

# PERFORMANCE EXCELLENCE 2020

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Main Line Health®

## IP CHF Pathway and Diuretic Protocol

### Introduction

Main Line Health Physician Partners (MLHPP) initiated this work as part of its strategy for integrated management of high risk patients. This IP CHF pathway and diuretic protocol is a part of cross-continuum of care effort to better manage the dyspneic patient in the ambulatory, ED, observation, inpatient, and SNF settings. This Advisory was developed jointly by the MLH PI team, ED, nursing, and hospitalist leadership with support from cardiology, nephrology, and pharmacy.

### ► KEY POINTS

- **Observation Status:**
  - Patient reevaluated 3x/day, including conversation at midnight
  - Decision to discharge or admit by 24 hours
- **Inpatients Cohorted** to designated CHF unit at each campus
- **Initial Admission Evaluation**
  - Identify HF Type (systolic/diastolic/mixed) and HF Stage
  - Use EDD (estimated date of discharge)
  - Consult Palliative Care if RN screen upon admission is +
  - Utilize the *MLH NIPPV Protocol*
- **Key Nursing Interventions**
  - Standing daily weight in the AM after voiding
  - Strict I/Os with urine output (UOP) measured per protocol
  - Mobility (daily 2 minute walk test + ambulate 3 times/day, OOB > 50%, OOB for meals)
  - CHF education organized by daily lessons
  - Personal CHF action plan
  - RN-driven diuretic and electrolyte replacement protocol
- **Diuretic Dosing and Electrolyte Replacement Protocol**
  - All patients should be on the CHF pathway, while only those who meet indications should be on the diuretic protocol (see page 3)
  - RN-driven diuretic dosing based on UOP
  - RN-driven electrolyte replacement per protocol
- **Twice Daily Rounding with RN to discuss:**
  - EDD, ambulation goals, output goals, and target weight
- **Discharge**
  - Contact PCP per HMS/PCP Communication Standards
  - 2 Minute Walk Test without O<sub>2</sub> < 92%
  - Follow up within 3-7 calendar days (PCP, Cards, or Urgent Care+)
  - OSA Referral for all STOP-BANG score > 4
  - Diuretic Dose Rescue Plan provided
  - Refer to HomeCare if patient is discharged home
  - Refer to OP Cardiac Rehab Program

### Goals

- 1) Reduce average LOS to 4.0 days
- 2) Reduce 30 day readmissions within MLHS observed/expected to 0.84
- 3) Improve HCAHPS for:
  - a) Rating Hospital of 9-10 >78%
  - b) Doctor Communication >74%
  - c) Discharge Process >89%
- 4) Reduce CHF cost per case by 15%
- 5) Reduce patients sent to SNF to 17%

### CHF IP Process Measures

- 1) Placed in Observation
- 2) Cohorted on designated unit
- 3) Placed on CHF Pathway
- 4) Placed on the diuretic protocol
- 5) Performed a 2-minute walk test
- 6) Scheduled follow up appointment for appropriate patients
- 7) Completed HomeCare referral



### ► WHY FOCUS?

Across MLH, CHF patients currently experience the following: **longer LOS than expected; more 30-day readmissions than expected; higher cost of care** than benchmark.

**Safe – Timely – Efficient – Effective – Equitable – Patient-Centered**

## IP CHF Pathway: Key Interventions

Day 1 Admission Day	Day 2 Mobility and Education	Day 3 Discharge Pre- Planning	Day 4 Standard Discharge
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### Initial Assessment

- Identify HF type and stage
- Complete EDD (estimated date of discharge)
- Determine whether the patient is eligible for the RN-driven diuretic protocol (see page 3)

### Vitals

- Strict I/Os and 24hr balance; UOP assessed per protocol

### Respiratory

- Continue Oxygen therapy to maintain O<sub>2</sub> Sat > 92%
- Use early and aggressive NIV treatment and wean per NIPPV Protocol
- Respiratory Therapy to complete STOP-BANG assessment and schedule Sleep Study if questionnaire score is > 4
- Home O<sub>2</sub> set up by Care Coordination

### Labs <sup>(a)</sup>

- BMP with AM labs (6am) and BMP at 4pm
- Mg with AM labs; if AM Mg <1.9, repeat at 4pm
- Afternoon labs if on protocol*

### Diet

- Cardiac diet, < 2g Na; 1500 ml fluid restriction

### Mobility (Rapid Rehab Bundle)

- Ensure patient understand mobility goals and targets
- 2 Minute Walk Test (2MWT) daily
- Out of bed for all meals and > 50% from 0700 to 2100
- Ambulate 4 times/day (including 2MWT) with goal to improve distance from previous day

### Consults

- Cardiology consult if patient has known cardiologist
- Notify patient's PCP (per HMS/PCP Communication Standards)
- Palliative Care consult if RN screen upon admission is +
- Dietary consults
- PT consult if patient cannot complete 2MWT and/or Rehab Bundle
- Cardiac rehab
- HomeCare and Care Coordination consults <sup>(b)</sup>

### Education

- Patient whiteboard with goal weight, goal distance, and EDD
- Focus on 1-2 topics (MAWDS) per day, and und use teach back <sup>(c)</sup>
- Complete personal CHF action plan in *Managing your heart health*

### Interdisciplinary Care Communication

- Review EDD, target mobility distance, and target weight loss and output with RN daily <sup>(d)</sup>

## Pathway Notes

❖ All patients should be on the CHF pathway, while only those who meet indications should be on the diuretic protocol (pg. 3)

(a) If you D/C the diuretic protocol, discuss with the RN if you still want BID labs or not (if still on TID diuretics, BID labs + aggressive PRN repletion is recommended)

(b) If discharged to Home, refer to HomeCare; CC will start to offer this service on DAY #2

Referral by calling 484-580-1601 or their link ([HomeCare](#)) for follow up assessment, medication management, home safety evaluation, dietary teaching, & telemonitor program

All referrals that are received within normal business hours M-F between 8:00 am–6:00 pm, or Saturday, Sunday and Holidays between 7:30 am–2:00 pm will receive a return phone call within two hours (all other referrals will be acknowledged on the next business day)

(c) MAWDS:

**Medications.** Review current meds on arrival and discharge meds at discharge

**Activity.** 30 minutes activity/day

**Weight.** daily at same time.

Criteria for notification if wt Δ

**Diet.** Review fluid and sodium restrictions, and high Na foods

**Symptoms.** Recognize symptoms to notify physician

(d) Identify distance target based on prior day's distance walked

Identify target weight: for example, if you want to take 10 liters off and the EDD is 4 days, then divide number of liters off by the number of days (e.g. 2.5 liters/day in this case)

## Diuretic Dosing and Electrolyte Replacement

### Diuretic Dosing <sup>(e)</sup>

- **Daily net negative fluid balance can be accomplished safely over 3 daily doses with accurate I/O's, known individual dose response, BID labs, and the ability to titrate based on response**
- Transient rise in SCr up to 0.3 (~20% of baseline) has been observed in clinical trials of loop diuretics without long term decline in GFR <sup>(f)</sup>
- IV diuretic protocol dosing with Furosemide or Bumetanide is always TID, though mg dosage may vary
- Dosing recommendation for normotensive heart failure is either:
  - Based on dose response in ED
  - Or 2x the equivalent of the daily home oral dose

#### RN-driven diuretic protocol

- Target at least 100 ml urine output per hour
- If UOP < 400 cc in 4 hrs., RN can double next dose of loop diuretic
- If UOP 400-900 cc in 4 hrs., RN will give next scheduled dose of loop diuretic
- If UOP > 900 cc in 4hrs., RN will give ½ next scheduled dose of loop diuretic

The table below is a guideline for initiating TID IV diuretic dosing – scheduled doses should be adjusted frequently based on UOP and RN driven protocol outcomes:

IV Furosemide Dosing (mg) - Three Times Daily		
Outpatient Furosemide Equivalent Dose (mg/day)	GFR >30	GFR <30
<40 mg	20 mg	40 mg
40-80 mg	40 mg	60 mg
81-120 mg	40 mg	80 mg
121-160 mg	60 mg	80 mg
>160 mg	80 mg	Cardiology Consult

- Equivalents: Torsemide (Demedex) 20 mg = Bumetanide (Bumex) 1mg = IV Furosemide (Lasix) 40 mg
- Max of 120 mg IV furosemide 1-time push dose; Max of 3 mg IV Bumetanide 1-time push dose

### Electrolyte Replacement (this is a guide only) <sup>(g)</sup>

Potassium Level (Normal Range: 3.6 – 5.1)		
≤ 3.0	3.1 - 3.4	3.5 - 3.9
Treat the electrolyte abnormality based on physician Order	1) 40 mEq orally now and in 2 hours 2) Give orally unless patient unable to tolerate orally	1) 40 mEq orally now 2) Give orally unless patient unable to tolerate orally
Magnesium Level (Normal Range: >1.8)		
<1.4 mEq	1.4 – 1.8 mEq	> 1.8mEq
Treat the electrolyte abnormality based on physician Order	Magnesium Sulfate 2g/50mL IV over 2 hours	No treatment is Necessary

### Pathway Notes

- (e) The goal of the protocol is to determine the right dose for the patient faster, and once discovered, the protocol can be discontinued

#### ❖ **DO NOT USE DIURIC PROTOCOL IF THE PATIENT HAS ANY OF THE FOLLOWING CONDITIONS:**

- Undifferentiated dyspnea
- On dialysis
- Acute MI
- SBP < 90 mg Hg
- Electrolyte Disorder – Na < 128, K < 3.1, Mg ≤ 1.3

CKD, AKI, AKI on CKD are NOT absolute contraindications for the diuretic protocol (only ESRD)

However, patients may receive this protocol at the discretion of the treating physician

Always reconsider starting patient on the CHF nurse diuretic protocol if the exclusion criteria are reversible (i.e. pt very hypokalemic on admission, not appropriate for diuretic protocol, K is repleted and stable, can reconsider starting IV diuretic protocol)

Diuretic dosing may not be necessary in the hypertensive CHF patient; primary focus is to achieve target mean arterial pressure

Dosing recommendation for hypertensive heart failure, IF GIVEN, is the IV equivalent of the daily home oral dose

- (f) Follow up to DOSE Clinical Trial: *NEJM*, March 2011
- (g) Metabolic panel checked twice/day to ensure adequate potassium replacement and stable renal function

## Discharge

### Discharge Checklist

- Can pass simplified 2 Minute Walk Test without O<sub>2</sub> < 92%
- Identify dry weight
- Seen in 3-7 calendar days (PCP -> Cardiology -> Next Care)
- OSA referral for all STOP-BANG score > 4
- Tier-1 Standard Rescue Dosing Protocol (see below)

### Communication

- Speak with appropriate ambulatory provider (PCP or specialist) to get appointment within 3-7 calendar days
- Discharge Summary on the day of discharge should include the discharge weight, last echo, EF, type of HF, HF etiology (if known) rescue diuretic dose (see below)
- Discuss with cardiology (if consulted) what the discharge of PO diuretics is AND what the rescue diuretic dose should be

### Referral

- If patient is discharged Home refer to HomeCare
- OP Cardiac Rehab Program

#### Tier-1 Standard Rescue Dosing Protocol

##### Indications for Rescue Dosing:

- If weight increases within 24 hours:
  - 2 lbs if symptomatic
  - 3 lbs if asymptomatic
- If 5 lbs increase in one week

##### Protocol

- Double loop diuretic dose for 3 days
- Patient notifies MD Office/HomeCare RN of diuretic dosing change due to symptom progression
- Daily Physician Office/RN Contact
- Obtain BMP 2 days after the first double diuretic dose (or as directed by physician) with a copy of lab results sent to the attending physician
- Adjustment of potassium supplement will be based on these results

*If MLS HomeCare Referral, MLS HomeCare RNs utilize this protocol and will make daily contact with the patient*

**Disclaimer:** This System Clinical Advisory is based on the best available scientific evidence at the time of publication. It is not a prescription for every physician, every patient, nor does it replace clinical judgement.

For questions or concerns, please contact Andrew Keser ([KeserA@MLHS.org](mailto:KeserA@MLHS.org))

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