Evidence Based Medicine Case on Heart Failure

Larry Money is a 55 year old white man who presents to the IMC to establish care. Over the last several months he is getting more and more short of breath with exertion. He used to work in construction, but had to quit 4 months ago because he just "couldn't keep up". He has also noted swelling in both of his legs up to his knees, and states he has put on about 20 pounds. At this point he can only make it up about one flight of steps without stopping to rest. He states he was admitted to another local hospital 3 years ago with chest pain, told he "didn't have a heart attack", but was told his heart was "somewhat weak" and advised to follow-up. He had no symptoms at the time so he did not bother to follow-up. He sleeps comfortably on 3 pillows, and denies waking up gasping for air. He has no symptoms at rest or while bathing, dressing, or preparing his meals. Denies HA, dizzy, sinus pain, sore throat, oral lesions, neck pain, chest pain, palpitations, cough or wheeze. He does admit to SOB with exertion as described above. He has attempted his girlfriends albuterol inhaler with no improvement of symptoms, otherwise denies any history of lung disease (asthma, COPD, etc…). Denies abdominal pain, nausea, vomiting, diarrhea, constipation (his bowels are "regular"). No dysuria or hematuria, no polyuria, polyphagia, polydipsia, no myalgias or arthralgias. No rash. He states "it's time I start feeling like myself again".

Past Medical Hx: "somewhat weak heart", "told pressure high", "doc, I've been very healthy otherwise"
Past Surgical Hx: Appendectomy at age 18
Allergies: NKDA
Social Hx: quit tobacco 8 months ago (previous ½ ppd for 20 years); former heavy drinker (6 beers daily) – again quit 8 months ago when started feeling poorly; remote marijuana, and experimented with cocaine in the '80's
Family Hx: Mom alive age 78 with "high pressure"; Dad deceased age 68 with "heart condition"; Brother alive age 58 with "high pressure – but he takes his meds" and otherwise healthy
ROS: as above

VITALS: Temp 98 HR 90 BP 160/94 Resp 14 Pulse Ox 94% RA Ht 72" Wt 250 lbs., BMI 34
General: A&Ox3; NAD; Nontoxic; Pleasant
HEENT: PERRL, EOMI, no scleral icterus, no conjunctival injection, TM's clear, oral mucosa moist, missing several teeth
Neck: Supple, no carotid bruit, prominent jugular veins when pt supine
Heart: RRR no murmur, gallop or rub; large point of maximal impulse
Lungs: Soft crackles at bilateral bases, otherwise clear with no wheeze or rhonchi, no prolonged expiration
Abdomen: Obese, Soft, normal bowel sounds, NT/ND, no fluid wave, unable to appreciate hepatojugular reflex

Extremities: Lower legs: +1-2 pitting edema bilateral low legs, no calf tenderness, no skin discoloration, no warmth, no Homan's sign
Neuro: Grossly intact
Vasc: Peripheral pulses palpable
Plato review: 1 ER visit in 2007 for repair of laceration on hand (no labs or studies otherwise)
Old records: records (3 years ago) from outside hospital: review of discharge summary shows pt presented with chest pain, was felt to be high risk so had left heart catheterization which revealed widely patent coronaries, no significant valvular disease, but "cardiomegaly with global cardiomyopathy" with an EF of 40%. DC summary states all labs at times including CBC,CMP, TSH, tox screen, Lipid Panel were unremarkable, the patient was to followup for further testing (including echocardiogram) and discharged on furosemide, ramipril, and metoprolol succinate. (you discuss with patient who states at time meds to expensive and he felt fine, so he never got them)

Please utilize the following link to ACC/AHA 2013 Heart Failure guidelines to answer the following questions:

http://circ.ahajournals.org/content/early/2013/06/03/CIR.
0b013e31829e8776.full.pdf

- What are the four stages of heart failure?
    - What are the recommended therapies for each stage?
    - What stage does Mr Money fit in (at the time of previous hospitalization, and now)?(pg84)

- What are the cardinal manifestations of heart failure?
- What are the 3 ways patients with heart failure typically present to healthcare providers? (pg 12)

- What is the single most useful test in evaluation of patients with heart failure?
    - What are the 3 fundamental questions to be addressed by this study
    - Should we order this test for Mr Money now?(pg 33)

- What laboratory, radiographic, and ECG tests should be included in the initial evaluation of patients with heart failure? (pg 29,32)
- What tests are recommended to be done routinely in heart failure patients
- How often should echocardiogram(assessment of EF) be done? (pg 33)
- Compile a list of test orders for Mr Money.

You tell Mr Money that your believe he has heart failure. He asks "how much time do I have left Doc?"

True or False:

- Validated multivariable risk scores can be useful to estimate subsequent risk of mortality in ambulatory or hospitalized patients with heart failure. (pg 27)

Please list selected multivariable risk scores to predict outcome in heart failure listed in the guidelines, and utilize Seattle Heart Failure Model to calculate Mr Money's anticipated 1 year and 5 year survival (use following – no current meds, EF 30%, sodium 130, total cholesterol 250, hemoglobin 12, lymphocytes 40%, uric acid 6 mg/dl) (pg 28)

Mr Money asks if there is anything he can do to "help himself"?
- He states his dad used to have a special diet and exercise program. Should he have one?
- He also states he uses ibuprofen several times a week for aches and pains. Is that ok?

(Answer next few questions to be prepared to answer Mr Money)

True or False:
- Heart failure patients need to understand how to monitor their symptoms and **weight fluctuations** , restrict their sodium intake, take their medications as prescribed, and stay physically active. Education regarding these recommendations is necessary, albeit not always sufficient, to significantly improve outcomes. (pg 43)

Should physical activity be encouraged? In a clinically stable patient, how can cardiac rehabilitation be useful? (pg 45-46)

What 4 classes of drugs can adversely affect the clinical status in patient with current or prior symptoms of heart failure with reduced EF, and should be avoided or withdrawn in these patients whenever possible? (pg 64)

Every patient with heart failure should have a clear, detailed and evidence based plan of care. What should that plan of care ensure achievement of? (pg 106)

Mr Money asks about medications, he states he currently could only afford about to pay $20 per month on medications (he has no insurance and is not working). Please answer the next question.

When are the following medications / treatments indicated or recommended in patients with reduced left ventricular ejection fraction?
   a. Diuretics
   b. ACE inhibitors
   c. Beta blockers (which specific agents are recommended as well)
   d. ARBs
   e. ICDs
   f. Cardiac resynchronization therapy

g. Aldosterone antagonist
h. Combination hydralazine / nitrates
i. Digitalis
(see pg 66-67, 75-76 – this information is very important know it very well!!!)

Please use the following link for the next three questions:
http://circ.ahajournals.org/content/early/2016/05/18/CIR.0000000000000435.full.pdf+html

• What is an ARNI? (pg 8)

• When is an ARNI considered to replace an ACE or ARB? (pg 10)

• What is ivabradine and when is it indicated in heart failure treatment? (pg 11)

Devise a treatment regimen for Mr Money, assuming the labs you ordered showed normal renal function and electrolytes. (you should "cheat ahead" to the second to last question in this module to help on this answer as well).

Mr Money asks what to expect if he does nothing. "What is the worst thing this "heart failure" could progress to anyways, what can make this worse, and if I get real short of breath and go to the hospital what can I expect?" (OK, a bit unrealistic but answer next several questions to be prepared to respond to Mr Money.)

• What are the clinical symptoms or signs of a patient with refractory end-stage heart failure?
• What should a physician confirm before a patient is considered to have refractory heart failure?(see text pg 77-78) Review table 25 on page 78-79 to review INTERMACS profiles.
• What are common factors that precipitate hospitalization for heart failure? (pg 87)
• Should you utilize intravenous or oral diuretics on the patient being admitted? How should diuretic dose be titrated?
• What labs should be followed? Should you continue the patients ACE and B-blocker therapy?
• If the patient was not already on a beta blocker, should it be started in the hospital, if so when?
• What should be addressed with the patient on discharge (and every heart failure patient we have clinical contact with)? (pg 88,94)
• What is the readmission rate at 6 months and mortality rate at 12 months following index hospitalization for heart failure? (pg 85)

What are the starting doses and maximum doses for the following medications utilized in heart failure treatment in the IMC: furosemide, lisinopril, and carvedilol? (pg 49,50-51)

If our patient had heart failure with normal left ventricular ejection fraction, what would be the major treatment recommendations? (pg68-70)

Case by Rex Wilford. Updated 7-2016