



Laboratory Sciences Delaware Mini Medical School

Cynthia E. Flynn, M.D.

Staff Pathologist and Section Chief of Microbiology and Molecular
Diagnostic Laboratories, ChristianaCare

8/13/25

Let Me Introduce Myself...

Cynthia Flynn, MD

Pathologist and Section Chief of Microbiology and Molecular Diagnostics Laboratories at Christina Care

I diagnosis cancer and infectious diseases.

I work with clinical doctors to help them diagnosis their patient's illness.

I lead the microbiology and molecular labs – We run tests for COVID, bacteria and other viruses

I am here to encourage you to pursue careers in Medical laboratories.

My Specialty



I went to College at McGill University in Montreal, Quebec, Canada & Medical School at Albany Medical College, Albany NY

I completed residency and fellowship at Massachusetts General Hospital

Staff pathologist at Christiana Care for 27, yrs.

I have special interest in GYN and Infectious Disease.

I work with a Microscope, Computer and Phone

Lab Professionals

What do they do?



MLS at work and teaching UD MLS class of 2021



Why Laboratory Professionals Are Important

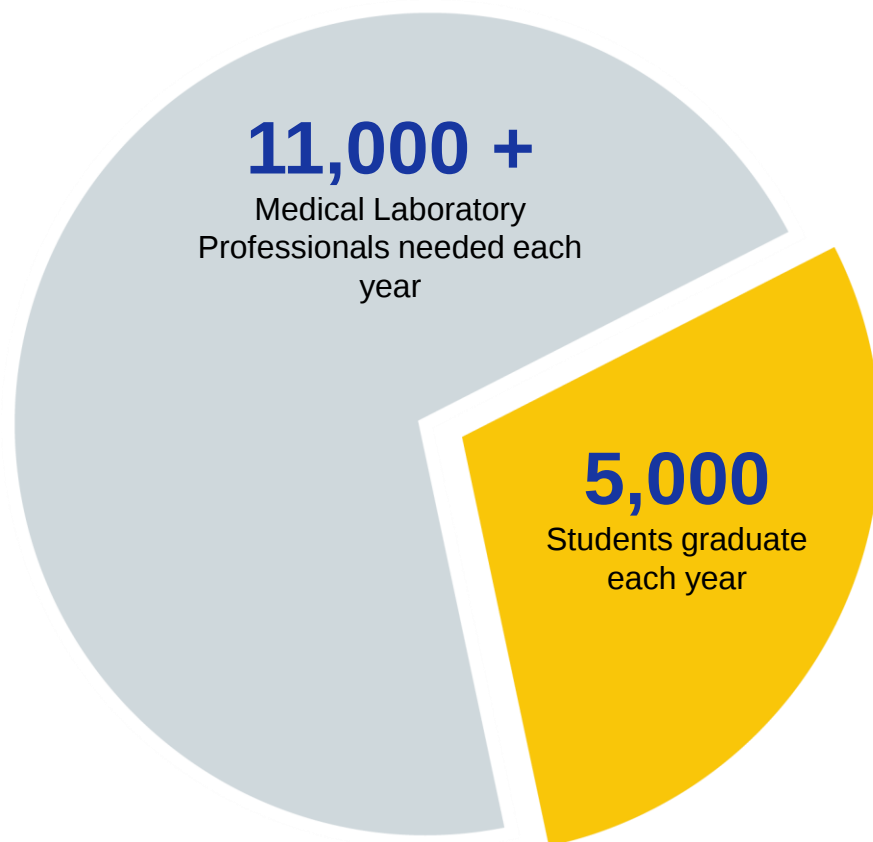
70%

Physician's diagnosis, prognosis, and treatment monitoring is based on accurate laboratory test results

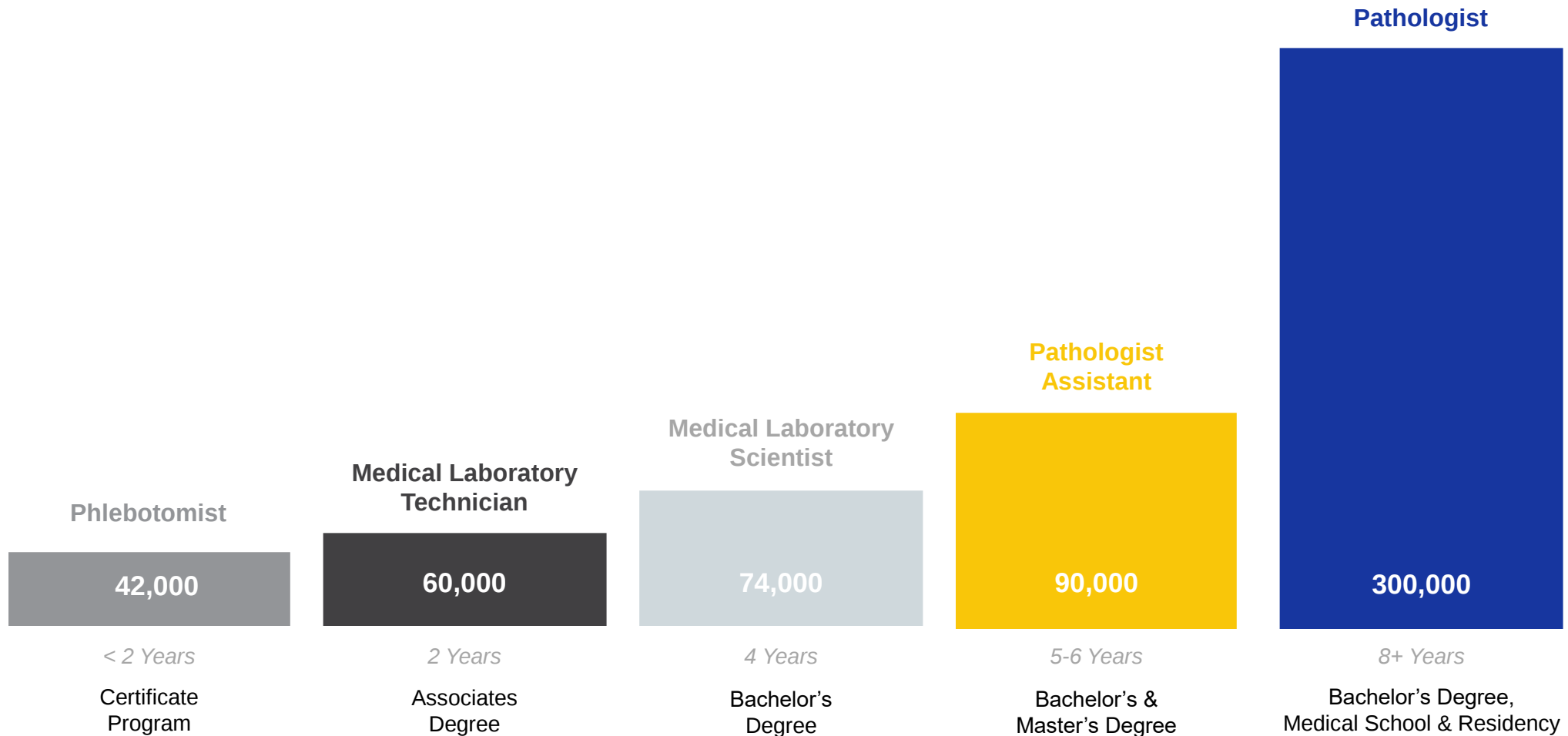
94%

The objective data in the patient's medical record is laboratory test information

The Challenge



Average Salaries for Various Laboratory Jobs



Receiving Staff

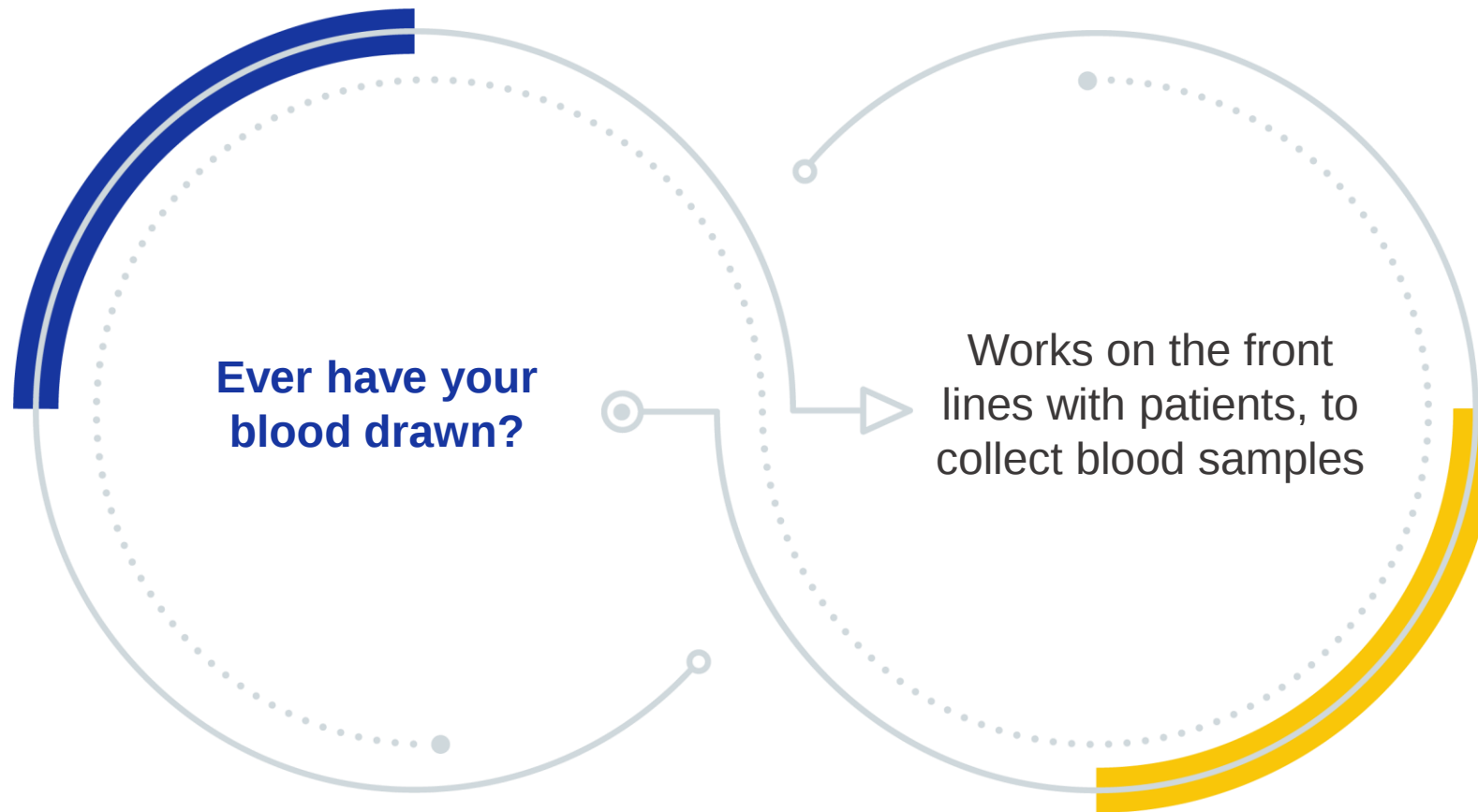
- Education & Experience Requirements:
 - High school graduate
 - Two years of applicable clinical experience or equivalent college courses in the health care field
- Knowledge, Skills & Abilities
 - Knowledge of clerical methods, techniques, office equipment and machines
 - Knowledge of a keyboard (typing or computer)
 - Ability to utilize information to accurately identify patient & match specimen to request
 - Ability to verbally communicate in a clear and understanding manner
 - Ability to courteously & efficiently handle all phone requests
 - Ability to follow written and verbal procedures

Receiving Staff

- Our Receiving Staff is super friendly
- They register our specimens into the computer system and send them to the correct sections of the lab.
- Specimens are shipped from every part of the hospital in the pneumatic tube system behind them.

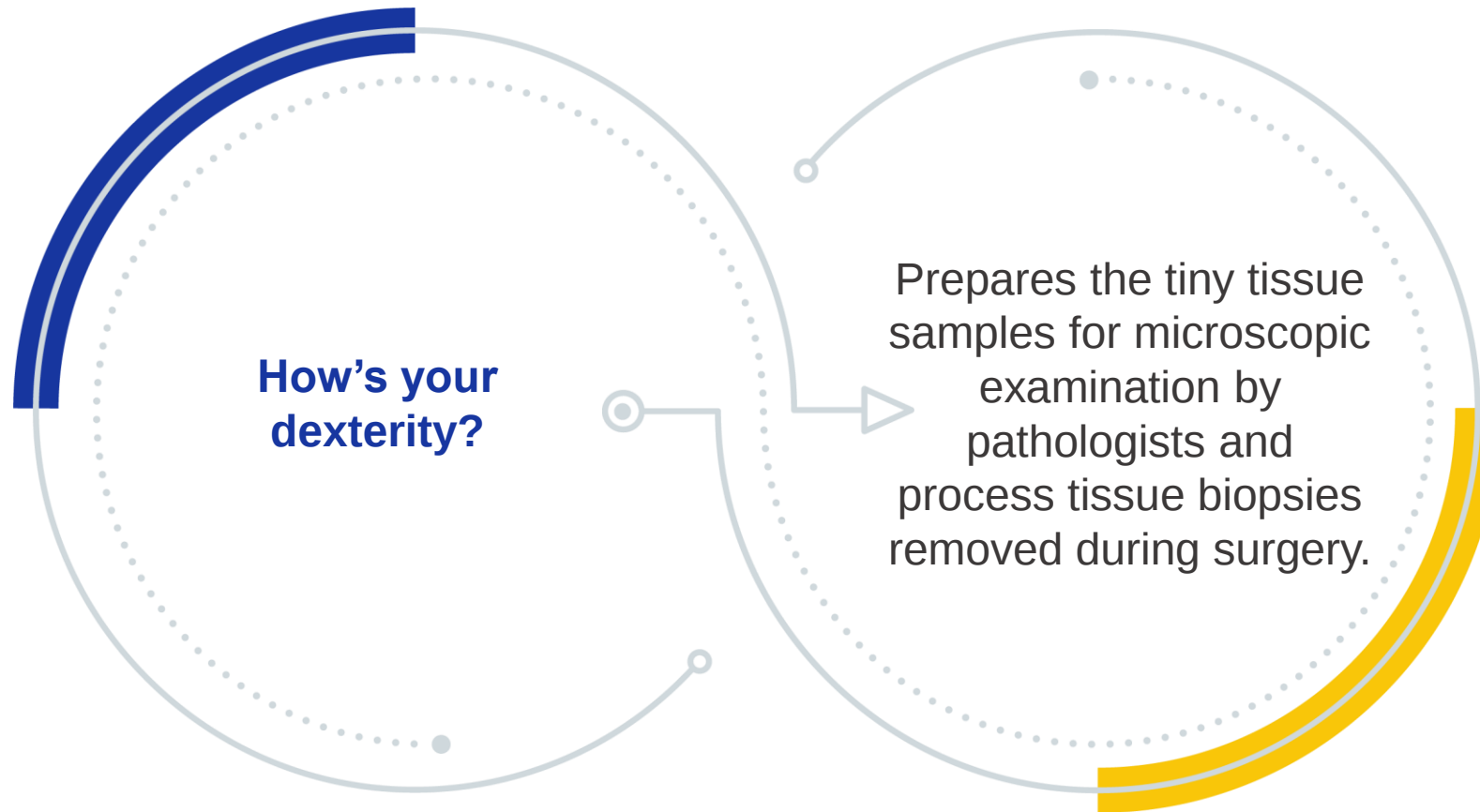


Phlebotomist (PBT)



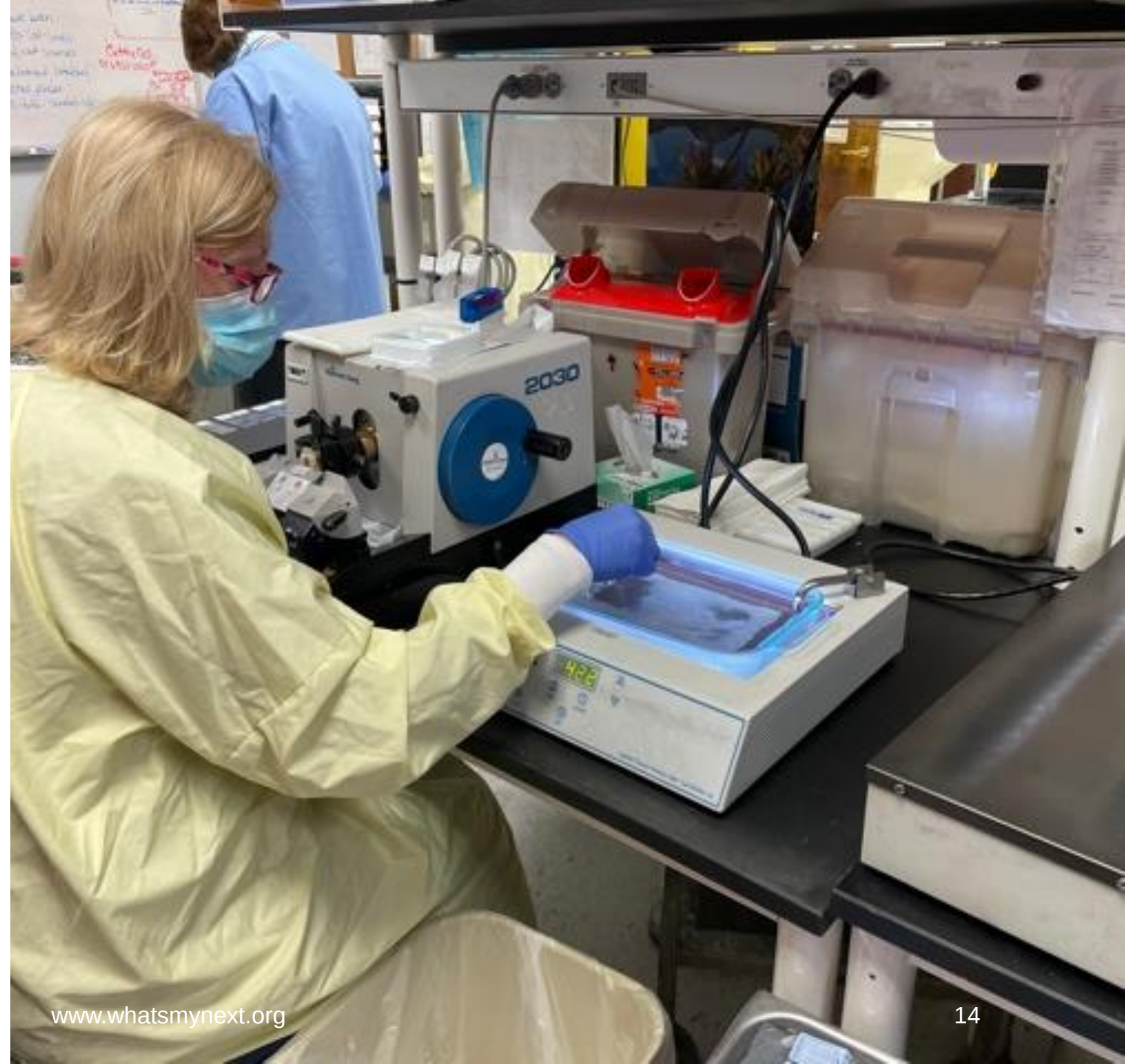


Histotechnologist (HT)

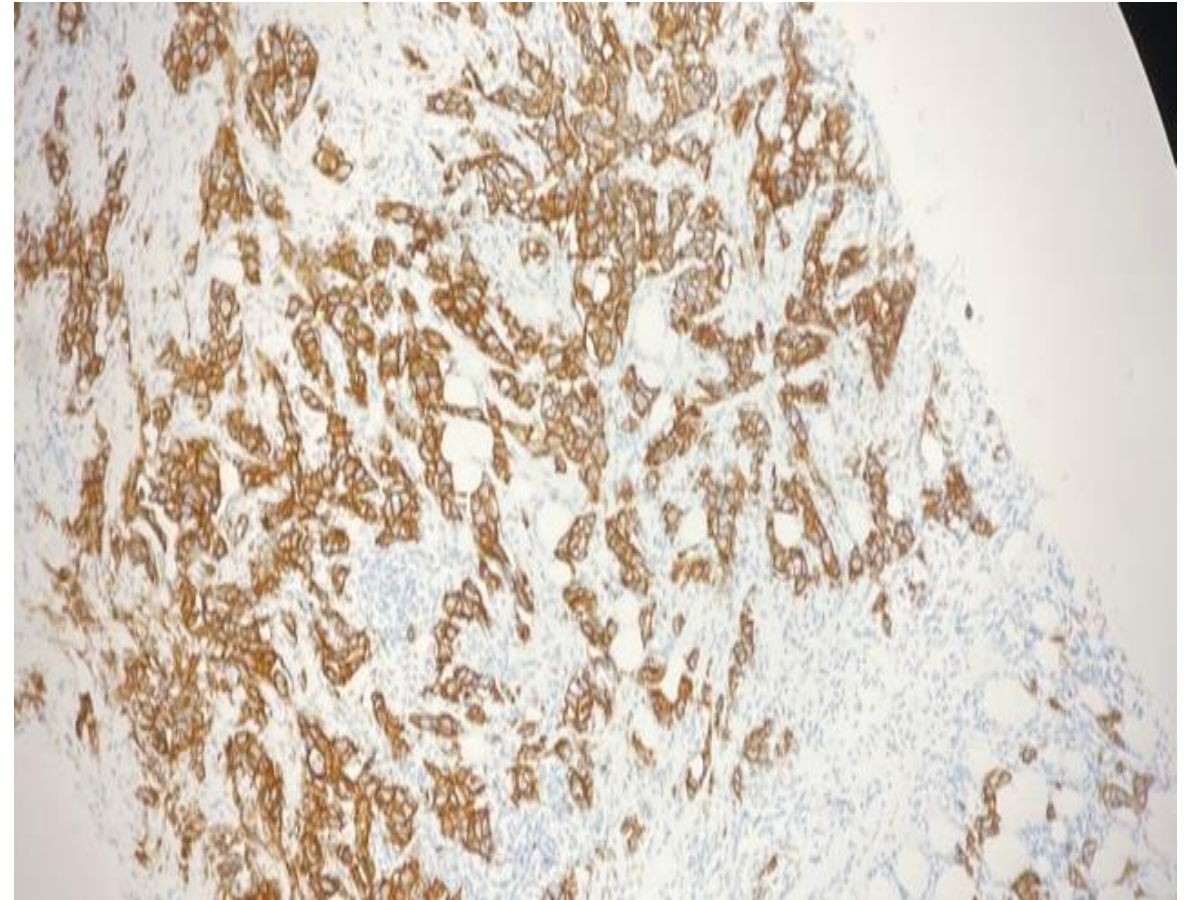
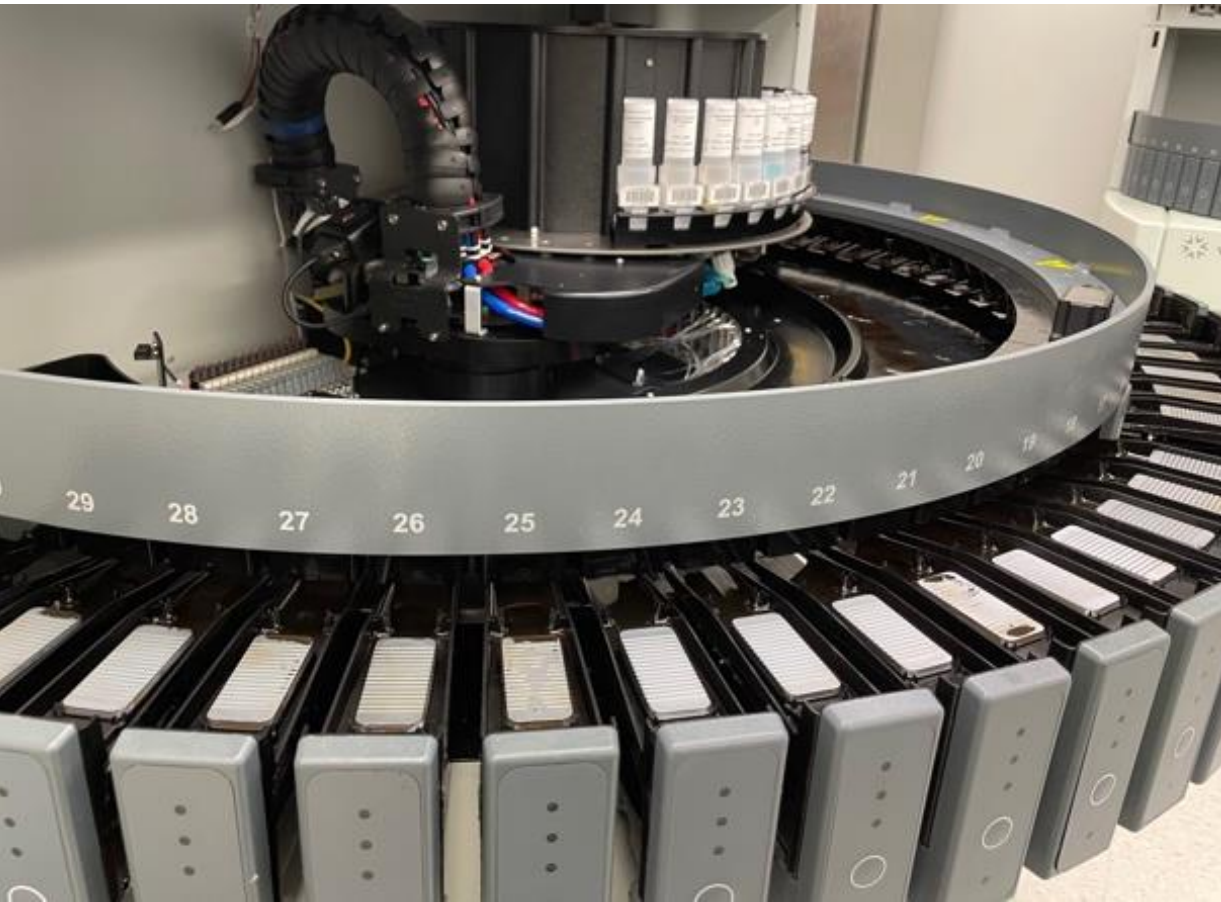


Histotech

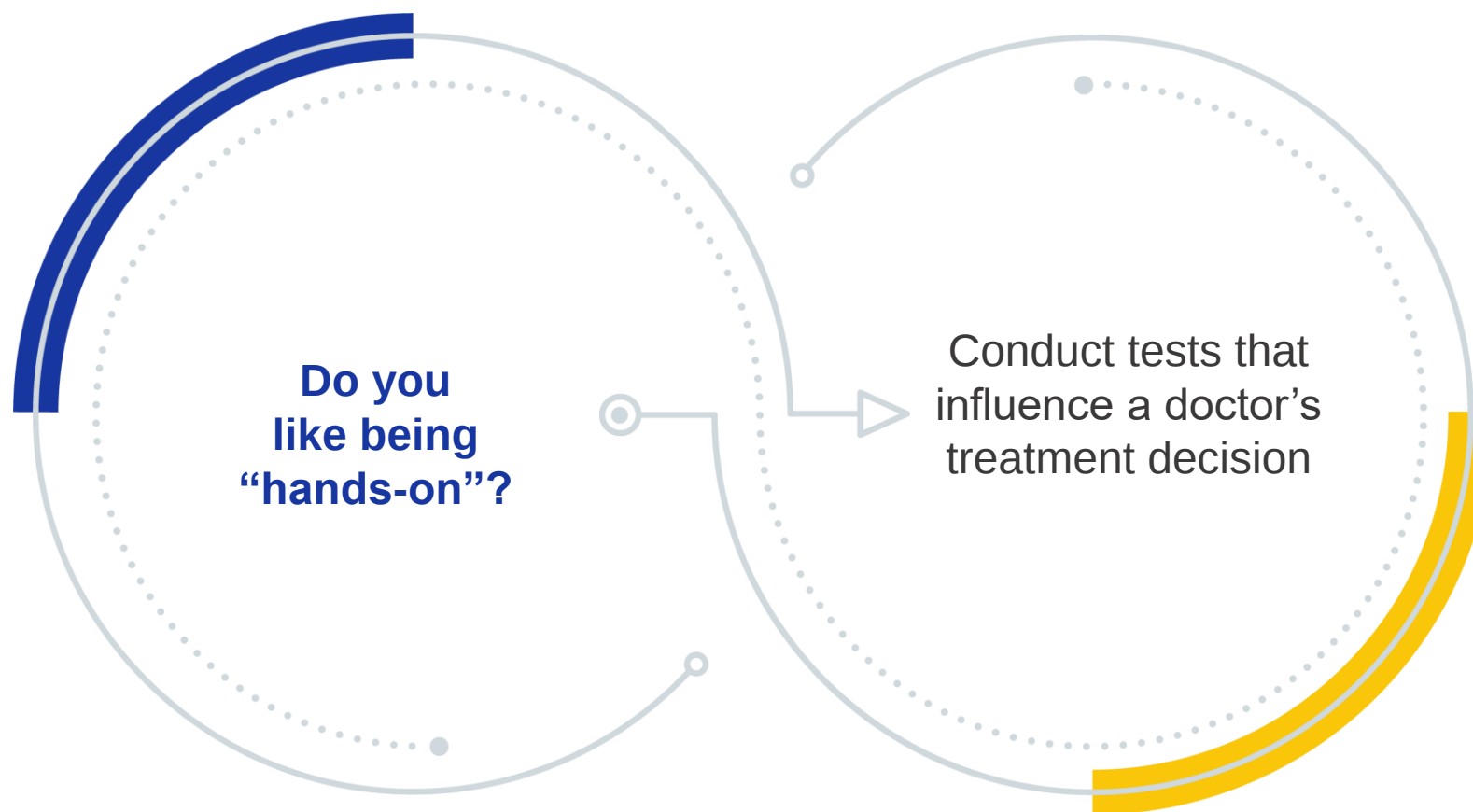
- Embeds tissue into paraffin wax
- Cuts slides on Microtome
- Floats slides on Water bath and picks up tissue sections on to glass slide
- Slides are then stained and given to pathologist
- Histotechs also cut frozen sections at time of surgery. Pathologist call surgeon in OR to help decide what additional surgery is needed.



Immunohistochemistry- Done by Histotechs



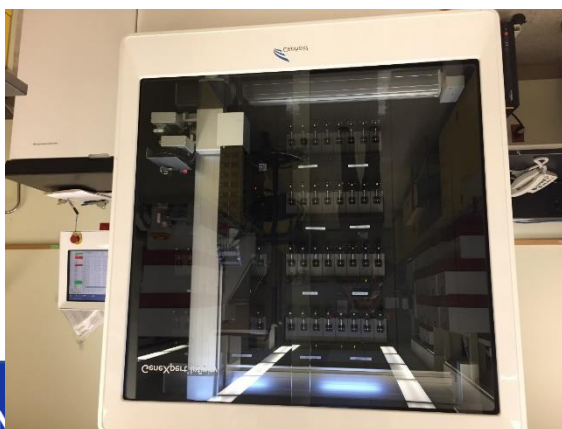
Medical Laboratory Technician (MLT)



Medical Laboratory Scientist (MLS)



Our Microbiology team – COVID PCR Test



Molecular and Blood bank MLS



Cytotechnologist (CT)



Cytotechnologist

- Examine cells for cancer, infectious disease and other diseases
- Alert Cytopathologist to the presence of those cells
- Report negative Cervical Pap smears
- Assist in collecting cells for Assisted Fine Needle Aspiration procedures



Pathologists' Assistant (PA)

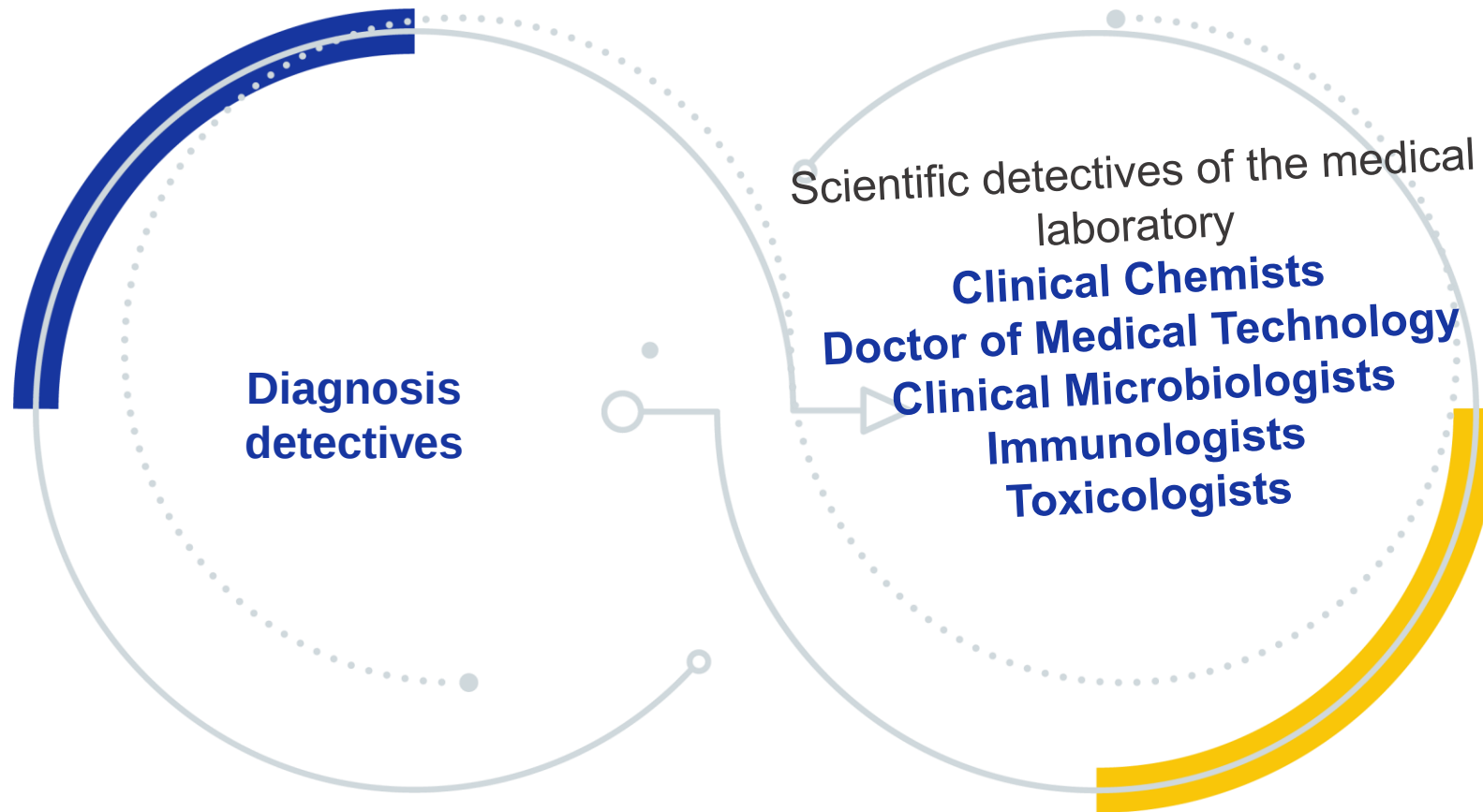


Pathology Assistant

- This pathology assistant is evaluating tissue to look for lymph nodes.
- Most cancers spread first to lymph nodes.
- They palpate and cut tissues to look for the lymph nodes
- Then the tissue is put in plastic cassettes for processing.



Clinical Scientist – PhD





Pathologist - MD

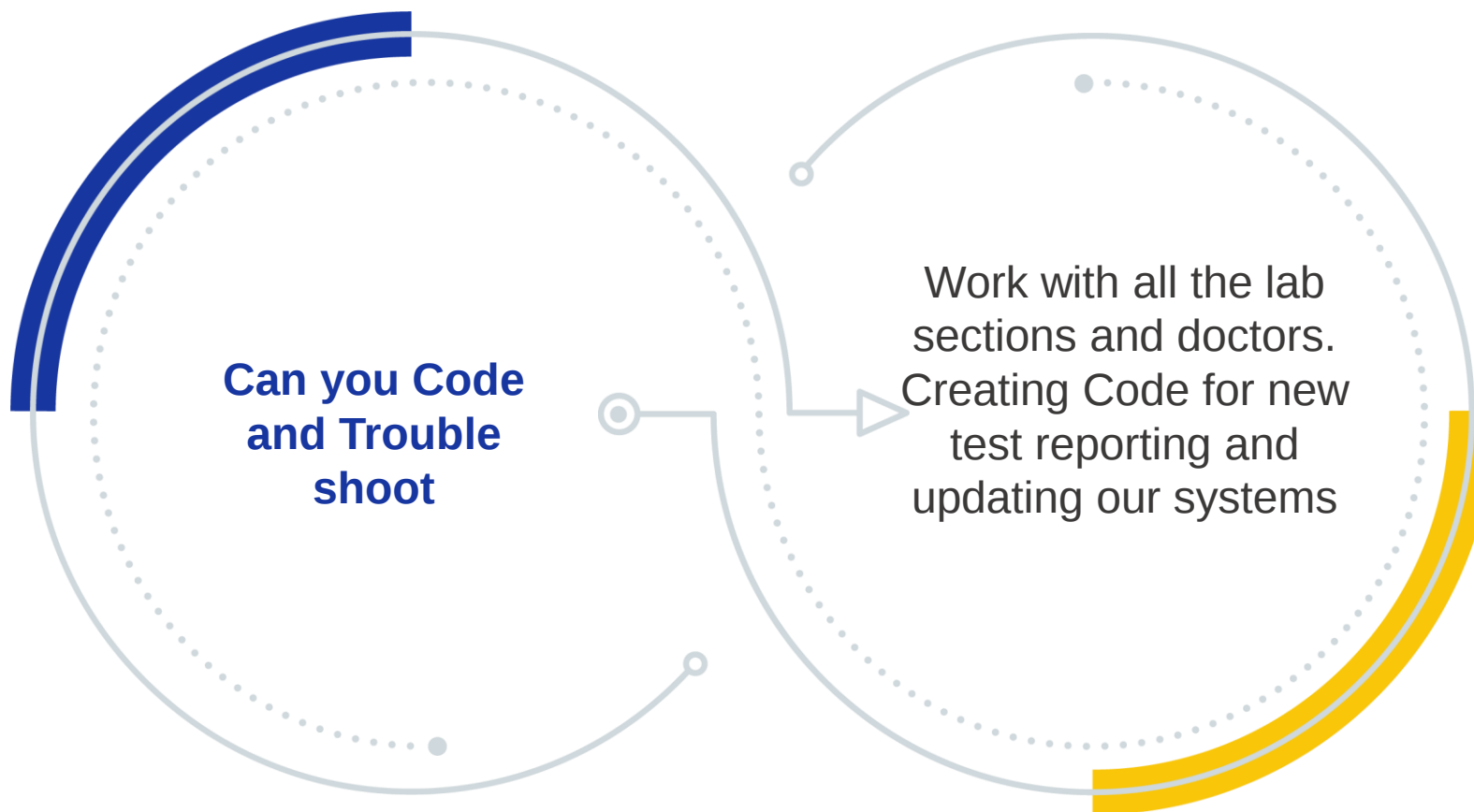


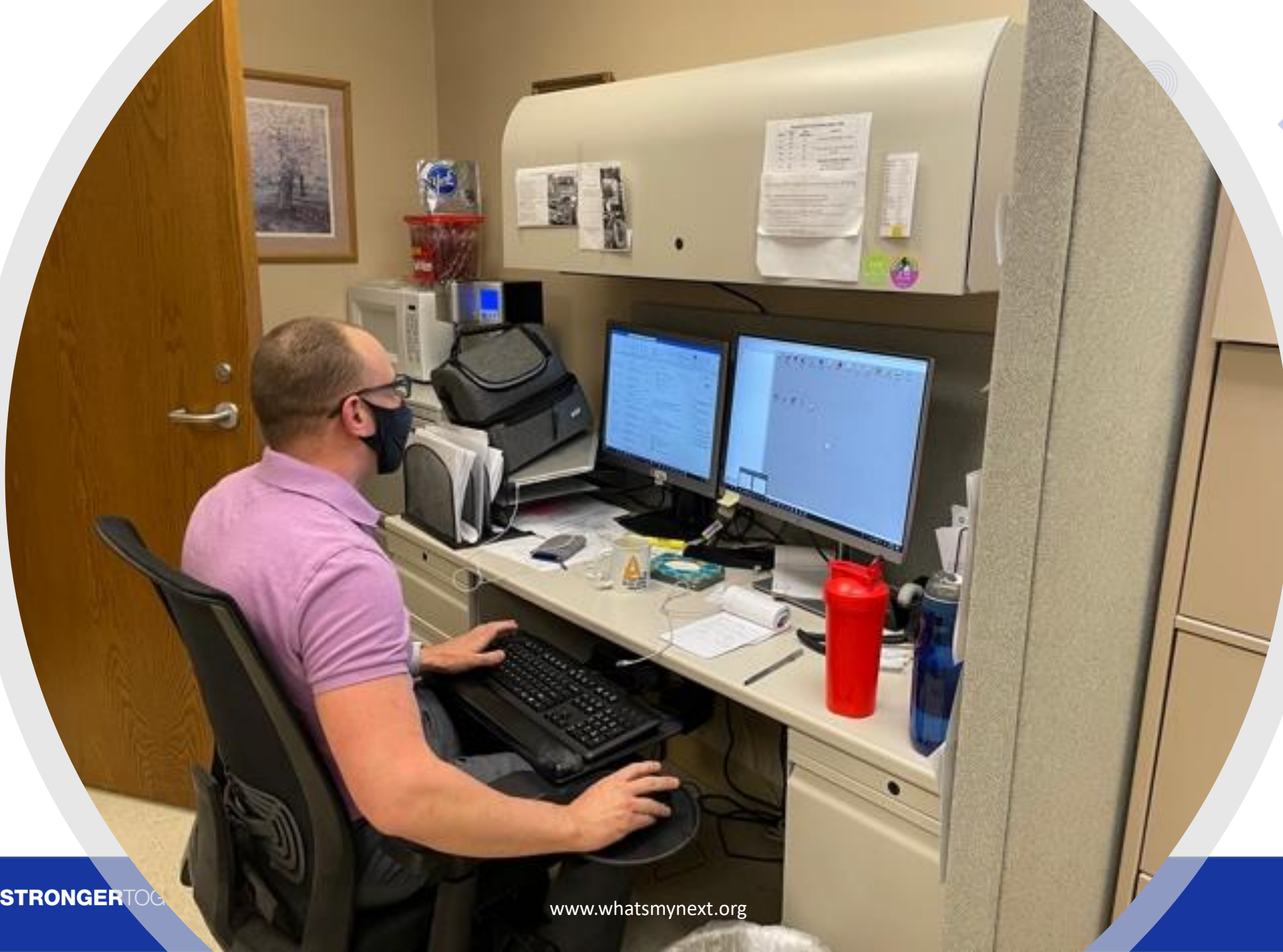
Pathologist at Work

- Anatomic pathologists use a microscope and a computer for most of their work.
- Clinical Pathologists: Use lab data, supervise the clinical labs and develop new test and evaluate and explain test results to other doctors



Computer scientists





Laboratory Administration

- Degree in health care administration or MBA
- Master degree programs after MLS degree
- Direct the finance of the laboratory and supervise staff
- Interact with other departments of the hospital and hospital leadership





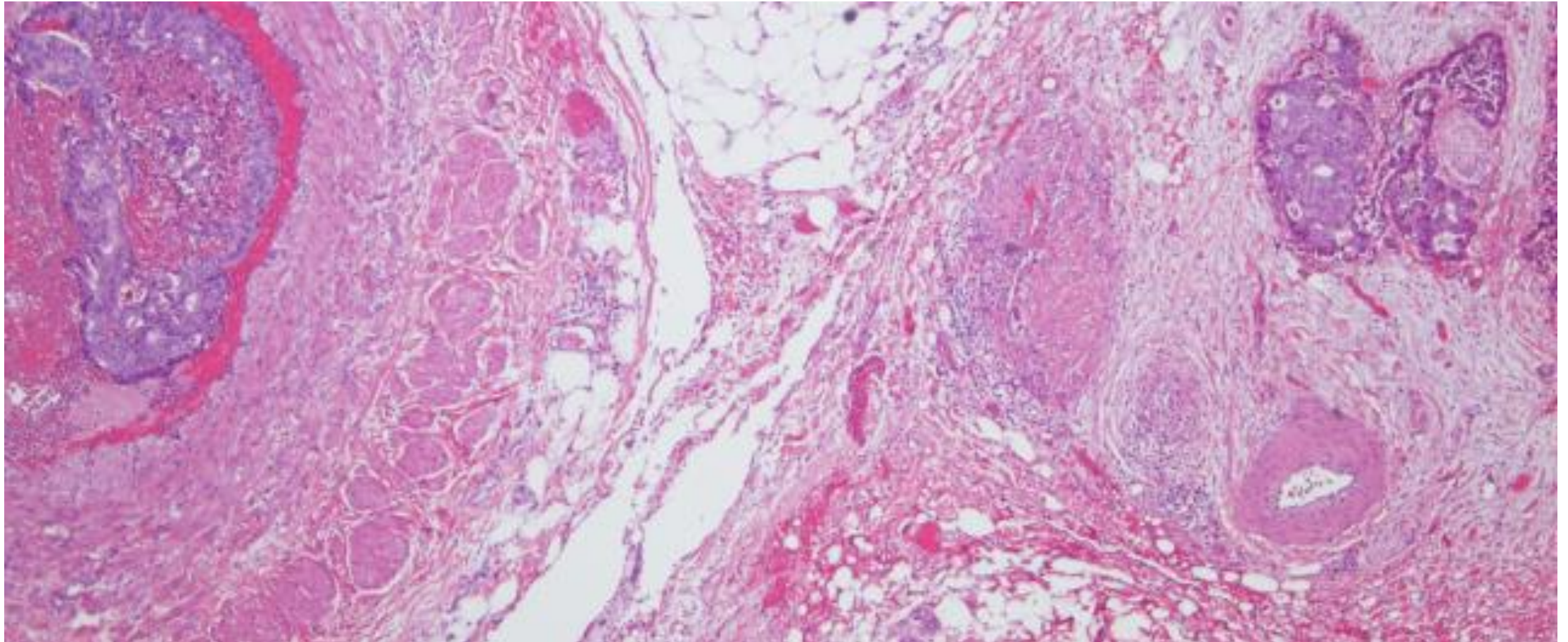
Case examples

Cancer and Infectious Disease Cases

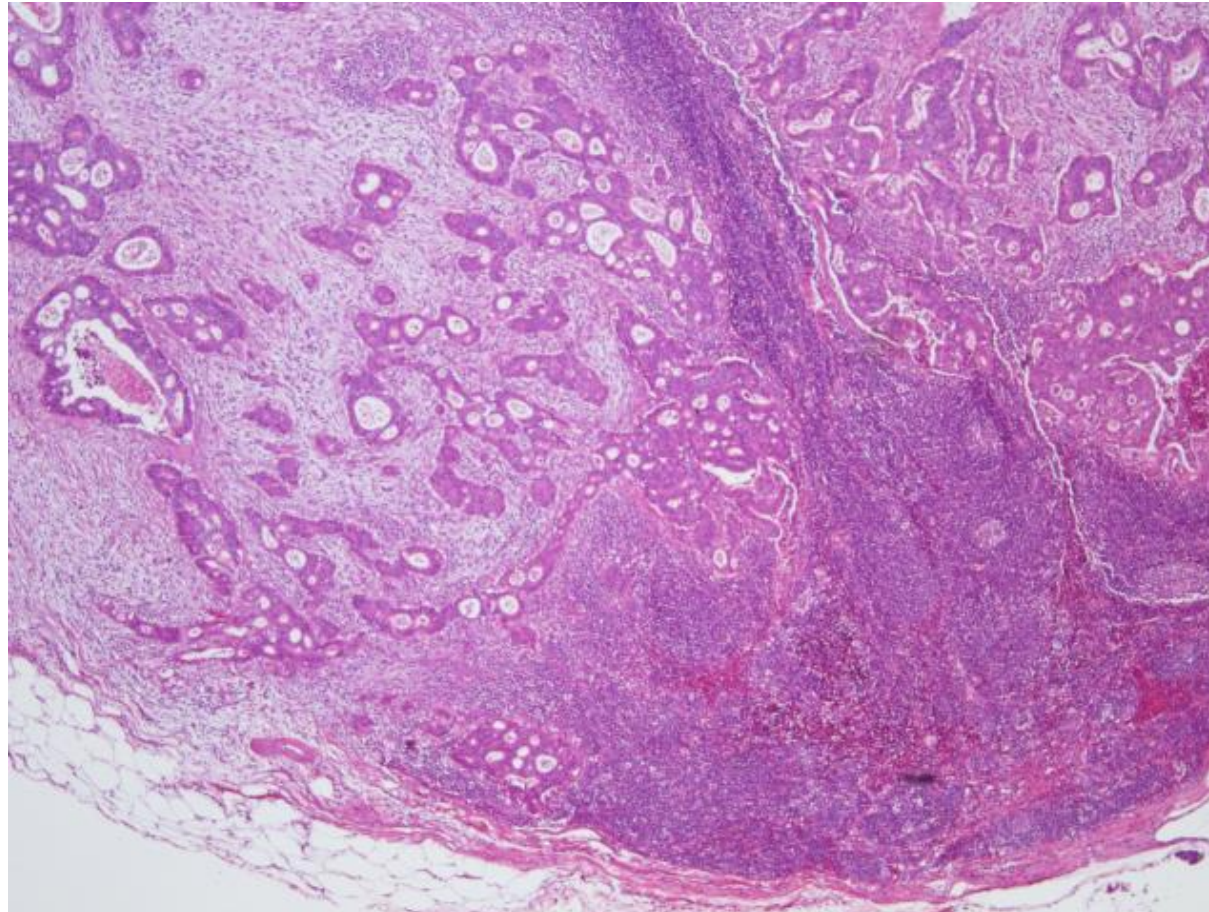
Example of colon cancer resection



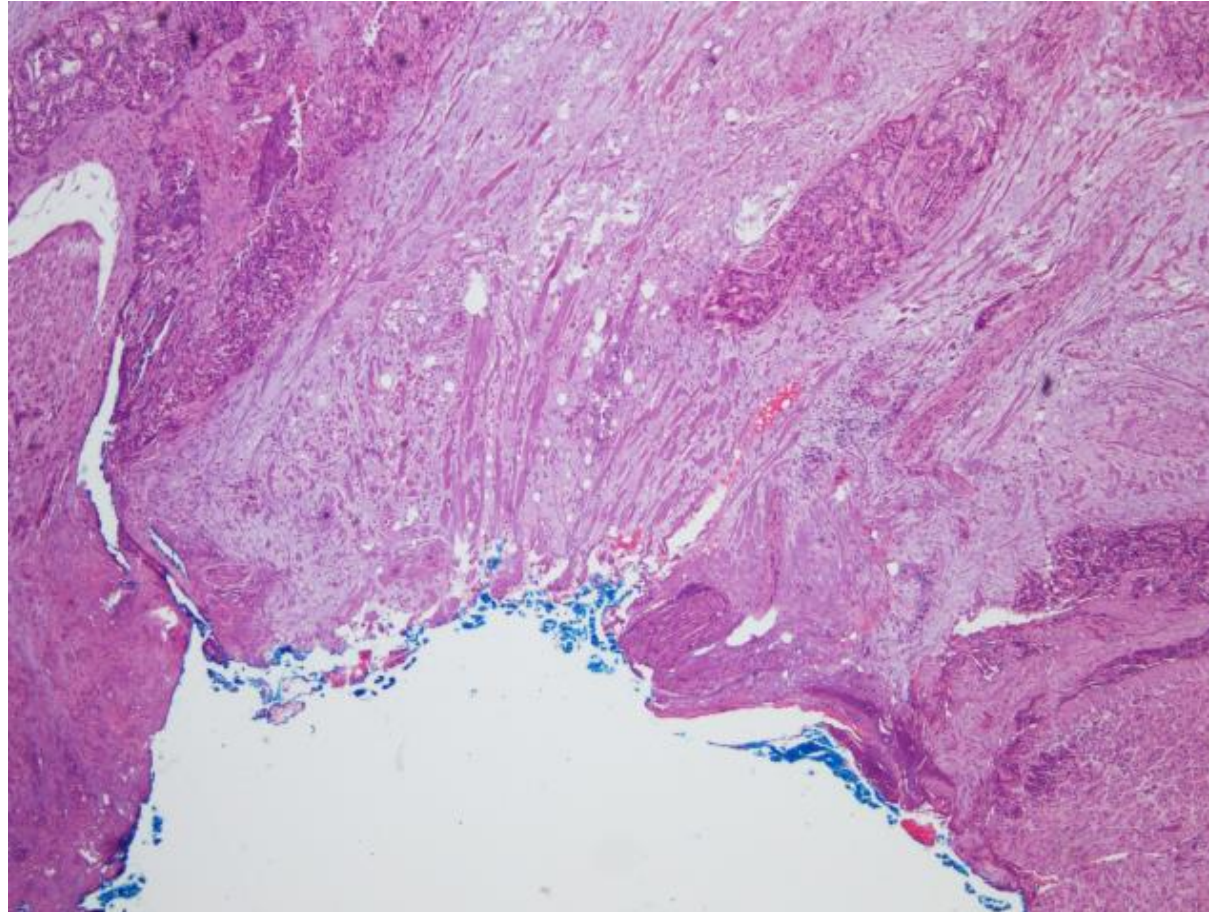
Colon & upper rectum resection: Artery, vein & perineural space invasion



+ lymph node in colon cancer resection

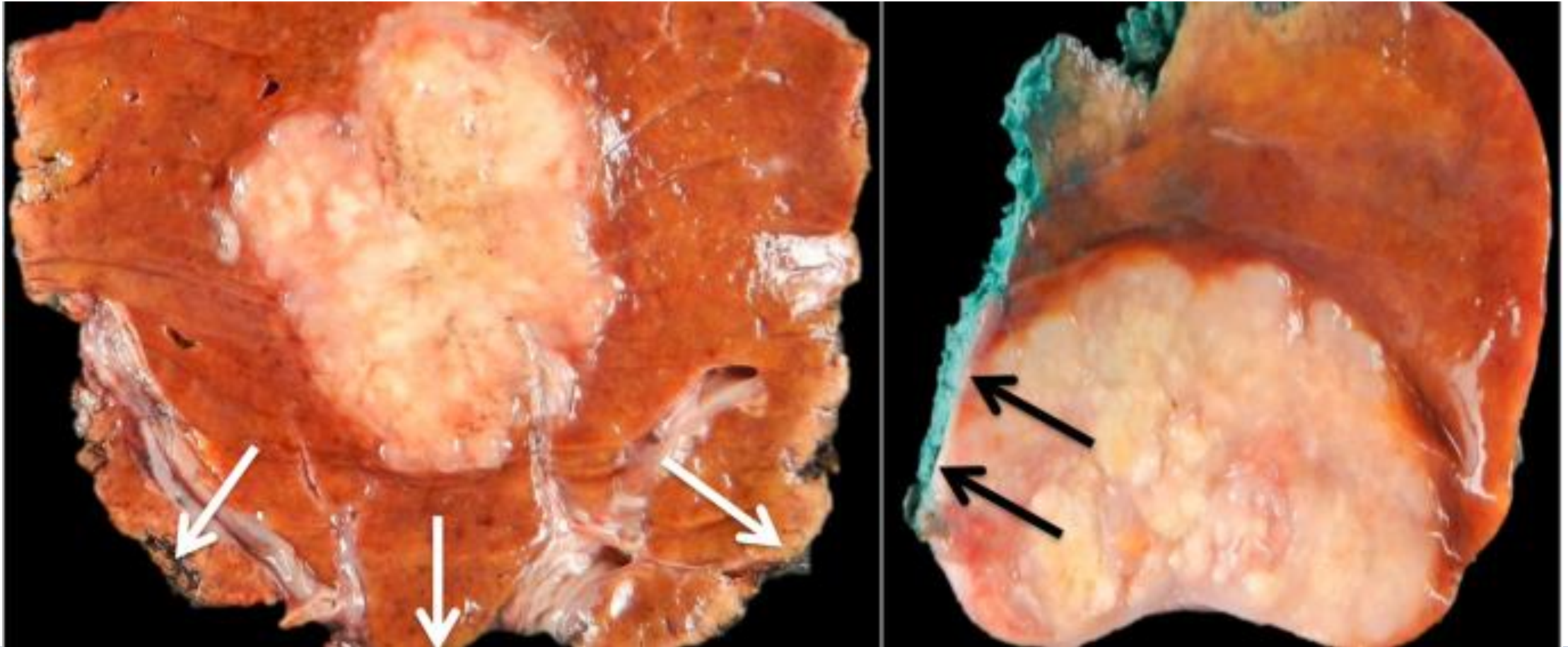


Sigmoid colon & upper rectum resection mesenteric margin 1mm from tumor

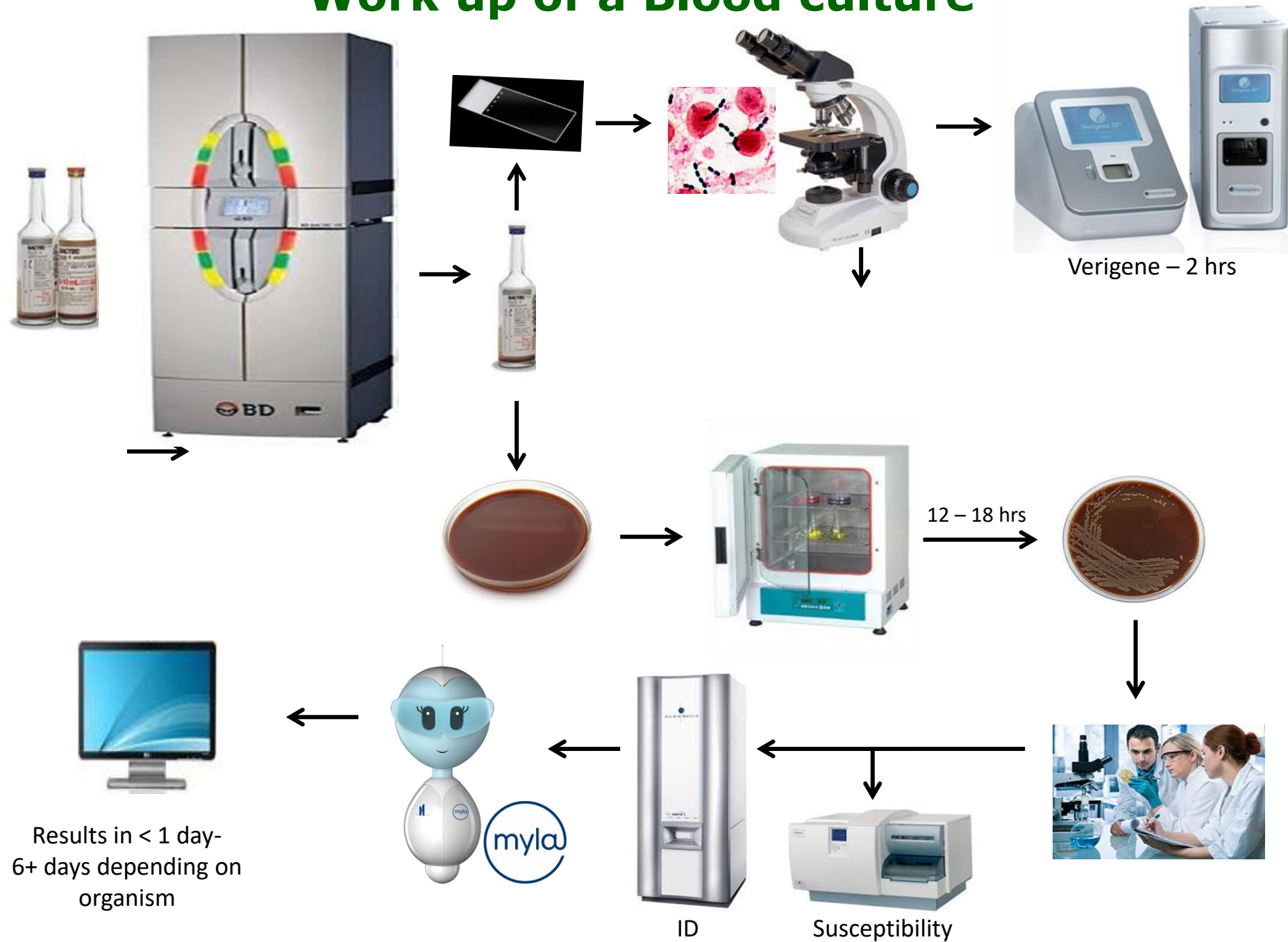


Colon cancer metastatic to liver tissue

Wedge resection

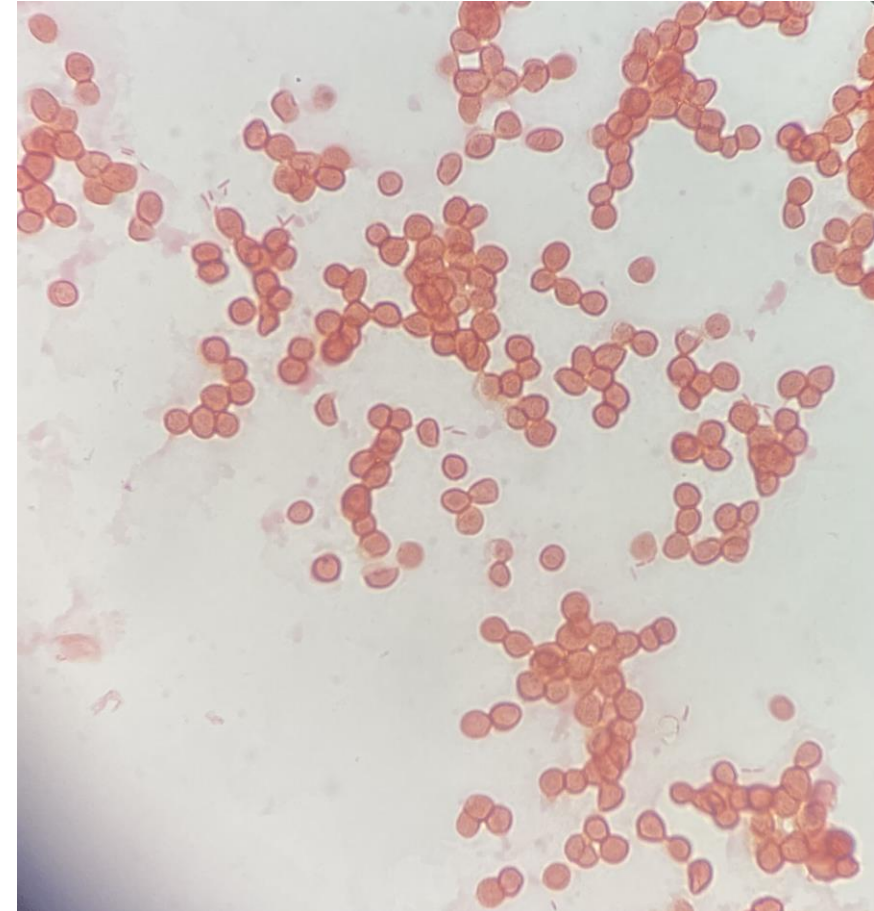
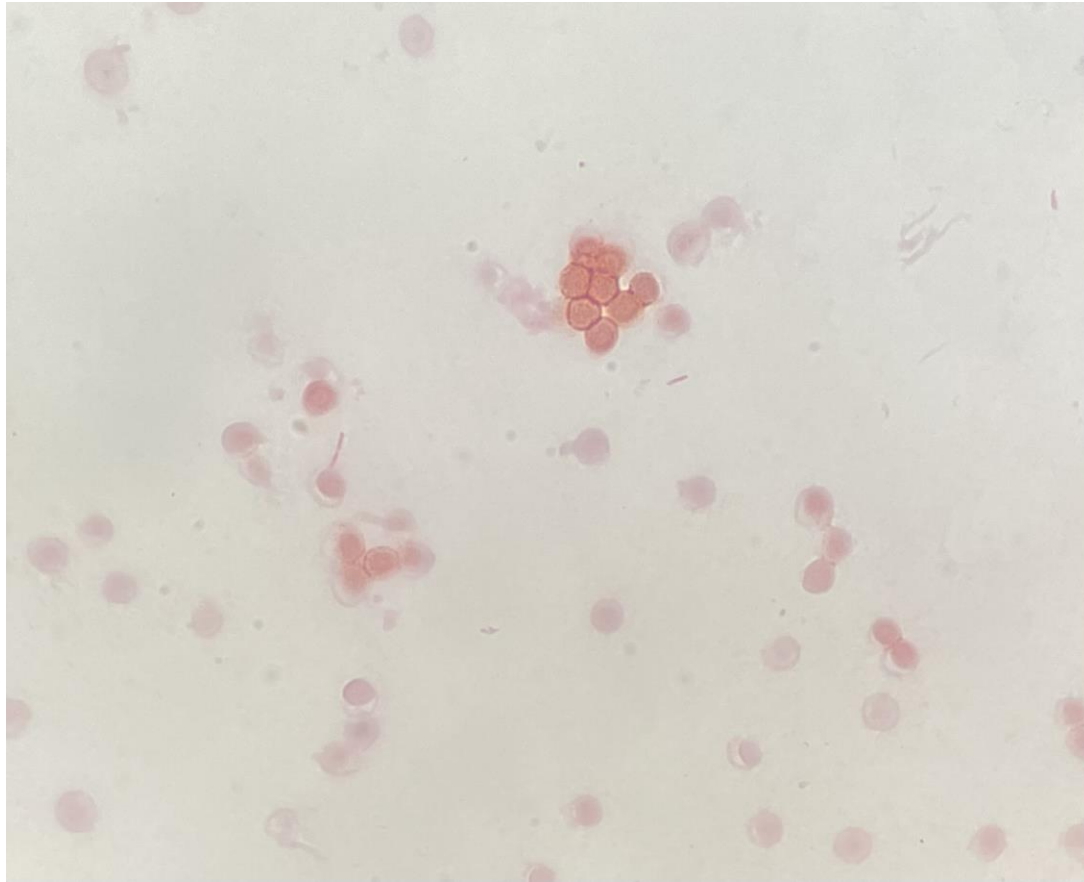


Work up of a Blood culture



Blood culture Gram Stain

3 of 4 bottles signaled growth (3 days incubation)

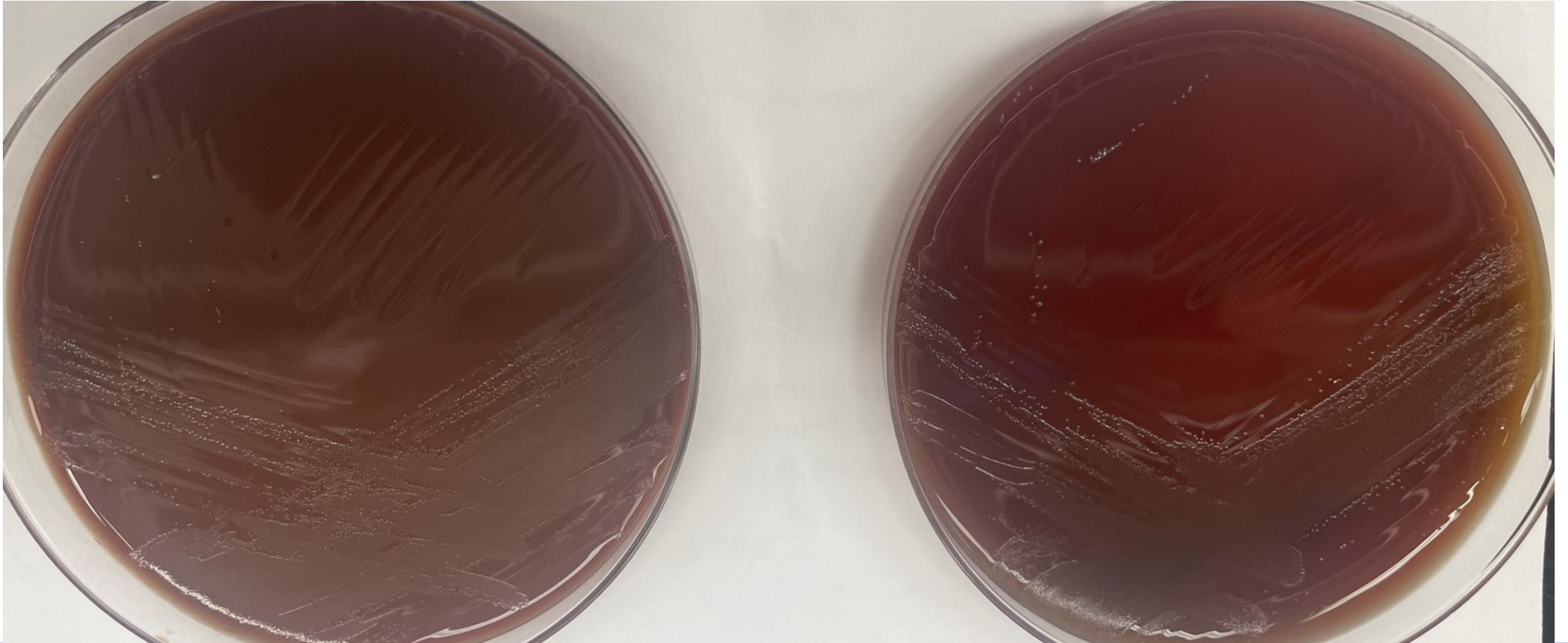


Blood culture

Aerobic bottle x2 and one aerobic bottle:

Verigene GN panel: TND

Growth of subculture to chocolate and agar



MALDI-TOF ID & Susceptibility

Cardiobacterium hominis

Antibiotic	<i>C. hominis</i>	
	MIC	INTRP
Amoxicillin/CA	$\leq 2/1$	S
Ampicillin	≤ 0.25	S
Ampicillin/sulbactam	$\leq 2/1$	S
Ceftriaxone	≤ 0.5	S
Ciprofloxacin	≤ 1	S
Imipenem	≤ 0.12	S
Levofloxacin	≤ 2	S
Meropenem	≤ 0.25	S
Penicillin	≤ 0.06	S
Tetracycline	≤ 1	S
Trimethoprim/Sulfa	$\leq 0.5/9.5$	S

S = SUSCEPTIBLE I = INTERMEDIATE R = RESISTANT
S-DD = SUSCEPTIBLE, DOSE DEPENDENT N = NON-SUSCEPTIBLE

Cardiobacterium hominis

- Gram-negative pleomorphic and fastidious rod-shaped bacterium that is part of normal human oropharyngeal flora (mouth organism)
- Rare cause of infective endocarditis, accounting for ~1 % of IE cases
- Associated with delayed diagnosis
 - Mild, nonspecific symptoms
 - Difficult to isolate on blood cultures (median time to grow is 4 days)
- Tends to form friable vegetations so prone to embolic complications (spread from heart through blood vessels to other organs)

Aortic valve excised 9/30/24.
Cultures of Vegetations: Negative
Patient discharged with cardiac rehab: 10/10/24



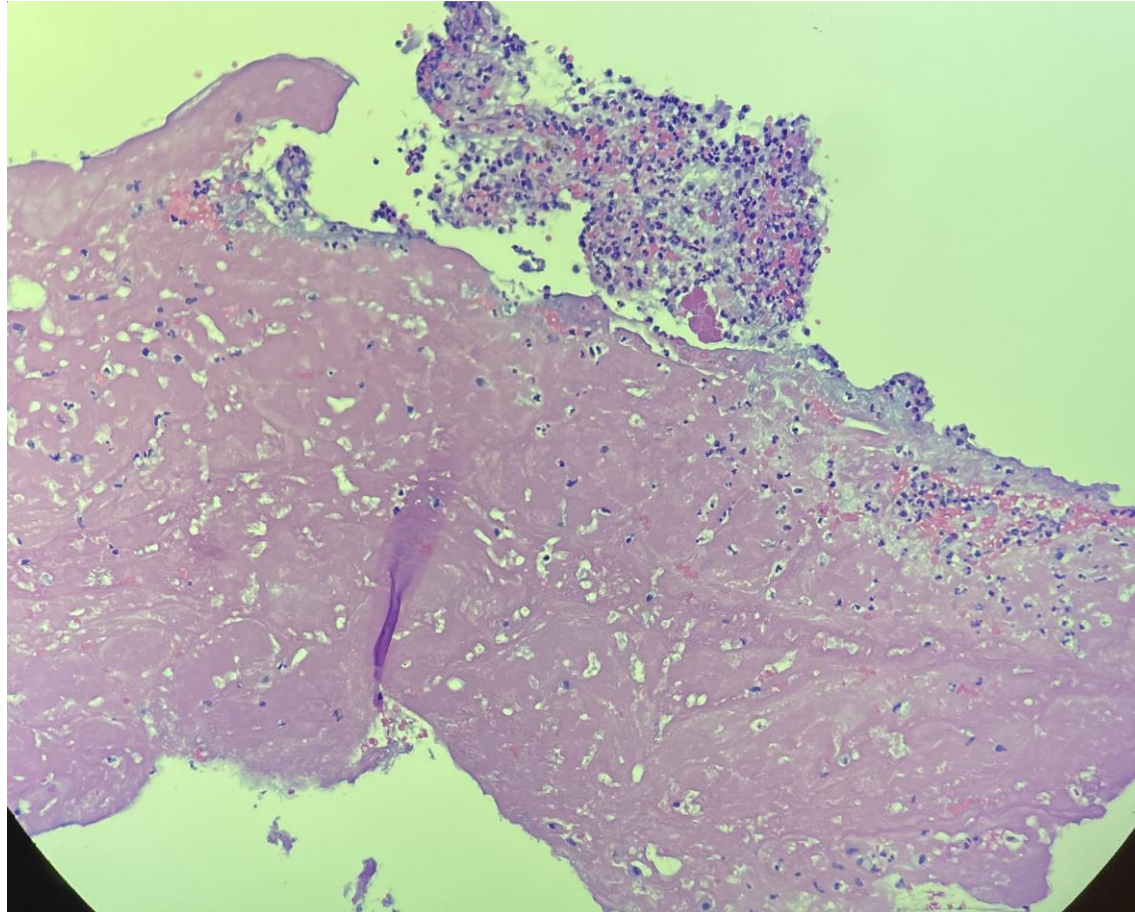
Heart valve histology:

Vegetation: fibrin & acute inflammation

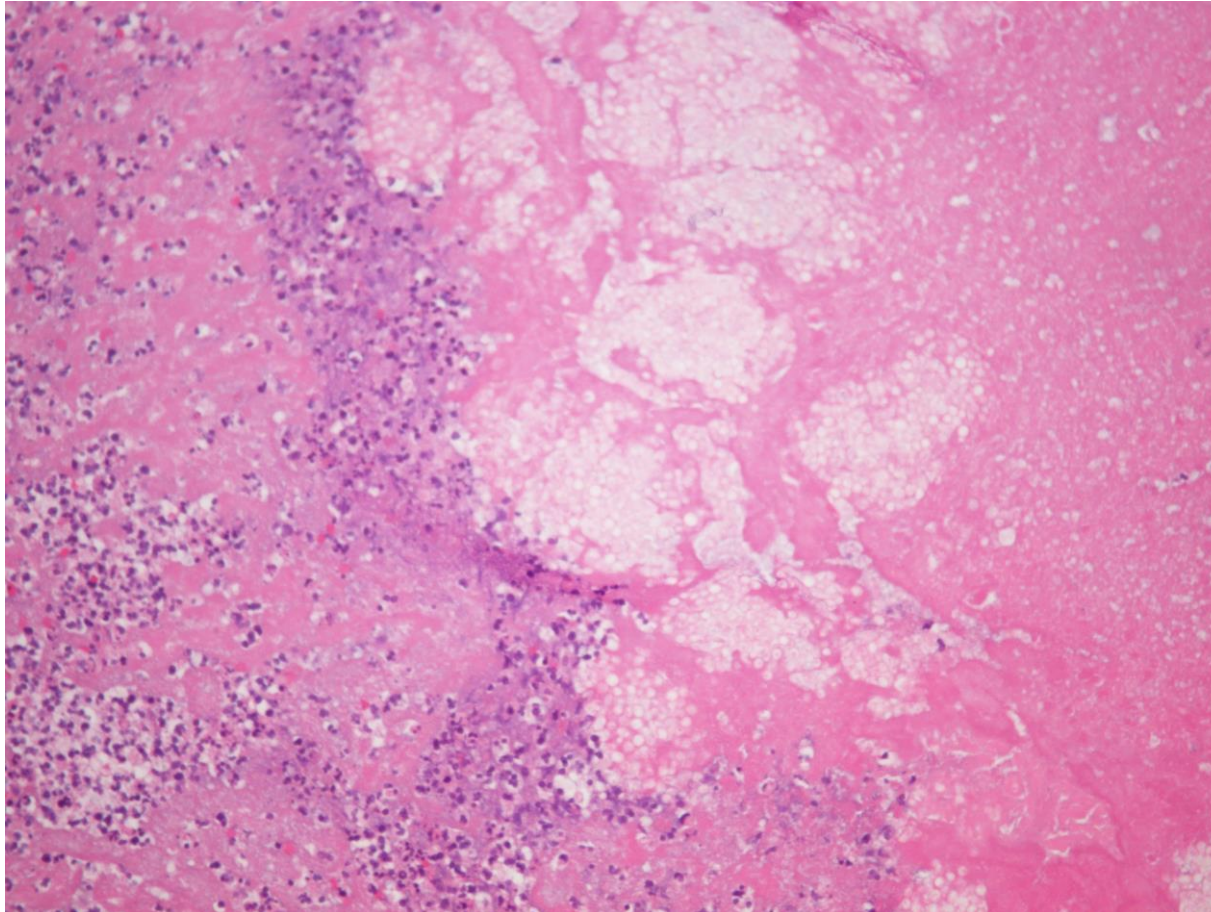


Microbiology:

Aerobic & anaerobic culture negative after 5D

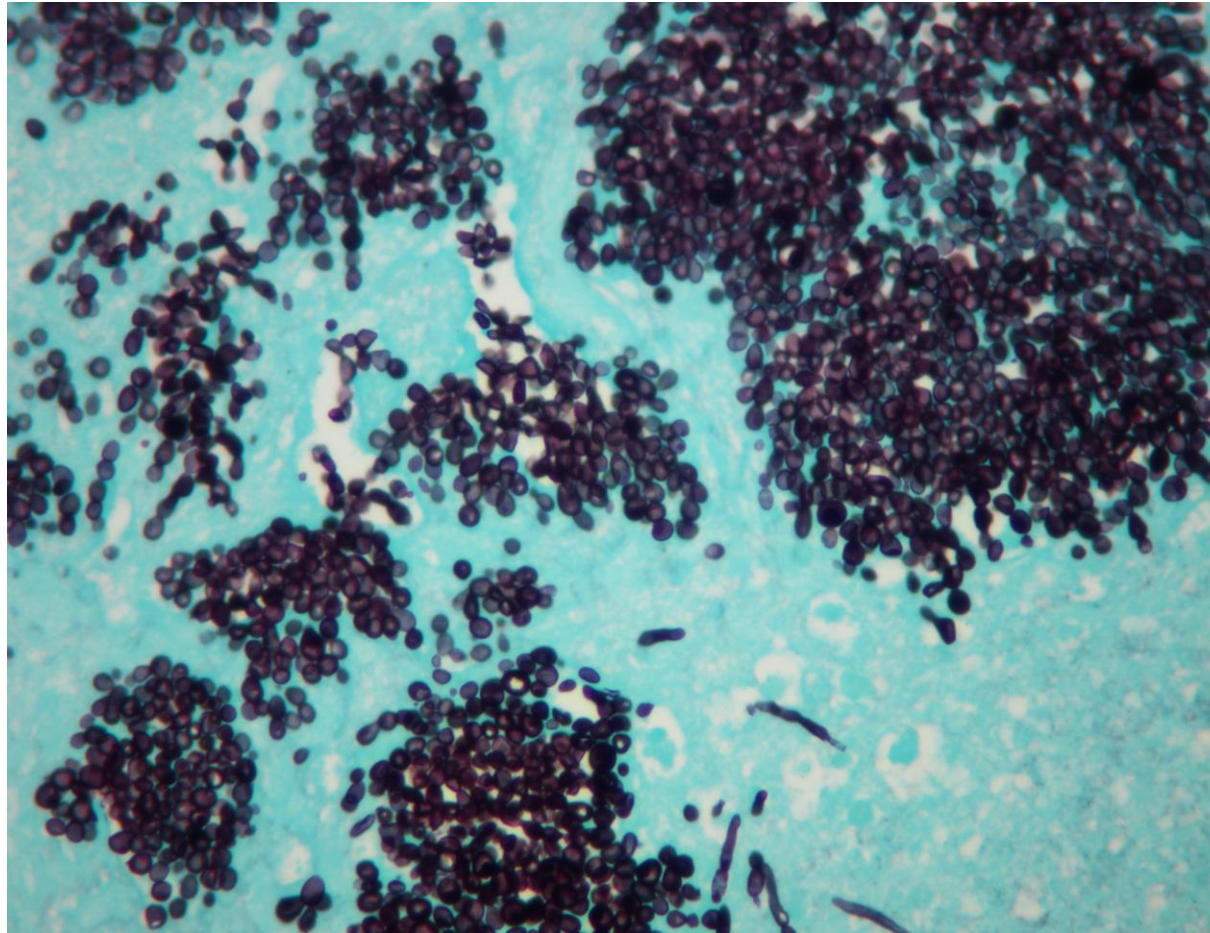


Different Case of Endocarditis: Tricuspid Valve



CS-24-15003 Tricuspid Valve Vegetation

400X GMS Fungal Stain: *Canada albicans*



How Can You Learn More?

- **GO** to **ASCP** web site: [whatsmynext.org](https://www.whatsmynext.org) & complete the “More Info” form to ask questions
- **SPEAK** to your school counselor
- **CONTACT** local hospitals and seek job shadowing opportunities
- Del Tech has Phlebotomist and Histotechnology & Medical Laboratory Technician programs
- University of Delaware & Drexel have Medical Technology program with Pre-Med and laboratory career tracts
- www.naacsl.org Has other schools with programs
- My email: cflynn@christinacare.org