Intra-Abdominal Pressure Monitoring using the
UnoMeter Abdo-Pressure Device.

This guideline is approved for use in Nepean Adult ICU only, where a patient receives continuous monitoring. The authors and Nepean ICU don't endorse, and aren't responsible, for the use of this guideline outside the ICU.

Purpose
To accurately measure the intra-abdominal pressure of a patient

Definitions
Intra-abdominal Pressure (IAP): is the pressure within the abdominal cavity. Normal IAP is 0 - 15 mmHg.

Intra-abdominal hypertension (IAH): is defined as an IAP greater than 15mmHg due to an increase in the volume of retroperitoneal or abdominal contents.

Abdominal compartment syndrome refers to a situation where the perfusion pressure for abdominal organs has been significantly reduced by sustained intra-abdominal pressure ≥ 20mmHg (net abdominal perfusion pressure = mean arterial pressure minus intra-abdominal pressure), and there is progressive intra-abdominal organ dysfunction.

Symphysis pubis: the midline of the pubic bones

Procedure
1. Always ensure the red clamp below the air vent is closed when the system is not in use (figure 1).
2. Attach system between IDC and urine bag aseptically

3. Prime the system with 20mls of normal saline through the red needle free port.

To take the measurement:

1. Position the patient supine
2. Place the zero point on the tubing in the mid-axillary line at the level of the symphysis pubis.

3. Hold the device in a vertical position and open red clamp to air.

4. Wait for the urine level to stabilise and read measurement at the end of expiration (when there is no abdominal muscle contraction).

5. Close the red clamp once measurement is obtained and place system on the bed above the urine collection bag.

NB: Scale is calibrated in mmHg not cmH₂O
If air vent becomes wet, please replace system before the next measurement
The system should be replaced every 7 days

**Risk Rating**
Low – For Review 3 years from validation date unless significant and compelling evidence becomes available to indicate a practice change within that time.

**Implementation Plan**
Endorsed by ICU Management Committee
Discussed at ICU Ward Meetings and other relevant unit meetings
New Procedure placed in ICU Communication Book
Electronic file loaded onto ICU website
Education and in service provided to relevant staff

**Education Notes**
The classic description of an intra-abdominal compartment syndrome includes a tense distended abdomen, decreased renal function, elevated peak airway pressure, hypoxia and inadequate ventilation. These signs are non-specific, and in many cases the only way to assess the likelihood of intra-abdominal compartment syndrome is to measure the intra-abdominal pressure. Measurement of
intra-abdominal pressure is indicated in the presence of abdominal distension plus the new onset of any of the following:

- Decrease in pulmonary compliance (eg elevated peak inspiratory pressures)
- Oliguria
- Hypotension and decreased cardiac output (mostly due to diminished venous return)

Causes of acute abdominal hypertension are either primary (presence of intra-abdominal or retroperitoneal pathology), or secondary due to a generalised capillary leak associated with massive fluid resuscitation, leading to ascites or oedema of otherwise normal bowel. Massive fluid resuscitation is defined as ≥ 5 L within a 24-hour period. Secondary abdominal compartment syndrome is often seen after fluid resuscitation for haemorrhagic or septic shock or burn injury.

The organ dysfunction from sustained intra-abdominal hypertension becomes clinically significant before organ infarction occurs. The process becomes self-sustaining at the point where intra-abdominal pressure increases the venous and lymphatic outflow resistance, leading to venous congestion, organ oedema and further increases in intra-abdominal pressure. When the intra-abdominal pressure is > 20mmHg, the reduction in capillary flow leads to activation of inflammation, which in turn worsens the capillary leak, increases the tissue fluid and intra-abdominal volume and so on.

At the same time, the rise in intra-abdominal pressure decreases venous return, leading to arterial hypotension and reduced cardiac output and reduced systemic oxygen delivery. The standard kidney response to hypoperfusion is activation of the renin-angiotensin system and anti-diuretic hormone secretion.

**Common risk factors** for intra-abdominal hypertension include:

- Large volumes of fluid resuscitation
- Closure of the abdomen after lengthy abdominal surgery
- Peritoneal tissue oedema secondary to diffuse peritonitis or severe abdominal trauma
- Retro-peritoneal haematoma secondary to trauma or aortic rupture
- Bowel obstruction
- Abdominal packing for control of haemorrhage
- Surgical closure of the abdomen under undue tension
- All forms of intra abdominal fluid accumulation e.g. haemorrhage, ascites
- Pelvic fractures
- Ileus

**Measurements may be inaccurate if there is:**

- Reduced bladder compliance and bladder spasm
- Neurogenic bladder and
- Small or contracted bladder

If there is no bladder, you can’t do it!
References and Related Policies


Version History

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