ADMIT	TO INPATIENT SERVICES: CCU		
PROCEI	DURE DATE:	PROCEDURE:	
ADMIT	TING SURGEON:	INTENSIVIST:	
ALLERG	GIES: NKA ALLERGIC T	0:	
Height	(cm): Weig	ht (kg):	
CONSU	<u>JLTATIONS</u>		
Card	diologist diac Rehabilitation nsult Pharmacy re: Medication Pro Hammoud/Bakleh for manageme	file Review nt of all Diabetic Patients	
HEMO	DYNAMIC MONITORING:		
1.	VITAL SIGNS: Every 15 minutes a	nd PRN until extubated and stable	/ may progress to every
	30minutes or hourly if STABLE.		
2.	DO NOT WEDGE SWAN		
3.	Continuous monitoring – ECG, Ai and SVO2	terial Line, Cardiac Index/Cardiac (	Output, pulse oximetry, PAP, CVP
4.	Maintain these parameters. If no	t – call	
CVP	PAP	Co/cı	SVO2
5.	Temperature on admission and t below 36C, rewarm with BAIR Hu	nen hourly until temp 36.1C, then	q4hrs and PRN. If temperature is
6.	FOLEY TO GRAVITY DRAINAGE	gger/ warm blankets	
		2 unless otherwise ordered and de	ocumented
		t foley removal bladder scan if >20	
		t cath and bladder scan have beer	
	unable to void 6 hours post st		
7.	•	il patient extubated and then hour	lv.
		rine output less than 30 mL/hr fo	·
Physicia Page 1	ian Signature of 10	Date (require	d) Time (required)

**PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE** Revised 3/18/2019

DR.

8. CHEST TUBES – Connect to -20 cm water suction	
Measure and Record Chest Tube Output q15 min x2 hours, then q30 min x4 hours, then q1 hour	٢
☐ Call Surgeon/NP if CT output >200 ml/hr	
9. EPICARDIAL PACEMAKER MONITORING (record thresholds every shift, keep temporary pacer	
attached x24 hours for CABG patients and x48hrs for valve patients	
Pace as necessary for HR less than 60	
DDD include AV interval and rate	
AAI include Rate, Atrial MA and Ventricular MA	
VVI – Rate 60, Ventricular MA 20	
10. INTRA-AORTIC BALLOON PUMP MONITORING	
Set Pump at 1:1  Set Pump at 1:2  Set Pump at 1:3  Peripheral Pulse Check (while sheath or balloon in place) – q15minutes x2; q30minutes x2; then q1hour	
11. NG/OG tube to low intermittent suction; remove NG/OG tube with extubation	
12. DAILY WEIGHT at 0500 on same scale and record in kilograms	
13. Soft Limb restraint- bilateral wrists while intubated x 24 hours to prevent injury	
DIAGNOSTICS	
STAT ABG, CBC with diff, CMP, APTT, PT/INR, Magnesium, Ionized Calcium on admission to CCU	
STAT portable CXR on admission to CCU and routine at 0700 daily while in CCU	
<ul> <li>STAT EKG on admission and at 0400 on POD 1 and PRN with changes.</li> <li>CBC 3 and 6 hours POST OP</li> <li>APTT, PT/INR, CBC, CMP, Mg, Ionized Calcium − POD 1</li> <li>Daily − CBC, CMP, starting POD 2</li> <li>Hemoglobin and Hematocrit - 2 hours post all PRBC transfusions</li> <li>ABG PRN Respiratory Distress and/or hemodynamic instability − call physician if abnormal</li> <li>Daily PT/INR</li> </ul>	
Physician Signature Page 2 of 10  Date (required)  Time (required)	

PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE

Revised 3/18/2019

M - 1708 - 203



PT.

MR.#/P.M.

### **BLOOD SUGAR PROTOCOL: FOR ALL PATIENTS**

$\boxtimes$	Glucometer Checks every 1 hour (even when drip is off) x 24 hours; call NP for further orders on non-
	diabetic patients after 24 hours
$\boxtimes$	Maintain Insulin infusion x 24 hours
$\boxtimes$	Initiate and titrate/manage insulin infusion utilizing the "Intravenous Insulin Order set and Adjustment
	Nomogram for Cardiac Surgery."
$\boxtimes$	Maintain blood sugar greater than 80 and less than 150 mg/dl.
$\boxtimes$	Resume insulin infusion if blood sugar is greater than or equal to 110 mg/dl.
$\boxtimes$	Consult Endocrinology if blood glucose >180 mg/dl and not already on case.
$\boxtimes$	When patient is eating, initiate the following Prandial Insulin Scale based on current IV Insulin rate:

	Consumes >50% of Meal	Consumes 25-50% of	Consumes < 25% of
		Meal	Meal
IV Insulin Infusion Rate	Insulin Lispro to be giver	n within 10 minutes after b	reakfast, lunch, and
units/hour	dinner. Continue to follow	IV Insulin Orders/Adjustm	ent Guide with hourly
		glucose checks	
0-0.5 units/hour (or on	3 units	2 units	0
HOLD)			
1-1.5 units/hour	4 units	3 units	0
2-3 units/hour	6 units	4 units	0
4-5 units/hour	8 units	5 units	0
6-7 units/hour	10 units	6 units	0
8-10 units/hour	12 units	6 units	0
More than 10 units/hour	14 units	7 units	0

### **MEDICATIONS:**

Discontinue all pre-procedural medications. medications.	May utilize the TMO to specif	fy all post-procedural
Maintain systolic blood pressure between	or MAP between	for first 12 hours
VASODILATORS		
Clevidipine (Cleviprex) 2 mg/hr continuous inf goal, then increase by 1 mg/hr every 5 minute	•	econds until approaching SBP
Nitroglycerin 10 mcg/min continuous infusion SBP or MAP. (Max rate: 400 mcg/min)	. Increase by 5 mcg/min every	5 minutes to maintain goal
VASOPRESSORS		
Norepinephrine 0.02 mcg/kg/min continuous SBP goal. (Max dose 0.2 mcg/kg/min) Notify s	urgeon if dose increased by >5	0% starting dose.
Dopamine 5 mcg/kg/min continuous infusion. SBP or MAP is achieved. (Max dose: 20 mcg/kg/min continuous infusion.)	,	very 15 minutes until goal
Epinephrine 0.01 mcg/kg/min continuous infu goal MAP or SBP. (Max dose 0.1 mcg/kg/min)		•
Physician Signature		Time (required)

Page 3 of 10

PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE



MR.#/P.M.

DR.

Revised 3/18/2019

M - 1708 - 203

Physician Signature	Date (required) Time (required)
Saline flush every 8 hours for peripheral lines	
Normal Saline at KVO	e at 50 mL / nour if hemodialysis patient x24nours
<ul><li>✓ 1 unit PRBC if Hgb less than 7 – call Surgeon before</li><li>✓ Lactated Ringers at 50 mL / hour –Use Normal Salin</li></ul>	·
PRN Volume Replacement  1 unit DRPC if High loss than 7 call Surgeon before	transfusion of any blood products
Volume Replacement – Give 500 mL Albumin IV ove	: I Hour X 2 doses-
Volume Penlacement - Give 500 ml Albumin IV eve	or 1 hour v 2 dococ
	.c. 13 1633 (11011 7 0 5) 111
<ul> <li>Start continuous IV infusion of Diltiazem (CARDIZ</li> <li>Titrate continuous IV infusion of Diltiazem (CARD Heart Rate greater than 70 BPM and Less than 1</li> <li>Discontinue the Cardizem infusion if the Heart Rat</li> </ul>	EM) 125 mg/125 mL at 10 mg/hour IZEM) by 1 mg/hr every 15 minutes to maintain I10 BPM (Max Dose 20 mg/hr)
Bolus Diltiazem (CARDIZEM) 0.25 mg/kg over 2 m	
<ul> <li>Discontinue Amiodarone infusion if heart rate is le</li> <li>DILTIAZEM (CARDIZEM) PROTOCOL: PRN A-Fib/Flutt</li> </ul>	
	g/min x 6 hrs then decrease to 0.5 mg/min X 18hours
Bolus Amiodarone 150 mg IVPB over 10 minutes	
AMIODARONE PROTOCOL: PRN A-Fib/Flutter with	ventricular rate >120 BPM
hemodynamically stable initiate following protocol:	
FOR ATRIAL FIBRILLATION/ ATRIAL FLUTTER with a ven	tricular rate greater than 120 BPM and
protocol if patient unstable. Obtain and document ${\sf EKG}$	strip.
<b>ARRHYTHMIAS:</b> NOTIFY SURGEON/NP if patient develo	ps atrial or ventricular arrhythmias; Initiate ACLS
Discontinue IV Diltiazem/Nitroglycerin after oral do	se started
Cardizem CD 120 mg PO daily start on POD 1	
Amlodipine 5 mg PO daily start on POD 1	
☐ Nifedipine (PROCARDIA XL) 30 mg PO daily start on	POD1
Nitroglycerin 50 mg/250 mL (Dose: 5mcg/min, flat	
Diltiazem 125 mg/125 mL (Dose: 5mg/hour, flat rat	e)
RADIAL/LIMA/RIMA ARTERY SPASMS	
dosing: 2-5 mcg/kg/min	
	aintain infusion until discontinued by provider. Normal
RENAL PERFUSION	
0.125 mcg/kg/min every 15 minutes until goal CI (M Dobutamine 2.5 mcg/kg/min continuous infusion. In CI. (Max dose: 20 mcg/kg/min)	crease by 2.5 mcg/kg/min every 10 minutes until goal
Milrinone 50 mcg/kg bolus over 10 minutes then 0.3	,
INOTROPES	

Page 4 of 10 **PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE** Revised 3/18/2019



PT.

MR.#/P.M.

DR.

# **CARDIAC SURGERY**

POST- OPERATIVE ORDERS
<u>SEDATION</u>
Propofol (DIPRIVAN) 10 mcg/kg/min continuous infusion. Increase by 10 mcg/kg/min every 5 minutes
until RASS score of -2. Maintain RASS score of -2 until hemodynamically stable and ready to wean (per
weaning protocol); when weaning, decrease rate by 5 mcg/kg/min every 5 minutes to RASS score to 0;
discontinue Propofol prior to extubation. Contact physician if a rate of 90 mcg/kg/min is achieved.
ANALGESICS
MILD PAIN (Scale 1-3)
Acetaminophen (OFIRMEV) 1000 mg IV given over 15 minutes – every 8 hours x 24 hours. (max dose of acetaminophen 3 gm/day); THEN Acetaminophen 650mg PO q6 hours PRN pain/fever (max dose 3GM/day)
MODERATE PAIN (Scale 4-6)- select only one
Ultram 50 mg 1 tab PO every 4 hours once able to take oral pain medication
Oxy IR 5 mg, 1 tab PO every 4 hours once able to take oral pain medication.
<ul><li>Ketorolac (TORADOL) 15 mg IVP every 6 hours PRN for moderate pain x 4 doses. Hold for a Creatinine</li><li>&gt; 1.4</li></ul>
SEVERE PAIN (Scale 7-10) While Intubated- select only one
Morphine 2 mg IVP every 2 hours PRN: may repeat 2 mg IVP in 15 minutes if severe pain unrelieved x 1
while intubated
Dilaudid 0.5 mg IVP every 2 hours PRN for severe pain while intubated
Fentanyl 50 mcg IVP every 2 hours as needed for severe pain while intubated
SEVERE DAIN (SCALE 7.10). Post Extubation
SEVERE PAIN (SCALE 7-10)- Post Extubation  Oxy IR 5 mg 2 tabs every 4 hours for severe pain once able to take oral pain medications.
Oxy in 3 mg 2 tubs every 4 hours for severe pulli office usic to tuke oral pulli medicutions.
BREAKTHROUGH PAIN- Post-Extubation- select only one
Morphine 2 mg IVP every 2 hours PRN: may repeat 2 mg IVP in 15 minutes if severe pain unrelieved for
break through pain post extubation
Dilaudid 0.5 mg IVP every 2 hours PRN for severe pain for break through pain post extubation
Fentanyl 50 mcg IVP every 2 hours as needed for severe pain for break through pain post extubation.
PROPHYLACTIC ANTIBIOTICS
Pharmacy to Dose
☐ Cefazolin (KEFZOL) — 2 gm (or 3 gm if patient ≥120kg)  DATE/TIME DOCUMENTED BY ANESTHESIA:
PRE OP DOSE: INTRA-OP DOSE (if given):
Give 1st post op dose 4 hours after intra op dose (OR 8 hours after pre-op dose, if no intra op dose
given) and then repeat every 8 hours x 4 additional doses to be discontinued within 48hours of surgery
end time
Give 1st post op dose 4 hours after intra op dose (OR 8 hours after pre-op dose, if no intra op dose
given) and then repeat every 8 hours x 2 additional doses.

**Physician Signature** 

Page 5 of 10 PHYSICIANS ORDERS AND **INSTRUCTIONS TO NURSE** 

PT.

Date (required)

Time (required)

MR.#/P.M.

M - 1708 - 203

Revised 3/18/2019

PHYSICIANS ORDERS AND	
Physician Signature Page 6 of 10	Date (required) Time (required)
Magnesium Hydroxide (MILK OF MAGNESIA) BID PRI	N and in AM of POD 4 if no BM
Senna Concentrate/Docusate (SENOKOT S) 2 tablets  Bisacodyl (DULCOLAX) suppository every day PRN an	
_	PO overviday
BOWEL ROUTINE – TO START POD 1	
Famotidine 20 mg IVP BID until extubated; then Fan	notidine 20 mg PO BID
Metoclopramide (REGLAN) 10 mg IVP every 4 hours	PRN nausea/vomiting, if Zofran ineffective.
☐ Ondansetron (ZOFRAN) 4 mg IVP every 6 hours PRN	I for nausea.
ANTIEMETICS/GASTROINTESTINAL	
Other	
Pravastatin PO/OG daily	
Atorvastatin (LIPITOR) 40 mg PO/OG daily	
STATIN	
Beta-blocker contraindicated due to:	
Other	
Carvedilol (COREG) 3.125 mg PO/OG every 12 ho	
_	
Metoprolol (LOPRESSOR) 12.5 mg PO/OG every 1.	
BETA-BLOCKER (Hold if SBP less than 100 or HR less than	n 60) – START on POD 1
DATE/TIME DOCUMENTED BY ANESTHESIA	Α
pre-op Vancomycin IVPB dose given.	
Vancomycin −1000 mg (or 1500 mg for patient ≥100	Okg)- IVPB to run over 90 minutes – 12 hours after
IF NASAL CULTURE POSITIVE FOR MRSA <u>OR</u> URGENT CAREFZOL IN ADDITION TO:	ASE WITH NO MRSA SWAB RESULTED- GIVE
Repeat every 12 hours x 2 additional doses	discontinued within 48 hours of surgery end time.
DATE/TIME DOCUMENTED BY ANESTHESIA	
surgery by anesthesia when cardiopulmo	
Vancomycin −1000 mg (or 1500 mg for patient ≥100	0 kg) - run over 90 minutes – First dose given in
IF ALLERGIC TO CEPHALOSPORIN or PENICILLIN:	

**INSTRUCTIONS TO NURSE** Revised 3/18/2019

MR.#/P.M.

#### McLaren - Flint

# CARDIAC SURGERY POST- OPERATIVE ORDERS

	Greater than 3.9	No treatment	No treatment	
		hour x 1 dose	hour x 2 doses	
	3.6-3.9	20 mEq/ 100 mL over 1	10 meq/100 mL over 1	Next AM
		hour x 2 doses	hour x 4 doses	
-	3.3-3.5	20 mEq/ 100 mL over 1	10 mEq/ 100 mL over 1	Next AM
	Notify Physician	hour x 3 doses	hour x 6 doses	last dose infused
-	Less than 3.2-	20 mEq/100 mL over 1	10 mEq/100 mL over 1	30 minutes after
	Potassium Level (mEq/L)	cardiac monitor	central access without cardiac monitor	Repeat K Level
	D	Central access with	Peripheral IV access or	
			de Dose Infusion Rate	
г		rotocol (normal range 3.6-5		
	_	ECTROLYTE REPLACEMENT F		ATIENTS
ELE	CTROLYTE REPLACE			
	Other			
닏				
닏				
닏	Amiodarone 200 m	-		
믬		X) 0.25 mg BID PRN for anxie	ety	
_		max doses of Cleveprex and	• •	
$\triangle$		IVP every 1 hour PRN for SB		wean Cieveprex and/or Nitr
X	-	PO PRN for sore throat	D > 100 (	a. Classanas and /an Nitu
	<del></del>			
то	HER			
Ш	Clopidogrel (PLAVI	X) 75mg PO daily; start on PO	UU 1	
님		op Rectally Once on arrival to		
X		O daily; start on POD 1		
	_			
PI A	TELET INHIBITORS			
	Anti-embolic bilate	eral knee-high leg stockings		
$\boxtimes$	Intermittent Pneur	natic Compression Device (IF	PC) worn at all times.	
	•	nts with Heparin allergy, activ	•	
	Arixtra (FONDAPA	RINUX) 2.5 mg subcutaneous	s daily to start on POD 1 (Co	ntraindicated if CrCl <30),
	platelet count <100	0,000		
	•		urs to start 8 hours after sur	0- //

Page 7 of 10

PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE

Revised 3/18/2019

Magnesium Protocol (normal range 1.5-2.6 mg/dL) (non-obstetrical use)

Magnesium Level		Repeat Mg
(mg/dL)	Magnesium Dose	and SCr Level
Less than 0.8 -	2 gram Magnesium Sulfate IV x 4 doses	Next AM
notify physician		
0.8-1.1	2 gram Magnesium Sulfate IV x 3 doses	Next AM
1.2-1.4	2 gram Magnesium Sulfate IV x 2 doses OR	Next AM
	400 mg magnesium oxide by mouth every 4 hours x 2 doses	
1.5-1.9	2 gram Magnesium Sulfate IV x 1 OR	Next AM
	400 mg Magnesium oxide by mouth x 1 dose	

<sup>\*</sup>IV replacement with 1 gram magnesium sulfate in 100 mL D5W for peripheral administration or 2 grams magnesium sulfate in 50 mL D5W for fluid restricted patients or central line administration, to be administered at a rate not to exceed 16 mEq (2 grams) per hour (or 1 gram per 30 minutes)

### \*\*If Serum Creatinine is greater than 2 mg/dL, use ½ the dose

### Calcium Gluconate Protocol

IV Calcium Gluconate Replacement and monitoring
28.2 mEq (6 gm) Calcium Gluconate IVPB over 6 hours; repeat ionized
calcium 2 hours post dose and follow algorithm
18.8 mEq (4 gm) Calcium Gluconate IVPB over 4 hours; repeat ionized
calcium 2 hours post dose and follow algorithm
9.4 mEq (2 gm) Calcium Gluconate IVPB over 2 hours; check ionized calcium
next AM

<sup>\*</sup> Infusion rate not to exceed 1 gm/hour Calcium Gluconate

#### **RESPIRATORY: VENTILATION, WEANING & EXTUBATION PROTOCOL**

- GOAL: Extubation within 24 hours, with ultimate goal within 6 hours if possible.
- Maintain the following parameters:
  - pH 7.32 7.48 (Notify physician if pH less than 7.25 or greater than 7.50)
  - PaCO<sub>2</sub> 32 50 mmHg
  - PaO<sub>2</sub> 60 150 mmHg
  - SPO<sub>2</sub> greater than 92%
  - CI greater than 2
  - HCO<sub>3</sub> greater than 18 mMol/L
- If patient awakes from anesthetic agitated and with a high respiratory rate greater than 24 bpm, change ventilator settings to PRVC at the same rate and FIO<sub>2</sub>, give sedation.
- Wean FIO<sub>2</sub> as tolerated to keep SpO<sub>2</sub> greater than 92%
- EzPAP with unit dose Albuterol every 4 hours.
  - Respiratory Therapy to assess and evaluate the need for EzPAP or SVN.

**Physician Signature** 

Page 8 of 10

**PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE** 

Revised 3/18/2019

Date (required)

Time (required)

PT.

MR.#/P.M.

DR.

<sup>\*\*</sup>If GFR less than 30 mg/dL check phosphate. If phosphate greater than 7 mg/dL contact provider before replacing calcium

- When patient fully awake, assess if patient meets the following criteria to wean
  - Hemodynamically stable
  - Temp greater than 36.1º F
  - Follow commands and communicates with meaningful gestures/nodding
  - No active bleeding
- If patient meets above criteria contact physician prior to weaning
- Start the ventilator weaning process by placing the ventilator to CPAP at 5 and PS (Pressure support) at 10, and current FIO<sub>2</sub>. Repeat ABGs 30 minutes after each change.
- Target ventilation parameters to include:
  - Respiratory rate less than 25 breaths per minute
  - Tidal volume 3 4 mL /kg ideal body weight
  - RSBI (Rapid shallow breathing index) less than 105
- When CPAP and ABG parameters are within range call the intensivist for extubation orders. Monitor oxygen saturation with pulse oximetry and adjust to maintain 92% saturation.

If patient not extubated, return to prior ventilator settings and restart CPAP trial in am.

#### **POST EXTUBATION**

- All patients with BMI >30 need to be placed on Auto Bipap immediately after extubation for 4-6 hours and THEN nightly for at least 2 nights
- Extubate ALL patients with BMI >30 to Auto Bipap Max IPAP 12, Min EPAP 4, PS 4
- Extubate ALL patients with BMI >35 to Auto Bipap Max IPAP 14, Min EPAP 6, PS 4 for at least 2 nights.
- Incentive Spirometer 10 times every hour DOCUMENT how many MLs patients was able to achieve deep breathing and coughing on all patients
- EzPAP with unit dose Albuterol every 4 hours.
  - o Respiratory Therapy to assess and evaluate the need for EzPAP or SVN.
- ABG PRN Respiratory Distress call surgeon and intensivist if abnormal
- Maintain SPO2 > 92%

#### **INCISION CARE:**

$\boxtimes$	Remove chest dressing in am
$\boxtimes$	Clean incisions, chest tube sites, pacer wire sites every 12hours with Chlorhexidine, DO NOT
	rinse; if DermaBond used on incision – wash with soap and water, do not use Chlorhexidine
$\boxtimes$	Reapply chest dressing after each cleansing and document date, time and initials
$\boxtimes$	Remove leg/arm incision bandage and/or ace wrap on POD 1
$\boxtimes$	CHG bath daily in CCU
$\boxtimes$	Heart Hugger ALL male patients – Apply and Maintain
$\boxtimes$	Surgical Bra ALL female patients – Apply and Maintain

Physician Signature
Page 9 of 10
PHYSICIANS ORDERS AND
INSTRUCTIONS TO NURSE



Date (required)

Time (required)

PT.

MR.#/P.M

M - 1708 - 203

Revised 3/18/2019

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## **CARDIAC SURGERY POST- OPERATIVE ORDERS**



NPO until 1 hours post extubation, then perform bedside swallow eval, ice chips as tolerates, then advance diet as tolerated with PO fluid restriction of 1,500 mL/24 hours. If patient is Diabetic, order the following diet – Women 1,500 Calorie, Men 1800 Calorie

### **ACTIVITY:**

Bedrest. Dangle if hemodynamically stable and extubated the night of surgery. Progress to up in chair by

POD 1 – Up to Chair TID -Ambulate in afternoon if no femoral arterial line present

POD 2 – Up to Chair TID, Ambulate in hall TID

POD 3 – Up to Chair TID, Ambulate in hall TID

Physician Signature

Page 10 of 10

**PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE** 

Revised 3/18/2019 M - 1708 - 203



PT.

Date (required)

Time (required)

MR.#/P.M