

# Caring for the Higher Acuity Patient in a Patient Surg Situation

## Stepdown Education

### March 2020

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## DKA Insulin Drip

Insulin Drip Concentration: 100units/100ml (1unit/ 1ml)

### Standards of Care:

- Check BG Q1H
- Patients are typically NPO
- Frequent Electrolyte checks (Q4H Renal Panel, Mag) and replacement necessary
- Once glucose is below 200 mg/dL, change IVF to D5-1/2NS.
- Notify MD when glucose decreases below 150 mg/dL or increases above 350 m/dL.
- When  $\text{HCO}_3^- > 15$  (anion gap  $< 10$ ) and glucose  $< 200$  mg/dL, contact MD for orders to transition off insulin drip and initiate SC insulin.
- DO NOT DISCONTINUE INSULIN DRIP UNLESS FSBS  $< 100$ .
- Turn off IV Fluids when D/C insulin Drip

### Titrating Drip

- If glucose is NOT decreasing by 50-100 mg/dL/hr, increase insulin infusion rate by 2 units/hour.
- If glucose is decreasing by  $> 100$  mg/dL/hr, decrease insulin drip by 2 units/hr.

### Electrolyte Replacement:

Frequent Electrolyte checks (Q4H Renal Panel, Mag ordered) and replacement necessary

- Follow Critical Care Replacement Protocol for K/Mag
- Follow DKA Phosphorus replacement
  - ⇒ If phosphorus is 0.1-1 mg/dL, supplement 0.08 mM/kg  $\text{KPO}_4$  in 250 ml NS over 4 hours.
  - ⇒ If phosphorus is less than 0.5 mg/dL and patient weighs less than 100 kg, supplement with 0.16 mM/kg in 250 ml NS over 4 hours.
  - ⇒ If phosphorus less than 0.5 mg/dL and patient weighs greater than 100 kg, supplement with 0.16 mM/kg  $\text{KPO}_4$  in 500ml NS over 6 hours.

Pharmacy to enter exact weight based doses.

**ICU Potassium Electrolyte Replacement (Initiated Pending)**

Patient Care	
	If K < 3.5, Check Magnesium
	ICU Potassium Replacement Instructions: Recheck K 1 hr after final IV infusion OR 2 hr after final enteral repletion; Recheck K in AM after using protocol; Repeat repletion protocol until serum K at goal.
Potassium Replacement Enteral	
<input type="checkbox"/>	rxCU K <= 2.4 mEq/L (Enteral)(subphase)
<input type="checkbox"/>	rxCU K 2.5-3.0 mEq/L (Enteral) (subphase)
<input type="checkbox"/>	rxCU K 3.1-3.4 mEq/L (Enteral) (subphase)
<input type="checkbox"/>	rxCU K 3.5-3.8 mEq/L (Enteral) (subphase)
Potassium Replacement IV	
<input type="checkbox"/>	rxCU K <= 2.4 mEq/L (IV) (subphase)
<input type="checkbox"/>	rxCU K 2.5-3.0 mEq/L (IV) (subphase)
<input type="checkbox"/>	rxCU K 3.1-3.4 mEq/L (IV) (subphase)
<input type="checkbox"/>	rxCU K 3.5-3.8 mEq/L (IV) (subphase)

**ICU Magnesium Electrolyte Replacement (Initiated Pending)**

Patient Care	
	May be used prn while patient in critical care
	ICU Magnesium Replacement Nursing Instructions - If no serum magnesium is available within the past 6 hours, draw a level to establish baseline. If magnesium < 1.6, check potassium level; Recheck magnesium 2 hours after IV infusion completed; Recheck magnesium in am after using protocol; Repeat repletion protocol until serum magnesium at goal
Medications	
<input type="checkbox"/>	rxCU MG <=1 mEq/L (IV) (subphase)
<input type="checkbox"/>	rxCU MG 1.1-1.3 mEq/L (IV) (subphase)
<input type="checkbox"/>	rxCU MG 1.4-1.6 mEq/L (IV)(Subphase)
Laboratory	
<input checked="" type="checkbox"/>	Magnesium Level <span style="float: right;">Blood, AM Draw, T+1;0330, Nurse coll...</span>

	\$	▼	Component	Status	Dose ...	Details
<b>ICU DKA Phosphorus Replacement (Planned Pending)</b>						
Medications						
Phosphorus 0.5 -1 mg/dL						
<input type="checkbox"/>			potassium phosphate		0.08 mmol/kg, IV Piggyback, Once, A...	Phosphorus 0.5 -1 mg/dL Per ICU DK...
Phosphorus LESS THAN 0.5 mg/dL						
<input type="checkbox"/>			potassium phosphate		0.16 mmol/kg, IV Piggyback, Once, A...	Phosphorus LESS THAN 0.5 mg/dL P...

DATE: \_\_\_\_\_ NURSE: \_\_\_\_\_ NURSE: \_\_\_\_\_ NURSE: \_\_\_\_\_ NURSE: \_\_\_\_\_ PATIENT STICKER

GLYCEMIC CONTROL											
TIME											
FSBS mg/dl											
Regular Insulin drip amt in units											
Total Carbs eaten											
Insulin bolus amt in units											
Hypoglycemic Treatment											
Multiplier											
RN initials											
RN initials											

DATE: \_\_\_\_\_ NURSE: \_\_\_\_\_ NURSE: \_\_\_\_\_ NURSE: \_\_\_\_\_ NURSE: \_\_\_\_\_

GLYCEMIC CONTROL											
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Multiplier											
RN initials											
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# POST STEMI PATIENT CARE

## Standard Care

- Vitals Q15 x4, Q30M X4, Q1H X4
- Document Neurovascular & Cath Site Assessment in Post Arteriogram Assessment in Interactive View Q15 X4, Q30M X4, Q1H X4
- Assure Telemetry order, assess rhythm in clinical access, monitor for changes

## Post Cath Site Complications

- Patient's will come out with TR band or Quick Clot - Check Removal Policy
- Monitor for oozing at site after dressing removal, place air back in TR band if oozing occurs
- Hematoma requires manual pressure and MD notification
- Assure Bedrest order for 2 hours post procedure if femoral access used, lock HOB to 30 degrees – Splint area with sneezing, coughing, etc. for 1 week

## Potential Complications POST STEMI

### Re-Occlusion:

- Call RRT & Notify MD for any Chest Pain, obtain 12 lead EKG

### Arrhythmias/ Heart Block

- Early Beta Blocker Administration
- Check electrolyte Imbalances– K & MG replacement protocol
- Rhythm changes are considered critical result! You Must Notify MD and consider RRT Call

### Heart Failure/ Cardiogenic Shock

- Heart & Lung auscultation– watch for FVO
- Tachycardia & Hypotension are most common signs of shock
- EKG, ECHO, Xray, Check BNP

### Pericarditis:

- Pleuritic pain, low grade fever, pericardial friction rub
- Treat with NSAIDS
- Can lead to Cardiac Tamponade & Chronic constrictive pericarditis

## Common IV Drip Medications

**Aggrastat, Angiomax:** Assure correct dosing compared to MAR, Note STOP times, Notify MD of any significant bruising or bleeding

**Refer to Sheath Care Folder for Instructions**

## Post tPA monitoring

### Monitoring and documentation for first 24 hours after tPA administration

Blood pressure and neuro checks (modified NIH):

- Q 15 min for 2 hours
- Q 30 min for 6 hours
- Q 1 hr for 16 hours

### Nursing Considerations

- Maintain BP < 180/105 first 24 hours
- Monitor carefully for suspected intracranial hemorrhage
  - Acute neuro deterioration
  - New headache
  - Acute HTN
  - Nausea/vomiting
- Monitor for signs of bleeding
  - New hematomas or ecchymosis
  - Hematuria or GI bleeding
  - Bleeding from puncture sites
- If any changes in patient condition → notify physician and call Neuro RRT immediately

***Invasive procedures such as arterial punctures or insertion of catheters or NG tubes should be avoided in the first 24 hours after tPA if the patient can safely be managed without them.***

### Hand off to EMS

- Transfer monitoring times from your cheat sheet to EMS transfer form for continuity of care including answering all time administration blanks on front.
- Do the next vitals and neuro checks with EMS
- Copy the filled out form and scan into the medical record – the original goes with EMS

## Reference Sheet for Neuro Checks

Question	Helpful Hints
Level of Consciousness	Use voice to wake a sleeping patient, then touch. May require vigorous stimulation
Ask Patient to Close Eyes & Make a Fist	If the patient's unaffected arm is amputated, then ask them to wiggle their toes
Lateral (horizontal) Gaze	Ask patient to follow your finger or face – moving eyes horizontally back and forth or if they cannot see your finger due to vision impairment, ask them to follow your face or head and move horizontally back and forth In altered or ventilated patients, take care and perform the oculocephalic maneuver – hold the eyes open and move the head quickly to one side – the patient's eyes should look in the opposite direction (normal). Eyes that follow the direction of the head are abnormal and score a 2. Caution should be taken in intubated patients as not to dislodge the tube and also in trauma patients with cervical spine injury.
Visual Field Testing	Patient with both eyes open, count 1 – 2 – 5 fingers in all visual fields If the patient is altered or has a language barrier, test using confrontation - come at the patient in the outer quadrants of the visual field quickly, if they have vision, they should blink
Motor Function – Left/Right Arm	Ask patient to lift arm 90 degrees if sitting or 45 degrees if supine for 10 seconds. If patient is unable to lift the affected arm, lift it for them to see if they can hold it up for 10 seconds. Test each side separately.
Motor Function Left/Right Arm	Ask patient to lift leg 30 degrees if supine for 5 seconds. If the patient cannot lift the leg, you may do so for them and ask them to hold it up for 5 seconds.
Speech (Content)	Use the picture cards or objects that are easily answered. Ask the patient to name the objects on the card or a pen, or a phone, glasses, etc. Also – ask them to read the sentences
Sensory	Ask patient to close their eyes. Touch the patient on one side or the other and ask which side they are being touched – test face, arms and legs. You may also touch both sides of the face, arms or legs and ask if they feel the same.

This is the Modified version of the Full NIH Stroke Scale. The Full NIH stroke scale must be documented once per shift.

Ensure you are clicking in the "total" box to get a score on each neuro check.

Patients are worsening with increasing numbers. A Neuro RRT call should be initiated with increasing score.

## Neuro Check Scoring Reference:

Level of Consciousness	Alert	0		Motor Function - Right Leg	No drift	0	
	Sleepy but arouses	1			Drifts down, does not hit bed	1	
	Can't stay awake	2			Drifts down, hits bed	2	
	No purposeful movement	3			Can move but cannot lift	3	
Ask patient to Close eyes and make a fist	Obeys both	0			No movement	4	
	Obeys one command	1		Motor Function - Left Leg	No drift	0	
	Obeys neither command	2			Drifts down, does not hit bed	1	
Lateral (horizontal) Gaze	Normal side to side mvmt	0			Drifts down, hits bed	2	
	Partial side to side mvmt	1			Can move but cannot lift	3	
	No side to side mvmt	2			No movement	4	
Visual Field Testing	Normal visual fields	0		Speech	Correct full sentence/naming	0	
	Blind upper OR lower field on one side	1			Wrong or incomplete sentences	1	
	Blind upper AND lower field on one side	2			Words do not make sense	2	
	Blind in both eyes/all 4 fields	3			Can't speak at all	3	
Motor Function - Right Arm	No drift	0		Sensory	Normal	0	
	Drifts down, does not hit bed	1			Decreased sensation	1	
	Drifts down, hits bed	2			Can't feel, no pain withdrawal	2	
	Can move but cannot lift	3			<b>Total</b>	<b>Add all scores and record</b>	
	No movement	4					
Motor Function - Left Arm	No drift	0					
	Drifts down, does not hit bed	1					
	Drifts down, hits bed	2					
	Can move but cannot lift	3					
	No movement	4					



# Front of Form

## ED & CCU Post tPA monitoring (not part of the medical record)

Patient Sticker

tPA total dose: \_\_\_\_\_  
 tPA bolus start time: \_\_\_\_\_ bolus dose: \_\_\_\_\_ ml *(infuse over 1 min)*  
 tPA drip start time: \_\_\_\_\_ drip rate: \_\_\_\_\_ ml/hr *(infuse over 1 hour)*  
 Expected completion time: \_\_\_\_\_

Full NIHSS documented in ED and upon admission to Critical Care

Initial Modified NIH score: \_\_\_\_\_  
*Stop drip and notify physician if score goes up or for worsening symptoms*

### q 15 min vital signs and NIH post tPA exam x 8 (2 hours):

<i>Fill in times</i> ➔	tPA Bolus Start time*:	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__
B/P done											
Modified NIH Scale Score done											

*\*make sure you document vital signs and post tPA exam the moment you start your bolus*

# Back of Form

### Q 30 min x 12 (6 hours):

<i>Fill In Times</i> ➔	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__
B/P done												
Modified NIH Scale Score done												

### Q 1 hr for 16 hours:

<i>Fill in Times</i> ➔	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__	__:__
B/P done												
Modified NIH Scale Score done												

<i>Fill In Times</i> ➔	__:__	__:__	__:__	__:__
B/P done				
Modified NIH Scale Score done				

\_\_\_\_\_  
ED RN Signature

\_\_\_\_\_  
CCU RN Signature

*Fax form to Brenda Bishop at 931-380-4105 upon completion or if ED only patient – place in Brenda's box*

# NEUROSURGICAL PROCEDURES



## **Craniotomy:**

- Phenytoin (Dilantin) to manage potential seizures
- Dexamethasone (Decadron)
- Call for any neurological changes and/or other concerns

## **Pituitary Tumor Resection:**

- Hydrocortisone
- Foley with strict UOP q30 mins.
- Urine Specific Gravity and Serum Osmolality for a UOP > 200 cc/hr X 2 (UOP > 300 cc in any hour)
- Call for neurological changes and any concerns

## **NeuroSurgical Patient Complications:**

- Seizures Precautions:  
**BASIC PRECAUTIONS:** a potential for seizures is present for all neurosurgical cases
  - Oral airway available on the unit
  - Side rails up and bed in low position**HIGH RISK PRECAUTIONS:** ADDITIONAL care for the patient with active seizures
  - Suction equipment readily available
  - Oxygen equipment readily available
- Speech deficits
- Motor strength alteration
- Asymmetrical motor disturbances
- Confusion / memory changes

## **General Post-Operative Care**

- VS and neurologic assessment q15 min. X4, q30 min. X4, qHr X4, then Q4Hr if stable
- Site/dressing
- Pain, nausea
- Pulmonary toiletry
- Bladder/bowel
- Activity: OOB as ordered, may be the evening of surgery

# EKOS THERAPY

A quick, safe and effective method to dissolve a thrombus in the lungs with a combination of a thrombolytic agent (tPA/Alteplase) and ultrasonic therapy.



## Initiation and Maintenance of EKOS Therapy:

- Confirm EKOS Control is running with flashing yellow light below the display, immediately left of the **GREEN** START button on the ultrasound unit.
- Ensure EKOS Control Unit is ALWAYS plugged into an electrical outlet when NOT transporting patient.
- **DRUG** and **COOLANT** agents are infused through hospital infusion pumps and the EKOS Control Unit delivers ultrasonic therapy.
- Confirm drug and coolant infusions are at physician specified rates.
  - **COOLANT** port: **NS** as ordered (minimum of 35 mL/hr and maximum of 120 mL/hr).
  - **DRUG** port: **tPA (alteplase)** as ordered (minimum 5 mL/hr to maximum 35 mL/hr).
- **Standard Alteplase Dosing:**
  - Unilateral EKOS catheter:** 1.0 mg tPA per hour X 6 hours. Total dose of 6mg.
  - Bilateral EKOS catheter:** 1.0 mg tPA per hour X 6 hours for **each catheter** (two identical bags). Total dose of 12 mg.
- If thrombolytic drug infusion is complete OR must be discontinued for any reason, run NS as ordered through both the **DRUG** and **COOLANT** ports. Medications/fluids **MUST** be infused until EKOS catheter is removed.
- **Never** aspirate from either the drug, coolant, or sheath lumens to prevent occlusion of the micro-pores in the infusion catheter.
- **Never** infuse other medicines via **COOLANT** or **DRUG** port.
- Apply non-vented port protectors to any access ports not connected to an infusion.
- Battery alarms every 5 mins. when unplugged. Alarm may be silenced up to 5 mins. by pressing and holding "MUTE" button on front of battery.

- Battery will operate for 60 minutes when it is fully charged. If battery discharges to a critical point, it beeps incessantly and cannot be silenced unless plugged into an electrical outlet.
- Proper functioning of EKOS Control Unit is confirmed by a flashing yellow light. If the yellow light is NOT blinking:
  - Ensure Control Unit must be plugged into battery on bottom of cart and battery turned on
  - Confirm Control Unit Connector is connected to front of Control Unit.
  - Confirm Connector Cable is connected to electrical cables of the Ultrasonic Core (black wire) and the Infusion Catheter (gray wire).
  - Any red circles noted on Control Unit screen will denote any loose/missing connections.
  - Confirm both thrombolytic drug and coolant infusions are flowing.
  - Press **GREEN** START button on front of the EKOS control unit and confirm yellow light at bottom left begins to flash.

## Assessment and Documentation of EKOS Therapy:

- Assess and document catheter site and neurovascular status of distal extremities.
- Monitor and maintain infusions as ordered.
- Assess for any potential signs of bleeding from thrombolytic (tPA/Alteplase).
- Patient may NOT go to MRI with EKOS therapy active.
- If performing arterial Doppler checks or an Echocardiogram is ordered during EKOS therapy, pause ultrasound therapy until test is complete.
  - A. Push YELLOW STOP button to pause ultrasound therapy. Maintain medication and fluid infusions as ordered.
  - B. An alarm will occur every 5 minutes as a reminder to restart the ultrasound. Pushing the Alarm SILENCE button will reset the 5 minute timer.
  - C. Resume ultrasound therapy after Doppler or Echo is finished by pressing the **GREEN** START button.
- Catheter Removal is ONLY completed by Provider or specially-training Critical Care RN.
- To end therapy at time when catheter(s) removed, turn ultrasound OFF by pressing the YELLOW STOP button on Control Unit and disconnect black and gray cables from connector cable.

## Troubleshooting of EKOS Alarms:

- If Control Unit alarms, mute by pushing upper right hand soft key beside Alarm Silence Icon.
- If Confirm control unit display shows any red circles indicating a disconnected cable, reconnect displayed cable and confirm alert goes away. Push the **GREEN** START button to resume.
- If alarm condition persists, identify troubleshooting icon that is flashing at bottom of Control Unit display between two gray bars.
- If unable to resolve, call EKOS 24-hour help-line at 888-356-7435. Note: Help Line number is located on top of EKOS Control Unit. When unable to resume therapy after contacting EKOS, contact the interventional physician.

## Transporting Patient:

- A. Unplug battery from the electric outlet.
- B. When battery is unplugged, an alarm will sound. Silence the alarm by pressing and holding the "MUTE" button located on the front of the battery for 2 seconds. Alarm will alert every 5 minutes.
- C. Transport patient to new location and plug battery into electric outlet as soon as possible.

# CARE FOR STABLE GI BLEED PATIENT

## Upper

- Esophageal Varices
- Mallory– Weiss Tear
- Ulcers

## Lower

- Tumors
- Ulcerative Colitis
- Chron’s Disease

## TREATMENT

IVF, Blood Products, Vitamin K  
SANDOSTATIN- 50 mcg IV bolus, then 50 mcg/  
hr IV continuously for 2 or 5 days  
Endoscopy, Colonoscopy

## SIGNS AND SYMPTOMS

Pain, Tachycardia, Hypotension

Elevated: BUN, Bilirubin, AST, ALT, PT, PTT

Decreased: HGB, HCT, Albumin

ABG’s– Metabolic Acidosis r/t Shock

### **Watch for Bleeding!**

Hematemesis– Vomiting bright or dark blood

Melena– dark tarry stools

Hematochezia– bright red blood from rectum

Occult Blood– detected through lab collection

## BLOOD PRODUCT ADMINISTRATION

Check order– obtain consent

Blood product request form

Administer through bridge

Monitor for reaction– stay with patient for first 15  
minutes

If reaction occurs, **STOP** infusion and notify MD!

Initial vitals, q15 min, then q1h

3M Ranger Pressure Infuser & Blood/Fluid Warming System Model 145.



## Rapid Infuser

- ⇒ Warms IVF/ Blood products
- ⇒ Prevents hypothermia
- ⇒ Located on CCU, OR, ED, Stepdown’s
- ⇒ Find Administration video on ICU-SD nursing page



## **Encephalopathy/Overdose: Narcan Drip**

Standard Concentration: 1 mg/250 mL NS or D5W

Starting rate: 0.2-6.25 mg/hr

Rate change: requires MD order

### **Typical Nursing Assessment and Documentation**

Vital signs, respiratory assessment, capnography, level of consciousness Q30 min and PRN

RR < 8/min or decreased LOC → notify MD and RRT call

Monitor and notify MD of abrupt opioid withdrawal symptoms: n/v, unusual sweating, tachycardia, increased blood pressure, tremors, seizures, cardiac dysrhythmias

## **Ativan Drip**

Standard Concentration: 40 mg/250 mL D5W (not compatible with LR)

Starting rate: 2 mg/hr

Rate change: titrate by 0.5 mg/hr as often as every 15 min (MAX 30 mg/hr)

### **CIWA Typical Nursing Assessment and Documentation**

Assessment completed Q 2 hours and PRN: vital signs, LOC, capnography

Follow CIWA protocol guidelines for interventions/medications related to CIWA score

Monitor for agitation/anxiety, sweats, tremors, and hallucinations

MD notification for HR > 110, BP >160/100, patients requiring >6mg lorazepam in 3 hr period

## VASOPRESSOR DRIPS

### Norepinephrine (Levophed):

Standard Concentration 8mg/500ml

Starting Dose 2mcg/min

Max Dose 20 mcg/min

Titrate by 2-5 mcg/min as often as every 3 minutes

### Phenylephrine (Neosynephrine)

Standard Concentration 50mg/500ml

Starting Dose: 20mcg/ min

Max Dose: 250 mcg/min

Titrate by 10 mcg/minute as often as every 5 minutes

### Vasopressin–

Standard Concentration 50 Units/50ml

Dose: 0.04 units/min

DO NOT TITRATE

Epinephrine– Standard Concentration  
4mg/250ml

Starting Dose 0.1mcg/kg/min

Max Dose 1mcg/kg/min

Titrate by 0.1 mcg/kg/ minute as often as every 15 minutes

Dopamine– Standard Concentration 800mg/500ml

Starting Dose 3mcg/kg/min

Max Dose 20mcg/kg/min

Titrate by 1-4 mcg/kg/ minute as often as every 5 minutes

### Documentation:

Vital signs Q15 minutes, while titrating

**\*Infuse through Central Line\***

**Titration Goal:** MAP  $\geq$ 65 and  
Systolic BP  $>$ 90

MAP Formula: 
$$\frac{2(DBP)+ SBP}{3}$$

### Additional Resources:

Go to the Pharmacy page on intranet and pull the MRMC Infusion Titration Protocol

Refer to policy

Consult Resource

Call Charge Nurse

**\*\*Parameters and Max doses  
can change if provider orders!  
Follow Provider orders\*\*\***