

What I DIDN'T learn in PA school

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Disclosures

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Objectives



Compare and contrast PA and laboratory education



Learn ways to educate other members of the medical team

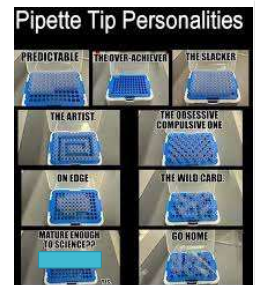


Identify strategies to work collaboratively with the medical team

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Who am I?

- The PA formerly known as Nicole Hager, MLS (ASCP) cm



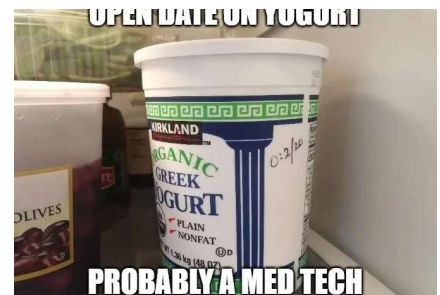
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My Practice – Heart of America

- Rural Health Clinic/ Critical Access Hospital
- Family Practice
- Rugby main campus
 - Dunseith Satellite
 - Maddock Satellite
- Medical Staff – 4 PAs, 4 NPs clinic, 3 ER NPs, 3 MDs (one surgeon), CRNA

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Still a lab tech at heart...



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PA School vs Lab School

PA

- 24 month program/80 credits/6 semesters
- 53 weeks of clinical experience
- Courses include: anatomy, pathophysiology, statistics, history & physical, pharmacology, etc
- 6 credits of Diagnostic Studies over 3 semesters

Lab

- 122 credits
- 6 pre-professional semesters
- 3 professional semesters
- Course work includes chemistry, hematology, urinalysis, etc
- 11 credits of Clinical Microbiology over 4 semesters

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Similarities

- National certification exam
- State licensure
- Continuing education

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Let's start the tour!

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Case study: Phlebotomy



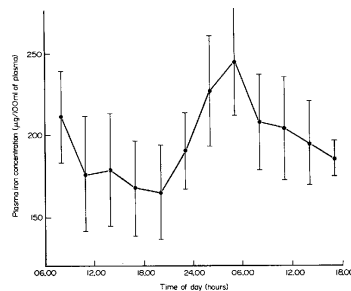
Lab says iron panels have to be drawn in the morning.



Me: It's noon, but my patient is still fasting. Can I send them down?

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Diurnal iron pattern



<https://www.semanticscholar.org/paper/CIRCADIAN-VARIATION-IN-PLASMA-IRON-CONCENTRATION-I-Lynch-Bothwell/4ecc92f4c783a95d352f09abf4c61076ad21e6c6>

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Phlebotomy/ Specimen Processing

- Phlebotomy tubes
 - Draw the rainbow/order of the draw
 - Tube additives
 - Test Add ons
 - Draw times

Specimen Processing/Turn around Time

- Give expectations

Interfering substances

- Fasting specimens

Test Catalog

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Case Study: Urinalysis

- 30 year old male comes in for DOT physical. Urine macro is positive for nitrites. Remainder of dip is negative. He denies dysuria, discharge, urinary frequency. Chart review shows similar results at his last few DOT physicals.



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Urinalysis

Interfering substances – Vitamin C

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Urinalysis

- Nitrates to Nitrites

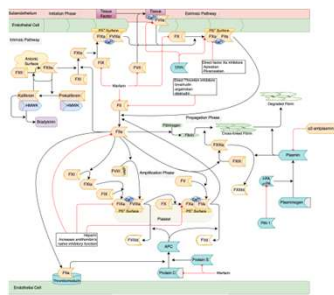
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Coagulation

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Coagulation

What Lab Professionals
learn...



<https://www.grepmed.com/images/16645/clot-thrombin-cascade-coagulation-platelet>

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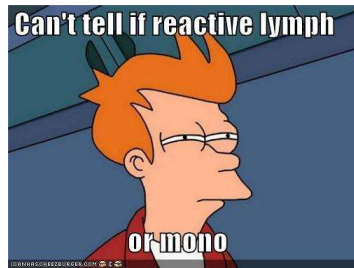
Coagulation

What providers know...

- INR
- PTT

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Hematology



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Case study: Hematology

- 5 year old female presents with fever and periumbilical pain. WBC is elevated with 85% neutrophils. Provider sends patient for further evaluation for appendicitis due to "left shift."
- What is a "left shift?"

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Hematology

Left Shift Definition

- Wikipedia: **Left shift** or **blood shift** is an increase in the number of immature cell types among the **blood cells** in a sample of blood.
- American Family Physician: an increase in the number of white blood cells, predominantly polymorphonuclear leukocytes and less mature cell forms
- Up To Date: **Left shift** is an ill-defined term that refers to an increase in the percentage of band forms, generally accompanied by metamyelocytes and myelocytes.

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Hematology Left Shift



<https://clinpath.com/hematology/hemogram-basics/leukogram/>

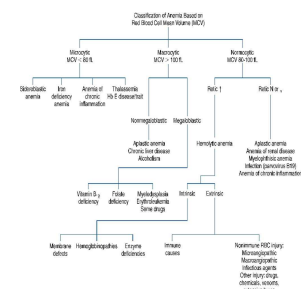
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Hematology Case Study

- 44 year old female is in for her annual exam. CBC shows the following:
- RBC **3.57** (3.65-5.25)
- Hgb **9.4** (11.5-15.3)
- Hct **28.1** (33.6-45.2)
- MCV **78.7** (80.4-98.0)
- MCH **26.2** (27.0-32.8)
- MCHC 33.3 (32-36)
- Provider orders the following to further evaluate her anemia: iron panel, B12, Folate.

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Hematology

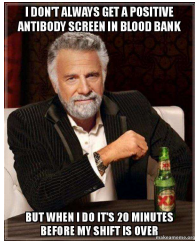


<https://doctorlib.info/hematology/rodak-hematology-clinical-principles-applications/20.html>

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Blood Bank

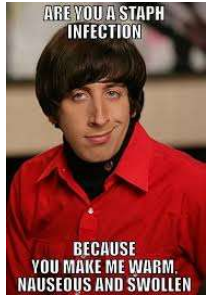
- Antibody Screen



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Microbiology

- Normal flora
- Reported Sensitivities



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Case Study - Chemistry

It's the Wellness Lab!

But wait, all these "well" people have low calcium?

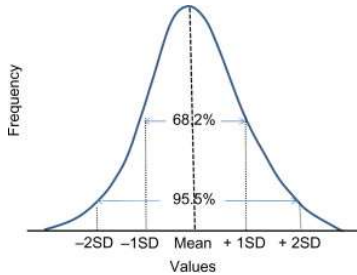
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Chemistry

- Statistics
- Calculated tests
- Calibrations

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Chemistry
Bell Curve



<https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/gaussian-distribution>

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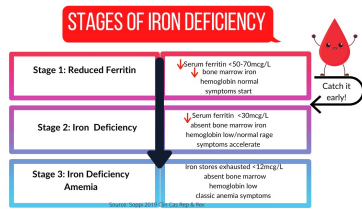
Chemistry
Iron Panel

Iron Deficiency Anemia

- Iron **decreased**
- TIBC **increased**
- Ferritin **decreased**
- Transferrin Saturation **decreased**
- MCV **decreased**
- Hgb **decreased**

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Chemistry



<https://maryannjacobsen.com/ferritin-blood-test-women/>

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Chemistry Case Study

- Eight year old female is seen in the emergency room. Work up is benign, but she has an elevated ALKP and AST and is asked to follow up in the clinic with her primary provider about her elevated liver enzymes.

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Chemistry

Alkaline Phosphatase: used to detect and monitor diseases of the liver or bone

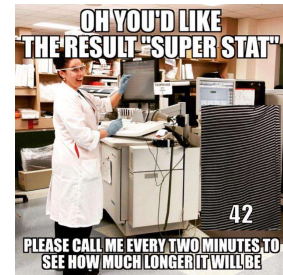
- Adult: 30-120 units/L
- Child/adolescent:
 - <2 years: 85-235 units/L
 - 2-8 years: 65-210 units/L
 - 9-15 years: 60-300 units/L
 - 16-21 years: 30-200 units/L

Aspartate Aminotransferase: found within highly metabolic tissue (heart, liver, skeletal muscle cells)

- Adult: 0-35 units/L
- Child/adolescent:
 - <3 years: 15-60 units/L
 - 6-12 years: 15-50 units/L
 - 12-18 years: 10-40 units/L

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So now what?



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So now what?

- Educate providers
 - New providers to the facility
 - Medical students
- Give expectations
- Give the "why"
- Be part of the team

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Questions?



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