Government of Western Australia
North Metropolitan Health Service
Women and Newborn Health Service

OBSTETRICS AND GYNAECOLOGY CLINICAL PRACTICE GUIDELINE	
# Peripheral parenteral nutrition (PPN)	
Scope (Staff):	WNHS Obstetrics and Gynaecology Directorate staff
Scope (Area):	Obstetrics and Gynaecology Directorate clinical areas at KEMH
This document should be read in conjunction with this Disclaimer	

Contents

Caution: PPN is administered via a peripheral line.

For central line administration, refer to the TPN Clinical Practice Guideline

Introduction

This document is to guide practice relating to Peripheral Parenteral Nutrition (PPN).

PPN is similar to standard Total Parenteral Nutrition (TPN), however contains a lower osmolality and concentration of nutrients allowing for administration via a peripheral vein.

PPN should be used to provide short term nutritional support (ideally less than 5 – 7 days) for appropriate patients, who have adequate peripheral venous access.

Risk statement

Non-compliance with this guideline will:

Breach legislative requirements	☐	Impact on Patient Quality of Care	☒
Breach National/State/Hospital Policy	☐	Impact on Patient Safety	☒
Breach professional standards	☒	Misconduct	☐
Breach SCGH Mission & Values	☐	Other:	☐

Definitions

Extravasation	The unintentional instillation or leakage of a medication or substance out of the blood vessel and into the surrounding tissue
Phlebitis	The presence of inflammation within a vein and is clinically associated with pain, tenderness, induration and erythema along the course of the superficial vein

Management of PPN

Indications for PPN

- Gastrointestinal tract is not functional or accessible.[1]
- Supplemental nutrition via a parenteral route is required for a short duration (ideally less than 5-7 days).[2]
- Awaiting access to enteral feeding or if enteral access is continuously lost.
- Malnourished patients where PPN can be used as a ‘bridging’ step to longer term forms of nutrition support (e.g. enteral nutrition (EN) or TPN) or as a supplementary nutrition source .[2]

Contraindications for PPN

- Patient is able to meet their nutritional requirements via oral or enteral intake.
- End of life / palliative care
- Patient is well-nourished and likely to commence oral or enteral intake in less than 3-7 days[1]
- Fluid restriction[3]
- Lymphoedema[2]
- Difficult intravenous vascular access or predicted poor vascular access[2]

- Known hypersensitivity to egg, soya proteins, corn (maize) and corn products, peanut protein, components of the container, or to any other ingredient in the feeding solution.
- Severe hyperglycaemia
- Severe hyperlipidaemia
- General contraindications for administering an intravenous infusion
- Renal failure (PPN contains set quantities of electrolytes that may have inadequate clearance)
- Congenital abnormalities of amino acid metabolism
- Severe blood coagulation disorders
- The patient is not located in KEMH Adult Special Care Unit (ASCU) or Ward 6.

Formulation of PPN

PeriOLIMEL® N4-600E is the **only** PPN formulation available at KEMH/WHNS for peripheral administration.

PeriOLIMEL® N4-600E is available as a 2000 mL volume, three chamber bag designed to be delivered over 24 hours.

Due to its osmolality (760 mOsmol/L), the solution can be administered via a peripheral vein.

Electrolytes:

- PeriOLIMEL® N4-600E contains a pre-set amount of electrolytes.
- Additional electrolytes cannot be added to the bag.
- If additional supplementation is required, supplement via a separate peripheral cannula. The responsibility for replacement of any electrolytes is with the treating team.

Vitamins and minerals:

- PeriOLIMEL® N4-600E does not contain any vitamins or trace elements.
- If daily vitamins and trace elements are required as per the discretion of the dietitian and/or treating team, these can be charted and administered separately (externally to the PPN bag) via a separate peripheral intravenous cannula.

Prescribing and ordering PPN

PPN may only be administered in the Adult Special Care Unit (ASCU) or on Ward 6

- PPN must be prescribed only by the Treating Team in conjunction with Dietetics and Pharmacy. If the Dietitian is unavailable, PPN may still be prescribed by the Treating team if appropriate.
- Peripheral Parenteral Nutrition (PPN) Order Form (MR742) to be completed and signed by the treating team Medical Officer.
- Dietitian to complete the 'Nutritional Requirements' section of the Peripheral Parenteral Nutrition (PPN) Order Form (MR742) and document the recommended starting rate and target rate of PPN.
    - Patients not at risk of refeeding syndrome can be commenced at the

intended final infusion rate, which would normally be 80 mL/hr.[2]

- The risk of refeeding is much less in those receiving PPN compared with TPN, due to the lower glucose content.
- For patients at risk of refeeding syndrome, refer to the SCGOPHCG Refeeding Syndrome Guideline and commence PPN slowly (a suggestion is commencing at 50% of the intended final infusion rate).

- Treating team or ward pharmacist or dietitian to chute order form to Pharmacy - as specified on the Peripheral Parenteral Nutrition (PPN) Order Form (MR742) by 1500 hours for same day delivery.
- Pharmacy will stock PeriOLIMEL® N4-600E.
- PeriOLIMEL® N4-600E PPN bag will be delivered to the ward labelled with the patient's name and the directions: "For peripheral parenteral nutrition use only."
- Store PPN bag at room temperature on ward.

Peripheral access

- PPN must only be administered via a peripheral intravenous line. In certain circumstances, upon Consultant approval, PPN can be administered via a central line if central access is already in situ.
- PPN must be delivered via a dedicated 20-22G peripheral intravenous cannula (PIVC) into the largest peripheral vein available in the forearm to minimise phlebitis and allow for adequate blood flow around the device (avoid the cubital fossa).[2-5]
- PPN is never to be delivered via PIVC in the hand or lower limb.
- All PIVC's must have a j-loop attached. Do not attach a three-way tap.
- PPN runs continuously over a 24-hour period.
- PPN commencement and change time is 1800 hours, however in extraordinary circumstances PPN could be initiated in the morning but would still need to be changed at 1800 the same day.
- No intravenous (IV) medications or other fluids should be administered concurrently through the dedicated PPN cannula whilst PPN is running.
- Aseptic technique should be maintained at all times during insertion and maintenance of the PIVC.
- Documentation of the PIVC insertion details are to be completed on the WNHS Peripheral Intravenous Canula Observation Record MR820 (KEMH) / MR120.2 (OPH).
- PIVC location and size is to be confirmed by medical officer on Peripheral Parenteral Nutrition (PPN) Order Form (MR742).
- All PIVCs are to be re-sited every 72-hours, or earlier, if clinically indicated. Refer to Department of Health Insertion and Management of PIVC guideline.

Administration

- Observe the five moments for hand hygiene. Always follow aseptic technique and use the risk assessment outlined in the WNHS Infection Prevention and Management Aseptic Technique Policy. This must include use of appropriate Personal Protective Equipment (PPE) to prevent contamination and mucosal or conjunctival splash injuries.
- PPN is to be administered through an infusion pump at the rate prescribed on Peripheral Parenteral Nutrition (PPN) Order Form (MR742).
- A 1.2-micron filter should be used to prevent complications from particulate matter or micro-organisms that may be present in the PN solution. It should be replaced routinely with the change of PN bags and giving sets every 24-hours.
- Prior to commencing or changing PPN infusions the patient identification must be checked by three indicators (e.g. name, DOB, address or UMRN) WNHS Pharmaceutical and Medicines Management Policy and Procedure, Medication Administration
- PPN must be checked at the bedside by two nurses, one of whom is a Registered Nurse/Midwife
- Both nurses must sign the Peripheral Parenteral Nutrition (PPN) Order Form (MR742).
- Protect from light with protective covering provided by Pharmacy.
- Check labelled PPN bag against PPN prescription.
- Use only if the bag is not damaged and inspect for uniformity of colour and absence of precipitates.
- The route of administration must be identified on all administration lines and include the date and time that the line is commenced.
- Ensure the triphasic PPN bag is mixed well / activated prior to attaching the PPN bag to the dedicated peripheral cannula.

  This will be done in pharmacy prior to delivering to the ward.

To mix and activate the triphasic PPN bag:

1. Ensure product is at room temperature.
2. Manually roll the bag onto itself, starting at the top of the bag (hanger end). The non-permanent seals will disappear from the side near the inlets.
3. Continue to roll until the seals are open along approximately half of their length.
4. Mix by inverting the bag at least 3 times.
5. After reconstitution, the mixture is a homogenous emulsion with a milky appearance.

Figure 1 - (A) & (B). Activation of PPN Bag (Baxter Healthcare Ltd)

(A)

(B)

Requirements

- Current valid PPN prescription
- PPN solution, giving set and 1.2 micron filter
- 10 mL sodium chloride 0.9% Posiflush SP TM Syringe Non-sterile gloves
- Chlorhexidine 2% in alcohol 70% solution or chlorhexidine 2% in 70% alcohol large wipe

Procedure

1. Perform hand hygiene.
2. Clean trolley with universal cleaning and surface disinfection wipes (e.g. Clinell wipes). Allow to dry.
3. Gather equipment for procedure.
4. Perform hand hygiene.
5. Check the PPN solution has been mixed/reconstituted. Please note that the triple chamber Baxter bag (2L N4-600E) that contains additions (vitamins and trace elements) must be mixed/reconstituted according to manufacturer instructions prior.

   See previous page - How to mix / activate PPN bag. This is important if using the bag from the after-hours cupboard, without Pharmacy support.
6. Attach filter to end of giving set, connect to PPN bag and prime.
7. Don non-sterile gloves. Protect key parts using a non- touch technique. Scrub the end of the needleless access port with a large chlorhexidine 2% and 70% alcohol wipe for 30-seconds using different areas of the wipe. Allow to air dry for 30 seconds.
8. Ensure the patient has a peripheral cannula dedicated for PPN use **ONLY or a dedicated lumen of a central venous access device**
9. Flush the PIVC/CVC/PICC with normal saline, using a pulsatile motion (push-pause).
10. Connect giving set.
11. Commence infusion at prescribed rate.
12. Dispose of waste appropriately. Remove gloves.
13. Perform hand hygiene.
14. Clean trolley with universal cleaning and surface disinfection wipes.
15. Perform hand hygiene.

Monitoring and management of PIVC, phlebitis and extravasation

- Observe PIVC insertion site for signs of phlebitis prior to use and each nursing shift.
- PIVAS should be performed 15-minutes after commencement of PPN infusion and 4-hourly thereafter – recorded on the Peripheral Intravenous Cannula Observation record MR820 (KEMH)/MR120.2 (OPH).
- Document inspection of the insertion site each 8 hours on the PIVC insertion record (MR820), by following the Peripheral Intravenous Assessment Score (PIVAS).
- Monitor for phlebitis - if PIVAS score ≥ 1 = increase PIVAS frequency to 2-hourly, monitor signs of progression and treat.
- If PIVAS score ≥ 2 = STOP THE INFUSION, inform medical officer, ensure Datix CIMS entered and treat as per PIVC guideline (link below).

Medical officer should assess that PPN has not extravasated into surrounding tissues.

- Refer to the Department of Health WA Insertion and Management of Peripheral Intravenous Cannulae in Western Australian Healthcare Guideline 2023.

If extravasation is suspected:

- Perform hand hygiene and apply PPE.
- Stop infusion immediately.
- Attempt to aspirate any infusion fluid from the PIVC, using a sterile 10 mL syringe.
- Remove PIVC.
- Dispose of equipment appropriately, remove PPE and perform hand hygiene.
- Notify Medical Officer for review/assessment of PIVC site.
- Document incident in the patient's medical notes and report using the Clinical Incident Management System (CIMS).

Monitoring of PPN

- Monitor and record the patient's core physiological observations a minimum of 4 hourly for the duration of the PPN infusion.
- Measure patient's weight prior to PPN commencement and then as directed by the dietitian or treating team.
- Record fluid intake and output on -
    - Fluid Balance Chart MR729, and
    - Fluid Balance Summary MR730, or
    - Adult Special Care Unit (ASCU) Observation Chart MR 731
- Record baseline blood glucose level (BGL) on the Adult Observation and Response Chart MR285.02, prior to commencement of PPN then monitor 6 hourly for 24 hours, then if stable (normoglycaemia 5-10 mmol), as per treating team. More frequent monitoring may be required depending on the patient's clinical status.
- Monitor biochemistry daily. The treating team is responsible for ordering and monitoring the following biochemistry[3]:
    - Urea and electrolytes
    - Full blood count
    - Liver function tests (LFTs)
    - Magnesium, phosphate, calcium
- Additional bloods can be ordered as clinically appropriate.
- Blood should never be taken from the lumen of a CVAD in which PN is running as the PN solution may potentially contaminate the blood sample, affecting the accuracy of the laboratory results. If a central line has two lumens PN may be

paused (do not disconnect) for 15 minutes and after flushing the line blood samples may be taken from the secondary lumen. PN should be recommenced once samples taken.

Cessation of PPN

- PPN is designed to be administered over 24 hours.
- The dietitian and/or treating team will make the decision regarding the continuation or cessation of PPN prior to the next scheduled bag change.
- Due to the lower glucose content of PPN, it is not essential to reduce the rate prior to cessation. For patients with unstable glycaemic control, the rate can be reduced by half for 2 hours before ceasing, as prescribed by the Dietitian or Treating Team.
- Check BGL one-hour post cessation and then as per treating team.

Compliance, monitoring and evaluation

The Gynae-oncology team will be responsible for monitoring compliance with this document via routine clinical incident review processes.

The Dietetics department will maintain a record of patients commenced on PPN and collect information on appropriateness, complications and information surrounding its use. This register will be regularly tabled at the PPN Working Group with escalation to Comprehensive Care Committee as required.

References

1. Society of Critical Care Medicine (SCCM) & American Society for Parenteral and Enteral Nutrition (ASPEN). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patients. **Journal of Parenteral and Enteral Nutrition**. 2016;33(3):277-316.
2. Carey S, Testro A, K H, et al. Protocol for use of peripheral parenteral nutrition. **Baxter Healthcare Pty Ltd**. 2018.
3. Ferrie S, Daniells S, T C, et al. Parenteral nutrition manual for adults in healthcare facilities. **DAA Nutrition Support Interest Group**. 2018.
4. Pertkiewicz M, SJ. D. Basics in clinical nutrition: Parenteral nutrition, ways of delivery parenteral nutrition and peripheral nutrition (PPN). **European e-Journal of Clinical Nutrition and Metabolism**. 2009;4(3):e125-7.
5. Alexandrou E, Ray-Barruel G, PJ C, et al. Use of short peripheral intravenous catheters: Characteristics, management, and outcomes worldwide. **Journal of Hospital Medicine**. 2018;13(5).
6. Innovation AfC. Parenteral Nutrition Pocketbook: for adults. New South Wales: Agency for Clinical Innocations; 2011.
7. Culebras J, Martin-Pena G, Garcia-de-Lorenzo A et al. Practical aspects of peripheral parenteral nutrition. Curr Opin Clin Nutr Metab Care. 2004; 7: 303-307

Acknowledgements

- SCGOPHCG Peripheral Parenteral Nutrition has been used as a base for this guideline.
- Government of Western Australia East Metropolitan Health Service. Peripheral Parenteral Nutrition (PPN) Management Clinical Practice Standard. Royal Perth Bentley Group. 2018.
- Ramsay Health Care. Medications – Adult Peripheral Parenteral Nutrition Guideline. Joondalup Health Campus. 2019.
- Baxter Healthcare Ltd. Olimel-PeriOlimel-Activation-Steps-Poster. 2021.

Related WNHS policies, guidelines and procedures

WNHS:

- Obstetrics and Gynaecology: Total Parenteral Nutrition (TPN) Clinical Practice Guideline
- Infection Prevention and Control Manual - Aseptic Technique Policy
- Pharmaceutical and Medicines Management, Policy and Procedure: Medication Administration

Useful resources and related forms

Australian Commission on Safety and Quality on Health Care (ACSQHC) Clinical Care Standard:

- Management of Peripheral Intravenous Catheters Clinical Care Standard (May 2021)

Department of Health, Western Australia. Communicable Disease Control Directorate Guideline:

- Insertion and Management of Peripheral Intravenous Cannulae in Healthcare Facilities (2023)

SCGOPHCG guidelines:

- Insertion, Maintenance and removal of Peripheral Vascular Catheters (PVC) (SCGH)
- Oral and Enteral Refeeding Syndrome Guideline
- Parenteral Nutrition Clinical Practice Guideline (SCGOPHCG) Infection Prevention and Control Manual - Aseptic Technique Policy

WNHS Obstetrics and Gynaecology Placeholder: Peripheral intravenous cannula insertion and management

WNHS Forms :

- Adult Observation and Response Chart MR285.02
- Adult Special Care Unit (ASCU) Observation Chart MR 731
- Fluid Balance Chart MR729
- Fluid balance Summary Chart MR 730
- Peripheral Intravenous Cannula Observation record MR820 (KEMH)/MR120.2 (OPH)
- Peripheral Parenteral Nutrition (PPN) Order Form (MR742)

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Version history

Number	Date	Summary
1	December 2022	First version. Launch planned mid-January 2023.
2	February 2025	WNHS Nutrition and Dietetics originally planning to combine TPN and PPN guidelines however decided to retain the existing WNHS PPN guideline, which required update before the due date of June 2026, as below: • Updated medical record numbers and hyperlinks. • Revised PIVAS score checking regime to 4-hourly. • Updated advice on cessation of PPN for patients with unstable glycaemic, as prescribed by the Dietitian or Treating Team. • Inclusion of statement "***PPN may only be administered in the KEMH Adult Special Care Unit (ASCU) or Ward 6.***" - Medicines and Therapeutics Committee suggested this statement be highlighted in a separate box so is not overlooked. • Clarity that IV medications and other fluids cannot be administered via the same PIVC as the PPN line, and that 3-way taps must never be attached to the J-loop.

This document can be made available in alternative formats on request for a person with a disability.

www.nmhs.health.wa.gov.au

Appendix 1: PPN formula

Nutrients	**2000mL PeriOLIMEL® N4-600E**
Nitrogen (g)	8
Amino acids (g)	50.6 (contains 17 amino acids, including 8 essential amino acids)
Glucose (g)	150
Lipid (g)	60
Lipid source	ClinOleic (80:20 Olive: Soy) (= 15% SFA, 65% MUFA, 20% PUFA)
Total Energy (kcal)	1400
Non nitrogen energy (kcal)	1200
Non nitrogen energy (kJ)	5040
Sodium (mmol)	42
Potassium (mmol)	32
Magnesium (mmol)	4.4
Calcium (mmol)	4.0
Chloride (mmol)	49
Phosphate (incl lipid) (mmol)	17
Acetate (mmol)	55
pH	6.4
Osmolarity (mOsm/L)	760