HFrEF Management in Primary Care:

Practical Decisions That Improve Outcome

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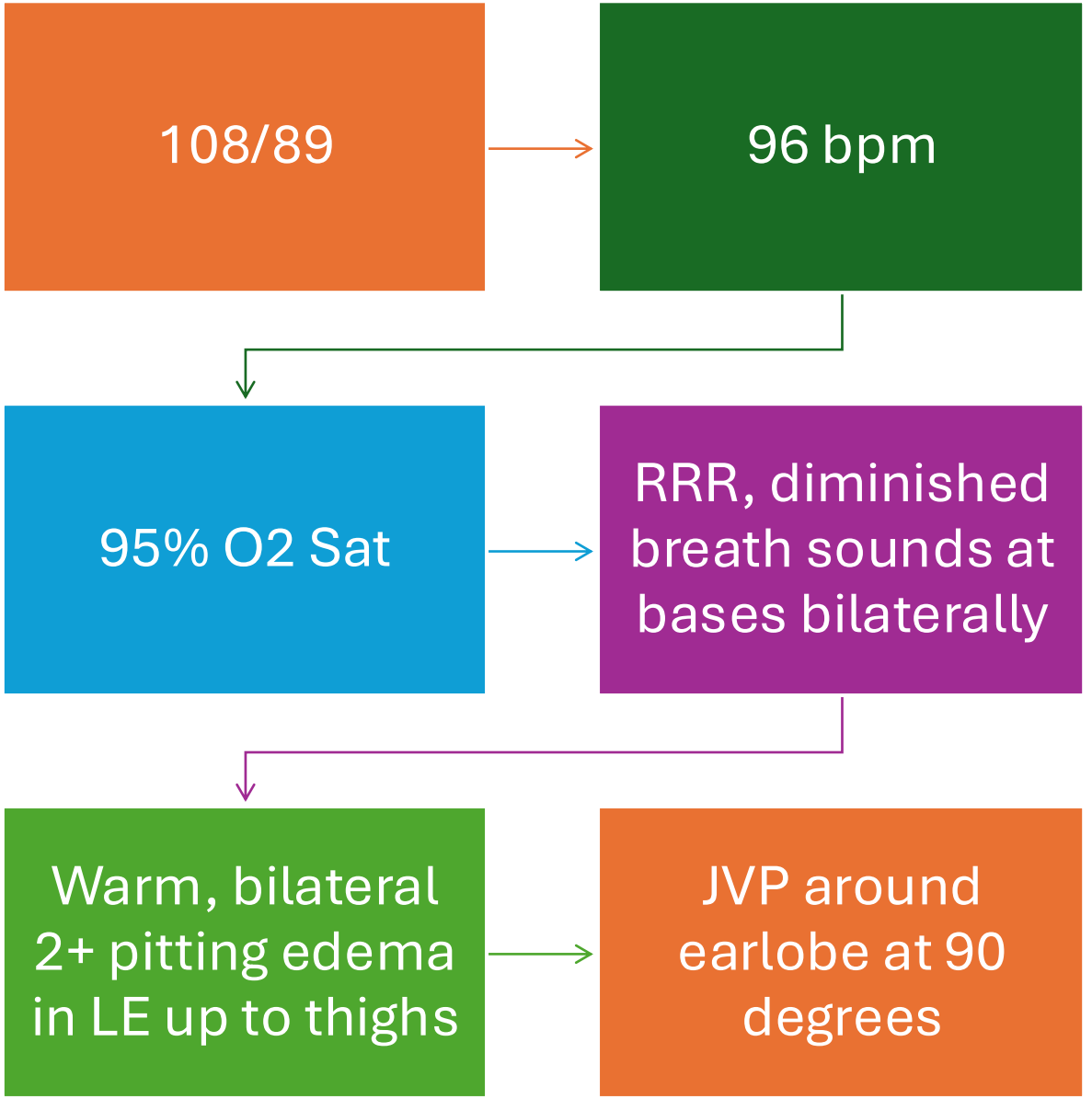
The views expressed in this presentation are solely my own and do not necessarily reflect the opinions of other cardiologists.

58 year old man

- HTN, HLD, DMII, BMI 38
- 3 months of dyspnea with exertion
- 30+ lb weight gain over the past year despite no major changes in diet
- Uncomfortable sleeping in bed, prefers a recliner
- Cannot fit into his shoes because of feet/legs swelling
- Feels short of breath when bending over to squeeze his swollen feet into sandals

Vitals and Physical Exam



What would you do next?

1. Send patient to ED?
2. CBC, CMP, NTproBNP, Stat echo, chest xray, Furosemide, f/u end of the week.
3. Stat referral to cardiology

Data

Labs

- Na 132
- K 3.8
- Creatinine 1.56 (baseline 1.1)
- NTproBNP 4800
- LFTs just mildly elevated
- Albumin 3.2

Echo

- LVEF 30-35% global hypokinesis with regional variation
- Normal RV function
- Mild-to-moderate MR
- Moderate TR
- RVSP 40

What medications would you prescribe next?

Decongestive therapy

Furosemide or Torsemide

(+/- KCl supplementation)

Guideline-directed medical therapy (GDMT)

ACE-I/ARB/ARNI

BB

MRA

SGLT-2 inhibitor

Decongestive therapy

Choose appropriate starting dose

- Loop diuretics are threshold drugs

Diuretic does not cause hypotension

- unless near euvolemia, which can result in transient intravascular volume depletion despite total body volume up.

If worsening renal function, escalate diuretic dosing

- Tolerate a degree of creatinine elevation (permissive worsening renal function)

Minimum starting dose:

- Furosemide 40mg q day
- Torsemide 20mg qday

- ? KCl 10-20 meq q day

- Consider concurrent use of spironolactone

My patient’s body weight is unchanged on Furosemide 40mg qday.

What should I try next?

1) Furosemide 40mg BID
2) Furosemide 80mg qday
3) Furosemide 40 mg + metolazone 2.5mg qday
4) Switch to torsemide 20mg qday

Note: Furosemide **40mg BID** is <u>not</u> the same as **80mg qday**

My patient’s body weight is not decreasing on Furosemide 40mg qday. Creatinine is rising 1.5 →1.9 (baseline 1.0). Potassium 4.5.

What should I do next?

1. Diuretic holiday for 2-3 days, then repeat labs
2. Furosemide 20mg qday
3. Furosemide 80mg qday
4. Furosemide 40 mg + metolazone 2.5mg qday
5. Switch to torsemide 40mg qday
6. Referral to Nephrology

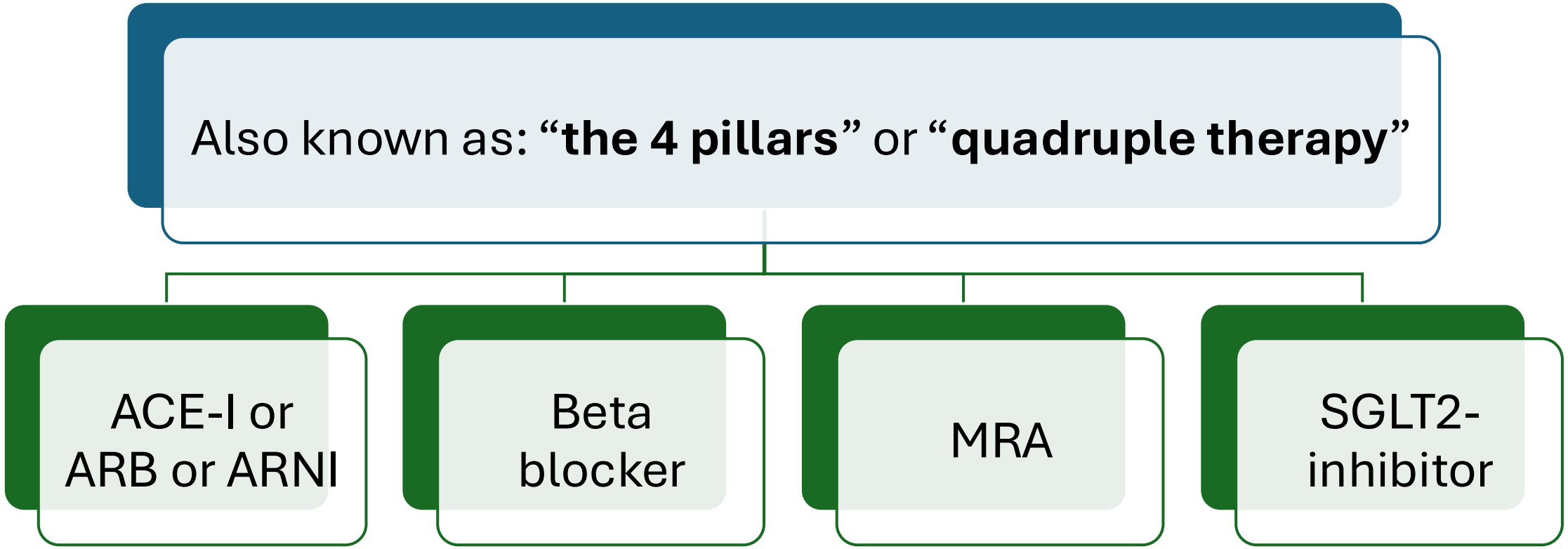
My patient is finally responding with furosemide 80mg qday, but very slowly. Losing only 1 lbs every 2-3 days.

What should I do next?

1. Furosemide 80mg/40mg BID
2. Furosemide 80mg BID
3. Furosemide 120mg qday
4. Furosemide 80 mg + metolazone 2.5mg qday
5. Switch to torsemide 40mg qday

Note: If threshold is achieved, and you want more diuresis, just increase dosing frequency.

Guideline-Directed Medical Therapy (GDMT)



Pathophysiology of HFrEF

Abnormal neurohormonal activation resulting in:

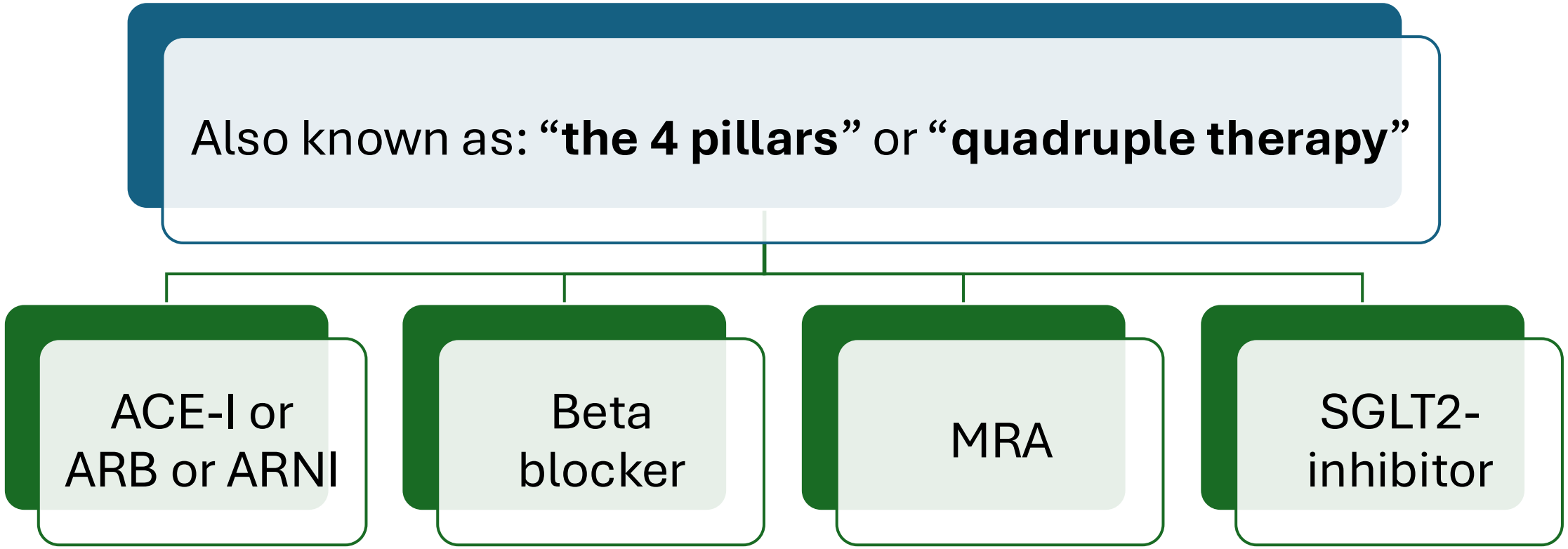
- Upregulation of the sympathetic nervous system (SNS)
  - Beta blockers antagonizes the abnormal upregulation of the SNS.
- Upregulation of the renin-angiotensin-aldosterone system (RAAS)
  - ACE-I, ARB, and MRA antagonizes the abnormal upregulation of the RAAS.

Natriuretic Peptide System (NPS)

- Endogenous compensatory system in HFrEF
  - Vasodilation (afterload reduction)
  - Diuresis
  - Natriuresis

- These protective peptides are naturally broken down by the enzyme neprilysin.
  - Entresto (specifically the sacubitril component) breaks down neprilysin, allowing for the build up of our endogenous natriuretic peptides.

Guideline-Directed Medical Therapy (GDMT)



ACE-I or ARB or ARNI

Angiotensin-converting enzyme inhibitor (ACE-I)	Lisinopril 2.5mg -> 40mg NOTE: Requires 36hr washout to transition to Entresto
Angiotensin receptor blocker (ARB)	Losartan 12.5mg -> 100mg NOTE: Okay to transition directly to Entresto
Angiotensin receptor neprilysin inhibitor (ARNI)	Entresto (sacubitril/valsartan) 24-26mg BID

Beta Blocker

Metoprolol succinate 12.5mg -> 200mg

- Selective inhibitor of B1, less to no effect on B2 at <100mg
- Metoprolol tartrate not used for HF

Carvedilol 3.125mg BID -> 25mg BID

- Nonselective inhibitor beta and alpha, so a stronger BP lowering med

Mineralocorticoid receptor antagonist (MRA)

Spironolactone 12.5mg -> 50mg

- If gynecomastia, switch to Eplerenone

Eplerenone 12.5mg -> 50mg

SGLT2-inhibitor

Empagliflozin 10mg

- Has the lowest eGFR threshold. Preferred in advanced CKD.

Dapagliflozin 10mg

Guideline-Directed Medical Therapy (GDMT)

Also known as: “**the 4 pillars**” or “**quadruple therapy**”

ACE-I or ARB or ARNI	Beta blocker	MRA	SGLT2-inhibitor
Lisinopril Losartan Entresto	Metoprolol succinate Carvedilol	Spironolactone Eplerenone	Jardiance Farxiga

What's the order of initiation of GDMT?

- Officially → Doesn't matter. Simultaneous initiation or rapid sequential initiation.
- In real life, the order depends on other comorbidities

NOTE: better to be on all 4 drugs at low doses than 2 or 3 drugs at higher doses.

- Personally
  1. ACE-I or ARB or ARNI
  2. MRA
  3. SGLT-2 inhibitor
  4. BB

58 year old man

- 108/89
- 98 bpm
- Creatinine 1.56 (baseline 1.1)
- K 3.8
- NTproBNP 4800
- LVEF 30-35%
- Significant intravascular and extravascular volume excess on physical exam

Personally

- Entresto 12-13mg bid (or Losartan 12.5mg q day or BID)
- Spironolactone 12.5mg qday
- Furosemide 40mg qday
- F/u 1 week with repeat labs

During subsequent follow up appointments:

- Increase Entresto and add Jardiance 10mg qday
- When near euvolemia, start metoprolol succinate 25mg qday
- Diuretic might need to be reduced when Entresto, MRA, and SGLT2 added, and with further uptitration of Entresto.

Don’t be afraid to uptitrate because of “soft BP”

If there is contractile reserve:

- increasing vasodilator therapy (afterload reduction) will result in augmentation in stroke volume

Not only will BP not decrease, it might paradoxically increase.

$$MAP = CO \times SVR$$

$$CO = HR \times SV$$

MAP = HR x SV x SVR

1. Preload
2. Afterload
3. Contractility

Special considerations

Avoid abrupt discontinuation of GDMT in:

- Asymptomatic hypotension
- Asymptomatic sinus bradycardia
- Inconsequential creatinine elevation
- Acute decompensated heart failure, unless in shock

What should we do when LVEF normalizes?

01

Continue GDMT

02

Downgrade Entresto to ACE-I or ARB

03

Discontinue 1 or 2 drugs, repeat echo in 3 months

Wording:

- HF with improved EF (as opposed to HF with recovered EF)
- HFrEF (in remission), now with LVEF 60-65%

In summary

Dose diuretics appropriately and escalate aggressively
Worsening creatinine requires escalating diuretic dosing
Initiate quad therapy of heart failure and titrate rapidly
Avoid abrupt discontinuation of GDMT unless in shock
GDMT is for life, to keep HFrEF in remission

Thank you!

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