

Continuous Intravenous Insulin Infusion Case Study

L.W. is a 38 year old Native American male with an 8 month history of angina for which he had not sought medical care. He was playing softball when he developed chest pain and was transported to the local emergency room by family, losing consciousness during transport. Past medical hx is significant for hypertension, morbid obesity, dyslipidemia, and a family history of CAD. Patient was a 1/2 to 1 ppd smoker.

A coronary angiogram at the local hospital showed a 100% occlusion of his proximal circumflex artery. ST segments were elevated and a stent was placed. Development of cardiogenic shock required IABP and PA catheter placement. He was intubated for pulmonary edema and transferred to UMMC for evaluation of potential need for further left ventricular assistance.

On admission, the patient had signs of acute renal failure, respiratory failure, and cardiogenic shock. Assessment on admission:

Cardiac echo: EF of 40%

IABP at 1:1 Assisted pressures – 94/58 Mean Pump pressure – 73

PAP 42/30

ARP 10

SpO₂ 94%

Lungs: diffuse basilar crackles,; no cyanosis; Vent settings: AC 14, TV 800, PEEP 5, FiO₂ 70%

Heart: S₁, S₂ no murmurs or extra heart sounds: EKG – NSR, Inferior Q waves, ST depression V1 – V3

Abdomen: soft with no bowel sounds auscultated

Extremities: cool, peripheral pulses present, but weak, no edema

Labs:

Na= 142 mmol/L

K = 2.9 mmol/L

Cl = 103 mmol/L

BUN = 38 mg/dl

Creat = 2.03 mg/dl

Glucose = 358 mg/dl

Ca = 7.4 mg/dl

Phos = 3.7 mg/dl

WBC = 15.6 10⁹ /L

Hgb = 13.7 g/dl

Hct = 40.5%

Platelets = 264 10⁹/L

INR = 1.37

PTT = 62

Magnesium = 2.0 mg/dl

Albumin = 3.4 g/dl

Medications:

Dopamine to keep MAP > 65 mmHg (between 3 and 10 mcg/kg/min)

Furosemide = 20 mg/hr

Heparin = 800 units/hr

Propofol = 20 mcg/kg/min

Norepinephrine = 0.03 mcg/kg/min

Pantoprazole = 40 mg NG daily
 Ciprofloxacin = 400 mg IV every 24 hrs
 Vancomycin = 2 g IV every 12 hours
 Piperacillin = 4.5 g IV every 8 hours
 Potassium and Magnesium per protocol
 Morphine prn

The Continuous Intravenous Insulin Infusion Orders were initiated and the following BGs and titrations occurred:

Hour of Infusion	Blood Glucose	Insulin Infusion Rate
1	358	
2	301	
3	260	
4	199	
5	145	
6	99	
7	88	
8	86	
9	68	
10	81	

1. What is the goal range?
2. What if the first drop at hour 2 had been from 358 to 208 (drop of 150 mg/dl)?
3. What is the maximum drop in blood glucose per hour that is acceptable?
4. What patient conditions or interventions will impact blood glucoses?
5. What if a hemoglobin A_{1C} had been drawn on admission and it was 7.8%? What does that mean?
6. Discuss patient characteristics that might indicate a patient may be either sensitive or resistant to insulin.
7. Discuss how to transition this patient to subcutaneous basal/bolus insulin management when he is ready to begin eating.

