**Total Parenteral Nutrition**

**St Paul’s Hospital**

**Rotation Manual**

# DESCRIPTION

The SPH Total Parenteral Nutrition (TPN) rotation is a one-week clinical rotation of the LMPS Pharmacy Practice Residency Program specializing in adult parenteral nutrition support. The resident will meet the learning objectives through readings, case studies, practical experience monitoring patients on the wards, and by carrying out distribution functions involved in a parenteral nutrition service. The resident will also have the opportunity to integrate with the multidisciplinary TPN team and provide pharmaceutical care to the patients and the staff.

# GOAL

The Resident will develop the knowledge and skills required to prepare TPN solutions and provide pharmaceutical care for patients who require parenteral nutrition support.

# OBJECTIVES

Upon completion of the 1-week rotation, the resident will demonstrate the ability to:

1. Evaluate the nutritional status of a given patient.
2. Determine the most appropriate form of the nutrition support required, if any.
3. Estimate protein and caloric requirements of a patient based on the disease state.
4. Design a suitable parenteral nutrition formulation for a given patient, allowing for compounding limitations of the pharmacy department, and medical conditions of the patient.
5. Monitor nutrition support for potential metabolic, infectious, or technical complications, and recommend appropriate TPN formula adjustments to better meet nutritional needs or to prevent adverse effects.
6. Identify altered nutrient requirements due to concomitant medications or drug-nutrient interactions.
7. Demonstrate competence in discussing the pathophysiology, clinical features, and management of the following disease states/processes:

Protein-energy malnutrition Refeeding syndrome

Overfeeding from parenteral nutrition

# RESIDENT’S OWN OBJECTIVES

Residents will identify several of their own objectives for the rotation. These should be documented in their ePortfolio and assessed at evaluation points during the rotation.

1.

2.

3.

# REQUIRED ACTIVITIES

The Resident will:

* 1. Provide pharmaceutical care to the patients on parenteral nutrition support as per the objectives above. This involves daily patient evaluation for efficacy and toxicity of parenteral nutrition support as well as detecting and solving potential TPN or drug- related problems. Patient load will be determined based on the Resident’s previous experience and proficiency and will be modified at the discretion of the preceptor. Assist in the initiation and continuation of appropriate parenteral nutrition support.
	2. Document all clinical activities in the patient’s health record. Notes should be discussed with the preceptor BEFORE placing them in the chart. All notes should be photocopied (on fax machine) for later review by the preceptor.
	3. Attend bedside rounds twice weekly with the TPN Support Team.
	4. Meet daily with preceptor to discuss the patients being followed, issues of interest, therapeutic controversies, ongoing evaluation, and special topics.
	5. Assist in checking TPN orders in the pharmacy IV room.
	6. Other activities as assigned by preceptor.

# GENERAL STRUCTURE OF THE ROTATION

**Monday Tuesday Wednesday Thursday Friday**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| OrientationInitial patient workup Therapeutic topics | Bedside RoundPatient report Therapeutictopics | Case studiesPatient report Therapeutictopics | Patient report Therapeutictopics | Bedside RoundPatient Report Patient Handover Evaluation |

**Week 1**

Monday

 Start working up patients from nutrition support viewpoint – collect and review patient’s medical, surgical, medication and nutritional history, check TPN bloodwork.

 Discuss patients with your preceptor in the afternoon. Suggest resident to take the time to look up and have a brief understanding of the surgical procdure, if any, (e.g.

Whipple procedure, enterocutaneous fistula, Billroth II surgery, nasogastric suctioning, etc.) that the patient had.

 Review topics: Indications for TPN, Protein-energy malnutrition, Nutrition Goals and Assessment, TPN checking in IV Room

Tuesday

 Attend TPN rounds. Rounds start at approximately 0900hrs with the Home TPN training patient (usually on medical wards). Otherwise round will start on the surgery ward. Rounds go very fast, so it may be helpful to make written notes of anything that comes up that isn't clear during rounds for discussion later in the day. Participate in TPN production in the IV Room.

Review literature to answer any questions that have come up. Patient report in the afternoon.

Review topics: TPN formula design, Patient monitoring, TPN bloodwork, refeeding syndrome, complications related to TPN

Wednesday

Further practice with TPN checking. Review case studies

Patient Follow-up

Review topics: TPN stability and compatibility, drug-nutrient interactions, other TPN- related safe practice issues

Thursday

Review TPN patients' progress, TPN bloodwork, medication profiles, etc. Finish case studies (if not yet completed).

Patient report in the afternoon.

Review topics: TPN patients with severe stress (e.g. ICU patient), or other medical conditions that may alter nutrient requirements

Friday

Attend TPN rounds. Round starts at 8.30am. Post-rounds: assist with TPN order checking. Evaluation in the afternoon.


# REQUIRED READING

**Before rotation:**

1. Head G. Parenteral nutrition support. Pdf document. Jun 2007.
2. Hoffer LJ. Clinical nutrition: 1. Protein-energy malnutrition in the inpatient. *CMAJ*

165(10): 1345-49.

1. Jeejeebhoy KN. Total parenteral nutrition: potion or poison? *Am J Clin Nutr* 2001; 74:160-63.
2. Kraft MD, Btaiche IF, Sacks GS. Review of the refeeding syndrome. *Nutr Clin Pract*

2005; 20:625-633.

1. Adult Parenteral Nutrition in Applied Therapeutics (Young, Koda-Kimble).
2. Chapters on Fluid and Electrolytes in Applied Therapeutics (Young, Koda-Kimble) or Pharmacotherapy (Dipiro et al).

# During rotation:

1. Btaiche IF, Khalidi N. Metabolic complications of parenteral nutrition in adults, part
	1. *Am J Health-Syst Pharm* 2004; 61:1938-49.
	2. Btaiche IF, Khalidi N. Metabolic complications of parenteral nutrition in adults, part
		1. *Am J Health-Syst Pharm* 2004; 61:2050-57.
		2. Klein CJ, Stanek GS, Wiles CE. Overfeeding macronutrients to critically ill adults: metabolic complications. *J Am Diet Assoc* 1998; 98:795-806.
		3. Vanek, VW, Seidner DL. A.S.P.E.N. Position Paper: Clinical Role for Alternative Intravenous Fat Emulsions. *NCP* 2012; 27 (2): 150-192.

# OTHER REFERENCES

1. Head G. TPN products and guidelines. Word document. 2005
2. American Society for Parenteral and Enteral Nutrition Board of Directors and the Task Force for the Revision of Safe Practices for Parenteral Nutrition. Safe practices for parenteral nutrition. *JPEN* 2004; 28(6, Suppl): S39-S70.
3. American Society for Parenteral and Enteral Nutrition Board of Directors and the Clinical Guidelines Taskforce. Guidelines for the use of parenteral and enteral nutrition in adult and pediatric patients. *JEPN* 2002; 26 (1, Suppl): 1SA-138SA.