IMPROVING EARLY DETECTION OF HAEMODIALYSIS CATHETER MIGRATION IN THE DIALYSIS UNIT

A Quality Improvement Project

RSA CONFERENCE 2026 — CHRISTCHURCH

Minn Tock | Royal Melbourne Hospital

Acknowledgement of Country

The Royal Melbourne Hospital acknowledges the Wurundjeri people of the Kulin Nation as the Traditional Custodians of the land we are conducted the research on and pay our respects to Elders past and present.

I would like to also acknowledge Ngāi Tahu, as mana whenua of this area, and pay my respects to their elders, past, present, and emerging.



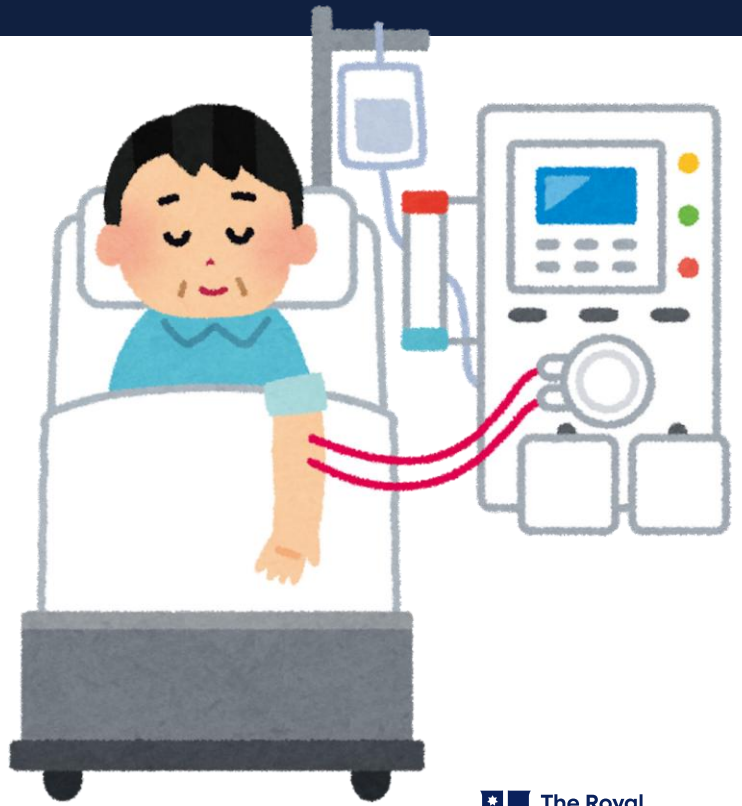
Connection
by Kenita-Lee McCartney

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INTRODUCTION — WHY IS THIS IMPORTANT?

Catheter migration can lead to:

- Exposed catheter cuff — increasing infection risk
- Catheter tip malposition — risk of massive bleeding and clinical complications
- Hospital admission
- Radiological or operative intervention
- Urgent dialysis in an acute setting



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CURRENT GOLD STANDARD

01

Chest X-Ray (or Abdominal X-Ray)

02

Monitoring of dialysis flow and pressures

03

Nursing assessments

IS THERE MORE WE CAN DO?

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CRITICAL INCIDENT

1

Patient attended satellite dialysis unit to offload pressure in the acute unit

2

Dialysis via RIGHT Haemodialysis Catheter — inserted 49 days prior

3

Dressing intact and not due for change. Hourly access checks performed as per policy

4

10 min before treatment completion — catheter migrated, internal cuff exposed.

SHORT-TERM SURVEILLANCE

FOUR WEEKS

of additional monitoring across three dialysis satellite units

ADDITIONAL DATA COLLECTED

Visible catheter length at each treatment, along with photographic records of catheter exit site and cuff position during weekly dressing changes

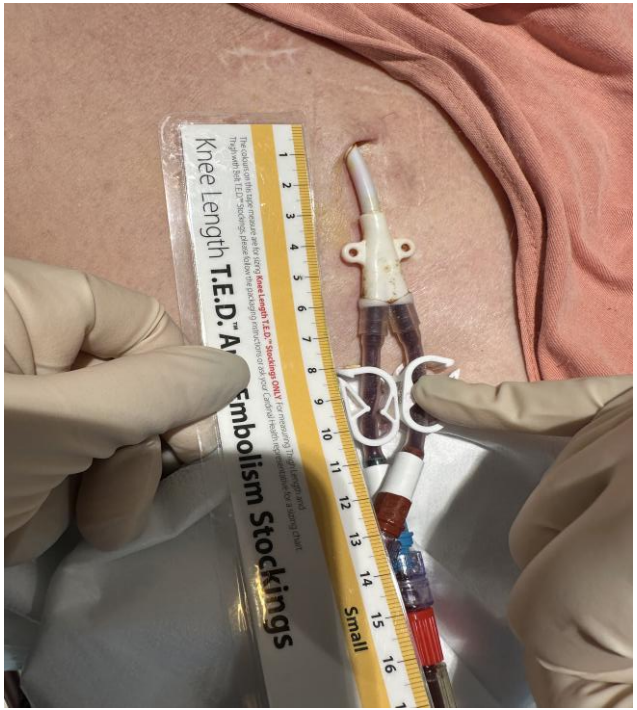
STANDARD CARE

Weekly catheter dressings/high flow needle-free connector changes, exit site assessment, BFR/clearance, PRN dressing changes if necessary

DOCUMENTATION

On electronic medical records, and the additional data collected was also collated onto a standardised collection tool

PHOTOGRAPHIC RECORDS & MEASUREMENTS





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AIM & OBJECTIVES

AIM

To evaluate current haemodialysis catheter assessment and monitoring practices, identify variations in care, and determine whether enhanced surveillance using routine external catheter length measurements may support earlier identification of catheter migration.

OBJECTIVES

01 Review trends in catheter measurements

02 Assess feasibility of enhanced monitoring within routine care

03 Explore factors associated with measurement variation, including dressing-related and dialysis-related factors

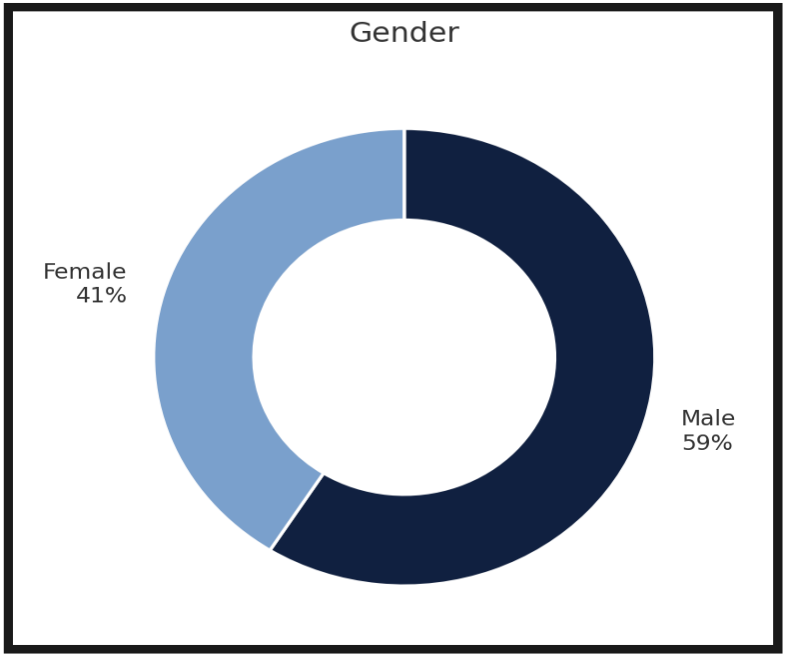
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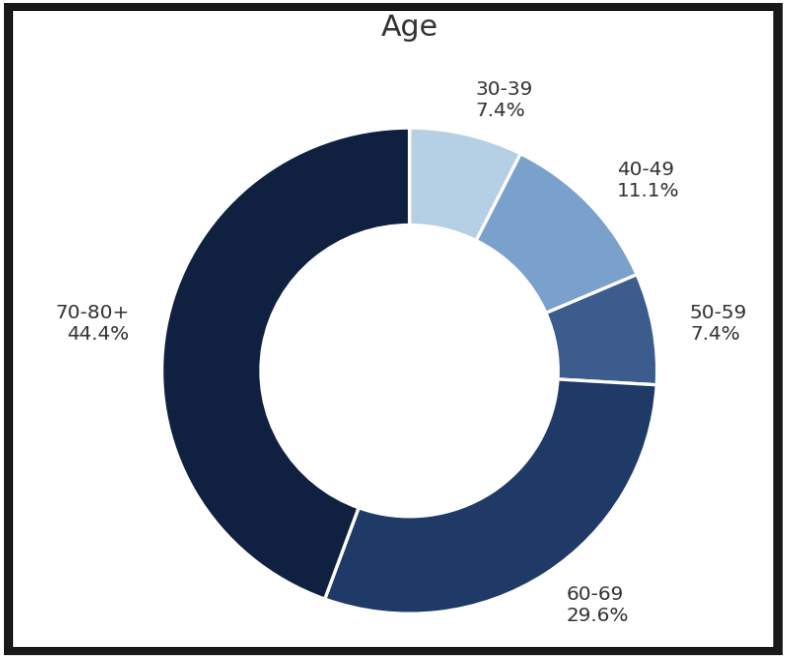
METHODOLOGY

What did we do? How did we do it?

- Retrospective QA review of the 4-week monitoring period within 3 dialysis satellite units
- Existing EMR and dressing records used
- Reviewed standardised measurement worksheet to ensure data accuracy
- Longitudinal line graphs plotted — change in visible catheter length relative to baseline, allowing visual assessment of catheter stability and trends
- Included correlation with BFR / Kt/V

Patient Demographics

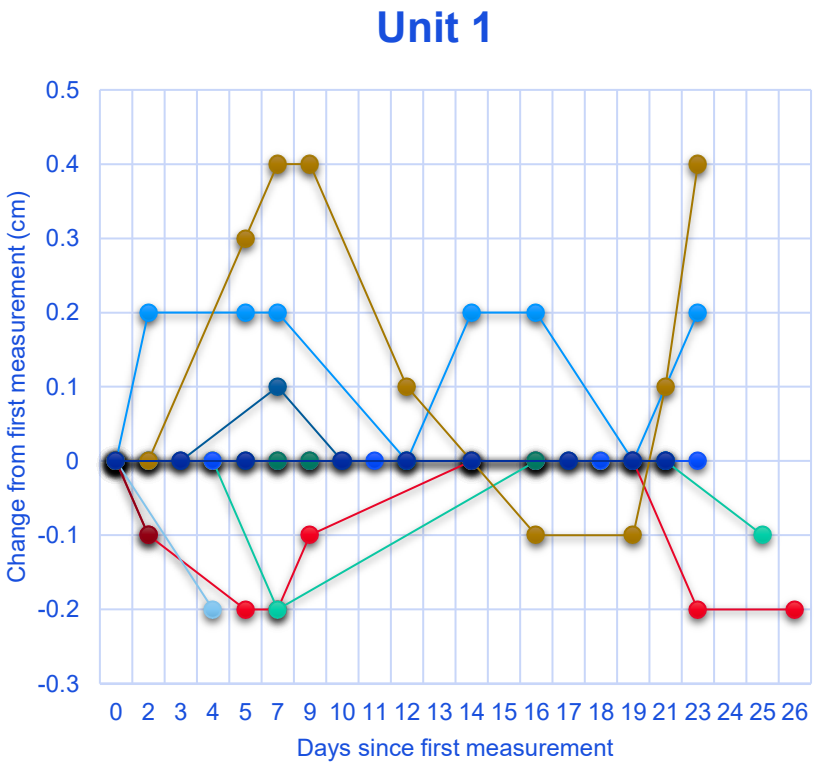




Mean Age= 65.2 (SD = 13.7)

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DATA · UNIT #1



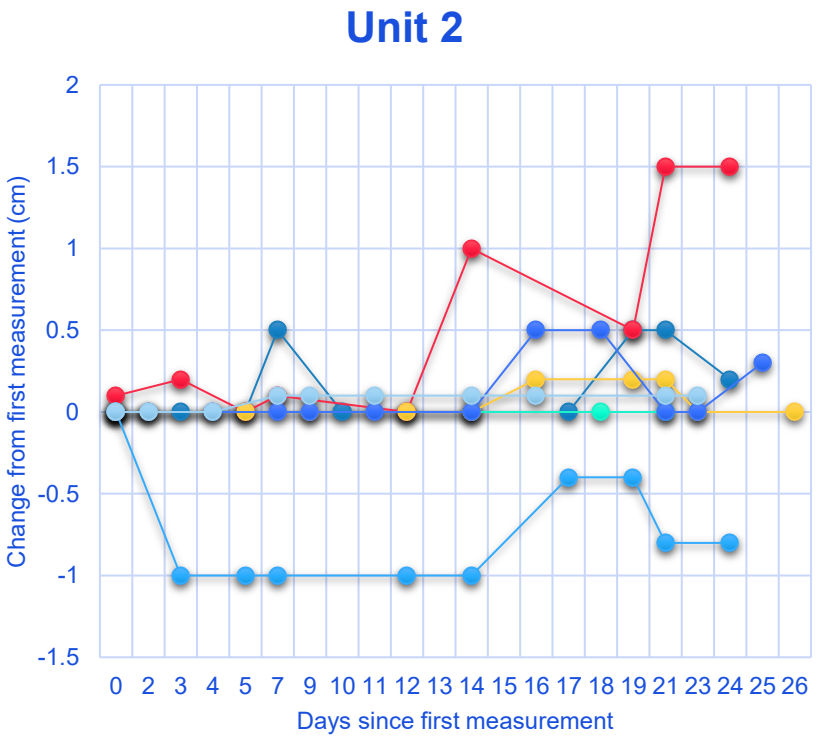
Stable measurements across the unit, minimal change **(-0.2cm to +0.4cm)**

Haemodialysis catheter dressings for two patients were completed every treatment.

Average duration of haemodialysis catheter: 10.5 months (SD=8.5)

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DATA · UNIT #2



Measurements ranged from **-0.8cm to +1.5cm**

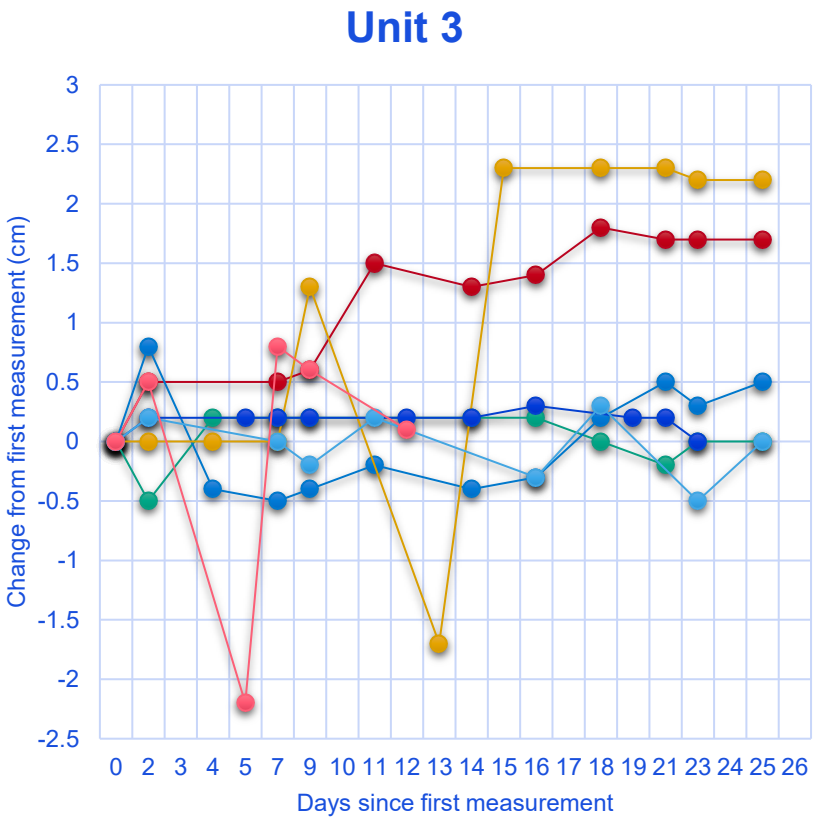
Notably, there was a gradual increase in the external length of **+1.5cm** since the initial measurement,

- associated with a decrease in the BFR from 300mls/min to 250-280mls/min.
- clearance (Kt/V) stable at 0.7-0.8

Average duration of haemodialysis catheter: 6.7 months (SD=4.9)

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DATA · UNIT #3



Measurements ranged from **-0.5 cm to +2.2cm**

Patient with the largest measurement variation (+2.2cm)

- Blood flow rates (BFR) commonly range between 250–285 mL/min, with occasional reductions to 225–250 mL/min
- Lower dialysis clearance values (Kt/V 0.8–0.9)

Patient with the second largest measurement (+1.7cm) variation demonstrated:

- BFR ranging between 230–300 mL/min
- Dialysis clearance values between Kt/V 1.0–1.3

Average duration of haemodialysis catheter: 16.1 months (SD=20.9)

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KEY FINDINGS

AIM

Enhanced surveillance was feasible and meaningful.

- Routine external catheter measurements were practical within existing dialysis workflows
- Measurable variations in catheter position were identified that may support earlier recognition of catheter migration

KEY FINDINGS — OBJECTIVES

01 Trends in catheter measurements

- Most catheters showed minimal positional change
- Unit 1 measurements within ±0.4 cm
- Range across all units: −0.8 cm to +2.2 cm

02 Feasibility of enhanced monitoring

- Successfully incorporated into existing dialysis workflows
- Collected alongside standard catheter assessments
- Low-cost, non-invasive, practical for routine use

03 Factors associated with variation

- Greater variation observed in one unit
- Larger changes linked with fluctuating BFR and lower Kt/V
- Dressing integrity may contribute to variation

DISCUSSION

Routine external catheter length measurement represents a:

- Simple
- Low-cost
- Non-invasive
- Nurse/Renal Physiologist-led surveillance strategy

This approach may assist in:

- Identifying patients requiring closer review — by detecting subtle positional changes earlier
- Prompting earlier escalation or imaging where clinically indicated
- Reducing the risk of significant catheter dislodgement and associated complications

Dressing integrity and management practices emerged as potential contributors to measurement variation — warranting further investigation.

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LIMITATIONS

01 Retrospective design, small sample size (n=27), short surveillance period (4 weeks)

02 Measurement techniques potentially varied between clinicians and across assessment periods

03 Limited continuity of monitoring data due to hospitalisation or patient leave

04 Intra and inter-observer error

05 No confirmed migration events occurred during the monitoring period

06 No established measurement threshold to indicate clinically significant migration requiring escalation

NEXT STEPS

1. Explore contributing factors: dressing integrity, patient handling, catheter care practices, and dialysis adequacy indicators (BFR and Kt/V)

2. Consider incorporating haemodialysis catheter length measurement into current clinical policy

3. Future prospective study with larger sample, longer monitoring period, and predefined escalation criteria

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- **Dialysis Units Managers and Staffs**
- **Department of Nephrology**
- **RMH Office for Research**

TAKE HOME MESSAGE

Routine haemodialysis catheter measurement monitoring may provide a simple, low-cost adjunct to standard surveillance practices and may assist in earlier identification of catheter migration in selected patients.

Questions?

Thank You

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