

THE USE OF PARENTERAL NUTRITION (TPN) IN ADULTS

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The following guideline is for use by medical staff caring for the patient, members of the Nutrition Support Team and registered dietitians. It applies to adult hospital based patients receiving parenteral nutrition (TPN).

Parenteral nutrition is a form of artificial nutrition support. The usual indication for its use is the inability to meet nutritional requirements orally or enterally. For adult patients -

Does the patient require TPN?

Parenteral nutrition is indicated if the patient is unable to meet their nutritional requirements using the gut. The general rule is 'If the gut is working, use it'.

Referral

Contact Dr Rob Lord (Ext 4412, or pager via switchboard) to discuss referrals for adult patients TPN. In his absence contact Debbie Stephens (Senior Dietitian on 8141) or Sue Gibbons (Pharmacist, on 8160). Details which will be needed include

1. Brief history of the reason for TPN
2. Current nutritional management
3. Current venous access
4. Recent U+E, glucose, LFTs, calcium, magnesium and phosphate results available.

Referrals need to be made as early as possible in the day (ideally by 11am) to allow time for the TPN to be made in Pharmacy. Patients referred in the afternoon are not likely to receive TPN until the next working day.

Venous access

Parenteral nutrition solutions have a high osmolality and will cause the rapid development of thrombophlebitis if given peripherally through an ordinary cannula. For this reason a special type of line is used to administer the TPN. This needs to be arranged by referring the patient to the **Vascular Access Team** (Andrew Jackson on 4745 or Sarah

Cooper on 7541) for insertion of a Peripherally Inserted Central Catheter (PICC) in CTR or a Midline catheter on the ward. The Vascular Access Team will assess the patient for the type of line, consent, and insert the line together with obtaining a CXR post insertion of a PICC (to check for tip position in SVC).

PICC - this type of line is required if the patient is likely to require venous vascular access for 2 weeks or more, has more than one form of intravenous therapy, or who has high nutritional requirements. A 'central' type of TPN fluid can be administered through this type of line.

Midline - this type of line is required if the patient is likely to require venous vascular access for a short period of time just for TPN. These lines may be inserted when veins are unsuitable for the larger PICC but tend to become blocked which limits their duration of use. A 'peripheral' type of TPN (with lower osmolality than the 'central' type) needs to be used.

If there are no suitable veins and TPN is needed then the referring team will need to arrange for insertion of a 'standard' central line - contact Surgical, Medical or Anaesthetic Registrar. A recent FBC and clotting result will be needed prior to insertion.

Administering the TPN

Dr Lord or Sue Gibbons will prescribe the TPN on a daily basis taking into account the patient's nutritional requirement, fluid balance and biochemistry results. The prescription is sent by Dr Lord to the Pharmacy Dept (Ext 6706) and the TPN bag made. The content of the bag is printed on the side of the bag. Other iv fluids should be adjusted accordingly once TPN is commenced.

The TPN bag is connected and disconnected by the nursing staff in CTR usually every 24 hours at about 18:00 each day. Only if the patient is too ill to be transferred to CTR may it be put up on the ward by a suitably trained registered nurse using aseptic technique.

Infusion of TPN must be through a pump and never by gravity alone. During the infusion the volume of feed should be monitored and accurate fluid balance documented.

Monitoring

The following are required as a minimum. Failure to provide this information could result in inappropriate administration of TPN.

Daily - temperature, BP and pulse.

BMs only needed for other reasons eg diabetic, on steroids, and are not routinely required for TPN monitoring unless specifically requested.

Accurately completed fluid balance charts (with documentation in medical notes of fluid balance)

U+E, glucose, LFT, calcium, magnesium and phosphate measured 2 times each week (in addition to any other biochemical monitoring required by the patient's clinical condition).

Patient weighed 2 times each week (Monday and Thursday if possible).

Problems

The Vascular Access Team (7545) are a useful resource who will advise on central venous catheter care and problem prevention and management.

Catheter related sepsis

This is usually indicated by a rise in temperature. Erythema, discharge and tenderness around the catheter exit site may also be present. Stop the TPN. Check for other causes of pyrexia (take wound swabs, urine sample etc) and **take blood cultures from both the central line and peripherally**. Do not discard any blood from the sample taken from the central line. If multiple lumens then blood samples must be taken from each lumen. Take a swab from the catheter exit site. Consider appropriate antibiotic therapy - discuss with Microbiology.

Removal of the catheter (preferably in CTR with the tip of the line being sent to microbiology) may be necessary but should only be done following discussion with the Registrar looking after the patient. Removal is usually only necessary in cases of a confirmed line infection or a suspected serious 'unconfirmed' line infection.

Line occlusion

Check for external occlusion of the line (eg kinking of the line underneath a dressing). Contact the Vascular Access Team who will arrange to attempt to unblock the catheter in CTR. If this is unsuccessful or they are unavailable the patient should be referred to their Registrar for review.

Hyperglycaemia

Occasionally the plasma glucose may rise above 11 mmol/L when the patient is on TPN. If this persists then the patient may require insulin (intravenous, sliding scale) to control glucose.

Stopping the TPN

TPN should be stopped in a planned manner following discussion with the Nutrition Support Team. This will ensure that Pharmacy is aware and that appropriate dietetic follow up is arranged. CTR must also be informed that TPN is stopping. If a central line is being used it may need to be left in situ for a period following cessation of the TPN to ensure that it is no longer required. The central line should be removed in CTR, with a 4cm portion of the tip saved for microbiology.