Acute Decompensated Heart Failure Management

First thing to do when assessing ADHF patients is to identify hemodynamic profile and triage accordingly
- if they are warm vs cold: consider altered mental status, lactate, cool extremities, narrow pulse pressure. warm indicates normal perfusion in which the cardiac index is >2.2, and cold indicating hypoperfusion in which the cardiac index is less than 2.2. narrow pulse presssures are the key hemodynamic marker of reduced cardiac output. cool extremities indicates poor peripheral perfusion.
-if they are dry or wet: this is the presence or absence of congestion on exam, either in the lungs, JVP, or pedal edema. For JVP make sure to use ultrasound if possible, look up how to do that.
-Majority of HFref and HfPEF patients will be warm and wet.

sure

		Congestion at Rest (PCWP)	
		Yes	**No**
Low Perfusion at Rest? (CO)	**Yes**	Warm & Dry (Compensated) *Outpatient mgmt.*	Warm & Wet (Congested) *Diuresis ± Vasodilators*
	No	Cold & Dry (Low Flow State) *Inotropes, vasodilators*	Cold & Wet (Decompensated) *Tailored Therapy (ICU)*

History taking

-identify decompensation triggers: FAILURE
-F = forgot to take medicine on time
-A= arryhthmia/anemia/afterload
-I=Infection/Ischemia
-L=lifestyle (salty diet)
-U= upregulation of caridac output (pregnancy, hyperthyroid)
-R = renal failure
-E=Embolism
-Other triggers: progression of cardiomyopathy, inadequate diuretic dose, medicines such as nsaids, steroids, ccb, anthracyclines, toxins such as etoh, new worsened valve
-HF history (prior CM dx, dry weiht, last NTproBNP, last TTE/EF, prior ischemic workup, outpatient cardiologisty), accurate Palliative medical care, social and family history

Admission considerations
- admission orders include telemetry monitoring, 2g na restricted diet, daily standing weights, strict I/Os, DVT prophylaxis, electrolyte replenishment scales
-cardiac icu admission indications: ejection fraction less than 25%, ntprobnp >=2500, arryhtmia induced HF. Black and Latinx patients with heart failure are less likely to be admitted to cardiology services
-avoid calcium channel blockers, nsaids, flecainide
-check nt probnp and weight on admission. ADHF

unlikely if nt probnp less than 300, likely if greater than 450. difficult to interpret in ckd/dialysis, may be falsely low in obesity and hfpef
-screen and treat iron dificiency, dx if ferritin is less than 100 or ferritin less than 300 and tsaturation <20%
-therapy is to replete with IV iron to decrease symptoms, increase functional capacity, and possibly improve outcomes.

Early and acute management:
-diuresis is the first step: the goal being is to decrease central venous pressure and pulmonary capillary wedge pressure to opitmize starling curve mechanics and relive symptoms.
-initial tx: IV loop diuretic, start with 20-40 mg IV furosemide if diuretic naive otherwise start w/ 2-2.5x home dose (IV/PO). bumex is actually 1:1. No difference between continuous gtt vs bolus
-refractory diuresis: add metolazone 2.5-5mg administered 30 minutes before loop diuretic. may need rhc to clarify hemodynamics or inotropes to augment diuresis. Acetazolamide 500mg daily as well as dapagliflozin 10mg daily may also augment succesful decongestion. step up pharmacologic therapy superior to RRT in the setting of cardiorenal syndrome.
-Worsening renal function: common occurence, mild-moderate creatinine bumps are benign, should not preclude further diuresis

- endpoints: target resolution of signs/symptoms of congestion. Daily weights, hemoconcentration, lungs and jvp pocus are useful adjuncts to ensure diuresis to euvolemia. B lines on lung US (indicate or foreshadow) increase risk of hf admissions and death.
-if acute pulmonary edema, NIPPV may improve mortality and reduce need for intubation
-vasodilators: arterial and venous dilation can releive symptoms by decreasing afterload, decreasing pcwp. considere in severe HTN, acute MR, or AR
    - if on the floor can use isosorbide dinitrate, hydralazine, nitropaste, captopril
    -SDU/CCU = nitro gtt, nitroprusside gtt

Home GDMT continuation: if not in shock or new AKI, continue the GDMT during adhf.

GDMT:
Hfref, hfmrEF +/- HFimpEF
prioritize initation of low dose quadruple gdmt prior to discharge
- betablockers initiate bb (carvedilol, metoprolol succinate, bisoprolol) COPERNICUS, MERIT-HF trials. caution if recent inotropes.
-RAAS inhibitors: if renal function stable, initiate/titrate ARNI (sacubitril/valsartan) (paradigm-hf; pioneer hf) trials; second line acei.arb (consensus/charm) trials.

switch to arni from acei/arb if no ci/cost concerns, 36 hour washout period for acei prior to arni
-MRA = initiate spironolactone or eplernone if crcl >30 (emphasishf;rales) watch for rebound hyper k after deescalation of diuretics
-sglt2i: dapagiflozin and empagiflozin reduce mortalitiy and hf admissions regardless of DM
-gdmt dosing

	βB		ARNi/ACEi/ARB			
	metop succ	carvedilol	sacub/val	lisinopril	losartan	
Initial Dose (mg)	12.5-25 qD	3.125 BID	49/51 BID	2.5-5 qD	25-50 qD	1
Target Dose (mg)	200 qD	25-50 BID	97/103 BID	20-40 qD	50-150 qD	

HfPEF: improve volume overload with diuretics, treat comorbidities (dm,htn,af) add GDMT
-sglt2i found to decrease cv death and hospitalizations in patients with ef>40%
-consider spironlactone if normal renal function/K, decrease CV death/admits in N/s Am. sites in TOPCAT
- no proven benefit to BB, Ace I, arni, arb
-finreerone, semaglutide

icd indicated if ischemic cm with ef<=30% or <=35% with nyha II-III: CRT if EF<=35% and prolonged qrs +/- LBBB and some w/ EF <50%

Pre discharge optimization
-document d/c weight and nt probnp, appt in hf clinic, referral to cardiac rehab
-optimization of gdmt as above
- diuretic plan: determine maintenance of oral diuretic dose and provide specific instructions for taking additional rescue does consider inpatient observation on maintenece dose and decide if needs k replacement.