

Nurse-led diabetes and renal impairment clinics: Challenging traditional care boundaries in Ireland

Denise Blanchfield, Colm McGurk

Article points

1. An effective disease management strategy for chronic kidney disease requires consolidation of all aspects of the condition.
2. A retrospective audit in 2006 demonstrated that there was a high prevalence of renal impairment amongst people with type 2 diabetes attending the diabetes clinic.
3. There was no structured assessment or management of renal impairment within the diabetes service.
4. Therefore, it was decided to establish an advanced nurse practitioner renal and diabetes service with the aim of improving clinical outcomes.

Key words

- Advanced nurse practitioner
- Chronic kidney disease
- Ireland

Denise Blanchfield is Advanced Nurse Practitioner Diabetes and Renal Impairment; Colm McGurk is Consultant Endocrinologist, St Luke's General Hospital, Kilkenny, Ireland

Approximately 13% of the adult population suffers from chronic kidney disease (CKD) and the numbers are expected to continue to climb (Coresh et al, 2007). Hypertension and diabetes are the main causes of progression from CKD to end stage renal disease (Arikan and Tuglular, 2005). An effective disease management strategy requires consolidation of all aspects of the condition, such as effective hypertension, lipid and glycaemic management together with assessment of renal function, to ensure timely and appropriate interventions which can have a significant impact on slowing the progression of CKD. This challenges existing services to adopt innovative ways of delivering care to meet patient and service need within current resources. In the Carlow/Kilkenny diabetes service in Ireland, one such innovation was the development of an advanced nurse practitioner role in diabetes and renal impairment. This article outlines how this new role combines elements from the disciplines of medicine and nursing to meet service needs and achieve clinical targets and low patient default rates (<1%).

There is significant evidence supporting the benefit of early detection and the aggressive management of diabetes and associated complications, as demonstrated by the Diabetes Control and Complications Trial Research Group (1993) and the UK Prospective Diabetes Study Group (1998).

Despite this, diabetes is the leading cause of established renal failure in the Western world (Kilberd, 2006). Failure to identify renal impairment associated with diabetes may lead to a delay in timely management of this problem. This has important healthcare

management implications, such as increased mortality and morbidity, cost and duration of hospitalisation (Kee et al, 2004).

Within the diabetes service at St Luke's General Hospital, Kilkenny, Ireland, an advanced nurse practitioner (ANP) diabetes and renal impairment role was developed to provide a "one stop shop for diabetes" which consolidates all aspects of care.

For the purpose of this article the following will be discussed:

- What are ANPs?
- Why this role was established.

- How this role was established.
- How the ANP service was developed.
- Does the ANP service work?

What are ANPs?

Definition and role: The international perspective

The concept of the ANP emerged in the USA in the early part of the 20th century and was later adopted in other countries, including the UK, Canada, the Netherlands and Australia. The stimulus for this change was multifactorial, including changes in the socio-political environment, governmental policy, the health needs of society and supply and demand within the healthcare workforce (Mantzoukas and Watkinson, 2006).

There is no standardised international generic description of the core features which embody the ANP role, with considerable international differences in what ANPs are called, how they are educated and what their role is when qualified. An emerging priority for many countries is a move towards national standardisation of the ANP role through legislation and regulation which govern educational and practice requirements (Gardner et al, 2004).

Definition and role: The Irish perspective

In 1998 the government of Ireland took the step of creating a new statutory body, the National Council for the Professional Development of Nursing and Midwifery (NCNM). Ireland became the first country to establish such an agency (Mac Lellan, 2007).

The NCNM has developed frameworks which define and delineate the ANP role. Supporting guidance documentation produced by NCNM (2007) outlines the definition of ANPs, advanced nursing practice, the core concepts and the competencies associated with these roles.

The prerequisites for the hospital structures necessary to support the ANP role, referred to as the site development process, are also strictly defined. If these are not met the ANP cannot be accredited. This has ensured clarity for nurses undertaking such roles and those who

intend to establish these roles within the Irish healthcare system.

The need for an ANP

Carlow/Kilkenny is a geographically diverse rural area with a population of approximately 138 000 people. A formal diabetes service has been created in the last 10 years. A regular annual audit has been used to measure service performance against international standards and to identify areas of service weakness.

A retrospective systematic audit in 2006 demonstrated that there was a high prevalence of renal impairment amongst people with type 2 diabetes attending the diabetes clinic. This was determined using the Modification of Diet in Renal Disease (MDRD) formula, which estimates glomerular filtration rate (eGFR) using creatinine, age and sex. Using the MDRD equation it was noted 24.3–27% of patients screened had an eGFR of <60 mL/min/1.73 m², representing stage 3 chronic kidney disease (CKD).

Many equations are used for the systematic staging of CKD. The MDRD equation performs well in populations with low range GFR and often out-performs the Cockcroft–Gault equation (Levey et al, 2007). Limitations of the formula have been noted, for example performance in healthy individuals is unclear and it has not been tested in children, elderly people aged over 75 years, pregnancy or those with extremes of body size, muscle mass or nutritional status. The MDRD formula is recommended for assessment of eGFR by NICE (2009) and the National Kidney Foundation (2002).

There was no structured assessment or management of renal impairment within the diabetes service. This resulted in people progressing through the earlier stages of kidney disease undetected and untreated. People from Carlow/Kilkenny represented 36.2% of those attending the specialist regional nephrology service at Waterford Regional Hospital.

Therefore, it was decided to establish an ANP renal and diabetes service with the aim of improving clinical outcomes.

Page points

1. An audit found a high prevalence of renal impairment amongst people with type 2 diabetes attending the diabetes clinic.
2. There was no structured assessment or management of renal impairment within the diabetes service, which resulted in people progressing through the earlier stages of kidney disease undetected and untreated.
3. It was decided to establish a nurse-led renal and diabetes service with the aim of improving clinical outcomes.

Table 1. Stages of chronic kidney disease (NICE, 2008).

CKD stage	eGFR	Description
1	> 90 mL/min/1.73 m ²	Normal GFR with other evidence of chronic kidney damage.
2	60–89 mL/min/1.73 m ²	Slight decrease in GFR, with other evidence of chronic kidney damage.
3 A	45–59 mL/min/1.73 m ²	Moderate decrease in GFR: 30–59 mL/min/1.73 m ² , with or without evidence of kidney damage
3 B	30–44 mL/min/1.73 m ²	
4	15–29 mL/min/1.73 m ²	Severe decrease in GFR 15–29 mL/min/1.73 m ² with or without evidence of kidney damage
5	< 15 mL/min/1.73 m ²	End-stage kidney disease. eGFR <15 mL/min/1.73 m ² or on dialysis. Established renal failure

eGFR=estimated glomerular filtration rate.

How the service was developed

For this predominantly rural area it was important to convince key local stakeholders as to the validity of this new concept. During the site preparation phase, the ANP visited many local general practices to outline the purpose of the service and how it could be accessed.

Initially there was some GP resistance to the concept of a nurse-led service of this nature, because there was no prior equivalent role within Ireland. However, a gradual roll-out of the programme, transparency and continued communication enhanced personal contacts which were essential when gaining support from GPs and other clinicians.

The ANP clinic service initially began in 2007 on site at St Luke’s Hospital with the support of medical colleagues. By 2010 the ANP service was fully developed and had extended services to a satellite clinic base at Sacred Heart Hospital, Carlow, which is 42 km from St Luke’s Hospital.

The ANP screens all those aged over 40 years with type 2 diabetes attending the diabetes service to identify those with potential renal impairment. This is done by determining eGFR using the MDRD formula.

All patients with an eGFR <60 mL/min/1.73 m² are removed from the standard medically led diabetes clinic and transferred to the diabetes and renal impairment clinic provided solely by the ANP.

There are five stages of CKD (Table 1). The ANP provides care for people with CKD stages 1–3. Clear referral protocols to the regional specialist nephrology centre exist for patients whose renal function is declining unexpectedly or who progress to stage 4 or stage 5 CKD. Referral documentation was agreed with consultant nephrologists based at Waterford Regional Hospital during the site development phase. This prevents multiple visits by predominantly older patients to the regional centre, which can be round trips of up to 160 km.

The ANP undertakes the annual review which includes:

- Medical history.
- Education review.
- Targeted system review including foot examination, fundoscopy, assessment of blood pressure, lipid profile, glycaemic control, renal function and anaemia status.

The annual review also incorporates patient management issues such as medication concordance, along with day-to-day issues, for example preparation for exercise, hypoglycaemia treatment and sick day rules. In essence, the ANP annual review incorporates elements of the medically led annual diabetes review with the skills of the diabetes nurse specialist to provide a “one stop shop for diabetes”. The patient sees the same care provider for each visit, providing a personalised and time-efficient service.

Within 1 week of their ANP clinic visit, all patients are contacted to discuss the outcomes of any investigations undertaken and any alterations which may be necessary in their treatment regimen.

Does the ANP service work?

The ANP service was developed incrementally from 2007 to 2009. By 2010, the ANP service was providing a full complement of clinics, with six to seven sessions weekly, held in two locations. To ensure confidence, the ANP clinic service was audited by means of a retrospective review in 2010. The aim of the audit was to:

- Determine if clinical targets for blood pressure, total cholesterol and HbA_{1c} as per NICE (2009) recommendations for type 2 diabetes were achieved.
- Determine if clinical targets for blood pressure, as per NICE (2009) recommendations, and total cholesterol and HbA_{1c} targets for type 2 diabetes and renal impairment were achieved.
- Assess annual rates of eGFR decline for those with CKD. The rate of annual eGFR decline was assessed by examining eGFR values on the same sample of patients with type 2 diabetes and renal impairment over a 3-year period (*n*=50).
- Compare ANP clinic attendance rates with that of usual care diabetes clinics provided by medical staff.
- Assess service user satisfaction.

The eligibility criteria for inclusion in the evaluation were that all persons had type 2 diabetes and were seen by the ANP on two or more occasions. These were compared with the outcomes for medically led diabetes care.

Results

Clinical outcomes

ANP care provided comparable outcomes to the traditional hospital-based diabetes care model in terms of meeting recommended NICE (2009) targets for blood pressure <140/80 mmHg, total cholesterol <4 mmol/L and HbA_{1c} <48 mmol/mol (6.5%) for people with type 2 diabetes (*n*=100).

A subsequent audit of 50 patients looked at the performance of the ANP clinic in achieving

the lower blood pressure targets specified by NICE (2009) for those with type 2 diabetes and kidney damage (<130/80 mmHg) as well as an HbA_{1c} target of <53 mmol/mol (7%) and a total cholesterol target of <4 mmol/L for people with type 2 diabetes with CKD.

Audit confirmed these outcomes were met.

A review of the literature suggests that there would be an expected decline in eGFR on an annual basis as per the Modification of Diet in Renal Disease study (Hunsicker et al, 1997). This study followed patients with all stages of CKD over a 2-year period and concluded that 85% of patients had a decline in their GFR, with the average rate of decline estimated at approximately 4 mL/min annually regardless of the baseline GFR.

The rate of annual eGFR decline was assessed by examining eGFR values on the same sample of patients with type 2 diabetes and renal impairment (*n*=50) over a 3-year period (2009–2011). The audit outcomes demonstrated that renal function was preserved and in fact improved over the 3-year period for patients attending the ANP service. The average eGFR in 2009 was 48.8 mL/min/1.73 m²; in 2010 it was 49.7 mL/min/1.73 m²; and in 2011 it was 51.05 mL/min/1.73 m².

Patient satisfaction outcomes

In 2010 and 2011 the ANP diabetes service had a much lower patient non-attendance rate (<1%) when compared with traditional medical-led diabetes care (16%). The reasons for this may lie in what the service user sees as added value from visiting a personalised local service which has follow-up telephone support and feedback following each consultation.

The ANP undertook patient satisfaction research in 2010 to measure patient satisfaction with the ANP-led diabetes care and to investigate the factors which influence continued engagement with the ANP diabetes service, utilising an anonymous postal survey (*n*=100, response rate=78%).

For the purpose of the research, Risser's Patient Satisfaction Instrument (1975) was utilised. This was chosen because it was one of the first instruments to specifically measure

Page points

1. Everyone seen in the ANP clinic is contacted within 1 week of their visit to discuss test results and any adjustment to their treatment regimen.
2. The ANP service was developed incrementally from 2007 to 2009, and was then audited.
3. ANP care provided comparable outcomes to the traditional hospital-based diabetes care model in terms of meeting NICE targets.

Page points

1. This research demonstrated that patients value continuity of care, care which is personalised to their individual needs and nurse-led care.
2. The service had clinical outcomes comparable to standard diabetes care for people with type 2 diabetes and those with type 2 diabetes and CKD.
3. This type of nurse-led care represents excellent value and use of resources.

patient satisfaction with advanced practice care in the outpatient/ambulatory setting.

The instrument provided a means by which ANPs can clearly measure satisfaction levels amongst the people they provide care for and also help to identify their unique contribution to patient care.

This research demonstrated that patients value continuity of care which is personalised to their individual needs. People also value diabetes care which is provided by a nurse, encompassing the characteristics which separate nursing care from that provided by other healthcare disciplines, such as empathy, advocacy and holism. These outcomes are supported by the fact that 98.5% of those surveyed said they would prefer to remain in ANP-led diabetes care rather than return to standard, medically led diabetes care.

Discussion

The outcomes from clinical audit demonstrate that the ANP service has outcomes comparable with standard diabetes care for people with type 2 diabetes alone and type 2 diabetes with CKD. There has also been a stabilisation in renal function and therefore a delay in the rate of progression to end-stage renal failure in people with CKD.

A decline in renal function can be anticipated with type 2 diabetes and the ageing process, however the interventions by the ANP and strict adherence to achieving target values for blood pressure, lipids and glycaemic control have had a positive impact preventing decline in renal function. Together with a low non-attendance rate (<1%) this represents timely, appropriate and cost-effective use of resources within the current economic climate.

Conclusions

The clinical audit outcomes demonstrate that the ANP service achieves clinical outcomes in line with national and international guidance. There is much evidence in the literature to support the benefit of the ANP role in terms of improved patient care, satisfaction and the considerable impact that nurse directed

care yielded on use of economic resources (Davidson et al, 2007).

Within the Irish healthcare system, the ANP is relatively new. However the role of the ANP and advanced practice are both clearly defined and operate within the NCNM framework (NCNM, 2007). This provides the operating mechanism to support such roles.

The site development process ensures the appropriate support structures are in place with participation from all key stakeholders. This promotes the environment for new expanded roles to move into the clinical setting and transcend the traditional boundaries of nursing care provision.

The outcomes from such service innovation have the potential to provide valuable data from a number of perspectives. At a time when money is limited, this type of care represents excellent value and use of resources. Consideration should therefore be given by planners and providers to examine new and innovative ways of delivering quality health care meeting the needs of the provider and participant in care.

ANPs may deliver many of the same services as their medical colleagues, however the way in which they deliver care differs in terms of content and emphasis. Nurse practitioner care encompasses the somatic and psychological needs of the patient, such as client education, early intervention, mutual goal setting, self-care, ongoing case management and support for the patient by the ANP, which according to Brown and Grimes (1995) are under-reported. ■

Arikan H, Tuglular S (2005) The growing global burden of end stage renal disease. *Marmara Medical Journal* **18**: 143–50

Brown SA, Grimes DE (1995) A meta-analysis of nurse practitioners and nurse midwives in primary care. *Nurs Res* **44**: 332–9

Coresh J, Selvin E, Stevens LA et al (2007) Prevalence of chronic kidney disease in the United States. *JAMA* **298**: 2038–47

Davidson MB, Ansari A, Karlan V (2007) Effect of a nurse-directed diabetes disease management program on urgent care/emergency room visits and hospitalizations in a minority population. *Diabetes Care* **30**: 224–7

- Diabetes Control and Complications Trial Research Group (1993) The Effects of Intensive treatment of diabetes in the development and progression of long term complications in insulin dependent diabetes mellitus. *New Engl J Med* **329**: 978–84
- Gardner G, Gardner A, Proctor M (2004) Nurse practitioner education: a research-based curriculum structure. *J Adv Nurs* **47**: 143–52
- Hunsicker LG, Adler S, Caggiula A et al (1997) Predictors in the progression of renal disease in the Modification of Diet in Renal Disease Study. *Kidney Int* **51**: 1908–19
- Kee F, Reaney EA, Maxwell AP et al (2004) Late referral for assessment of renal failure. *J Epidemiol Community Health* **59**: 386–8
- Kilberd B (2006) The chronic kidney disease epidemic: stepping back and moving forward. *J Am Soc Nephrol* **17**: 2967–73
- Levey AS, Coresh J, Greene T et al (2007) Expressing the Modification of Diet in Renal Disease Study equation for estimating glomerular filtration rate with standardized serum creatinine values. *Clin Chem* **53**: 766–72
- Mac Lellan K (2007) Expanding practice: developments in nursing and midwifery career pathways. *Nurs Manag (Harrow)* **14**: 28–34
- Mantzoukas S, Watkinson S (2006) Review of advanced nursing practice: the international literature and developing the generic features. *J Clin Nurs* **16**: 28–37
- National Council for the Professional Development of Nursing and Midwifery (2007) *Framework for the Establishment of Advanced Nurse Practitioner and Advanced Midwife Practitioner Posts*. 3rd ed. National Council for the Professional Development of Nursing and Midwifery, Dublin
- National Kidney Foundation (2002) K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Am J Kidney Dis* **39** (2 Suppl 1): S1–266
- NICE (2008) *Early Identification and Management of Chronic Kidney Disease in Adults in Primary and Secondary Care*. Clinical Guideline 73. NICE, London. Available at: www.nice.org.uk/cg73 (accessed 18.03.12)
- NICE (2009) *Type 2 Diabetes: The management of type 2 diabetes*. Clinical Guideline 87. NICE, London. Available at: www.nice.org.uk/cg87 (accessed 18.03.12)
- Risser NL (1975) Development of an instrument to measure patient satisfaction with nurses and nursing care in primary care settings. *Nurs Res* **24**: 45–52
- UK Prospective Diabetes Study Group (1998) Intensive blood glucose control with Sulphonylureas or insulin compared with conventional treatment and risk of complications in people with type 2 diabetes. (UKPDS 33). *Lancet* **352**: 837–53