McLaren - Flint

TAVR
POST- OPERATIVE ORDERS

ADMIT TO INPATIENT SERVICES: CCU

PROCEDURE DATE: _____ PROCEDURE: TAVR _____

ADMITTING SURGEON: _____ INTENSIVIST: _____

ALLERGIES: ☐ NKA ALLERGIC TO: _____

Height: _____ Weight: _____

CONSULTATIONS

☒ Cardiologist _____

☒ Cardiac Rehabilitation

☐ PCP _____

☐ _____

HEMODYNAMIC MONITORING:

1. VITAL SIGNS: Every 15 minutes and PRN until extubated and stable. Once hemodynamically stable for Q15 X 4, may progress to Q 30 minutes x 2, then hourly. If patient becomes unstable, resume Q 15 minutes
2. Continuous monitoring – ECG, Arterial Line.
3. Temperature on admission and then hourly until temp 36.1C, then q4hrs and PRN. If temperature is below 36C, rewarm with BAIR Hugger/warm blankets
4. FOLEY TO GRAVITY DRAINAGE
   ☒ DISCONTINUE FOLEY 1 hour after bed rest complete unless otherwise ordered and documented. ☒ Straight cath for inability to void after 8 hrs.
5. INTAKE and OUTPUT q15min until patient extubated and then hourly.
6. CHEST TUBES – Connect to -20cm water suction
   ☒ Measure and Record Chest Tube Output q15min x2 hours, then q30min x4 hours, then q1hour ☒ Call Surgeon/NP if CT output >200ml/hr
7. PACEMAKER MONITORING (check thresholds every shift) ☒ Pace as necessary for HR less than 60
8. DAILY WEIGHT at 5am on same scale and record in kilograms
9. NEURO CHECKS q 2 hours x 24 hours; then q 4 hours x 24 hours; then q 8 hours until discharge.
10. Bilateral groin/incisions checks q 2 hours x 24 hours; then q 4 hours x 24hours; then q 8 hours until discharge.

DIAGNOSTICS

☒ STAT portable CXR on admission to CCU and routine at 0500 daily while in CCU STAT EKG on admission
☒ and at 0400 on POD 1 and PRN with changes.
☒ STAT ABG, CBC with diff, CMP, APTT, PT/INR, Magnesium, Ionized Calcium on admission to CCU CBC 3
☒ and 6 hours POST OP
☒ APTT, PT/INR, CBC, CMP, Mg, Ionized Calcium – POD 1
☒ Daily – CBC, CMP, Magnesium, and Ionized Calcium
☒ Hemoglobin and Hematocrit - 2 hours post all PRBC transfusions
☒ Complete Echocardiogram on POD 2

Physician Signature **Date (required)** **Time (required)**

PHYSICIANS ORDERS AND INSTRUCTIONS TO NURSE
M-1708-312

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BLOOD SUGAR PROTOCOL: FOR ALL PATIENTS

☒ Glucometer Checks every 1 hour (even when drip is off) x 24 hours ☒ Maintain Insulin Drip x 24 hours
☒ Titrate and manage insulin drip utilizing the "Intravenous Insulin Adjustment Nomogram." Maintain blood
☒ sugar greater than 80 and less than 150 mg/dl.
☒ Resume insulin drip if blood sugar is greater than or equal to 150 mg/dl.
☒ When patient is eating, initiate the following Prandial Insulin Scale based on current IV Insulin rate:

	Consumes >50% of Meal	Consumes 25-50% of Meal	Consumes < 25% of Meal
IV Insulin Infusion Rate	Insulin Lispro to be given within 10 minutes after breakfast, lunch, and dinner. Continue to follow IV Insulin Orders/Adjustment Guide with hourly glucose checks		
0-0.5 units/hour (or on HOLD)	3 units	2 units	0
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. May utilize the TMO to specify all post-procedural Medications***.

1. Maintain systolic blood pressure between_____or MAP between_____for first 12 hours.

VASODILATORS

☐ Clevidipine (Cleviprex) 25 mg/50 mL Starting dose: 2 mg/hr continuous infusion. Double dose every 90 seconds until approaching SBP goal, then increase by 1 mg/hr every 5 minutes. Max rate 21 mg/hr.
☐ Nitroglycerin 50mg/250ml D5W. Starting dose: 10 mcg/min continuous infusion. Increase by 5 mcg/min every 3 minutes to maintain goal SBP or MAP. (Max rate: 400 mcg/min)

VASOPRESSORS

☐ Norepinephrine 8 mg/250 mL. Starting dose: 2 mcg/min continuous infusion. Increase by 1 mcg/min every 10 minutes (Max dose: 30 mcg/min)
☒ Dopamine 400 mg/250 mL. Starting dose: 5 mcg/kg/min continuous infusion. Increase by 2.5 mcg/kg/min every 15 minutes until goal SBP or MAP is achieved. (Max dose: 20 mcg/kg/min)
☐ Epinephrine 5 mg/250 mL. Starting dose: 1 mcg/min continuous infusion. Increase by 0.05 mcg/kg/min every 10 minutes until goal MAP or SBP (Max dose: 4 mcg/min)

BETA BLOCKER

☒ Esmolol 10mg bolus IVP then start drip at: 50mcg/kg/min continuous infusion. Increase by 25 mcg/kg/min every 5 minutes until desired HR and SBP are achieved. (Max: 200mcg/kg/min; hold for HR <90 AND SBP <100)

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2. ARRYTHMIAS: NOTIFY SURGEON/NP if patient develops atrial or ventricular arrhythmias; Initiate ACLS protocol if patient unstable.

FOR ATRIAL FIBRILLATION/ ATRIAL FLUTTER with a ventricular rate greater than 120 BPM and hemodynamically stable initiate following protocol:

☒ AMIODARONE PROTOCOL: PRN A-Fib/Flutter with ventricular rate >120 BPM

- Bolus Amiodarone 150mg IVPB over 10minutes
- Start continuous IVPB infusion of Amiodarone 1mg/min x 6hrs then decrease to 0.5mg/min X 18hours
- Discontinue Amiodarone drip if heart rate is less than 70 BPM

☐ DILTIAZEM (CARDIZEM) PROTOCOL: PRN A-Fib/Flutter with ventricular rate >120 BPM

- Bolus Diltiazem (CARDIZEM) 0.25 mg/Kg over 2 minutes – (Max dose 20mg)
- Start continuous IV infusion of Diltiazem (CARDIZEM) 125mg/125 mL at 10 mg per hour
- Titrate continuous IV infusion of Diltiazem (CARDIZEM) by 1 mg increments to maintain Heart Rate greater than 70 BPM and Less than 110 BPM
- Discontinue the Cardizem drip if the Heart Rate is less than 70 BPM

3. IV FLUIDS/FLUID REPLACEMENT

☒ Volume Replacement – Give 250 mL of Albumin 5% IV over 1 hour x 2 doses- PRN Volume Replacement
☒ 1 unit PRBC if Hgb less than 7 – call Surgeon before transfusion of any blood products
☒ Normal Saline at 50 mL / hour
☒ Saline flush every 8 hours for peripheral lines

4. ANALGESICS

☐ Propofol (DIPRIVAN) 10 mg/ml IV infustion. Start at 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.

☐ Morphine 2mg IVP every 2 hours PRN severe pain:
may repeat 2 mg IVP in 15 minutes if severe pain unrelieved x 1

☐ Dilaudid 1mg IVP every 2 hours PRN for moderate-severe pain:

☒ Acetaminophen (OFIRMEV) 1000mg IV given over 15minutes – every 8 hours x 24 hours. (max dose of acetaminophen 3 gm/day)

☒ OxyIR 5 mg, 1 tab PO every 4 hours for moderate pain and 2 tabs every 4 hours for severe pain once able to take oral pain medications

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5. PROPHYLACTIC ANTIBIOTICS

☐ Cefazolin (KEFZOL) – 2GM (or 3GM 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 2 additional doses.

IF ALLERGIC TO CEPHALOSPORIN or PENICILLIN:

☐ Vancomycin –1GM (or 1500mg I patient ≥100kg) - run over 90minutes – First dose given in surgery by anesthesia when cardiopulmonary bypass completed:
DATE/TIME DOCUMENTED BY ANESTHESIA_____

☐ Repeat every 12 hours x 2 additional doses

IF NASAL CULTURE POSITIVE FOR MRSA - GIVE KEFZOL IN ADDITION TO:

☐ Vancomycin –1GM (or 1500mg I patient ≥100kg)- IVPB to run over 90 minutes – 12 hours after pre-op Vancomycin IVPB dose given.
DATE/TIME DOCUMENTED BY ANESTHESIA_____

6. BETA-BLOCKER (Hold if SBP less than 100 or HR less than 60) – START on POD 1 Metoprolol (LOPRESSOR) 12.5 mg PO/OG every 12 hours ☐

☐ Other _____ Carvedilol (COREG) 3.125 mg PO/OG every 12 hours ☐

☐ 6.25 mg PO/OG every 12 hours

☐ Other _____

Beta-blocker contraindicated due to: _____

7. STATIN

☐ Atorvastatin (LIPITOR) 40 mg PO/OG daily
☐ **Other** _____

8. ANTIEMETICS/GASTROINTESTINAL

☒ Ondansetron (ZOFRAN) 4 mg IVP every 6 hours PRN for nausea.
☒ Metoclopramide (REGLAN) 10 mg IVP every 4 hours PRN nausea/vomiting, if Zofran ineffective.
☒ Pepcid 20 IVP BID until extubated; then 20 mg PO BID

9. BOWEL ROUTINE – TO START POD 1

☒ Senna Concentrate/Docusate (SENOKOT S) 2 tablets PO every day
☒ Bisacodyl (DULCOLAX) suppository every day PRN and in AM of POD 3 if no BM Magnesium Hydroxide
☒ (MILK OF MAGNESIA) BID PRN and in AM of POD 4 if no BM

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10. DVT PROPHYLAXIS

☐ Heparin 5000 Units subcutaneously every 8 hours to start 8 hours after surgery, Hold if active bleeding
☒ or platelet count <100,000
☒ Intermittent Pneumatic Compression Device (IPC) at all times. Anti-embolic bilateral knee-high leg
☒ stockings

11. PLATELET INHIBITORS

☒ Aspirin 325mg PO daily; start on POD 1
☐ Clopidogrel (PLAVIX) 75mg PO daily; start on POD 1

12. OTHER

☒ Cepacol Lozenges PO PRN for sore throat Hydralazine 10mg IVP every 1 hour for SBP >160
☒ Other _____

ELECTROLYTE REPLACEMENT:

☒ ***HOLD ELECTROLYTE REPLACEMENT PROTOCOL FOR DIALYSIS PATIENTS***

☒ **IV Potassium Protocol (normal range 3.6-5.2 mEq/L)**

Potassium Level (mEq/L)	Potassium Chloride Dose Infusion Rate		Repeat K Level
	Central access with cardiac monitor	Peripheral IV access or central access without cardiac monitor	
Less than 3.2- Notify Physician	20 mEq/100 mL over 1 hour x 3 doses	10 mEq/100 mL over 1 hour x 6 doses	30 minutes after last dose infused
3.3-3.5	20 mEq/ 100 mL over 1 hour x 2 doses	10 mEq/ 100 mL over 1 hour x 4 doses	Next AM
3.6-3.9	20 mEq/ 100 mL over 1 hour x 1 dose	10 meq/100 mL over 1 hour x 2 doses	Next AM
Greater than 3.9	No treatment	No treatment	

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

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

*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**

Ionized Calcium	IV Calcium Gluconate Replacement and monitoring
Less than 0.9	28.2 mEq (6 gm) Calcium Gluconate IVPB over 6 hours; repeat ionized calcium 2 hours post dose and follow algorithm
0.9-0.99	18.8 mEq (4 gm) Calcium Gluconate IVPB over 4 hours; repeat ionized calcium 2 hours post dose and follow algorithm
1-1.1	9.4 mEq (2 gm) Calcium Gluconate IVPB over 2 hours; check ionized calcium next AM

* Infusion rate not to exceed 1 gm/hour Calcium Gluconate
**If GFR less than 30 mg/dL check phosphate. If phosphate greater than 7 mg/dL contact provider before replacing calcium

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RESPIRATORY: VENTILATION, WEANING & EXTUBATION PROTOCOL

- GOAL: Extubation within 24 hours, with ultimate goal of 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)
  - PaCO2 32 - 50 mmHg
  - PaO2 60 - 150 mmHg
  - SPO2 greater than 92%
  - CI greater than 2
  - HCO3 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_2, give sedation.
- Wean FIO_2 as tolerated to keep SpO_2 greater than 92%
- Incentive Spirometer every one hour – deep breathing and coughing on all patients
- EzPAP with unit dose Albuterol every 4 hours.
  - Respiratory Therapy to assess and evaluate the need for EzPAP or SVN.
- When patient fully awake, assess if patient meets the following criteria to wean
  - Hemodynamically stable
  - Temp greater than 97º 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_2. 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
  - Negative inspiratory force - 20 cm H2O minimal
  - 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.

INCISION CARE (FOR DIRECT AORTIC APPOACH):

☒ Remove dressing in am
☒ Clean incisions every shift with Chlorhexidine, DO NOT rinse
☒ Reapply chest dressing (Bordered gauze) after each cleansing and document date, time and initials

Diet:

☒ NPO until 2 hours post extubation, then perform bedside swallow eval, then advance diet as tolerated with PO fluid restriction of 1,500 mL in 24 hours. If patient is Diabetic, order the following diet - Women 1,500 Calorie, Men 1800 Calorie

Activity:

☒ Bedrest x4 hours; then advance as activity as tolerates

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