Assessing patient suitability for peritoneal dialysis

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Abstract

Learning outcomes:

On completion of this continuing professional development activity, participants will be able to:

1. List the relative and absolute contraindications for peritoneal dialysis.
2. Discuss the main issues related to the assessment of people considering peritoneal dialysis.
3. Identify assessment tools that can be utilised to assess people’s capability to perform peritoneal dialysis safely.

Keywords

Peritoneal dialysis, patient assessment, pre-dialysis, kidney, continuing professional development.

Introduction

Peritoneal dialysis (PD) is a home-based therapy in which a Tenckhoff catheter, made of silicone rubber, is inserted into the patient’s abdomen accessing the peritoneal cavity. In Australia and New Zealand, PD is undertaken by 20% and 32% respectively, of all patients undertaking treatment for end-stage kidney disease (ESKD) (ANZDATA, 2014). A solution called dialysate is instilled into the peritoneal cavity and left to dwell for a prescribed period of time. The fluid comes into contact with the semipermeable lining of the cavity termed the peritoneum, which is laced with a network of capillary blood vessels. The presence of the dialysate facilitates the diffusion of solutes and the movement of water via osmosis providing ‘dialysis’. PD can either be performed manually using small bags of dialysate, more commonly referred to as continuous ambulatory peritoneal dialysis (CAPD) or with the assistance of a machine overnight, known as automated peritoneal dialysis (APD).

Patients, or their nominated carers, must be able to perform PD safely at home in order to maintain independence and quality of life and prevent technique failure. Technique failure is a term used to describe a negative event in relation to PD, for example a pleural leak or peritonitis, which requires the patient to transfer to haemodialysis permanently or in some cases can directly or indirectly cause death. PD-associated peritonitis and other infectious complications are the leading cause of technique failure in Australia and New Zealand (ANZDATA,
The most common cause of PD-associated peritonitis is catheter contamination due to poor technique or the inability to maintain a sterile environment (Piraino, et al., 2011).

Safe PD technique relies on many factors, all of which need to be assessed prior to commencing PD to ensure patient selection considers both individual needs and patient safety. The following continuing professional development paper is the first of a three-part series that will consider key aspects relating to the assessment and care of people undertaking PD. There are currently no validated tools to enable the nephrology team to evaluate the suitability of an individual for PD (Holt, et al., 2014). Consequently, part one of this series discusses the assessment of the individual’s capacity to undertake PD in addition to the relative and absolute contraindications of PD.

Patients with a declining kidney function should undergo predialysis education in preparation for the onset of ESKD; this should occur ideally around stage 3b (eGFR 44-30ml/min) Chronic Kidney Disease (CKD) (Kelly, et al., 2005). A thorough pre-dialysis nursing assessment should be conducted, between stage 3b and stage 4 of the CKD trajectory (Atai & Johnson, 2012). This is sometimes referred to as the ‘treatment options’ or the ‘pre-dialysis’ talk and affords the patient the opportunity to make an informed decision regarding which renal replacement treatment pathway they would like to take.

The Method to Assess Treatment Choices for Home Dialysis (MATCH-D) see http://goo.gl/9gCBFT (Schatell & Witten, 2011) or Jo pre-training assessment tool (JPAT) for home dialysis (Chow, 2005; Chow & Tran, 2012) may assist nephrology teams to identify and assess suitable candidates for home dialysis therapies. Assessment at this stage of the CKD trajectory is a continuous process and education and follow-up must be tailored to each patient.

The multidisciplinary team plays an integral role in the assessment of an individual’s suitability for PD. Several factors need to be considered when making this decision, including a full medical assessment by either a nurse practitioner or nephrologist, and an assessment of the individual’s fine motor skills, cognitive function and social support structures (Jose, et al., 2011). Training an individual or their family to perform PD requires the allocation of significant resources in training time and equipment. Consequently, patient selection plays an integral role in ensuring positive patient outcomes (Jose, et al., 2011; Li & Chow, 2009).

Once the decision is made that a person is suitable for PD, the multidisciplinary team needs to be involved throughout their CKD pathway and consider the need for re-assessment if there are any changes in clinical or social circumstances. Once the patient approaches ESKD the treating team needs to ensure the timely insertion of a Tenckhoff catheter for dialysis. Utilising a primary nurse model has been demonstrated to decrease the fragmentation of care and affords the development of therapeutic nurse–patient relationships that will empower and support patients in the process of becoming active self-managers (Johansson, et al., 2015; Quan, et al., 2012; Yang, et al., 2012).

### Determining patient eligibility for PD

PD is suitable for most people, but in some cases contraindications or barriers will be identified during the assessment process. Contraindications to PD are described as being relative (Table 1) or absolute (Table 2). Absolute contraindications will rule out PD as a modality choice and their early identification is a vital component of pre-modality assessment. The identification of relative contraindications to PD does not necessarily preclude PD as a modality choice. Rather, further assessment and intervention may assist in overcoming challenges presented in this area.

<table>
<thead>
<tr>
<th>Table 1: Relative contraindications to PD</th>
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<tr>
<td>1. Large abdominal hernia including inguinal hernia</td>
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<td>2. High body mass index (BMI)</td>
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<td>3. Chronic respiratory disease</td>
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<td>4. Chronic bowel disease, in particular inflammatory bowel disease</td>
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<td>5. Severe malnutrition</td>
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<td>6. Recurrent episodes of diverticulitis</td>
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<td>7. Major abdominal surgery in the past</td>
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<td>8. Severe peripheral neuropathy</td>
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<td>9. Poorly controlled epilepsy or seizures</td>
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<td>10. Physical barriers such as poor dexterity and strength, poor vision, immobility, frailty</td>
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<th>Table 2: Absolute contraindications to PD</th>
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<tr>
<td>1. Major previous abdominal surgeries</td>
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<td>2. Abdominal stoma</td>
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<td>3. Irreparable abdominal hernia</td>
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<td>4. Major psychiatric illness</td>
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<td>5. Inadequate or poor social circumstance such as homeless or unsuitable home environment</td>
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<td>6. Inability to maintain personal hygiene, self-care or a sterile environment</td>
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<td>7. Significant cognitive impairments</td>
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<td>8. Poor compliance and insight</td>
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Abdominal assessment of PD candidate

During the initial pre-dialysis assessment meeting, an abdominal examination should be conducted. This examination will assist in further determining the presence of any relative or absolute contraindications to PD, particularly abnormalities that the individual may not be aware of such as a small inguinal hernia (Khanna & Krediet, 2009; Talley & O’Connor, 2014). Prior to the examination, the nature of the procedure should be clearly explained to the patient. If an inguinal-scrotal examination is indicated, the nature of the examination must be explained patient in advance (Talley & O’Connor, 2014). It is recommended to have an observer present when performing an inguinal-scrotal examination, with the patient’s permission. A pelvic and/or gynaecological examination is not indicated and is not in the scope of practice for a nephrology nurse.

A full abdominal assessment will include a comprehensive history review and abdominal examination. Once the abdomen is exposed, the nurse should examine for any scars and link these to previously known surgical history. It is important to examine the inguinal-scrotal region for hernias (Talley & O’Connor, 2014). Sometimes with thorough examination additional scars can be identified that may have not been explained in the history. The nurse must document the abdominal examination findings including abdominal girth in people with centripetal obesity. Whilst large abdominal girth is not an absolute contraindication to PD, it remains a relative contraindication.

Assessment for any hernia requires specialised examination. It is important to establish whether the hernias are reducible, and for males, whether there is any extension of the hernia into the scrotal sac. This can be identified by instilling non-ionic contrast medium into the dialysate and performing a nuclear med scan to assess the hernia or dialysate leak (Crabtree, 2006).

Abdominal hernias are considered relative contraindications to PD, but if identified in a timely manner, they can be repaired prior to the insertion of a Tenckhoff catheter. If unable to be corrected prior to the patient requiring initiation of PD it is not an absolute contraindication to commence the patient with a hernia as the hernia can be corrected with minimal interruption to the patient’s PD. This needs to be assessed on an individual basis and is hernia-dependent (Crabtree, 2006). Once the abdominal examination has been completed, the nurse should co-ordinate further investigations of the patient’s abdomen with the multidisciplinary team.

The nurse should investigate whether the patient has undergone previous abdominal surgery including inguinal-scrotal issues, and obstetric history should be included as required. The patient’s medical file should be reviewed if the patient is unclear and unable to recall the details of previous abdominal surgery. Any abdominal surgery that may generate bowel adhesions or small bowel obstructions is of clinical importance and should be documented for review (Khanna & Krediet, 2009). It is important to include the patient’s general practitioner and treating medical team in this process. This may be particularly helpful in people with mild cognitive impairment or for establishing the nature of prior surgery. Any history of inflammatory bowel disease, excessive alcohol intake or other risk factors for cirrhosis of the liver or recurrent diverticulitis should also be documented. If there is any suggestion of cirrhosis of the liver and/or ascites, an abdominal ultrasound is warranted to establish a diagnosis. An abdominal CT scan may be indicated to investigate the presence of bowel adhesions or any other major bowel abnormalities (Goldstein, et al., 2013). A surgical assessment should also be undertaken by the operating surgeon prior to catheter placement.

Chronic diarhoea or constipation may be a relative contraindication to PD. Constipation is a common medical condition and people who are considering PD need to properly assessed and educated regarding the importance of maintaining healthy bowel function. Several factors contribute to constipation such as low-fibre diet, poor fluid intake, lack of exercise and sedentary lifestyle. People with CKD have added factors that contribute to constipation such as dietary and fluid restrictions and unavoidable medications like phosphate binders. Constipation can provide dialysate flow issues for some PD patients due to catheter malposition (Figure 1a and 1b) usually characterised by poor dialysate outflow or failure to drain the peritoneal cavity. In some cases, constipation and associated enteric organisms may be a causal factor of peritonitis (Piraino, et al., 2011).

Patient assessment should include the use of Bristol Stool Form Scale (BSFS) (http://goo.gl/bTzShR) and Rome III criteria (Drossman & Dumitrascu, 2006) which are tools used to assess constipation. Reliance on patients’ self-reporting or perception is unreliable and not indicative of the actual problem (Lee, 2011). Constipation needs to be managed in a proactive fashion rather than when it becomes a problem. All patients should be provided with information and education which encourages monitoring of bowel movements and recognising prevention strategies.

A comprehensive abdominal assessment by the PD nurse is vital in establishing a patient’s suitability for PD. Early abdominal assessment affords the opportunity for appropriate interventions to be carried out if required, which will enable a smooth transition to Tenckhoff catheter insertion.

Assessment of cognitive function

Many patients with kidney disease have multiple co-morbidities such as diabetes or cerebro-vascular disease that may impair cognitive function (Kalrao, et al., 2011). Consequently, the
assessment of cognitive function should be considered as an ongoing element of care not just as a pre-modality choice assessment. A cognitive function assessment assists in evaluating whether the patient or their nominated carer has the capability to understand the principles of PD, the equipment used and the concepts of sterility and contamination.

The PD nurse can assess the patient or their carer’s cognitive function in the following ways:

1. Assessment of their level of education, that is, schooling level or higher education.
2. Assessment of their literary skills by assessing their ability to read and write in English.
3. Assessment of their ability to comprehend the principles of PD during discussion.
4. Use of next of kin or family members to gain insight into the patient’s cognitive function.
6. Performance of a mini-mental state examination and, if required, a full mental state examination.
7. Referral for formal neuropsychiatry assessment.

One validated cognition screening tool that can be utilised is the MoCA (Nasreddine, et al., 2005). The MoCA can assist with the detection of mild cognitive impairment, which may be a precursor to dementia (Kalirao, et al., 2011). If a carer is going to be performing the PD then they should be assessed as well. Any abnormal findings can be referred on for further assessment by an appropriate member of the multidisciplinary team. It is prudent to reassess cognitive function if there is any evidence of cognitive decline whilst the patient is awaiting commencement or is established on PD.

**Assessment of dexterity**

A requisite level of dexterity is required to perform PD independently at home. Fine motor skills are required to manage system connectivity and several barriers exist that can compromise this process and increase the risk of system contamination (Oliver, et al., 2007). Consequently, the patient’s ability to perform fine motor skills should be evaluated during the pre-dialysis assessment. For PD, the patient should be able to pick up small objects, use line clamps and be able to open the dialysate bag. A home dialysis pre-training assessment tool such as the JPAT (Chow & Tran, 2012) will assist the treating team to comprehensively assess an individual’s suitability for home dialysis. If a carer or family member will be taking an active role in the PD process this person should also be assessed.

The level of dexterity required for PD is dependent on the modality utilised. CAPD requires slightly less dexterity due to the nature of the system used. To perform CAPD the patient or carer must firstly connect the Tenckhoff catheter to the PD bag tubing and then be able to open and close the clamp on the drainage system. The patient must also be able to lift the bag (usually 2 litres) above shoulder height onto a hook (Holt, et al., 2014). APD, on the other hand, requires a higher level of dexterity due to the actions required to ‘set up’ the machine and its associated connectivity. The patient must be able to safely connect the catheter to the patient line, open and close...
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plastic clamps, open various packaging and safely remove caps off the dialysate lines. APD bags are also heavier, up to 6 litres, requiring a certain amount of strength in the hands and shoulders during handling.

The patient or carer should undertake a hand and shoulder examination, with the range of movement documented. Hand strength must be assessed, monitored and observed during a hands on demonstration to see that they are able to perform all the activities required to perform PD. Dexterity assessment can be performed by an occupational therapist but this role may not be available across all health services, in which case it must be included in the nursing assessment.

Psycho-social and support structure assessment

Home dialysis places a significant burden of care on people undertaking PD and their significant others (Tong, et al., 2013). Consequently, the assessment of psycho-social factors influencing successful PD in the community is essential. Poor social circumstances and social support adversely influence PD outcomes, particularly in the elderly population (Jose, et al., 2011). In Australia, 18% of technique failure is attributed to psycho-social factors, either because of patient preference or an inability to manage self-care at home (ANZDATA, 2014). Psycho-social assessment must include the evaluation of living arrangements, occupation, marital status and any existing social or community supports. Early identification of potential stressors affords the opportunity for early referral to the multidisciplinary team, including social workers, occupational therapists or psychologists as well as to mobilise any community supports that may improve the patient’s social circumstances.

As social circumstances can change over time, social stressors must be assessed regularly to identify any changes which may impact on the ability to perform PD at home. Regular home visits by the PD team enable the early detection of issues in most cases and are known to improve patient outcomes and technique survival (Martino, et al., 2014).

Other areas of importance in patient assessment

The nursing assessment may identify other challenges such as visual or hearing impairment which will not necessarily preclude a person from undertaking peritoneal dialysis. Rather, it will require further assessment and modifications to the training program and equipment selection. The patient’s hands and nails should be assessed to identify any break in skin integrity, skin disorders, skin allergies or fungal nail infections which may increase the risk of infection. Females who have artificial or acrylic nails should be advised to remove them prior to commencing PD as they are known to harbour more microorganisms than natural fingernails (Firanek & Guest, 2011).

Conclusion

PD is a safe and effective home-based dialysis therapy which enables patients and/or their carers to be actively involved in the management of their ESKD. People preparing for renal replacement therapy need to be comprehensively informed of their options and be adequately assessed prior to selecting a dialysis modality that is appropriate for them. Pre-dialysis assessment and treatment option discussions should be undertaken in a timely manner. When discussing PD as a treatment option, relative and absolute contraindications should be considered in addition to a comprehensive abdominal assessment. Other key assessment areas include dexterity, cognition and social support. These assessment findings are crucial in ensuring people are suitably identified for PD in order to minimise the potential for adverse outcomes and maximise technique success. The next paper in this series will discuss best practice associated with the education and training of people for PD and consider which approaches will assist in delivering positive patient outcomes.

References


