internal and external devices.

Venipuncture  The puncture of a vein to extract blood for laboratory tests.

Venous monitor  A monitor on the haemodialysis machine which measures venous pressure (in the dialysis circuit).
APPENDIX 2

PARTICIPANT INFORMATION SHEET

“Understanding The Development Of Expertise In Nephrology Nursing: A Grounded Theory Study.”

Chief Investigator: Ann Bonner
Doctoral Candidate
University of Western Sydney Nepean

Academic Supervisor: Professor Jennifer Greenwood
Professor of Nursing
Joint Appointment (Western Sydney Area Health Service & University of Western Sydney, Nepean)

I am a doctoral candidate at the University of Western Sydney Nepean, and would like to invite you to participate in this study which is designed to understand how nephrology nurses develop expertise in their practice. This study seeks to identify the characteristics of expertise and the process of developing expertise in nephrology nursing. The study also aims to understand how expert nephrology nurses practice differently to non-expert nephrology nurses.

Study Procedure

This study will involve observation of your nursing practice, interviews and a review of your nursing documentation. Before commencing the study, you will need to give written informed consent. You will sign a consent form and a copy will be given to you. All information I gain from this study will be kept in strict confidence. Following consent, a panel of senior renal nurses, consisting of the Senior Nurse Manager, Renal Clinical Nurse Consultants and myself, will identify, for the purposes of this study only, whether you are an expert or non-expert nephrology nurse. The selection criteria has been determined by previous research into expert nursing, and is based primarily on amount of experience in nephrology nursing and nephrology nursing qualifications. You will be classified as an expert nephrology nurse if you meet all of the selection criteria and, if you do not, you will be classified as a non-expert nephrology nurse. The selection panel will be advised to keep your classification confidential, and to not use it for your performance appraisal. I will advise you which classification you have been given. Once you have been classified, I will then arrange a mutually convenient time, during your normal working hours, to commence the study.

Your nursing practice will be observed for periods of no longer than 4 hours at any one time, and this will occur, initially, at a time nominated by you, but then as the research continues, observation will occur at random times. You will be observed on several occasions but for no longer than twenty hours in total. I will not be assessing your practice in anyway, and I will encourage you to practice as you normally would. The
purpose of this observation is different to that of nurse educator or supervisor who observed you for formal assessment reasons. I will be observing you to identify the characteristics and processes through which nephrology nurses become more expert. The information that I gather will be used for research purposes only and will be non-judgemental. This study is not related in anyway to your performance appraisals that are undertaken by your supervisor. I do, however, have a duty of care to discuss with you any instances of practice which concern me.

During the observation periods you will be able to converse normally with me. I will write down notes away from you so as not to distract you and to gather my thoughts. You are welcome at any opportunity to view the notes I make about you. Additionally, if you, the patient or myself believe that patient care is in any way being compromised or disrupted by the study, observations will cease. If at any time you feel uncomfortable being observed, you can tell me to cease observing you.

Also during an observation period, your nursing documentation will be reviewed. The purpose of reviewing your documentation is to understand the focus of your nursing care and to provide further evidence of your practice. Your documentation will be used by me to assist in clarifying what you did during an observation period. Your documentation will not be reviewed at any other time.

Following an observation period, an individual interview will be conducted with you that has been arranged at a mutually convenient time and place. You will be interviewed for no longer than 1 hour at any one time, and will not be interviewed more than 5 times. During the interview, you may be asked to clarify certain points about your nursing practice. These interviews will consist of open-ended questions related to your nursing practice. Questions will seek clarification and rationale of actions; the focus/plan of your actions; and self-evaluation of your practice.

Examples of possible questions are:
- Please tell about why you became a nephrology nurse?
- How did you organise your nursing care today?
- How did you decide what you were going to do and why you did it?
- Please explain why you did ... today?
- I noticed that you did... why did you do that?

All interviews will be audio-taped and I will also make some notes. The purpose of the interviews is for you to verify and explain your nursing actions. You have the right to retract any information or to request that the information not be used.
Participant Information Sheet cont'd

Demands on You

It is not expected that you will experience any psychological distress during the observational or interview periods. You may, at first, find it a little uncomfortable being observed but you should find that you become more comfortable with my presence as time progresses. Also you may feel a little apprehensive when the interview commences but, once again, as the interview progresses you will become more comfortable.

The total time required from you will be a maximum of 20 hours of being observed and no more than 5 interviews. This is consistent with previous studies involving 'grounded theory' methodology.

At no stage will your identity be recorded. Confidentiality during data collection (i.e. participant observation, interview and documentation) will be maintained by identifying you through the use of a pseudonym. Only I will be aware of to whom the pseudonym relates. Only your pseudonym will be used in any reports that emerge from this study. All information will be treated with absolute confidentiality, and you have the opportunity to view the field notes or interview transcriptions at any opportunity.

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any stage without threat of penalty. Your decision to withdraw will be respected by myself.

If you have any enquiries regarding this study, please feel free to contact me (Ann Bonner) on (02) 9674 1197.

If you have any concerns regarding this study or my conduct, please contact your Senior Nurse Manager or Professor Jennifer Greenwood.

This study has been approved by the (...) Area Health Service Human Research Ethics Committee.

Thank you for your participation in this study.

Ann Bonner

I sign the Participant Information Sheet in acknowledgment that I have received a copy.

Signature of Participant: ___________________________ Date: ___
APPENDIX 3

CONSENT FORM

Study Name:
"Understanding The Development Of Expertise In Nephrology Nursing:
A Grounded Theory Study."

I ............................................................................................................. agree to:

• my nursing practice being observed on several occasions for a maximum of twenty hours;
• being interviewed for no longer than one hour at any one time for a maximum of five times; and
• my nursing documentation being reviewed during an observation period.

I understand that the research will be carried out as described in the Participant Information Sheet and my participation is required for no longer than twelve months. I have read and understood this information sheet and all of my questions have been answered to my satisfaction. I give permission to the researcher to record the interviews using an audio tape recording device and for the results to be used in publication.

I understand that any information that is divulged by me will be treated in absolute confidence; and my identity will not be revealed without my written consent to anyone other than the researcher conducting this study.

I understand that my participation in this study is entirely voluntary and that I may withdraw from the study at any stage without threat of penalty. I do not have to give a reason for the withdrawal of my consent.

I understand that participation in this project will not be used in any performance appraisal of my practice nor will it influence my employment conditions.

I acknowledge that I have received a copy of this consent and the Participant Information Sheet, which I have signed.

Signature of Participant: ___________________________ Date: ___

Signature of Investigator: ___________________________ Date: ___
APPENDIX 4

NUD*IST INDEX TREE

(1) Base data
   (1 1) Being a Renal Nurse
       (1 2) expert
           (1 2 1) qualifications
             (1 2 1 1) initial RN
             (1 2 1 2) Renal Qualifications
             (1 2 1 3) other
           (1 2 2) Experience
             (1 2 2 1) all nursing
             (1 2 2 2) renal
           (1 2 3) position
           (1 2 4) hours worked
           (1 2 5) hospital
             (1 2 5 1) Out-patient Unit
             (1 2 5 2) Hospital
           (1 2 6) Professional activity
           (1 2 7) Peer rating
           (1 2 8) number of patients
           (1 2 9) self rating
       (1 3) non-expert
           (1 3 1) qualifications
             (1 3 1 1) initial RN
             (1 3 1 2) Renal Qualifications
             (1 3 1 3) other
           (1 3 2) experience
             (1 3 2 1) all nursing
             (1 3 2 2) renal
           (1 3 3) position
           (1 3 4) hours worked
           (1 3 5) hospital
             (1 3 5 1) Out-patient unit
             (1 3 5 2) Hospital
           (1 3 6) Professional activity
           (1 3 7) Peer rating
           (1 3 8) self rating
   (1 4) Renal Course

(2) Expert Nurses - Producing the Magnum Opus
   (2 1) Extensive knowledge
     (2 1 1) specialty knowledge
     (2 1 2) sources of knowledge
       (2 1 2 1) nurse
       (2 1 2 2) doctor and others
       (2 1 2 3) patients
       (2 1 2 4) documentation, equipment
     (2 1 3) precise rationales
     (2 1 4) knowing the patient
       (2 1 4 1) similar clinical profiles
       (2 1 4 2) length of time patient is known
       (2 1 4 3) avoiding, preventing problems
   (2 2) Vast experience
     (2 2 1) Confident Practice
     (2 2 2) Not a Lot is New
       (2 2 2 1) Knowing What to Do and When to Act
(2 3) Exercising advanced skills

(2 3 1) Blurring the Boundaries
(2 3 1 1) Nursing, Medical
  (2 3 1 1 1) rules
    (2 3 1 1 1 1) observing rules
    (2 3 1 1 1 2) setting rules
    (2 3 1 1 1 3) breaking rules
      (2 3 1 1 1 3 1) not wearing gloves
      (2 3 1 1 1 3 2) medications
      (2 3 1 1 1 3 3) safe breaking of the rules
    (2 3 1 1 1 3 4) calculated risk
  (2 3 1 2) telling doctors what do
  (2 3 1 3) trusted
  (2 3 1 4) confronting others
  (2 3 1 5) suggesting treatment

(2 3 1 2) Admin, Clinical
  (2 3 1 2 1) extra responsibilities
  (2 3 1 2 2) extra work

(2 3 1 3) Work, Home
  (2 3 1 3 1) fitting work and home life together
  (2 3 1 3 2) out of hours work
  (2 3 1 3 3) going to their home

(2 3 2) Recognition of Expertise
  (2 3 2 1) by patients
  (2 3 2 2) by nurses
  (2 3 2 3) by doctors
  (2 3 2 4) accepts responsibility for actions
  (2 3 2 5) recognises own limitations
  (2 3 2 6) taking charge

(2 3 2 7) Role Model
  (2 3 2 7 1) who is the expert?
  (2 3 2 7 2) for nurses
  (2 3 2 7 3) for patients
  (2 3 2 7 4) a resource person
  (2 3 2 7 5) peers rely on
  (2 3 2 7 6) respected by others

(2 3 2 8) looks after more difficult, complex patients
(2 3 2 9) relieving other nurses
(2 3 2 10) trusted

(2 3 2 11) Extended role or scope of practice
  (2 3 2 11.1) disagrees with treatment
  (2 3 2 11.2) suggesting treatment

(2 3 2 12) teaching
  (2 3 2 12.1) patients
  (2 3 2 12.2) other nurses
  (2 3 2 12.3) doctors & others

(2 3 4) Managing Workload
  (2 3 4 1) team leader
  (2 3 4 2) organising workload
    (2 3 4 2 1) nursing appointments
    (2 3 4 2 2) being organised
    (2 3 4 2 3) Time Management
      (2 3 4 2 3 1) prioritising
      (2 3 4 2 3 2) routines
    (2 3 4 2 4) being flexible
      (2 3 4 2 4 1) no hard and fast rules
      (2 3 4 2 4 2) recognises differences in practice
(2 3 4 3 5) simultaneous activity
(2 3 4 3) takes pre-emptive action
(2 3 4 3 1) avoiding problems
(2 3 4 3 2) not waiting for medical orders
(2 3 4 3 3) planning ahead
(2 3 4 3 4) instinct
(2 3 4 3 5) knowing when to act
(2 3 4 4) cutting corners

(2 4) Being patient focused
(2 4 1) Outcomes
(2 4 1 1) for nurse
(2 4 1 1 4) job satisfaction
(2 4 1 2) for patient
(2 4 1 3) for others
(2 4 2) Providing pt centred care
(2 4 2 1) focus of practice - patient
(2 4 2 2) Patients as Individuals
(2 4 2 3) continuity of care
(2 4 2 3 1) barriers to
(2 4 2 3 2) recent issues, problems or events
(2 4 2 3 3) longer-term
(2 4 2 3 4) for the future
(2 4 2 3 5) at home
(2 4 2 3 6) ensuring patient follow up
(2 4 2 3 7) coordinating care

(2 4 3) Being there
(2 4 3 1) patients
(2 4 3 2) staff
(2 4 4) keeping a close eye on

(9) Preconditional Factors
(9 1) specialty knowledge
(9 1 1) knowing the patient
(9 2) Experience & Exposure
(9 2 1) recognises own limitations
(9 2 2) recognises others limitations
(9 2 3) has experience
(9 2 4) additional skills
(9 2 5) past experiences
(9 3) Attitude
(9 4) developing trust
(9 5) skilfulness
(9 5 1) assessment
(9 5 1 1) physical
(9 5 1 2) mental
(9 5 1 3) emotional
(9 5 2) automatic
(9 6) Having an Obligation
(9 6 1) patients
(9 6 2) nurses
(9 6 3) other staff
(9 7) role models
(9 7 1) patients
(9 7 2) nurses
(9 8) enjoyment and commitment
Characteristics of Experienced Non-Experts

Exercising routine skills

- Still following the rules
  - Wearing gloves
  - Observing rules
    - Stays within the rules
    - Refusing to break rules
  - Begin taking leading role
    - Teamleader

Adequate Experience

- Repeated practice
- Routines are easier
- Time management
  - Routine
  - No routines
  - Not enough time

Focus of practice

- Patient
- On nurse
  - For my comfort

Sufficient specialist knowledge

- Increased knowledge
  - Sources of knowledge
    - Nurse
    - Doctor and others
    - Patients
    - Documentation, equipment
  - Sufficient rationales
  - Sharing knowledge

Ways of Thinking

- Something in your head
- Concentration
- Thinking about next activity or step
- Storing information

Experienced non-expert things

- Not needing to check or confirm with expert RN
- Doesn’t know everything
- Has some experience with or exposure to
- Quite experienced
- Problem-solving is improving or faster
- Needs help sometimes
- Confident
- Bad habit
- Being held back
- Not always confident

Characteristics of Non-Experts

Superficial nephrology nursing knowledge

- No or minimal teaching
  - Vague rationale
    - Attempting to rationalise
    - Inaccurate or incorrect

Limited Experience

- Backwards and forwards, backwards and forwards
  - Unnecessary action, activity
  - Not organised
  - Doesn’t complete task

356
(30 2 1 4) easily interrupted
(30 2 1 5) cannot make things easier
(30 2 2) gaining experience
(30 2 3) no experience
(30 2 4) Playing within the boundaries
  (30 2 4 1) stays within the rules
  (30 2 4 2) refusing to break rules
  (30 2 4 3) following rules, procedures
(30 2 5) feels incompetent
  (30 2 5 1) finds everything a challenge
  (30 2 5 2) not confident
(30 2 6) others recognise inexperience

(30 3) Building Up Nursing Skills
(30 3 1) seeking confirmation and needing support
  (30 3.1.1) explaining actions to more experienced nurse
  (30.3.1.2) uses a resource person
  (30.3.1.3) seeking assistance
    (30.3.1.3.1) from patients
    (30.3.1.3.2) from nurses
    (30.3.1.3.3) from others
(30 3 2) being told what to do
(30 3 3) less skilful
(30 3 4) routine
  (30 3 4 2) learning routine
  (30 3 4 3) developing own routine
  (30 3 4 4) following procedure
(30 3 5) mentally rehearsing
  (30 3 5 1) thinking out a loud

(30 4) Focus of practice
(30 4 1) on needs
(30 4 3) tasks
  (30 4 3 1) medications
  (30 4 3 2) charts
  (30 4 3 3) observations
  (30 4 3 4) fluid balance
  (30 4 3 5) one thing at a time
  (30 4 3 6) cannulation
  (30 4 3 7) dialysis
(30 4 8) Continuity of Care
  (30 4 8 1) short-term
    (30 4 8 1 1) current admission

(30 8) non-expert things
(30 8 1) recognises own limitations
(30 8 2) not able to do something
(30 8 3) doesn't realise consequences of actions
(30 8 4) creates more work
(30 8 5) problem solving is slower
(30 8 6) doesn't know what to do
(30 8 7) no or lack of knowledge
(30 8 8) misses something, doesn't recognise
(30 8 9) others recognise inexperience

(100) Quotable
(100 1) experts
(100 2) non-experts
(100 3) experienced non-expert