Fluid Balance Monitoring

WHAT IS FLUID BALANCE?
Fluid balance is a term used to describe the balance of input and output of fluids in the body, to allow metabolic processes to function properly.

Who is responsible for monitoring and escalating?

WHO IS RESPONSIBLE: MONITORING AND ESCALATION

Next of Kin

What does water do for you?

Table: Fluids and their Functions

<table>
<thead>
<tr>
<th>Body Fluid</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intracellular fluid</td>
<td>Forms cells, carries nutrients and waste, stores energy reserves</td>
</tr>
<tr>
<td>Extracellular fluid</td>
<td>Mediates chemical communication between cells, helps maintain osmotic balance</td>
</tr>
<tr>
<td>Interstitial fluid</td>
<td>Supports and nourishes cells, helps maintain tissue health</td>
</tr>
</tbody>
</table>

WHAT IS HYDRATION?
Hydration is the science and practice of maintaining an adequate balance of fluids in the body to ensure proper cell function and maintain homeostasis.

Why monitor fluid balance?

WHY MONITOR FLUID BALANCE?

Fluid imbalances can cause a range of symptoms, from mild discomfort to life-threatening conditions.

When to monitor fluid balance?

When to escalate?

Fluid balance charts, physical assessment of fluid balance and management of blood results.

When and how to monitor fluid balance?

How do we monitor fluid balance?

Knowing the signs and symptoms of Fluid Imbalance in the body is a crucial aspect of hospital care and assessment. It is assessed in 3 ways: fluid balance charts, physical assessment of fluid balance and management of blood results.

Who should monitor fluid balance?

Diagnosis

Fluid Balance Charts

Identifying a positive (+) or negative (-) fluid balance should be easily visible.

Increased fluid output

Diarhoea and vomiting – risk of dehydration, malnutrition and significant electrolyte disturbances including hyperkalaemia

High urine output – polyuria (>2000mls/hr) – leads to dehydration if unmanaged. Common causes: diabetes, resolving AKI, excessive diuretics

High output stoma – increased frequency or ↑1 litre in 24 hrs

Urinary catheter, conduit, urestomy or irrigation – volumes must be measured, treatment patients may self-limit in attempt to manage problem.

Post-operative patients should be closely monitored

Large open wounds - output should be estimated if an accurate output cannot be measured

Unconscious patients

Uncoupled patients

Acute illness

Monitoring fluid balance helps monitor acute fluid losses, and early recognition of further deterioration. In some illnesses the fluid may be moved from and into extracellular spaces unusually (as in the case of ascites). Fluid loss is still in the body but no longer in a useful form. One example can lead to a fluid loss of 1500 ml/s in 24 hour period

Reduced urine output

Oliguria – low urine output (0.5mls per kilogram per hour. Oliguria can be an early sign of poor renal perfusion. Most common causes: hypotension or hypovolaemia. Anuria - absence of urine: 1100mls or greater

Acute Kidney Injury (AKI) Chronic Kidney Disease

Patients with raised creatinine blood levels combined with a low urine output may have an AKI: the kidneys are not effectively filtering blood, reabsorbing vital elements and excreting others. Prompt identification of an AKI is crucial as it can lead to serious complications if left untreated.

Fluid balance should be monitored throughout therapy and for 24h post last dose

Who should monitor fluid balance?

Trained nurses to calculate cumulative measurements

WHAT’S THE IMPACT OF FLUID BALANCE?

An imbalance of electrolytes in the blood can lead to fluid imbalance. Laboratory blood tests such as urea and electrolytes, magnesium, calcium will determine discrepancies and lead to the right treatment.

Laboratory results associated with fluid imbalance

<table>
<thead>
<tr>
<th>Fluid imbalance</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased serum osmolality</td>
<td>Dehydration</td>
</tr>
<tr>
<td>Reduced serum osmolality</td>
<td>Hyponatraemia</td>
</tr>
</tbody>
</table>

Fluid imbalance can lead to a range of symptoms, from mild discomfort to life-threatening conditions. Laboratory results associated with fluid imbalance include:

Increased serum osmolality - Dehydration

- Increased urine output
- Decreased urine specific gravity
- Fatigue
- Headache
- Dizziness
- Confusion
- Nausea and vomiting

Reduced serum osmolality - Hyponatraemia

- Increased urine output
- Decreased urine specific gravity
- Fatigue
- Headache
- Dizziness
- Confusion
- Nausea and vomiting

Fluid loss

- Increased serum osmolality
- Reduced serum osmolality
- Fluid overload

Fluid gain

- Edema
- Ascites
- Pleural effusion
- Pericardial effusion

Increased serum osmolality

- Dehydration
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Reduced serum osmolality

- Hyponatraemia
- Increased urine output
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Fluid overload

- Edema
- Ascites
- Pleural effusion
- Pericardial effusion

Fluid balance

- Volume overload
- Volume depletion

Fluid overload

- Edema
- Ascites
- Pleural effusion
- Pericardial effusion

Fluid depletion

- Dehydration
- Increased urine output
- Decreased urine specific gravity
- Fatigue
- Headache
- Dizziness
- Confusion
- Nausea and vomiting