

SERVICE	ATTENDING	RESIDENT	SEE ORCA FOR ALLERGIES
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UWMC PRE-OP HOLDING & SURGERY INSULIN INFUSION PROTOCOL
Goal Blood Glucose (BG) Range = 80-150 mg/dL

Algorithm 1 Recommend start here for type 1 diabetes		Algorithm 2 Recommend start here for type 2 diabetes		Algorithm 3 Recommend NO patients start here		Algorithm 4 Recommend NO patients start here	
BG	Units/hr	BG	Units/hr	BG	Units/hr	BG	Units/hr
<60 = Hypoglycemia (See below for treatment)							
<70	Off	<70	Off	<70	Off	<70	Off
70-109	0.2	70-109	0.5	70-109	1	70-109	1.5
110-119	0.5	110-119	1	110-119	2	110-119	3
120-149	1	120-149	1.5	120-149	3	120-149	5
150-179	1.5	150-179	2	150-179	4	150-179	7
180-209	2	180-209	3	180-209	5	180-209	9
210-239	2	210-239	4	210-239	6	210-239	12
240-269	3	240-269	5	240-269	8	240-269	16
270-299	3	270-299	6	270-299	10	270-299	20
300-329	4	300-329	7	300-329	12	300-329	24
330-359	4	330-359	8	330-359	14	>330	28
>360	6	>360	12	>360	16		

General Guidelines:

- **Standard insulin infusion:** 100 units/100 mL 0.9% Sodium chloride via an infusion device
- **Start insulin infusion when:**
 - BG > 150 X 2 readings for patients not previously on insulin
 - BG ≥ 70 for patients with Type 1 diabetes or already on insulin infusion therapy
- **Check blood glucose EVERY hour**
- **Hypoglycemia protocol for BG < 60 mg/dL**
 - **Turn off** infusion AND give 50% dextrose IV
 BG 50-60 mg/dL **25 mL** (1/2 amp)
 BG <50 mg/dL **50 mL** (1 amp)
 - **Recheck blood glucose (BG)** every 20 minutes and repeat **25 mL** of 50% dextrose IV if BG < 60 mg/dL. Restart infusion *at a lower algorithm* once blood glucose is >70 mg/dL X 2 checks

Changing Algorithms according to blood glucose:

- Moving Up: blood glucose (BG) is out of goal range **and** has not decreased by at least 60 mg/dL
- Moving Down: BG < 70 mg/dL **OR** BG decreases >100 mg/dL in an hour **OR** pt has hypoglycemic episode.

TPN/Tube Feeds

- **Decrease insulin infusion rate by 50% if nutritional therapy is discontinued or significantly reduced and check BG every hour.**

PHYSICIAN SIGNATURE	PRINT NAME	PAGER	UPIN/NPI	DATE	TIME
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NAME

DOB

UW Medicine
 Harborview Medical Center – UW Medical Center
 University of Washington Physicians
 Seattle, Washington

UWMC SURGERY INSULIN INFUSION ORDERS

*** DRAFT ***

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WHITE - MEDICAL RECORD
 CANARY - PHARMACY
 PINK - NURSING

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UWMC Insulin Infusion Protocol

Goal BG Range = 80-180 mg/dL

ICU Goal BG Range = _____

Discontinue All Previous Insulin Orders

Algorithm 1		Algorithm 2		Algorithm 3		Algorithm 4	
BG	Units/hr	BG	Units/hr	BG	Units/hr	BG	Units/hr
<60 = Hypoglycemia (See below for treatment)							
<70	Off	<70	Off	<70	Off	<70	Off
70-109	0.2	70-109	0.5	70-109	1	70-109	1.5
110-119	0.5	110-119	1	110-119	2	110-119	3
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300-329	4	300-329	7	300-329	12	300-329	24
330-359	4	330-359	8	330-359	14	>330	28
>360	6	>360	12	>360	16		

General Guidelines:

- **Standard drip:** 100 units/100 mL 0.9% NaCl via an infusion device
- Start when:
 - BG > 120 for patients who have received oral diabetes medication within 24 hrs
 - BG ≥70 for patients treated with insulin prior to hospital admission
- Discontinue insulin infusion when patient is eating **AND** has received first dose of subcutaneous insulin.
- Hypoglycemia protocol for BG<60 mg/dL (see back for specifics)

Intravenous Fluids:

Recommendations for patients that are not eating:

DM Type 1 (10 grams glucose/hour) **DM Type 2** (5 grams glucose/hr)

- D51/2 normal saline with 20 mEq/L Potassium chloride IV at _____mL/hr
- D5LR with 20 mEq/L Potassium chloride IV at _____mL/hr
- TPN or Enteral Feeds (see separate orders) _____ at _____mL/hr

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 University of Washington Physicians
 Seattle, Washington

UWMC INSULIN INFUSION PROTOCOL ORDERS

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WHITE - MEDICAL RECORD
 CANARY - PHARMACY
 PINK - NURSING

PHYSICIAN ORDER YELLOW

Initiating The Infusion

- **Algorithm 1:** Start here for most patients.
- **Algorithm 2:** Start here if s/p CABG, solid organ transplant, receiving glucocorticoids, or patient receiving >80 units/day of insulin as an outpatient.
- **Algorithm 3** NO PATIENTS START HERE.
- **Algorithm 4** NO PATIENTS START HERE

Moving Algorithms: (Move up or down only one algorithm per BG check)

- Moving Up: If BG is out of goal range **and** has not decreased by at least 60 mg/dL
- Moving Down: When blood glucose <70 mg/dL or if BG decreases >100 mg/dL in an hour **OR** if pt has hypoglycemic episode.

Maintain Patient Within Current Algorithm-Once BG is in Goal Range

- Adjust **RATE** within current algorithm until patient is in goal range for 4 hours
- Once patient is within goal range for 4 hours, **there is no need to adjust RATE unless BG falls out of goal range**

Patient Monitoring:

- Check BG every hour until it is within **goal** range for 4 hours. Then check every 2 hours X2, then every 4 hours. Resume hourly checks if BG falls out of goal range.
- Hourly monitoring may be indicated for critically ill patients even if they have stable blood glucose.
- If patient is eating, check BG every hour X 3 after meals.
- **TPN/Tube Feeds**
 - **Decrease insulin infusion rate by 50% if nutritional therapy is discontinued or significantly reduced and check BG every hour X 4 hrs.**

Treatment of Hypoglycemia (BG<60 mg/dL) Signs and symptoms include, palpitations, diaphoresis, weakness, altered mental status.

- **Turn off** drip AND
- Give D50W IV
 - BG 50-60 mg/dL **25 mL** (1/2 amp)
 - BG <50 mg/dL **50mL** (1 amp)
- Recheck BG every 20 minutes and repeat **25mL** of D50W IV if BG<60mg/dL. Restart drip once blood glucose is >70 mg/dL X2 checks. *Restart infusion at a lower algorithm* (see moving down).

Notify the Physician:

- For any blood glucose change >100 mg/dL in one hour.
- For blood glucose \geq 360 mg/dL
- For any hypoglycemia which results in loss of consciousness
- For hypoglycemia which has not resolved within **20 min** of administering **50mL** of D50W IV and discontinuing the insulin infusion.
- Failure of algorithm 4 (Consider Endocrine consult)

ANESTHESIOLOGY PERIOPERATIVE ORDERS

- Historical Medical Record at bedside
- IV: Start upon pre-op arrival
 - Lactated Ringers at _____ mL/hr
 - 0.9% Sodium chloride at _____ mL/hr
- D5NS at _____ mL/hr
- Meds: _____
- EKG CXR Urine HCG

- Labs _____

- Other _____

GLUCOSE CONTROL ORDERS

Check capillary blood glucose (BG) on arrival and every hour—

Check One of the Following:

- Patient uses subcutaneous insulin pump at home**
 1. Turn pump off and disconnect tubing when patient arrives
 2. Piggyback Insulin Infusion per UWMC Operating Room Insulin Infusion Protocol
 3. If IV fluid does NOT contain dextrose - piggyback dextrose 5% to deliver 50-100 mL/hour

- Patient is an inpatient already on the insulin infusion protocol.**
 1. Continue insulin infusion at current rate UNLESS TPN/enteral feeds will be interrupted. Reduce rate by 50% for these cases per the insulin infusion protocol
 - a) If IV fluid does NOT contain dextrose - piggyback dextrose 5% to deliver 50-100 mL/hour
 - b) Continue hourly BG monitoring and titration per protocol

- Patient is not currently receiving an insulin infusion**
 1. Check blood glucose hourly and if >150 mg/dL confirm with another point of care test or lab draw within 20 minutes.
 2. If confirmed BG>150 (see step 1) OR any single BG>250 mg/dL
 - Initiate UWMC Operating Room Insulin Infusion Protocol with BG monitoring per protocol.
 - If IV fluid does NOT contain dextrose - piggyback dextrose 5% to deliver 50-100 mL/hour

If BG<60 mg/dL:

1. Give 25 mL of 50% dextrose and turn off insulin infusion if on (see OR insulin infusion protocol orders)
 2. If IV fluid does NOT contain dextrose - piggyback dextrose 5% to deliver 50-100 mL/hour
 3. Recheck BG in 20 minutes.
- If blood glucose is still <60 mg/dL, retreat with 50% dextrose and call anesthesiologist.

ANESTHESIOLOGIST SIGNATURE	PRINT NAME	PAGER	NPI	DATE	TIME
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ANESTHESIOLOGY PERIOP ORDERS

*** U2397 ***

U2397

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WHITE – MEDICAL RECORD
CANARY – PHARMACY
PINK – NURSING

PHYSICIAN ORDER YELLOW

