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Neonatal Oxygen Saturation Guideline /Greater Glasgow Guideline Group/Linda Hannah Advices the following

The Target Range represents the values we are aiming for when the infant is stable and at rest. The Saturation limits to be set on the pulse oximeter are deliberately lower than the target range to limit the number of desaturation alarms and discourage frequent, and often inappropriate, increases in FiO2. For infants who are in air the upper limit can be set at 100% however must be reset to the limits documented below if maintained in oxygen.

	Babies at risk of ROP < 1500g **or** <32 weeks	**Babies discharged from ROP screening & All other babies**
Target Range	91-95%	>92%
Limits to be set on monitor	89-95%	91-98%

* Note that this recommended range is not applicable to infants with cyanotic congenital heart disease or persistent pulmonary hypertension of the newborn. Please refer to appropriate guidelines for the care of these infants
Limits should be checked at the start of each shift and documented.

Response to Desaturations

Whilst this new guideline has set higher oxygen saturation targets it remains important to avoid hyperoxia in infants at risk of ROP. Arguably, this issue is now more important than previously, as the very studies that have recently identified a higher mortality in the group of infants with lower set limits also report higher rates of ROP in the group with higher set limits. The following approaches to help avoid excessive oxygen use and limit over reaction to destauration events should be considered first.

- No Treatment. There should always be an assessment to determine whether the desaturations represents monitoring artefact. Look at the monitor to ensure there is a good pulse wave and that the heart rate correlates with the ECG. Remember to look at the baby. Many babies will recover from desaturation events spontaneously with no intervention.
- Gentle stimulation. If a baby is apnoeic there is no benefit to increasing the FiO2.
- Manual breaths/ mask ventilation. For the baby who is apnoeic and does not respond to stimulation. When performed with blended air & oxygen to provide a similar FiO2 to that which the baby is currently receiving.

If an increased FiO2 is necessary

When it is necessary to increase the FiO2 (if SpO2 remains low after adequate respirations have been established) this should be done in small increments of around 5%.

If the FiO2 is increased by more than 5% from baseline levels the carer (doctor or midwife/nurse) should remain with the baby until the SpO2 recovers and the FiO2 has been returned to its original level. Alarms should not be muted unless the carer remains with the baby. If it is not possible to return the FiO2 to a level within 5% of the baseline level a review of ventilatory requirements is warranted.

Making large changes in FiO2 and walking away is strongly to be discouraged.

Response to high saturation alarms

It is important to respond to high saturation alarms with the same degree of urgency as the response given to desaturation alarms

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Dr.Sanaa Tantawy ,AL Azhar University wrote
Newborn hearing screening

Newborn hearing screening is the standard of care in hospitals nationwide. The primary purpose of newborn hearing screening is to identify newborns who are likely to have hearing loss and who require further evaluation. A secondary objective is to identify newborns with medical conditions that can cause late-onset hearing loss and to establish a plan for ongoing monitoring of their hearing status. Infants who do not pass the newborn hearing screening (and/or rescreening) are referred immediately for a comprehensive audiologic evaluation, with a goal of having hearing loss confirmed by 3 months of age.

Auditory Brainstem Response (ABR) offers a noninvasive modality to assess neural integrity of the auditory pathway. It is an effective and simple method that requires less cooperation of the patient and measures the specific part of the auditory pathway. It is not significantly altered by state of consciousness, drugs, or environmental factors.

ABR used to detect auditory neuropathy or neural conduction disorders in newborns. Because ABR are reflective of auditory nerve and brainstem function, these infants can have an abnormal ABR screening result even when peripheral hearing is normal.

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Egyptian Neonatal Safety Training Network
(ENSTN)
الشبكة المصرية لسلامة حديثى الولادة
June 2015 Issue Volume 1 Issue 3

Patient safety is the core of health care

سلامه المريض هى اساس وجوهر الرعاية الصحيه

Together we can make a difference to provide safe care in NICU

معا سويا قادرون على توفير بيئه امنه لسلامه الرضع فى وحدات حديثى الولاده والرعايه المركزه

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- Professor Nadia Badrawi, Professor of Pediatrics, Cairo University and president of EAN, Arab Network of Quality Assurance in higher education.
- Four NICU patient safety training workshops were conducted from February 2015 to June 2015 in Tanta, Mansoura ,Zagazig and ALAZhar University.
- First NICU patient safety leadership workshop was conducted on 7-8/3/ 2015 in ALAzhar University ,it was followed by second in Tanta on 11-12 /3 2015.
- The first three scientific research workshops were conducted in ALAzhar University on 9-10 March 2015 ,Zagazig University on 31 March to 1 April 2015 and Tanta on 17-18 June 2015 to teach staff how to implement research to improve patient safety in NICU .
- Training visits to Egypt beneficiary sites by Liverpool and Tartu Universities as well as to UP/EHU , by Liverpool and Tartu Universities had been taken place during the previous 6 months .

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Articles of interest:

Guideline on the Use of Oxygen in the Newborn/ Perinatal Society of Malaysia

Retinopathy of prematurity (ROP), formerly known as retrolental fibroplasia (RLF) was first described in 1942. In the 1950's reports started to appear suggesting that oxygen toxicity was a possible cause2 and by 1956 four randomised clinical trials on oxygen restriction had been published establishing the association between the unrestricted use of oxygen and ROP. A systematic review of these trials showed that restricted oxygen use led to a marked reduction in the prevalence of ROP without any increase in neonatal morbidity and mortality.

Intermittent arterial blood gas sampling is widely practiced but has never been proven as a means of reducing ROP. The safe limits of PaO2 are 50 -80 mmHg.11 The risk of ROP has been shown to be related to the length to time that the PaO2 is more than 80 mmHg. Infants with increased variability of the TcPO2 in the first 2 weeks of life are at increased risk of ROP. Arterialised capillary gases in a well perfused infant are useful in excluding hypoxia but will not reliably rule out hyperoxia. It is not reliable in the first 24 hours of life, in seriously ill infants, or those with shock, hypotension or peripheral vasocontriction.
Transcutaneous oxygen monitoring and/or pulse oximetry allows for continuous monitoring of oxygen therapy. The Guidelines for Perinatal Care state that "because neither technique measures PaO2 directly, they should be used as adjuncts to, rather than substitutes for, arterial blood gas sampling, especially in infants with moderate to severe respiratory distress. In infants whose condition is unstable, noninvasive measurements should be correlated with PaO2 at least every 8-12 hours. More frequent analyses of arterial blood gas may be indicated for the assessment of pH and PaCO2. In infants whose condition is stable, correlation with arterial blood gas samples may be performed less frequently. The use of either transcutaneous oxygen measurement or pulse oximetry may shorten the time required to determine optimum inspired oxygen concentration and ventilator settings in the acute care setting." The Australian National Health and Medical Research Council have stated that pulse oximeters are probably safe if levels of 89 - 94% are maintained There should be an institutional policy for the documentation of oxygen therapy and monitoring. Current evidence suggests that ROP is linked to the duration of oxygen rather than the concentration, thus the use of 100% oxygen to resuscitate the newborn does not pose a problem. The American Academy of Pediatrics and American Heart Association recommend that "...since the risk of hyperoxia over a short period is negligible compared with the risks of hypoxia, infants requiring resuscitation at birth should be given 100% oxygen," 18 and the Guidelines to Perinatal Care states that "The use of supplemental oxygen other than for resuscitation should be monitored by regular assessments of P aO2.

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It is therefore important that ROP be detected early and the affected neonates followed up until they are no longer at risk. Eye examination should begin with indirect ophthalmoscopy at 4 - 6 weeks of age for all infants < 1250g and less than 32 weeks gestation. This should be repeated at 2-4 weekly intervals until vascularisation reaches Zone 3 using the International Classification for Retinopathy of Prematurity or the risk of threshold disease passes. If disease develops then these examinations should be repeated every 1-2 weeks until the need for treatment is established. The need for surveillance in babies of higher gestations is not clear. Infants of 32 – 36 weeks who had a complicated clinical course felt at high risk for ROP should probably be followed up to term.

Recommendations

1. An understanding is required that Retinopathy of Prematurity (ROP) is currently not preventable in some neonates, even with optimal monitoring of oxygen therapy. Many factors other than hyperoxia may contribute to the pathogenesis in this condition.
2. Nevertheless, supplemental oxygen should only be used when there are specific indications such as respiratory distress, cyanosis or documented hypoxia.
3. In an emergency when oxygen is needed, it should be used without restriction, and concern for ROP should not override the need to save a life. Transient elevations of do not cause ROP.
4. The use of supplemental oxygen beyond the emergency period should be monitored by means of regular arterial PaO2 measurements. Arterialised capillary sampling is an acceptable alternative if arterial sampling is not possible.
5. Term infants requiring oxygen therapy for periods longer than a few hours and all preterm infants requiring oxygen should be managed in a facility where monitoring of oxygen therapy is available. When this is not possible, the concentration of oxygen administered should be just enough to abolish cyanosis. It should be safe in the term neonate to administer oxygen for a few hours without monitoring arterial oxygen.
6. Transcutaneous oxygen measurement and/or pulse oximetry allow for continuous monitoring of oxygen therapy. The recommended levels of SaO2 are 89 to 95%. This should be supported by intermittent arterial blood gas analysis. A recommended range for most preterm neonates would be a PaO2 of 50 -80 mmHg (6.7 –10.7 kPa).
7. In some neonates, efforts to keep the PaO2 within this range may result in unacceptable episodes of hypoxia. In such a situation, it might be necessary to accept PaO2 levels above this range. Such decisions should be documented clearly.
8. Institutions should have a written protocol for the documentation and monitoring of oxygen therapy. Recognising the benefits of early detection and treatment of ROP, eye examination at 4- 6 weeks of age is recommended for: a. all babies less than 32 weeks gestation at birth or weight less than 1250gm. b. other babies above 32 weeks and 1250 gm depending on individual risk as assessed by the clinician.
9. Eye examination should be repeated at 2-4 weekly intervals until vascularisation reaches Zone 3 or there is no longer a risk of threshold disease. If threshold disease develops then ablative therapy should be considered for at least one eye within 72 hours of detection. (Every effort should be made to provide such a service for all these neonates, although it is recognised that access to ophthalmological examination might be difficult some parts of Malaysia.)