UCSF Medical Center

ADULT DIABETIC KETOACIDOSIS (DKA) AND HYPEROSMOLAR COMA MANAGEMENT ORDERS

(For Use In Critical Care and Transitional Units Only)

DO NOT TRANSCRIBE ITALICIZED TEXT ADJACENT TO ORDERS

(Check "√" in box activates orders)

UNIT NUMBER

PT. NAME

BIRTHDATE

DATE:	TIME:

LOCATION DATE

1. DIET: NPO

2. INITIAL LABORATORY WORK *(if not done in Emergency Department):*

☐ A. CBC, Na, K, Cl, CO_2, Glucose, BUN, Creatinine, Ca, PO_4, Mg, Serum Ketones, Serum Osmolality, urinalysis, ABG

3. SUBSEQUENT LABORATORY ORDERS – RUN ALL LABS STAT.

☐ A. STAT check blood glucose (BG) every hour with glucose meter. If BG >400 send to lab. Do not use fingertip for blood sample if patient is hypotensive or in shock.

☐ B. STAT Na, K, Cl, CO_2 every 2 hours x 3, then every 4 hours

☐ Other _____

4. **INSULIN INFUSION MAINTENANCE IV FLUIDS.**

(See Fluid Management and Electrolyte Management #1 on back of sheet)

☐ Bolus: _____

☐ NS at _____ mL/hour

☐ 1/2 NS at _____ mL/hour

☐ Additive: KCl _____ mEq/L

☐ Other: _____

5. **INITIAL INSULIN DOSE**

A. IV Regular insulin bolus: give 0.1 units/kg = _____ units IV push x 1, if not done in ED

B. Give Regular insulin IV infusion: 100 units/100 mL NS (1 unit = 1 mL)

C. Begin Regular insulin IV infusion at 5 units/hour

6. **ADJUSTMENT OF REGULAR IV INSULIN INFUSION RATE**

A. When BG >200 mg/dL, adjust Insulin Infusion rate as follows:

1. If BG has decreased by 50-200 mg/dL in a one hour period keep the insulin drip rate the same.
2. **CALL MD** IF BG has decreased by <50 mg/dL or >200 mg/dL in a one hour period. *(Aim to correct BG by 100 mg/dL per hour. See General Guidelines on back)*

B. When BG <200 mg/dL, call MD and:

1. Change IV solution to: ☐ D5 1/2 NS at _____ mL/hour + ☐ KCl _____ mEq/L
2. Change insulin infusion to _____ units/hour *(See General Guidelines on back)*
3. Check BG every hour.
4. **Adjust Insulin Infusion rate as follows:**

BG <80 mg/dL	STOP insulin infusion and **Call MD; see #7 below**
	Do not restart insulin infusion until BG ≥100 mg/dL
BG 80-120	Decrease drip by 0.5 unit/hour
BG 121-180	No change in drip rate
BG 181-250	Increase drip by 0.5 unit/hour
BG ≥ 250	Bolus 5 units regular insulin and increase drip by 0.5 unit/hour

7. **For a BG <80 mg/dL or >400 mg/dL, call MD.**

- BG <80 mg/dL but >60 mg/dL, stop insulin infusion. Check BG every 15 minutes.

☑ BG ≤60 mg/dL, stop insulin infusion; give **50 mL D50W IV push**; check BG and repeat treatment every 15 minutes. until BG ≥100 mg/dL. When BG ≥100 mg/dL, **call MD** for new insulin infusion rate.

- BG >400 mg/dL, call MD to reassess insulin infusion rate

8. Monitor I/O every 2 hours. **Call MD** for urine output <30 mL/hour.

9. When converting to subcutaneous (SQ) insulin, give prescribed SQ dose 30 minutes prior to discontinuing insulin infusion.

10. Discontinue above D50W order and Insulin Infusion Maintenance IV fluids when insulin infusion discontinued.

If patient is receiving Extraneal, Gamimune N, Octagam, D-xylose, WinrhoD SDF, Hepagam B, Orencia, or Adept adhesion reduction solution, do not use glucose meter for BG checks. All BGs must be sent to the laboratory.

Signature _____ **Provider No.** __ __ __ __ __ **Date** _____ **Time** _____ **Pager** _____

ORDERS MUST INCLUDE LEGIBLE PROVIDER NUMBER, DATE, AND TIME

Orders checked by (name) _____ **Date** _____ **Time** _____

(Specify title, i.e., RN, LVN, etc.)

602-563 (Rev. 09/10) WorkflowOne MEDICAL RECORD COPY

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ADULT DIABETIC KETOACIDOSIS (DKA) AND HYPEROSMOLAR COMA MANAGEMENT ORDERS
(For Use In Critical Care Units Only)

DIAGNOSTIC CRITERIA

	DKA	HYPEROSMOLAR COMA
Serum HCO_3	low (< 15 meq/l)	Normal or slightly low
pH	< 7.3	> 7.3
BG	< 800 mg/dL & can be normal	Often > 800 mg/dL
Serum Ketones	> 5 mmol/l	< 5 mmol/l
Urine Ketones	large	small

Na correction: 2.4 X (plasma glucose - 100)/100 (Am. J. Med. 1999;106:399)

Anion Gap: Na - (Cl + CO_2) = AG (normal 3-14)
(Use measured Na)

Calculated Osmolality: 2 (Na + K) + glucose/20 (coma: calculated osmolality exceeds ~ 340)

FLUID MANAGEMENT

Assume about 10% dehydration (100 mL/kg). Give 1 liter/hour for 4 hours and then 250-500 mL/hour for the next 2-4 hours; then 100-250 mL/hour. Correct fluid deficit over 36-48 hours. Give NS initially; give 1/2 NS if corrected Na is >150 meq/l. Change to D5 NS or D5 1/2 NS when BG <200 mg/dL.

ELECTROLYTE MANAGEMENT

1. **Potassium:**

Serum K^+	KCl
<3.5 meq/l	give 40 meq
3.5-5.5 meq/l	give 20 meq
>5.5 meq/l	no replacement necessary

Maximum KCl administration rate:
Central line: 20 meq/hour
Peripheral line: 10 meq/hour

2. **Bicarbonate:**
   Generally replacement not recommended. May administer ONLY if pH <7; give 50 meq Na bicarbonate in 1/2 NS with KCl 20 meq/l over 1 hour. The non-gap acidosis that occurs in the recovery phase generally does not require management.

3. **Phosphate:**
   Generally replacement not recommended despite anticipated fall during Days 1 and 2.
   May administer ONLY if serum PO_4 <1 mg/dL.
   Use sodium phosphate (3 mmol P/mL; 4 meq Na/mL)
   Give 0.3-0.6 mmol P/kg/day. Give phosphate ordered in millimoles over 6 hours. Do not use if patient has hypercalcemia or renal failure. Monitor Ca, PO_4, and Na.

4. **Magnesium:**
   Administer ONLY if serum Mg <1.8 mg/dL or if patient has tetany; give Mg sulfate 5 gms in 500 mL 1/2 NS over 5 hours (100 mL/hour).

GENERAL GUIDELINES FOR ADJUSTING INSULIN INFUSION RATE:

1. **When BG >200 mg/dL:**
   If BG has decreased by <50 mg/dL in the one hour period, increase the insulin drip rate 50-100%, depending on the degree of insulin resistance.
   If BG has decreased by >200 mg/dL in the one hour period, decrease the insulin drip rate by 50%.
2. **When BG <200 mg/dL:**
   Usually, starting the insulin infusion rate at approximately 2-4 units/hour is adequate. Generally, the insulin infusion rate should be 1 unit/hour for every 100 mL/hour of D5 1/2 NS (e.g., if D5 1/2 NS is set at 200 mL/hour, then the insulin infusion rate should be 2 units/hour).