Providing peritoneal dialysis safely to patients with barriers to self-care

Home Dialysis Interest Group Meeting
Richmond Hill

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University of Toronto
May 22, 2014
Declarations

- Inventor of the Dialysis Measurement Analysis and Reporting (DMAR) quality improvement system

- Support for a new ISPD – North American Chapter PD Catheter Quality Improvement Registry from Baxter Corporation
Objectives

- To describe barriers to self-care PD
- To describe how support impacts patients with barriers to self-care
- To review safety concerns for assisted PD patients
The demographic profile of new dialysis patients in Ontario, Canada

Assisted PD patients are much older than self-care patients

<table>
<thead>
<tr>
<th></th>
<th>Self-care (N=44)</th>
<th>Assisted (N=61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean</td>
<td>63</td>
<td>74</td>
</tr>
<tr>
<td>Diabetes, %</td>
<td>50</td>
<td>53</td>
</tr>
<tr>
<td>Coronary artery disease, %</td>
<td>25</td>
<td>51</td>
</tr>
<tr>
<td>Congestive heart failure, %</td>
<td>23</td>
<td>38</td>
</tr>
<tr>
<td>Other cardiac, %</td>
<td>25</td>
<td>44</td>
</tr>
<tr>
<td>Peripheral vascular disease, %</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Cerebrovascular disease, %</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>History/active cancer, %</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>12 months of predialysis care, %</td>
<td>68</td>
<td>75</td>
</tr>
<tr>
<td>eGFR at start, ml/min, mean</td>
<td>8.1</td>
<td>12.9</td>
</tr>
</tbody>
</table>

Sunnybrook Data, unpublished
Patients have shortened life expectancy

Figure 1: Quartiles of life expectancy after dialysis initiation by age group.

Framework to understand PD utilization

1. Identify patients
2. Assess for PD eligibility
3. Determine if eligible for PD
4. Offer PD to eligible patients
5. Patient chooses PD and attempts PD catheter
6. Patient receives PD

Add new PD patients

Time on PD therapy

PD population

Loss of PD patients

7. Technique failure
8. Transplantation
9. Death
10. Other loss (Transfer out)

Eligibility – Contraindications, barriers and support

Incident ESRD Patients

Contraindications to PD (Medical or Social)

Potential PD Candidates

Barriers to self-care PD (cannot be overcome by support)

Eligible for PD

PD contraindications

- Abdominal aneurysm
- Abdominal scarring
- Ascites/cirrhosis
- Bowel cancer
- Colostomy
- Diverticulitis
- Future abdominal surgery
- Hernia (not repairable)
- Ileal conduit
- Ileostomy
- Obesity
- Polycystic kidney disease
- Nursing home
- Complex continuing care
- Retirement home
- No permanent residence
- Residence - other
Barriers to peritoneal dialysis

- Medical
- Cognitive
- Physical
- Social
- Other

DMAR system, unpublished
Barriers to peritoneal dialysis

**Medical**

- Abdominal aortic aneurysm
- Abdominal scarring
- Ascites
- Bowel cancer
- Bowel obstruction
- Colostomy
- Diarrhea
- Diverticulitis
- Future abdominal surgery
- Gastroparesis
- Other

- Hernia
- Ileal conduit
- Ileostomy
- Incontinence
- Inflammatory bowel disease
- Insomnia
- Ischemic gut
- Nephrotic syndrome
- Obesity
- Polycystic kidneys

DMAR system, unpublished
Barriers to peritoneal dialysis

**Physical**

- Decreased hearing/deafness
- Decreased manual dexterity
- Decreased strength to lift PD bags
- Decreased vision/blindness
- Frailty
- Poor hygiene
- Reduced mobility
- Other

DMAR system, unpublished
Barriers to peritoneal dialysis

Cognitive

- Anxiety
- Aphasia/dysphasia
- Dementia
- Language barrier
- Other
- Learning disability
- Mild cognitive impairment
- Non-compliance
- Psychiatric disorder

DMAR system, unpublished
Barriers to peritoneal dialysis

Social

- Employment
- Primary caregiver
- Small living space
- Other

Other

- Imminent transplant
- Moving out of region
- Other

DMAR system, unpublished
### Eligibility – Barriers to self-care PD

N = 940 consecutive patients across 3 programs who were assessed for PD and did not have a medical or social contraindication identified (unpublished data)

<table>
<thead>
<tr>
<th>Category</th>
<th>Types</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Strength, Dexterity, Vision, Hearing, immobility, frailty</td>
<td>41%</td>
</tr>
<tr>
<td>Cognitive</td>
<td>Dementia, psychiatric illnesses, anxiety, non-compliance, language barriers, learning disabilities</td>
<td>37%</td>
</tr>
</tbody>
</table>
Eligibility – Contraindications, barriers and support

Incident ESRD Patients

Potential PD Candidates

Eligible for PD

Contraindications to PD (Medical or Social)

Barriers to self-care PD (cannot be overcome by support)

Support overcomes barriers to self-care

PD Support

- Family
- Home Care
- Paid Caregiver
- Nursing Home
Support overcomes barriers to self-care

Family assistance increases PD choice

Eligibility and Choice

13% of patients expressed doubt, anxieties, and lack of confidence as a reason for not choosing PD

The utilization of assisted PD is high in Ontario, Canada where it is widely available.
Key components of assisted PD

- **Target population:** Patients with barriers to self-care (elderly)
- **Target area:** Densely populated (urban)
- **Assistants:** Nurses or nursing assistants
- **Tasks:** Assessments, machine set-up, connection, disconnection
- **Funding:** Home agencies, PD programs and Industry
Tasks being performed

Five most common PD steps for which elderly patients require assistance

- Preparing bags
- Discarding supplies
- Cleaning catheter site
- Ordering supplies
- Troubleshooting

Oliver MJ and Jassal VJ. ISPD study - ongoing
Cost considerations

![Bar chart showing patient percentages for different groups](image-url)
Cost is largely determined by mean rate of visits

Figure 1 | Weekly rate of home care nursing visits. The rate of home care visits is indicated in the total PD population living in the region of home care assistance (solid line) and the subgroup of patients who received assistance at some point (dashed line). The home rate was stable over time and below the maximum rate available, which were 14 visits per week.

Additional operating cost of $12,000 per patient-year at $50.00 per visit (all RNs) during the pilot program.

Support overcomes barriers to self-care

PD Support
- Family
- Home Care
- Paid Caregiver
- Nursing Home

Provision of Peritoneal Dialysis in Long-Term Care (LTC) Homes

Process and Guidelines for Approval of LTC Homes to Provide PD Care

December 11, 2008

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1.1 The Provincial Peritoneal Dialysis Initiative
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2.2 Process for approval of LTC homes to provide PD care
2.2.1 Submitting an expression of interest

Section 3: Establishing a Partnership between CKD Regional Programs and LTC Homes
3.1 Determining eligibility of a LTC home to provide PD care
3.2 Joint letter of request for approval of a CKD regional program partnered LTC home to provide PD care
3.2.1 Content of the joint letter of request
3.2.2 Terms and Conditions
3.2.3 Submission of the joint letter of request/approval
3.3 Review and Recommendation
3.4 Approval/Denial

Section 4: Program Funding and Resources
4.1 Appendices

Appendix A: Partnership Agreement
Appendix B: LTC PD protocol
Appendix C: Funding for LTC home staff training replacement costs
Appendix D: Sample invoice for funding for LTC home staff training replacement costs
Appendix E: Weekly report for LTC homes - draft example
Appendix F: Weekly report for LTC homes - blank form
Virtual Wards

- Multi-centre study of home dialysis patients
- Intervention = once to thrice-weekly physician or nurse administered standardized patient assessment tool
- Admission for 14 days

Methods/Design:
The HDVW Pilot Study will enroll consecutive PD and HHD patients who fulfilled our inclusion criteria, which include anyone of: 1. following discharge from hospital, 2. after interventional procedure(s), 3. prescription of anti-microbial agents, or 4. following completion of home dialysis training. Clinician-led telephone interviews are performed weekly for 2 weeks until VW discharge. Case-mix (modified Charlson Comorbidity Index), symptoms (the modified Edmonton Symptom Assessment Scale) and patient satisfaction are assessed serially. The number of VW interventions relating to eight pre-specified domains will be measured. Adverse events such as re-hospitalization and health-services utilization will be ascertained through telephone follow-up after discharge from the VW at 2, 4, 12, and 24 weeks.

Schachter et al. BMC Nephrology 2014, 15:33
Remote monitoring

Fresenius Ultracare with KNX™

Text based support in India
Safety Concerns
Technique survival – French PD registry

<table>
<thead>
<tr>
<th>Event per Type of Assistance</th>
<th>6 Months</th>
<th>12 Months</th>
<th>18 Months</th>
<th>24 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-PD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>death</td>
<td>1.8</td>
<td>3.8</td>
<td>5.4</td>
<td>7.2</td>
</tr>
<tr>
<td>renal recovery</td>
<td>0.6</td>
<td>1.0</td>
<td>1.1</td>
<td>1.3</td>
</tr>
<tr>
<td>transfer to HD</td>
<td>6.6</td>
<td>12.4</td>
<td>17.2</td>
<td>21.5</td>
</tr>
<tr>
<td>renal transplantation</td>
<td>4.4</td>
<td>12.2</td>
<td>19.1</td>
<td>24.7</td>
</tr>
<tr>
<td>Assisted PD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>death</td>
<td>13.8</td>
<td>24.3</td>
<td>32.5</td>
<td>39.8</td>
</tr>
<tr>
<td>renal recovery</td>
<td>0.7</td>
<td>1.1</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>transfer to HD</td>
<td>6.1</td>
<td>9.5</td>
<td>12.7</td>
<td>15.0</td>
</tr>
<tr>
<td>renal transplantation</td>
<td>0.3</td>
<td>0.7</td>
<td>0.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Data are expressed as percentages. PD, peritoneal dialysis; HD, hemodialysis.

Technique survival – increased by assistance


<table>
<thead>
<tr>
<th>Assistance</th>
<th>Cause-Specific RH (95% CI)</th>
<th>Subdistribution RH for HD (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Death</td>
<td>Recovery</td>
</tr>
<tr>
<td>Family-assisted PD (reference group: nurse and self-care PD)</td>
<td>2.23 (1.97–2.53)</td>
<td>0.72 (0.40–1.31)</td>
</tr>
<tr>
<td>Nurse-assisted PD (reference group: family and self-care)</td>
<td>2.18 (1.96–2.42)</td>
<td>0.74 (0.48–1.13)</td>
</tr>
<tr>
<td>Assisted PD (reference group: self-care PD)</td>
<td>2.19 (1.98–2.43)</td>
<td>0.73 (0.49–1.10)</td>
</tr>
</tbody>
</table>

Adjusted for age, sex, modified Charlson comorbidity index, underlying nephropathy, failed transplantation, transfer to hemodialysis, early peritonitis, and center size. RH, relative hazard; CI, confidence interval; HD, hemodialysis; PD, peritoneal dialysis.
Peritonitis

- Verger et al (France) – 1 per 36 months (similar to self-care, worse than family assisted PD)
- Xu et al (China) – 1 per 55 months (no difference between assisted and self-care PD)
- Hsieh (Taiwan) – 1 per 24 months (higher than family assisted or self-care PD)
Table 4. Probability of being peritonitis free at 24 and 36 months for AAPD patients when assisted by a private nurse, whether the training centre makes home visits or not

<table>
<thead>
<tr>
<th>Type of Centre</th>
<th>Number of patients</th>
<th>Probability of being peritonitis free (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>at 24 months</td>
<td>at 36 months</td>
</tr>
<tr>
<td>With home visits</td>
<td>207</td>
<td>63.8% (51.7–75.9%)</td>
<td>50.8% (34.2–67.5%)</td>
</tr>
<tr>
<td>Without home visits</td>
<td>152</td>
<td>42.4% (28.9–55.9%)</td>
<td>33.9% (17.4–50.3%)</td>
</tr>
</tbody>
</table>

What is not known about PD support interventions

- The effect of implementing support on PD utilization at a program, regional or national level.
- Whether the added cost of implementing programs is “paid back” from increasing PD utilization
- The effect of support on other important outcomes such as hospitalization and mortality adjusted for the significant differences in the populations
  - ICES – DMAR study comparing assisted PD to matched incenter HD patient is underway
Summary

- Barriers to self-care are common because of the aging of the dialysis population.
- Barriers are common and can be classified as medical, physical, cognitive, social, and other.
- Assisted PD and home visits are the primary intervention to address barriers but newer interventions such as virtual wards and remote monitoring are being developed.
- Evidence suggests patients with barriers have a high rate of adverse events due to age and comorbidity but there is no clear evidence PD is unsafe in these patients.
Partners

ICES Institute for Clinical Evaluative Sciences

Sunnybrook Health Sciences Centre

Halton Healthcare

MaRS

Manitoba Renal Program Programme manitobain des maladies rénales

London Health Sciences Centre

The Ottawa Hospital L'Hôpital d'Ottawa

St. Michael's Inspired Care. Inspiring Science.

MG-CARE

Alberta Health Services

hospital ORILLIA SOLDIERS' MEMORIAL