



Paediatric Intensive Care Unit Nursing Guideline: Parenteral Nutrition (PN)

This is a summary of the Cardiff & Vale University Health Board guide '**Parenteral Nutrition in Paediatrics**' as it relates to PICU. The full guideline can be found in the clinical portal by accessing policies and procedures and searching in all files/documents for 'parenteral nutrition'.

- If not contraindicated it is beneficial to give a small amount of enteral nutrition (trophic feed) in order to maintain gut integrity and to reduce the risk of liver cholestasis (this is why the term 'total parenteral nutrition' is avoided).
- The child's full nutritional requirement is built up over the first 5 days so there is likely to be little benefit in using PN for less than 5 days.

Checking PN

- PN is a prescription only medication and must be prescribed on our yellow fluid prescription chart with the volume to be infused and infusion rate.
- The following checks should be carried out in order to confirm that the correct product is given to the correct patient:
 - Patient's full name, date of birth, hospital number and first line of address (fluid prescription, PN solution prescription and name band)
 - Volume for infusion
 - Rate of infusion
 - Components of infusion (check bag components against prescription)

- Any discrepancies must be discussed with the medical staff before administration of the solution.
- The prescription should be signed by the doctor and placed into the medical notes.
- Check that the PN solution is:
 - Not leaking
 - The fluid inside is not cloudy (if no fat is present in the mixture)
 - There is no visible precipitation in the bag
 - Not out of date

Setting up PN

- The PN should be removed from the refrigerator and hung up **2 hours** before it is required so that it can reach room temperature prior to administration. This avoids the infusion of a solution that is too cold and will encourage the oxygen to bubble out of the solution thus preventing air in the line during infusion.
- Two nurses are required to connect and disconnect PN.
- Meticulous aseptic non-touch technique is required in handling the feeding line and also changing the PN bag and giving set.
- PN must be administered through a dedicated lumen of the central venous catheter.
- The lumen should be flushed with 0.9% sodium chloride between infusions using a turbulent flush technique to clear the line of any debris as there is an increased risk of line occlusion and embolus when PN is administered.
- A 'Ready-set FEED' filter should be attached to the PN lumen, dated and changed aseptically every 96hrs. The glucose solution is administered via the filter; the lipid solution is not filtered.

- Once the infusion is connected it should not be disconnected to remove air in line. If it is necessary, a new bag should be run through and the old one discarded.
- The set volume to be infused should be equivalent to the hourly rate to prevent over-infusion.
- Pharmacy will deliver the PN infusion to the ward in a black/grey bag if protection from light is necessary in order to prevent breakdown of light sensitive products.

Management of PN

- Pharmacy should be contacted no later than 12.00pm each day in order to ensure adequate time for preparation of PN. On Friday three PN bags are prepared, therefore three days will need to be ordered.
- If possible, the child's weight, height and head circumference (if < 2 years old) should be plotted on a growth chart prior to starting.
- The lumen dedicated to PN must not be used for drug administration or blood sampling as this will increase the risk of line infection and occlusion.
- The lipid solution should be stopped for 4 hours prior to blood sampling for laboratory analysis (although this is not essential). This will usually be at 2-3am. This allows any lipaemia to clear so as not to interfere with the measurement of the serum sodium (may give a falsely low serum Na result).
- If PN is stopped for > 4 hours it should be disconnected and discarded.
- **Blood glucose should be taken and recorded at least every 6 hours** when on PN. The frequency may need to be increased during the first 5 days when the glucose content is increasing.

- Daily monitoring of plasma electrolytes is essential. Other blood laboratory tests should be performed as recommended on the Paediatric Parenteral Nutrition prescription (see also Appendix 2 of the C&V guideline, 2011).

For advice contact:

Claire Sadlier (Nutrition Nurse Specialist) pager: 07623 905 719 ext. 45331

Kath Singleton (dietician) pager: 07623 905 796 ext. 43190

Anthony Lewis (PN pharmacist) bleep: 6330 ext. 43710

Reference

Cardiff and Vale NHS Trust (2011) Parenteral Nutrition in Paediatrics. Children's Hospital for Wales, Cardiff. A guide for doctors and nurses.

Further Reading

Sadlier, C. (2008) Intestinal failure and long term parenteral nutrition in children. Paediatric Nursing, 20, 10, pp. 37-43.

Wardle, E. N. (1986) Endotoxin, respiratory and renal failure. Care of the Critically Ill, 2, pp. 54-56.

Author: Julie Armstrong (RN1, RNC)

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