

Fluid Assessment: A Competency Assessment Package for Advanced Nephrology Nursing Practice

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Abstract

Fluid assessment is a skill which nephrology nurses perform routinely when preparing a patient for dialysis and is well within their scope of nursing practice. This paper reviews the concept of nursing competence and presents a competency assessment package for fluid assessment which can be used by differing levels of nephrology nurses to enhance their career progression and nephrology nursing practice. The competency package comprises two parts. The first section consists of a learning package, which describes the processes and sources of information used to perform a fluid assessment. The second section consists of the various tools used to assess competence in fluid assessment. The final component of this paper is an explanation of the educational, ethical and managerial considerations in implementing the competency assessment package.

Introduction

Advanced nephrology nursing practice requires the nephrology nurse to perform multiple complex skills (Bonner & Greenwood 2006). Competent fluid assessment is one important nursing skill that is routinely performed by nephrology nurses as part of the dialysis preparation phase. By performing frequent fluid assessments, nephrology nurses participate in the prevention of the long term complications associated with chronic fluid overload (Jaeger & Mehta 1999) and have a positive influence on the number of episodes of intradialytic hypotension (Hosli 2005). Fluid assessment is a skill which nephrology nurses should routinely perform at the start of each treatment (Hosli 2005) and is well within their scope of practice (Purcell, Manias, Williams & Walker 2004). The particular

skills of nephrology nurses should be formally acknowledged so that committed nephrology nurses can be credited with the increased status and recognition for the expertise they have developed. Ultimately, the formal recognition of a nurses' professional practice by health facilities will have a positive effect on the retention of these motivated nurses within those renal units (Walker 2005).

Walker (2005) reviews the models that have been used to determine career progression in Australia, pointing out that criteria for ascending the clinical career ladder can be highly variable, vague and subject to others' appraisals of the candidate's worthiness for promotion. The Competency Standards for the Australian Advanced Practice Nephrology Nurse (Renal Society of Australasia 1999) provide a framework

Key Words

Advanced nursing practice, Nephrology nursing, Competency, Assessment

for the development of assessment items which reveal the intricacies involved in advanced nephrology nursing practice. This paper presents one method in providing objective evidence of advanced nephrology nursing practice by using an assessment item related to fluid assessment. Obtaining formal written evidence of advanced nursing practice will assist nephrology nurses in their career pathways with the potential for nurse practitioner status. Australian state registering authorities demand annual evidence of current competency in clinical practice (Walker 2005) and fluid assessment competency will contribute to that body of evidence.

Nursing Competence

Nursing competence is the ability of a person to fulfil the nursing role effectively (Manley & Garbett, 2000; Meretoja, Erikson & Leino-Kilpi 2002). The term "competency" was created to expand on the idea that nurses were not just performing skills but incorporating the knowledge and attitudes inherent in performing those specialised nursing tasks (Manley & Garbett 2000). Nephrology nurses work in challenging environments and are accountable to the community for providing high quality care through safe and effective work practices (Manley

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& Garbett 2000; Rusche, Besuner, Partusch & Berning, 2001; Meretoja et al. 2002). Competencies reflect the unique characteristics of nursing by identifying the knowledge, skills and attitudes required by nurses by revealing the complex nature of nursing activities. The Australian Nursing Council Inc. (ANCI) National Nursing Competencies have been accepted by Australian nurse registering authorities as the *minimum* competencies to be demonstrated by nurses for entry to the practice of nursing (ANCI 2000). Competency in this context is based on giving the student a satisfactory or an unsatisfactory grade. If competence has not been achieved then the student is given further remedial education and further opportunities to pass the skills being assessed.

Manley & Garbett (2000) indicate that competencies can differentiate between superior performance to that of a beginning Registered Nurse. Therefore, the competencies for the advanced practice nurse are not graded as “pass” or “fail” but in a framework that recognises that the nephrology nurse has reached the appropriate level of advanced nephrology nursing practice. Assessment in this context rests on the nephrology nurse providing evidence that they have acted intelligently and wisely in their specific area of nephrology nursing. In other words, not only does the advanced practice nephrology nurse operate as a safe practitioner but they operate at a higher order of competence (Manley & Garbett 2000).

Bonner and Greenwood (2006) describe three stages of nephrology nursing expertise. The non-expert nephrology nurse is the beginning nephrology nurse who is acquiring basic nephrology nursing skills and knowledge and they perform their nursing practice within a very narrow spectrum. The second stage of nephrology nursing expertise is where nurses who have sufficient nephrology

nursing skills and knowledge perform routine nephrology nursing practice automatically. The third stage is the expert nephrology nurse who is able to demonstrate extensive nephrology nursing skills and knowledge so as to deliver high quality nephrology nursing care. The focus of advanced competent nursing practice is in deep understanding and the holistic management of the situation rather than breaking the task down into specific steps (Corcoran-Perry, Narayan & Cochrane, 1999; Meretoja et al. 2002). As Manley & Garbett (2000) explain, frameworks for assessing both competence and expertise need to be developed to elucidate the standards of excellence that capture the essential features of best practice.

A variety of approaches are required to understand what experts do. Advanced nursing practice aims to provide proficient nursing practice and so the Competency Standards for the Australian Advanced Practice Nephrology Nurse (Renal Society of Australasia 1999) were written to expand on the beginning nurse competencies and provide a framework for advanced nephrology nursing practice.

Competence in Fluid Assessment

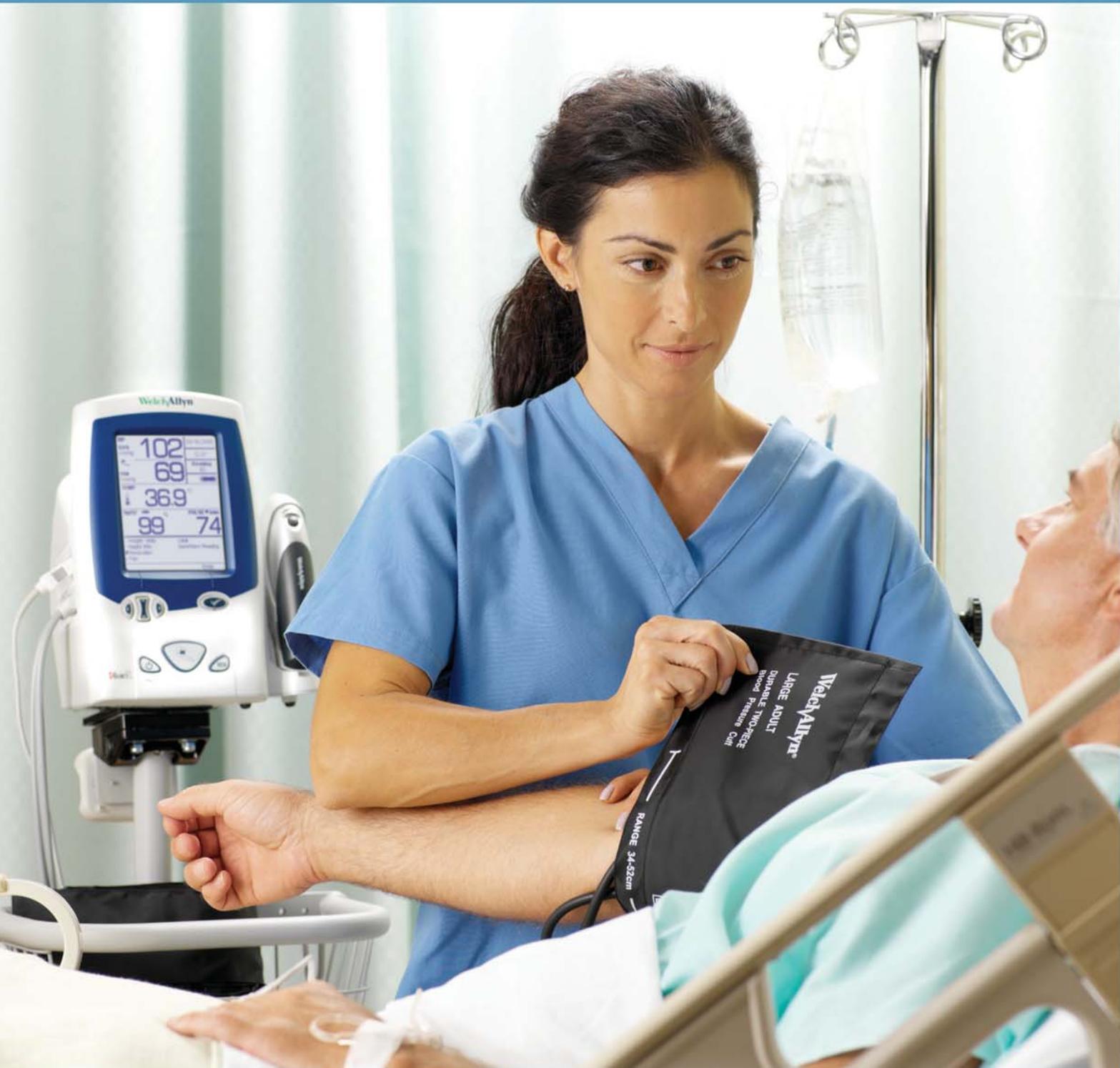
This paper offers a fluid assessment competency package based on Competency 12 of the Competency Standards for the Australian Advanced Nephrology Practice Nurse (Renal Society of Australasia 1999). Competency 12: “*Holistically manages complex therapeutic renal interventions*” (Renal Society of Australasia 1999 p 48) is vital for advanced nephrology nursing practice, as a major aspect of this role is to deliver safe and competent dialysis to people with end stage renal disease (ESRD) (Bevan 2000). Element 12.2: “*Incorporates comprehensive assessment and interpretive skills to achieve optimal care*” (Renal Society of Australasia 1999 p 49)

can be interpreted as the nephrology nurse performing a physical assessment of the dialysis patient including physical, biochemical and fluid assessment. The nephrology nurse uses critical thinking skills to analyse this data to determine the patient’s dry weight on which to base the dialysis therapy (Brunt 2005).

A competency assessment package can be used at the three levels of nephrology nursing practice (Bonner & Greenwood 2006). Firstly, the assessment competency package can be used as a learning package as it contains information to assist new nephrology nurses to understand and recognise fluid imbalances within the body. The assessment item is not relevant in this situation. Secondly, the learning package and assessment item can be used by the experienced non-expert nephrology nurse to develop a portfolio of evidence which will assist their progression to expert stage. The nephrology nurse is able to use the learning package to review the process of fluid assessment and then attempt the assessment item, of correctly performing a fluid assessment and estimation of a patient’s dry weight, under the supervision of the renal unit nurse educator or a nominated experienced renal nurse who will be their assessor. Finally, expert nephrology nurses may wish to use the competency assessment package to provide written evidence of their continuing commitment to advanced nephrology nursing practice.

This competency assessment package uses a variety of approaches to capture the essentials of advanced nephrology nursing practice associated with the competency of fluid assessment. The four methods to assess advanced practice competence are:

- (i) direct observation of the skill by the assessor.
- (ii) completion of a short answer quiz.
- (iii) photocopies of documentation where the candidate has written



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their findings in the patient's progress notes.

- (iv) a reflective essay of approximately 500 words by the candidate on their self-appraisal of performing the assessment.

As well as completing the above requirements, the candidate must be able to communicate to the assessor their estimation of the patient's dry weight and be able to validate this decision (Corcoran-Perry, Narayan & Cochrane 1999). Upon successful completion of this competency the candidate is issued with a "Statement of Attainment" which can be placed in the candidate's professional portfolio (Walker 2005; Moore 2006). If competence is not achieved, then any deficiencies in the nurse's knowledge of fluid assessment can be rectified with additional education by the assessor or nephrology nurse educator.

The learning outcomes to be assessed in this competency assessment package are:

1. An understanding of the fluid compartments within the body.
2. An understanding of the term dry weight.
3. Knowledge of the effects of intradialytic weight gain on morbidity and mortality.
4. Ability to take cardiovascular observations including blood pressure.
5. Ability to take an accurate body weight measurement.
6. Ability to determine differences in nutritional and hydration status.
7. Ability to understand and interpret biochemical markers such as albumin.
8. Correct dry weight estimation.
9. Accurate documentation.

To perform an estimation of a patient's dry weight or fluid balance status requires the candidate to gather information from a variety of sources. As reported by Purcell et al. (2004) dry weight can

not be assessed by a single parameter and therefore the performance criteria: "*Gathers assessment data from a variety of sources*" (Renal Society of Australasia 1999 p 49) is consistent with the multifactorial nature of fluid assessment.

Data for this assessment is drawn from the patient's physical symptoms, current medications, biochemical status and radiological data. Finally, consistent with Competency 12 (RSA 1999), the nephrology nurse manages complex therapeutic renal interventions by acting on their assessment to set the dialysis machine to remove the appropriate amount of fluid. Fluid overload has been demonstrated to have significant effects on long term cardiovascular complications such as volume-dependent hypertension, left ventricular hypertrophy and congestive cardiac failure (Ishibe & Peixoto 2004). Purcell et al. (2004) recommend that more frequent fluid assessment by nephrology nurses could lower the incidence of hypertension and subsequent cardiac disease in the dialysis dependent population by recognising subtle signs of fluid overload and acting on those observations.

Ishibe & Peixoto (2004) indicate that the physical examination is the classic tool in the evaluation of fluid volume status while Purcell et al. (2004) reinforce that physical assessment is a valid and accessible method to assess hydration status.

Dry Weight

Purcell et al. (2004) have investigated several definitions of the term "dry weight". One definition is "the lowest weight a patient can tolerate without intradialytic symptoms or hypotension, in the absence of overt fluid overload" (p 634). This is the patient's body weight in which there is no evidence of fluid overload and the patient is normotensive. Clinical decision making is the process that nurses use to gather

and evaluate information to make a judgment in the provision of professional patient care interventions (Corcoran-Perry & Narayan & Cochrane, 1999; Hoffman, Duffield & Donoghue 2004). Nephrology nursing expertise and sound clinical decision making should be recognised within renal units by allowing the nephrology nurse the freedom to make changes to the dialysis therapy. Hoffman et al. (2004) explains that an increased quality of patient outcomes is associated with an increased participation of nurses in the clinical decision making process. Renal units should allow accredited nephrology nurses the freedom to act on their findings rather than delivering a dialysis prescription that may be inconsistent with the patient's current fluid status (Purcell et al. 2004).

Framework for Fluid Assessment

Using the top to toe physical assessment framework, the nephrology nurse commences the assessment by questioning the patient directly regarding their physical well-being and experience of symptoms related to fluid status (Purcell et al. 2004). The candidate may engage in a discussion with the patient on how well they tolerated the previous dialysis sessions including any episodes of intradialytic hypotension or other irregularities.

Complaints of headaches can be indicative of fluid overload (Black & Hokanson Hawkes 2005) and more recently have been identified as a symptom of dehydration. The patient's face is then examined. An overall examination of the face is made to determine if the face is oedematous indicating fluid overload or sunken as in dehydration. Excess wrinkles are present in dehydration as there is insufficient fluid to fill in the subcutaneous tissue. The periorbital area is examined for evidence of oedema or "bags" under the eyes. The mouth, tongue and mucous

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membranes are examined for moistness or dryness in the case of dehydration (Black & Hokanson Hawkes 2005). The colour of the lips should be examined to detect any evidence of cyanosis. A subtle bluish discoloration may indicate that overt fluid overload has affected the arterial oxygen level.

The next parameter to be examined is the jugular venous pressure (JVP). The patient is placed in a relaxed supine position with his/her head slightly elevated to about 30 to 45 degrees. The measurement of a euvoaemic JVP should be 3 or 4 cms above the sternal angle. The higher the double flicker of the jugular vein is, signifies the amount of fluid overload present (Black & Hokanson Hawkes 2005).

Next in the examination is the chest cavity. The patient should be questioned if they have experienced any coughing or blood tinged sputum, which could indicate pulmonary oedema. A respiratory rate is taken to determine if the patient has tachypnoea or if breathing is laboured. The nephrology nurse should notice if the patient is experiencing dyspnoea or orthopnoea (Purcell et al. 2004). A pulse oximeter will determine the level of oxygen saturation and with a normal reading of between 96% to 100% (Black & Hokanson Hawkes 2005).

Purcell et al. (2004) recommend that nephrology nurses should embrace chest auscultation during their physical assessment. Breath sounds should be clear and air entry should be equal in both the right and left lungs. Crackles can be heard on auscultation in both lower lung lobes when there is evidence of left ventricular failure. Pulmonary capillary pressure increases resulting in fluid being pushed into the intra-alveolar spaces.

As air rushes over these fluid filled spaces, crackling noises can be heard through

the stethoscope (Black & Hokanson Hawkes 2005). The amount of fluid overload will determine how high in the lung lobes, crackles can be heard. A pleural effusion will be evidenced by decreased breath sounds near the effusion due to the constriction of the alveoli by the increased pressure caused by the effusion. Purcell et al. (2004) accept that nephrology nurses may not feel that they have the expertise to perform this skill but practicing auscultation under supportive guidance from senior nursing and medical staff will enable more nephrology nurses to develop these vitally important clinical assessment skills.

The next parameter is to record a blood pressure including an orthostatic blood pressure (Purcell et al. 2004). This nursing skill is a simple and noninvasive method of measuring cardiac output. Orthostasis, or taking the blood pressure initially lying down for five minutes then standing for five minutes, has no effect on fluid overload however a drop of more than 20 mm Hg in the systolic blood pressure reading on standing will indicate significant dehydration (Black & Hokanson Hawkes 2005). The degree of fluid overload will be reflected in the blood pressure reading. Purcell et al. (2004) explain that retention of excess water expands the plasma volume and raises blood pressure through increasing venous return, thereby increasing the cardiac output.

Auscultation can then be used to assess the blood flow through the heart for valvular incompetence as a result of fluid overload. The nurse can now examine the patient's medication chart or question the patient to determine if they are taking any antihypertensive medications. Oral antihypertensive medications are required to keep the patient normotensive during non-dialysis days but cause severe hypotension and subsequent abandonment of ultrafiltration if taken prior to the

initiation of the dialysis session (Purcell et al. 2004). Other medications that influence the fluid status of the patient are the use of oral non-potassium sparing diuretics.

A radial pulse is taken on the arm that does not have the arterio-venous (AV) fistula, observing the pulse for rate and rhythm (Black & Hokanson Hawkes, 2005). The AV fistula should be examined for the bruit or thrill. Dehydration will affect blood flow through the fistula with collapse of the artificial anastomosis being of great concern. Swollen fingers are evidence of fluid overload. Care must be taken to remove jewellery and rings if the fingers start to swell before skin ischemia develops.

The nephrology nurse can then examine the patient's legs. Dehydration is evidenced by dry skin with easily identifiable ankle bones. Patient reports of cramps in the calves may indicate dehydration. However, fluid overload in the form of peripheral oedema may affect the feet, ankles, calves and thighs, depending on the degree of hypervolaemia (Purcell et al. 2004). Pitting oedema refers to the pitting mark of the finger when slight pressure is placed on the oedematous area (Black & Hokanson Hawkes 2005). Leakage of serum through the pores of the lower legs signifies severe fluid overload.

The next intervention is to take the patient's current weight. Taking an accurate body weight is a simple but important nursing intervention that has significant implications in determining the percentage of water to be removed at the dialysis session (Stegmayr 2003). To decrease body weight inaccuracies, the patient should be advised to wear similar weight clothing to the dialysis unit at each session and to remove their shoes immediately prior to weighing.

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Another source of information available to the candidate is the patient's most recent biochemical markers, specifically serum sodium and albumin. The candidate and assessor should engage in a discussion of the patient's biochemical status and be able to link this data to the patient's physical findings. The candidate should be able to explain the link between the patient's serum albumin and the ability to remove fluid during the dialysis session. As Purcell et al. (2004) explain plasma refilling is reduced during haemodialysis in the presence of hypoalbuminaemia due to the reduced oncotic pressure exerted by albumin within the vascular space.

A further source of information is to examine any available radiological data.

The candidate should be able to examine the chest x-ray and be able to recognise areas, within the lung fields, of whiteness or haziness which are consistent with pulmonary oedema. The final source of information is for the candidate to examine the patient's medical records and progress notes to determine if there are any other factors relating to the patient's current fluid status that has been identified by other nephrology colleagues.

When the candidate completes the assessment they should be able to explain their findings clearly to the assessor and confirm these findings with the patient. In this way, the assessor is able to gauge the candidate's ability to recognise the signs and symptoms of fluid overload or dehydration. The candidate then

determines an approximation of the patient's dry weight and documents the new ideal body weight in the patient's progress notes and communicates this information to the relevant staff. Photocopies of these patient notes are kept as evidence of the nurse's performance of documentation. All patient identification must be removed from the assessment documentation (Pearson Education Australia, 2005).

Assessment Tools

1. The fluid assessment competency checklist

The fluid assessment competency checklist provides a guide for the assessor to validate the candidate's competence in performing the physical assessment

Table 1. 12 point fluid physical assessment competency checklist

Did The Candidate ...	Competent	Education Required?	Comment
1. Name the three fluid compartments in the body			
2. Describe the term dry weight			
3. Discuss the long term effects of fluid overload			
4. Take an accurate blood pressure reading and determine normal values			
5. Examine oral antihypertensive medications or diuretics.			
6. Take an accurate body weight measurement.			
7. Link recent biochemical markers such as sodium and albumin to hydration status			
8. Examine all the body parts that provide evidence of fluid accumulation			
8a. Examine the face and oral cavity for evidence of fluid accumulation			
8b. Examine the neck and jugular venous pressure for evidence of fluid accumulation			
8c. Using a stethoscope, listen to the lungs for evidence of fluid accumulation such as crackles and wheezes			
8d. Using a stethoscope, listen to the heart for valvular incompetence			
8e. Examine the abdomen for evidence of fluid accumulation			
8f. Examine the legs for evidence of fluid accumulation or cramping.			
9. Examine radiological data if available			
10. Examine progress notes for significant information from colleagues			
11. Collate the evidence to make an estimation of the patient's current dry weight			
12. Accurately document findings in the patient's progress notes.			
13. Provide a reflective essay of 500 words			

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for evidence of fluid and making a dry weight estimation. The checklist in this competency package can be modified by nephrology nurse educators to suit their unit's needs and further validation can be achieved by submitting the checklist to a panel of expert nephrology nurses within their renal unit. The 12 point fluid physical assessment competency checklist is described in Table 1.

2. Quiz Questions

Competence in this section will be awarded depending on the depth of the answers provided by the candidate. There is no word limit but answers should be limited to short answers.

- Q1 Identify the three fluid compartments in the human body and state the function of these compartments.
- Q2 Discuss the term "dry weight".
- Q3 Discuss the mortality/morbidity effects of fluid overload.
- Q4 Discuss the influence of sodium and albumin on fluid status.

Q5 Discuss nursing interventions to avoid severe hypotension episodes during the dialysis session

3. 500 word reflective essay

The essay provides an opportunity for the candidate to convey to the assessor, his/her feelings related to reflective practice and performance of the competency assessment item. The candidate is able to reflect on both the positive and negative aspects of the skill. Competence in this section will be awarded on the depth of the reflection undertaken.

Considerations for the Assessment

According to Pearson Education Australia (2005) the nephrology nurse or candidate must be given the optimum opportunity to be successful in gaining advanced practice recognition. The candidate is to inform the assessor when they feel that they are able to perform the assessment. Timing for the assessment must be

based upon the confidence of the candidate, rather than the schedule of the nephrology nurse educator. Additionally, the assessment must not interfere with the patient's dialysis regimen and the candidate must obtain consent from the patient to allow the candidate to perform the fluid assessment competency.

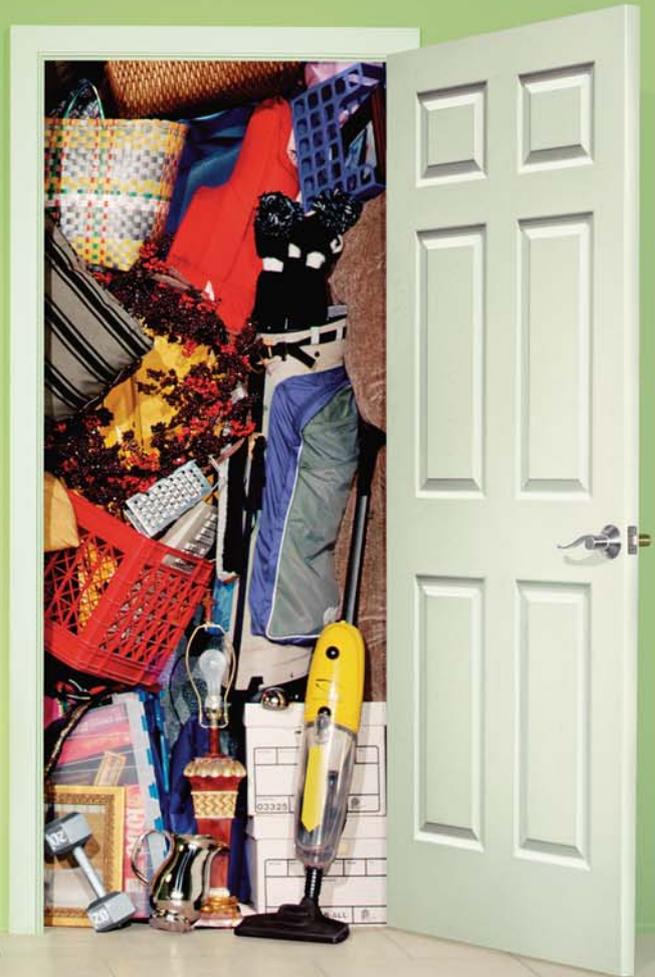
The assessor must clarify instructions to the candidate clearly. Each renal unit should develop an assessment guideline (or rules) stating the decision making process for the assessment. These assessment guidelines must be available for the assessor and candidate prior to attempting the assessment. Examples of rules include the time the candidate will be allowed. Additionally, the candidate must ensure that they have free access to the patient's progress notes or computer to access recent biochemical data during this assessment task. As well, there should be a clear understanding between the assessor and the candidate that all the items on the checklist must receive a "yes" for the candidate to be assessed as competent.

Table 2. A table of assessment evidence

Performance Standard	Assessment Method(s) / Evidence to Collect
1. Names the three different fluid compartments	Supplementary evidence by short answer questionnaire. Correct answer provided from nursing literature
2. Describes the term "dry weight" means	Supplementary evidence by short answer questionnaire. Correct answer provided from nursing literature
3. Discusses the long term effects of fluid overload	Supplementary evidence by short answer questionnaire. Correct answer provided from nursing literature
4. Takes an accurate blood pressure reading and determines normal values	Direct evidence by observation of skill by assessor using approved checklist
5. Takes an accurate body weight measurement	Direct evidence by observation of skill by assessor using approved checklist
6. Links recent biochemical markers such as sodium and albumin to nutritional level and hydration status	Supplementary evidence by short answer questionnaire. Correct answer provided from nursing literature
7. Performs the physical assessment and determines the patient's current fluid status	Direct evidence by observation of skill by assessor using approved checklist
8. Make an approximation of the patient's dry weight based on clinical findings	Direct evidence by observation of skill by assessor using approved checklist
10. Completes reflective essay	Supplementary evidence as judged by assessor.

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To confirm the candidate's advance practice, the assessment methods must be valid. The short answer questions will be obtained from the recent nephrology nursing literature. The assessor must be a registered nurse who is already competent in fluid assessment. The assessor uses the validated checklists which allows for consistency across different assessors. The candidate can elect to be assessed to perform a fluid assessment at any time that is convenient for the patient, candidate and assessor as long as the assessment is performed before the dialysis session commences.

Conclusion

This competency assessment package was developed to assist nephrology nurses to have their nephrology skills formally recognised. The comprehensive competency package assists new nephrology nurses to learn and understand the processes involved in fluid assessment, non-expert nephrology nurses to advance in their career progression and advanced nephrology nurses to have their ongoing competence in advanced nephrology nursing practice formally validated.

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