

Acute Heart Failure Management Guidelines Card

1. DECONGEST WITH LOOP IV DIURETIC

- a. Use 2x home dose IV bid with rapid escalation if not responding (e.g., Home Furosemide 40mg daily-> 40mg IV furosemide BID)
- b. Admission labs, BNP, Q8-12 lytes; keep K> 4.0 (add aldo blocker early)
- c. Target 2-3L daily urine output or 2-5lbs daily weight loss as tolerated
- d. Use standing daily weights; or accurate ins and outs
- e. IF weight not decreasing by 2lbs/day, add thiazide and increase dosing IV loop diuretics BID/TID/drip

Loop Diuretic Equivalence Table (mg)			
	IV* bid-tid	ORAL q24h-bid	NOTES
Furosemide	20-100 IV Push >100-200 IVPB over 30 min	40-200	Max recommended daily dose 600 mg IM administration available
Bumetanide	1-2 IV Push >2-5 IVPB over 30 min	1-5	Max recommended daily dose 10 mg IM administration available
Ethacrynic acid/ Ethacrynate sodium	50	50-100	May consider Ethacrynate sodium IV if: 1. True allergy to furosemide, torsemide, bumetanide or thiazide (i.e. anaphylaxis, rash, itching, urticaria); NOT a sulfa allergy AND 2. NPO, contraind to enteral access or GI malabsorption AND 3. Chair of Medicine approval required prior to initiation.

Equivalent dosing
Furosemide 40mg PO = Furosemide 20mg IV = Bumetanide 1mg (IV/PO) = Torsemide 20mg = Ethacrynic acid 50mg

Thiazides for combination diuretic Rx (mg)			
Metolazone	n/a	2.5-10	Give 30 minutes before IV loop diuretic Max recommended daily dose 20 mg Monitor for hypokalemia
Hydrochlorothiazide	n/a	25	Monitor for hypokalemia (maximum dose 100mg daily)

2. WORK UP DECOMPENSATION

- a. Review recent TTE or perform Telemetry for arrhythmia
- b. Consider pacemaker/ICD interrogation
- c. Ischemia evaluation, myocarditis workup
- d. r/o co-morbidity ie, infection, PE, TFTs, HIV and OSA
- e. Other (diet, alcohol, NSAIDs, meds, Utox, etc.)

3. CONSIDER CARDIOLOGY CONSULT AND/OR HEART FAILURE OUTPATIENT REFERRAL

- a. CHF readmission
- b. SBP <100 or syncope
- c. Hypoperfusion: Cr>1.8 or increase by 25%, rising LFTs, ▲MS, cool extremities or inotrope
- d. Na <130
- e. Persistent elevated troponin
- f. No weight change 48 hours
- g. EF <35%
- h. Difficult to manage or atypical HFpEF
- i. Age <50
- j. Intolerance or down titration neurohormonal blockade
- k. Pre-discharge pro-BNP >4,000, or BNP >700, trigger HF outpatient referral
- l. HFREF w/LBBB, QRS>150, or RV paced
- m. Appropriate ICD shock

Cardiology Consult: **718-661-8154**
Advanced Heart Failure Outpatient: **Weill Cornell 212-746-2381**

4. CONSIDER HEART FAILURE CONSULT OR TRANSFER

- a. ≥2 of above criteria listed in #3
- b. Persistent shock: SBP <90, Cardiac Index <2, or cold extremities or inotropes
- c. Challenging atrial/ventricular arrhythmias
- d. EF <20% or recent inotrope (outpatient, if stable)
- e. Mod PH: PASP >50 (or if SBP <90 then >40mmhg) or mPAP >35
- f. >2 admissions in 6mo for medical reasons
- g. Complicated valvular or congenital heart disease

Heart Failure Consult: **929-362-9987 (NP/Fellow)**
Inpatient Heart Failure Transfer via Cardiology Fellow: **718-661-8154**
Transfer Center: **1-800-NYP-STAT**

5. GUIDELINE MEDICATIONS FOR HFREF AND HFpEF

Class	Indications		Contraindications
	HFREF (LVEF ≤ 40%)	HFpEF (LVEF ≥ 50%)	
ACEI or ARB	All pts (COR I), for RR 17/31%* Use caution during IV diuresis. After IV diuresis, test/retest low dose & begin uptitration. If BP ↓ or Cr ↑, hold/reduce diuretic & retest	SBP > 130 after euvolemic (COR I)	AKI or significant CKD K > 5.0 Hx of angioedema (ACEI) Hold for anesthesia & dye studies
ARNI Sacubitril/valsartan	Replaces ACEI/ARB in stabilized Class 2/3 pts (COR I) for additional RR 16/20% vs. ACEI.* Consider hold/reduce diuretic for test dose	Unknown	AKI or significant CKD or K > 5.0 ACEI within 36 hrs Hx of angioedema Hold for anesthesia & dye studies
Beta-blocker	All pts (COR I), for RR 34/41%* Consider ½ home dose in decompensation if BP stable. Once euvolemic, resume cautious titration	Use limited to HTN, ischemia, MI, arrhythmias, HOCM	Bronchospasm HR < 55, heart block Cardiogenic shock Do not give IV BB in acute HFREF
Aldo blocker	All pts (COR I), for RR 30/35%* Consider during IV diuresis for K-sparing. Consider higher dose for HTN, ↓K, or diuretic resistance	May be cardioprotective (COR IIb). May start during IV diuresis for K-sparing. Consider higher dose for HTN or ↓K	AKI or eGFR < 30 K > 5.0 Unable to monitor well
Hydralazine-nitrates	Add for refractory sx on optimal diuretic, ACEI/ARB & BB +/- aldo blocker (COR I) for RR 43/33%* esp. in Blacks. Alternative to ACEI/ARB when RAS blocker contraindicated, i.e. AKI (COR IIa)	Unknown	Intolerance Use caution before anesthesia

COR = ACC/AHA Class of Recommendation: I = Strong, IIa = Moderate, IIb = Weak (www.acc.org)
* Risk Reduction of All-cause mortality / HF hospitalization in clinical trials, with Rx titrated to target dose (medium to high dose, except aldo blockers at low dose). Cautious titration usually completed as out-patient, more slowly for beta-blockers, and as tolerated.
Avoid NSAIDs, steroids, most anti-arrhythmics (other than amiodarone), pioglitazone, gliptins; **and for HFREF avoid** diltiazem & verapamil

6. DISCHARGE PLANNING: (Provider & Care Coordination)

- a. Hospital day 1-2:**
 - Identify Outpatient Follow-up Providers
 - Mobilize OOB early; order PT/OT
 - Identify high risk patients at interdisciplinary rounds
 - Identify High Risk Care Team (Outpatient MD, Care Transition Provider, Care Manager)
 - Identify Special Needs:
 - home care services
 - home meals
 - home IV infusion
 - outpt IV therapies
- b. Patient Education on Heart Failure:**
 - NYP CHF education booklet available on infonet <https://infonet.nyp.org/PatientED/Pages/Resources.aspx>
 - Daily AM weights & call MD for gain of 2 lbs in 2d or 5 lbs in a wk
 - Low Na diet and special combo diets
 - Fluid restriction
 - Medications
- c. Discharge Ready**
 - Off inotropes for 24h (or d/c on inotropes)
 - Out of bed, ambulating if able
 - Repeat BNP 24 hours prior to d/c
 - 7-10 days follow-up appt scheduled
- d. Discharge Summary must include:**
 - Admission and Discharge Data: wt, exam, Cr, BNP, diuretic doses
 - Target weight
 - Med titration instructions
 - Follow-up appointment with transition provider in 7-10 days. Include specific date, time, location and phone number.

Outpatient Referral Line for Advanced Heart Failure Clinic:
Weill Cornell: 212-746-2381 (M-F, 9am–5pm)

DRIP MEDICATIONS						
	Concentration	Line	Bolus	Typical Starting Rate	Maximum Infusion Rate	Special Comments
Diuretics						
Bumetanide	25 mg/100 mL NS (0.25 mg/mL)	Peripheral	Doses 0.5-2 mg IVP over 2-3 min Doses > 2 mg via IVPB	0.1 mg/h	Soft: 1 mg/h Hard: 2 mg/h	None
Furosemide	100 mg/100 mL NS (1 mg/mL)	Peripheral	≤ 100 mg IVP over 2-5 min (no faster than 20 mg/min) Doses > 100 mg via IVPB	1-5 mg/h	Soft: 20 mg/h Hard: 40 mg/h	None
Other drip medications						
Dobutamine	250 mg/250 mL (1 mg/mL) 500 mg/250 mL (2 mg/mL)	Peripheral (large vein)	None	2.5-5 microgram/kg/min	<u>Non-Intensive Areas:</u> Soft: 10 mcg/kg/min	Monitor BP, HR at initiation or dosage change: every 15 min x 1 h, every 30 min x 2 h, then every 4 h
Dopamine	200 mg/250 mL (0.8 mg/mL) 400 mg/ 250 mL (1.6 mg/mL)	Peripheral	None	0.5-5 microgram/kg/min	<u>Non-Intensive Areas:</u> Soft: 5 mcg/kg/min <u>Intensive Areas:</u> Soft: 20 mcg/kg/min Titrate available: 1-3 mcg/kg/min q 5 min	Central Line Only Monitor BP, HR at initiation or dosage change: every 15 min x 1 h, every 30 min x 2 h, then every 4 h
Milrinone	20 mg/100 mL (200 microgram/mL)	Peripheral	12.5-50 microgram/kg IVP over 10 min (generally avoid)	0.125 microgram/kg/min	Soft: 0.5 mcg/kg/min Hard: 0.75 mcg/kg/min	<u>NYP/Q: ICU only</u> Caution with renal dysfunction Monitor BP, HR at initiation or dosage change: q 15 min x 1 h, q 30 min x 2 h, then q 6h
Nesiritide	1500 mcg/250 mL NS (6 microgram/mL)	Peripheral	2 microgram/kg IVP over 60 sec (generally avoid)	0.005 - 0.01 microgram/kg/min	Hard: 0.03 mcg/kg/min	<u>NYP/Q: ICU only</u> Monitor BP every 15 min x 4 upon initiation & after every dose change. An MD, NP, or PA must be present the first hour after initiation and during every dosage change; then monitor per nursing unit protocol.
Nitroglycerin	100 mg/250 mL (0.4 mg/mL)	Peripheral		5-50 microgram/min	<u>Non-Intensive Areas:</u> Soft: 100 mcg/min <u>Intensive Areas:</u> Soft: 200 mcg/min	None

*Use concentrations listed above, Allscripts ordering system has multiple options that are not available at NYP, Queens.