East Midlands Neonatal
Operational Delivery Network

GOOD PRACTICE POINTS:
OXYGEN PRESCRIBING ON THE NEONATAL UNIT

Introduction

'Oxygen must be considered as a medication and the use of oxygen must be documented for each patient' Royal Pharmaceutical Society 2005.

The British National Formulary (2017) goes on to state that oxygen should be regarded as a drug and that oxygen should not be administered to neonates except under expert supervision.

Neonatal medicine is complex and adjustments to oxygen levels are often made multiple times throughout a day, resulting in a logistical issue regarding the prescription and recording of oxygen. It is well documented that the neonate, particularly if born prematurely commonly displays variations in oxygen saturation recordings. If these desaturations are fleeting and self-correcting, then they are not likely to have a significant clinical reason, or require any significant adjustment to oxygen requirements.

However, there are many causes of significant desaturations, and dependent upon the cause there may be several actions to take; one of which would be the increasing of oxygen levels.

Neonatal teams aim to ensure that oxygen levels remain within defined saturation targets, which are dependent upon the gestational age and condition of the neonate (Targeted Saturation levels). This practice aims to reduce the risk of developing conditions such as Chronic Lung Disease, Retinopathy of Prematurity and the development of Necrotising Enterocolitis.

Scope of Practice

In order to ensure that oxygen is safely prescribed and recorded, and to avoid the unintended consequence of saturation levels running at a too high, or too low level, these good practice points have been produced for use in Neonatal Units across the East Midlands Neonatal ODN.

These Good Practice Points do not relate to the neonate who still has an oxygen requirement at discharge. Care of these patients must be undertaken according to local Trust guidelines.

Good Practice Points

- All babies who have an oxygen requirement should have this prescribed on a prescription chart.

- Oxygen must be prescribed by a member of the medical team or ANNP after completion of the prescribing course.

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- The oxygen prescription should specify the appropriate target for saturation for the individual patient.

- The oxygen delivery device should be indicated on the prescription chart.

- Nursing staff must sign the prescription chart when oxygen therapy has been commenced.

- Alarm limits should be fixed to ensure tight control within the targeted saturation range. These limits should be checked at the start of each nursing shift.

- Recording of the Respiratory rate, oxygen saturation levels and oxygen flow rate, along with the delivery method, should be recorded in accordance with the local unit guidance for the monitoring and documentation of clinical observations for babies being cared for in the neonatal unit. These should be documented on the appropriate Trust observation chart, along with any other physiological variables.

- Oxygen saturation levels and requirements must always be interpreted along with the neonates' clinical condition.

- All babies receiving oxygen therapy should have continuous pulse oximetry with the exception of babies with Bronchopulmonary dysplasia who are ready for discharge and have a download confirming that they are safe in a specified level of oxygen.

- If desaturations persist, medical staff must be summoned as per Trust policies and guidelines.

- In the event of an emergency situation where it is clear that **either** oxygen needs to be commenced or that it should be significantly increased, then this should take place immediately as per emergency procedures, and medical assistance summoned as soon as possible. Any treatment administered in the case of an emergency must be clearly documented in the patient notes.

- Decisions to discontinue oxygen therapy must be clearly documented in the baby's notes.

- All staff should be aware that a fall in oxygen saturation levels are generally due to deterioration in the neonate's condition, however the possibility of equipment failure should always be considered.

Auditable Standards

- 100% of neonates who are receiving oxygen should have that oxygen therapy prescribed on an appropriate prescription chart.

- 100% of prescriptions should record the targeted saturation level.

- 100% of oxygen prescriptions should be signed and dated by a member of the medical or ANNP team.

- 100% of neonates who receive oxygen therapy must have continuous pulse oximetry monitoring (with the exception of BPD babies who are ready for discharge as detailed above).

- 100% of neonates receiving oxygen therapy should have saturation alarm limits set according to the agreed saturation target according to the gestation, age and clinical condition.

- 100% of deviations from the prescription chart and the agreed saturation targets must be clearly documented on the paperwork which has been agreed within the individual Trust.

References

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Further Reading

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NEWBORN RESUSITATION GUIDELINES, 2010. The Resuscitation Council (UK). The Resuscitation Council

SAUGSTAD, O.D., AUNE, D. 2011. In Search of the Optimal Oxygen Saturation for Extremely Low Birth Weight Infants: A Systematic Review and Meta-Analysis. Neonatology 100:1-8

WORLD HEALTH ORGANISATION, 2016. Oxygen Therapy for Children. [Online]. Accessed at: http://apps.who.int/iris/bitstream/10665/204584/1/9789241549554_eng.pdf

Appendix – Sample Drug Chart

CHECK ALLERGY STATUS

OXYGEN	Start date	As Per Guidance Below	Starting Delivery Device (please circle) ETT, CPAP, Nasal, Head box, AMB
Prescriber Signature	Print name and GMC/ NMC number		Nurses Signature when started

Record respiratory rate, oxygen saturation, changes to oxygen delivery device and flow rate on observation chart.
If saturations persists >98% wean oxygen unless otherwise directed

OXYGEN ADVICE

Guidance for monitoring oxygen saturations

	Gestation at Birth	Post menstrual age		Target Saturations	Alarm limits		Comments
					Lower	Upper	
Premature Babies	<33 weeks	<36 weeks	Oxygen	91 to 95%	80%	96%	In line with current results from Boost II study. Lower limit to avoid unnecessary alarms. Use PaO2 measurements when available. Aim for 6-10kPa.
			Air	>91%	80%	Off	
At 36 weeks corrected age change to:-			Oxygen	91 to 95%	88%	96%	In keeping with the outcome of the Boost I study. If in oxygen at 36 weeks consider referral for overnight oxygen study. Saturations will then be guided by results of this.
			Air	≥91%	88%	Off	
Term / near term baby with respiratory problems	>33 weeks	>33 weeks		≥93%	93%	100%	In particular infants with **PPHN, Diaphragmatic Hernia, or Meconium aspiration** a low arterial oxygen content may precipitate pulmonary hypertension so lower oxygen saturations should be avoided. Aim for PaO_2 around 10 kPa in these babies.
Cyanotic congenital heart disease	Any	Any		To be agreed for each baby on an individual basis	2% below agreed target	2% above agreed target	*Usually avoid giving additional oxygen to these infants* May be acceptable to have saturations much lower than we would normally allow

All babies in intensive care or high dependency must have the sodium chloride flushes recorded on the observation chart.

	Baby's location	Where to Record flushes	Sodium Chloride Delete strength as appropriate*		Prescribers signature	Start date
Sodium chloride IV flushes	**ITU/High dependency**	On obs chart	0.45%*	0.9%*		
	Low dependency	On drug chart (see below)	0.9%			
	Post natal ward	On drug chart (see below)	0.9%			

SODIUM CHLORIDE IV FLUSHES

For other flushes prescribe on regular or as required section of chart.

Date Time										
Total Vol										
Initials										
Date Time										
Total Vol										
Initials										

Date Time										
Total Vol										
Initials										
Date Time										
Total Vol										
Initials										

FLUSHES GUIDANCE

Peripheral	Type	Volume for flush	Heparinised saline lock – Must be prescribed	Priming volume
Peripheral Venous Cannula	Jelco 24G + T Piece	0.5ml per flush		
Central Lines	**Type**	**Volume for flush**	**Heparinised saline lock – Must be prescribed**	**Priming volume**
Neonatal Long line	Vygon Long line 24G	2-5mL per flush	0.12ml heparinised saline 10 units/ml if not used within 8 hours	0.12ml
UVC	Vygon Double Lumen UVC	2ml		0.3ml (each lumen)
	Vygon Umbilical catheter 4G	2ml		0.4ml
Broviac Line	Broviac line 2.7F	2-5mL per flush	0.15ml heparinised saline 10 units/ml if not used within 8 hours	0.15ml
	Broviac line 4.2F	2-5mL per flush	0.3ml heparinised saline 10 units/ml if not used within 8 hours	0.3ml