Breaking through barriers: tackling medical complexities locally and globally

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Proverb of the day

"To a man who only has a hammer in his tool kit, every problem looks like a nail"

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Framework for problem solving

Content

- Clinical knowledge of various topics (e.g., hyponatremia, CHF, DIC)

Structure

- Approach to solving the problem (e.g., frameworks, VITAMIND, system based, head to toe)

Style

- “The practice of medicine in society” (e.g., patient characteristics, pros and cons of clinical decisions, personal biases)

- Vascular
- Infection
- Trauma
- Autoimmune
- Metabolic
- Idiopathic
- Neoplasia
- Drugs

- Skin
- Muscle
- Nerves
- Vessels
- Bones

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Framework for problem solving

Where should I have lunch?

- Mutually
- Exclusive
- Completely
- Exhaustive

Lunch location?

Internal

- West End Cafe
- Brew HaHa
- Corner Cafe

External

Far

- TBD
- Planet Mars?

Near

- Market Kitchen bar
- Border café
- TBD

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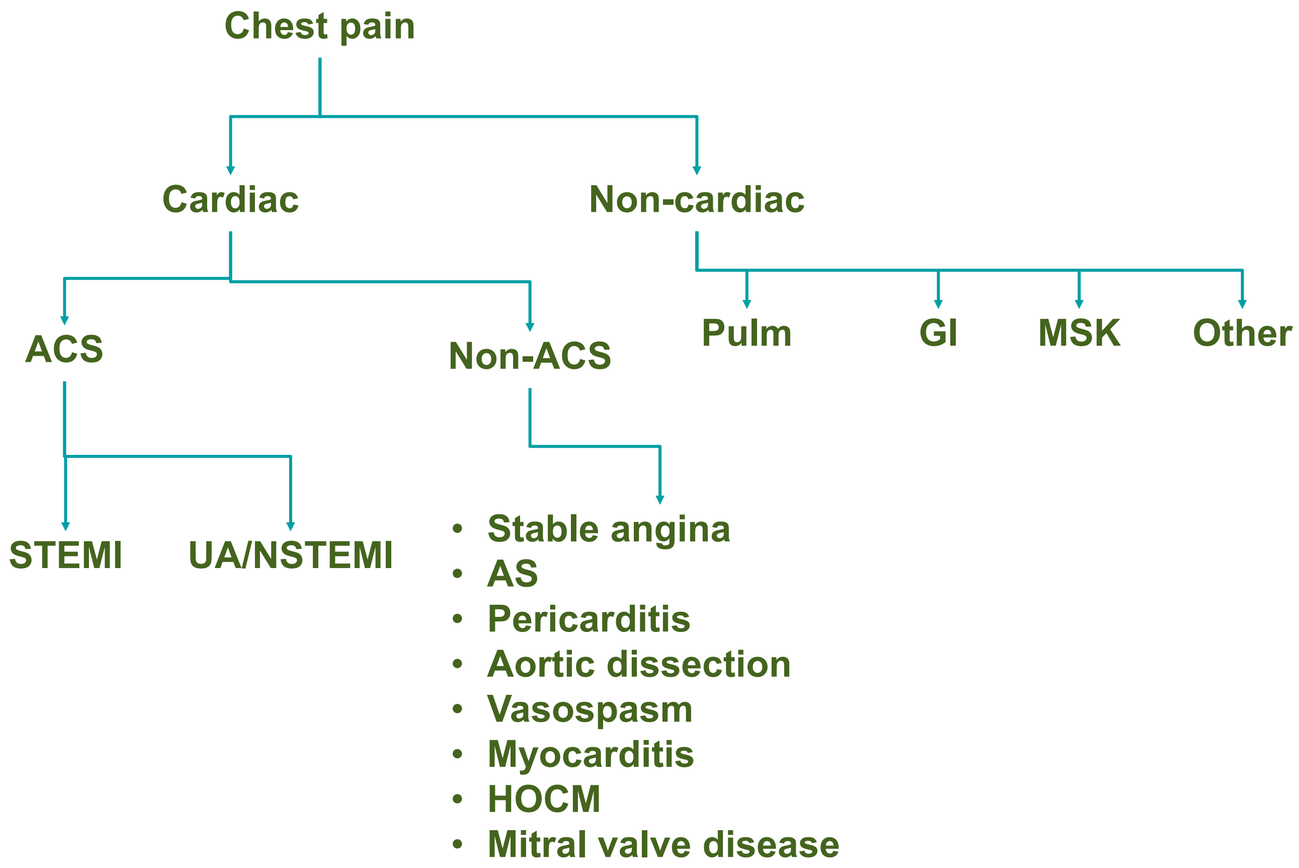
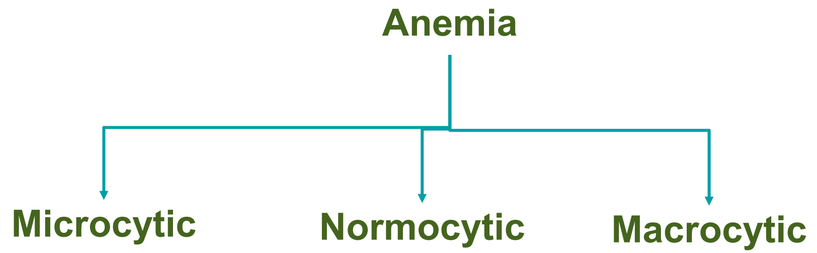
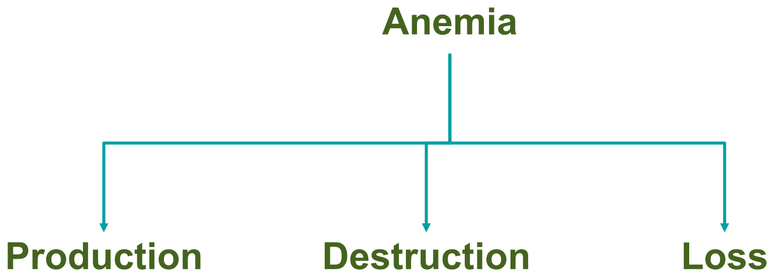
Framework for problem solving
Practice cases

What frameworks can you use for the following complaints?







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Why am I broke?

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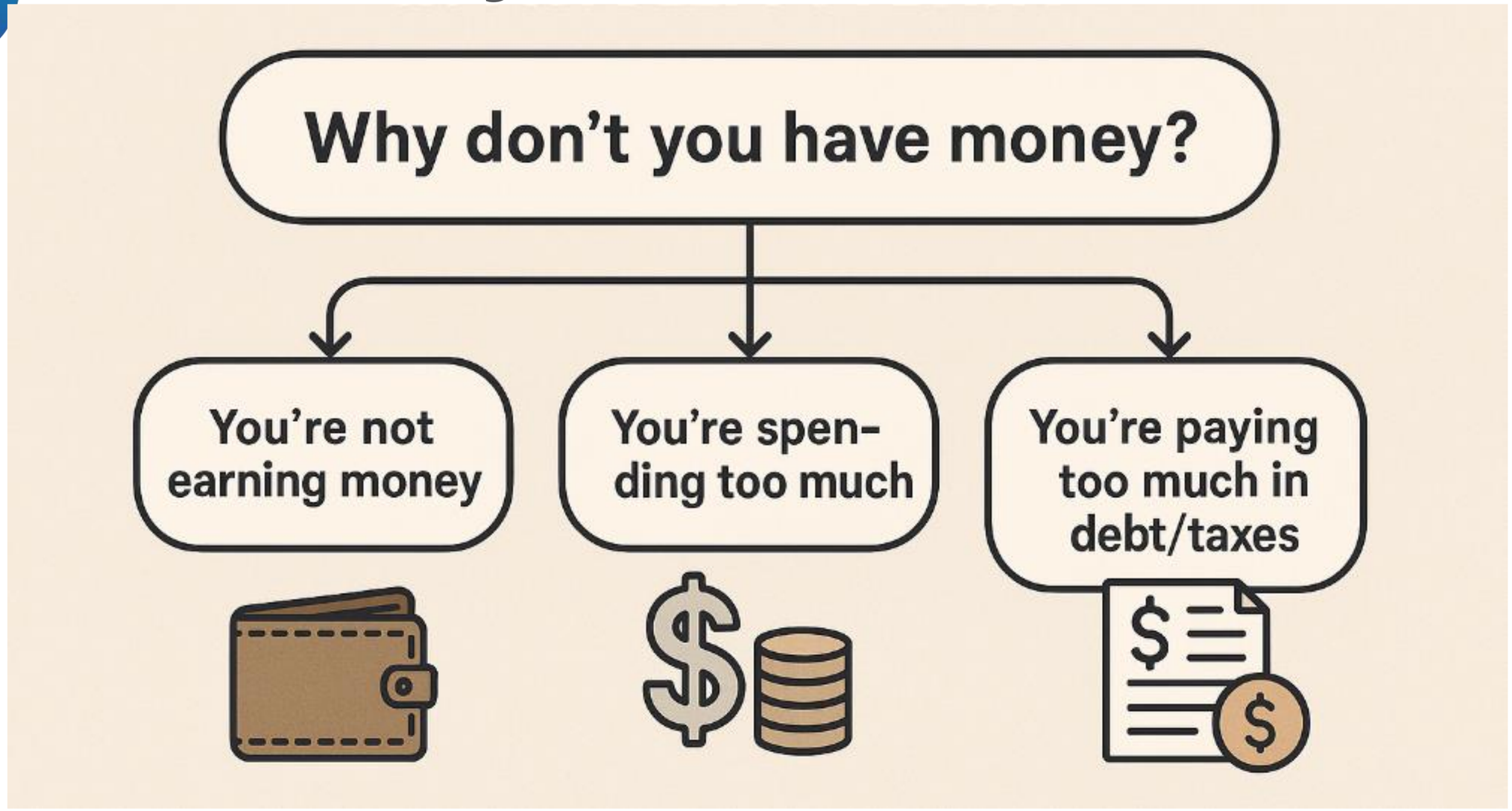
Why am I broke?



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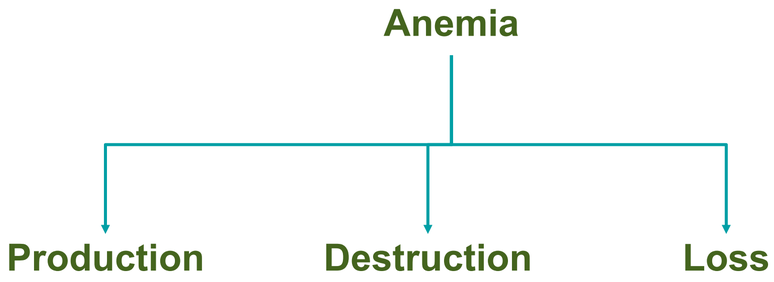

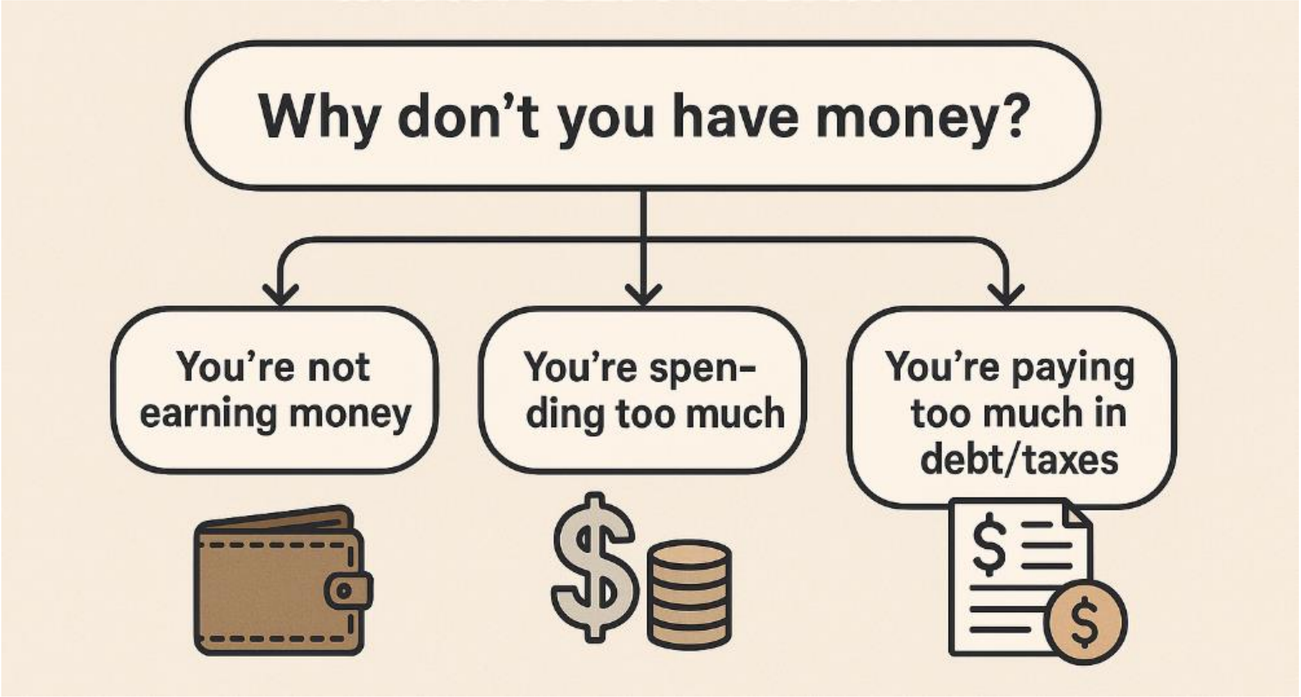

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Case presentation

Case

HISTORY OF PRESENT ILLNESS

A 55-year-old man with unknown past medical history comes into clinic with complaints of **shortness of breath** and diffused pains for the past 1 week.

Case presentation

Case

HISTORY OF PRESENT ILLNESS

A 55-year-old man with unknown past medical history comes into clinic with complaints of **shortness of breath** and diffused pains for the past 1 week.

PAST MEDICAL HISTORY

None

FAMILY HISTORY

Not aware of any medical problems in his family

MEDICATIONS

None

SOCIAL HISTORY

Lives with his wife and works as a taxi driver.
Denies alcohol, smoking and illicits

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Case presentation
Physical Exam

- Vitals: 98.6 HR 125 (60-90) BP 146/74 RR 16 Oxygen saturation 85% on room air
- General: In moderate distress and reports diffused body aches
- Eyes: EOMI, Sclera anicteric and without injection, oral mucosa dry
- Cardiac: Tachycardic, no murmurs
- Lungs: Trace wheezes and bibasilar crackles
- Abdomen: Soft, non tender, non distended, no hepatosplenomegaly
- Extremities: 5/5 strength in all extremities and tender to palpation diffusely
- Neuro: Alert, Oriented x1, CN II-XII intact, no focal lesions

Case presentation

What is on the differential for Shortness of Breath?

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Shortness of breath

- Cardiovascular system
  - Heart failure
  - Anemia
  - Deconditioning
- Respiratory system
  - Controller
  - Ventilatory pump
  - Gas exchanger

Shortness of breath

Cardiovascular system

Heart failure

- Ventricular systolic
- Ventricular diastolic
- Cardiac tamponade

Anemia

- Loss
- Production
- Destruction

Deconditioning

- Other

Respiratory system

Controller

- Brainstem
- Drugs (e.g., Aspirin)
- Pregnancy
- DKA

Ventilatory pump

- Neuromuscular weakness
- Chest wall compliance
- Lung compliance

Gas exchanger

- Emphysema
- Pulmonary fibrosis
- Dilated capillaries (e.g., hepatopulmonary syndrome)

Takeaways

Takeaway 1

- Ensure a structured approach to problem solving when confused or have limited data– **STRUCTURE – STRUCTURE - STRUCTURE**

Takeaway 2

- …

Takeaway 3

- …

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Case recap

- A 55-year-old man with no known past medical history comes into clinic with complaints of **shortness of breath** and diffused pains for the past 1 week.

- He does not take any medications, alcohol or illicit drugs and he works as a taxi driver.

- He presents in moderate distress with and O2 sat is 85% on RA

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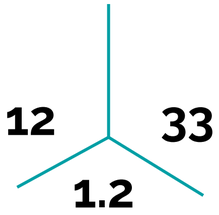
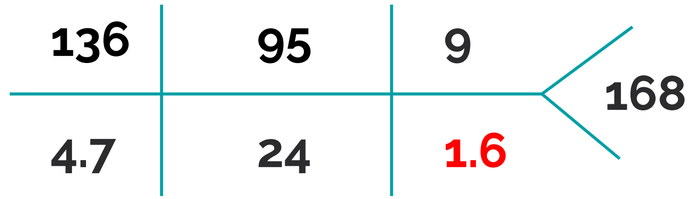
Case presentation
Labs

CBC

Coags



Chem 10



Ca: 8.3 Phos: 3.2 Mg: 1.9

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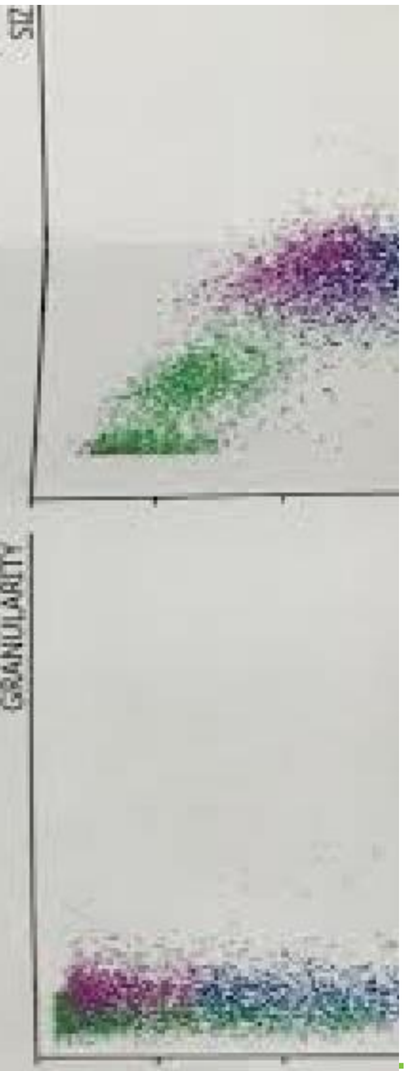
Labs

Item	Result	Unit	Range	Hit
WBC (WBC)	8.51	10^9/L	3.00 ~ 10.00	
LYM% (LYM%)	34.07	%	20.00 ~ 50.00	
MON% (MON%)	34.77	%	3.00 ~ 10.00	H
NEU% (NEU%)	30.42	%	40.00 ~ 75.00	L
EOS% (EOS%)	0.70	%	0.40 ~ 8.00	
BASO% (BASO%)	0.04	%	0.00 ~ 1.00	
LYM# (LYM#)	2.899	10^9/L	1.100 ~ 3.200	
MON# (MON#)	2.959	10^9/L	0.100 ~ 0.600	H
NEU# (NEU#)	2.589	10^9/L	1.800 ~ 6.300	
EOS# (EOS#)	0.060	10^9/L	0.020 ~ 0.520	
BASO# (BASO#)	0.003	10^9/L	0.000 ~ 0.060	
RBC (RBC)	1.44	10^12/L	4.30 ~ 5.80	L
HGB (HGB)	2.3	g/dL	11.0 ~ 17.5	L
HCT (HCT)	7.6	%	40.0 ~ 50.0	L
MCV (MCV)	53.0	fL	82.0 ~ 100.0	L



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Labs

Item	Result	Unit	Range	Flit
WBC (WBC)	20.83	10^9/L	3.00 ~ 10.00	H
LYM% (LYM%)	22.18	%	20.00 ~ 50.00	
MON% (MON%)	5.05	%	3.00 ~ 10.00	
NEU% (NEU%)	71.97	%	40.00 ~ 75.00	
EOS% (EOS%)	0.62	%	0.40 ~ 8.00	
BASO% (BASO%)	0.18	%	0.00 ~ 1.00	
LYM# (LYM#)	4.620	10^9/L	1.100 ~ 3.200	H
MON# (MON#)	1.052	10^9/L	0.100 ~ 0.600	H
NEU# (NEU#)	14.991	10^9/L	1.800 ~ 6.300	H
[illegible] (EOS#)	0.129	10^9/L	0.020 ~ 0.520	
BASO# (BASO#)	0.037	10^9/L	0.000 ~ 0.060	
RBC (RBC)	1.02	10^12/L	4.30 ~ 5.80	L
HGB (HGB)	3.5	g/dL	11.0 ~ 17.5	L
HCT (HCT)	10.4	%	40.0 ~ 50.0	L
			82.0 ~ 100.0	

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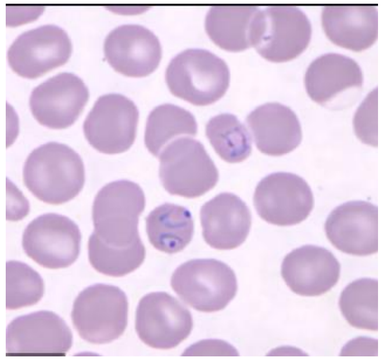
Tests

Malaria

- Rapid diagnostic test (Blood Film for Malaria Parasite – BF4MP)



Sickle Cell

- “Sickling” test (rapid test just like pregnancy test kit: positive or negative test)
- Hb electrophoresis once sickling test is positive

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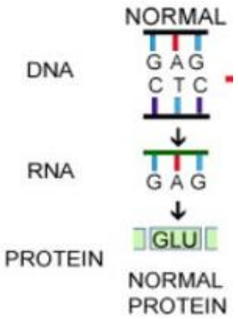
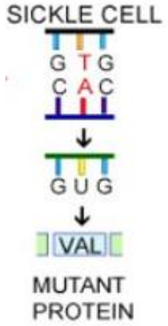
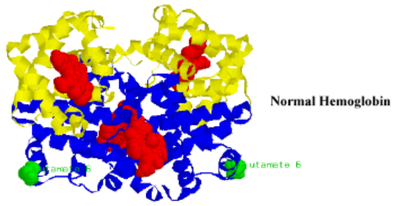
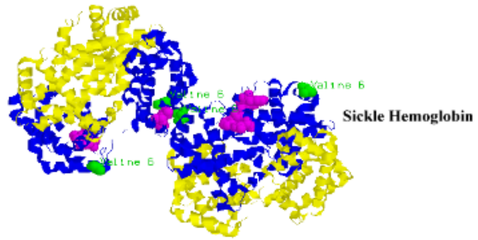
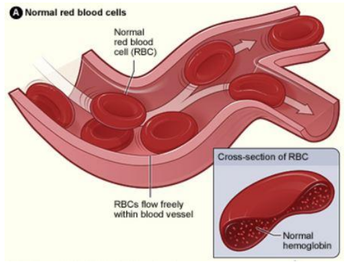
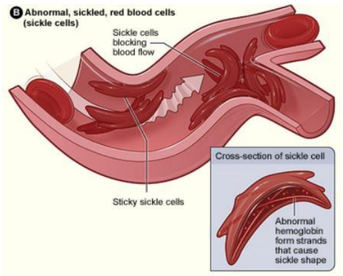
Sickle Cell Disease

	Normal	Sickle Cell	
DNA level			• Substitution of Valine for Glutamic acid
Protein level			• Formation of hemoglobin tetramer that is poorly soluble when deoxygenated
Organ level			• Polymerization of deoxy HBS leads to vaso-occlusive phenomena

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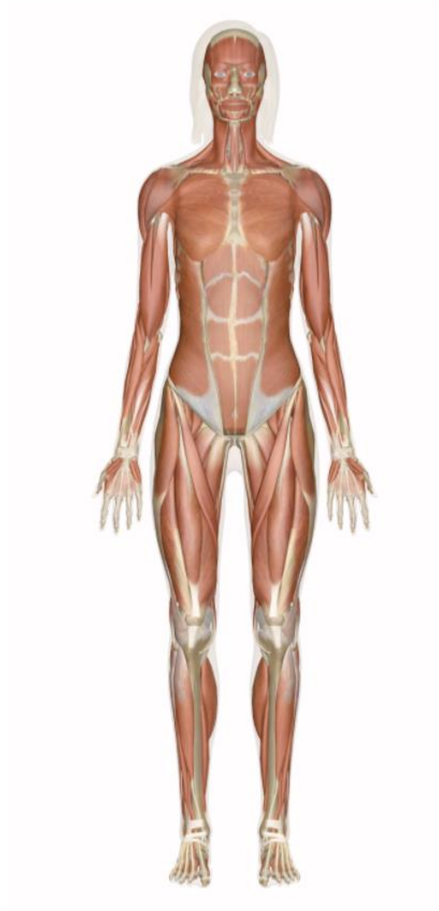
Sickle Cell Disease

For each organ system what is the ACUTE and CHRONIC manifestation



Focus area	Acute manifestation	Chronic manifestation
CNS	• Ischemic stroke, hemorrhagic stroke	• Silent cerebral infarcts, cognitive delay
Pulmonary		
Cardiac		
Hepatobiliary		
GU		
Blood		
Infection		
Pain		

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Sickle Cell Disease

Focus area	Acute manifestation	Chronic manifestation
CNS	• Ischemic stroke, hemorrhagic stroke	• Silent cerebral infarcts, cognitive delay
Pulmonary	• ACS, Asthma, PEs, Fat emboli	• Pulmonary HTN
Cardiac	• MI, dysrhythmia, sudden death	• Diastolic dysfunction, heart failure
Hepatobiliary	• Cholecystitis, liver injury, hepatosplenomegaly	• Pigment gallstones
GU	• Priapism	• Erectile dysfunction
Blood	• Anemia (aplastic crisis)	• Chronic hypersplenism
Infection	• Sepsis, PNA, Meningitis	• Leg ulcers, osteomyelitis
Pain	• Acute vaso-occlusive pain	• Osteonecrosis, ulcers

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Takeaways

Takeaway 1

- Ensure a structured approach to problem solving when confused or have limited data– **STRUCTURE – STRUCTURE - STRUCTURE**

Takeaway 2

- Sickle Cell Disease affects multiple organs from head to toe
- …

Takeaway 3

- …

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Sickle Cell Disease

Acute chest syndrome

- **Leading cause of death** for patients with sickle cell disease
- Pulmonary infiltrates leading to fever, chest pain, hypoxemia, wheezing, cough
- Cause is multifactorial: **infection, vaso-occlusion, hypoventilation, thrombosis, or fat embolism**

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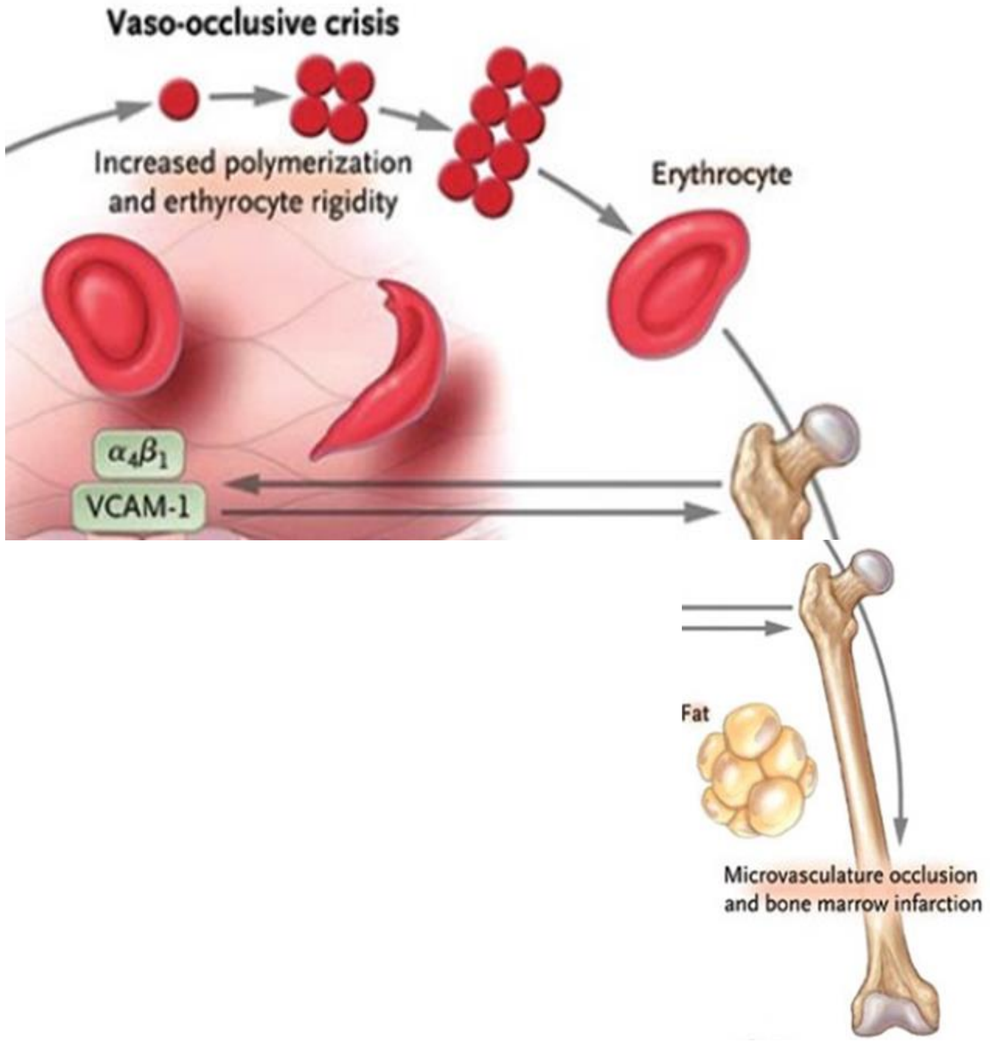
Acute chest syndrome (1/5)



Vaso-occlusive crisis leading to microvascular occlusion and bone marrow infarction

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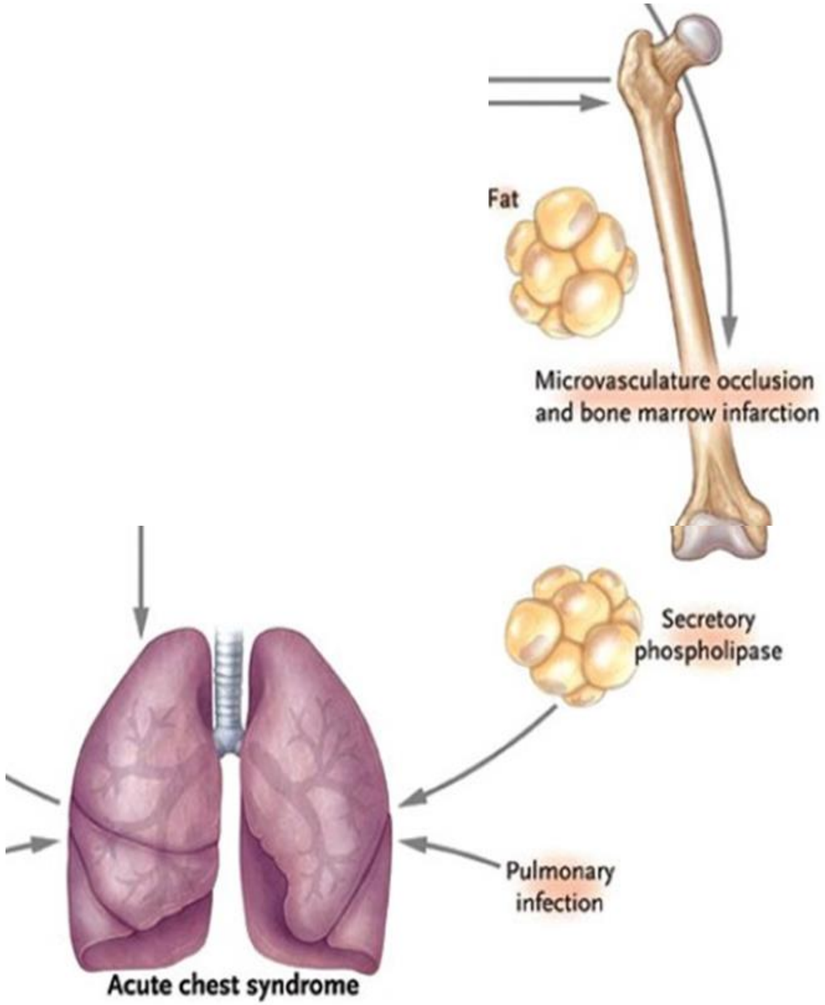
Acute Chest Syndrome (2/5)



- Multiple factors leading to ACS
- Infection also leading to ACS

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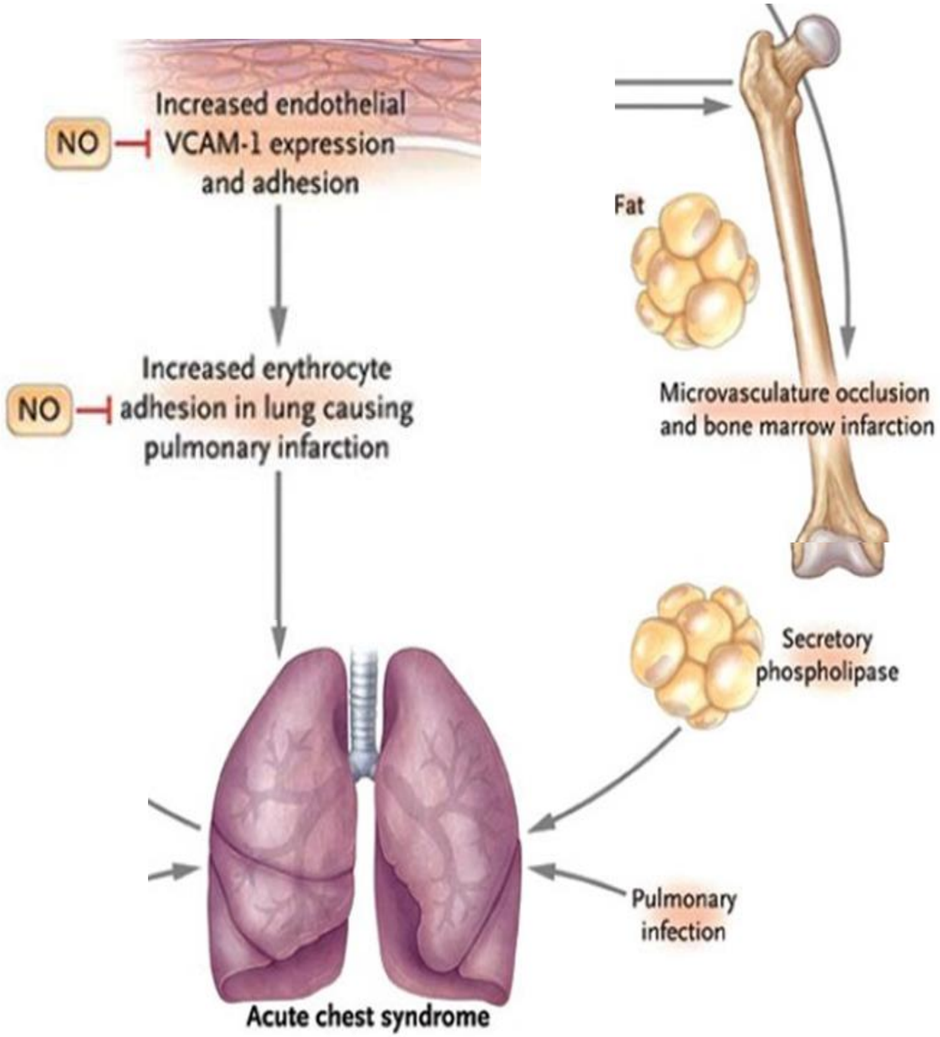
Acute Chest Syndrome (3/5)



- Vascular instability leading to inactivation of Nitric Oxide which leads to increase RBC adhesion in lung causing pulmonary infarction

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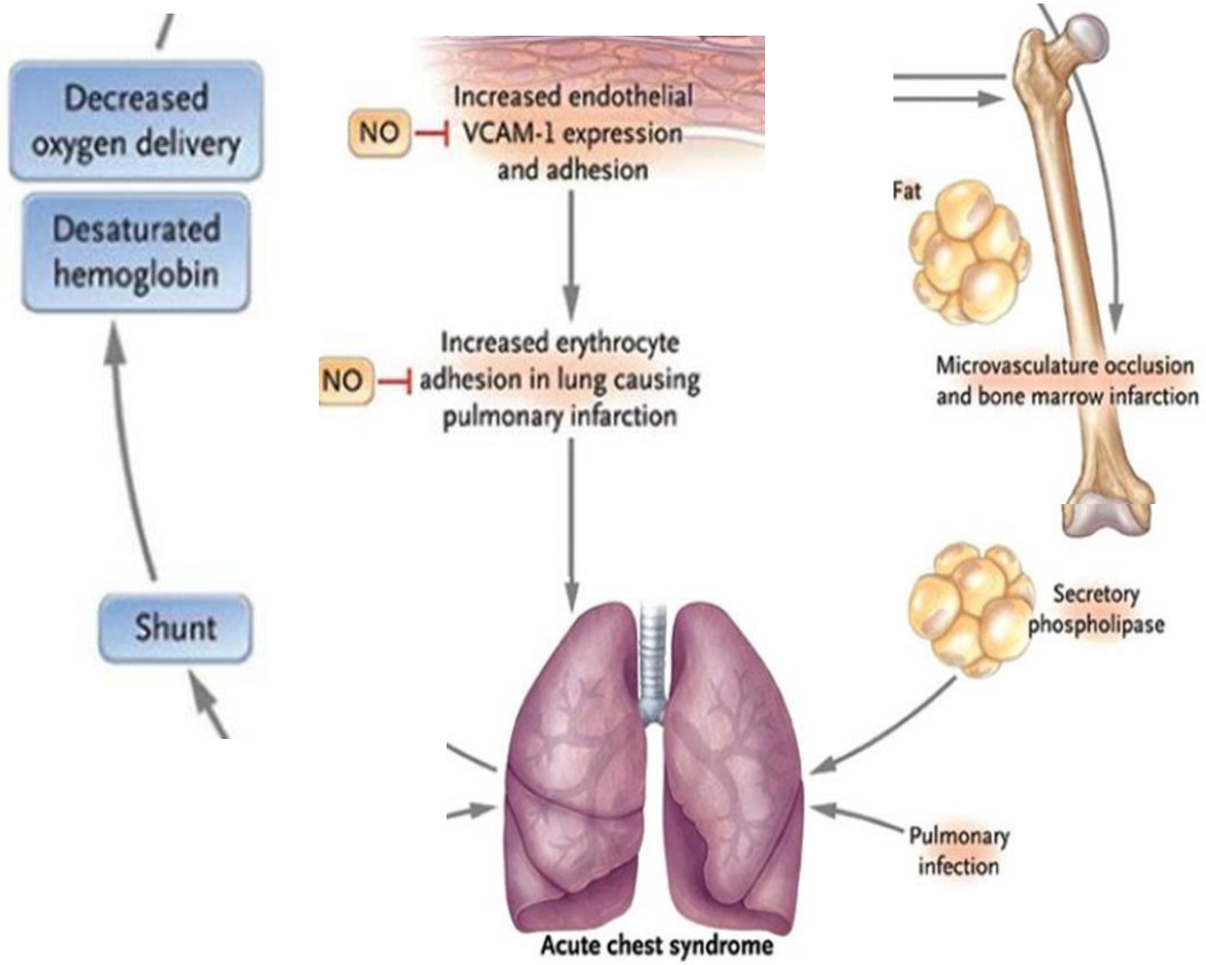
Acute Chest Syndrome (4/5)



- Pulmonary infarction and infection leading to shunting and decreased O2 delivery to RBCs

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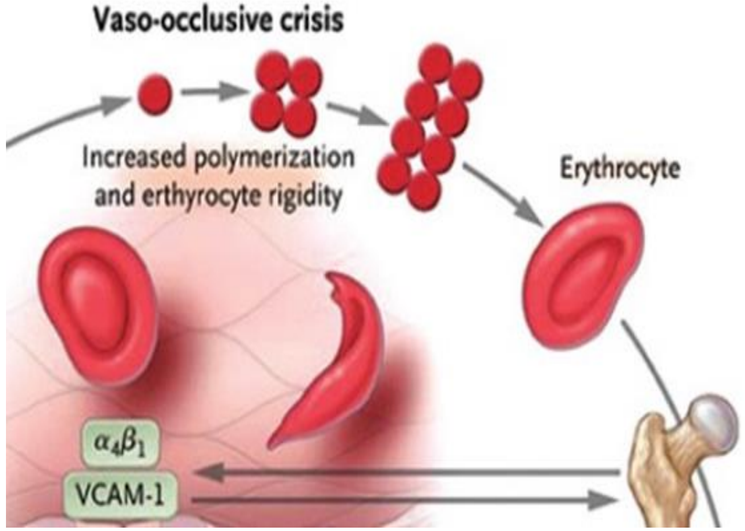
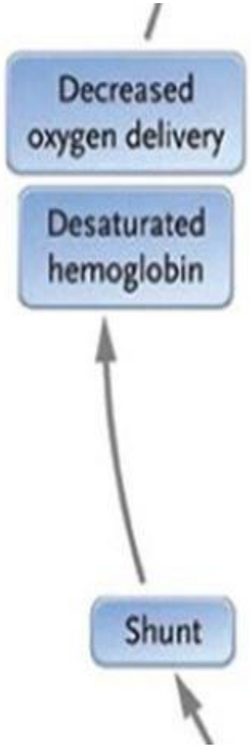
Acute Chest Syndrome (5/5)





- RBCs without oxygen leads to increased polymerization and vaso-occlusive crisis

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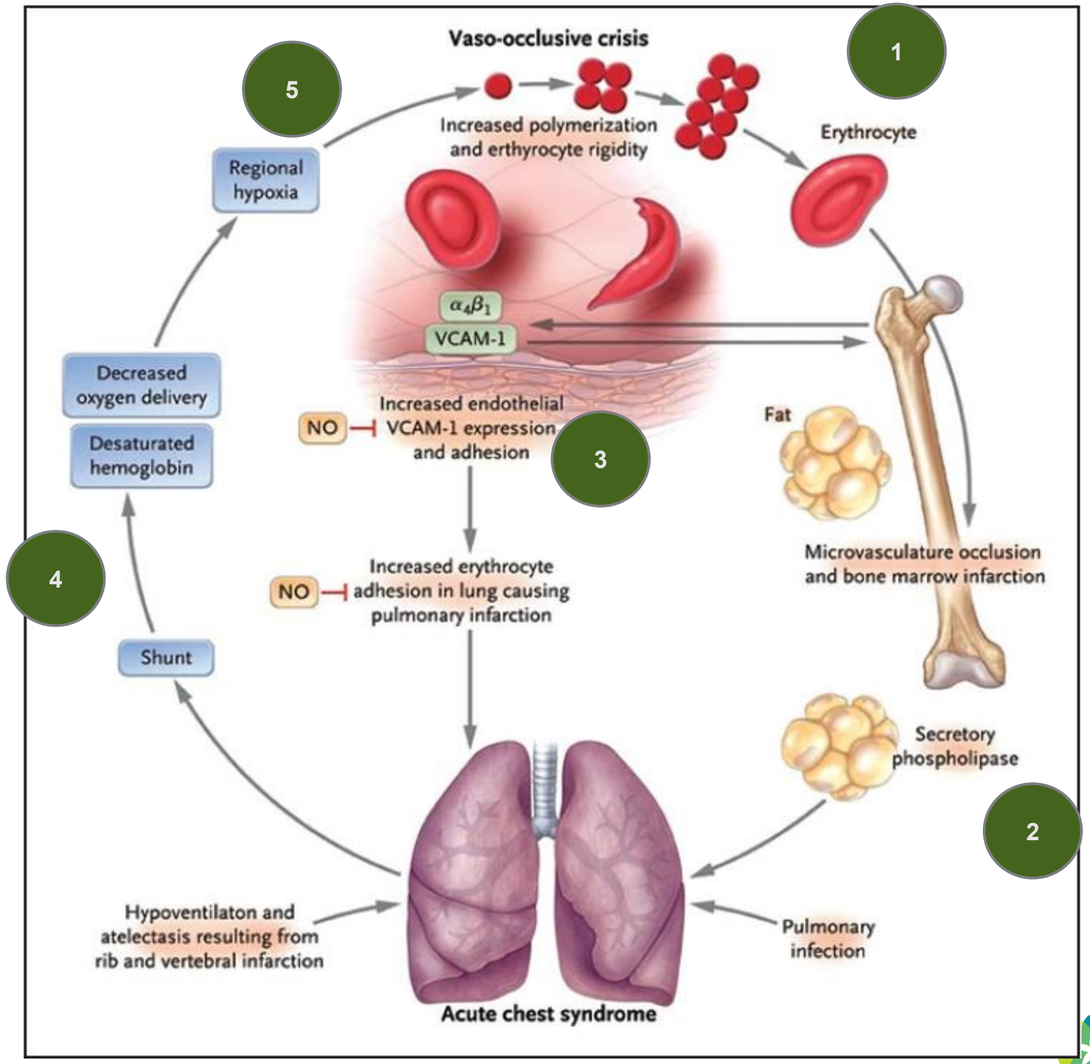
Acute Chest Syndrome

- Vicious cycle of vaso-occlusive crisis
- Acute Chest Syndrome is one of the few POSITIVE FEEDBACK LOOPS in the body (reinforces itself)



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Takeaways

Takeaway 1

- Ensure a structured approach to problem solving when confused or have limited data– **STRUCTURE – STRUCTURE - STRUCTURE**

Takeaway 2

- Sickle Cell Disease affects multiple organs from head to toe
- FEAR **Acute Chest Syndrome**

Takeaway 3

- …

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- Infection
- Trauma
- Autoimmune
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- Neoplasia
- Drugs

- Skin
- Muscle
- Nerves
- Vessels
- Bones

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“The idea that some lives matter less is the root of all that is wrong with the world” –

Paul Farmer, MD PhD
Chair, Department of Global Health and Social Medicine, Harvard Medical School
Co- Founder, Partners in Health

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Sickle Cell Disease
Pain management

- **Perception vs. reality**
- **Presents differently in everyone**
    - Unpredictable
- **What contributes to pain?**
    - Medication, stress, coping skills, emotions, lifestyle habits
- **How to improve access to pain management**
    - Individualized pain plans
    - Education for provider teams

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Sickle Cell Disease
Pain management

1. Physicians **not believing** patient's self report of pain

2. Physicians **assuming patient is drug seeking** because they know which medication and dosing that works best

3. Physicians **believing dosage of medication** needed to control pain is too high or too frequent

Negative healthcare provider attitude interferes with adequate assessment of pain and leads to insufficient treatment in patients with SCD

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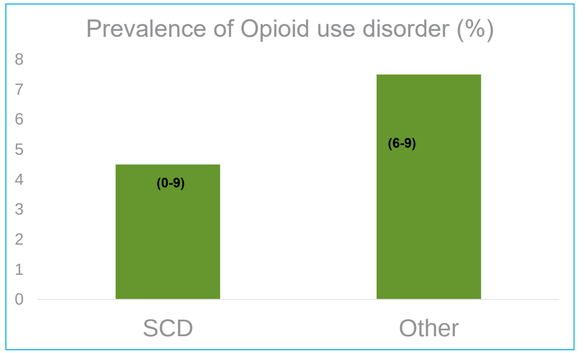
Sickle Cell Disease
Pain management

Misconceptions

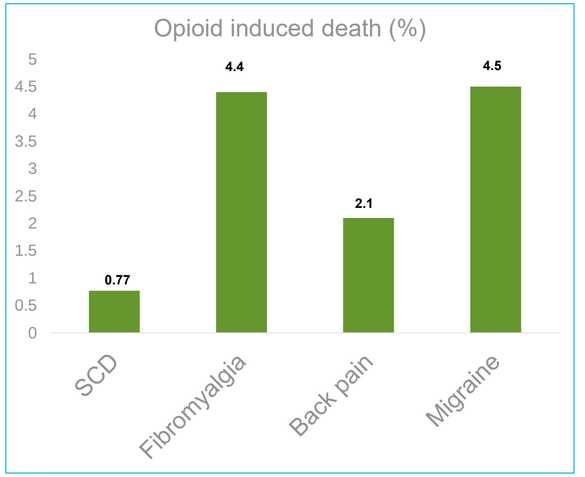
- 2005 survey: **86% of MDs did not believe that self-report** is the most reliable indicator of pain for patients with SCD
- 1997 survey: **50% of ED physicians and 23% Hematologists** believe patients with SCD are addicted to opioids
- 2001 survey: Out of 77 RNS treating patients with SCD, **63% believe that addiction frequently develops**

Facts

- **Prevalence of opioid-use disorders in individuals with SCD is similar to or lower than the general population or chronic pain patients**



- **Between 1999-2013, patients with SCDs had lower mortality (due to opioids) than others on opioids**



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Sickle Cell Disease
Pain management

Do Words Matter? Stigmatizing Language and the Transmission of Bias in the Medical Record

Anna P. Goddu, MSc[1], Katie J. O'Conor, BA[1], Sophie Lanzkron, MD, MHS[2], Mustapha O. Saheed, MD[3], Somnath Saha, MD, MPH[4,5], Monica E. Peek, MD, MPH, MSc[6], Carlton Haywood, Jr., PhD, MA[2], and Mary Catherine Beach, MD, MPH[1]

[1]Johns Hopkins University School of Medicine, Baltimore, MD, USA; [2]Division of Hematology, Johns Hopkins University School of Medicine, Baltimore, MD, USA; [3]Department of Emergency Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA; [4]Section of General Internal Medicine, VA Portland Health Care System, Portland, OR, USA; [5]Division of General Internal Medicine and Geriatrics, Oregon Health and Science University, Portland, OR, USA; [6]Section of General Internal Medicine, The University of Chicago, Chicago, IL, USA.

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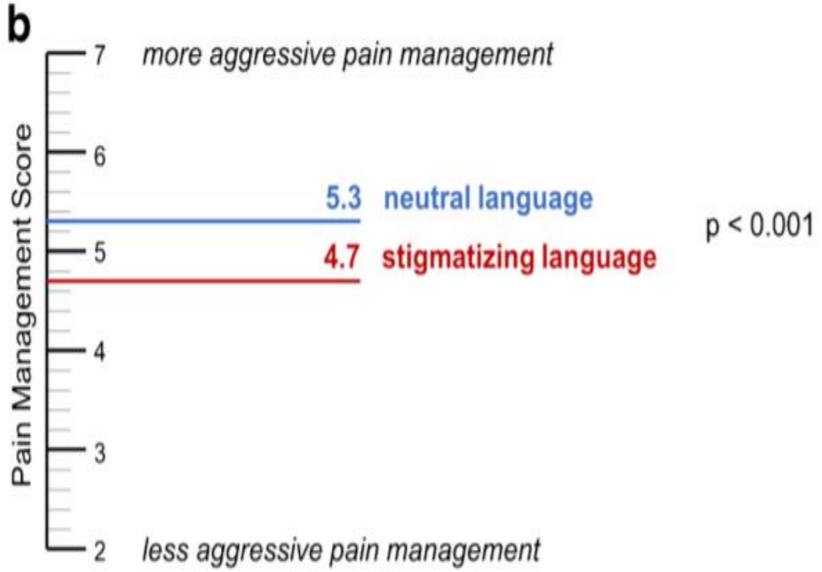
Sickle Cell Disease
"Pain and Prejudice"

Biased / Stigmatizing language	Neutral language
• *He is narcotic dependent and a **frequent flier** to our ED*	• *He has about **8-10 acute pain crises per year**, for which he typically requires opioid pain meds in the ED*
• *On physical exam **he appears to be in distress***	• *On physical exam he **is in obvious distress***
• *He **refuses to wear** his oxygen mask and is **insisting that his pain "is still a 10"***	• *He **is not tolerating** the oxygen mask and **still has 10/10 pain***



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Sickle Cell Disease
"Pain and Prejudice"

HEALTHY LIVING

White Doctors In Training Believe Some Disturbing Stuff About Black Patients

Racial disparities plague the health care system.

04/08/2016 03:33 pm ET | **Updated** Apr 12, 2016

"Medical students and residents believe black patients have less pain"

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Sickle Cell Disease
"Pain and Prejudice"

March 2016

PNAS

Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites

Kelly M. Hoffman[a,1], Sophie Trawalter[a], Jordan R. Axt[a], and M. Norman Oliver[b,c]

[a]Department of Psychology, University of Virginia, Charlottesville, VA 22904; [b]Department of Family Medicine, University of Virginia, Charlottesville, VA 22908; and [c]Department of Public Health Sciences, University of Virginia, Charlottesville, VA 22908

Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and approved March 1, 2016 (received for review August 18, 2015)

Table 1. Percentage of white participants endorsing beliefs about biological differences between blacks and whites

Item	Study 1: Online sample (n = 92)	Study 2			
		First years (n = 63)	Second years (n = 72)	Third years (n = 59)	Residents (n = 28)
Blacks age more slowly than whites	23	21	28	12	14
Blacks' nerve endings are less sensitive than whites'	20	8	14	0	4
Black people's blood coagulates more quickly than whites'	39	29	17	3	4
Whites have larger brains than blacks	12	2	1	0	0
Whites are less susceptible to heart disease than blacks*	43	63	83	66	50
Blacks are less likely to contract spinal cord diseases*	42	46	67	56	57
Whites have a better sense of hearing compared with blacks	10	3	7	0	0
Blacks' skin is thicker than whites'	58	40	42	22	25
Blacks have denser, stronger bones than whites*	39	25	78	41	29
Blacks have a more sensitive sense of smell than whites	20	10	18	3	7
Whites have a more efficient respiratory system than blacks	16	8	3	2	4
Black couples are significantly more fertile than white couples	17	10	15	2	7
Whites are less likely to have a stroke than blacks*	29	49	63	44	46
Blacks are better at detecting movement than whites	18	14	15	5	11
Blacks have stronger immune systems than whites	14	21	15	3	4

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Barriers to improved health outcomes

- Mistrust of healthcare institutions
- Transportation
- Healthcare deserts
- Medication/treatment requiring extensive authorizations
- Access to (nutritious) food
- Lack of funding

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Ways to improve?

- Education in healthcare providers
  - Increasing knowledge of SC amongst Hematologist and PCP
  - Improving care standards

- Advocacy
  - Increase funding
  - Raise awareness of care bias

- Community Based Organizations
  - Sickle Cell Association of Delaware
  - The Healing Tree

Sickle Cell Association of Delaware
SCADE
Advocate, Educate, Empower

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New drug for sickle cell

TREATMENTS

FDA advisers see no roadblocks for gene-editing treatment for sickle cell disease

UPDATED OCTOBER 31, 2023 · 4:30 PM ET

HEARD ON MORNING EDITION

What is the cost of treatment?

Polls

For iphone users

For all other inferior phones???

Text **EMMANUELMENS590** to **37607** once to join, then **A or B**

Poll Everywhere

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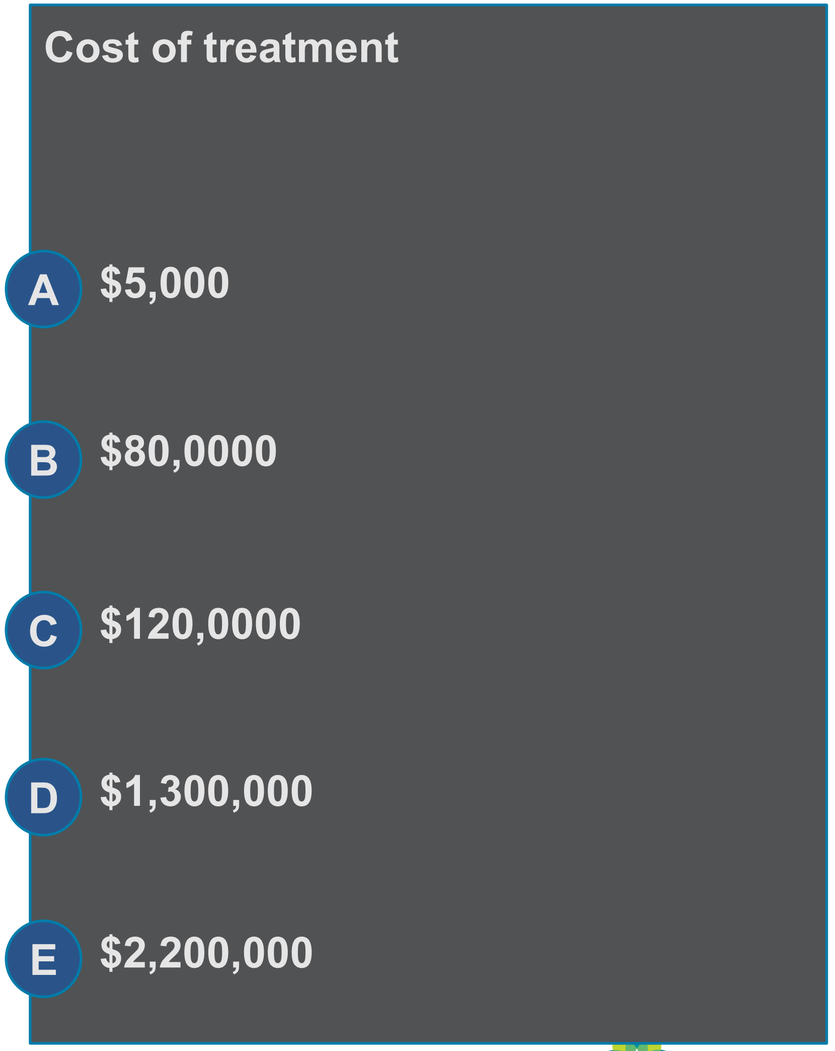
Poll 1

Poll 1

What is the cost to treat one patient with the new drug for sickle cell (Casgevy)?



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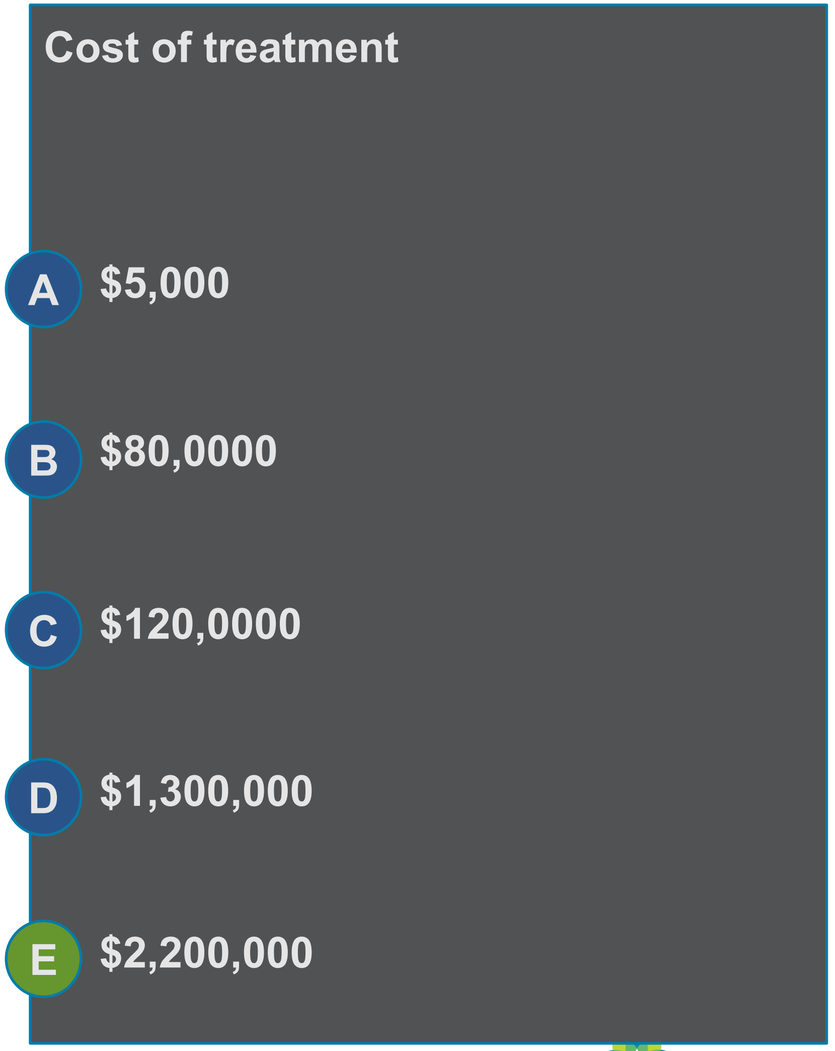
Poll 1

Poll 1

What is the cost to treat one patient with the new drug for sickle cell (Casgevy)?



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New drug for sickle cell

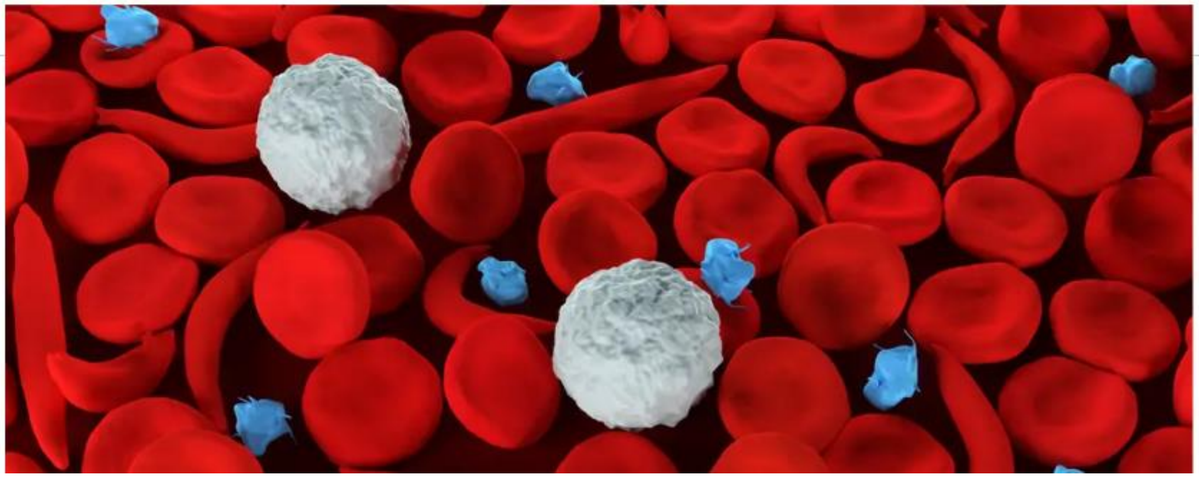
BUSINESS INSIDER

DOW JONES -0.24% NASDAQ -0.67% S&P 500 -0.64% AAPL -3.14% NVDA 0% MSFT +0.24% AMZN -1.88% META +0.34% TSLA 0%

HEALTH

The FDA just approved the first gene editing therapy for sickle cell anemia, but it'll cost $2.2 million per person

By Kenneth Niemeyer



$2.2 Million per treatment

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Takeaways

Takeaway 1

- Ensure a structured approach to problem solving when confused or have limited data– **STRUCTURE – STRUCTURE - STRUCTURE**

Takeaway 2

- Sickle Cell Disease affects multiple organs from head to toe
- FEAR **Acute Chest Syndrome**

Takeaway 3

- Negative healthcare provider attitude interferes with adequate assessment of pain and insufficient treatment – **“words matter!”**

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Proverb of the day

The river that forgets its source, runs dry

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“In judging our progress as individuals, we tend to concentrate on external factors such as one’s social position, influence and popularity, wealth and standard of education… but internal factors may be even more crucial in assessing one’s development as a human being: humility, purity, generosity, absence of vanity, readiness to serve your fellow men and women – qualities within the reach of every human soul”

- Nelson Mandela in a letter to Winnie Mandela, 1977

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The ChristianaCare Way

We serve our neighbors as respectful, expert, caring partners in their health. We do this by creating innovative, effective, affordable and equitable systems of care that our neighbors value.

We serve together guided by our values

Love & Excellence

We anticipate the needs of others and help with compassion and generosity.

We embrace diversity and show respect to everyone.

We listen actively, seek to understand and assume good intentions.

We tell the truth with courage and empathy.

We accept responsibility for our attitudes and actions.

We commit to being exceptional today and even better tomorrow.

We use resources wisely and effectively.

We seek new knowledge, ask for feedback, and are open to change.

We are curious and continuously look for ways to innovate.

We are true to our word and follow through on our commitments.

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