



Queensland Trauma Education

**CHEST TRAUMA**

# Intercostal catheter set up, insertion and chest drain management

Procedural skill

Facilitator resource kit

## Queensland Trauma Education

The resources developed for Queensland Trauma Education are designed for use in any Queensland Health facility that cares for patients who have been injured as a result of trauma. Each resource can be modified by the facilitator and scaled to the learners needs as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.

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### Queensland Trauma Education

**Chest Trauma – Intercostal catheter set up, insertion and chest drain management: Procedural skill – Facilitator resource kit**

**Version 2.0**

Published by the State of Queensland (Clinical Skills Development Service), 2024



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## About this training resource kit

This resource kit provides healthcare workers with knowledge of the technical skills required for the set up and insertion of an intercostal catheter (ICC) and chest drain system management for the management of haemothorax or pneumothorax following trauma.

### National Safety and Quality Health Service (NSQHS) Standards



### Target audience

Emergency department medical and nursing clinicians.

### Duration

45 minutes.

### Group size

Suited to small group participation.

### Learning objectives

By the end of this session the participant will be able to:

- Identify and set up the essential equipment for ICC insertion.
- Identify the anatomical landmarks for safe insertion.
- Perform and or support the insertion of an ICC utilising the correct procedure.
- Understand the management a chest drainage system and troubleshoot any issues following intercostal catheter insertion.

### Facilitation guide

A multidisciplinary approach is recommended during this procedural skill.

1. Facilitator to discuss equipment and preparation with the use of an aseptic technique.
2. Facilitator to describe and discuss procedure (use ICC insertion video if required).
3. Participants to perform and assist procedure as professionally appropriate.
4. Facilitator to demonstrate UWSD set up (use instructional video if required).
5. Facilitator to discuss the components of the chest drain system, the purpose of - swing, bubbling and drainage and potential trouble shooting situations.

### Supporting documents

1. Dry suction water seal chest drain infographic (e.g., Atrium oasis).
2. Intercostal catheter insertion and management videos available from: [Queensland Trauma Education \(QTE\) \(csds.qld.edu.au\)](http://QueenslandTraumaEducation(QTE)(csds.qld.edu.au))

## Procedural skill

### Resources required

<b>Equipment</b>	<p><b>ICC set up and insertion component</b></p> <p>Part task trainers</p> <ul style="list-style-type: none"><li>• 2 x Super Annie Gen 3 on 2 separate patient trolleys</li><li>• 1 x Super Annie Gen 3</li><li>• 9 x standard ICC insertion pads of ICC trainer</li></ul> <p>Other equipment</p> <ul style="list-style-type: none"><li>• 3 x silver trolleys</li><li>• 3 x sharps bins</li></ul> <p>PPE (Personal Protective Equipment)</p> <ul style="list-style-type: none"><li>• 6 x sterile gowns</li><li>• Box of sterile gloves</li><li>• Goggles</li></ul> <p>Insertion Kits x 4</p> <ul style="list-style-type: none"><li>• IDC pack (inside pack – add:)<ul style="list-style-type: none"><li>○ suture pack (scissors, needle holder, artery forceps)</li><li>○ 2 x curved Kelly clamp</li></ul></li></ul> <p>ICC insertion consumable packs x 10</p> <ul style="list-style-type: none"><li>• Size 12 scalpel</li><li>• 1.0 or 0.0 silk curved suture</li><li>• Split dressing pads</li><li>• Opsite IV3000</li><li>• 10ml syringes</li><li>• drawing up needle</li><li>• 23g (blue) needles</li><li>• Lignocaine/adrenaline simulated ampoules</li></ul> <p>Clinical consumables</p> <ul style="list-style-type: none"><li>• 3 x atrium chest drainage units (for simulation of connection only)</li><li>• 3 x size 24f ICC</li><li>• 1x either 28f or 32f (to demonstrate difference in size)</li><li>• 6 x Fenestrated drape with adhesive backing</li><li>• Fixomol</li><li>• Packet of gauze</li><li>• 3 x Simulated chlorhexidine/alcohol skin prep</li></ul>
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	<p><b>Chest Drain System Component</b></p> <ul style="list-style-type: none"> <li>• 1 ‘Super Annie Gen 3 setup on patient trolley/silver trolley</li> <li>• 1 x atrium oasis (for comparison)</li> <li>• 1x Atrium express attached to ICC on ‘Super Annie’ – setup with modification to demonstrate swinging/bubbling/drainage</li> <li>• 1x wall suction regulator or portable suction</li> </ul>
<p><b>Delivery tool</b></p>	<p>Face to face                  White board and pens for anatomical landmarks                  Video resources on website as pre-reading, demonstration or post-course</p>

## Detailed guide of topics to cover

### Chest Drain System set up

- Demonstrate Setup of Atrium Express/Oasis
- Demonstrate where water is administered on atrium express vs atrium oasis
- Discuss features of atrium express: collection chamber, air leak monitor, suction regulator/suction port connector

### Chest Drain System insertion

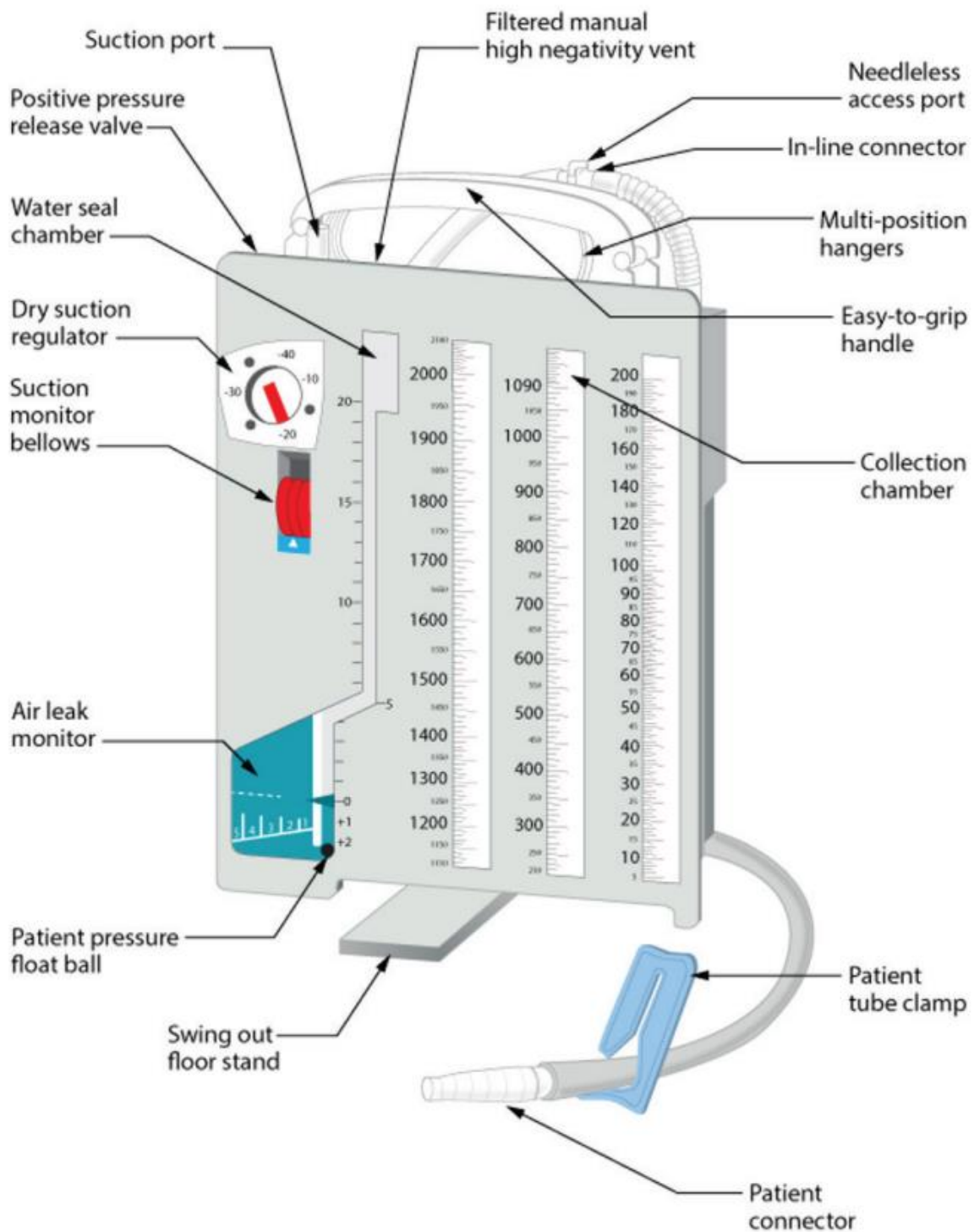
- Discuss environment and equipment
- Discuss triangle of safety/landmarks/patient positioning
- Participants to setup equipment and don PPE
- Discuss sizing of tube for blunt dissection
- Discuss LA and perform infiltration of LA – discuss anatomy and where to infiltrate
- Perform incision along 5<sup>th</sup> intercostal space within triangle of safety
- Perform blunt dissection using curved forceps, insert forefinger and perform finger sweep (do not remove finger)
- Using loaded tube insert forceps into pleural space guide upward – once insitu clamp tube distally and quickly connect to UWSD – UNCLAMP ASAP
- Suturing technique using 0/1.0 silk
- Perform dressing and securing of tube: along connector and to patient torso

### Chest Drain System management

- For each item discuss relationship to patient physiology and troubleshooting
- Demonstrate swing
- Demonstrate bubbling (varying levels of air leak)
- Demonstrate draining (different chambers)
- Discuss height/positioning below chest
- Discuss drain clamping (never if PPV/ otherwise limit the time of clamping)
- Discuss application of suction to drainage system: medical order etc
- Discuss drain knock-over management

Discuss what observations are required and how frequently

## Dry suction water seal chest drain infographic (e.g., Atrium oasis)



## Acronyms and abbreviations

Term	Definition
ICC	Intercostal catheter
UWSD	Underwater seal drain
PPV	Positive pressure ventilation
LA	Local anaesthetic
PPE	Personal protective equipment

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