# Postoperative vasopressor usage: a prospective international observational study

## CRF1

### PRE-OPERATIVE

<table>
<thead>
<tr>
<th>Month and year of birth</th>
<th>Sex [m/f]</th>
<th>Height [cm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
</table>

Clinical Frailty Scale (Rockwood): point 0 to 9. (Will be explained in final CRF)

Previous medical history:
- Coronary Artery Disease: Y/N
- Cerebrovascular Disease: Y/N
- Peripheral vascular disease: Y/N
- Atrial fibrillation: Y/N
- Heart failure: Y/N
- Hypertension: Y treated and controlled, Y treated but not controlled, No
- Diabetes: Takes insulin/managed without insulin/None
- Chronic liver disease: Y/N
- Chronic respiratory disease: COPD/other/None
- Chronic Kidney Disease: No/Yes/Yes and receives renal replacement therapy
- Long-term steroid use: Y/N
- Recent/current treatment for cancer (including chemotherapy, radiotherapy, surgery)

### Regular medications

| ACE inhibitor: Y and took today/ Y omitted today/N |
| Alpha blocker: Y and took today/ Y omitted today/N |
| Angiotensin Receptor Blocker: Y and took today/ Y omitted today/N |
| Beta blocker: Y and took today/ Y omitted today/N |
| Calcium channel blocker: Y and took today/ Y omitted today |
| Diuretic: Y and took today/ Y omitted today/N |
| Regular NSAIDs: Y/N |
| Regular PPI: Y/N |

### Haemodynamics

Measurement in the past 6 months, at least 12h prior to the operating room, at rest:
- Systolic
- Diastolic
- Heart rate

The reading immediately prior to induction of anaesthesia:
- Systolic
- Diastolic
- Heart rate

### Laboratory results, most recent (if known within 2 months prior to surgery) (we need to ask for units for each hospital)

| Creatinine |
| Albumin |
| Haemoglobin concentration |

## SURGERY

Reason for surgery: Infection/cancer/exploratory/fracture/bleeding/other

SORT (will be implemented in the eCRF from the sortsurgery.com website):

Details of type of surgery

ASA-PS (provide link to favoured definitions, to slightly reduce variability)

Urgency

### INTRA-OPERATIVE

<table>
<thead>
<tr>
<th>Start of anaesthesia:</th>
<th>hhmm DDMMYY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of surgery:</td>
<td>hhmm DDMMYY</td>
</tr>
<tr>
<td>End of surgery:</td>
<td>hhmm DDMMYY</td>
</tr>
<tr>
<td>End of anaesthesia:</td>
<td>hhmm DDMMYY</td>
</tr>
</tbody>
</table>

### SURGICAL

Estimated blood loss (EBL, ml):
- <250ml
- 251-1000ml
- 1001-3000ml
- >3000ml

### ANAESTHETIC

Blood pressure

- Lowest recorded blood pressure: Systolic/Diastolic (MAP can be calculated)

Anaesthesia: tick all applicable

- Volatile/TIVA/sedation without securing airway/regional/spinal/CSE/epidural
SQUEEZE

Endotracheal tube/supraglottic airway/O2 facemask or nasal cannula

Interventions:
Arterial line: Y/N
Central venous line: Y/N
SQUEEZE

Intra-operative vasoactive drugs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Infusion</th>
<th>Bolus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angiotensin II</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Atropine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Akinor® (Cafedrin/Theodrenalin)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Dobutamine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Dopamine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Ephedrine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Epinephrine (Adrenaline)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Epifrine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Glycopyrilllonium</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Metaraminol</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Nitrates</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Norepinephrine (Noradrenaline)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Vasopressin or Terlipressin</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Other 1</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Was the patient receiving a vasopressor infusion prior to surgery starting: Y/N

Fluids and blood products received INTRA-operatively only, volume of

Crystalloid:
Colloid (starch, gelofusine, albumin):
Packed red blood cells:
Fresh frozen plasma:
Platelets:
Whole blood or autotransfusion [in ml]:

POST-OPERATIVE

EARLY EVENTS

- We are interested in which vasoactive drugs were given and how they were given.
- We have split all vasoactive drugs into those that are VASOPRESSORS (in green column) and those that are not (blue).
- We only want additional information (completion of CRF2) if it was POSTOPERATIVE, was a VASOPRESSOR and was INFUSED.

Following the end of surgery, did the patient receive any vasopressor boluses Y/N

oral/enteral vasopressor (midodrine) Y/N
infusion Y/N, if Y, then did this continue for more than 1 hour after the end of surgery: Y/N
if yes then this fulfils our criteria for PVI, so please also complete CRF2.

Would you liked to have given some vasopressor infusion but lacked appropriate resources to permit this to occur safely?

LATE COMPLICATIONS = WITHIN FIRST WEEK

Organ support
Pulmonary
Ventilation: invasive mechanical ventilation / NIV / both / neither
Cardiovascular
New dysrhythmia: AF/other/none
Acute Myocardial Infarction (type 1, using WHO 4th universal definition)
Renal
Highest creatinine (within the first week) postoperatively: Value/Not available [we calculate KDIGO]
Received renal replacement therapy: Y/N (excluding chronic RRT users)
Gastrointestinal
Received parenteral nutrition: Y/N

Commented [BC1]: Detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL, and with at least one of the following:
- Symptoms of acute myocardial ischaemia;
- New ischaemic ECG changes;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology;
- Identification of a coronary thrombus by angiography including intracoronary imaging or by autopsy.
SQUEEZE

Infection
Treated with antibiotics for a newly diagnosed infection: Y/N
If Y: skin or soft tissue / respiratory / urinary / abdominal / lines / other

Surgical
Accordion Severity Classification of Postoperative Complications (Annals 2009): 0 (none) to 4 (death)

END OF EPISODE (intra-hospital follow up to 30 days)
Did the patient receive PVI that started more than 24h following surgery?: Y/N
Did the patient die: Y/N
Date of discharge, death or end of observational period: DDMMYY

Commented [2]:
1. Mild complication
   Requires only minor invasive procedures that can be done at the bedside such as insertion of intravenous lines, urinary catheters, and nasogastric tubes, and drainage of wound infections.
   Physiotherapy and the following drugs are allowed- antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physiotherapy.
2. Moderate complication
   Requires pharmacologic treatment with drugs other than such allowed for minor complications, for instance antibiotics. Blood transfusions and total parenteral nutrition are also included.
3. Severe complication
   All complications requiring endoscopic or interventional radiologic procedures or re-operation as well as complications resulting in failure of one or more organ systems.
4. Death
SQUEEZE

CRF2: Additional information for those who received postoperative vasopressor infusion (PVI)

PLEASE DO NOT complete if:
- receiving inotropes without vasopressors
- received vasopressor only intra-operatively or for less than one hour postoperatively
- received vasopressors starting more than 24 hours postoperatively

At one hour after the completion of surgery, is the patient:

| Receiving continuous infusion of neuraxial anaesthesia/analgesia i.e. epidural infusion | Y/N |
| Still receiving a sedative infusion | Y/N |
| Still has an airway in place (endotracheal tube, tracheostomy or supraglottic airway) | Y/N |

1. How was it initially assessed that this patient should receive a vasopressor infusion?

Options:
1. Already receiving a vasopressor infusion and attempts to lower the infusion rate produced unacceptable hypotension
2. It was decided that the patient would no longer benefit from further attempts to increase the cardiac output through administration of IV fluids and the blood pressure was unacceptably low. This was on the basis of:
   A. clinical assessment alone (vital signs, examination, lab results)
   B. clinical assessment AND a measurement of preload responsiveness using cardiac output monitoring (or some direct surrogate of)
   C. clinical assessment AND a measurement of preload responsiveness using echocardiography
   D. clinical assessment AND a previously established maximum for IV fluid administration has been met i.e. 2L or 20ml/kg etc...
   E. other - free text
   F. unknown

Day 0 = the calendar day of the start of the operation

2. Organ failure scores

<table>
<thead>
<tr>
<th>SOFA score</th>
</tr>
</thead>
</table>

3. Blood pressure target and levels

<table>
<thead>
<tr>
<th>Target MAP (if known)</th>
<th>POD1</th>
<th>POD2</th>
<th>POD3</th>
<th>POD4</th>
<th>POD5</th>
<th>POD6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest recorded MAP</td>
<td></td>
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</tr>
<tr>
<td>Highest recorded MAP</td>
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</tbody>
</table>

4. Vasoactive drug infusion details

<table>
<thead>
<tr>
<th>Vasopressor infusion 1</th>
<th>POD1</th>
<th>POD2</th>
<th>POD3</th>
<th>POD4</th>
<th>POD5</th>
<th>POD6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasopressor infusion 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vasopressor infusion 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vasopressor infusion 4</td>
<td></td>
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</tr>
</tbody>
</table>

For each vasopressor drug, for each day, we want the highest infused rate – for example, noradrenaline 0.5 mcg/kg/min

<table>
<thead>
<tr>
<th>Inotrope 1</th>
<th>POD1</th>
<th>POD2</th>
<th>POD3</th>
<th>POD4</th>
<th>POD5</th>
<th>POD6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inotrope 2</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

For each inotropic drug, for each day, we want the highest infused rate – for example, milrinone 0.3 mcg/kg/min

5. Fluids

<table>
<thead>
<tr>
<th>Fluids</th>
<th>POD1</th>
<th>POD2</th>
<th>POD3</th>
<th>POD4</th>
<th>POD5</th>
<th>POD6</th>
</tr>
</thead>
</table>
SQUEEZE

<table>
<thead>
<tr>
<th>Fluid balance</th>
</tr>
</thead>
</table>

A value between -5000 and +5000, in millilitres. If <-2000 or >+5000 then eCRF to ask data entry person to double check. Represents the volume of fluid in (including medications, liquid feeding etc), minus the volume of fluid out (includes urine output, drain output etc…). Option not to provide this information if not known.

6. Organ support in the first 28 days

Total number of days of receipt of ventilation (invasive or NIV):
Total number of days of receipt of vasopressor infusion:
Total number of days of receipt of parenteral nutrition:
Total number of days of receipt of renal replacement therapy:

Commented [BC3]: Whole days. If received for any period of time (>1h) then to be included as a day.