- Laboratory tests give medical personnel objective data about a patient's body systems and organ function. By evaluating different labs, medical personnel have information about a patient's condition at that point in time. If the same lab tests are repeatedly performed (every 6 hours, 12 hours, 24 hours, etc), then personnel can identify the improvement or deterioration of a patient's condition.
- Many different body fluids can be sampled for laboratory tests to gain information. Most often, blood (serum) is sampled to give personnel information about the patient's systemic condition. In other instances, body fluid from an organ or system itself may be sampled for more local and precise information (like urine to evaluate kidney function, pus from an abscess, etc).
- A "panel" is a group of tests commonly performed together. Many often also contain the reference ranges for normal values to help aid in interpreting what the patient value means.
- Different reference labs may vary on the normal ranges they provide. This is why you may see slight variances between *Nursing Central* and your different textbooks as to what is "normal". In practice, always consult the lab you are working with. For this assignment we will be using the values found in *Nursing Central* and are given to you in this section.
- "Normal" lab values also may vary based on age and sex of the patient. Be sure to evaluate correctly according to your patient demographics.

Lab Panels and Normal Values for This Assignment

Basic Metabolic Panel	**Normal Range**
Sodium	135- 145 mEq/L
Potassium	3.5-5.3 mEq/L
Bicarbonate	22-26 mEq/L

Chloride	97-107 mEq/L
Calcium	9-10.5 mg/dL
Blood Urea Nitrogen (BUN)	8-21 mg/dL
Creatinine	M: 0.61–1.21 mg/dL F: 0.59–1.04 mg/dL
Glucose	Does not matter for this assignment

Comprehensive Metabolic Panel	**Normal Range**
Sodium	135- 145 mEq/L
Potassium	3.5-5.3 mEq/L
Bicarbonate	22-26 mEq/L
Chloride	97-107 mEq/L
Calcium	9-10.5 mg/dL
Blood Urea Nitrogen (BUN)	8-21 mg/dL
Creatinine	M: 0.61–1.21 mg/dL F: 0.59–1.04 mg/dL
Glucose	Does not matter for this assignment
Albumin	3.7–5.1 g/dL
Total Bilirubin	Less than 1.2 mg/dL
Total Protein	6-8 g/dL
Alanine Amniotransferase (ALT)	M: 19-36 units/L F: 24-36 units/L

Alkaline Phosphatase (ALP)	M: 35-142 units/L F: 25-125 units/L
Aspartate Amniotransferase (AST)	M: 20-40 units/L F: 15-30 units/L

Complete the following questions by either copying the questions into a text box below, or using the Word document and uploading to this assignment. Please leave the original questions visible with your answers:

1. Evaluate the individual tests in the given basic metabolic panel and the comprehensive metabolic panel in the Notes section. Fill out the chart with x's below to determine which organs or systems are evaluated by each panel and then answer the question: why might a provider choose to order the CMP instead of a BMP?

Body System/Organ Evaluated	Basic Metabolic Panel	Comprehensive Metabolic Panel
Kidney		
Liver		
Metabolism/Electrolytes		

Reason for ordering a CMP instead of a BMP:

2. For the next part of the assignment you will be given different patient scenarios as well as some common patient lab panels and normal ranges. Based on the patient values given for each panel and how they may differ according to the normal ranges, determine which patient (A, B, C, D or E) has a condition and status that is most likely to match each panel and write the letter for the corresponding patient

where it says “Patient” with the panel you think they belong to below. Write your explanation for why you believe that patient belongs with that lab panel in complete sentence thoroughly explaining your reasoning where it says “Rationale”. Each patient is only used once.

Note: these tests are not the ONLY ones that should be performed during patient care for patients with the given conditions, but as a healthcare worker, you are evaluating which of the present choices would be the most helpful for the patient, or most explains the patient condition illustrated.

Patients:

Patient A: A 36 year old male patient admitted with acute abdominal pain and fever

Patient B: A 43 year old male patient admitted with abdominal pain, fatigue and tar-like stool for three days

Patient C: A 63 year old female patient with CKD admitted with shortness of breath, fluid retention and decreased urinary output

Patient D: A 28 year old female admitted with dysuria and fever who was recently on antibiotics

Patient E: A 65 year old male patient who has an intestinal obstruction and has been vomiting for three days

Lab Panels:

Complete Blood Count	Patient Value	Normal Range
Red Blood Cells	4.18	M: 4.51-6.01 F: 4.01-5.51
Hemoglobin	11	M-14-17.3 g/dL F- 11.7-15.5 g/dL

Hematocrit	38%	M: 42-52% F: 36-48%
Platelets	200,000	150-450 x 10^3
WBCs	7,000	4500-11,100/mm^3

Patient:

Rationale:

White Blood Cell Differential	Patient Value	Normal Range
WBC	15, 000/mm^3	4500-11,100/mm^3
Neutrophils	76%	40-75%
Lymphocytes	15%	12-44%
Monocytes	5%	4-9%
Eosinophils	3%	0-5.5%
Basophils	0.8%	0-1%

Patient:

Rationale:

Basic Metabolic Panel	Patient Value	Normal Range
Sodium	132	135- 145 mEq/L

Potassium	3.0	3.5-5.3 mEq/L
Bicarbonate	27	22-26 mEq/L
Chloride	98	97-107 mEq/L
Calcium	9.2	9-10.5 mg/dL
Blood Urea Nitrogen (BUN)	23	8-21 mg/dL
Creatinine	0.9	M: 0.61–1.21 mg/dL F: 0.59–1.04 mg/dL
Glucose	77	In normal range for this patient
Patient:		
Rationale:		

Urinalysis	Patient Value	Normal Range
pH	7.5	4.5-8.0
Protein	2	Negative
Glucose	Negative	Negative
Ketones	Negative	Negative
Specific gravity	1.009	1.005-1.03
WBCs	10/high powered field	Less than 5/high powered field
Patient:		
Rationale:		

Renal Function Tests	Patient Value	Normal Range

GFR	67 mL/min
BUN	27 mg/dL
Creatinine	5.7 mg/dL

Patient:

Rationale: