Formulary approved equivalent will be dispensed unless the words "NO SUBSTITUTES" are written.

ENDO IP INSULIN INFUSION (EPIC 3040000131)

Date of Order: _______________ Time of Order: _______________

Do Not Use for DKA patients - Goal Blood Glucose Range 140 -180 mg/dL

General Guidelines
- Surgical patients who have received an oral diabetes medication within 24 hours should start this protocol when blood glucose greater than 140 mg/dL.

Telemetry Order Set Links
- To order telemetry with Monitored Bed Orders now, select the Monitored Bed Order Set link
  - Monitored Bed Orders Telemetry order set (PPO #3820)

Additional Order Set Links
- ENDO IP Insulin Subcutaneous with Correction order set (PPO #5389)

Nursing Orders

Blood Glucose Management
- Metered blood glucose PRN for suspected hypoglycemia, hyperglycemia, and/or monitoring insulin infusion
- Choose from the following orders for patients with diabetes and hyperglycemia with a blood glucose starting at 180 mg/dL
- Metered blood glucose every hour until in goal range times 4, then every 2 hours. If blood glucose out of range return to every hour
- Metered blood glucose (specify): ___________

Contingency

Metered Blood Glucose:
- Notify Provider for blood glucose 70 mg/dL or less or greater than 400 mg/dL times 2 consecutive tests
- Notify Provider for any blood glucose change greater than 150 mg/dL in 1 hour move down two algorithms (Starting insulin infusion for blood glucose greater than 180 mg/dL)
- Notify Provider for blood glucose greater than 150 mg/dL and infusion rate unchanged on Algorithm #5 or highest algorithm for 4 hours
- Notify: Metered Blood Glucose (specify): ___________

Assessments:
- Notify Provider when patient tolerating solid foods, to consider changing insulin orders to subcutaneous insulin; Ensure that long-acting insulin (NPH or Lantus) has been given 2 hours prior to discontinuing the insulin infusion
- Notify Provider if interruption for any reason other than hypoglycemia
- Notify: Assessments (specify): ___________

Treatment:
- Notify Provider for hypoglycemia which has not resolved within 15 minutes of receiving hypoglycemia treatment and discontinuing the insulin infusion
- Notify: Treatment (specify): ___________

Labs:
- Notify: Labs (specify): ___________

Medications:
- Notify Provider if patient is on greater than 30 units/hr of insulin
- Notify: Medications (specify): ___________

Neuro Specific:
- Notify: Neuro (specify): ___________

Physician Signature______________________________ Date Signed: ________________ Time Signed: ___________
Nursing Orders (Continued)

Interventions
- Use metered blood glucose only (NO LAB DRAWS) to adjust insulin infusion
- Document metered blood glucose results, algorithm used, and insulin infusion rate

Laboratory

Chemistry
- Glycohemoglobin if not done within the last 60 days

Medications

Insulins
- insulin regular (human) (HumuLIN R) standard concentration infusion, Intravenous, Run first 10 - 20 mL through tubing and waste before connecting to patient. Titrate per algorithm. See Reference Link for algorithm table. Goal blood glucose 140 – 180 mg/dL
- Dose
  - 0-45 Units/hr
  - Other (specify): _____ Units/hr
- Titrating (yes/no)?
  - Yes (must use dose range when ordering)
  - No (do not use dose range when ordering and do NOT complete titration questions below)
  - Follow algorithm (yes/no)
    - Yes
      - Name of algorithm (specify): Insulin Infusion Protocol Algorithm
    - No (complete titration questions below)
  - Titration units (defaults to appropriate selection):
    - Units/hr (Adult/Adolescent)
      - Starting rate (Units/hr):
        - 0.5 Units/hr
        - 1 Units/hr
        - 1.5 Units/hr
        - 2 Units/hr
        - 2.5 Units/hr
        - Other (specify): _____ Units/hr
      - If not at goal, titrate every (minutes):
        - 60 minutes with repeated blood glucose level
        - Other (specify): _____ (minutes)
      - Titrate by:
        - Other (specify): ________________
    - Titrate to maintain:
      - Blood glucose 110-150 mg/dL
      - Blood glucose 110-200 mg/dL
      - Other (specify): 140 – 180 mg/dL
  - Notify the provider when:
    - Unable to attain clinical goal within parameters
    - Other (specify): ________________
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ENDO IP INSULIN INFUSION (EPIC 3040000131)

Medications

**Insulins – Continued**

- insulin lispro (HumaLOG) injection 4 Units 3 times daily after meals, Subcutaneous, Give immediately post meal, if patient eats more than 50% of meal, while on insulin infusion
- Use algorithm table and start on (select):
  - Consider starting on algorithm 3 if neuro surgery patient, stroke patient, post solid organ transplant or islet cell transplant patient, receiving glucocorticoids, or diabetic patient receiving greater than 80 units/day of insulin as an outpatient
  - Consider limiting to algorithm 1-2 if patient is Type 1 Diabetic
- Use algorithm tables and start on algorithm #1 - Start here for most patients
- Use algorithm tables and start on algorithm #2 - Start here if patient is receiving glucocorticoids (steroids) or is a known diabetic patient receiving between 60 and 80 units of insulin per day as an outpatient
- Use algorithm tables and start on algorithm #3 - Start here if patient is a known diabetic patient receiving more than 80 units of insulin per day as an outpatient
- Use algorithm table and select algorithms:
  - Use algorithm(s) 1 - 7
  - Use algorithm 1 – 6 only
  - Use algorithm 1 – 5 only
  - Use algorithm 1 – 4 only
  - Use algorithm 1 – 3 only
  - Use algorithm 1 – 2 only

**Insulin Infusion: Moving from Algorithm to Algorithm**

- MAINTAIN current algorithm: When either: 1) Blood glucose is within goal range (140 - 180 mg/dL), OR 2) Blood glucose is above the goal range (greater than 180 mg/dL) AND blood glucose has decreased by 30 – 80 mg/dL from previous result.
- Moving UP an algorithm: When either: 1) Blood glucose is above the goal range (greater than 180 mg/dL) AND the blood glucose has increased any amount, OR 2) Blood glucose is above the goal range (greater than 180 mg/dL) AND the blood glucose has decreased from previous results by 1 – 29 mg/dL. MOVE UP an algorithm. *Notify Provider if already on Algorithm 7.
- Moving DOWN an algorithm: When either: 1) Blood glucose is below the goal range (less than 140 mg/dL), HOLD insulin infusion, treat hypoglycemia if necessary and monitor glucose every hour. Resume when glucose is greater than140 mg/dL. Resume at algorithm LOWER than where you stopped. *If already on Algorithm 1, resume at 50% the listed rate, OR 2) Blood glucose is above the goal range (greater than 180 mg/dL) AND the blood glucose has decreased by 81-150 mg/dL in 1 hour. MOVE DOWN an algorithm *Maintain if already on Algorithm 1, OR 3) Blood glucose is above the goal range (greater than 180 mg/dL) AND the blood glucose has decreased greater than150 mg/dL in 1 hour. MOVE DOWN TWO algorithms. Notify Provider. *Maintain if already on Algorithm 1
- Metered Blood Glucose every hour until in goal range times 4, then every 2 hours & PRN. If blood glucose falls out of goal range, repeat the process

Physician ____________________________  Date ____________________________  Time ____________________________

Signature ____________________________________________  Signed: ____________________________
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ENDO IP INSULIN INFUSION (EPIC 3040000131)

**Medications**

**Treatment of Hypoglycemia if patient is obtunded, NPO, or unable to swallow**
- For signs of hypoglycemia do STAT metered blood glucose
- Dextrose 50% injection 25 gm PRN, Intravenous, Hypoglycemia, For blood glucose less than 40 mg/dL (if patient obtunded, NPO, or unable to swallow)
- Dextrose 50% injection 12.5 gm 1/2 amp PRN, Intravenous, Hypoglycemia, For blood glucose 40-70 mg/dL (if patient obtunded, NPO, or unable to swallow)
- Glucagon (GLUCAGEN) injection 1 mg PRN, Intramuscular, Hypoglycemia, For blood glucose 70 mg/dL or less (if patient obtunded, NPO, or unable to swallow) Give if no IV access

**Treatment of Hypoglycemia if Blood Glucose is 40 - 70 mg/dL**

**Treatment of Hypoglycemia if patient is awake, responsive, able to take po orals and Blood Glucose is 40 - 70 mg/dL**
- Administer 15 g of carbohydrate oral as one of the following: 15 g of glucose gel (1 tube) OR 4 ounces of juice. May repeat oral carbohydrate one time in 15 minutes if patient is still symptomatic from hypoglycemia glucose 40 - 70 mg/dL
  OR
- Dextrose (GLUTOSE) 40% gel 15 g (1 tube) PRN, Oral, Hypoglycemia, For blood glucose 40 - 70 mg/dL if patient is awake, responsive and able to take oral fluids. Repeat 1 time after 15 minutes for persistent signs or symptoms of hypoglycemia

**Treatment of Hypoglycemia if Blood Glucose is less than 40 mg/dL**

**Treatment of Hypoglycemia if patient is awake, responsive, able to take po orals and Blood Glucose is less than 40 mg/dL**
- Administer 30 g of carbohydrate oral as one of the following: 30 g of glucose gel (2 tubes) OR 8 ounces of juice. May repeat oral carbohydrate one time in 15 minutes if patient is still symptomatic from hypoglycemia glucose less than 40 mg/dL
  OR
- Dextrose (GLUTOSE) 40% gel 30 g (2 tubes) PRN, Oral, Hypoglycemia, For blood glucose less than 40 mg/dL if patient is awake, responsive and able to take oral fluids. Repeat 1 time after 15 minutes for persistent signs or symptoms of hypoglycemia

**IV Fluids**
- Most patients will need 5-10 gm of glucose per hour or equivalent (PN, enteral feeds etc.)
- Dextrose 5% / sodium chloride 0.45% infusion at 50 mL/hr, Intravenous
- Dextrose 5% / sodium chloride 0.9% infusion at 50 mL/hr, Intravenous
- Sodium chloride 0.9% infusion at 50 mL/hr, Intravenous

Other:_____________________________________________________________________________________________________
_________________________________________________________________________________________________________
_________________________________________________________________________________________________________

Insulin Infusion Protocol Algorithm

<table>
<thead>
<tr>
<th>Physician</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
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<td>Signed:</td>
</tr>
</tbody>
</table>

PPO 00005565
PHYSICIAN ORDERS
(Orders)
(Revised 11/18/2019)
ENDO IP INSULIN INFUSION (EPIC 3040000131)

Inpatient Adult Insulin Infusion Algorithm (for ICU and non-ICU patients)

<table>
<thead>
<tr>
<th>Algorithm 1</th>
<th>Algorithm 2</th>
<th>Algorithm 3</th>
<th>Algorithm 4</th>
<th>Algorithm 5</th>
<th>Algorithm 6</th>
<th>Algorithm 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG Units/ hr</td>
<td>BG Units/ hr</td>
<td>BG Units/ hr</td>
<td>BG Units/ hr</td>
<td>BG Units/ hr</td>
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<td>BG Units/ hr</td>
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<tr>
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<td>&gt;420</td>
<td>Call MD</td>
<td>&gt;420</td>
<td>Call MD</td>
<td>&gt;420</td>
</tr>
</tbody>
</table>

BG <140 mg/dL – See below section Insulin Infusion Protocol Algorithm Decision Tree

When restarting insulin infusion - See below section Insulin Infusion Protocol Algorithm Decision Tree

BG 70 mg/dl or less, treat for hypoglycemia

Insulin Infusion Protocol Algorithm Decision Tree

<table>
<thead>
<tr>
<th>Blood Glucose</th>
<th>Decision Point</th>
<th>Algorithm Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Glucose &lt; 140 mg/dL</td>
<td>HOLD insulin infusion, treat hypoglycemia if necessary and monitor glucose every hour</td>
<td>Resume when glucose is &gt;140 mg/dl using instructions below.</td>
</tr>
<tr>
<td>Blood Glucose 140 – 180 mg/dL</td>
<td>Within goal range</td>
<td>MAINTAIN current algorithm</td>
</tr>
</tbody>
</table>

**Look at previous blood glucose to assess rate of change**

- Blood Glucose > 180 mg/dL
  - Glucose DECREASED from previous by 1 – 29 mg/dL
    - MOVE UP an algorithm
    - Notify Provider if already on Algorithm 7
  - Glucose DECREASED 30 – 80 mg/dL
    - MAINTAIN algorithm
  - Glucose DECREASED 81 – 150 mg/dL in 1 hour
    - MOVE DOWN an algorithm
    - Maintain if already on Algorithm 1
  - Glucose DECREASED > 150 mg/dL in 1 hour
    - MOVE DOWN TWO algorithms
    - Notify Provider
    - Maintain if already on Algorithm 1
  - Glucose INCREASED by any amount
    - MOVE UP an algorithm
    - Notify Provider if already on Algorithm 7

* Metered Blood Glucose every hour until in goal range times 4, then every 2 hours & PRN. If blood glucose falls out of goal range, repeat the process

Physician ________________________________ Date ____________________ Time ____________________

Signature ________________________________ Signed: ____________ Signed: ____________

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(Orders)

(Revised 11/18/2019)