Cardiovascular Cases

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Case 1

SB is a 57 YO obese BF (5’3”, 208 lbs.) that was newly diagnosed with HTN referred by PCP for HTN management and education.

Her BP is 140/84 mmHg, which is around her readings for the last 2 months.

She has been trying lifestyle modification for the last 3 months, but her BP has not changed. She is not taking any medications for HTN.

What stage HTN does SB have?

Case 1 continue

You have identified a need for additional medication. Which of the following is the most appropriate initial pharmacotherapy for SB?

1) Candesartan

2) HCTZ

3) Metoprolol

4) Ramipril

What if?

The blood pressure was 164/94 mmHg?

A) HCTZ

B) Lisinopril + Losartan

C) HCTZ + carvedilol

D) HCTZ + quinapril

SB has a history of Type 2 DM?

A) Candesartan B) HCTZ

C) Metoprolol D) Ramipril

Case 2

WE is an 79 YO WM with a history of gout and BPH. He presents today complaining of urinary frequency, frequent urination at night, and difficulty starting urination. He reports that the BPH symptoms have gotten better since starting finasteride 3 months ago.

Vital today: BP 154/94 mmHg, pulse 72

What is the goal BP?

Case 2 continue

- **You identified a need for additional medication. What would be the most appropriate intervention to recommend?**
- A) Initiate amlodipine
- B) Initiate atenolol
- C) Initiate chlorthalidone
- D) Initiate doxazosin
- **What if WE was also recently diagnosed with CKD?**
  - A) Initiate amlodipine
  - B) Initiate atenolol
  - C) Initiate chlorthalidone
  - D) Initiate lisinopril

Case 2 continue

- He is started on amlodipine 2.5 mg daily and is titrated up a few weeks later to 5 mg daily. He reports tolerating the medication “just fine.” Slight peripheral edema is noted in the feet bilaterally, but it is not bothersome to the patient. BP today is 145/88 mmHg
- **Which of the following is the most appropriate intervention?**
- Add HCTZ 12.5 mg to help peripheral edema
- Add terazosin 1 mg HS
- Continue amlodipine 5 mg daily
- Increase amlodipine to 10 mg daily

Case 3

- JK is a 62 YO WF with a history of Type 2 DM, HTN, and peripheral neuropathy.
- BP: 149/89 mmHg
- Current medications include:
  - Metformin 850 mg twice daily
  - HCTZ 25 mg daily in the AM
  - Valsartan 160 mg once daily
  - Gabapentin 300 mg TID
  - ASA 81 mg daily
- What is the BP goal?
- What do you think about HCTZ use in diabetes?

Case 4

- AA is a 69 yo WM with PMH significant for tobacco dependency, COPD. He was diagnosed with HTN 3 months ago. He takes HCTZ 25 mg daily with no changes to BP. He is adherence to medication,
- BP 153/ 83 mmHg, pulse 79
- HCTZ 25 mg po qd
- Spiriva one inhalation daily
- Albuterol inhaler 2 puffs QID prn SOB
- Lorazzepam 0.5 mg po TID PRN anxiety

- What is the BP goal for this patient?

- What of the following is the most appropriate intervention?
- A) Switch HCTZ to furosemide
- B) Discontinue HCTZ and switch to metoprolol
- C) Discontinue HCTZ and switch to candesartan
- D) Discontinue HCTZ and switch to Spiranolactone

Case 4

Case 5

- AA is a 68 YO WF with HTN x 10 years. Her HTN was initially managed with dihydropyridine CCB. Although she had a good response, she developed pedal edema that prevented her from getting her shoes on. She was subsequently switch to diltiazem. She currently takes ER diltiazem 300 mg po qd. She was recently diagnosed with peripheral arterial disease, intermittent claudication, and CKD with proteinuria.
- BP: 148/ 84 mmHg, Pulse 62 bpm
- **Which of the following is the most appropriate?**
- A) Increase diltiazem to 480 mg once daily
- B) Add atenolol 50 mg once daily
- C) Add HCTZ 25 mg once daily
- D) Add lisinopril 10 mg daily

Case 5

- Lisinopril 10 mg daily is added to diltiazem. At a follow-up visit, her BP is 142/82 mmHg.
- **Which of the following is the most appropriate intervention?**
- A) Continue current regimen
- B) Increase lisinopril to 20 mg daily
- C) Discontinue lisinopril and add HCTZ 12.5 mg daily
- D) Discontinue lisinopril and add valsartan 80 mg daily
- E) Discontinue Lisinopril and add clonidine 0.1 mg twice daily

Case # 6

- MA is a 65 yo WM (5'9", 220 lbs) who is referred to you the clinical pharmacist following a recent admission for acute HF (SOB with minimal exertion, "recliner" orthopnea). PMH is significant for HTN, HPLD, CAD (3V CABG 2008) and HFrEF (EF by TTE 35% in 2010).
- Patient diuresis 8 pounds over 3 days. During recent admission
- No Known Drug allergies
- labs: CBC – wnl, BMP – SCr 1.1 mg/dl, BUN 27 mg/dl, serum K+ 4.5 mmol/L, LDL 130 mg/dl, HDL 35 mg/dl, TG 178 mg/dl. Liver panel - wnl
- Current Medications: lisinopril 20 mg daily, amlodipine 10 mg at bedtime, furosemide 40 mg qam and 40 mg q afternoon prn, ASA 81 mg daily
- What additional information is needed?

Case # 6 continue Additional information

- Medications prior to recent admission
  - Metoprolol succinate 100 mg daily, furosemide 40 mg qam, lisinopril 5 mg daily, amlodipine 10 mg at bedtime, ASA 81 mg daily
- What, if anything, precipitated Symptoms
  - Fluid intake greater than 2 L
  - Did not understand L to ounces conversion
- Vital signs
  - Patient takes vitals at home: HR 89s, BPs 2h after AM medications 129s/71s; Today in your clinic – BP 137/70 mm Hg, HR 90 bpm
- Current signs and symptoms of HF
  - NYHA class II – Difficulty of breathing while walking up 2 flights of stairs, none while walking into clinic, (-) orthopnea, mild edema in lower extremites, (-) JVD, fatigue at baseline, no dizziness or syncope

Case 6 Continue

You Decided that he need additional therapy Which of the following is the most appropriate option?

A. Start carvedilol 6.25 mg bid

B. Start carvedilol 3.125 mg bid

C. Initiate low-dose digoxin: digoxin 0.125 mg qam

D. Start Metoprolol Tartrate 25 mg qam

Case 6 Continue

- You have identified a need for additional therapy for another CV chronic disease.
- **Which of the following is the most appropriate option?**
- A. Start atorvastatin 10 mg daily
- B. Initiate niacin 500 mg with a meal
- C. Initiate simvastatin 40 mg at bedtime
- D. Start pravastatin 10 mg at bedtime

- **What education should be given to patient regarding HF self- care (non-adherence)?**
- A. Sodium consumption less than 3 grams per day
- B. Total daily fluid less than 2 L
- C. Only take vitals in the AM prior to medications
- D. Only drink water since it is the most hydrating fluid

Case # 6

- MA is a 68-year-old AAM who has been filling prescriptions at your pharmacy for years. You frequently socialize when he comes to pick-up medications. He has come to you with questions regarding medications many times and has learned you recently graduated from Birzeit University With a PharmD . He would like for you to review his HF regimen and give his cardiologist recommendations for treatment.
- He has not been hospitalized for over 1 year but has at least NYHA class III symptoms regularly.
- PMH includes HFrEF (EF < 20%), HTN, BPH, obesity, and gout.
- Allergies – cough to ACEi

Case 6 Continue

- Current Medications:
  - Carvedilol 25 mg bid
  - Losartan 25 mg daily
  - Furosemide 20 mg bid
  - Digoxin 0.125 mg qam
  - Terazosin 2 mg at bedtime
  - Allopurinol 300 mg daily
  - Colchicine 0.6 mg qam prn for acute gouty pain
- Vital Signs:
  - Ht 5’8” Wt 240# (stable), BP 128/68 mm Hg HR 58 bpm
- Current Labs: CBC, CMP – WNL, K+ 4.9 mmol/l, NT-proBNP 2523 pg/ml (baseline 2000-3000)
- Current HF s/sx: Dyspnea on exertion at 50-100 meters , no s/sx of congestion

Case 6 Continue

- You have identified a potential ineffective medication. What would be the most appropriate intervention?

  - Stop carvedilol and start metoprolol succinate 200 mg daily
  - Stop furosemide, start bumetanide 1 mg bid, repeat BMP in 1 week
  - Stop digoxin. Digoxin is not needed since patient is still symptomatic
  - Stop losartan, start candesartan 32 mg daily, and repeat BMP in 1 week

Case 6 Continue

- MA took your recommendation to cardiologist concerning changing ARB. Repeat labs show SCr 1.1 mg/dl and serum K+ 4.6 mmol/l. BP today is 129/69mm Hg and HR 60 bpm. He confirms mostly NYHA class III symptoms. It has been 1 month since patient switched to the medication you recommended You have identified a need for additional drug therapy.
- **What would be the most appropriate intervention?**
  - Initiate spironolactone 50 mg qam
  - Start eplerenone 50 mg qam
  - Start hydralazine/ISDN combination (BiDil) one-half tablet (18.75/10 mg) tid
  - Hydralazine 25 mg 4 times a day and ISDN 20 mg 4 times a day

Case # 7

- JB is a 63 yo WM with a PMH of HFrEF (EF 25-29%), CAD (s/p 4v-CABG 2008), HTN, DM type 2, OSA, CKD and neuropathy.
- He was admitted for acute HF six weeks ago. He comes to you for recommendations regarding BP after being seen by cardiologist yesterday.
- Current Medications:
  - Metoprolol succinate 25 mg qdaily
  - Lisinopril 2.5 mg qdaily
  - Bumetanide 1 mg bid
  - Amlodipine 10 mg daily
  - Atorvastatin 80 mg at bedtime
  - ASA 81 mg qdaily
  - Insulin glargine 20 units at bedtime
  - Gabapentin 400 mg tid

Case # 7

- Vital Signs:
- Ht 6”0, Wt 182#, BP 102/54 mm Hg, HR 101 bpm
- Current Labs:
  - CBC, CMP – WNL, SCr 1.5 mg/dl, K+ 4.1 mmol/l
- Current HF s/sx: DOE with brisk walking, (-) orthopnea
- Signs and symptoms of HF at baseline
- Likely NYHA class II symptoms.
- Patient is adherent to sodium and fluid limits
- Vital signs
  - Patient takes vitals at home: HR 90-100s, BPs prior to medications are 150/90s and 2h after AM medications 80-100/50s mm Hg.
  - Patient typically does not take medications prior to MD appointments.
  - Adherence to CPAP
  - Patient cannot sleep without CPAP. He even wears it for naps during the day.

Case 7 continue

What medication therapy problem Does JB have?

Which of the following is the most appropriate intervention?

1) Reduce amlodipine to 5 mg daily and increase metoprolol succinate to 50 mg daily

2) Stop amlodipine and increase metoprolol succinate to 50 mg daily

3) Advise immediate evaluation in the ER

4) Stop amlodipine, increase metoprolol succinate 50 mg daily and initiate spironolactone

Case 7 continue

- JC appreciated all your recommendations over the last few months and has tolerated changes to date. Cardiologist recently repeated echocardiogram to reassess EF for consideration of a defibrillator. He is disappointed that EF is still low (25-29%), especially with HF medication uptitration. ECG shows NSR, rate 82.
- Current Medications:
- Metoprolol succinate 200 mg qdaily
- Lisinopril 10 mg at bedtime
- Bumetanide 1 mg bid
- Metolazone 2.5 mg qam prn
- Spironolactone 25 mg qam
- Atorvastatin 80 mg at bedtime
- ASA 81 mg qdaily
- Insulin glargine 25 units at bedtime
- Gabapentin 800 mg tid

Case 7 continue

- Vital Signs:
  - Ht 6”0, Wt 180#, BP 96/52 mm Hg, HR 82 bpm
- Current Labs:
  - CBC, CMP – WNL, SCr 1.6 mg/dl, K+ 5.2 mmol/l NT-proBNP 3620 pg/ml (baseline 3500-4000 pg/ml)
- Current HF s/sx: DOE with minimal activity and abdominal fullness, no orthopnea or pnd, no dizziness or syncope (NHYA class III)
- What Medication Therapy problem?

Case 7 continue

- You have identified that JC is currently optimized on beta blocker and ACEi. He is still symptomatic but has not been hospitalized (4 months ago) since visiting your clinic. Patient has developed mild hyperkalemia due to spironolactone dose and diet.
- Which of the following is the most appropriate intervention?

  - Start digoxin 0.125 mg qam
  - Increase lisinopril to 20 mg at bedtime
  - Reduce spironolactone to 12.5 mg qam
  - Start valsartan/sacubitril 100 mg bid
  - Start ivabradine 5 mg bid

Case 7 continue

- JC successfully underwent pacemaker implant. He feels great and has much more energy. He can walk up stairs now without limiting DOE. He denies orthopnea . BPs are now 80-90s/50s and HR 60. He is feeling dizzy upon standing. Weight is down to 172#.
- Current Medications:
  - Metoprolol succinate 200 mg qam
  - Lisinopril 10 mg at bedtime
  - Ivabradine 5 mg bid
  - Bumetanide 1 mg bid
  - Metolazone 2.5 mg qam prn
  - Spironolactone 25 mg qam
  - Atorvastatin 80 mg at bedtime
  - ASA 81 mg qdaily
  - Insulin glargine 25 units at bedtime
  - Gabapentin 800 mg tid
- Vital Signs: Ht 6”0, Wt 172#, BP 88/50 mm Hg, HR 60 bpm
- Current Labs: CBC, CMP – WNL, SCr 2.2 mg/dl, K+ 5.3 mmol/l NT-proBNP 960 pg/ml (previous 3620 pg/ml)
- Current HF s/sx: Dizziness (NHYA class I)

Case 7 continue

- You have identified that JC's weight is down 8 bounds from baseline, natriuretic peptide is much lower than baseline, renal function is worse, and patient may be having symptomatic hypotension.
- **Which of the following is the most appropriate intervention?**
  - Stop metolazone and hold bumetanide. Check labs in 2-3 days
  - Stop metolazone, hold bumetanide and reduce spironolactone to 12.5 mg daily. Check labs in 2-3 days
  - Do not do anything
  - Stop ACEi, spironolactone, metolazone and metoprolol succinate