

**Appendix 1. First Affiliated Hospital of Sun Yat-sen University Cardiovascular Surgical
Intensive Care Unit Blood Glucose Monitoring and Control Protocol
(Updated 2010)**

■ **Blood Glucose (BG) Monitoring Protocol**

Initial BG monitoring starts immediately after the patients' admission to ICU.

1. If initial BG ≤ 144 mg/dL (8mmol/dL), check BG q 2 hour for 6 hours.
 - a. If BG continues to be ≤ 144 mg/dL (8mmol/dL) in the first 6 hours, for 18 consecutive hours, change frequency of BG testing to q 3 hours or as ordered by authorized prescriber.
 - b. If BG should rise >144 mg/dL (8mmol/dL), check BG hourly.
 - c. If BG should rise >180 mg/dL (8mmol/dL), revert to "initiating the insulin infusion", as below.

2. If initial BG >144 mg/dL (8mmol/dL), check BG hourly for 6 hours.
 - a. If BG should drop to ≤ 144 mg/dL (8mmol/dL) in the first 6 hours, for 18 consecutive hours, change frequency of BG testing to q 3 hours or as ordered by authorized prescriber.
 - b. If BG >144 mg/dL (8mmol/dL) but ≤ 180 mg/dL (10mmol/dL) in the first 6 hours, for 18 consecutive hours, change frequency of BG testing to q 2 hours or as ordered by authorized prescriber.
 - c. If BG should rise >180 mg/dL (10mmol/dL), revert to "initiating the insulin infusion", as below.

3. When on an insulin drip, check BG hourly.

■ **Initiating the Insulin Bolus and Infusion [only if BG is greater than 180 mg/dL (10mmol/dL)]**

1. IV Insulin concentration is 1 unit regular human insulin per 1 ml of 0.9% NaCl. Continuous IV insulin must be administered via an infusion pump. Infusion rates are rounded in increments of 0.5 units/ hr.
2. Prime all IV tubing before connecting to patient with 25 ml of insulin infusion.
3. Bolus & Initial Insulin Infusion Rate: Divide initial BG level by 100, and then round to the nearest 0.5 for the insulin bolus and initial insulin infusion rate. If BG is > 400 mg/dL, drip shall be managed by authorized prescriber.

EXAMPLE: Initial BG = 335 mg /dL. Divide by 100; 3.35, round to 3.5. IV bolus of 3.5 units and start drip at 3.5 units/hour.

■ **Changing the Insulin Infusion Rate**

Step 1: Determine the CURRENT BG LEVEL: This identifies a column in the chart on the following page.

Step 2: Determine the CHANGE IN BG IN THE PAST HOUR from the PRIOR BG LEVEL: This will identify a cell underneath the column in the table. Once you have found that cell, stay on that row in which that cell lies and move to the right for instructions.

Current BG Value								
Changes in BG Value in the Past Hour	BG < 72 mg/dL	BG 72-144 mg/dL	BG 144-180 mg/dL	BG 180-270 mg/dL	BG 270-360 mg/dL	INSTRUCTIONS	BG > 360mg/dL	
	D/C Insulin. Give D50 IV 12.5 g (25 ml). Check BG q15min until BG >90 mg/dL twice. Then, continue to check BG q1 hour until BG >144 mg/dL, and then restart insulin IV at 50% of most recent rate.				BG ↑ > 50 mg/dL/hr	BG ↑ (any increase)	↑ INFUSION Following COLUMN "B" below	Drip shall be managed by the prescriber outside of this protocol.
				BG ↑ > 25 mg/dL/hr	BG ↑ 1-50 mg/dL/hr BG UNCHANGED	BG UNCHANGED BG ↓ 1-25 mg/dL/hr	↑ INFUSION Following COLUMN "A" below	
		BG ↑ (any increase)	BG ↑ 1-25 mg/dL/hr BG UNCHANGED BG ↓ 1-25 mg/dL/hr	BG ↓ 1-50 mg/dL/hr	BG ↓ 26-75 mg/dL/hr	NO INFUSION CHANGE		
		BG UNCHANGED OR BG ↓ 1-25 mg/dL/hr	BG ↓ 26-50 mg/dL/hr	BG ↓ 51-75 mg/dL/hr	BG ↓ 76-100 mg/dL/hr	↓ INFUSION Following COLUMN "A" below		
		BG ↓ >25 mg/dL/hr D/C Insulin. Check BG q15min until BG >90 mg/dL twice.	BG ↓ > 50mg/dL/hr	BG ↓ > 75 mg/dL/hr	BG ↓ > 100 mg/dL/hr	HOLD 30min then recheck BG. If BG > 100, restart infusion AND INFUSION Following "B" below		

Current Insulin Rate (units/hr)	A Rate Change (units//hr)	B Rate Change (units//hr)
< 3.0	0.5	1
3.0 – 6.0	1	2
6.5 – 9.5	1.5	3
10 – 14.5	2	4
15 – 19.5	3	6
20 – 24.5	4	8
≥ 25	5	10 (consult authorized)

Noted: Since the last update in 2010, the TARGET GLUCOSE LEVEL is set to a broader extent of **72 mg/dL to 180 mg/dL** (corresponding TARGET GLUCOSE LEVEL in previous protocol was **72 mg/dL to 144 mg/dL**). The indication of INITIALIZING INSULIN INFUSION was altered from **144 mg/dL** to **180 mg/dL** . The changes in 2010 UPGRADE from previous version has been marked in red.