

**VANDERBILT UNIVERSITY MEDICAL CENTER  
MULTIDISCIPLINARY SURGICAL CRITICAL CARE**

**SURGICAL INTENSIVE CARE UNIT INSULIN TRANSITION PROTOCOL**

---

---

**Purpose:** To improve glycemic control when transitioning from a continuous insulin infusion (CII) to subcutaneous insulin and provide guidance on appropriate insulin dosing regimens.

**Patient Categories:**

**-Category 1:** Patients with a history of DM **OR** those requiring insulin infusion of  $\geq 3$  units/h

**-Category 2:** Patients without a history of diabetes requiring CII  $< 3$  units/h infusion transition to SSI

**Transition From IV to SQ Insulin**

For **Category 1** patients:

1. Determine average hourly rate of CII and multiply by 24 to obtain the average insulin requirement for the past 24 hours.
  - Clinical judgment may supersede exact calculation of 24 hour insulin requirements if patients clinical status has rapidly changed or if the patients BG/CII rate has not been stable
2. Calculate 70% of the 24h insulin requirement. This will be the total daily dose (TDD) of subcutaneous insulin divided into long and short acting insulin.
  - a. Give 50% of TDD as basal insulin (insulin glargine)
    - i. Basal insulin should be administered 2 hours prior to discontinuation of CII
    - ii. Give regardless of oral intake
  - b. Give 50% of TDD as scheduled short acting insulin in divided doses
    - i. For patients on continuous tube feeds or those not with stable diet (**preferred**):
      1. Divide TDD into 4 doses of regular insulin given every 6 hours.
      2. If tube feeds are stopped, hold scheduled regular insulin
        - a. Consider starting a 10% dextrose infusion to maintain euglycemia
    - ii. For patients stable on a regular diet (three meals per day):
      1. Divide TDD into 3 doses of rapid acting insulin and give before meals
      2. Hold if patient is NPO
3. Order SQ insulin sliding scale per the SICU protocol to be given with scheduled short acting insulin (same type of insulin and same frequency)

For **Category 2** patients:

- Order sliding scale lispro insulin per the SICU protocol in Wiz/HEO
- SSI dose based on a formula calculated as:

$$\frac{[\text{blood glucose (mg/dL)}] - 90}{15}$$

- SSI adjusted by changing denominator in calculation: range 8-15
  - 8 as most restrictive scale and 15 as least restrictive scale

**Clinical failure on SQ insulin defined as two consecutive BG readings >250 mcg/dL**

- **Results in transition back to CII**

**Suggested starting doses for SQ insulin based**

Average hourly rate of IV insulin (CII)		Dose of basal insulin		Dose of bolus insulin (short/rapid acting)		
2 units/hour	=	16 units one daily	+	4 units every 6 hours or 5 units before each meal (TID)	+	Sliding Scale Insulin
3 units/hour	=	24 units one daily	+	6 units every 6 hours or 8 units before each meal (TID)	+	
4 units/hour	=	32 units one daily	+	8 units every 6 hours or 10 units before each meal (TID)	+	
5 units/hour	=	42 units one daily	+	10 units every 6 hours or 14 units before each meal (TID)	+	
6 units/hour	=	50 units one daily	+	12 units every 6 hours or 16 units before each meal (TID)	+	
7 units/hour	=	58 units one daily	+	14 units every 6 hours or 20 units before each meal (TID)	+	
8 units/hour	=	66 units one daily	+	16 units every 6 hours or 22 units before each meal (TID)	+	

TID= three times per day

**Example calculation for SSI administration**

Patient's blood glucose	Units of lispro to administer based on denominator of SSI calculation		
	8	12	15
120 mg/dL	3.75 units	2.5 units	2 units
170 mg/dL	10 units	6.6 units	5.3 units
250 md/dL	20 units	13.3 units	10.6 units

Authors:

Michael Kenes, PharmD, BCPS

Kelli Rumbaugh PharmD, BCPS

Date last updated: 2/10/2015

References:

1. Bode BW, Braithwaite SS, Steed RD, Davidson PC. Intravenous insulin infusion therapy: indications, methods, and transition to subcutaneous insulin therapy. *Endocr Pract* 2004;10(2):71-80.
1. Hsia E, Seggelke S, Gibbs J, et al. Subcutaneous administration of glargine to diabetic patients receiving insulin infusion prevents rebound hyperglycemia. *J Clin Endocrinol Metab* 2012;97(9):3132-7.
2. Weant KA, Ladha A. Conversion from continuous insulin infusion to subcutaneous insulin in critically ill patients. *Ann Pharmacother* 2009;43:629-34.
3. Furnary AP, Braithwaite SS. Effects of outcome on in-hospital transition from intravenous insulin infusion to subcutaneous therapy. *Am J Cardiol* 2006;98(4):557-64.