Estates and Facilities Alert

NHSE/I-2020/003 Issued: 19 November 2020

Covid-19 Response – Oxygen Supply and Fire Safety

Summary

In relation to oxygen supplies within NHS acute and specialist hospital trusts and independent hospitals, trusts are reminded to be aware of:

- **High ambient oxygen levels and fire risk:** Use of high flow open circuit oxygen devices carries a risk of increasing ambient oxygen concentration. If this exceeds 23% this poses a potential fire risk.

- **Low supply pressure risk:** If the demand through multiple wall outlets exceeds the maximum capacity of the vacuum insulated evaporator (VIE) delivery system, there is a risk of a rapid pressure drop in oxygen supply pipes. This could lead to a failure of oxygen delivery systems throughout the hospital, including to patients on face masks, high flow nasal oxygen ($HFNO_2$), Continuous Positive Airway Pressure (CPAP) or other non-invasive ventilation (NIV), ventilators and operating theatres. There is also a risk of rapid and unpredictable depletion of the VIE. Both of these situations present a potentially significant risk to multiple patients simultaneously.

Actions

Actions on Fire Safety

Working with local Incident Management Teams, establish specific leadership teams including key clinical leaders and fire safety teams to reduce the risk of physical hazards associated with oxygen use through:

1. Reviewing the fire risk assessment and significant findings, to ensure it includes the additional challenges of care during the COVID19 pandemic. This includes having a fire evacuation plan for patients on NIV/ventilation and evaluating /addressing risks to staff and other patients when evacuating patients who are COVID19 - positive

2. Arranging table-top or bedside drills / walk-through of response to actual or potential fires where this will help test or improve the speed of response to real emergencies, including additional challenges related to COVID19 patients

3. Risk assessing the use of oxygen cylinders. Oxygen cylinders create a potential explosion hazard in the event of a fire. Therefore, use of cylinders in usual practice should be minimised, and ideally reserved for emergencies and transport.

4. Procuring/securing safe holders for oxygen cylinders for use at bedsides, trolleys, wheelchairs, etc.

5. Reviewing and strengthening existing restrictions for the whole hospital site of ignition sources e.g. patients' smoking materials and e-cigarettes, and other personal items that could provide a source of ignition

6. Establishing systems for monitoring ambient oxygen levels at least on a daily basis in all clinical areas using large amounts of oxygen, particularly in areas not specifically designed for this type of care (e.g. operating theatres or critical care wards which have specifications around humidity control and air changes)

7. Providing guidance for all clinical areas on what they need to do if the oxygen levels are above 23%, including how to seek immediate advice from Estates and IPC colleagues on how to reduce oxygen levels whilst continuing to maintain good infection prevention and control practices.

8. The document "Fire Risk Assessment: Guidance on completing specific FRA for temporary wards provided for Covid-19 treatment or care" should be reviewed alongside these actions.

Actions on Oxygen Supply

Establish leadership teams including key clinical leaders and hospital oxygen engineering teams (including expertise from medical gases committees) to ensure oxygen demand does not outstrip supply by:

9. Identifying the current maximum flow rate from your VIE.

10. Clarifying the safest physical location to treat multiple patients on high flow O_2 or high flow support devices such as wall CPAP (i.e. critical care vs. ward)

11. Identifying any improvements that could be made to pipework architecture or other potential modifications which enable more patients to be managed on oxygen.

12. Establishing at least daily checking systems for good oxygen housekeeping on every ward and department – See Annex 1.

13. Instituting a system to monitor average hourly oxygen usage and ensuring an escalation plan has been developed for if this exceeds 75% of maximum VIE outflow.

14. Risk assessing the local controls to manage provision of oxygen supply to ensure unintended effects that create unnecessary delay in providing oxygen to patients who need it are minimised

15. Risk assessing the local controls to avoid wastage of oxygen supply to ensure unintended effects are minimised (e.g. risk of failing to restart flow of oxygen after turning off when not in use)

16. Establishing effective systems for ensuring used and emptied cylinders are identified and promptly collected and returned for refilling

Note many of the actions to reduce oxygen wastage will also have a positive effect on reducing fire risk

Action by

- Chief Pharmacists
- Chief Executive Officers,
- Medical Directors and Directors of Nursing
- Critical Care Directors and Matrons
- Respiratory and acute medicine directors and matrons
- Estates and Facilities Directors
- EPRR Leads

Deadlines for action

Actions underway: Immediately
Actions complete: 18th December 2020

Device details

Not applicable

Problem / background

As hospitals come under increased pressure from acute respiratory admissions due to COVID19 and Winter viruses, oxygen estates may also come under pressure due to:

- Admitting large numbers of COVID19 patients in addition to their usual workload of elective, urgent and emergency care;
- Creating new bays or wards to care for patients with COVID19 or other respiratory illnesses;
- Have older estates, or;
- Using Continuous Positive Airway Pressure CPAP, non-invasive ventilation (NIV) and/or High Flow Nasal Oxygen ($HFNO_2$) as part of the care pathway for acute respiratory patients (COVID or non-COVID);

Demand for oxygen this Winter is also likely to be higher than in Spring because:

- There are more general and acute patients in hospital than in the Spring, many of whom require some oxygen; and
- There is proportionately greater use of $HFNO_2$ and CPAP in patients with COVID19 and in general, these devices use more oxygen than critical care ventilators
- Operating theatres and recovery wards are largely continuing to run as normal rather than acting as COVID surge capacity.

It is therefore particularly important that trusts continue to follow previously issued guidance and good practice in relation to oxygen supplies

Manufacturer contacts

Non applicable

Distribution

NHS acute and specialist hospitals hospital trusts, independent hospitals

References

- Fire Risk Assessment: Guidance on completing specific FRA for temporary wards provided for Covid-19 treatment or care https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/C0131-covid-19-estates-facilities-fire-risk-assessment.pdf

- Estates and Facilities Alert NHSE/I - 2020/0002 OXYGEN USAGE https://www.cas.mhra.gov.uk/ViewandAcknowledgment/ViewAttachment.aspx?Attachment_id=103518

Enquiries

Enquires should be addressed to: nhsi.estatesandfacilities@nhs.net

Reporting adverse incidents in England

Defects or failures should be reported on this system: http://efm.hscic.gov.uk/

The web-based D&F reporting system is managed by the NHS Digital on behalf of NHS Improvement. For further information on this system, including obtaining login details, please contact the efm-information Helpdesk. Tel 0300 123 2106.

© Crown Copyright 2020
Addressees may take copies for distribution within their own organisations

Annex 1 - Good Oxygen Housekeeping
For use on ALL WARDS AND DEPARTMENTS

Ward and Department checklist

Complete before shift handover and during pharmacy rounds

- ☐ Advise all staff working of the location the oxygen outlet alarm panel
- ☐ Check stock of oxygen cylinders is readily available in case of emergency
- ☐ Replace empty or near empty oxygen cylinders
- ☐ Turn off oxygen flowmeters which are not in use
- ☐ Remove medical air flowmeters when not in active use

Patient checklist

- ☐ Titrate patients' oxygen to targeted SpO_2. Guidance on suggested oxygen titration is found on page 11 of this guidance:

  https://static1.squarespace.com/static/5e6613a1dc75b87df82b78e1/t/5f999cd5b3df86542e85d0ab/1603902680560/AdultCriticalCare-COVID-19-October2020.pdf

- ☐ Turn off oxygen flowmeter if not in use
- ☐ Ensure no more than 15L/Min are given by a standard ward oxygen flowmeter

High flow nasal oxygen ($HFNO_2$) and CPAP/NIV devices patient checklist

- ☐ Turn off devices when not in use
- ☐ Limit large mask leaks with CPAP / NIV devices: call for help to review / refit mask if required
- ☐ Where possible avoid the use of oxygen cylinders to support CPAP / NIV devices (both risk of oxygen failure and potential fire risk)

If an oxygen alarm sounds, this must be taken seriously and not ignored
Please contact [Insert local point of contact] as a matter of urgency.