1) **For the past 2 weeks a 45 yo female patient has abdominal bloating, joint pain, fever (low grade), pruritus (itching) and hyponatremia (low sodium). Use DXplain to look into some possibilities and submit a list of the top 5 suggested diagnostic considerations. Then, try using the "focus" function on abdominal bloating to see what changes.**

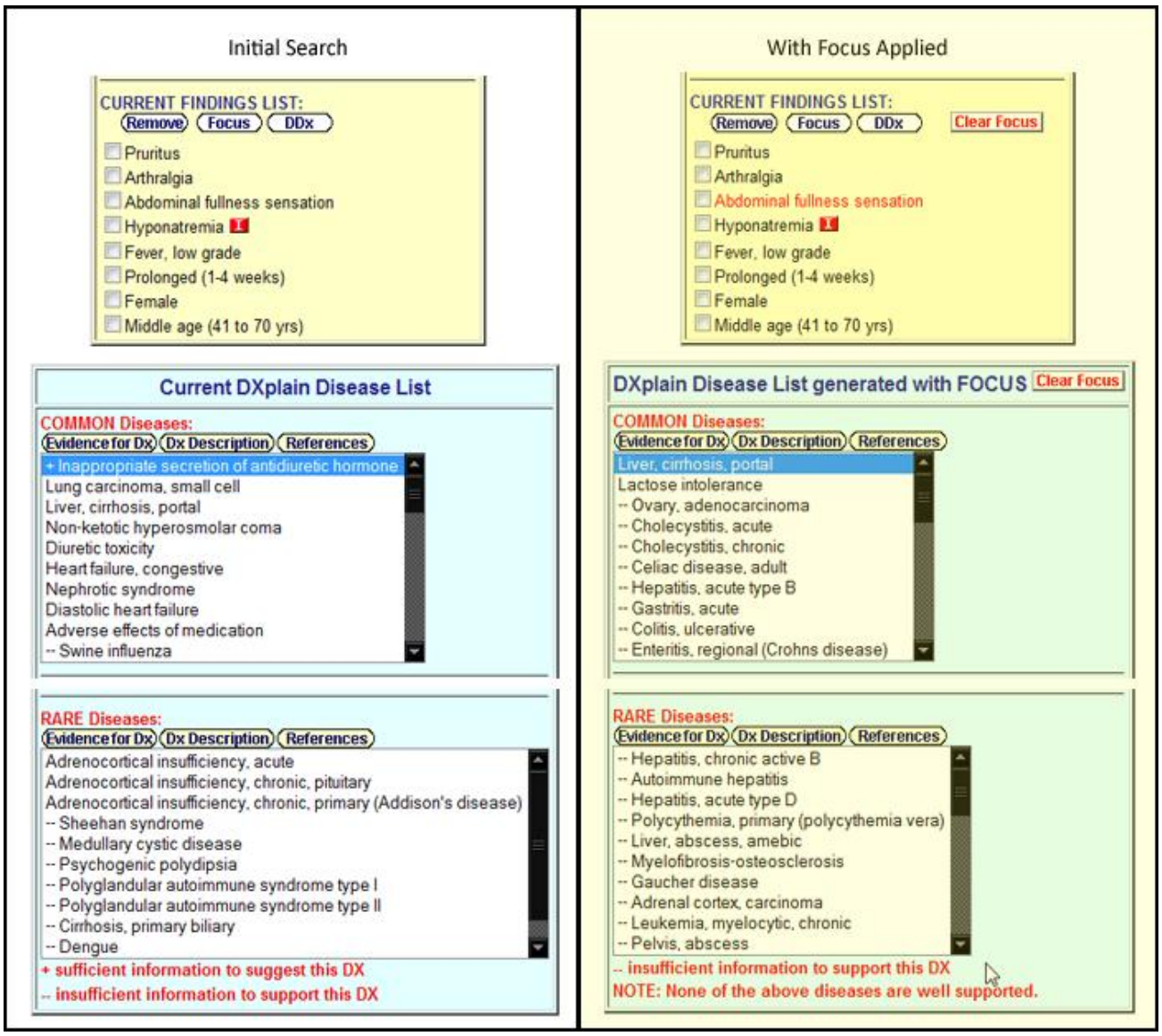
Using DXplain with the above criteria, it recommended the following possible diseases with "Inappropriate secretion of antidiuretic hormone" indicated as "sufficient information to suggest this DX. The top five suggested diagnostic considerations were:

1. Inappropriate secretion of antidiuretic hormone
2. Lung carcinoma, small cell
3. Non-Ketotic hyperosmolar coma
4. Diuretic toxicity
5. Heart failure, congestive

I found it interesting that after applying a focus on abdominal bloating that instead of increasing diagnoses with sufficient information it instead made it that none of the diseases recommended were well supported. The top 5 changed to the below:

1. Liver cirrhosis, portal
2. Lactose intolerance
3. Ovary adenocarcinoma
4. Cholecystitus, acute
5. Cholecystitis, chronic

The following is a visual to show the initial search followed by applying a focus that I did while using the tool.



I also found it helpful to be able to click on "Evidence for DX" as well as "Dx Description" to be able to see the supporting evidence that explained the suggested Disease list and to get more background on the diseases from the provided lists.

Sources:

- DXPlain from the Galter Health Sciences Library, http://dxplain.org.ezproxy.galter.northwestern.edu/dxp/dxp.direct.pl?login=weblp
- Session 3 DXPlain tutorial video done by Dr. Liebovitz

Please also answer the following essay questions based on text and article readings over this past few weeks:

2) What is the definition of a disease? How does this definition relate to a problem list?

A disease is an identifiable abnormal physiologic process(es) leading to specified clinical characteristics. A disease can also be an identifiable group of symptoms for which interventions may be studied and longitudinal prognoses may be assigned.

A problem list is a list of significant illnesses and operations. It can serve as a historical record for the clinician to

compare with in making a diagnosis of a disease. A problem list includes all of the medical, social and psychological problems that the patient has or may have. The problem list can be used to form a differential diagnosis through the process of weighing the probability of a disease or disorder existing given the presence found in their problem list.

The differential diagnosis seeks to limit the disease to a human organ system or two. By doing this it provides a context for how a disease might affect a person. It essentially helps classify a disease and it's symptoms and effects. The text lists 11 different disease categories on page 30. Knowing a disease category or severity of a disease can help prioritize treatment or care. When multiple diseases are present, it can also direct focus on the disease with more severe risks.

With context of defining a disease during the diagnostic process, it involves outlining its borders, clearly identifying it and describing it and excluding all other possibilities. As mentioned in the text, defining a disease seeks to "establish a set of criteria that are fulfilled by *all* patients who are alleged to have a particular disease and fulfilled by *no* patients who do not have it.

Sources:
- Session 3 Lecture Slides (20-22)
- Problem Solving in Clinical Medicine, pp 30-31

3) What is meant by a "key clue" or "pivotal clue"?

When there are many symptoms that seem unrelated in or lead together to rule a certain diagnosis, it is a key clue that can help point a clinician in the right track and prompt further investigation that might help further establish a proper diagnosis. The idea being that the clinician is looking for a common thread that presents in the patient that is known to exist in a specified variety of clinical circumstances. The "key clue" is the one that centers the clinician to focus in on the leading symptom that narrows the focus. As pointed out in the text, the "key clue" may be a symptom, a sign, or a laboratory abnormality. Once discovered, the clinician uses it to perform further diagnostics and tests to rule in or out the possibility or lack of symptoms of a focused disease.

Similar to a "key clue", a "pivotal clue" serves as the foundation for which a diagnosis is built around. The evidence focuses on or around the pivotal clue. Without it, there is no basis for the diagnosis.

Sources:
- Session 3 Lecture Slides (24-25)
- Problem Solving in Clinical Medicine, pp 30, 38

4) What classes of items are appropriate to include in a patient's problem list? What are examples of each?

As shared in the text there are three primary classes of information to record in a patient's problem list. The text offers an excellent example of a patient who is committing blood and is known to have migraines and to be diabetic. Following the same example, the different classifications are illustrated along with the examples of how the problem list might be broken down to its appropriate classifications. In my example the classifications are indicated in bold.

Medical
1) hematemesis
2) diabetes mellitus
3) Migraine

Social
4) Poverty

Psychological
5) Recent Divorce
6) Depressed

Classifying the problems might prove useful in considering them together with knowing how one might impact or influence the other.

Sources:

- Problem Solving in Clinical Medicine, pp 30

5) How and why should a problem list change during a patient's hospitalization?

A problem list is a combination of a historical record of the patients significant illnesses or operations and their current list of complaints that is adversely affecting their current health. The combination of all helps the clinician to make a proper diagnosis. The problem list is formulated after collecting information in dialogue with the patient. After it is collected, the physician then focuses in on each individually and then tries to consider clusters to come up with patterns or syndromes that might lead to early hypothesis generation. These then feed into a differential diagnosis list so that the physician can begin to prove or disprove the probability of disease.

In the diagnostic process and in working towards a diagnosis certain items in a problem list can be found to be unsubstantiated and therefore eliminated. Sometimes as explained in the text, information must be suppressed because the patient offers too much information to process.

Also the text covers this in chapter 12 and gives a good example on page 114 of a problem that starts with 11 items. After evaluation, the clinician determines that problems 1,2 and 3 are all related and combines them into a single problem. In situations like this, it is then appropriate to revise the problem list so that it is timely and accurate and reflects information as it is processed so that it can be utilized better as a resource in making an accurate diagnosis and generating a plan of care.

With consideration to how changes might be captured, they could be done through traditional methods including:

- Charting manually in a patients paper record through pen and paper
- Dictating the changes to be later transcribed and updated in the patient record
- Electronically through a CPOE or an EHR system to codify the problem through standardized means of referring to the problem (ICD9-CM, ICD-10, SNOMED CT are all examples)

Sources:
- Session 3 Lecture Slides (20-22)
- Problem Solving in Clinical Medicine, pp 28-35, 112

6) What are some factors contributing to diagnostic errors?

The article assigned in our reading for the week pointed out a number of contributing to diagnostic errors. They include; human, organizational, technical, patient related and other. Included within the human factors are three sub classifications. Each are described below:

- Knowledge based – the inability of an individual to apply his or her existing knowledge to a novel situation.
- Rule based – **Qualification** rule is an incorrect fit between an individual's training or education and a particular task. **Coordination** rule is a lack of task coordination in a health care team in an organization. **Verification** rule is the correct and complete assessment of a situation, including related conditions of the patient and materials to be used before starting the intervention. Intervention rules are failures that result from fault in task planning and execution. **Monitoring** rules are failures to monitor a process or patient status.
- Skill Based – slips where a failure to perform a highly developed skill occurs (ie computer based skill). Tripping involves physical error involving "slipping, tripping, or falling"

In addition within Human factors are those that are external in that they happen beyond the control and responsibility of the affected organization. There are also deliberate factors which happen with blatant disregard for rules set by the organization.

The article pointed out that Human failures were identified as the main cause in as much as 96.3% percent of studied adverse events. Diagnostic Errors were more severe subset of the larger adverse affect type.

Sources:
- Article: Patient Record Review of the Incidence, Consequences, and Causes of Diagnostic Adverse Events
- Article: Invited Commentary on Adverse Events