HEALTH HOLDING
HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

| | | | |
|---|---|---|---|
| **Department:** | Maternal Intensive Care Unit | | |
| **Document:** | Departmental Policy and Procedure | | |
| **Title:** | Glucose Control in Maternal Intensive Care Unit | | |
| **Applies To:** | All Maternity Intensive Care Unit Staff | | |
| **Preparation Date:** | January 12, 2025 | **Index No:** | ICU-DPP-020 |
| **Approval Date:** | January 26, 2025 | **Version:** | 2 |
| **Effective Date:** | February 26, 2025 | **Replacement No.:** | ICU-DPP-020(1) |
| **Review Date:** | February 26, 2028 | **No. of Pages:** | 2 |

## 1. PURPOSE:

1.1 To provide guidelines for glucose level control in critically ill non Diabetic Ketoacidotic (non-DKA) patients.

## 2. DEFINITIONS:

2.1 **Glucose Level** – Normal range of glucose level in blood 70-110 mg/dl.

## 3. POLICY:

3.1 Maintain target blood glucose (110-150 mg/dl) in all critically ill patients in MICU.
3.2 Regular insulin intravenous infusion shall be used to control blood glucose.
3.3 Insulin drip can be started with any patients as long as serum glucose level check by finger prick is done every 1 hour or 2 hours and the adjustment of the drip is made.

## 4. PROCEDURE:

4.1 If Epinephrine infusion, enteral feeds, or TPN are discontinued decrease insulin infusion to ½ previous levels and recheck after 1 hour.
4.2 If unable to complete hourly BG for whatever reason, discontinue infusion until BG is able to assessed hourly.
4.3 Discontinue insulin infusion during transportation.
4.4 Check K+ q4 hours and replace as per Electrolyte Replacement Protocol.
4.5 Call ICU physician if BG <60 mg/dl x 2 times; or > 200 mg/dl x 4 times after 4 hours of IV insulin infusion. Consider D10 or D25 infusions in case of consistently low BG, as per physician order.
4.6 All signs of hypoglycemia or hyperglycemia have to be reported directly to the duty physician and documented in the patient medical record.

## 5. MATERIAL AND EQUIPMENT:

5.1 Glucometer
5.2 Spirit swab
5.3 Tape
5.4 Sterile gauze

## 6. RESPONSIBILITIES:

6.1 Physician
6.2 Nurse

## 7. APPENDICES:

N/A

## 8. REFERENCES:

8.1 Guidelines for Adult ICU Care/ Ministry of Health, General Directorate of Health Centers- Riyadh, 2013
8.2 Yale Insulin infusion protocol 2013

## 9. APPROVALS:

| | Name | Title | Signature | Date |
|---|---|---|---|---|
| **Prepared by:** | Ms. Doha Al Anizi | Maternal Intensive Care Unit Head Nurse | | January 12, 2025 |
| **Prepared by:** | Dr. Mogahid Mahmoud Ali | Maternal Intensive Care Unit Quality Coordinator | | January 12, 2025 |
| **Reviewed by:** | Mr. Sabah Turayhib Al - Harbi | Director of Nursing | | January 14, 2025 |
| **Reviewed by:** | Dr. Abdelghany Ibrahim | Head of the Department Anesthesia | | January 15, 2025 |
| **Reviewed by:** | Mr. Abdulelah Ayed Al - Mutairi | QM&PS Director | | January 16, 2025 |
| **Reviewed by:** | Dr. Thamer Naguib | Medical Director | | January 19, 2025 |
| **Approved by:** | Mr. Fahad Hezam Al - Shammari | Hospital Director | | January 26, 2025 |

Kingdom of Saudi Arabia
Hafar Al Batin Health Cluster
Maternity and Children Hospital

المملكة العربية السعودية
التجمع الصحي بحفر الباطن
مستشفى الولادة والأطفال

# INSULIN INFUSION PROTOCOL

*The following insulin infusion protocol is intended for use in hyperglycemic adult patients in an ICU setting, but is not specifically tailored for those individuals with diabetic ketoacidosis (DKA) or hyperglycemic hyperosmolar states (HHS). When these diagnoses are being considered, or if BG≥ 500mg/dl, an MD should be consulted for specific orders. Also, please notify an MD if the response to the insulin infusion is unusual or unexpected, or if any situation arises that is not adequately addressed by these guidelines.*

## INITIATING AN INSULIN INFUSION

1.) INSULIN INFUSION: Mix 1U regular human insulin per 1cc 0.9% NaCl. Administer via infusion pump (in increments of 0.5 U/hr)

2.) PRIMING: Flush 50 cc of infusion through all IV tubing before infusion begins (to saturate the insulin binding sites in all tubing)

3.) TARGET BLOOD GLUCOSE (BG) LEVELS: **100-139 mg/dl**

4.) BOLUS & INITIAL INSULIN INFUSION RATE: Divide initial BG level by 100, then round to nearest 0.5 for bolus AND initial infusion rate.
Examples: 1). Initial BG = 325 mg/dL: 325 + 100= 3.25 round ↑ to 3.5: IV bolus 3.5 U + start infusion @ 3.5 U/hr
2). Initial BG = 174 mg/dL: 174 + 100= 1.74, round ↓to 1.5: IV bolus 1.5 U + start infusion @ 1.5 U/hr

## BLOOD GLUCOSE (BG) MONITORING

1.) Check BG hourly until stable (3 consecutive values within target range). In hypotensive patients, capillary blood glucose (i.e., finger sticks) may be inaccurate and obtaining the blood sample from an indwelling vascular catheter is acceptable.
2.) Then check BG q 2 hours; once stable x 12-24 hours. BG checks can then be spaced to q 4 hours IF:
a.) No significant change in clinical condition AND b.) no significant change in nutritional intake.
3.) If any of the following occur, consider the temporary resumption of hourly BG monitoring, until BG is agin stable (2-3 consecutive BG values within target range)
a.) Any change in insulin infusion rate (i.e.,BG out of target range)
b.) Significant changes in clinical condition
c.) Initiation or cessation of pressor or steroid therapy
d.) Initiation or cessation of renal replacement therapy (hemodialysis, CVVH, ect)
e.) Initiation, cessation, or rate change of nutritional support (TPN, PPN, tube feedings, ect)

## Changing the Insulin Infusion Rate

If BG< 50 mg/dl:
**D/C INSULIN INFUSION** Give 1 amp (25g)D50 IV: recheck BG q 15 minutes
→ when BG ≥ 100mg/dl, wait 1 hour, then restart insulin infusion at 50% of original rate.

If BG 50-74 mg/dl:
**D/C INSULIN INFUSION** **if symptomatic (or unable to assess), give 1 amp (25g) D50 IV; recheck BG q 15 minutes.**
**if asymptomatic give 1/2amp (12.5g) D50 IV or 8ounces juice; recheck BG q 15-30 minutes**
**→ when BG ≥ 100mg/dl, wait 1 hour, then restart infusion at 75% of original rate.**

If BG≥75 mg/dl:
**STEP 1**: Determine the CURRENT BG LEVEL – identifies a COLUMN in the table:

| BG 75-99 mg/dL | BG 100-139 mg/dL | BG 140-199 mg/dL | BG≥ 200mg/dL |
|---|---|---|---|

**STEP 2:** Determine the RATE OF CHANGE from the prior BG level – identifies a CELL in the table – Then move right for **INSTRUCTIONS.**
*(Note: if the last BG was measured 2-4hrs before the current BG, calculate the hourly rate of change. Example/: if the BG at 2PM was 150 mg/dL and the BG at 4PM is now 120 mg/dL the total change over 2 hours id -30 mg/dL; however the hourly change is 30 mg/dL + 2 hours = -15mg/dL/hr)*

| BG 75-99 mg/dL | BG 100-139 mg/dL | BG 140-199 mg/dL | BG≥ mg/dL | INSTRUCTIONS* |
|---|---|---|---|---|
| | | BG ↑ by > 50mg/dL | BG↑ | ↑ INFUSION BY "2Δ" |
| | BG ↑ by > 25 mg/dl/hr | BG ↑ by 1-50 mg/dl/hr Or BG UNCHANGED | BG UNCHANGED OR BG↓ by 1-25 mg/dL/hr | ↑ INFUSION BY "Δ" |
| BG↑ | BG↓ by 1-25 mg/dL/hr, BG UNCHANGED, OR BG↓ by 1-25 mg/dL/hr | BG↓ by 1-50 mg/dL/hr | BG↓ by 1-50 mg/dL/hr | NO INFUSION CHANGE |
| BG UNCHANGED OR BG↓ by 1-25 mg/dL/hr | BG↓ by 26-50 mg/dL/hr | BG↓ by 51-75 mg/dL/hr | BG↓ by 76-100 mg/dL/hr | ↓ INFUSION BY "Δ" |
| BG ↓ by > 25 mg/dl/hr see below | BG ↓ by > 50 mg/dl/hr | BG ↓ by > 75 mg/dl/hr | BG ↓ by > 100 mg/dl/hr | HOLD X 30 min, then ↓ INFUSION by "2Δ" |

*** D/C INSULIN INFUSION;**
**✓BG q 30mns when BG≥ 100 Mg/dL, restart infusion@75% of Most recent rate.**

*CHANGE IN INFUSION RATE("Δ") ARE DETERMINED BY THE CURRENT RATE:

| CURRENT RATE (U/hr) | Δ = Rate Chnge (U/hr) | 2Δ =2x Rate Change (U/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 MD) |