A rapid response report by the National Patient Safety Agency outlines how the risks of oxygen use can be minimised to prevent serious harm to patients

Why do we need to change practice?
Nurses administer supplemental oxygen to patients daily. However, as with any other medicine, oxygen has potential risks if it is not administered safely and appropriately. Underuse of oxygen is dangerous as it exposes critically ill patients to the risk of hypoxic organ damage. However, overuse of oxygen can also be harmful, especially for vulnerable patients such as premature infants and those with chronic obstructive pulmonary disease. The National Patient Safety Agency (NPSA) received 281 serious incidents relating to the use of oxygen in hospitals between December 2004 and June 2009. It was found that poor oxygen management has caused nine patient deaths and contributed to a further 35 patient deaths.

The data prompted the release of a Rapid Response Report (RRR) by the NPSA, which aims to change practice at both a system and an individual level.

Serious reported incidents included:
- Patients on oxygen were not monitored
- An under-performing patient required 80% flow oxygen and regular monitoring. However, despite his modified Early Warning Score (mEWS) being 5, no observations were performed overnight. The patient required intubation and admission to the intensive care unit.
- Abnormal saturation levels were not acted upon
- A patient had a saturation oxygen level documented at 77%. There was no documented evidence of treatment or escalation to senior nursing or medical staff and no evidence of oxygen administration.
- There were no subsequent observations until the patient had a fatal cardiac arrest four hours later.
- Patients connected to medical compressed air instead of oxygen
- A patient went into respiratory arrest and a crash call went out. The patient was intubated, recovered but subsequently re-arrested. The second attempt to resuscitate failed and the patient died. When staff were clearing up they noticed that the tubing from the ambu-bag had been connected to the air rather than oxygen.
- Oxygen cylinders were found to be empty

The NPSA rapid response report identified key actions for organisations and frontline staff to make practice safer.

Find out how your hospital is putting these actions into practice:
- Minimise use of oxygen cylinders on wards (it is more expensive and less safe than piped oxygen for clinical areas with regular use)
- Ensure reliable and adequate supplies of oxygen cylinders in transfer and emergency situations
- Assess the risks of confusing oxygen and medical compressed air (for instance, covering air outlets and pulse oximetry is an essential tool in assessing the oxygen saturation of the blood and results should be recorded)
- Don’t confuse oxygen and medical compressed air

How to use the rapid response report to change practice
Norma Linaker, respiratory nurse specialist at Salford Royal Foundation Trust, explains how the rapid response report (RRR) on oxygen safety has helped to improve patient safety.

“Oxygen therapy is commonly used within healthcare settings, and is often administered routinely. However, while oxygen can be lifesaving it can also be harmful if given inappropriately.

“The target saturation prescribing system has helped change this mindset, so that the use of oxygen is outcome led rather than habit. It gives nurses more autonomy to manage oxygen safety by emphasising monitoring and observation, ensuring patients are kept within a safe target range for that individual. Nurses now have an objective tool which they can refer to so they know when to act or contact a doctor.

“We had an adverse incident a few years ago, so the trust had already developed a target saturation oxygen prescribing system before publication of the RRR in 2009.

“The medical high dependency unit had utilised target oxygen saturations for some time, but we felt this could be widened across the trust. Initially we used a sticker system; then we had drug charts reprinted – now most wards use electronic prescribing.

“The RRR was circulated throughout the trust in September 2009 and has used the profile of the prescription and administration of oxygen therapy. It has made staff aware that it is not just a trust issue but a nationwide issue.

“The report has helped to highlight areas where we can still improve, such as creating physical barriers to prevent incorrect attachment to air instead of oxygen. We have advised removal of all air gauges that are not in use, as these are also confusing.

“The report has shown areas where we can improve, such as creating physical barriers to prevent attachment to air instead of oxygen.

The report has also highlighted that although we provide oxygen therapy, which both the practice educators and ourselves can use in training, the RRR has helped push those forward and take it to the next level.

“The report also highlighted that although we provide training on the ‘clinical’ aspects of oxygen therapy, we don’t always encompass the ‘technical’ aspects. We are now looking at this with the trust’s Medical Gases Committee who have led work around cylinder handling.

“The RRR gives renewed focus to a very basic and important aspect of training all health professionals – in the past it wasn’t given that significance.”

Every reported incident counts
Each serious incident you report is reviewed at the NPSA. We look for themes and potential national action on RRRs by looking for further evidence of similar or related incidents. This is done through incident reports recorded by nurses, doctors and others.

Each RRR starts with a single incident – in this case, a patient attached to air instead of oxygen. Please carry on reporting to ensure safer care.
https://tinyurl.com/oxygenadvice

Find the Rapid Response Report and additional information (including a briefing sheet for nurses and FAQs on the NPSA website at www.npsa.nhs.uk/oxygen

Did you know?
- The colour coding in the UK is white for oxygen and black for air.
- You can easily calculate how long a full cylinder will last. The formula for calculating is: volume of cylinder in litres/flow rate = minutes it lasts. For example: how long would a D size cylinder (340 litres) last when on nasal “spills” at 4 litres a minute?
- (340 litres) / 4 = 85 minutes (1.4 hours)
- All hospitals were asked to complete key actions by March 2010. Have you?
- A network of “oxygen champions” has been established in hospitals across the UK. The oxygen champions facilitate staff training and disseminate the educational materials and new standardised documentation for the prescription and monitoring of oxygen use. To find out more information about your local champion please contact emergencyoxygen@nhs.net
"