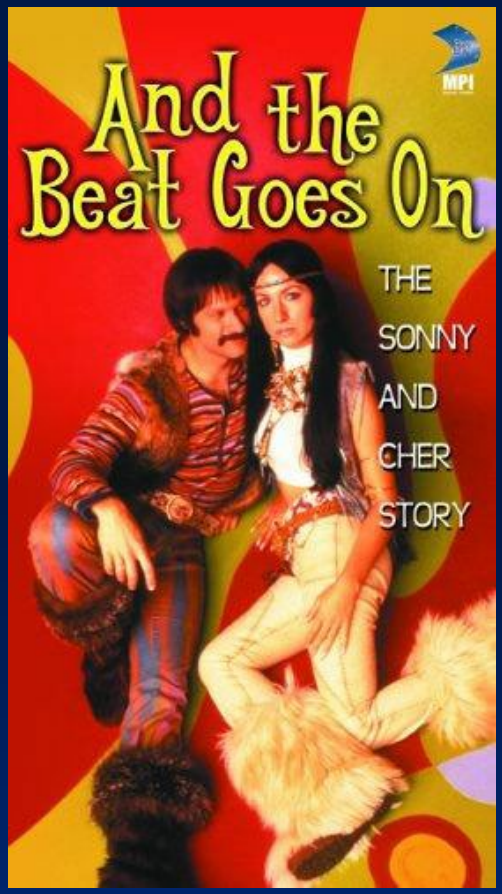
Atrial Fib and Heart Failure

When the Beat Goes Wrong



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Disclosures

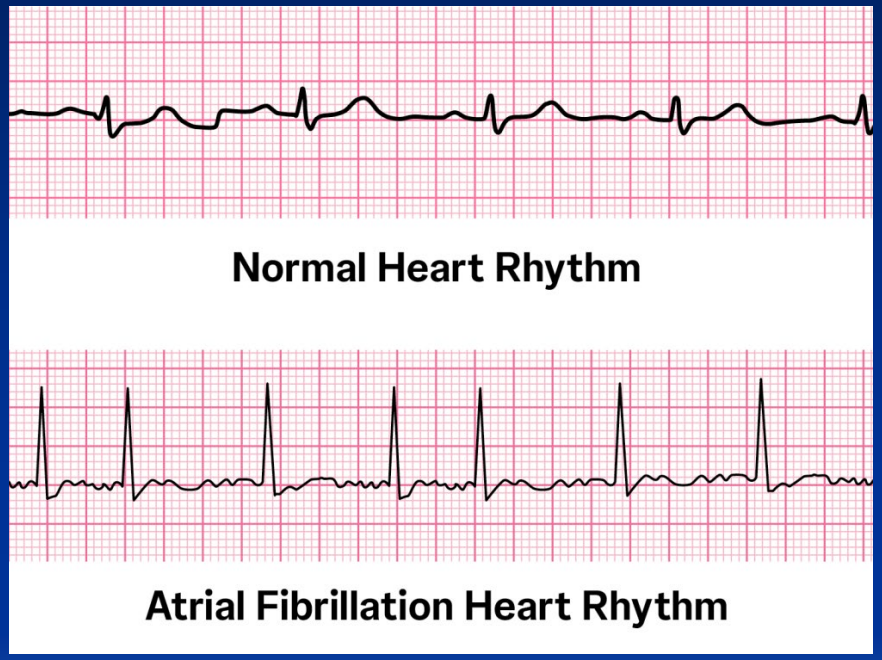
- None

Goals in Rapid A Fib

- Review therapy for rate control
- Review Cardioversion
- Review impact of Heart Failure on treatment

Case 1: Rapid Afib

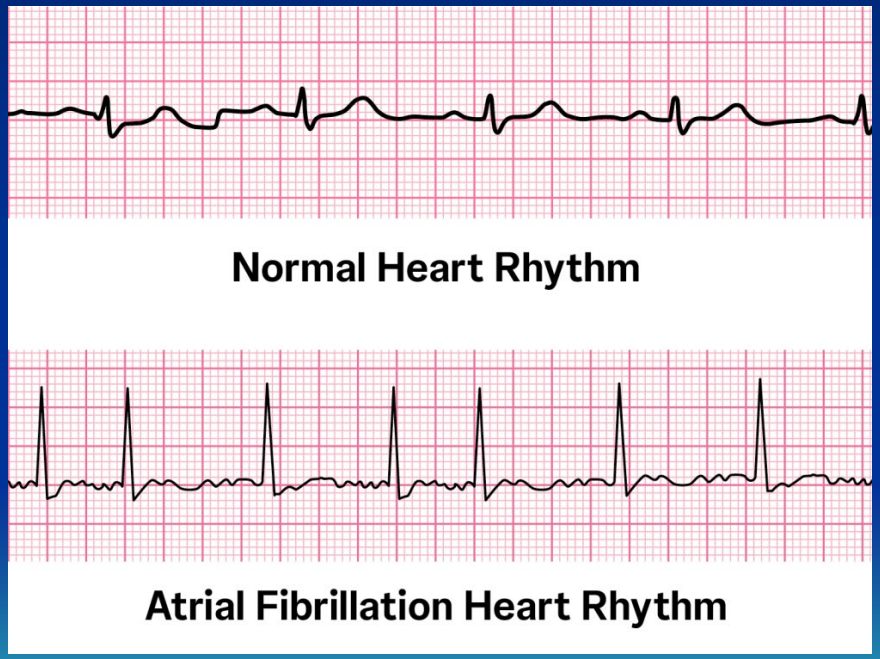
- 75 M BIBA w Chronic Afib, + DOAC
  - Well appearing
  - Afib at 140, BP = 140/70
  - Rest of exam unremarkable
- What is your next step?



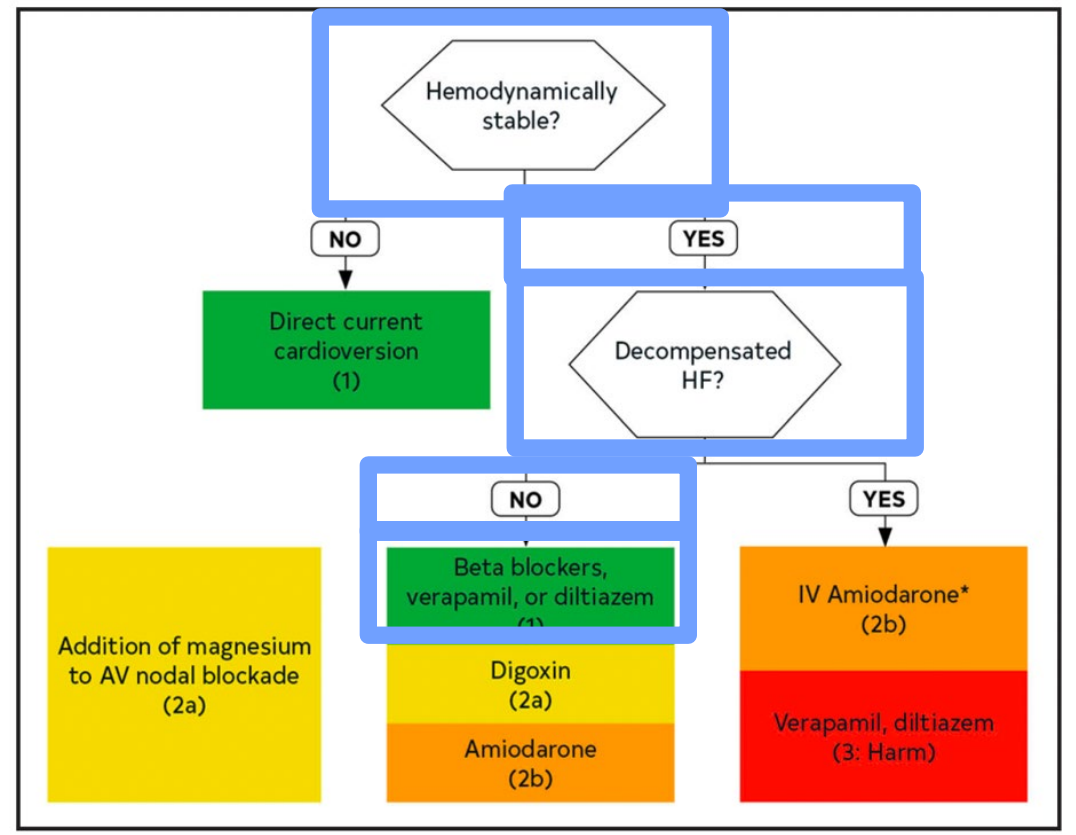
Consider and Treat Underlying Causes

Consider and Treat Underlying Conditions

- Medication Noncompliance
- ETOH Withdrawal
- Methamphetamine
- Volume Depletion/GIB
- Infection
- ACS/PE/CHF
- Hyperthyroid
- Other



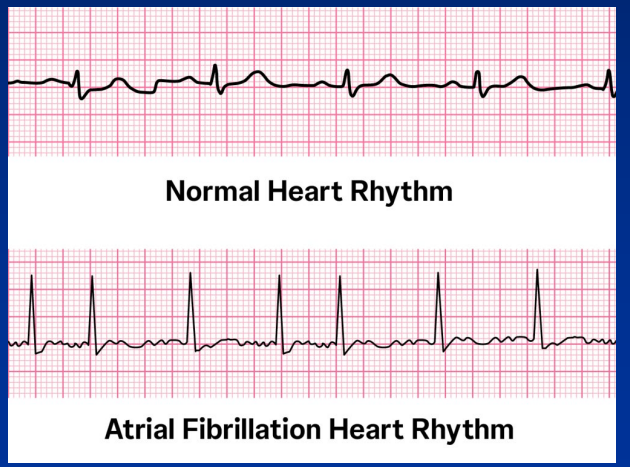
Rate Control of Rapid AFib



2023 ACC/AHA Guideline for Dx and Management of Atrial Fibrillation

Case 1: Rapid Afib - Conclusion

- 75 M BIBA w Chronic Afib, + DOAC
  - Well appearing
  - Afib at 140, BP = 140/70
  - Rest of exam unremarkable
- You treat them for their underlying ETOH withdrawal
- You restart their home regimen
- You slap high five to your RN and go to see your next patient



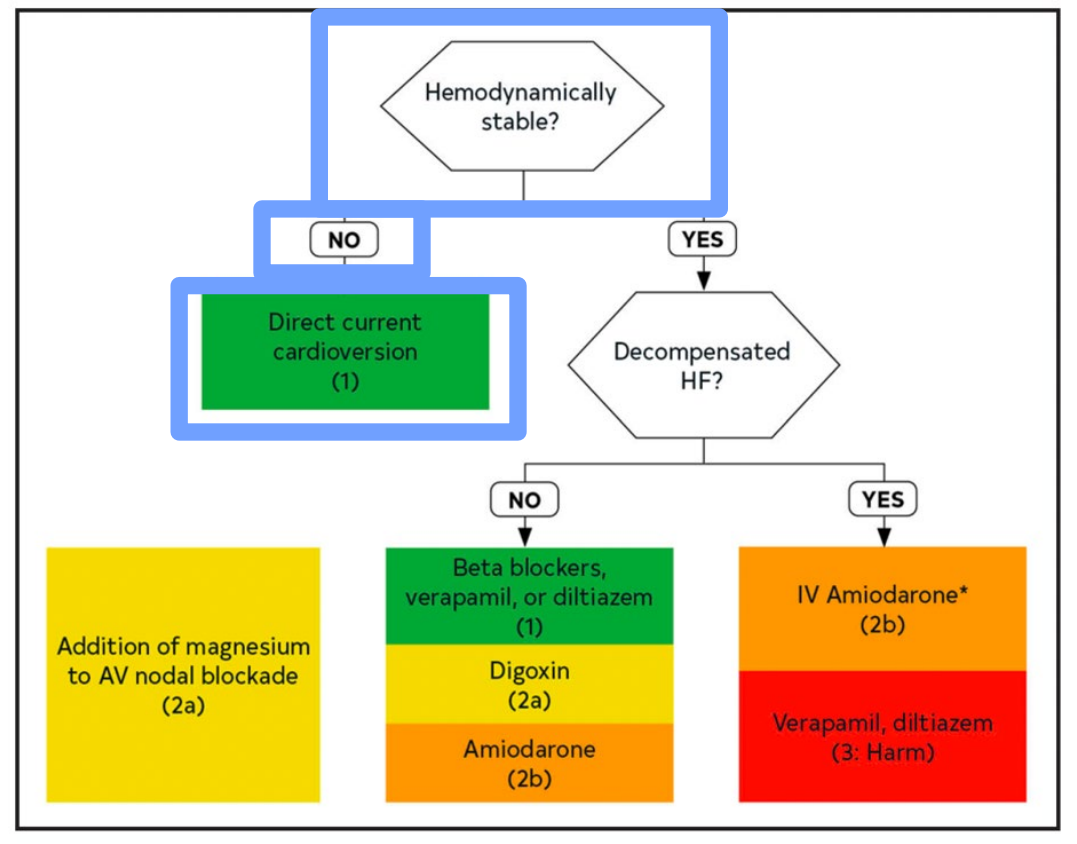
Case 2: Rapid Afib with “Soft Pressures”

- 75 M BIBA w Chronic Afib, + DOAC
  - Well appearing
  - Afib at 140, BP = 100/60
  - Rest of exam unremarkable

3 QUESTIONS

- **Hemodynamically Stable?**
- **Heart Failure?**
- **Other Causes needing evaluation/treatment?**

Rate Control of Rapid AFib



2023 ACC/AHA Guideline for Dx and Management of Atrial Fibrillation

“Soft Pressures”

Don’t Call it “Soft” BP => Call it SHOCK!

- Consider Age!
  - SBP < 90 for 10 to 65 yrs
  - SBP < 110 for age over 65
- SBP is the marker of shock
- MAP is the focus of treatment
  - Consider Pressors (<60 despite volume resus)

Sepsis and Septic Shock. NEJM. 2024

“Soft Pressures”

- You don’t necessarily need immediate ICU or pressors
- But you do need some immediate actions
  - Cardiac and IVC POCUS
  - Fluids unless contra-indicated
  - Abx if suspected infection
  - Labs and imaging as indicated

Case 2: Rapid Afib with “Soft Pressures”

- 75 M BIBA w Chronic Afib, + DOAC
  - Well appearing
  - Afib at 140, BP = 100/60
  - Rest of exam unremarkable

POCUS => decreased EF, Full IVC

Cardioversion for Hemodynamically Unstable AFib

2 ways rapid AFib contributes to Hypotension

- Afib impairs diastolic ventricular filling
  - Cardioversion returns “atrial kick”
  - Affects output by up to 10 %
- Rapid rate impairs diastolic ventricular filling
  - Cardioversion is a form of rate control
  - Meds for rate control often worsen hypotension
  - Meds for cardioversion often worsen hypotension

Cardioversion for Hemodynamically Unstable AFib

- **Electrical vs Chemical**
  - **Electrical is more effective (90+% v 60%)**
  - **Chemical has more side effects**
    - **Hypotension: Avoid with EF < 40%**
    - **QTc prolongation**
  - **Amiodarone is somewhat effective at 8-12 hours BUT not effective in ED**
  - **Electrical can take more resources (procedural sedation)**

Optimize Your Cardioversion

- IV Magnesium Loading
- Anticoagulate
- Optimize Cardioversion

IV Magnesium for Afib Cardioversion

- **2 gms IV over 20 mins**
- **Enayati et al, J Cardiovasc Electrophys, 2023**
  - **Efficacy of IV Mg for the management of non-post operative rapid Afib: A systematic review and meta-analysis.**
  - **9 RCTs w 1038 pts: Standard care + either IV Mg or placebo**
  - **Odds Ratio for success with Mag = 1.45 (CI 1.04–2.03)**
  - **Dosages all over the place**

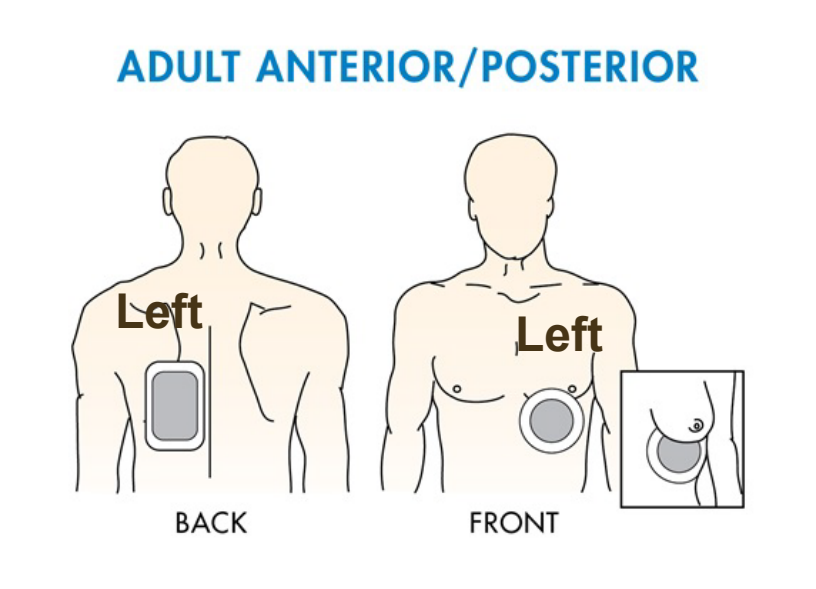
Anticoaguation for Afib Cardioversion

- **We use Lovenox 1.5 mg/kg**
- **Use Whatever you have**

•. 2024

Optimizing Electrical Cardioversion

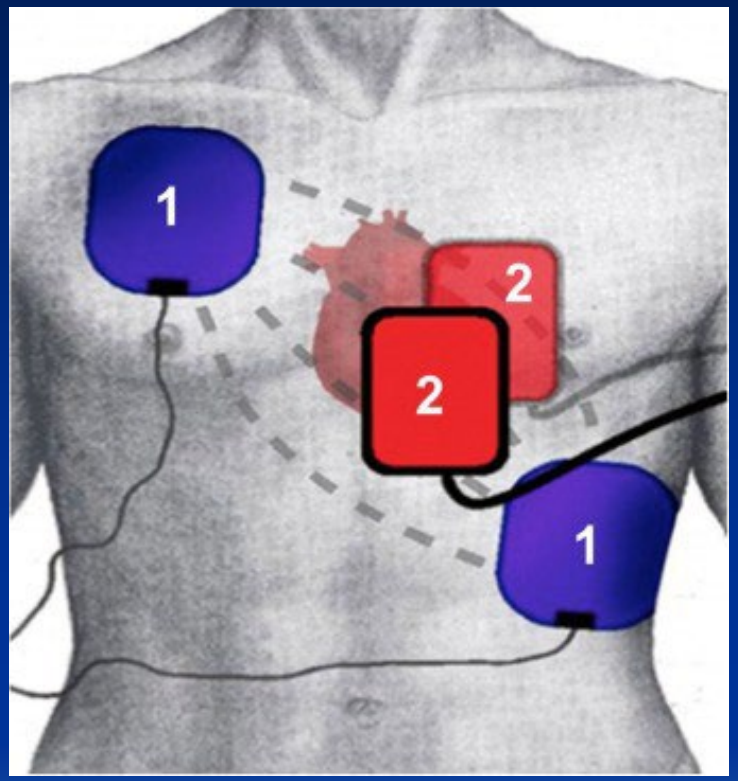
- Cardiovert (don’t defibrillate!)
- Start with 200J biphasic (not escalating doses)
- AP Pad Placement



•. 2024

Optimizing Electrical Cardioversion

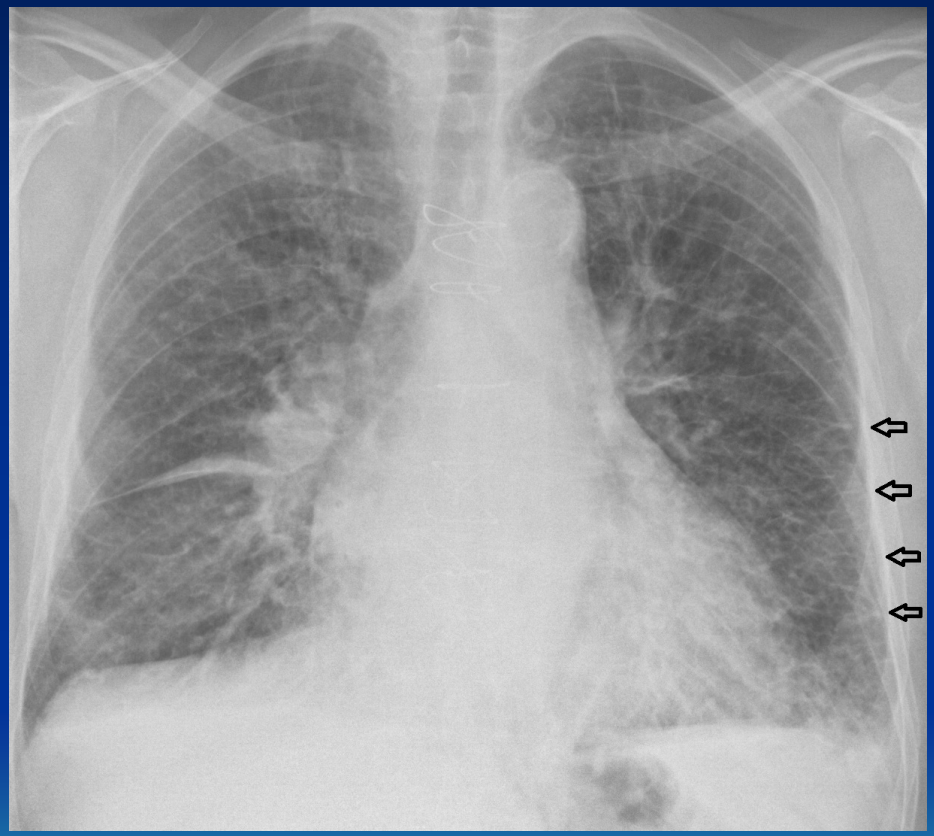
- If refractory
  - Change to Anterolateral Pad Position
  - Manual pressure augmentation
  - Dual cardioversion -> 98% vs 87% with single cardioversion (P = 0.002)



Aymond, Jama Cardiol, 2024. Dual vs Single Cardioversion of Atrial Fib in Patients With Obesity: An RCT

Case 3: Rapid Afib with Heart Failure

- 75 M BIBA w Chronic Afib, + DOAC
  - Well appearing
  - Afib at 140, BP = 140/60
  - 100% on 2L
  - CXR -> mild-mod CHF
- What is your next step?

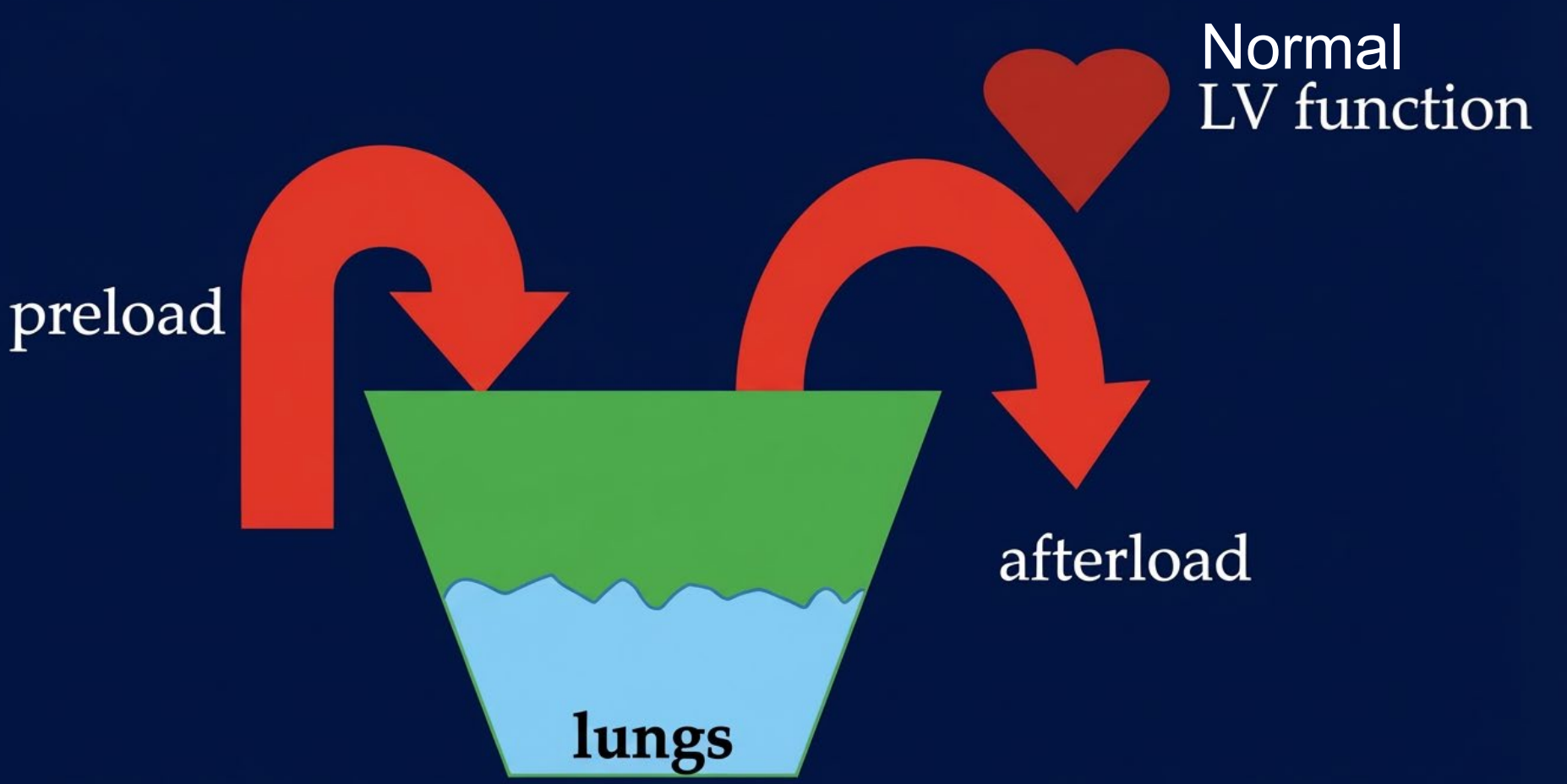


POCUS => decreased EF, Full IVC

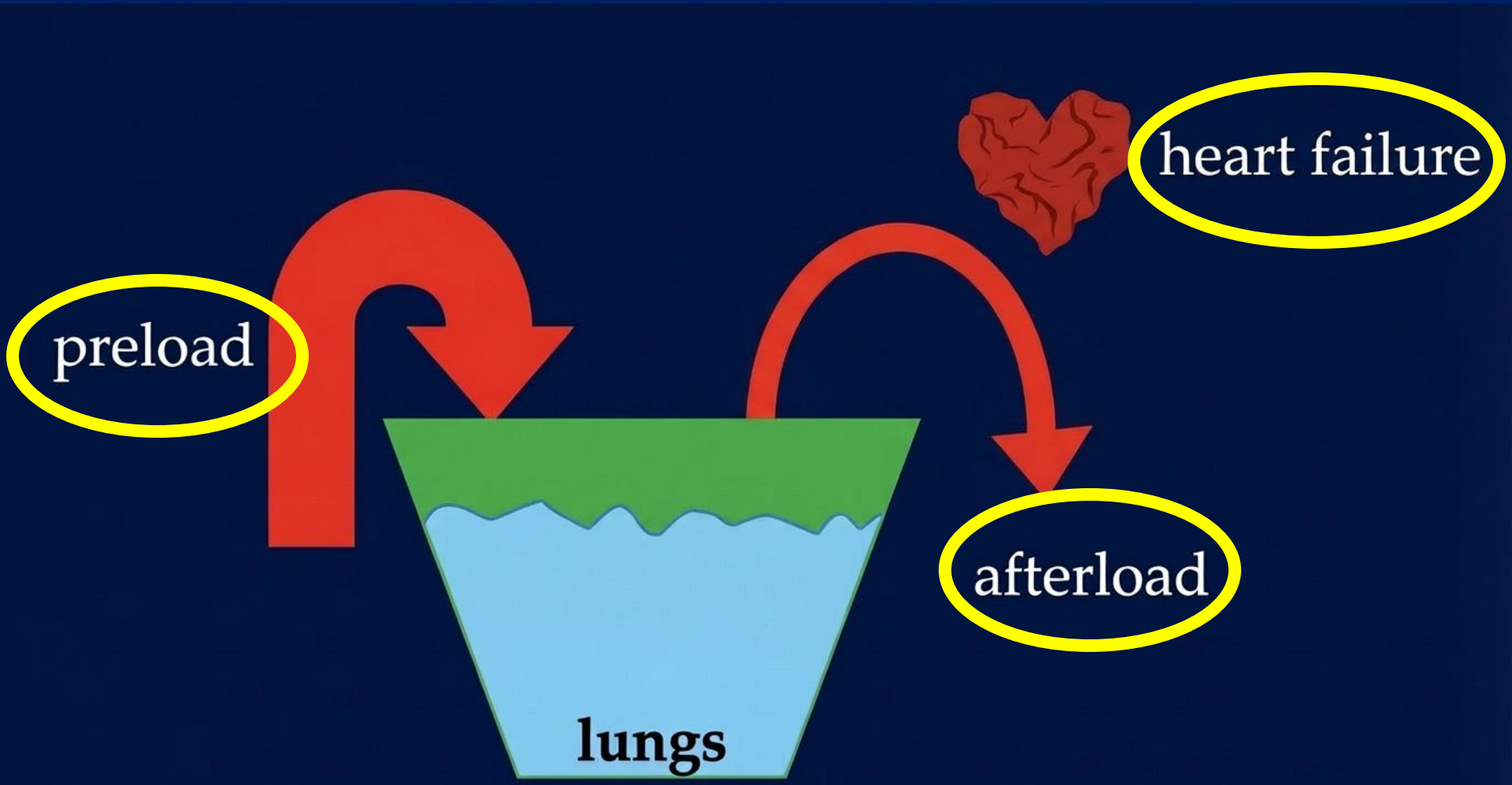
Hemodynamic Goals in Heart Failure

- Decrease Afterload (Dilate Arteries)
- Decrease Preload (Dilate Veins or Diurese)
- Increase Contractility (Improve Ventricular Squeeze)

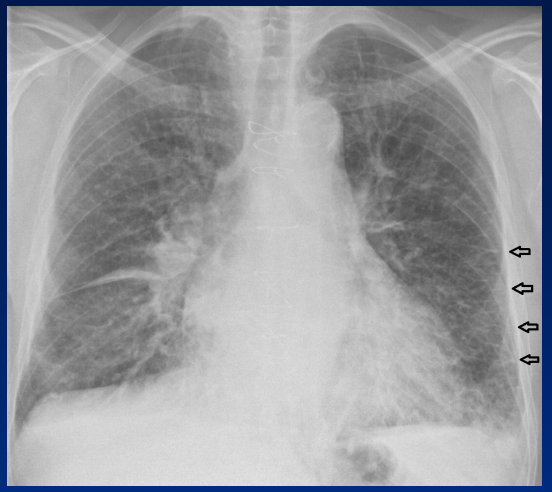
Hemodynamic Goals in Heart Failure



Hemodynamic Goals in Heart Failure



Meds for CHF



- Reduce Afterload (Dilate Arteries)
  - Nitrates, Nipride, ACEI, etc.
- Reduce Preload (Dilate Veins or Diurese)
  - Nitrates
  - Lasix
- Increase Inotropy (Improve Squeeze)
  - Pressors (but increases afterload)
  - Beta Agonists – e.g. Albuterol
  - Digoxin

Meds for Rate Control

- ~~Diltiazem and Metoprolol => Decrease Contractility~~

Avoid Diltiazem/Verapamil with impaired LV function!!!!

3: Harm	**B-NR**	5. In patients with AF with rapid ventricular response and known moderate or severe LV systolic dysfunction with or without decompensated HF, intravenous nondihydropyridine calcium channel blockers should not be administered.[14,15]

2023 ACC/AHA Guideline for Dx and Management of Atrial Fibrillation

Meds for Rate Control

- ~~Diltiazem and Metoprolol => Decrease Contractility~~
- Amiodarone – Less Decrease in Contractility (but still some). Most longterm toxicity

Meds for Rate Control

- ~~Diltiazem and Metoprolol => Decrease Contractility~~
- Amiodarone – 300 mg IV over 1 hr
  - Less Decrease in Contractility (but still some). Most longterm toxicity
- Digoxin – 0.5 mg over 5 mins then 0.25mg Q6 x 2
  - Increases Contractility, Some diuresis, BUT Slow Onset

2a	B-R	2. In patients with AF with rapid ventricular response in whom beta blockers and nondihydropyridine calcium channel blockers are ineffective or contraindicated, digoxin can be considered for acute rate control, either alone or in combination with the aforementioned agents.[5–9]

Meds for Rate Control

- ~~Diltiazem and Metoprolol => Decrease Contractility~~
- Amiodarone – Less Decrease in Contractility (but still some). Most longterm toxicity
- Digoxin – Increases Contractility, Some diuresis, BUT Slow Onset
- IV Magnesium loading may help

2a	A	3. In patients with AF with rapid ventricular response, the addition of intravenous magnesium to standard rate-control measures is reasonable to achieve and maintain rate control.[10,11]

IV Magnesium Loading for Rate Control of Rapid AFib

- **Enayati et al, J Cardiovasc Electrophys, 2023**
  - **A systematic review and meta-analysis.**
  - **9 RCTs w 1038 pts**
  - **Standard care + either IV Mg or placebo**
  - **Odds Ratio for success with Mag = 1.87 (CI 1.13−3.11)**
  - **Dr. Coralic, our Pharm D, recommends: 2 gms over 20 mins**

Case 3: Rapid Afib with Heart Failure

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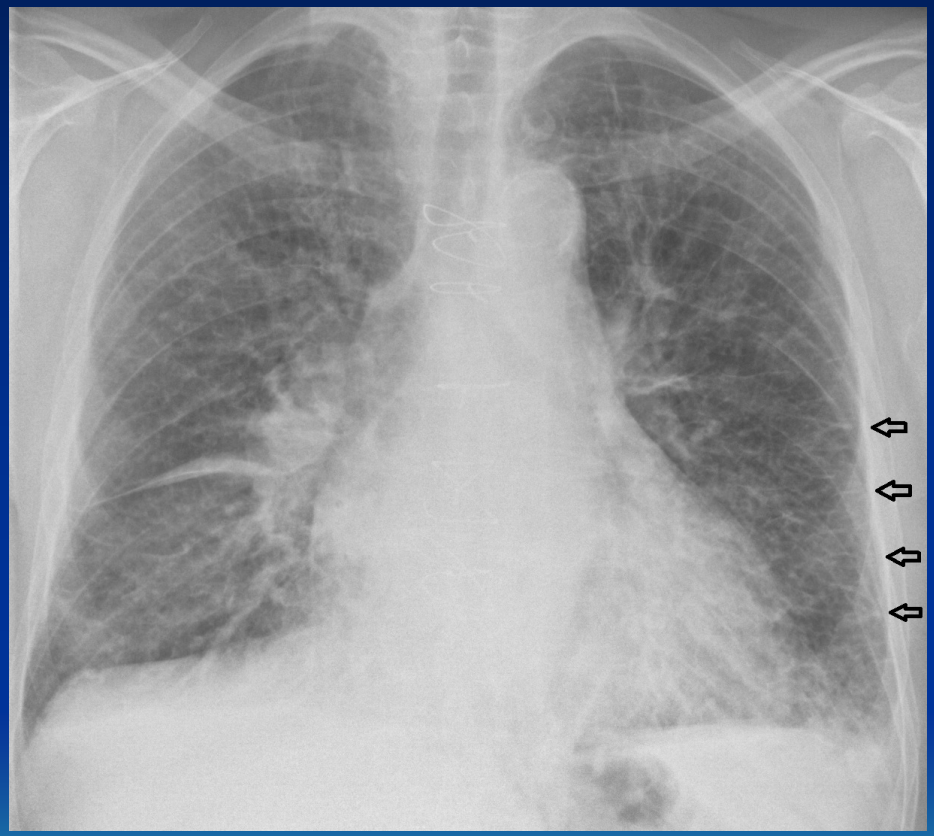
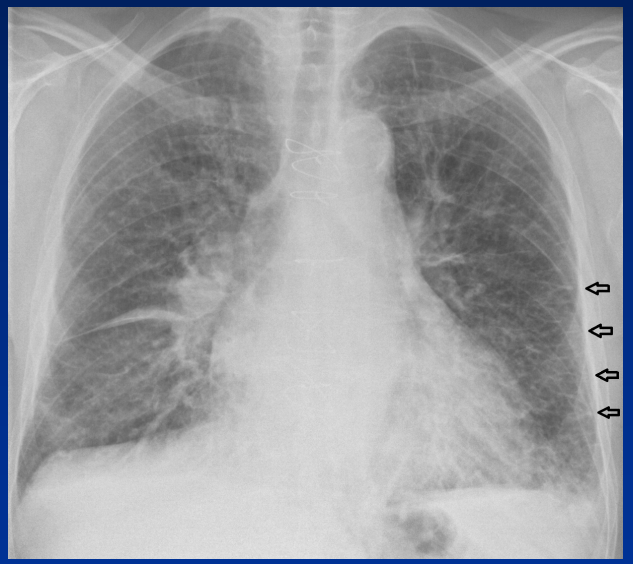


POCUS => decreased EF, Full IVC

Case 3: Rapid Afib with Heart Failure

- 75 M BIBA w Chronic Afib, + DOAC
- Lasix – given po home dose IV
- Digoxin – 0.5 mg IV over 5 mins
- IV Mg 2 gm over 20 min
- Electrolytes repleted
- Patient admitted and discharged after diuresis in 2 days
- You slap high five to your RN and go see the dropoff gunshot wound



Take Points:
Rapid Afib with Low"ish"BP

- "Borderline" or "Soft" BP = Shock! LOW Threshold for electrical cardioversion
- Fluids for soft pressures only if IVC POCUS supports
- AVOID Diltiazem
- If you ***must*** try rate control, consider Dig, Amio, or possibly esmolol
- Low threshold for Electrical Cardioversion
- Early admission may be your most effective strategy!

Take Points: Cardioversion for Rapid Afib

- **IV Magnesium**
- **Anticoagulate**
- **AP pad placement**
- **Switch to Anterolateral placement if unsuccessful**

Take Points:
Rapid Afib with Heart Failure

- Avoid Diltiazem and Metoprolol in Acute Heart Failure
- Lasix and Nitrates if BP tolerates
- IV Mag
- For rate control consider Dig, Amio, or possibly esmolol
- Low threshold for cardioversion