The introduction of Assistants in Nursing in an Australian haemodialysis service
Josephine Chow, Susana San Miguel, Maria LiDonni and Judith Isbister


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Abstract
As a strategy to counter the current crisis in staff recruitment and retention in dialysis nursing, a new model of care was designed to introduce staff via an assistant in nursing (AIN) program in the haemodialysis units. The aim of this project was to introduce AINs into the haemodialysis units at a major tertiary area health service in Sydney, Australia. These AINs were student nurses who were completing second or third year of their undergraduate nursing degree. A self-directed learning package for haemodialysis was developed and introduced to the AINs. This project involved the development of job descriptions, recruitment and training in dialysis procedures in the haemodialysis units of the AINs. Fifty percent of the twelve AINs completed a program evaluation questionnaire towards the end of the program. Ninety percent of the respondents were satisfied with the content and the organisation of the program. All respondents reported that they received enough support from the nurse unit managers and nurse educators at all time. In general, the AINs reported a high level of comfort, satisfaction and confidence. In this article, the authors describe the design and implementation of an educational program for AINs practising in specialised haemodialysis units.

Key Words
Dialysis, haemodialysis, nursing, assistants in nursing, workforce, model of care of Australian Governments (COAG) reforms that made recommendations for role substitution and increased division of labour in the health care industry. It also provided strategies for the State Health Plan to give a direction for NSW Health towards 2010.

Lower patient to nurse ratios have been associated with lower ‘failure-to-rescue’ rates in hospitals, specifically each additional patient per nurse has been associated with a 7% increase in the odds of ‘failure-to-rescue’ (Aiken, Clarke, Sloane, Sochalski & Silber, 2002). ‘Failure to rescue’ has been defined as ‘clinicians inability to save a hospitalised patient’s life when he experiences a complication’ (Clarke & Aiken, 2003). This applies to the healthcare team when medical and nursing staff are managing the complication.

Further, it has been reported that patients cared for on ‘short-staffed’ wards experienced more complications than comparable patients nursed on ‘adequately staffed’ wards (Flood & Diers, 1988; Canadian Nurses Association, 2004). Despite these conclusions it has been suggested that factors known to increase greater autonomy and control

Introduction
Recruitment and retention of nurses in New South Wales (NSW) remains a priority (NSW Health, 2002). In September 2001, NSW Health released the NSW Nursing Workforce Action Plan, which recommended ‘comprehensive research on workload, case-mix, skill mix and patient outcomes’ (NSW Health, 2001). In early 2000, $1.2 million was allocated to examine the effect of nursing workload, skill mix, models of care and nurse to patient ratios on patient outcomes (NSW Health 2003). In 2008, the Special Commission of Inquiry into Acute Care Services by Commissioner Garling recommended that the NSW Health workforce be realigned so that patient centred care is provided by a team and components of that care are performed by a member of the team according to their qualifications and experience (Garling, 2008). Furthermore, Australian health ministers have undertaken initiatives recognising the critical role of the health workforce in the future provision of quality health services, and identified that the skills of the health workforce are not being fully utilised (NSW Health, 2007). This is part of the Productivity Commission Report 2005 (NSW Health 2007) and Council

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in nursing practice are more important than the proportion of registered nurses (RNs) on the staffing profile (Page, 2004). There is a lack of effective staff mix decision-making models within the current healthcare system and studies with different design show associations between increased staff and lower odds of hospital related mortality and adverse patient events (Canadian Nurses Association, 2004).

To date, only a few published studies examining these issues have been undertaken within Australia (Pratt, Burr, Leelarthaeapin, Blizard & Walsh, 1993; Morrison, Beckmann, Durie, Carless, Gilles, 2001). Retrospective audits conducted in the United States of America (USA) have used large administrative databases to examine the effect of nursing skill mix on patient outcomes (Aiken et al., 2002; Needleman, Buergers, Mattke, Steward & Zelevinsky, 2002; Cho, Kefelian, Barkauskas & Smith, 2003).

While there is a growing body of literature explicating associations between nursing skill mix and positive outcomes, the evidence does not as yet provide firm directions in determining the best configuration (Lee, Yeh, Chen & Lien, 2005; Ayre, Gerdtz, Parker & Nelson, 2007). In addition, differences in nursing workforce characteristics also make it difficult to apply findings from one healthcare setting to another.

Only four studies have used either a comparison group (Pratt et al., 1993), or a pre/post intervention design, to evaluate the effect of new skill mix models on nurses’ satisfaction or patient outcomes, or both (Ringerman & Ventura, 2000; Barkell, Killinger & Schultz, 2002; Pratt et al., 1993). No randomised trials have been reported. One of these four studies evaluated the introduction of all registered nurse (RN) staffing compared with mixed nursing grades (Segesten, Agelii, Elmcrona, Lindstrom & Lundgren, 1994), while another evaluated the use of ‘patient care associates’ (Barkell, Killinger & Schultz, 2002). One of these four studies evaluated a change from an all-RN model to an RN-licensed vocational nurse model in a critical care area (Ringerman & Ventura, 2000). This study found increased patient and physician satisfaction but decreased nurse satisfaction. The last of these four studies, undertaken in Australia, measured the effects of an all-RN model in an acute medical ward and compared outcomes with an 80% RN:20% enrolled nurse (EN) model in an acute surgical ward (Pratt et al., 1993). RNs stated that working with inexperienced ENs increased their workload and made their work more stressful. No significant differences were found between wards regarding the performance and recording of a range of nursing procedures. Results from this study are limited by the lack of similarity between patient casemix of the two participating wards.

As a strategy to counter the current crisis in staff recruitment and retention in dialysis nursing, a new model of care was introduced utilising enrolled nurses into what was previously an almost exclusively registered nurse workforce (Chow, Lau & Gibb, 2008). The program comprised training in medication administration in the technical and further education (TAFE) system, training in dialysis procedures in the haemodialysis unit, and clinical placement in the renal ward. Successful participants were recognised as endorsed enrolled nurses who would be able to undertake extended roles in renal nursing care. While findings from Chow (Chow, Lau & Gibb, 2008) indicated no significant difference in patient admission rates, infection rates, medication or procedure errors with the program the nurses reported a high level of comfort, preparedness, confidence, competence and control.

In this article, the authors describe the design and implementation of an educational program for AINs practicing in specialised haemodialysis units.

**Design**

The renal nursing leaders identified a severe shortage of specialist-trained nurses, especially in dialysis settings and recommended that if adequate and appropriate training and education was provided the AINs could assist the registered nurse in undertaking some of the tasks required in dialysis units. A group of senior renal nurses (manager, educator and clinician) met and brainstormed the various roles and tasks for the AINs and finalised a job description for this new role.

The renal nursing leaders then set-up a communication process with the facility management team and proceeded to develop the theoretical and clinical components of the program, beginning with the competencies needed for AINs in renal units. The renal nursing leaders liaised with nurse unit managers and conducted an education session with registered nursing staff to ensure that AINs would be well supported in the clinical areas. Finally, candidates for the AIN role were recruited. To be an AIN the candidate needed to be in second or third year of an undergraduate course in nursing studies at a tertiary institution. The University undergraduate nurses were the target candidates as there were an ongoing flow and supply of them. There was already an existing undergraduate nursing workforce in the general wards of the hospital and recruitment had never been an issue.

The objective of the program was to promote and enhance the role of the AINs in the dialysis setting, under the direction and supervision of
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registered nurses. At all times, the AINs remained responsible and accountable for their actions in providing delegated nursing care (Australian Nursing Council Incorporated, 2002).

The program has two main strands: theoretical component via a self-directed learning package, and a clinical assessment overseen by clinical nurse educators working in the haemodialysis units (Table 1). The purpose of this self-directed learning package was to assist the AINs to enhance their skills, expand their knowledge base and develop clinical skills in the area of haemodialysis. Upon completion of this package along with supported clinical experience, it was anticipated that the AIN: would be able to understand the theory of how haemodialysis worked; develop their knowledge base for safe practice when attending to patients in the haemodialysis unit; and communicate with the patients and their significant others, and members of the renal team. The program therefore focused on knowledge and skills transfer, and practical application.

Throughout the training, the AINs had individualised clinical teaching and supervised practice so that they could achieve accreditation in haemodialysis policies and procedures. These theoretical and clinical components were conducted in the hospital setting by clinical nurse educators and clinical nurse specialists respectively.

Contents of the self-directed learning package included: functions of the kidney; principles of haemodialysis; transport principles; haemodialysis vascular access; haemodialysis equipment; and haemodialysis water purification system. Within the first week, the

<table>
<thead>
<tr>
<th>Clinical Skills-Demonstrate knowledge &amp; skill:</th>
<th>Demonstrated Date</th>
<th>Mastery Date</th>
<th>Assessor Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of the common complications during haemodialysis – (theoretical knowledge only)</td>
<td></td>
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<tr>
<td>Hypotension</td>
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<td>Cramps</td>
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<td>Vomiting</td>
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<tr>
<td>Dizziness</td>
<td></td>
<td></td>
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<tr>
<td>Machine set up:</td>
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<td></td>
<td></td>
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<tr>
<td>Set-up haemodialysis machine</td>
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<tr>
<td>Set-up haemodialysis machine for haemodiafiltration</td>
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<tr>
<td>Remove all lines from machine post dialysis &amp; clean machine</td>
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<tr>
<td>Machine maintenance and documentation</td>
<td></td>
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<tr>
<td>Care/Disinfection of haemodialysis machine –bleach</td>
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<tr>
<td>Care/Disinfection of haemodialysis machine-Citrosteril™</td>
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<tr>
<td>Disinfection of the reverse osmosis (RO) unit</td>
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<tr>
<td>General maintenance of dialysis machine</td>
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<tr>
<td>Changing filters on haemodialysis machine</td>
<td></td>
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<tr>
<td>Arteriovenous fistula/graft (AVF/AVG) care</td>
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<tr>
<td>Care of new and current AVF/AVG</td>
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<tr>
<td>AVF/AVG dressing change</td>
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<td></td>
<td></td>
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<tr>
<td>Removal of fistula needles</td>
<td></td>
<td></td>
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<tr>
<td>Water testing and documentation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Reading and recording RO machine rejection and conductivity rates</td>
<td></td>
<td></td>
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<tr>
<td>Daily water testing for chlorine &amp; chloramines</td>
<td></td>
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<td>Monthly water testing- RO water – colony forming units (CFU)</td>
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<td>Monthly water testing – dialysate – CFU</td>
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<tr>
<td>Documentation of results. Hard &amp; electronic copy</td>
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<td></td>
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<tr>
<td>Preparation of pathology forms and blood tubes</td>
<td></td>
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<tr>
<td>Prepare routine monthly sample tubes and pathology request forms (including special blood tests for patients on transplant list)</td>
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<tr>
<td>Documentation-</td>
<td></td>
<td></td>
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<tr>
<td>Demonstrate the use &amp; knowledge of</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Clinical notes – documentation Note: all clinical notes must be countersigned by a registered nurse</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Haemodialysis flow chart/care plan</td>
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</tbody>
</table>
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AINs were expected to be familiar with the following tasks:

- patient documentation
- care of haemodialysis machine including safe working practices
- set up, stripping and disinfection of the dialysis machine as directed by the registered nurse
- preparation of dialysis equipment for the next shift
- cleaning of dialysis machines, tables and chairs at the end of treatment
- assisting in general maintenance of dialysis machines
- care of AV fistula/grafts, including, fistula observations and dressing change
- hold of patients’ cannula sites post dialysis
- checking and recording blood sugar level (BSL)

- assisting in movement of dialysis chairs as required
- assisting restocking of consumable supply in clinical areas
- checking and restocking emergency supplies as needed
- assisting with pressure area care if needed
- feeding patients as required
- testing water.

Results

Recruited assistants in nursing

Twelve AINs were recruited in three separate recruitment periods with three months apart. Ten participants completed the education program with eight of them continuing with regular shifts. Seventy five percent (n=6) of the participants were female and 75% were in the third year of their university undergraduate program (Table 2). Thirty seven percent (n = 3) of the AINs remained in the organisation after 12 months while 63% of the participants graduated from the university undergraduate programs and became registered nurses. One AIN was recruited into the permanent vacancy in one of the dialysis units after completion of her undergraduate degree.

The average number of shifts worked by the AINs was 6.5 shifts per month with 7.5 hours per shift. Fifty percent of the AINs completed a program evaluation questionnaire towards the end of the program. Ninety percent of the respondents were satisfied with the content and the organisation of the program. All respondents stated that they had received enough support from the nurse unit managers and clinical nurse educators at all times. In general, the AINs reported a high level of comfort, satisfaction and confidence.

The following paragraphs are some of the comments received from the above evaluation questionnaires. The implementation of the program was smooth and there were no major issues reported.

Table 2- Profile of the assistants in nursing

<table>
<thead>
<tr>
<th>Undergraduate nurse</th>
<th>University year</th>
<th>Gender</th>
<th>Average shift per months</th>
<th>Average hours per shift</th>
<th>After 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>F</td>
<td>2.5</td>
<td>7</td>
<td>Graduated</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>M</td>
<td>9</td>
<td>6.5</td>
<td>Remained in dialysis unit as AIN</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>F</td>
<td>14</td>
<td>7</td>
<td>Remained in dialysis unit as AIN</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>F</td>
<td>3.5</td>
<td>8</td>
<td>Graduated</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>F</td>
<td>9</td>
<td>8</td>
<td>Graduated</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>F</td>
<td>3</td>
<td>8</td>
<td>Remained in dialysis unit as AIN</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>F</td>
<td>9</td>
<td>8</td>
<td>Graduated</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>M</td>
<td>2.5</td>
<td>8</td>
<td>Graduated</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>6.5625</td>
<td>7.5625</td>
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</tbody>
</table>
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Discussion

With the continuous increasing demand for renal workforce to cope with the rapid growth of the dialysis population, there will need to be innovative approaches to models of care and skill mix in the dialysis units. The Australian and New Zealand Dialysis Workforce Study described future workforce strategy in which the number of enrolled nurses and patient care technicians working in dialysis units would be increased (Bennett, McNeill & Polaschek, 2009). However, as stated in literature, the substitution of lower workforce skill mix such as the employment of AIN have economic implications but not necessarily maintain the quality of care (Flynn, Thomas-Hawkins & Bodin, 2008). Future studies are required to examine the impact of workforce skill mix and patient outcomes.

The key elements for the success of the AINs program in the dialysis unit were the leadership and open mindedness of the nursing managers and key clinical nursing staff who designed the education program. Comprehensive specifications for job performance for the AINs were developed. The defined duties/tasks were well within the realm of the AINs’ scope of practice in compliance to the current Nurses’ Act (NSW Nurses’ Association, 2001). The decision to keep over 80% of registered nurses in each dialysis shift continues to ensure safety in the workplace in a healthcare delivery system that is rapidly moving high acuity patients with complex procedures through the continuum of care. Further studies will need to be undertaken to confirm the ongoing success of this change in the skill mix of this newly introduced model of care.

For healthcare institutions, this model would help to alleviate the shortage of trained nursing personnel and provided

Table 3.

The best aspects of the program were:

- “Good and very supportive staff”
- “I’ve learned a lot of knowledge and new skills about haemodialysis”
- “Specialising in renal nursing gives opportunities for AINs to think about their career.”
- Excellent and supportive clinical nurse educators and nursing staff. It is an interesting field of nursing, which as an undergraduate I would not have been privilege to otherwise.”

My recommendations to improve the program are:

- “It will be better for us to do some more such as returning patient from dialysis”
- “More in-service educations are needed for AINs.”
- “I would recommend the possibility to travel around the different units to experience all of the in-centre and satellite units.”

Would you recommend the program to other students? Why?

- “Yes, good insight into haemodialysis”
- “I think it is very worthy to introduce other student this clinical area because we don’t actually get a lot of chances to know what dialysis is. It is different but very interesting experience.”
- “Yes, it’s a different aspect of nursing. Every student should get a glimpse of renal nursing.”
- “Yes, as it’s a great introduction to an excellent specialty field. As an AIN it’s great for several clinical aspects such as blood studies, etc.”

Will you consider employment in the renal specialty when you graduate?

- “Yes, I’m very interested in the renal specialty especially haemodialysis. I wish I could be a dialysis nurse when I graduate.”
- Of course, Yes. I hope I get a position.”
- “I would definitely consider renal nursing as a specialty.”

Any additional comments?

- “I really enjoy the studying and working experience in dialysis unit. I’m very happy to be a dialysis nurse when I become a RN.”
- “Everyone in dialysis unit is very supportive. I feel proud to work in this unit. Hope to get more shifts for work.”
a succession plan to staff committed to renal nursing. AINs are a new resource for performing nursing care in the dialysis units and further recruitment of AINs may help prepare for future expansion of the dialysis service to meet the rapid growth of the population with end stage renal disease.

The legitimisation of the role, through a formalised program for the AINs, greatly enhances the career potential for this group of health carers (Hall, 1997; Anthony, Standing & Hertz, 2001). This program serves not only to educate but also attract and retain nurses who are committed to renal nursing. The enhancement of the AINs role will assist in the better provision of patient care during medical and surgical interventions within a system characterised by registered nurse shortages, ongoing technological change and economic constraints.

The introduction of AINs in haemodialysis units is ahead of the state wide ‘Take the Lead’ project aimed at redesigning the nursing/midwife unit manager role and the Essentials of Care (EOC) program aimed at putting patients at the centre of care by engaging nurses and other clinical staff with a focus on improving the experience of the patient and achieving cultural change in the workplace. Contrary to recommendations for the development of new paraprofessional groups such as the proposed NSW healthcare assistants, the innovation described in this paper builds on the strengths of an existing profession - nursing. It provides paid clinical practice for nurse students and encourages graduates to specialise in this renal nursing specialty. One of the strengths of the approach is that these AINs have already done considerable practical and theoretical work in nursing care. They do not come to the role as lay person as would be the case if this program took students directly from school into a TAFE program. The program builds on what they have already learnt at university. It contributes to the links between university, TAFE and industry. In fact it contributes to university programs by value adding in terms of training and practice. It also provides students with real workplace experience.

The AINs program in dialysis protects the nursing profession from the array of occupational groups of non regulated workforce such as patient service assistants and care workers that may be introduced into the system further eroding wholistic nursing care. While there is a division of labour between these assistants and RNs, these workers are nurses in the making, this will serves an important element in the long term.

Furthermore, award classifications in nursing have progressively developed which recognise the expanding role of registered and enrolled nurses to more complex and specialised areas such as special grade enrolled nurse and clinical nurse specialist Grade II. All these strategies will facilitate the goal of enhancing future nursing workforce both in recruitment and retention.

Conclusion
The aim of this article was to discuss our experience in the development and evaluation of a new model of care, the introduction of AINs in haemodialysis units. These AINs were completing their second and third year undergraduate nursing degree. The implementation of the initiative was well co-ordinated and supported by both management and clinical leaders. This initiative and actions were in response to the shortfall of specialised (RN) nursing workforce. The success of the AINs program in the renal specialty was a result of commitment and support from the whole healthcare team including administrators, medical, nursing and allied health staff. The outcome of the project will be applicable and transferable to other facilities and clinical services. The long term plan is to continue the program and recruit new AINs each year to meet the demand and to respond to the AINs turnaround once they complete their university degree and become registered nurses.

Acknowledgements
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References
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Kidney Health Australia provides grants for Registered Nurses wishing to study Masters Degrees in Nursing. The aim of the program is to encourage nurses to pursue a career in renal nursing in any of its components – clinical practice, education or research - across the continuum of chronic kidney disease from prevention and early detection to renal replacement.

Nature of Funding. The amount of the grant will be up to $3,000 per year for a maximum period of up to 3 years. The funding is awarded annually for the duration of the Award but funding in the 2nd and 3rd year is contingent on Kidney Health Australia receiving evidence of satisfactory annual progress from the relevant university.

Funding may be provided to those already enrolled in one of the above courses. While grants of this nature are usually tax exempt, the final determination of their tax status rests with the Australian Tax Office.

For further information go to http://www.kidney.org.au and follow the links to nursing scholarships or contact KHA by phoning 08 8334 7555 or email teresa.taylor@kidney.org.au