Queensland Trauma Education

Queensland Government

Structured trauma assessment

Primary survey

C **Catastrophic haemorrhage**
Find and control massive external haemorrhage

Life threats:
Exsanguinating external haemorrhage

A **Airway/C-spine**
Maintain or secure airway and C-spine

Life threats:
Airway obstruction, blunt/penetrating neck injury

B **Breathing/ventilation**
Support adequate ventilation/oxygenation

Life threats:
Tension pneumothorax, massive haemothorax, open pneumothorax, flail chest, ruptured diaphragm

C **Circulation with haemorrhage control**
Assess and control bleeding. Support haemodynamics

Life threats:
Cardiac tamponade, penetrating cardiac injury, intra-abdominal and pelvic trauma

D **Disability**
Rapidly assess and protect neurological status

Life threats:
Catastrophic cerebral haemorrhage

E **Exposure**
Assess for further injuries then maintain normothermia

Life threats: Hypothermia

Pre-simulation briefing

Establishing a safe container for learning in simulation

1 Clarify objectives, roles and expectations

- Introductions
- Learning objectives
- Assessment (formative vs summative)
- Facilitators and learners' roles
- Active participants vs observers

2 Maintain confidentiality and respect

- Transparency on who will observe
- Individual performances
- Maintain curiosity

3 Establish a fiction contract

Seek a voluntary commitment between the learner and facilitator:

- Ask for buy-in
- Acknowledge limitations

4 Conduct a familiarisation

- Manikin/simulated patient
- Simulated environment
- Calling for help

Note: Adjust the pre-simulation briefing to match the demands of the simulation event, contexts or the changing of participant composition.

5 Address simulation safety

Identify risks:

- Medications and equipment
- Electrical or physical hazards
- Simulated and real patients

V2 Effective: 1/7/2021. Adapted from Rudolph, J., Raemer, D. and Simon, R. (2014). Establishing a Safe Container for Learning in Simulation. Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 9(6), pp.339-349.

CSDS Clinical Skills Development Service

Queensland Government

Major haemorrhage protocol (MHP)

MHP activation criteria **Actively bleeding and any of the following:**
- Major haemorrhage, estimated blood loss of > 2.5 L
- Actual or anticipated need for ≥ 5 units RBC in 4 hours
- Haemodynamic instability
- Clinical or laboratory signs of coagulopathy

OR in lower resource settings as per local protocol

Lead clinician activates MHP
- Notify usual/nearest laboratory/blood bank
- Request additional staff support relevant to local setting e.g. anaesthetist, haematologist, surgeon, interventional radiologist
- Identify time frame for blood product delivery
- Inform lab if using ROTEM® or TEG®
- Contact RSQ 1300 799 127 early (as relevant to service)

ROTEM® or TEG® ?

Yes → **Blood components as per local ROTEM®/TEG® algorithm**

No → **MHP resources limited?**

Yes → **Follow local protocols**
- PoC pathology if available (e.g. i-STAT, Hemocue®)

Give as available
- IV fluid replacement up to 3.5 L total
  - Crystalloid up to 2 L
  - If additional indicated, crystalloid/colloid up to 1.5 L
- RBC 2 units (Group specific or O Negative)
- FFP 2 units
- PLT 1 adult dose

No → **Blood products per locally agreed configuration***

MHP PACK 1
- RBC 4 units
- FFP 2 units

MHP PACK 2
- RBC 4 units
- FFP 2 units
- PLT 1 unit every 8 units of RBC

As indicated:
- **Early fibrinogen replacement**: fibrinogen concentrate 3–4 g *or* whole blood cryoprecipitate 10 units *or* apheresis 4 units
- **Calcium supplementation:** if ionised calcium < 1 mmol/L or at least ev 4 units RBC give 10% calcium gluconate 10 mL IV

Bleeding controlled?

Yes → **Lead clinician deactivates MHP**

No → **Haematologist advice** Repeat blood products in response to results

Consider coagulation profile CONCURRENTLY during management

Continue resuscitation
- Give tranexamic acid 1 g IV over 10 minutes (if not already given)
- Maintain accurate fluid balance
- Refer to flowchart: Initial response to PPH

Optimise
- Oxygenation
- Tissue perfusion
- Cardiac output
- Temperature
- Metabolic state

Targets
- Temperature > 35° C
- pH > 7.2
- Base excess > minus 6 mmol/L
- Lactate < 4 mmol/L
- Ionised calcium > 1 mmol/L
- Platelets > 50 x 10^9/L
- PT/aPPT < 1.5 x normal
- INR ≤ 1.5
- Fibrinogen > 2.5 g/L

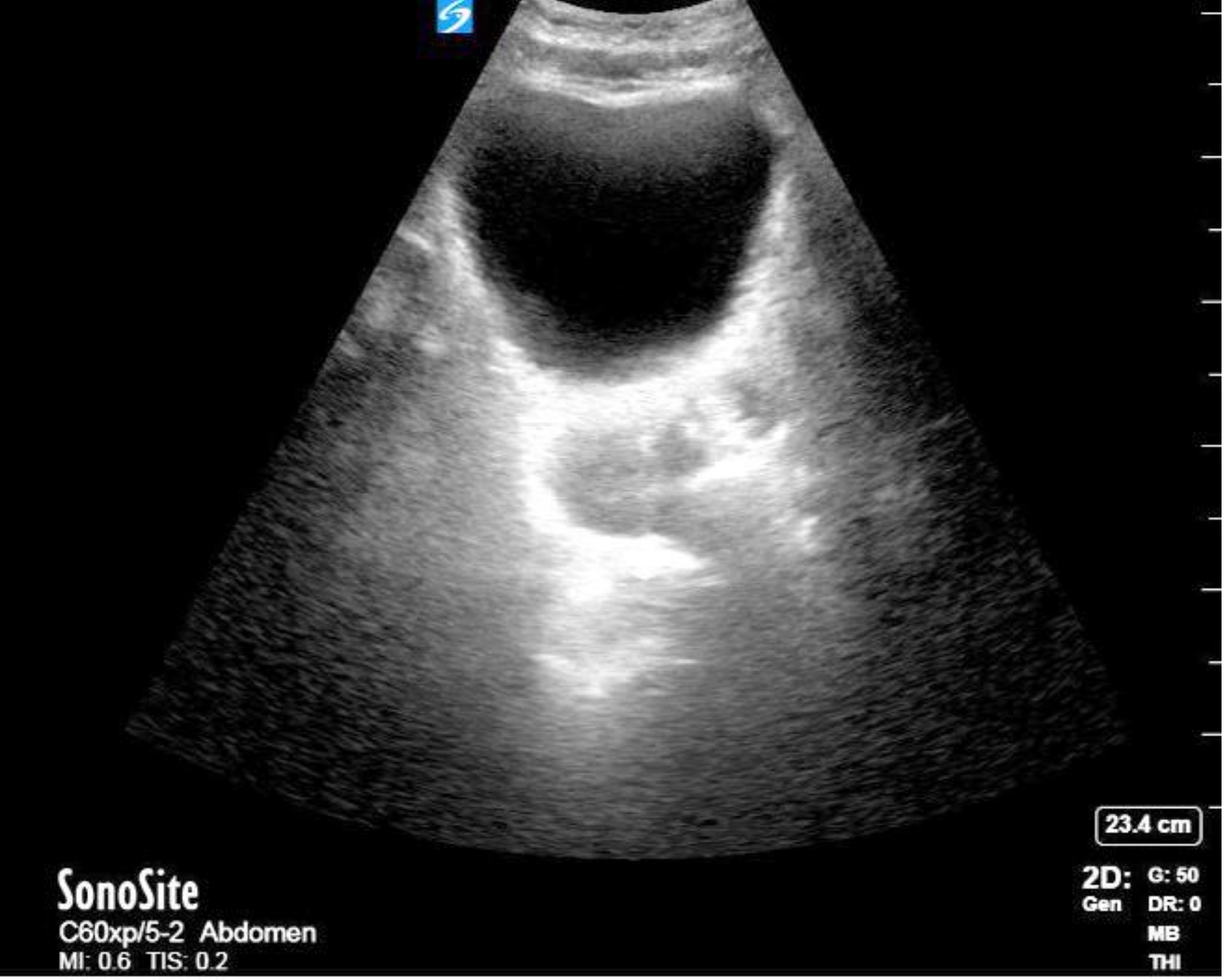
Monitor (30–60 minutely)
- FBC
- Fibrinogen levels (Clauss more accurate than PT derived assays)
- Coagulation screen
- Ionised calcium
- Arterial blood gases

If ROTEM®/TEG®
- 10 minutes post blood components

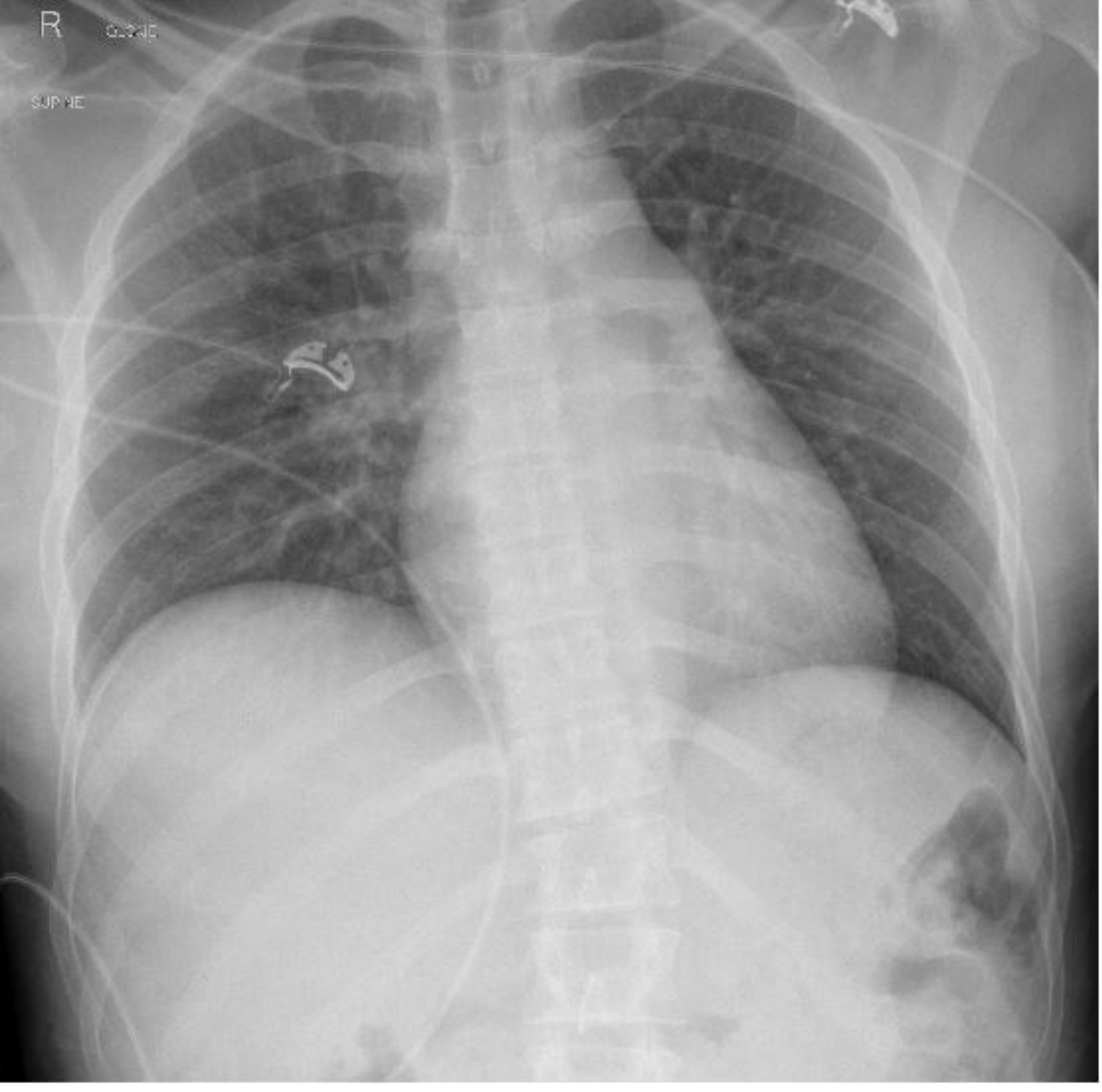
Communication
- Notify lab of products required
- Specialist involvement ASAP
- Check special situations (e.g. warfarin)
- Notify lab when MHP ceased
- Inform partner/family

APPT: activated partial thromboplastin time, **ASAP**: as soon as possible, **FBC**: full blood count, **FFP**: fresh frozen plasma, **INR**: international normalised ratio, **IV**: intravenous, **MHP**: major haemorrhage protocol, **PLT**: platelets, **PoC:** point of care, **PPH:** postpartum haemorrhage **PT**: prothrombin time, **RBC**: red blood cells, **ROTEM®/TEG®**: types of blood clotting analysers, **RSQ**: retrieval services Queensland, **<**: less than, **>:** greater than, **≥** greater than or equal to
**Aim for transfusion ratio RBC:FFP:PLT no lower than 2:1:1*

Queensland Clinical Guideline. *Primary postpartum haemorrhage*. Flowchart: F24.1-2-V5-R29


23.4 cm
SonoSite
C60xp/5-2 Abdomen
MI: 0.6 TIS: 0.2
2D: G: 50
Gen DR: 0
MB
THI


21.0 cm
2D: G: 50
Gen DR: 0
SonoSite
P21xp/5-1 Cardiac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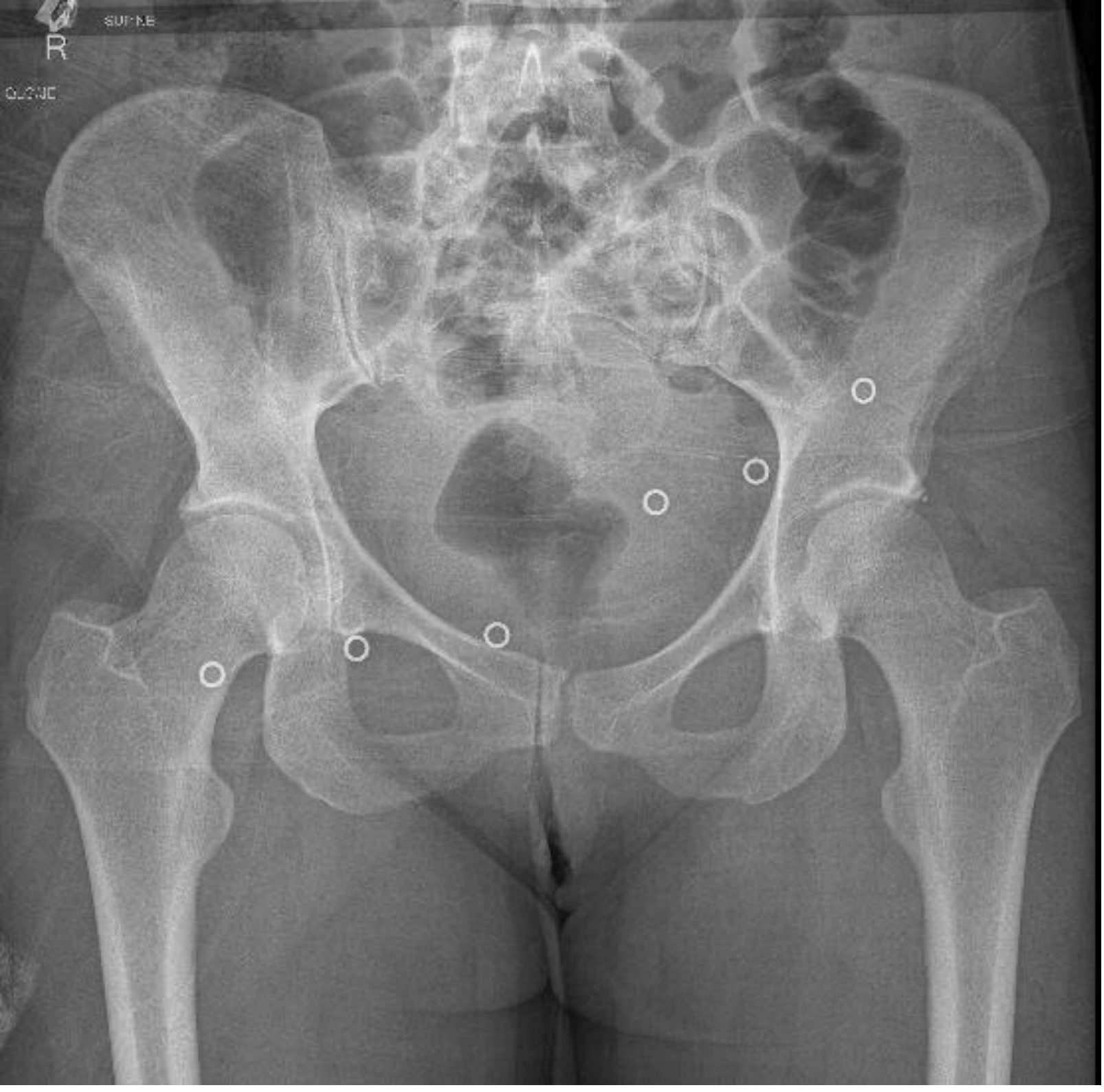
SUPINE


R

ROTEM Sigma POCT

FIBTEM	A5	5	mm	(5 - 20)
	A10	6	mm	(6 - 21)
EXTEM	CT	60	sec	(50 - 80)
	A10	41 L	mm	(43 - 63)
	ML	7	%	(< 15)
INTEM	CT	143 L	sec	(161 - 204)
	A10	41 L	mm	(43 - 62)
	ML	8	%	(< 15)
HEPTEM	CT	141 L	sec	(160 - 211)
	A10	41 L	mm	(45 - 63)
APTEM	A10		mm	(39 - 61)
	ML		%	(< 15)