HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Pharmaceutical Care Department		
Document:	Multidisciplinary Policy And Procedure (MPP)		
Title:	Total Parenteral Nutrition (TPN)		
Applies To:	Physician, Pharmacist and Nurses		
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1. PURPOSE:

1.1 provide guidelines for medical , pharmacy and nursing staff for prescribing , preparing , dispensing and discontinuing Total Parenteral Nutrition (TPN)

2. DEFINITONS:

2.1 Total Parenteral Nutrition- is a hypertonic solution which provides glucose, amino acids, lipid emulsion, vitamins, and trace minerals via a central/ peripheral venous access. It is commonly ordered for patients in situations when oral/ enteral feedings cannot meet the patient's nutritional needs due to malfunction of the GI tract. Goal of TPN Therapy is to replenish depleted stores of protein, promote wound healing, weight maintenance, immune competence, and nitrogen balance

2.2 IV Section :is the intravenous admixture area located adjacent to the inpatient pharmacy that is responsible for preparation and dispensing TPN AND IV PREPARATIONS to all nursing units

2.3 BAXA EM 2400 COMPOUNDER – are automated pumping system that quickly and accurately compound multi ingredient sterile formulas by withdrawing requested amounts of source ingredients from their containers in a user-specified sequence and pumping them into a final container. The exacta mix operating software directs this process by using a formula and directing the operation of the compounder to prepare the defined formula.

2.4 ABACUS – is the electronic TPN ordering software

3. POLICY:

3.1 A physician order to initiate TPN Therapy.

3.2 TPN orders written by: Physician for Intensive Care Unit and complete the TPN form for patient before 12 PM

3.3 The TPN form must reach to iv section before 1:00 pm

3.4 Original of TPN form must be in the patient profile, The copy of TPN form shall be sent to iv section for preparation.

3.5 IV ADMIXTURE STAFF must prepare TPN under aseptic technique by automated compounding (BAXA EM 2400 COMPOUNDER)

3.6 All TPN preparations shall be protected from light and covered if water soluble multivitamins are added and will be stable for 24 hours from the time of addition

3.7 TPN and lipids must be infused utilizing two separate pumps. TPN solution requires a 0.22- micron in-line filter using a Y-connector with clamps. Use only filter sent from the pharmacy, common filters on the nursing floor may not meet the specifications for TPN solution.

3.8 Tubing and Filter changes: change 0.22- micron filter & IV primary pump tubing (TPN) every 72 hours. Change IV primary pump tubing (Lipids) every 24 hours.

3.9 Double- checking is a must during the preparation in each stage of any TPN solution, and make the visual inspection on final product.

3.10 In the patient's chart, the TPN prescriptions, composition, infusion rates of TPN and IV lipids are written (LABELLING)

3.11 Iv admixture staff will dispense TPN to all nursing units in the morning shift up to 3 :00 pm

3.12 ANY BABY DELIVERED BETWEEN 12;00 PM UNTIL NEXT DAY 12:00 PM (Administer D10W or Dextrose Saline solution with or without Kcl through the new or rewired central line, until next TPN is available.)

3.13 No additives can be added to the TPN at any time after the TPN has been attached to the patient.

3.14 Two nurses must check the bag against the Parenteral Nutrition Order Form to validate accuracy of contents, date and sign in designated area at the bottom of the form.

3.15 If TPN bag is damaged or is leaking, stop TPN, then contact physician. An alternate solution must be ordered until the following day when a new TPN solution is prepared.

3.16 When infusing Lipids for the first time, obtain baseline vital signs prior to initiation, Then at 15 minutes and hourly for two hours. Monitor the patient for allergic reaction. If any of allergies occur, stop the lipid infusion immediately and notify the physician.

3.17 The maximum osmolality must be taken into account for peripheral administration Maximum osmolarity for Adult must not exceed 900 MOsmol/L for adult or patent over 12 years of age: 1000 MOsmol/ for paediatrics (2 years- 12 years of age), and 1100 MOsmoUL for infant and neonate. The maximum dextrose concentration in peripheral TPN for infants is 12.5 %, paediatric 10% and adult 8 %.

3.18 TPN should not be interrupted for more than 1 hour without an alternate solution, D5W/ D10W or Dextrose saline solution with or without additive to be infused at previous TPN rate. This occlusion or line dislodged, immediately notify the physician A peripheral access must be obtained and Dextrose Solution or Dextrose-Saline solution infused at the previous TPN rate. The patient is at risk for an insulin rebound (hypoglycaemia) when the TPN (particularly central TPN) is suddenly discontinued.

3.19 Intake and output must be measured and recorded on Daily basis

3.20 Daily weights are to be done at the same time and on the same scale

3.21 TPN Management for Patients Leaving the Unit for procedure TPN should be replaced by dextrose saline

4. PROCEDURE:

4.1 PROCESSING OF TPN ORDERING

- 4.1.1 The physician calculate , review THE TPN and filling the order form
- 4.1.2 The pharmacist entering the TPN form to the BAXA software system (ABACUS)
- 4.1.3 Additional IVF will be ordered separately
- 4.1.4 Calculate the TPN by using the computer program or manually if need. If any item is not listed by the computer as ordered, be sure to manually add this preparation sheet and alter the water volume.

4.2 TPN PREPARATION

- 4.2.1 How to use compounder : the baxa exacta –mix 2400 compounder (EM 2400) is an automated compounding for preparing multi-ingredient parenteral solutions and machine should be operated according to the manufacturer manual policy and procedure
- 4.2.2 Personal qualifications: training courses for the IV admixture staff on how to use the machine will be done from the manufacturer.
- 4.2.3 Use only sterile bag for TPN preparations
- 4.2.4 IV admixture staff must clean and disinfect laminar air flow hood before TPN preparation to minimize air born contamination risk
- 4.2.5 Environmental monitoring of iv section temperature, humidity and pressure must be ensured before starting TPN preparation

4.3 ADDITIVES PREPARATIONS

- 4.3.1 Prepare the LAFH and collect the needed equipment and drug
- 4.3.2 Draw up the required volume of additives as listed on the TPN work sheet with a syringe of appropriate size for the volume desired.
- 4.3.3 Another pharmacist should check the volumes after having draw up
- 4.3.4 After swabbing the entry port of base solution with alcohol add all additives to the base solution through a filter.

4.4 LIPID PREPARATION

4.4.1 For preparation of fat multivitamin filter needle 5 micrometre should be used.

4.4.2 Double check all steps in the TPN preparation as this is mandatory

4.5 CHECKING AND LABELING

4.5.1 Check TPN solution bag for cores, particulate matter and precipitate using the light , if a core is found this can be removed via filtration , if a precipitate is found the cause should be determined , corrective action taken and then remake the TPN with the new formulation

4.5.2 Check the label against the order and the work sheet, make sure the final concentration and the rate are present on the label

4.5.3 TPN tubing (50 ml for adult and 30 ml for neonate and paediatric TPN

4.6 QUALITY ASSURANCE

4.6.1 IV section supervisor must make random quality assurance checking of 5 % of total TPN preparations monthly by visual TPN solution inspections for any precipitation or discoloration.

5. MATERIAL AND EQUIPMENT:

5.1 Neonate and paediatric Total Parenteral Nutrition Order Forms (ministry form)
5.2 Baxa Em 2400 Compounder
5.3 ABACUS software
5.4 Compatibility Chart.
5.5 Computerized Patient drug Profile form.
5.6 Transfer memo.
5.7 Medication Reconciliation Form.
5.8 Prescribers list.
5.9 List of acceptable abbreviations and List of Prohibited abbreviations.

6. RESPONSIBILITIES:

6.1 All physicians, pharmacist, nurses and IV admixture staff in MCH

7. APPENDICES:

7.1 Total Parenteral Nutrition (TPN) Order Form. (If ABACUS system not working)

8. REFERENCES:

8.1 American Society Of Health System Pharmacists(ASHP) 2008
8.2 Joint Commission On Accreditation Of Healthcare Organization(JCAHO) 2008
8.3 BAXA EM 2400 COMPOUNDER Manufacturer Manual

9. APPROVALS:

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Maternity and Children's Hospital - Hafr Al Batin	مستشفى الولادة و الأطفال بحفر الباطن

Name		Age
MRN		

G. Age (Wks)		Calculated Rate		ml/hr
Weight (Kg)		Actual Rate		ml/hr

وزارة الصحة
Ministry of Health

Ordered Item	Total		I.V. site	
Dextrose %	%		Volume (ml)	
Protien	gm/Kg/day		Duration (hrs)	
Ca Gluconate	mg/kg/day		TPN Days	
NaCl	meq/kg/day		Omolarity	
Na Phosphate	meq/kg/day			
Na Acetate	meq/kg/day			
KCl	meq/kg/day			
K Phosphate	meq/kg/day			
K Acetate	meq/kg/day			
Mg Sulfate	meq/kg/day			
MVI Pediatric	ml/Day			
Multitrace Ped	ml/Kg/Day			
Heparin	IU/ml			
Lipid 20%	gm/kg/day			
Total Lipid Volume	ml			
Lipid Infusion Rate	ml/hr , for 20 hours			

Suggested Changes

	Time	Nurses' name / BN / Sign
▷ TPN & Lipids order checked	@	
▷ TPN & Lipids bag checked	@	
▷ TPN & Lipids rate checked	@	

TPN Calories (Actual Rate) =

*Glucose .....g/kg X 3.4 + Protein .....g X 4 + Lipid.....g X 10 = ...Calories (target 90-120/kg)

Glucose	Protein	Lipid	Total Cals :	Kcal/kg
Enteral feeding Calories =	Kcal/kg	S24	MCT oil Calories =	Kcal/kg

[__ : __] Ca:PO4 Ratio Target (1.3 – 1.7:1)

Ca (mg)	NaPO4 mmol	Ratio
20	0.5	1.3:1
30	0.7	1.3:1
40	1	1.3:1
50	1.2	1.3:1
60	1.5	1.3:1
70	1.7	1.3:1
80	2	1.3:1

GIR (Glucose Infusion Rate)

Infusion Rate
(I.V Fluid or TPN)
X D% X 10 ÷ 60 ÷ Weight

GIR from TFI

Actual GIR
From Actual TPN Rate — mg/kg/ml

Notes:

1) Maximum Recommended Ca in Peripheral Line is 20 mg in each 100 ml of TPN or I.V Fluid.

2) KPO4 (Inorganic Potassium Phosphate) must not be used without Consultant Approval.

NICU Physician Name & Signature _____

Reviewed & Approved by the Clinical Pharmacist: _____

Date _____