

Competencies for Pharmacists covering Neonatal Intensive Care

Introduction

This paper lists the standards and competencies required of a pharmacist working in a neonatal intensive care unit. Most of these standards will apply to most general medical units. Surgical units and other specialist units may have more extensive requirements

Summary

The standards are grouped as follows.

- General
- Gestation
- Labour
- Stabilisation/Resuscitation
- Intensive Care
- Complications
- Infection
- Nutrition
- Ventilation
- Long term problems

General.

-  Be familiar with common terminology used on NICU
-  Have an understanding of the pharmacokinetic and pharmacodynamic changes that occur in neonates.
-  Demonstrate an ability to perform both simple and complex calculations involving, doses, infusion rates, fluid balance, glucose concentrations, conversions from mg-microgram-nanograms and ml/hr.
-  Be aware of the different types of I/V access used on NICU and their positioning . Including short long lines, peripheral cannulae, scalp veins and umbilical catheters.
-  Be aware of the potential for IV drug incompatibilities, sources of information regarding compatibility and strategies for minimising the risk.
-  Be familiar with the working practises of the neonatal nurses taking in to account possible areas of error avoidance.
-  Be able to communicate confidently with both healthcare professionals of all grades as well as parents.
-  Be able to give presentations use teaching skills to other healthcare professional working in the speciality.

Gestation

-  Be able to describe the main periods of gestation and the important developments and when they occur e.g. maturation of the lungs, Gut and Brain
-  Be aware of the drugs used to treat common conditions during pregnancy and their likely effect on the foetus

Labour

-  Understand the common reasons for premature labour and the ways in which labour can be prevented
-  Understand the common risk factors such as rupture of membranes, Group B strep, absent end diastolic flow, meconium aspiration and their likely effect on the neonate.

## Stabilisation / Resuscitation.

-  Be familiar with the role surfactant in newly delivered babies. Including dosage, method of administration, use for rescue, prophylaxis, cost.
-  Understand the role of Morphine in sedation, pain relief and pre medication for intubation. The dose and methods of administration.
-  Be aware of the local policy on Vitamin K for prophylaxis of Haemorrhagic disease of the newborn.

## Intensive Care

-  Be aware of fluid requirements for neonates and the factors which affect fluid requirements. i.e., Gestational Age, plasma Sodium, Urine Output
-  Understand the use, dose and administration of common IV infusions used in the early days of life. i.e. Morphine, dopamine, dobutamine, pancuronium, vecuronium, insulin, midazolam.

## Complications

-  Be aware of the treatment options for seizures, the doses and be able to advise on the therapeutic drug monitoring and dose adjustments of anti-convulsants
-  Be familiar with the treatment for Patent Ductus Arteriosus both pharmacological and surgical.
-  Be aware of the treatment options for neonatal abstinence syndrome. The doses of the various agents used and the most appropriate method of monitoring their effects.

## Infection

-  Be familiar with the most likely pathogens the most appropriate anti-infective and the way in which these treatments should be monitored.
-  Be able to advise and monitor the dose of aminoglycosides
-  Be familiar with the use of antifungal agents -fluconazole, and amphotericin and flucytosine.

## Nutrition

-  Understand the importance of nutrition to brain development and overall growth.
-  Understand the importance of breast milk and be familiar with the common formula feeds.
-  Have a detailed knowledge of the prescribing and delivery of intravenous nutrition (TPN) in particular monitoring the various parameters necessary for the correct prescribing of TPN i.e. Fluid balance, sodium, potassium, glucose, calcium, phosphate etc.
-  Have a detailed knowledge and understanding of the common complications of TPN and the ways in which they can be avoided.
-  Be aware of the pharmaceutical implications of changing TPN formulation. i.e. the formation of Calcium Phosphate

## Ventilation

-  Be familiar with the common forms of ventilation and their differences.
-  Be familiar with the aetiology, prevention and treatment of respiratory distress syndrome and chronic lung disease.

-  Be aware of the use of inhaled nitric oxide for the treatment of Pulmonary hypertension.

### **Long Term Problems**

-  Be familiar with the treatment options and monitoring for the common long term medication used in premature babies.
-  Diuretics, Iron, Vitamins, Phosphate, sodium, and anti reflux treatment.