

# Advanced practice nursing in dialysis: effect of the renal access coordinator on patient outcomes.

Monica Schoch<sup>1</sup>, Paul Bennett<sup>2</sup>, Renee Fiolet<sup>1</sup>, Bridie Kent<sup>3</sup> & Catherine Au<sup>4</sup>

<sup>1</sup>Deakin University, Victoria, Australia <sup>2</sup>Deakin University/Western Health Partnership, <sup>3</sup>Plymouth University UK, <sup>4</sup>Deakin University/Monash Health Partnership

## Introduction

Advanced practice nursing has evolved slowly in Australia when compared to international counterparts. Whilst it is important to develop advanced practice nursing roles in healthcare to streamline the patient journey and provide clinical career pathways for expert nursing staff, there needs to be associated outcome measures to quantify the value of the role<sup>1</sup>

## Aim

To critically appraise and synthesise the best available evidence related to the impact of renal access coordinators on dialysis patient outcomes and associated service delivery.



## Methods & Materials

A three-step search strategy was utilised in line with the Johanna Briggs Institute (JBI) systematic review process<sup>2</sup> to find published and unpublished studies. Studies published between 1990 and October 2014 were considered for inclusion.

## Results

The search only identified prospective and retrospective studies before and after studies and one prospective quality assurance report to evaluate the impact of the RAC on patient outcomes and service delivery.

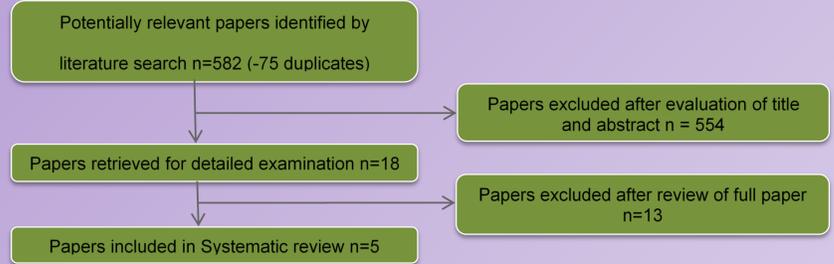


Figure 2: Search Results

Studies	RAC+: full time	Protocols Implemented	AVF incidence & prevalence	AVG incidence and prevalence	CVC incidence and prevalence	P value	Patency rates
Dwyer (2012)	Yes	Comprehensive protocols for management of AVF, AVG, CVC.	PP ↑19.3%	PP ↓7%	* <90 days in situ (p=0.924) #>90 days in situ (↓5%, p=0.000018)	Increase in AVF rate pre vs post implementation PP: p= <0.001 Decrease in CVC rates pre vs post intervention PP: p= <0.003	Not measured
Kalman (1999)	Yes	Algorithm for selection of vascular access type and site	Not measured	Not measured	Not measured	AVF vs AVG Primary success P= <0.01 AVF vs AVG Primary Assisted success p= <0.001 AVF vs AVG Secondary Success P=0.331	Measured at 2 years Primary: AVF 54% ± 4%, AVG 18% ± 4% Primary Assisted: AVF 62% ± 4%, AVG 44% ± 6%. Secondary: AVF 70% ± 4%, AVG 60% ± 5%.
Kiaii (2008)	Yes	Provincial surgical urgency criteria scale (wait list)	IP ↑25% PP ↑4%	IP ↓4%	IP Tunnelled: ↓ 29%. IP Non-Tunnelled no change PP Tunnelled: ↓ 11%	Increase in AVF rates vs decrease in tunnelled CVC rates pre and post intervention. IP: p= 0.04 PP: p= 0.015	Not measured
Polkinghorne (2009)	Yes	Algorithm to prioritize surgery	IP ↑19%	IP ↓4%	IP ↓ 14%	Likelihood of starting dialysis with AVF pre vs post implementation IP: p= 0.03	Not measured
Van Loon (2007)	Yes	Multidisciplinary protocols for maintenance and intervention of vascular access.	IP ↑ 8% PP ↑ 3%	IP ↓7% PP ↓1%	IP Temp. subclavian CVC's : ↓ 23% Temp. IJ CVC's: ↑ 10% (overall *non-tunnelled: ↓ 13%). IP Tunnelled : ↑ 12% # Non-Tunnelled CVC's: ↓ 2% PP Tunnelled CVC's: No change (11%)	Increase in AVFs pre vs post intervention. IP: p= <0.01 PP: p= <0.01	Not measured

Figure 3: Synthesis of articles

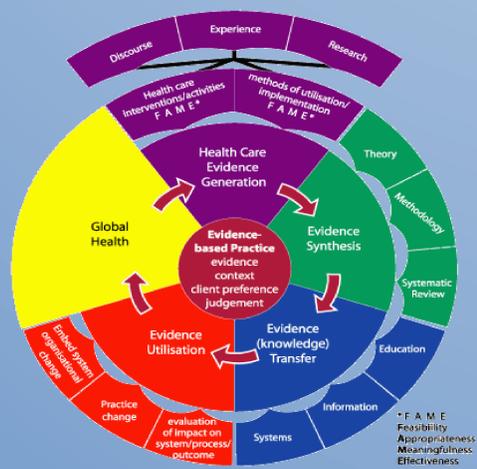
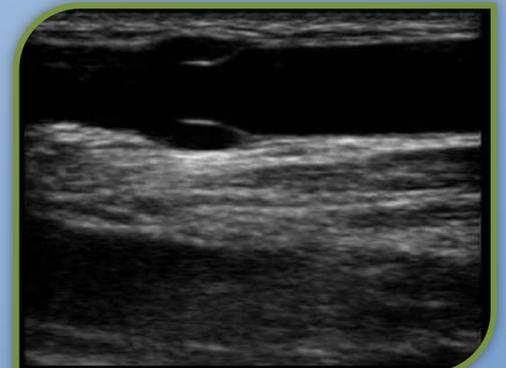


Figure 1: The JBI Conceptual Model of Evidence-Based Health Care<sup>2</sup>



## Conclusions

This review found that patient outcomes, such as the incidence and prevalence of AVF compared to AVG and CVC and patency rates of AVF and AVG can be improved with the introduction of a vascular access program with a coordinating RAC.

Although anecdotally it has been reported that the RAC has a positive effect on patient outcomes, and the included studies did attribute the beneficial outcomes partly to the RAC, it was difficult to delineate between the effect of the multidisciplinary intervention (or any other unknown nuisance variable) and the RAC intervention.

This review highlighted that there is a significant gap in the literature, particularly a lack of RCTs and longitudinal studies, measuring the effect of RAC role on patient outcomes and service delivery in haemodialysis units. Based on the pre and post cohort studies and quality report presented in this review a RAC may have a positive effect on improvement of patient outcomes, however there is insufficient high level evidence to draw firm conclusions.

Based on the evidence presented in this review, implementation of a vascular access program which includes an RAC as a central coordinator is provisionally recommended to improve patient outcomes related to vascular access, such as an increase in AVF creations and decrease in CVC insertions (JBI Level of evidence E3c<sup>3-7</sup>).

## References

- Happell, B, Pharm, M & Stud, MN 2006, 'The clinical nurse specialist and nurse practitioner roles: Room for both or take your pick?', *Australian Journal of Advanced Nursing*, vol. 24, no. 2.
- Pearson, A, Wiechula, R & Lockwood, C 2005, 'The JBI model of evidence-based healthcare', *International Journal of Evidence-Based Healthcare*, vol. 3, no. 8, pp. 207-15.
- Kalman, PG, Pope, M, Bhola, C, Richardson, R & Sniderman, KW 1999, 'A practical approach to vascular access for hemodialysis and predictors of success', *Journal of Vascular Surgery*, vol. 30, no. 4, pp. 727-33.
- Kiaii, M & MacRae, JM 2008, 'A dedicated vascular access program can improve arteriovenous fistula rates without increasing catheters', *The Journal Of Vascular Access*, vol. 9, no. 4, pp. 254-9.
- Polkinghorne, KR, Seneviratne, M & Kerr, P 2009, 'Effect of a vascular access nurse coordinator to reduce central venous catheter use in incident hemodialysis patients: A quality improvement report', *American Journal of Kidney Diseases*, vol. 53, no. 1, pp. 99-106.
- Van Loon, M, Van der Mark, W, Beukers, N, De Bruin, C, Blankestijn, P, Huisman, R, Zijlstra, J, van der Sande, F & Tordoir, J 2007, 'Implementation of a vascular access quality programme improves vascular access care', *Nephrology Dialysis Transplantation*, vol. 22, no. 6, pp. 1628-32.
- Dwyer, A, Shelton, P, Brier, M & Aronoff, G 2012, 'A vascular access coordinator improves the prevalent fistula rate', in *Seminars In Dialysis*, vol. 25, pp. 239-43.