1. DECONGEST WITH LOOP DIURETIC

a. Use 2x home dose IV bid with rapid escalation if not responding (e.g., Home Furosemide 40mg daily) or 40mg IV furosemide BID
b. Admission labs, BNP, Qb-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

<table>
<thead>
<tr>
<th>Loop Diuretic Equivalence Table (mg)</th>
<th>IV* bid-tid</th>
<th>ORAL q24h-bid</th>
<th>NOTES</th>
</tr>
</thead>
</table>
| Furosemide                           | 20-100 IV Push >100-200 IVP over 30 min | 40-200 | Max recommended daily dose 600 mg I
diuretic administration available |
| Bumetanide                           | 1-2 IV Push >1-2 5 IVP over 30 min | 1-5 | Max recommended daily dose 10 mg I
diuretic administration available |
| Ethacrynic acid/ Ethacrylate sodium   | 50         | 50-100 | May consider Ethacrylate 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, contraindicated 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 50-200 25 Monitor for hypokalemia (maximum dose 100mg daily)

2. WORK UP DECOMPENSATION

a. Review recent TTE or perform d. Ischemia evaluation, myocarditis workup e. Other (diet, alcohol, b. Telemetry for arrhythmia f. True co-morbidity ie, infection, PE, TTPs, NSAIDS, meds, c. Consider pacer/ICD interrogation HIV and OSA d. Target weight e. Renal evaluation, musculoskeletal f. Other (diet, alcohol, cool extremities or inotrope

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

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

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

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

4. CONSIDER HEART FAILURE CONSULT OR TRANSFER

a. ▲ 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 e. >2 admissions in 6mo (outpatient, if stable) for medical reasons f. Mod PH: PASP >50 (or if SBP <90 then >40mmhg) or mPAP >35 g. Complicated valvular or congenital heart disease

5. GUIDELINE MEDICATIONS FOR HFpEF AND HFPfEF

<table>
<thead>
<tr>
<th>Class</th>
<th>Indications</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACEI or ARB</td>
<td>All pts (COR I), for RR 17/31% Use caution during IV diuresis. After IV diuresis, test/retest low dose &amp; begin uptitrination. If BP &lt;1 or Cr ↑, hold/reduce diuretic &amp; retest</td>
<td>SBP &gt; 130 after euvoelmic (COR I) AKI or significant CVD K &gt; 5.0 Hx of angiodema (ACEI) Hold for anesthesia &amp; dye studies</td>
</tr>
<tr>
<td>ARNI</td>
<td>Sacubitril/valsartan</td>
<td>Replaces ACEI/ARB in stabilized Class 2/3 pts (COR I) Consider hold/reduce diuretic for test dose</td>
</tr>
<tr>
<td>Beta-blocker</td>
<td>All pts (COR I), for RR 34/41% Use limited to HTN, ischemia, MI, arrhythmias, HOCM</td>
<td>Bronchospasm HR &lt; 55, heart block Cardiogenic shock Do not give IV BB in acute HFpEF</td>
</tr>
<tr>
<td>Aldo blocker</td>
<td>All pts (COR I), for RR 33/35% Consider during IV diuresis for K-sparing. Consider higher dose for HTN, Jk, or diuretic resistance</td>
<td>May be cardioprotective (COR III). May start during IV diuresis for K-sparing. Consider higher dose for HTN or Jk</td>
</tr>
<tr>
<td>Hydralazine-nitrates</td>
<td>Add for refractory sx on optimal diuretic, ACEI/ARB &amp; BB +/- aldo blocker (COR I for RR 43/33% esp. in Blacks. Alternative to ACEI/ARB when RAS blocker contraindicated, i.e. AKI (COR III)</td>
<td>Unknown Intolerance Use caution before anesthesia</td>
</tr>
</tbody>
</table>

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
     * outp 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

b. 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)
<table>
<thead>
<tr>
<th>DRIP MEDICATIONS</th>
<th>Concentration</th>
<th>Line</th>
<th>Bolus</th>
<th>Typical Starting Rate</th>
<th>Maximum Infusion Rate</th>
<th>Special Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diuretics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bumetanide</td>
<td>25 mg/100 mL NS (0.25 mg/mL)</td>
<td>Peripheral</td>
<td>Doses 0.5-2 mg IVP over 2-3 min Doses &gt; 2 mg via IVPB</td>
<td>0.1 mg/h</td>
<td>Soft: 1 mg/h Hard: 2 mg/h</td>
<td>None</td>
</tr>
<tr>
<td>Furosemide</td>
<td>100 mg/100 mL NS (1 mg/mL)</td>
<td>Peripheral</td>
<td>≤ 100 mg IVP over 2-5 min (no faster than 20 mg/min) Doses &gt; 100 mg via IVPB</td>
<td>1-5 mg/h</td>
<td>Soft: 20 mg/h Hard: 40 mg/h</td>
<td>None</td>
</tr>
<tr>
<td><strong>Other drip medications</strong></td>
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<tr>
<td>Dobutamine</td>
<td>250 mg/250 mL (1 mg/mL) 500 mg/250 mL (2 mg/mL)</td>
<td>Peripheral (large vein) None</td>
<td>2.5-5 microgram/kg/min</td>
<td>Non-Intensive Areas: Soft: 10 mcg/kg/min</td>
<td>Monitor BP, HR at initiation or dosage change: every 15 min x 1 h, every 30 min x 2 h, then every 4 h</td>
<td></td>
</tr>
<tr>
<td>Dopamine</td>
<td>200 mg/250 mL (0.8 mg/mL) 400 mg/250 mL (1.6 mg/mL)</td>
<td>Peripheral None</td>
<td>0.5-5 microgram/kg/min</td>
<td>Non-Intensive Areas: Soft: 5 mcg/kg/min Intensive Areas: Soft: 20 mcg/kg/min Titrate available: 1-3 mcg/kg/min q 5 min</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td>Milrinone</td>
<td>20 mg/100 mL (200 microgram/mL)</td>
<td>Peripheral</td>
<td>12.5-50 microgram/kg IVP over 10 min (generally avoid)</td>
<td>0.125 microgram/kg/min</td>
<td>Soft: 0.5 mcg/kg/min Hard: 0.75 mcg/kg/min</td>
<td>NYP/Q: ICU only 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</td>
</tr>
<tr>
<td>Nesiritide</td>
<td>1500 mcg/250 mL NS (6 microgram/mL)</td>
<td>Peripheral</td>
<td>2 microgram/kg IVP over 60 sec (generally avoid)</td>
<td>0.005 - 0.01 microgram/kg/min</td>
<td>Hard: 0.03 mcg/kg/min</td>
<td>NYP/Q: ICU only Monitor BP every 15 min x 4 upon initiation &amp; 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.</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>100 mg/250 mL (0.4 mg/mL)</td>
<td>Peripheral</td>
<td>5-50 microgram/min</td>
<td>Non-Intensive Areas: Soft: 100 mcg/min Intensive Areas: Soft: 200 mcg/min</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

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