# RCP Ten Top Tips for Parenteral Nutrition

***Introduction***

Parenteral nutrition (PN) is a lifesaving treatment that can have potentially fatal complications. Patients needing PN are best managed by a multidisciplinary nutrition support team (consisting of at least a clinician, nutrition nurse specialist and dietitian). The team will be responsible for the patient's assessment (including the need for PN and the risk of re-feeding problems), calculation of requirements, catheter insertion, safe administration of the PN and monitoring. It will regularly audit its outcomes (including catheter related sepsis). PN may be needed if a patient is malnourished or at risk of becoming malnourished and has a dysfunctional, short, obstructed or perforated gut. PN may be needed if enteral feeding is considered unsafe, has failed to improve/maintain nutritional status or if enteral access cannot be achieved. Only staff who have been trained in surgical aseptic non-touch techniques should access a PN catheter.

***Key practical points***

1. PN is most safely given through a dedicated single lumen catheter.
2. When feeding through a central vein the catheter tip should be at the vena cava/right atrial junction.
3. Before starting PN there should be an assessment of the risk of re-feeding problems.
4. PN is not an emergency treatment and should be started electively with clear aims.
5. PN should always include vitamins and trace elements.
6. The volume of PN must be included on fluid balance charts.
7. Patients having PN in hospital should be clinically monitored every day (especially fluid balance).
8. Catheter-related sepsis (CRS) usually originates from the hub connection so surgical aseptic non-touch techniques are needed for all procedures that access the catheter*.
9. SVC thrombosis is an emergency that needs treatment to re-establish venous patency.
10. Abnormal LFTs on PN more commonly relate to pre-existing liver disease, drugs or sepsis than to the parenteral nutrition solutions.

***:** CRS is suggested by a temperature that begins ½ to 3 hours after the PN begins in those feeding at night only (cyclical PN) whereas in those fed continuously it is often a low grade persistent temperature. CRS in short term catheters usually requires removal, however long term catheters may be treated with a week of appropriate antibiotics given down the catheter (except if staph aureus or a fungal infection).

# RCP Top 10 tips for parental nutrition – Long version

1. **PN is most safely given through a dedicated single lumen catheter**. If a multi-lumen line is used, one lumen must be dedicated to PN (ideally the most distal i.e. nearest the heart). This reduces the chance of CRS.

2. **When feeding through a central vein the catheter tip should be at the vena cava/right atrial junction.** Central vein thrombosis risks are minimized if the catheter tip is at the SVC/RA junction on chest X-ray (or rarely IVC/RA junction if a femoral or IVC line.

3. **Before starting PN there should be an assessment of the risk of re-feeding problems.** While the refeeding risks are less with parenteral nutrition than enteral nutrition they must be assessed and prevented (e.g. special attention to phosphate, thiamine and magnesium which may fall).

4. **PN is not an emergency treatment and should be started electively with clear aims.** This includes having a desired outcome and criteria for stopping (e.g. bowel functioning, a stated BMI being reached or after a surgical procedure).

5. **PN should always include vitamins and trace elements.** PN prescriptions should be individualised and should include appropriate macronutrients, electrolytes, vitamins and minerals in every patient. Glutamine may be given in ITU, bone marrow transplantation or after major surgery. After 5 days of PN feeding, a move to cyclical provision (usually 10-16 hours at night) should be considered.

6. **The volume of PN must be included on fluid balance charts.** They can usually be formulated to meet all the patient's fluid needs. Allowance for stoma/fistula losses which usually contain about 100 mmol/L sodium must be made (N.B gastric and colonic fistula losses may have lower, and biliary higher, sodium concentrations).

7. **Patients having PN in hospital should be clinically monitored every day (especially fluid balance).** Blood tests are done daily for the first 3-5 days (especially if risk of refeeding hypophosphataemia) then 2-3 times a week when the prescription is stable and if the patient has normal renal function. Blood glucose control should be tight especially in critical care patients.

8. **Catheter-related sepsis (CRS) usually originates from the hub connection so surgical aseptic non-touch techniques are needed for all procedures that access the catheter.** Only staff trained in these techniques should access a PN line and CRS rates should always be audited. Sometimes treatment of long-term catheters with antibiotics in the line is coupled with urokinase and alcohol line locks to remove intraluminal fibrin and debris. Recurrent infections may be prevented by taurolidine locks.

9. **SVC thrombosis is an emergency that needs treatment to re-establish venous patency.** Occluded central veins can prevent parenteral nutrition being given and are a reason to

consider small bowel transplantation. A thrombolytic drug (e.g. t-PA) can be infused directly into a clot to restore venous patency.

10. **Abnormal LFTs on PN more commonly relate to pre-existing liver disease, drugs or sepsis than to the parenteral nutrition solutions**. Lipids (especially LCTs) can cause abnormal LFTs in the long term.

**Other points:**

1. Feeding catheters are flushed with saline between bags or drugs. In general nothing is administered through a feeding catheter except nutrition/fluid, and blood samples are not taken.

2. If PN continues for longer than 28 days referral to an IF unit should be considered.

References


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