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ORDER SET REVIEW TOOLKIT

NORTH YORK GENERAL
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Summary

The purpose of this Order Set Review Toolkit is to guide hospitals across Ontario in reviewing and implementing a Heart Failure Admission Order Set. This initiative is part of Evidence2Practice (E2P) Ontario, a cross-sector collaborative in partnership with North York General Hospital, the Centre for Effective Practice, and the eHealth Centre of Excellence. E2P aims to improve provider experience and enhance patient care through digital interventions that integrate evidence and quality standards into frontline clinical systems, beginning with heart failure.

This toolkit equips hospitals with a complete process for analyzing current order sets and amending these to integrate up-to-date evidence. The Order Set Review Toolkit includes a step-by-step guide, examples of evidence review and identified interventions, and completed order sets from North York General Hospital (NYGH) and St. Mary's General Hospital.

Before You Start

Depending on the organization, this guide will be useful to clinical informaticians, cardiology subject matter experts, and/or project managers who may be involved in reviewing and implementing a Heart Failure Admission Order Set at their respective sites.

The length of this process may differ based on an organization's resources and state of readiness. The hospitals that implemented the Order Set Review process went live within 5 months of initiation. Please note that the resulting order sets of both hospitals found at the end of this document differ due to respective clinical workflows and localization. Hospitals leveraging this toolkit for review and implementation may observe the same result.

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Order Set Review – Overall Approach

The steps below outline the recommended high-level overall approach to conducting the Heart Failure Admission Order Set review. The Canadian Heart Failure Society (CHFS) Heart Failure Admission Order Set was a key resource in developing the final product.

This review is the first step of a five-month process for implementing evidence-based care for heart failure. By integrating the key principles of heart failure care upon admission, hospitals across Ontario can improve patient and provider experience.

Note: CHFS is the national association representing cardiovascular specialists devoted to treating heart failure. To ensure that their hospital-based colleagues across Canada have the latest evidence-based recommendations to optimize treatment for their patients, they launched the CHFS Heart Failure Admission Order Set. This paper Order Set encompasses the latest evidence and recommended therapy for the management of heart failure in the hospital. The CHFS Heart Failure Admission Order Set can be used as a main resource in conducting your hospital's order set review, containing heart failure standards and evidence from 2021.

Step 1: Run a Heart Failure Order Set utilization report to better understand how order sets are being utilized in your organization

Step 2: Review evidence from the list below and compare it to your current Order Set

Step 3: Review North York General Hospital and St. Mary's General Hospital's Heart Failure Admission Order Sets (2022) to see samples of two sites who conducted their own order set review based on the evidence listed above.

Step 4: Consult acute care subject matter experts (e.g., cardiologists, nurse practitioners), on discrepancies between current order set, CHFS order set, and other evidence

Step 5: Send Order Set for review and approval through internal channels (e.g., Medical Advisory Committee)

Step 6: Implement revised Heart Failure Admission Order Set

Step 7: Evaluate order set utilization

Step 1: Run a Heart Failure Order Set utilization report

To better understand how order sets are currently utilized in your organization, run a Heart Failure Order Set Utilization report based on a 1-year sample of all discharged and coded electronic charts with a primary coded discharge diagnosis CMG (case mix group) of congestive heart failure.

Step 2: Review evidence and compare to current order set

Once the baseline utilization of the heart failure order set has been established, the order set review can begin. This process entails reviewing a number of heart failure resources and comparing the evidence to your hospital's current order set. A recommended primary resource is the CHFS Heart Failure Admission Order Set from 2021 as this proved to be the most translatable source. Note that other heart failure resources may also be useful. Below is a list of resources to consider:

1. CHFS Heart Failure Admission Order Set (2021)
2. Heart Failure Quality Based Procedure (2015)
3. Ontario Health Heart Failure Quality Standards
4. Zynx
5. CCS Guidelines (2017; HFrEF 2021)
6. CCS Quality Indicators for Heart Failure

See Table 1 in the Appendix for a template that St. Mary's General Hospital used to consolidate evidence between various heart failure resources. Each column represents the heart failure resource used by St. Mary's General Hospital when conducting an Order Set content gap analysis. This exercise was helpful in seeking alignment between various sources of evidence.

Step 3: Review NYGH & SMGH's order sets as examples

See page 8 for NYGH and St. Mary's General Hospital's final order set. You may use these order sets as examples of recently updated Heart Failure admission order sets.

Step 4: Consult subject matter experts

In your literature review, you may start to identify gaps between the CHFS Heart Failure Admission Order Set 2021, other evidence, and your current order set. These potential changes can be reconciled by consulting your subject matter experts at your hospital. In preparation of for this meeting, consider using Table 2 to keep track of your discussion. St. Mary's outlined a comprehensive list of potential changes prior to meeting with their subject matter experts, then highlighted in green the changes that would be pursued for Medical Advisory Committee approval after the discussion.

Localized differences in hospital order sets are to be expected. Below is an example of key changes made to the NYGH Order Set and rationale for each change.

Section	Added/Maintained/Did Not Include	Rationale
Diet	Added fluid restriction of 1.5L/24h	Based on the CHFS Order Set
	Added Low Sodium 87 mmol/L diet option	Based on the CHFS Order Set
Activity and O2 Therapy	Maintained Activity & O_2 Therapy Orders CHFS Order Set – O_2 Therapy Continuous O_2 saturation monitor or every q _ h Oxygen therapy _____, Maintain oximetry reading ≥ 90%; apply oxygen by nasal cannula from 0-6 L/min or facemask prn For COPD patients: Maintain oximetry reading between 88-92%; applying oxygen by nasal cannula from 0-4 L/min or facemask prn NYGH Order Set – O_2 Therapy: • Provide supplemental oxygen only for heart failure patients who are hypoxic. Oxygen Therapy PRN Instruction: To keep oxygen saturation ≥ 92% Apply oxygen by nasal cannula at 0-6 L/min or facemask PRN PRN Instruction: To keep oxygen saturation 88-92% (For COPD patients with CO_2 Retention) Apply oxygen by nasal cannula at 0-4 L/min or facemask PRN CPAP 5-15 cmH_2O For patients with Obstructive Sleep Apnea CHFS Order Set – Activity Level 1: Bedrest, commode chair Level 2: Up in chair, bathroom privileges Level 3: Progressive increase in mobilization, shower after consulting physician/nurse practitioner (Recommended) NYGH Order Set – Activity Activity as Tolerated Up in chair for all meals. Progress to mobilizing patient 3 times per day as tolerated. Bedrest	Maintained that oxygen saturation should be ≥92%. The CHFS Order Set targets an oxygen saturation of up to 92% for COPD but 90% for non-COPD and the NYGH team wrote to CHFS to understand the clinical rationale. The NYGH HF subject matter expert (SME) and order set team have decided to maintain the standard of ≥92% until further clinical evidence supports this change. Maintained activity order to be up in chair for all meals, and progressing to mobilize patient 3x a day as tolerated. This order originated from the NYGH HF QBP review, and after discussion with the HF SME, it was determined that NYGH's activity order is more specific and helpful for clinicians.

Medications	Added ARB/ARNIs, SGLT2 inhibitors	Based on CHFS order set
	Removed oral diuretics	Based on SME suggestion, oral diuretics have a low utilization and are not typically ordered on admission. This aligns with the CHFS Order Set which also does not include oral furosemide and suggests discontinuing oral furosemide. CCS Guidelines include oral metolazone, but in discussion with the HF SME, we decided to maintain this decision as metolazone is typically added later on in the patient's admission (e.g., ordered via med rec if the patient is already on it)
	Updated reminders to align with CCS/CHFSE	Examples of reminders: • Removed reminders deemed unnecessary/ redundant by HF SME • Reworded reminder to say "Reassess medications which are not recommended in heart failure (e.g., NSAIDs and/or COX 2 inhibitors, saxagliptin, dihydropyridines, thiazolidinediones)". This reminder used to only focus on NSAIDS and calcium channel blockers (CCS Guidelines 2017) • Added "Should be continued" to ACE-inhibitors (CCS Guidelines 2017) • Added "ARBs should be continued. Avoid starting ARBs in acute setting (e.g., first 8-12 h) unless elevated SBP is present, and avoid in patients with SBP < 80 mmHg, Cr > 265 micromole/L, or K > 5 mmol/L" • Updated wording on role of Aldosterone Antagonists and vasodilators (hydralazine, nitrate) to align with CHFS
	Did not include digoxin, amiodarone and ivabradine out of the order set	Based on SME suggestion as these medications are uncommonly initiated for acutely ill patients
Laboratory	Did not include urea	As per the Choosing Wisely campaign, BUN has been left out of the HF Admission Order Set as it offers limited information on renal function above and beyond creatinine.
	Creatinine and electrolytes daily x 3 days	As per input from clinician leaders and Choosing Wisely members, 3 days is determined to be the standard maximum, and daily bloodwork without a stop date can continue inappropriate. Clinicians can always re-order bloodwork to continue past 3 days.
	Included BNP disclaimer that says: • Routine ordering of NT pro-BNP for all HF patients is not indicated. Consider ordering NT pro-BNP only if diagnosis of HF is unclear. NT pro BType Natriuretic Peptide Evidence Routine in AM	Based on SME recommendation, lab, CADTH 2019 and the HF OH Quality Standard

Other investigations	Did not include ECG with chest pain in the order set	RNs will use a medical directive to order an ECG if the patient presents with chest pain, therefore including it in the order set is redundant
Discharge Planning	Did not include "Consult to Discharge Planning Services" and "Education Orders"	Currently have discrete orders for social work, CCAC, palliative care, etc., as well as means to disseminate education embedded within clinical workflows. For example, CHF patients are routinely educated on medications by the pharmacist, cardiology educator, and have materials that are given to them at the Heart Function clinic.

Step 5: Send out order set for review

Once you have identified updates to your heart failure admission order set, you will need to send it out for review. Note that each hospital may have an established review and approval process. These approaches may be collaborative, multidisciplinary, require a minimum of 3 cardiology physicians' approval, and final approval by the MAC.

Step 6: Implement

See examples below for NYGH and St. Mary's General Hospital HF Admission Order Set.

- NYGH Heart Failure Admission Order Set
- St. Mary's Heart Failure Admission Order Set

Step 7: Evaluate order set utilization/specific orders within the order set

Consider pulling a utilization report to better understand usage analytics and compare order set utilization to baseline. To further evaluate standard adherence, see "Clinical Terminology Mapping and Reporting Toolkit" on mapping terminology to SNOMED CT and pulling reports.

Appendix

NYGH Heart Failure Order Set

Admission/Transfer

- SEE LINK for QBP: Clinical Handbook for CHF Source
- Clinical criteria may be used to determine functional levels and staging (e.g. NYHA classification) Evidence

Admit To

☑ Regular Bed Patient Diagnosis: Heart Failure Coverage Instructions: Consult and Admit to Attending MD, Internist on Call Until 0800

- IMPORTANT: If admitting to a telemetry bed, please also order Cardiac Monitoring.

Cardiac Monitoring/ Telemetry

CHF (Moderate to Severe Heart Failure)

Resuscitation Status

Resuscitation Status

☐ FULL Resuscitation
☐ No Resuscitation
☐ No Resus EXCEPT Specific Interventions

Alerts

Patient Isolation

☐ Droplet Contact
☐ Contact
☐ Airborne

Diet Evidence

- Consider restriction (1.5 to 2 L/day) for all patients with fluid retention or congestion not easily controlled with diuretics, or in patients with substantial renal dysfunction or hyponatremia Evidence

Heart Healthy Diet

☑ 1500 mL Fluid (1200 mL on tray)
☐ Heart Healthy Diet

Low Sodium 87 mmoL Diet

☐ 1500 mL Fluid (1200 mL on tray)
☐ Low Sodium 87 mmoL Diet

Diabetic 6,500 - 7,500 kJ Diet

☐ 1500 mL Fluid (1200 mL on tray)
☐ Diabetic 6,500 - 7,500 kJ Diet

LINKED CONTENT: Modified Texture Diets (Adult) (Module)

Activity

Activity as Tolerated

☑ Up in chair for all meals. Progress to mobilizing patient 3 times per day as tolerated.
☐ Bedrest

Vital Signs/Monitoring

Vital Signs Evidence

- [x] q4h x 12 hours, then q8h

Orthostatic Vital Signs

- [ ] once,
- [ ] daily,
- [ ] q8h,

Patient Care

Assessments

Weight Evidence

- [x] daily Before breakfast, ideally on standing scale

Intake and Output Evidence

- [x] q8h,

Capillary Blood Glucose Monitoring

- [ ] tidac,
- [ ] daily,
- [ ] bidac,
- [ ] tidac&hs,

Interventions

Elevate Head of Bed

- [ ] 30 Degrees
- [ ] 45 Degrees
- [ ] Other (Special Instructions)

Respiratory Care

- Provide supplemental oxygen only for heart failure patients who are hypoxic.

Oxygen Therapy

- [x] PRN Instruction: To keep oxygen saturation >= 92% Apply oxygen by nasal cannula at 0-6 L/min or facemask PRN
- [ ] PRN Instruction: To keep oxygen saturation 88-92% (For COPD patients with CO2 Retention) Apply oxygen by nasal cannula at 0-4 L/min or facemask PRN

CPAP 5-15 cmH2O

- [ ] For patients with Obstructive Sleep Apnea

Tubes and Drain Care

Urinary Catheter (Indwelling)

- [ ] 2 way Straight Drainage

LINKED CONTENT: Urinary Retention (Adult) (Module)EKM

Communications

Obtain Medical Records Other Institutions

- [ ] Recent cardiology consult notes and ECHO reports from the health care provider

Prophylactic Measures

LINKED CONTENT: DVT/VTE Prophylaxis: Medical Condition (Adult) (Module)

LINKED CONTENT: Common Vaccinations (Influenza/Pneumococcal) (Adult) (Module)

- Smoking cessation counseling should be provided to smokers

LINKED CONTENT: Smoking Cessation/Nicotine Withdrawal (Adult & Adolescent) (Module)

IV Solutions

Convert IV to Saline Lock

☑ Routine

IV Maintenance Therapy

normal saline

☐ 1000 mL Bag IV 30 mL/hr

☐ 1000 mL Bag IV 60 mL/hr

Medications

Reminders

- See treatment algorithm attached (2021 Canadian CHF guidelines, Figure 1) Source
- Reassess medications which are not recommended in heart failure (e.g. NSAIDs and/or COX 2 inhibitors, saxagliptin, dihydropyridines, thiazolidinediones) Source
- For patients with hypertension, consider the use of an antihypertensive agent (singly or in combination) to achieve a target blood pressure < 130/80 mm Hg; angiotensin-converting enzyme inhibitors, or beta-blockers are first-line therapy in patients with Low EF (previously termed "systolic heart failure") Evidence
- Consider reducing dose of diuretics, ACE inhibitors, ARBs and spironolactone in patients who are oliguric or have elevated creatinine (>30% above baseline). These medications may need to be held in severe or unstable renal dysfunction (serum creatinine > 200 micromole/L). Reassess frequently until renal function improves Source
- Doses of guideline directed medications should gradually be increased to meet target doses, if possible/tolerated Source

Diuretics

- Please refer to NYGH Guidance document on CHF Diuretic Management Source
- REDUCED EF (HF-REF): Patients admitted with evidence of significant pulmonary or peripheral congestion should be promptly treated with IV loop diuretics as first line Source
- PRESERVED EF (HF-PEF): Loop diuretics should be used for relief of symptoms due to volume overload (e.g. peripheral edema, pulmonary congestion) Evidence
- PATIENTS CURRENTLY ON LASIX: The initial intravenous furosemide dose should be equal or exceed their chronic furosemide oral daily dose Source

- LASIX-NAIVE: For CrCl >/= 60 mL/min: Consider furosemide 20-40 mg IV bid-tid as INITIAL IV dose (or 5-20 mg/h). CrCl < 60 mL/min: furosemide 40-80 mg IV bid-tid. Source

Lasix inj Source

☐ 20 mg Inj IV ONCE
☐ 40 mg Inj IV ONCE
☐ 60 mg Inj IV ONCE
☐ 80 mg Inj IV ONCE

- For those requiring IV diuretic therapy, furosemide may be dosed intermittently OR as continuous infusion (DOSE study, 2011, shows no advantage of continuous infusion in acute decompensated HF) Source

Lasix inj Source

☐ 40 mg Inj IV daily Hold if SBP < 95 mmHg,
☐ 60 mg Inj IV daily Hold if SBP < 95 mmHg,
☐ 80 mg Inj IV daily Hold if SBP < 95 mmHg,
☐ 40 mg Inj IV bid Hold if SBP < 95 mmHg,
☐ 40 mg Inj IV q8h Hold if SBP < 95 mmHg,
☐ 80 mg Inj IV bid Hold if SBP < 95 mmHg,

LINKED CONTENT: Furosemide (Lasix) Infusion for ED/Cardiology In-Patients (Module)

- Switch to oral furosemide once euvolemia is achieved. The bioavailability of oral furosemide is 50% of the IV dose Source
- For persistent volume overload despite use of optimal dose loop diuretic, add a thiazide diuretic (e.g. metolazone). Evidence

ARNI (ARB/Neprilysin Inhibitors) Evidence

- There is evidence supporting initiation of ARNI in the acute setting Source
- HF-REF: Angiotensin Neprilysin Inhibitor (ARNi) is the preferred drug for HF with LVEF < /= 40% (unless intolerant/contraindicated) Source
- Do not initiate sacubitril-valsartan with an ACE inhibitor or within 36 hours of the most recent dose of an ACE inhibitor, or to patients with a history of angioedema Evidence

ENTRESTO 24.3 mg/25.7 mg Source

☐ 1 tab Tab PO q12h Hold if SBP < 95 mmHg,

ENTRESTO 48.6 mg/51.4 mg Source

☐ 1 tab Tab PO q12h Hold if SBP < 95 mmHg,

ENTRESTO 97.2 mg/102.8 mg Source

☐ 1 tab Tab PO q12h Hold if SBP < 95 mmHg,

ACE Inhibitors Evidence

- ACE-inhibitors should be continued. Avoid starting ACE-inhibitors in acute setting (e.g. first 8-12 h) unless elevated SBP is present, and avoid in patients with SBP < 80 mmHg, Cr > 265 micromole/L, or K > 5 mmol/L Source
- ACE-inhibitors are recommended in all patients with HF-REF (LVEF < 40%), and should be considered in most patients with HF-PEF (LVEF >40%), unless contraindicated. Evidence
- Perindopril and ramipril require dose adjustment for renal dysfunction

Altace Source

- ☐ 1.25 mg Cap PO daily Hold if SBP < 95 mmHg,
- ☐ 2.5 mg Cap PO daily Hold if SBP < 95 mmHg,
- ☐ 2.5 mg Cap PO q12h Hold if SBP < 95 mmHg,
- ☐ 5 mg Cap PO daily Hold if SBP < 95 mmHg,
- ☐ 5 mg Cap PO q12h Instructions: (target dose) Hold if SBP < 95 mmHg,
- ☐ 10 mg Cap PO daily Hold if SBP < 95 mmHg,

Coversyl Source

- ☐ 2 mg Tab PO daily Hold if SBP < 95 mmHg,
- ☐ 4 mg Tab PO daily Hold if SBP < 95 mmHg,
- ☐ 8 mg Tab PO daily Instructions: (target dose) Hold if SBP < 95 mmHg,

ARBs (Angiotensin Receptor Blockers)

- ARBs should be continued. Avoid starting ARBs in acute setting (e.g. first 8-12 h) unless elevated SBP is present, and avoid in patients with SBP < 80 mmHg, Cr > 265 micromole/L, or K > 5 mmol/L Source
- REDUCED EF (HF-REF): Angiotensin-II receptor blockers (ARBs) are recommended in ACEI-intolerant patients, to reduce morbidity and mortality. Routine combination of ACE-I, ARB, and aldosterone antagonist therapy is potentially harmful Evidence
- PRESERVED EF (HF-PEF): ARBs may be considered in patients with hypertension, or to decrease hospitalization for patients with heart failure and PEF. Evidence

Atacand Source

- ☐ 4 mg Tab PO daily Hold if SBP < 95 mmHg,
- ☐ 8 mg Tab PO daily Hold if SBP < 95 mmHg,
- ☐ 16 mg Tab PO daily Hold if SBP < 95 mmHg,
- ☐ 32 mg Tab PO daily Instructions: (target dose) Hold if SBP < 95 mmHg,

Diovan Source

- ☐ 40 mg Tab PO q12h Hold if SBP < 95 mmHg,
- ☐ 80 mg Tab PO q12h Hold if SBP < 95 mmHg,
- ☐ 160 mg Tab PO q12h Instructions: (target dose) Hold if SBP < 95 mmHg,

Beta Blockers Evidence

- REDUCED EF (HF-REF): Continuation (or initiation at a low dose) of a beta blocker is recommended when the patient's condition allows (i.e. patient no longer symptomatic from hypotension or bradycardia) Source
- Use of proven beta blockers (e.g. bisoprolol or carvedilol) is recommended for all patients with current or prior symptoms of HF-REF unless contraindicated, to reduce morbidity and mortality Source
- Titrate beta blocker therapy SLOWLY to target dose (or maximum tolerated dose if target dose not reached). Source
- Bisoprolol requires dose adjustment for renal dysfunction

Monocor Source

☐ 1.25 mg Tab PO daily Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 2.5 mg Tab PO daily Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 5 mg Tab PO daily Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 7.5 mg Tab PO daily Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 10 mg Tab PO daily Instructions: (target dose) Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,

Coreg Source

☐ 3.125 mg Tab PO q12h Instructions: Give with food to minimize risk of orthostatic hypotension. Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 6.25 mg Tab PO q12h Instructions: Give with food to minimize risk of orthostatic hypotension. Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 12.5 mg Tab PO q12h Instructions: Give with food to minimize risk of orthostatic hypotension. Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 25 mg Tab PO q12h Instructions: (target dose FOR WEIGHT </= 85 KG) Give with food to minimize risk of orthostatic hypotension. Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,
☐ 50 mg Tab PO q12h Instructions: (target dose FOR WEIGHT > 85 KG) Give with food to minimize risk of orthostatic hypotension. Hold if HR < 55 bpm, Hold if SBP < 95 mmHg,

Aldosterone Antagonists Evidence

- Aldosterone antagonists are recommended for LVEF < /= 40%. (Consider in patients with HFpEF if potassium < 5 mmol/L and CrCl > /=30 mL/min) Source
- Monitor serum potassium levels and creatinine clearance carefully, especially following initiation or change in aldosterone antagonist

Aldactone

☐ 12.5 mg Tab PO daily Hold if SBP < 95 mmHg,
☐ 25 mg Tab PO daily Hold if SBP < 95 mmHg,
☐ 50 mg Tab PO daily Instructions: (target dose) Hold if SBP < 95 mmHg,
☐ 12.5 mg Tab PO q2d Hold if SBP < 95 mmHg,

Vasodilator Agents Evidence

- HF-REF: Combination nitrate + hydralazine is recommended for patients not currently eligible for ARB/ACEI or ARNI (e.g. intolerance, severe CKD [CrCl < 30 mL/min], hyperkalemia [potassium > 5.5 mmol/L]) Source

Apresoline

- ☐ 10 mg Tab PO q8h Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 25 mg Tab PO q8h Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 50 mg Tab PO q8h Instructions: (Target Dose) Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,

- Standard schedule for nitroglycerin patch is on at 0800, off at 2100, as below. If desired, timing of administration can be adjusted according to the patient's anginal pain pattern. For nocturnal angina, consider starting patch at 2000, off at 0800

Trinipatch

- ☐ 0.2 mg Patch TRANSDERMAL daily Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 0.4 mg Patch TRANSDERMAL daily Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 0.6 mg Patch TRANSDERMAL daily Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 0.8 mg Patch TRANSDERMAL daily Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,

Nitrolingual Pumpspray

- ☐ 1 spray Spray SL q5min PRN Angina Instructions: (1 spray is equivalent to 0.4 mg). Maximum 3 sprays in 15 minutes. Notify MRP or Med On-Call if chest pain not relieved with Nitro Spray x 3 doses.

- Standard schedule for oral nitroglycerin administration is tid with a 12 hour nitrate free period (0600, 1200, 1800)

Isordil Source

- ☐ 20 mg Tab PO tid Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 30 mg Tab PO tid Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,
- ☐ 40 mg Tab PO tid Hold if HR > 100 bpm, Hold if HR < 50 bpm, Hold if SBP < 90 mmHg,

SGLT-2 Inhibitors Evidence

- HF-REF: SGLT-2 inhibitors are recommended in patients with or without concomitant type 2 diabetes (unless intolerant/contraindicated), to improve outcomes Source
- HFpEF: SGLT2 inhibitor (empagli lozin) has been shown to signi icantly reduce hospitalizations Source
- Not recommended in patients with CrCl < 25 mL/min

FORXIGA Source

☐ 10 mg Tab PO daily

JARDIANCE Source

☐ 10 mg Tab PO daily
☐ 25 mg Tab PO daily

Concomitant Atrial Fibrillation

- Avoid routine use of antiarrhythmic agents. Consider amiodarone in patients with HF and atrial ibrillation, in whom beta-blocker therapy is not tolerated or contraindicated. See Atrial ibrilation (Module) Evidence
- For all patients without contraindications who have heart failure and chronic or documented paroxysmal atrial ibrillation, an anticoagulant should be used (SEE LINK "Atrial Fibrillation Risk Strati ication") Source
- ****FOR ALL ANTI-THROMBOTIC OPTIONS IN A.F.:****
  LINKED CONTENT: Atrial Fibrillation: Anticoagulants/Antiplatelets (Adult) (Module)
- ****After reviewing above module, see below if warfarin is desired: ****
  LINKED CONTENT: Pharmacist Directed Warfarin/Coumadin Management (Adult) (Module)
  LINKED CONTENT: Coumadin/Warfarin Physician/Prescriber Daily Dosing (Adult) (Module)

Concomitant Ischemic Heart Disease

- Consider the use of aspirin only for patients with ischemic heart failure Evidence

ASA enteric coated Source

☐ 81 mg EC Tab PO daily
☐ 162 mg EC Tab PO daily
☐ 325 mg EC Tab PO daily

- For patients who have had an MI, consider the use of clopidogrel or warfarin as an alternative to aspirin Evidence
- Gastroprophylaxis with a proton pump inhibitor should be reserved for select patients. SEE LINK for guidance on "Risk Assessment and Prevention of Gastrointestinal Toxicity" Source

PRN Medications

- For patients with hepatic insufficiency, lower doses (i.e. maximum 2-3 grams of acetaminophen per 24 hours) are suggested.
  Tylenol Regular Strength Source

☐ 650 mg Tab PO q4h PRN Pain/Fever Maximum dose 4g acetaminophen per 24 hours.
☐ 325 mg Tab PO q4h PRN Pain/Fever Maximum dose 4g acetaminophen per 24 hours.

- In acute decompensated HF, avoid routine use of morphine, especially in patients with impaired respiratory drive Evidence
  LINKED CONTENT: Bowel Routine (Adult) (Module)

Laboratory Evidence

Chemistry

- For patients with heart failure due to systolic dysfunction who are taking aldosterone antagonists, monitor serum potassium levels upon initial presentation, and during change in therapy
  Electrolytes (CO2 / Na / K / Cl)

☑ Routine in AM daily, for 3 days Blood
☐ Routine in AM

Creatinine Level

☑ Routine in AM daily, for 3 days Blood
☐ Routine in AM

Glucose Random

☐ Routine in AM

Magnesium Level

☐ Routine in AM
☐ Routine in AM daily, for 2 days

- Monitor hepatic function in patients taking amiodarone
  LINKED CONTENT: Liver Enzymes: x1 (ALT/ALP/TBili Opt: Lipase/Dbili/INR) (Mini-set)
  LINKED CONTENT: Cardiac/Diabetes Screen (Opt: TnT/Gluc/Chol/HBa1c/ECG) (Adult) (Mini-Set)
  LINKED CONTENT: CaMP (Ca/Mg/PO4 x 1 Opt: Alb) (Mini-Set)
- For patients with acutely decompensated heart failure, consider a baseline troponin measurement to establish prognosis Evidence
  Troponin T

☐ STAT

LINKED CONTENT: Troponin T: High Sensitivity (Serial) (Mini-Set)

Urate

☐ Routine in AM

TSH

☐ Routine in AM

- Routine ordering of NT pro-BNP for all CHF patients is not indicated. Consider ordering NT pro-BNP only if diagnosis of CHF is unclear.

NT pro BType Natriuretic Peptide Evidence

☐ Routine in AM

ABGs

☐ ASAP

Iron Profile

☐ Routine in AM

Ferritin

☐ Routine in AM

Hematology

CBC

☑ Routine in AM daily, for 2 days

☐ Routine in AM

INR

☐ Routine in AM

☐ ASAP

aPTT

☐ Routine in AM

☐ ASAP

Fluids/Stones/Stools

Routine and Microscopic Urine

☐ Routine

Diagnostic Imaging

General Radiology

Chest AP Evidence

☐ Reason for Exam: Heart failure Routine

Chest PA / Lateral Evidence

☐ Reason for Exam: Heart failure Routine

Nuclear Medicine

- For all appropriately selected patients with heart failure due to systolic dysfunction, cardiac radionuclide imaging to assess left ventricular function, evaluate extent of ischemia, or determine myocardial viability should be performed Evidence

Other Investigations

Diagnostic Cardiology

ECG 12 Lead Evidence

☐ ASAP

ECG 12 Lead

☑ Routine in AM T+1;0600

☐ Routine in AM T+1;0600 daily 3 days

- Echocardiography to assess left ventricular function should be performed. Do not order repeat echocardiogram for patients with known Grade IV left ventricle. Evidence

Echocardiogram Full Study

☐ Congestive Heart Failure Routine

Holter Monitor

☐ Routine

- For patients who have systolic heart failure and a left bundle-branch block with a QRS interval > 150 milliseconds, cardiac resynchronization therapy should be performed, with or without ICD therapy Evidence
- Consider ICD therapy for selected patients with EF < 35% Evidence

Physician Consults

Consult to Cardiology

☐ Cardiology Heart failure

- Consider Consult to Palliative Care for Patients with End Stage/NYHA class IV Heart Failure Evidence

Consult to Palliative Care

☐ Supportive Cardiology

Multiprofessional Consults/Follow Ups

- For patients who are at high risk for clinical deterioration or hospital admission, a multidisciplinary disease management program should be used Evidence

Consult to Pharmacist

☑ Routine Medication Counselling (Education & Compliance) PRIOR TO DISCHARGE

☐ Routine Medication Review

Consult to Physiotherapy

☑ Reason for Consult: Assessment and Intervention Instructions: Walkability testing

Consult to Dietitian

☐ Reason for Consult: Assessment Instructions: New or readmitted patients within 30 days

Consult to Occupational Therapy

☐ Reason for Consult: Assessment and Intervention

Consult to Social Work

☐ Reason for Consult: Assessment

Discharge Planning Evidence

Consult to Home and Community Care Evidence

☑ Inpatient Patient with Heart Failure Rapid Response Nursing Program No Medical Orders Required No Nursing Invention is Required Patient is NOT ALC

Follow Up with Primary Care Provider

☑ Instructions: Arrange follow up appointment with patient's Primary Care Provider (PCP) within 7 days of discharge. Please document if unable to obtain appointment, or if patient prefers to arrange own follow up.

Expected Discharge Date

☑ t+5;1000

Non Categorized

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Printed on: 04-Oct-2022 12:33 Page 1 of 10 Domain: c1788
Unique Plan Description: CARDIO MED Heart Failure (CHF) Admission
Plan Selection Display: CARDIO MED Heart Failure (CHF) Admission
Plan Type: Medical
Version: 4
Begin Effective Date: 02-Sep-2022 02-Sep-2022 15:06
End Effective Date: Current
Available at all facilities

CARDIO MED Heart Failure (CHF) Admission
Admission/Transfer/Discharge

This Power Plan may be used for all patients with heart failure. NOTE: Medications located in the "Unit-Specific / Restricted Medications" section of the Power Plan should only be ordered on patients admitted to a critical care area. (NOTE)*
Clinical criteria may be used to determine functional levels and staging (e.g., NYHA classification) (NOTE)*
Consider inpatient intervention that includes follow-up by a specialized multidisciplinary team (NOTE)*

Alerts

☑ Resuscitation Status
- Full Code (DEF)*
- Do Not Resuscitate
- Not Yet Discussed - Assume Full Code
- Limited (Please Specify)

☐ Patient Isolation

Discharge Planning

Consider referral to Heart Function Clinic if two or more emergency department visits or admissions to hospital with the diagnosis of heart failure (NOTE)*

☑ Expected Discharge Date
- Expected Discharge Date: t+5;1000

Dietary

Per 2017 CCS Heart Failure Guidelines: Sodium restriction - 2-3 grams per day Fluid - 2 litres per day (NOTE)*

☑ CHF Diet
- Start Meal: Now, Fluid Modifiers 2000 mL (DEF)*
- Start Meal: Now, Renal, Fluid Modifiers 2000 mL
- Start Meal: Now, Consistent Carb, Fluid Modifiers 2000 mL

Activity

- ☑ Activity as Tolerated
  Instructions: Up in chair for all meals
- ☐ Ambulate
  Instructions: Progress to mobilizing patient 3 times per day as a minimum, as tolerated
- ☐ Bedrest
  Strict (DEF)*
  Dangle at Bedside
  With Bedside Commode
  With Bathroom Privileges

Vital Signs/Monitoring

- ☑ Vital Signs
  q4h x 48hrs then q12h and PRN
- ☐ Cardiac Monitoring/ Telemetry
- ☐ Patient may transfer off of unit for a diagnostic test or procedure.
  with Nurse and monitor. (DEF)*
  without Nurse and monitor.
- ☐ Orthostatic Vital Signs
  Once, 1 times (DEF)*
  Daily, 3 day
  q8h

Patient Care

Respiratory Care

For all patients without contraindications who have acute heart failure and hypoxemia, oxygen therapy should be used; for patients with heart failure, avoid the routine use of supplemental oxygen therapy in the absence of hypoxia (NOTE)*

- ☑ Oxygen Therapy
  SpO2 goal Greater than 92 (DEF)*
  SpO2 goal 88-92
- ☐ CPAP
- ☐ CPAP / BiPAP Based Upon Home Settings

Assessments

- ☑ Weight
  T;0500, q24h-ATC, Daily before breakfast, after voiding, using the same scale. (DEF)*
  T+1;0500, Once, 1 times, before breakfast, after voiding, using the same scale.
  T+1;0500, q1week, before breakfast, after voiding, using the same scale.
  T+1;0500, q48h-ATC, Every 2 days before breakfast, after voiding, using the same scale.
  qMon/Thu, before breakfast, after voiding, using the same scale.

☐ Height/Length
Once
☑ Intake and Output
q12h (DEF)*
q6h
☐ Capillary Blood Glucose Monitoring
TID before meals & HS (DEF)*
TID before meals
BID before meals
daily before meals

Lines/Tubes/Drains
☐ Urinary Retention with CAUTI criteria (SUB)*
☐ Urinary Catheter (Indwelling)
Catheter Type: Indwelling, PRN
Comments: Follow CAUTI protocol

Communication
☑ ECG 12 Lead Nurse order when
Chest pain or rhythm change and notify MD
☐ Obtain Medical Records Other Institutions
Recent cardiology consult notes and ECHO reports from the health care provider

IV Solutions/Infusions
☑ Saline Lock
Routine

Medications
Reminders
See 2017 CCS Heart Failure Guideline (NOTE)*
See 2021 CCS/CHFS Heart Failure Pharmacologic Update (NOTE)*
Previously termed "SYSTOLIC" heart failure will be referred to "REDUCED EF (HF-REF)", and "DIASTOLIC" as heart failure with "PRESERVED EF" (HF-PEF) (NOTE)*
Certain medications should be used with caution in patients with heart failure - see attached list (NOTE)*
Avoid routine use of nonsteroidal anti-inflammatory drugs (NSAIDs may need to be suspended during acute phase of heart failure, and reassessed once patient is stable) (NOTE)*
For patients with hypertension, consider the use of an antihypertensive agent (singly or in combination) to achieve a target blood pressure less than 130/80 mm Hg; ACE inhibitors (ARBs, if ACE intolerant), or beta-blockers are first-line therapy in patients with Low EF (previously termed "systolic heart failure") (NOTE)*
Consider reducing dose of diuretics, ACE inhibitors, ARBs and spironolactone in patients who are oliguric or have elevated creatinine (greater than 30% above baseline). These medications may need to be held in severe or unstable renal dysfunction (serum creatinine greater than 200 micromole/L). Reassess frequently until renal function improves (NOTE)*

Angiotensin II Receptor Blocker; Neprilysin Inhibitor

a) Early use of ARNI, in place of ACEi/ARB, is now recommended by both ACC and CCS guidelines on heart failure. In most circumstances, we should attempt to initiate ARNI for newly diagnosed heart failure or those with existing heart failure and are newly admitted for heart failure decompensation. If patients are being switched from existing ACEi treatment, there should be a washout period of 36-48 hours of the ACEi prior to initiating ARNI.

b) Caution: BNP (not NT pro BNP) can be falsely elevated during early initiation of ARNI for up to 8 months until levels reach steady state.

☐ sacubitril 24 mg - valsartan 26 mg oral tablet
- 1 tab, PO, TAB, BID (DEF)*
- 2 tab, PO, TAB, BID
- 3 tab, PO, TAB, BID
- 4 tab, PO, TAB, BID

Angiotensin-Converting Enzyme Inhibitors

ACE-inhibitors are recommended in all patients with HF-REF (LVEF less than 40%) and should be considered in most patients with HF-PEF (LVEF greater than 40%), unless contraindicated. (NOTE)*

Avoid starting ACE-inhibitors in acute setting (e.g., first 8-12 h), and avoid in patients with SBP less than 80 mmHg, SCr greater than 265 micromole/L, or K greater than 5 mEq/L(NOTE)*

Perindopril and ramipril require dose adjustment for renal dysfunction (NOTE)*

ACE-I dose should gradually be increased to meet target, if possible/tolerated (target doses are based on normal renal function). Submaximal doses of ACE-I are significantly less effective in preventing future hospitalizations. (NOTE)*

Formulary ACE inhibitors - 1. If patient was on ramipril prior to admission, continue ramipril, if desired. 2. If patient was NOT on an ACE inhibitor, start perindopril. 3. If patient was on an ACE inhibitor other than ramipril or perindopril, automatic substitutions will be made per hospital policy. (NOTE)*

NOTE TO PROVIDERS - If you would like specific hold parameters (i.e., Hold if SBP below 90 mmHg), please enter these under the "Order Comments" tab when ordering. (NOTE)*

☐ perindopril
- 2 mg, PO, TAB, Daily (DEF)*
- 4 mg, PO, TAB, Daily
- 6 mg, PO, TAB, Daily
- 8 mg, PO, TAB, Daily

  Comments: **TARGET DOSE**

Angiotensin Receptor Blockers

REDUCED EF (HF-REF): Angiotensin-II receptor blockers (ARBs) are recommended in ACEI-intolerant patients, to reduce morbidity and mortality. Routine combination of ACE-I, ARB, and aldosterone antagonist therapy is potentially harmful (NOTE)*

PRESERVED EF (HF-PEF): ARBs may be considered in patients with hypertension, or to decrease hospitalization for patients with heart failure and PEF. (NOTE)*

NOTE TO PROVIDERS - If you would like specific hold parameters (i.e., Hold if SBP below 90 mmHg), please enter these under the "Order Comments" tab when ordering. (NOTE)*

☐ candesartan
- 4 mg, PO, TAB, Daily (DEF)*
- 8 mg, PO, TAB, Daily
- 12 mg, PO, TAB, Daily
- 16 mg, PO, TAB, Daily
- 24 mg, PO, TAB, Daily
- 32 mg, PO, TAB, Daily
  - Comments: **TARGET DOSE**

☐ valsartan
- 40 mg, PO, TAB, BID (DEF)*
- 80 mg, PO, TAB, BID
- 160 mg, PO, TAB, BID
  - Comments: **TARGET DOSE**

Beta Blockers

REDUCED EF (HF-REF): Continuation (or initiation at a low dose) of a beta blocker is recommended when the patient's condition allows (i.e., after optimization of volume status and discontinuation of IV vasodilators, inotropic agents) (NOTE)*

Use of proven beta blockers (e.g., bisoprolol or carvedilol) is recommended for all patients with current or prior symptoms of HF-REF unless contraindicated, to reduce morbidity and mortality (NOTE)*

PRESERVED EF (HF-PEF): Consider use of a beta blocker in patients with preserved ejection fraction and previous MI(NOTE)*

Titrate beta blocker therapy SLOWLY to target dose (or maximum tolerated dose if target dose not reached). (NOTE)*

Bisoprolol requires dose adjustment for renal dysfunction (NOTE)*

☐ bisoprolol
- 1.25 mg, PO, TAB, Daily (DEF)*
  - Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)
- 2.5 mg, PO, TAB, Daily
  - Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)
- 5 mg, PO, TAB, Daily
  - Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)
- 7.5 mg, PO, TAB, Daily
  - Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)
- 10 mg, PO, TAB, Daily
  - Comments: **Target dose**Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

There is limited evidence for short-acting metoprolol in heart failure (NOTE)*

☐ **metoprolol**

6.25 mg, PO, TAB, BID (DEF)*
Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

12.5 mg, PO, TAB, BID
Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

25 mg, PO, TAB, BID
Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

37.5 mg, PO, TAB, BID
Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

50 mg, PO, TAB, BID
Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

75 mg, PO, TAB, BID
Comments: Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

100 mg, PO, TAB, BID
Comments: **Target dose**Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

☐ **carvedilol**

3.125 mg, PO, TAB, BID (DEF)*
Comments: Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

6.25 mg, PO, TAB, BID
Comments: Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

9.375 mg, PO, TAB, BID
Comments: Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

12.5 mg, PO, TAB, BID
Comments: Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

15.625 mg, PO, TAB, BID
Comments: Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

18.75 mg, PO, TAB, BID
Comments: Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

25 mg, PO, TAB, BID
Comments: **TARGET DOSE for weight less than or equal to 85kg**Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

50 mg, PO, TAB, BID
Comments: **TARGET DOSE for weight greater than 85kg**Give with food to minimize orthostatic hypotension. Hold if HR less than 50 bpm or SBP less than 90 mmHg or new heart block (and notify MD/NP)

Aldosterone Antagonists

Aldosterone antagonists are recommended for (1) NYHA II-IV heart failure with LVEF less than or equal to 35%; (2) following an MI in patients with LVEF less than 40% who develop HF symptoms, who have a history of DM or HFpEF requiring aggressive diuresis with otherwise normal renal function/ serum potassium. (NOTE)*
Avoid use if estimated GFR less than 30 mL/min, and/or K+ greater than 5. Monitor serum potassium levels and creatinine clearance carefully, especially following initiation or change in aldosterone antagonist (NOTE)*
Consider holding spironolactone in acute dehydrating illness because hyperkalemia is more common in this setting (NOTE)*

☐ spironolactone
12.5 mg, PO, TAB, Daily (DEF)*
Comments: Notify MD/NP if K greater than 5.3
25 mg, PO, TAB, Daily
Comments: Notify MD/NP if K greater than 5.3
50 mg, PO, TAB, Daily
Comments: **TARGET DOSE**Notify MD/NP if K greater than 5.3
12.5 mg, PO, TAB, q2day, First Dose: T+1;0800
Comments: Notify MD/NP if K greater than 5.3

☐ eplerenone
12.5 mg, PO, TAB, Daily (DEF)*
Comments: Notify MD/NP if K greater than 5.3
25 mg, PO, TAB, Daily
Comments: Notify MD/NP if K greater than 5.3
50 mg, PO, TAB, Daily
Comments: **TARGET DOSE**Notify MD/NP if K greater than 5.3
12.5 mg, PO, TAB, q2day, First Dose: T+1;0800
Comments: Notify MD/NP if K greater than 5.3

SGLT2 Inhibitors

For all patients diagnosed with heart failure regardless of LVEF, exclusion criteria: type 1 diabetic, eGFR less than 20mL/min. (NOTE)*
Provider to order HbA1C prior to starting SGLT2i(NOTE)*

☐ empagliflozin 10 mg oral tablet
10 mg, PO, TAB, Daily

☐ dapagliflozin 10 mg oral tablet
10 mg, PO, TAB, Daily

Diuretics

☐ Diuretic orders can be ordered either using:(1) Diuretics in Acute Heart Failure (CHF)" subphase for bolus dosing OR (2) "Furosemide (Lasix) infusion" subphase (NOTE)*

☐ Diuretics for Acute Heart Failure (CHF)(SUB)*
Furosemide (Lasix) Infusion (SUB)*

Supplements

Note: combination antihypertensives may contain diuretics. (NOTE)*

Consider potassium supplementation in patients with normal renal function taking loop (e.g., furosemide) or thiazide (e.g., hydrochlorothiazide or metolazone) diuretics. Patients on potassium-sparing diuretics, ACE inhibitors, or ARB's may be less likely to develop hypokalemia (NOTE)*

Potassium Chloride products:(1) SR CAP = Micro-K - capsules can be opened and the micronized pellets inside can be spread over applesauce for patients with swallowing issues. Comes as 8mEq capsules. (2) SR TAB = K-Dur - larger tablets but allows patient to take larger doses without swallowing large number of pills. Comes as 20mEq tablets. (NOTE)*

- ☐ potassium chloride SR capsule (Powerplans)
  - 40 mEq, PO, SR CAP, Daily, PRN electrolyte management
    - Comments: Give if serum potassium is less than or equal to 3.9 mmol/L Capsule may be opened; do not crush contents.
- ☐ potassium chloride SR tablet (Powerplans)
  - 40 mEq, PO, SR TAB, Daily, PRN electrolyte management
    - Comments: Give if serum potassium is less than or equal to 3.9 mmol/L Do not crush.
- ☐ Hypokalemia (Potassium Supplements) (SUB)*
- ☐ Hypomagnesemia (Magnesium Supplements) (SUB)*

Vasodilators

HF-REF: Combination of isosorbide dinitrate and hydralazine is recommended in addition to standard therapy (ACE-inhibitors, and beta blockers) for persistently symptomatic patients of African descent, with NYHA class III-IV(NOTE)*

HF-REF: Combination of isosorbide dinitrate and hydralazine is can also be considered for patients with HF-REF who are ACE-I/ARB intolerant, hypotensive, or have renal insufficiency (NOTE)*

Hydralazine in RENAL INSUFFICIENCY - If CrCl less than 10mL/min, reduce frequency of administration to BID or TID. (NOTE)*

- ☐ hydralazine
  - 10 mg, PO, TAB, TID (DEF)*
    - Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
  - 25 mg, PO, TAB, TID
    - Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
  - 37.5 mg, PO, TAB, TID
    - Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
  - 50 mg, PO, TAB, TID
    - Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
  - 75 mg, PO, TAB, TID
    - Comments: **TARGET DOSE**Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.

10 mg, PO, TAB, QID
Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
25 mg, PO, TAB, QID
Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
37.5 mg, PO, TAB, QID
Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
50 mg, PO, TAB, QID
Comments: Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.
75 mg, PO, TAB, QID
Comments: **TARGET DOSE** Hold if HR above 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg.

Avoid nitrates in patients who have received a phosphodiesterase inhibitor within the last 24 to 48 hours (e.g., sildenafil/Viagra, tadalafil/Cialis, vardenafil/Levitra) (NOTE)*

☐ Nitroglycerin Patch (SUB)*

☐ nitroglycerin 0.4 mg sublingual spray

0.4 mg, SL, SPRAY, q5min, PRN chest pain
Comments: For chest pain. Maximum 3 sprays in 15 minutes. Notify MRP if chest pain not relieved with 3 doses of Nitro-spray.

Standard schedule for oral nitroglycerin administration is TID with a 12 hour nitrate free period (0800, 1200, 1700) (NOTE)*

☐ isosorbide dinitrate

10 mg, PO, TAB, TID with meals (DEF)*
Comments: Hold if HR greater than 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg
20 mg, PO, TAB, TID with meals
Comments: Hold if HR greater than 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg
30 mg, PO, TAB, TID with meals
Comments: Hold if HR greater than 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg
40 mg, PO, TAB, TID with meals
Comments: Hold if HR greater than 100 bpm, Hold if HR less than 50 bpm, Hold if SBP less than 90 mmHg

Cardiac Glycosides

REDUCED EF (HF-REF): Digoxin use is controversial. Consider digoxin in patients with: (1) moderate to severe HF symptoms despite optimized HF therapy, to reduce symptoms and hospitalizations, or (2) atrial fibrillation with poor rate control despite optimal beta blocker therapy (NOTE)*

HF-PEF: For heart failure with HF-PEF, there is inconclusive evidence for the use of a cardiac glycoside (NOTE)*

Digoxin is CONTRAINDICATED in patients with pre-excitation states and/or accessory bypass tracts (e.g., Wolff-Parkinson-White syndrome) due to paradoxical increase of ventricular response. (NOTE)*

☐ TDM Digoxin (SUB)*

Other Medications

For patients who are in NSR with heart rate above 75 on beta blocker or are intolerant to BB. Ivabradine is an I(f) Inhibitor - Selective sinus node inhibitor. Usual starting doses are 2.5 to 5 mg BID with a target dose 7.5mg BID. (NOTE)*

☐ ivabradine

2.5 mg, PO, TAB, BID with meals (DEF)*

Comments: for patients who are in NSR with heart rate above 75 on beta blocker, or are intolerant to BB

5 mg, PO, TAB, BID with meals

Comments: for patients who are in NSR with heart rate above 75 on beta blocker, or are intolerant to BB

Unit-Specific / Restricted Medications

The following medications can only be given in certain units. Please refer to institution specific IV manuals/policies before ordering. (NOTE)*

☐ ED ICU Vasopressors/Inotropes (SUB)*

☐ nitroglycerin 100 mg in D5W 250 mL premix (IVS)*

premix

IV-CONTINUOUS, Titration range: 0 to 200 mcg/min

nitroglycerin (additive)

100 mg, EB, mcg/min

☐ nitroglycerin 50 mg in D5W 250 mL (IVS)*

premix

IV-CONTINUOUS, Titration range: 0 to 200 mcg/min

nitroglycerin (additive)

50 mg, EB, mcg/min

Concomitant Atrial Fibrillation

Avoid routine use of antiarrhythmic agents. Consider amiodarone in patients with HF and atrial fibrillation, in whom beta-blocker therapy is not tolerated or contraindicated. See Atrial fibrillation subphase. (NOTE)*

See “Atrial Fibrillation: Anticoagulants/Antiplatelets” subphase below for all anti-thrombotic options in atrial fibrillation(NOTE)*

☐ Atrial Fibrillation: Anticoagulants/Antiplatelets (AFIB)(SUB)*

**After reviewing above subphase, if warfarin is indicated please choose one of the following options for dosing. Note, Pharmacist-Directed Warfarin dosing currently only available at GRH **(NOTE)*

☐ Pharmacist Directed Warfarin (Coumadin)(SUB)*

☐ Physician Dosing Warfarin (Coumadin)(SUB)*

Antiplatelet Agents

Avoid routine combination of antiplatelet and anticoagulant therapy except in patients with concomitant conditions (e.g., acute coronary syndrome, stent) (NOTE)*
For heart failure of NON-ischemic origin, AVOID the routine use of aspirin (NOTE)*
For heart failure of ischemic origin, consider the use of aspirin only. Clopidogrel or warfarin may be considered as alternatives for patients who have had an MI(NOTE)*

☐ acetylsalicylic acid
80 mg, PO, CHEW TAB, Daily

Calcium Channel Blockers

HF-REF with comorbidities (e.g., symptom limiting angina etc..): Calcium channel blockers are NOT routinely recommended. Non-dihydropyridine calcium channel blockers (e.g., diltiazem, verapamil) should be avoided because they can depress cardiac function and worsen HF(NOTE)*
HF-PEF and comorbidities: Consider the use of a calcium channel blocker for symptom-limiting angina, hypertension, or atrial fibrillation (NOTE)*

VTE Prophylaxis

All inpatients with acute heart failure should be considered for VTE prophylaxis (NOTE)*

☐ VTE Prophylaxis: General (SUB)*

Prophylactic Measures

☐ Nicotine Withdrawal & Replacement (NRT)/Smoking Cessation (SUB)*
Consider annual immunization against influenza in patients with heart failure (NOTE)*
Consider pneumococcal vaccine if not previously received in last 5 years or if status unknown (NOTE)*

☐ Common Vaccinations (influenza & pneumococcal) (SUB)*

Opioid Analgesics

In acute decompensated HF, avoid routine use of morphine, especially in patients with impaired respiratory drive (NOTE)*

Ancillary Orders

☑ acetaminophen
650 mg, PO, TAB, q4h, PRN pain
Comments: Maximum dose of acetaminophen 4000mg in 24 hours from all sources.

☐ Bronchodilators: salbutamol (Ventolin) & ipratropium (Atrovent)(SUB)*
☑ Insomnia (Sleep / HS Sedation) (SUB)*
☑ Bowel Routine (SUB)*

Laboratory

Chemistry

For patients with heart failure due to systolic dysfunction who are taking aldosterone antagonists, monitor serum potassium levels upon initial presentation, and during change in therapy (NOTE)*

- [x] Electrolytes
  - Blood, AM Draw (Inpatient Only), T+1;0530, Daily, for 3 day (DEF)*
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once, for 1
- [ ] LAB CAMP (Calcium, Albumin, Mg, PO4: x1) (SUB)*
- [x] Creatinine
  - Blood, AM Draw (Inpatient Only), T+1;0530, Daily, for 3 day (DEF)*
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once
- [x] Glucose Random
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once (DEF)*
  - Blood, Routine, T;N, Once
- [ ] Hemoglobin A1c
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once
- [ ] LAB Liver Function Tests (LFTs): x1(SUB)*

For patients with acutely decompensated heart failure, consider a baseline troponin measurement to establish prognosis (NOTE)*

- [ ] Troponin I
  - Blood, Routine, q10h-ATC, for 2 times (DEF)*
  - Blood, Routine, q8h, for 24 hr
- [ ] high sensitivity Troponin I
  - Blood, Routine, T;N, q10h-ATC, for 2 times (DEF)*
  - Blood, Routine, T;N, q8h-ATC, for 24 hr
- [ ] Lipid Panel (GRH)
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once
- [ ] Lipid Panel (SMGH)
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once
- [ ] Uric Acid
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once
- [x] Thyroid Stimulating Hormone
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once
- [x] BNP
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once

Hematology

- [ ] Complete Blood Count
  - Whole Blood, AM Draw (Inpatient Only), T+1;0530, Once (DEF)*
  - Whole Blood, AM Draw (Inpatient Only), T+1;0530, Daily, for 3 day
- [ ] INR
  - Blood, AM Draw (Inpatient Only), T+1;0530, Once (DEF)*

Blood, AM Draw (Inpatient Only), T+1;0530, Daily, for 3 day

☐ Partial Thromboplastin Time
Blood, AM Draw (Inpatient Only), T+1;0530, Once (DEF)*
Blood, AM Draw (Inpatient Only), T+1;0530, Daily, for 3 day

☐ D-Dimer
Blood, Stat, T;N, Once (DEF)*
Blood, AM Draw (Inpatient Only), T+1;0530, Once

Urine Studies

☐ Urine R & M
Urine, Routine Collect, T;N, Once

Blood Gases

☐ Blood Gas Arterial
Arterial Blood, Routine Collect, T;N, Once

Diagnostic Imaging

☐ XR Chest 1 View
Routine, Reason: CHF (DEF)*
Stat, Reason: CHF

☑ XR Chest 2 Views
Routine, Reason: CHF, If not already completed in ED. (DEF)*
Stat, Reason: CHF

Nuclear Medicine

For all appropriately selected patients with heart failure due to systolic dysfunction, cardiac radionuclide imaging to assess left ventricular function, evaluate extent of ischemia, or determine myocardial viability should be performed (NOTE)*

Cardiovascular

☐ ECG 12 Lead
T;N, Stat, Heart Failure

☐ ECG 15 Lead
T;N, Stat, Heart Failure

☑ ECG 12 Lead
T+1;0800, In AM, Heart Failure (DEF)*
T+1;0800, In AM, Heart Failure, Daily, 3, day

For patients with heart failure, perform echocardiography to assess LV function during initial evaluation and for patients who have received treatment that might affect cardiac function or are being considered for device therapy. (NOTE)*

☐ Echo
Routine, Congestive Heart Failure

☐ Echo Transesophageal
Routine

☐ Holter Monitor 48 Hr
Priority Routine, Heart Failure

For patients who have systolic heart failure and a left bundle-branch block with a QRS interval > 150 milliseconds, cardiac resynchronization therapy should be performed, with or without ICD therapy (NOTE)*
Consider ICD therapy for selected patients with EF less than 35%(NOTE)*

Physician Consults

- ☐ Consult to Cardiology
  Consider Consult to Palliative Care for Patients with End Stage/NYHA class IV Heart Failure (NOTE)*
- ☐ Consult to Palliative Care
- ☐ Consult to Geriatrics
- ☐ Consult to Nephrology
  Patient is on hemodialysis or peritoneal dialysis

Multiprofessional Consults/Follow-Ups

For patients who are at high risk for clinical deterioration or hospital admission, a multidisciplinary disease management program should be used (NOTE)*

- ☐ Refer to Home and Community Care
- ☐ Consult to Pharmacist
  Other, Comment: Medication review
- ☐ Consult to Pharmacist
  Patient Education, Comment: prior to discharge
- ☐ Physiotherapy Assessment and Treatment
- ☑ Consult to Dietitian Adult
  Reason for Consult Other, Heart Failure patient
- ☐ Occupational Therapy Assessment and Treatment
- ☐ Consult to Social Work
- ☐ Consult to Respiratory Therapy
- ☐ Refer to Cardiac Rehabilitation Clinic SMGH
- ☑ Refer to ICC
  CHF

***Report Legend:**

DEF - This order sentence is the default for the selected order
GOAL - This component is a goal
IND - This component is an indicator
INT - This component is an intervention
IVS - This component is an IV Set
NOTE - This component is a note
Rx - This component is a prescription
SUB - This component is a subphase

Table 1: Comparing the Evidence

QBP Heart Failure Recommended Practices 2015		Quality Standard	CHFS SCIC Order Set 2021	CCS Guideline	Comments	Possible Intervention
2.1 Diuretic monitoring and management (acute phase)	IV furosemide BID	"In addition to quadruple therapy other medications may be considered..., loop diuretics"	Discontinue PO furosemide (closed box) Furosemide Bolus IV, Furosemide infusion, metolazone (open box)	IV 20-80 mg bolus or IV infusion 5.20mg/hr	We have Lasix PO included in the order set currently, but this is not used in cardiology.	Consider removing PO route option for furosemide.
	Recording of daily weights	"A physical examination, should include, at minimum... weight change"	Weight on admission and daily (before breakfast, ideally on a standing scale) (open box)	Assess weight change and/ or urine output over 24 hours	Daily weight ordered for duration of stay (closed box)	Consider adding "on standing scale" or "using same scale" to order details.
	Recording of intake and output every 6 hours		Total 24-hour fluid intake limit ___ ml/24h (open box) Intake and output measurement q_h (open box)	Assess weight change and/ or urine output over 24 hours	Current order set includes I&O q12 (closed box). In practice, staff are documenting throughout the shift. Patients with foleys	Keep q12h as primary order sentence; add q6h as an option to select
	Recording of sodium intake	"A medical history should address, at minimum, the following: ... sodium intake"	Healthy heart diet (low LDL, low fat, no added salt) (open box) Sodium restriction in 24h: <2g/day (87mmols) (open box) 1800 kcal diabetic diet (open box)	Sodium restriction between 2g-3g/day is reasonable	Current diet order HF diet with 2000ml (closed box). Confirmed current guideline is 2-3g/d. In actual practice, diet office provides about 2300mg/d on trays.	Maintain 2-3g/ day as per the CCS 2017 guidelines and updated this reference in our order set.

Table 2: Organizing Potential Order Set Changes

Red = will not seek implementation
Yellow = will consider cost/benefit ratio of implementation
Green = will seek implementation

Section	Content (Reference) with notes
Risk Stratification	1. Include heart failure risk stratification (i.e.., EHMRG) to identify -patients for admission vs. ED dis-charge? • Decision to admit has already occurred by the time admission order set is being placed. ED does not use ED HF order set, so no benefit in adding. Notes on order set can be overly compli-cated, so will remove this from the admission order set
Diet	2. Add comment "ideally on a standing scale" on weight order (CHFS Order set) • May consider adding comment on order for nursing. May be too much information and could distract from more important messages i.e.., using same scale. Patients may be frail for standing scale. 3. Keep q12h intake/take output, but add q6hours as a drop-down option (QBP 2015) • This is done throughout shift so order sentence may not change practice, q6h therefore should be reserved for patients who really need 4. Change sodium restriction to <2.0g/day CHFS Order Set (CCS 2017), from current 2-3g/day sodium intake. • The CCS 2017 guidelines recommend 2-3g/day of sodium intake. We will not seek to change.
Activity	5. Added comment to Activity as Tolerated order: progressive mobilization with ambulation q6h as tolerated. • Unsure if this would benefit staff or contribute to clutter on orders. Needs more input from staff.
Medications	6. Remove PO Lasix from order set (CHFS Order set) • Felt could be kept if needed. Order set prioritizes IV routes 7. Add SGLT2i to order set (CHFS Order set), with notes about use in HFrEF/HFpEF 8. Notes to say: MRA in HFpEF, SGLT2i in HFpEF
Laboratory	9. BNP (closed box) on order set (CHFS Order set) • Will pursue this option, needs discussion with lab 10. Add HbA1C prior to starting SGLT2i (open box) 11. TSH changed to (closed box) • Will pursue this option, needs discussion with lab
Other Investigations	12. Task ED/inpatient clerical to pull latest echo results and find out if specialist already involved • Needs more discussion if this would help decrease repeat referrals/echo. Process does exist in ED, not in inpatient 13. Update language to help determine if new echo indicated • Will leave to clinical judgment. Risk of overcomplicating notes on order sets 14. Goals of Care: Comfort measures only order? More options between Full code/DNR. POLST for inpatients? • Felt not in scope for this project. Current DNR options acceptable with comments if required
Inpatient Discharge	15. Cardiac Rehab referral alert at time of discharge • Not felt appropriate to have closed box at time of admission, as appropriateness for rehab not yet known 16. Remove e-referral to HFC, add paper referral form link • E-referral was creating too much work to clinic to discern is referral was appropriate 17. Include ICC referral order on order set 18. Clerical to attempt contact with PCP prior to discharge • Needs conversation with clerical and management to determine feasibility

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