Non-invasive ventilation (NIV) is increasingly being used in acute hospitals and a recent audit\(^1\) has highlighted the importance of giving NIV in an appropriate environment by appropriately trained staff.

A particular risk relating to the delivery of NIV has been identified. A serious incident reported to the National Reporting and Learning System (NRLS) described that a mask for non-invasive ventilation (NIV) was attached to a patient’s face but the ventilation machine had not been switched on. The patient became severely hypoxic and died. A similar case has also been reported to MHRA.

A review of NRLS data since 2012 identified three additional fatal incidents in which the oxygen supply was found to be disconnected when patients were receiving NIV. In these cases, the length of time that the oxygen tubing was detached was unknown as no regular checking of oxygen tubing was completed, and no patient observations were recorded.

Unlike ventilators that provide life-sustaining ventilation, non-invasive ventilators may lack features to warn staff of delivery problems, such as disconnection and loss of gas supply. Where devices delivering NIV have an alarm facility, this function has sometimes been disabled by staff. Devices also differ in their modes of operation; for example, following a pause in NIV therapy, some machines automatically revert to ventilation support when the mask is re-fitted; others need to be manually reactivated.

Review of incidents reported to the NRLS suggest that risks are increased when:

- patients, especially those with limited ability to summon help, are not closely monitored;
- staff are not familiar with the equipment and its correct use (e.g. unclear about when to use vented or non-vented masks, or patients bringing devices from home); and
- a new make and model of device is implemented; staff, even when they have been trained on the new device, may instinctively expect the device to work in the same way as the previous make and model in use.

NHS England and MHRA will continue to review risks relating to NIV and will provide further advice if required.
Technical notes

NRLS search dates and terms
The National Reporting and Learning System (NRLS) was searched on 12 January 2015 for incidents, which were reported since 1 January 2012 as resulting in severe harm or death and which contain the keywords [NIV, non_invasive_ventilation, BIPAP or CPAP]. In total, 206 incidents were found and all were reviewed. In addition to the trigger incident, four reports were identified describing oxygen disconnections during non-invasive ventilation. Three of the patients involved have died.

Stakeholder engagement
The Patient Safety Alert was developed with advice from MHRA, the British Thoracic Society (BTS) and the NHS England Medical Specialties Patient Safety Expert Group (see www.england.nhs.uk/patientsafety/patient-safety-groups/ for membership details) who fully supported the publication of this alert.

Useful resources

