

Fluid Assessment

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Goal

Review the how and why of fluid assessment.

Objectives

1. Identify important aspects of patient history in the assessment of fluid balance.
2. Describe the major techniques for physical assessment related to fluid balance.
3. List the laboratory data that are beneficial in fluid balance assessment.

For any patient, wherever they may be situated – home, extended care facility or acute hospital – fluid assessment is a vital part of nursing assessment and care. For the person with renal insufficiency, acute renal failure (ARF), chronic renal failure (CRF), haemodialysis (HD) peritoneal dialysis (PD), transplanted, fluid assessment is even more essential for their ongoing care.

This section will provide you with an overview of the techniques for performing a thorough fluid assessment of your patient. It will discuss general fluid assessment for all of the above situations. The specific procedures and practices for the different treatment modalities, eg HD versus PD will not be considered.

Fluid assessment of any person should always include an evaluation of the person's history (recent as well as past), clinical observation and laboratory data.

HISTORY

As with all nursing assessment, the starting point should be the patient. Asking the patient and referring to patient history provides the necessary foundation on which clinical assessment and laboratory data can build.

Your consideration of the person's history should include:

1. Is a disease process or injury state present that can disrupt fluid (and electrolyte) balance? For example; renal disease, cardiac disease, bowel obstruction, pre or post surgical, traumatic blood loss, burns. What type of fluid imbalance would the condition cause?
2. Is the patient receiving any medication or treatment that can disrupt fluid balance? For example; diuretics, steroids, intravenous therapy (IVT). How might this therapy effect fluid balance?
3. Has the patient been able to take in adequate fluids and nutrients? If not, how long has the inadequate intake been present?
4. How does the total fluid intake compare to output?
(from Metheny 2000)

CLINICAL OBSERVATION

After getting as much information from the patient a thorough physical assessment should be performed. This is of course not just a 'once off' occurrence. As long as you suspect that your patient may have some fluid imbalance the assessments should be repeated.

Weight.

Weighing the patient on a regular basis provides the best way of monitoring changes in their fluid status. Remember that one litre of water weighs one kilogram. Rapid changes in body weight are most likely due to changes in body water. Weight changes due to nutritional causes, ie loss or gain of muscle mass or fat, are usually gradual, over a period of time (Thomas 2002).

Blood Pressure.

Blood pressure is often related to fluid balance. Hypertension may indicate volume overload whilst hypotension (especially with postural drop) may indicate dehydration. These findings must be interpreted using the information gained from the patient history. Other conditions such as autonomic neuropathy (diabetics), and many medications can also produce postural hypotension. Knowledge of your patient's cardiac function is important when assessing blood pressure.

Oedema.

Oedema is the excessive accumulation of interstitial fluid, only becoming clinically apparent after 3 to 4 litres of fluid has accumulated (Metheny 2000). Oedema can be caused by renal or cardiac failure and can accumulate in dependent areas (lower extremities, sacrum) or generalised areas (periorbital, scrotal). Pitting oedema is often related to salt retention oedema and can be manifested by finger pressure into the soft tissue. After releasing the pressure the 'pit' gradually disappears. Excessive shifting of fluid into the pulmonary interstitium and air spaces results in pulmonary oedema. This may result from cardiac or renal insufficiency (Kallenbach et al. 2005).

Respirations.

The rate and rhythm of your patient's respirations should be assessed. Shortness of breath is a common symptom of fluid overload, as well as many other conditions (infection, chronic airways disease, anaemia, cardiac failure). Signs of Pulmonary Oedema include dyspnoea, anxiety, restlessness and expectoration of pink frothy fluid. Altered rate and rhythm may be due to alterations in the patient's acid-base balance or potassium or magnesium levels. Once

again, physical assessment needs to be based on your history taking as well as other information gained during your assessments.

Jugular Venous Pressure (JVP).

The jugular veins provide a direct indication of changes in central venous pressure (CVP). Assessment using the right vein is preferred as it is virtually a direct conduit to the right atrium whilst the left vein may be inaccurate due to connecting vessels being obstructed or compressed. Provided that the patient is not in heart failure, JVP reflects changes in fluid volume with neck vein distension indicating increased volume.

Other Physical Signs.

Many other physical signs can be assessed to provide confirmatory information for your assessment, such as;

1. Mucous membrane moisture
2. Thirst
3. Temperature
4. Skin Turgor
5. Capillary refill
6. Pulse
7. Level of consciousness

LABORATORY DATA

Several laboratory tests can provide invaluable information about the patient's fluid (and electrolyte) status. These will be discussed fully in another edition of this journal. For completeness the major tests are listed below for your consideration.

1. Blood Tests
 - a) Haematocrit and/or Packed Cell Volume
 - b) Serum albumin
 - c) Serum sodium
 - d) Haemoglobin
2. Urine Tests
 - a) 24 hour urine volume
 - b) Urinary Sodium
 - c) Urinary specific gravity
 - d) Urine osmolality

CONCLUSION

Whether your patient is acute or chronic, dialysis dependent or not, living at home or in a care facility, assessment of fluid balance is an important part of ongoing care. A knowledge of your patient's history, a thorough physical assessment and referral to laboratory data are the mainstays to an accurate and effective assessment of your patient's fluid status. As with most things, practice and repetition will see you improve and master this very important area of patient care.

Review Questions

1. Fluid assessment of a person should always include
 - a) Evaluation of person's history
 - b) Physical assessment
 - c) Review of laboratory data
 - d) All of the above
2. From the patient's history, significant disease processes or injuries to consider in fluid assessment include
 - a) Renal disease,
 - b) Cardiac disease
 - c) Blood loss
 - d) Surgery
 - e) All of the above
3. Information about the following medications being taken by the patient needs to be included in the fluid assessment.
 - a) Diuretics
 - b) Steroids
 - c) Intravenous therapy
 - d) All of the above
4. Assessing any discrepancy between intake and output of the patient is an important part of fluid assessment.
 - a) True
 - b) False
5. Weighing the patient on a regular basis is an effective way of assessing fluid balance because.
 - a) Changes in body mass are usually gradual
 - b) One litre of water weighs one kilogram

- c) Nutritional changes effect weight gain and loss over a period of time
 - d) All of the above
6. Alterations in your patients blood pressure may be due to
 - a) Dehydration and antimicrobial use
 - b) Volume overload and
 - c) Dehydration and antihypertensives
 - d) Cardiac failure
7. Oedema, the accumulation of excess body fluid, may be found in the
 - a) Ankles
 - b) Sacrum
 - c) Lungs
 - d) All of the above
8. The only cause of shortness of breath in a patient is fluid overload.
 - a) True
 - b) False
9. Jugular Venous Pressure, provided the patient is not in cardiac failure, gives an accurate reflection of
 - a) Stress levels in the patient
 - b) Changes in fluid volume
 - c) Patient's infectious status
 - d) Liver function
10. Other physical signs and symptoms that provide information about fluid status include
 - a) Alopecia, temperature and pulse
 - b) Level of consciousness, petechiae and skin turgor
 - c) Thirst, skin turgor and mucous membrane moisture
 - d) Parasthesia, thirst and temperature

References

- Kallenbach JZ, Gutch CF, Stoner MH & Corea AL (2005) *Review of Hemodialysis for Nurses and Dialysis Personnel*. 7th edition. Elsevier Mosby, St Louis.
- Methany N (2000) *Fluid & Electrolyte Balance: Nursing Considerations*. 4th edition. Lippincott, Williams & Wilkins. Philadelphia.
- Thomas N (2002) *Renal Nursing* 2nd edition. Bailliere Tindall, London