

Blood control safety cannula & needle thoracostomy for tension pneumothorax

Date of issue:

02 April 2020

Reference no:

NatPSA/2020/003/NHSPS

This alert is for action by: Acute and specialist hospital providers (adult and children's) and ambulance trusts.

This is a safety critical and complex National Patient Safety Alert. Implementation should be co-ordinated by an executive lead (or equivalent role in organisations without executive boards) and supported by clinical leaders in paramedic response, emergency medicine, respiratory medicine, resuscitation, and theatres.

Explanation of identified safety issue:

Tension pneumothorax can occur following chest trauma, respiratory disease and infection, or during resuscitation requiring invasive or non-invasive ventilation. It is a life-threatening condition resulting from a collapsed lung when air trapped in the pleural cavity compromises cardiopulmonary function.^{1,2}

Immediate temporary decompression is required to prevent cardiac arrest.^{1,2,3,4,5} This is commonly done by inserting a needle and cannula, usually used for intravenous access, through the chest wall into the pleural cavity (needle thoracostomy) – see Note 1. The needle is withdrawn, and the cannula left in place to allow the trapped air to flow out.

New blood control (closed system) intravenous cannulas are increasingly used in the NHS; at least 130 trusts bought a total of three million of them in the last year (see Note 2 for suppliers). They look very similar to both traditional and standard safety cannula (with needle guard or shield) but have an extra integral septum which closes when the needle is withdrawn and stops free flow in or out of the cannula. Flow is only possible once an intravenous line or Luer-lock syringe is attached to the hub, which opens the septum.

Blood control (closed system) cannulas help prevent blood spillage, exposure and contamination, when used for their intended intravenous purpose, but they cannot be used to decompress a pneumothorax without additional equipment.

The main patient safety risks are:

- staff may select a blood control (closed system) cannula not realising its limitations for this procedure
- a blood control (closed system) cannula may wrongly be assumed to be functioning in a patient who is deteriorating rapidly
- a second needle might be introduced risking very significant damage to the lung as it re-inflates.

Actions required



Actions to be completed by 09/04/2020

1. Identify if your organisation purchases blood control (closed system) safety cannula
 - See Note 2.
2. If it does, for all clinical areas and teams likely to undertake needle thoracostomy, including ambulances, emergency departments (EDs), intensive care units, respiratory units or any unit providing invasive or non-invasive ventilation, including units for COVID-19 patients:
 - a) Provide standard safety cannulas* for needle thoracostomy in appropriate trays, drawers, pockets, within emergency workspaces, emergency kit bags, and resuscitation trolleys, and clearly label '*For use in tension pneumothorax*'.
 - b) Attach visible warnings/notices to cupboards, drawers, etc in these emergency workspaces, emergency kit bags, and resuscitation trolleys where blood control (closed system) cannula are stored stating: '*Do **not** use for tension pneumothorax*', with a direction to where standard safety cannulas can be found.
 - c) Amend labelling/checklists in store cupboards used to restock these resuscitation areas, emergency kit bags and resuscitation trolleys to ensure clear distinction between standard safety cannula and blood control (closed system) cannula.
 - d) Inform clinical and materials management staff who restock these resuscitation areas, emergency kit bags and resuscitation trolleys of these changes.

*A minority of units may already have switched to specific thoracostomy/decompression kits and trained all local staff in their use. They can continue using them, but other units where staff may be unfamiliar with these kits should not introduce them at this time.

For further detail, resources and supporting materials see: <https://www.england.nhs.uk/2020/04/blood-control-safety-cannula-and-needle-thoracostomy-for-tension-pneumothorax>

For any enquiries about this alert contact: patientsafety.enquiries@nhs.net

Additional information:

Notes

1. The decompression technique using an intravenous cannula is widely taught to medical staff, paramedics and healthcare professionals in acute emergency care roles, and is supported by NICE and national professional guidelines.^{1,2,3,4,5} Most guidance does mention some limitations of using intravenous cannulas, but specially designed tension pneumothorax decompression needles and the open thoracostomy technique requires additional training.
2. **Identifying if your trust purchases closed system safety cannulas** - Refer to NHS Supply Chain Important Customer Notice 1009 <https://www.supplychain.nhs.uk/icn/national-patient-safety-alert-blood-control-safety-cannula-and-needle-thoracostomy-for-tension-pneumothorax/> for full Product Listing and ordering codes including Global Trade Item Number to help those providers buying equipment through other routes.

Patient safety incident data and other information

Via the Royal College of Emergency Medicine Safer Care Committee an ED alerted us to their concerns about mistaken use of blood control (closed system) cannula for needle decompression. As clinical staff are unlikely to realise their selected cannula is a blood control (closed system) safety cannula, or that it will not decompress a tension pneumothorax, any impact on the patient is unlikely to be identified from reported incidents. However, specialist thoracic staff, medical device safety officers, acute and emergency frontline staff and ambulance networks confirm variation in local training and equipment and that the risks of using closed system cannula for this tension pneumothorax are poorly understood.

References

1. British Thoracic Society (2010) *Management of spontaneous pneumothorax* https://thorax.bmj.com/content/thoraxjnl/65/Suppl_2/ii18.full.pdf
2. Royal College of Emergency Medicine (2017) *Spontaneous pneumothorax e-learning module* <https://www.rcemlearning.co.uk/reference/spontaneous-pneumothorax/#1571135501541-a9a7e58a-fd9d>
3. Resuscitation Council UK (2015) *Resuscitation guidelines* <https://www.resus.org.uk/resuscitation-guidelines/>
4. NICE (2016) *Major trauma: assessment and initial management* <https://www.nice.org.uk/guidance/ng39/chapter/recommendations>
5. Joint Royal Colleges Ambulance Liaison Committee, Association of Ambulance Chief Executives (2019) *JRCALC Clinical guidelines 2019*. Bridgwater: Class Professional Publishing

Resource

1. NHS England (2020) Guidance for the role and use of non-invasive respiratory support in adult patients with coronavirus (confirmed or suspected) https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/CLEARED_Specialty-guide_-NIV-respiratory-support-and-coronavirus-v2-26-March-003.pdf

Stakeholder engagement

- National Clinical Director – Respiratory Medicine
- National Patient Safety Response Advisory Panel (for a list of members and organisations represented on the panel, see www.improvement.nhs.uk/resources/patient-safety-alerts/)

Advice for Central Alerting System (CAS) officers and risk managers

This is a safety critical and complex National Patient Safety Alert. In response to [CHT/2019/001](https://www.improvement.nhs.uk/resources/national-patient-safety-alerting-committee/) your organisation should have developed new processes to ensure appropriate oversight and co-ordination of all National Patient Safety Alerts. CAS officers should send this Alert to the executive lead nominated in your new process to coordinate implementation of safety critical and complex National Patient Safety Alerts, copying in the leads identified on page 1, and your local leads for COVID-19 response.