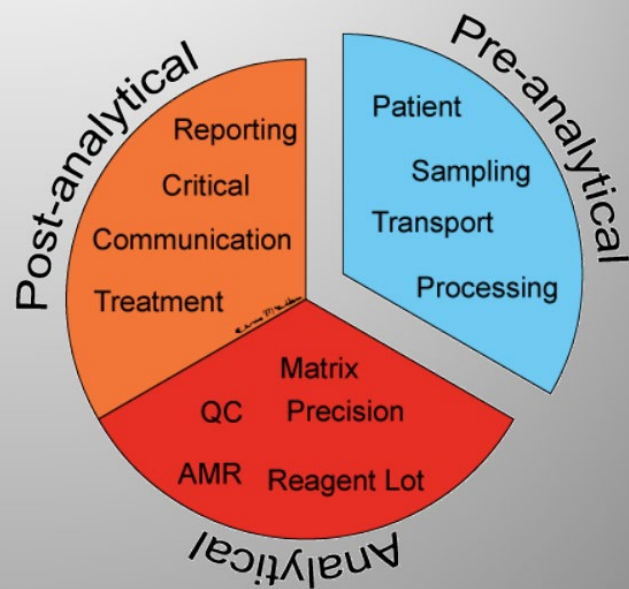


INTRODUCTION TO PRE- ANALYTICAL LAB ERRORS



AMY KINGSLEY, CLS, MLS(ASCP)^{CM}
SHARON MCGOLDRICK MS. ED, CLS
MICHELLE KITTINGER, MHA, HMS PA(ASCP)



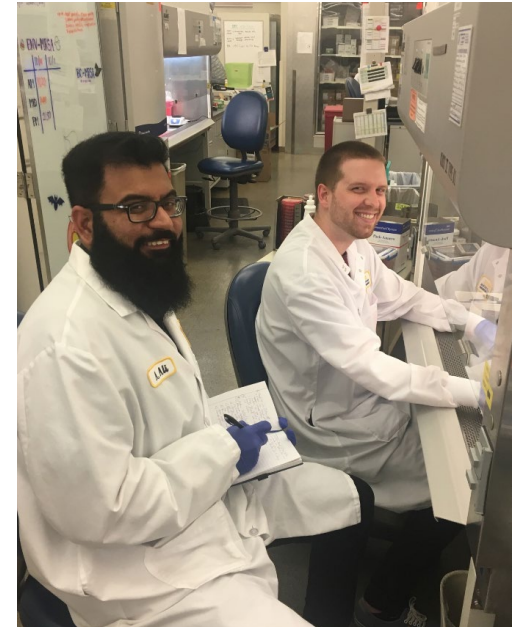
PHLEBOTOMY PRACTICES TO REDUCE PRE-ANALYTICAL LAB ERRORS



Over 70% of diagnostic and treatment decisions made by clinicians are based on medical laboratory test results.

Lab team-

- Pathologists and Pathologists' Assistants
- Medical Directors
- Clinical Lab Scientists
- Medical Laboratory Technicians
- Phlebotomists
- Lab Assistants





Core Lab (SESP)

Specimen Processing
Hematology & Coagulation
Transfusion Medicine
Chemistry



Specialty Testing Center

Microbiology
Toxicology
Special Chemistry
Immunology



UC Davis Health Clinical Laboratory Locations





■ The Department of Pathology has **5** testing locations that are CAP accredited.

■ Testing Volume

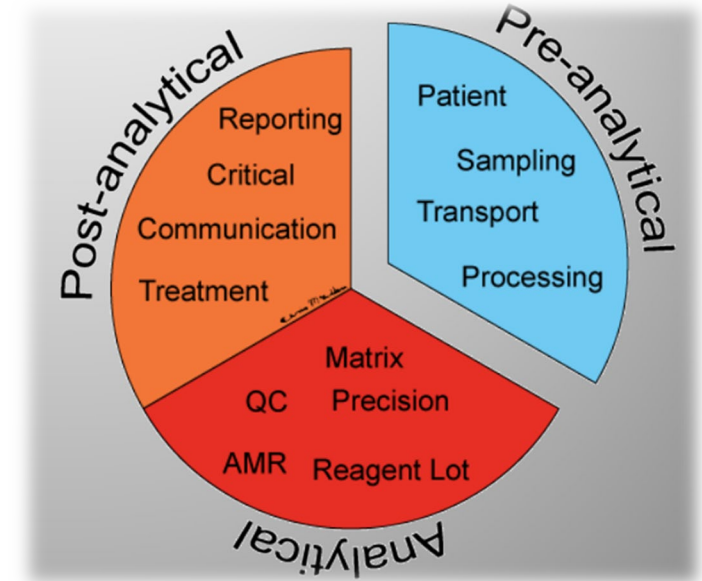
1. Main Lab at SESP: **11,173,493**
2. STC Lab- Specialty Testing Lab: **932,319**
3. Pathology Building: **272,747**
4. Cancer Center Lab: **128,155**
5. 48X Center: **1,500**

Last year's total volume: **12,508,214**

■ Daily Average: ~34,269 tests

Laboratory Errors

- ☐ Pre-Analytical
 - Order
 - Specimen collection**
 - Processing
 - Transportation
 - Storage
- ☐ Analytical
 - Testing wrong patient
 - Instrument problems
 - Quality Control failure
- ☐ Post-Analytical
 - Calculation error
 - Posting results to wrong patient's record
 - Not reporting or not documenting critical values



Goal is to draw specimens correctly to provide the lab with a quality sample, the healthcare team with a meaningful test result and the patient with a minimum number of sticks.

Quality Specimens = Quality Results

Over 70% of diagnostic and treatment decisions made by clinicians are based on medical laboratory test results

Pre-Analytical Errors: **Specimen Collection and Transport**

- Patient ID (misabeled/unlabeled specimens)

- IV contamination-dilution effect

- Hemoconcentration

- Carryover Effect

- Hemolysis

- Clotting

- Quantity Not Sufficient (QNS)

- Wrong container for test (often seen in Microbiology)

PHLEBOTOMY QUIZ

- What is recommended time to leave ***tourniquet*** on during specimen collection by venipuncture?
- What is meant by “***order of draw***”?
- What is “carryover effect”?
- Name 3 results of incorrect phlebotomy technique.
- Name 3 tests that can be affected by incorrect phlebotomy technique.
- Name 3 things that can cause hemolyzed or clotted specimens.

Patient Identification- is a **MUST**

- Make positive patient identification using at least 2 identifiers
The Joint Commission NPSG01.01.01
UCDHS Venipuncture Verification and Blood Withdrawal Policy # 13029
UCDHS Specimen Labeling for Laboratory Processing Policy # 18004
- Compare identification on lab order to patient identification on wrist band
- Compare each label to patient identification on wrist band

Venipuncture Preparation

- Needle

Vacuum system – preferred

Syringe with needle – used for small & fragile veins (Requires Transfer Device to fill tubes)

Butterfly – hand veins, pediatric patients

- Tourniquet

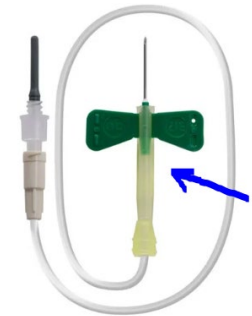
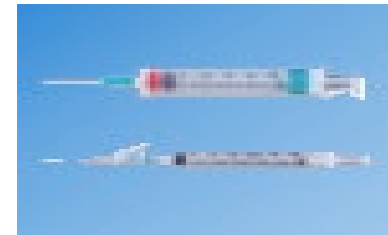
- Alcohol routine blood draws

- CHG (Chloro-Prep) for blood cultures

- Tubes – based on tests ordered and volume required

- PPE: gloves, goggles, mask, gown, respirator

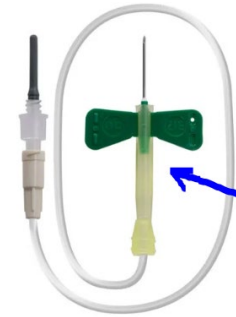
- Post-venipuncture care (gauze, tape, Band-Aid)



Venipuncture

- Cleanse site and allow to **air dry**
- Tourniquet < **1 minute**
- Anchor vein and insert needle at ~ **30-degree angle**
- If blood is flowing freely, release tourniquet (**<1 minute**)
- Fill tubes using **correct “Order of Draw”**
- **Fill tubes completely** to the required volume
- **Invert each tube 8-10 times immediately** after collecting
- Remove needle and use safety device
- **Use transfer devices** for syringe draws
- Recheck labels
- Specimen transport

Any item in bold may affect the clinical lab result



Specimen Integrity Problems

- Hemolysis
- Clotting
- IV contaminated-dilution effect
- Quantity Not Sufficient (QNS)
- Hemoconcentration
- Carryover Effect

Commonly Used Tubes & Correct Order of Draw

- Sterile Blood Cultures
- LTBLU: Blue top (sodium citrate)
- RED: Red top (serum tube, has clot activator)
- SST: Gold top (serum separator tube, has clot activator + gel separator)
- LTGRN: Light Green top PST (lithium heparin)
- DKGRN: Dark Green (sodium heparin)
- LAV: Purple top (EDTA)
- ACD: Yellow top (acid citrate dextrose)
- GRAY: Gray top (sodium fluoride/potassium oxalate)

Carryover Effect- When trace amounts of additives in one tube are transferred to the next tube.

FOLLOW CORRECT ORDER OF TUBE DRAW

Collecting blood in wrong order may cause cross contamination of additives in lab tubes, false increase in coagulation times, contaminated blood cultures, inaccurate test results.

UC Davis Health System
Department of Pathology & Laboratory Medicine
Order of Draw Guide – Vacutainer Common Tubes

Sterile Blood Culture Bottles are always collected **first** when drawn at the same time as other lab tests/tubes.



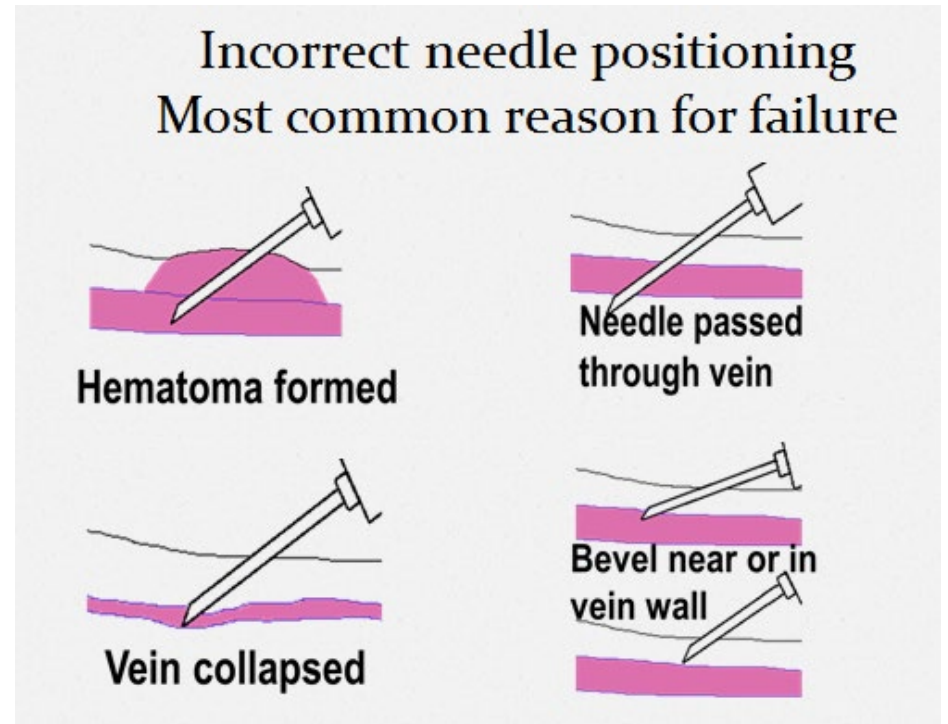
Lab Test Directory www.testmenu.com/ucdavis
Client Services (916) 734-7373

	# 1: [LTBLU] Blue/Lt Blue Top Sodium Citrate 2.7 mL or 1.8 mL (pediatric)		# 5: [DKGRN] Dark Green Top Sodium Heparin 4 mL
	# 2: [RED] Red Top 4 mL or 0.6 mL microtainer		# 6: [LAV] Lav/Purple Top (EDTA) 4 mL or 0.5 mL microtainer
	# 3: [SST] Gold Top Serum Separator Tube (SST) 5 mL, 3.5 mL, or 0.6 mL microtainer		# 7: [ACD] Acid Citrate Dextrose 8.5 mL
	# 4: [LTGRN] Light Green Top Lithium Heparin (PST) 3 mL or 0.6 mL microtainer		# 8: [GRAY] Gray Top (Sodium Fluoride/Potassium Oxalate) 4 mL or 0.6 mL microtainer

Hemolysis

Hemolysis caused by mechanical trauma to cells:

- not letting alcohol dry before venipuncture
- excessive pulling on syringe
- needle too small (causes increased pressure)
- improper needle placement in vein
- not using transfer device and/or pushing blood through stopper of tube
- vigorous shaking of tube instead of inverting
- drawing thru IV or Central Line
- milking site of capillary puncture or scooping or scraping of blood into tube



Clotting

Clotting may be caused by

- Leaving blood too long in syringe before transferring to tubes
- Improper mixing

Best practice is to invert tubes 8-10 times immediately after collection
(includes microtainers)

IV Contamination

- **IV contamination & dilution effect**

Avoid arm with IV

Shut off IV for 2 minutes (*follow nursing policy) and draw below IV

Discard first 5 cc blood (usu. 2.5 times dead space volume; follow nursing policy)

- **Vascular Access Devices (VADs)**

Vascular access devices, such as catheters and needles, exert shear forces during blood flow, which creates a predisposition to cell lysis

Limited access (who can access, # times can access); requires flushing and may require discard-reinfusion of blood for neonates/critically ill

Can result in heparin contamination of sample: ensure to use proper discard volume

Higher rate of hemolyzed samples compared to venipuncture: avoid pulling too hard or too fast on the syringe when withdrawing blood from VAD

QNS (Quantity Not Sufficient) & Under Filled Tubes

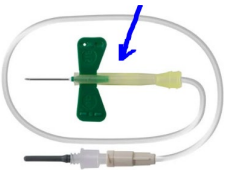
QNS typically encountered difficult sticks & add-on tests

- “Hard stick”, poor blood flow- microtainers available



Correct volume is critical to maintain correct blood to anticoagulant ratio. Use the Lab Test Directory as a guide to minimum volumes

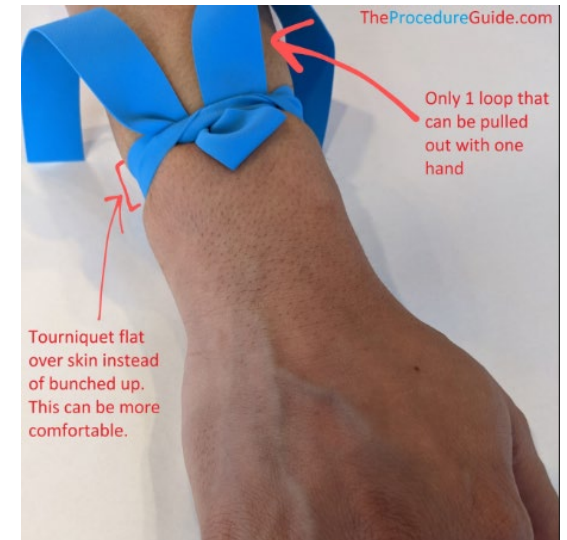
- Underfilled CBC tube (lavender) causes falsely decreased HCT and MCV
- Must use “discard” tube for Coagulation studies (blue top) **IF** a butterfly is used; allows for dead space/air in the line to be cleared allowing proper tube filling
 - Under filled blue top tubes: yield falsely increased coagulation times
 - blue top tubes -Underfilled, clotted, and hemolyzed are all canceled
- Volumes are critical for Blood Culture bottles for best organism recovery (QNS may lead to false-negative result)



Hemoconcentration

- Blood can pool at the venipuncture site when occluded
 - Some analytes will remain in vessel temporarily and significantly increase in concentration WBC, RBC, Hgb, Hct, glucose, K+, ionized calcium, albumin, triglycerides, alk phos, total protein
 - Can lead to erroneously high or low levels of certain analytes.
 - Best Practice is to release tourniquet when blood is flowing into collection tubes and draw with a *relaxed hand*.

DO NOT LEAVE TOURNIQUET ON > 1 MINUTE



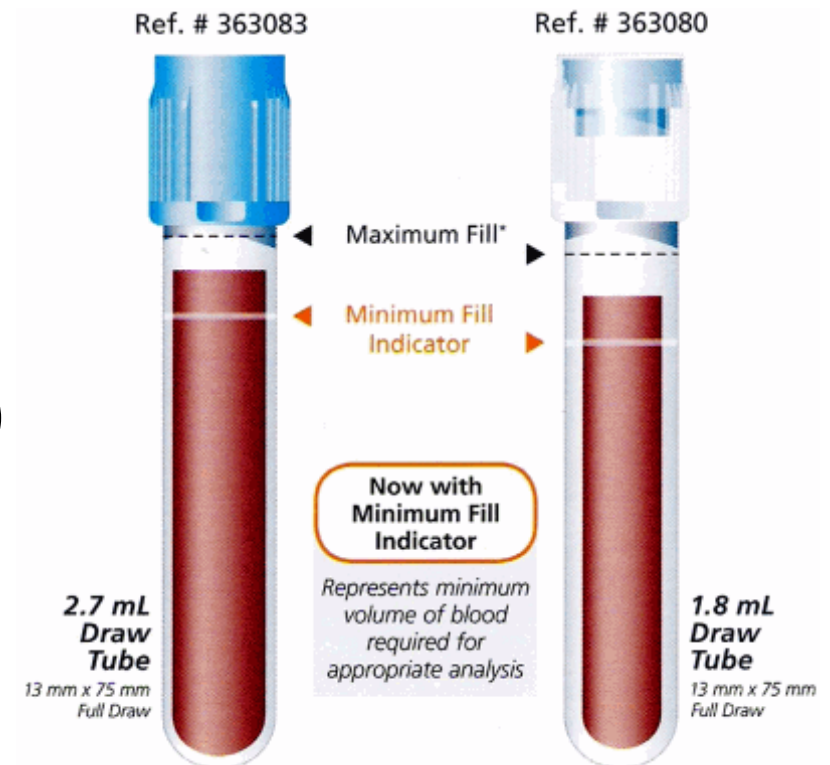
Ensure tourniquet is not tied too tightly and the ends are not in the draw area.

Chart demonstrating effect of poor phlebotomy practice- first row is an example of best practice

Error	Effect	1 st Tube Drawn	2 nd Tube Drawn	Analyte to be Tested
None – best practice	No carryover	1st = light green (lithium heparin)	2nd = purple (potassium EDTA)	K+ = 3.5 mEq/L Result reflects true patient value
incorrect order of draw	carryover of anticoagulant	1st = purple (potassium EDTA)	2nd = light green (lithium heparin)	K+ = 4.5 mEq/L Falsely increased due to contamination
incorrect order of draw	carryover of anticoagulant	1st = light green (lithium heparin)	2nd = blue (sodium citrate)	PTT > 150 seconds
hemolysis	↑ K+	light green	n/a	K+ = 5.7 mEq/L Falsely increased due to release of intracellular RBC K+
hemolysis	↓ Hct ↓ Hgb	purple	n/a	Hct = 20 % Hgb = 6.7 gm/dL Analyzers count individual cells, cells lysed
clotted	↓ PLTS	purple	n/a	PLTS = 15,000 Slide will be reviewed for evidence of platelet clumping & fibrin strands
mislabeled	WBIT	purple	n/a	ABO/RH = A+ (historical type = B+) Canceled
IV contamination	↓ Hct	purple	n/a	Hct = 13 % Sample diluted
IV contamination	↑ glucose	gray	n/a	Glucose = 800 mg/dL
QNS (underfilled)	wrong anticoagulant to blood ratio	blue top	n/a	INR = 0.7

Common Pre-analytical Errors

- Sample collected in wrong tube (CBC ordered – red tube collected/sent)
- Glucose ordered; sample not spun
 - Glucose obtained from unprocessed blood samples can decrease 5%–7% per hour due to glycolysis
- Clotted
- Hemolyzed
- Incorrectly filled (QNS)
 - ESR
 - Coagulation Studies (Blue top/Citrate Tube- binds Ca^{++})



COMMON SPECIMEN LAB ERRORS

Patient Identification Pre-Analytical

- Ordering Issues
- Specimen collection
- Labeling Issues
- Specimen processing
- Transport

Analytical

- Testing Issues
- Quality Control
- Device Malfunction

Patient Identification Post-Analytical

- Reporting
- Interface Issues
- Delayed communication to clinician

COMMON SPECIMEN ERRORS

Collection Issues	Labeling Issues
Wrong Container for Test	Unlabeled specimens
Underfilled/ Overfilled Tubes (Urine specimens, QuantiFERON Tubes)	Mislabeled Specimens / Incomplete Labels
Expired collection tubes/ kits	Unlabeled <u>primary</u> containers – Slide holder labeled, slide unlabeled. (Slide is the primary container)
Results	Ordering Issues
POCT tests performed on expired cartridges/ kits	Unclear or Incorrect orders
POCT procedures not followed	Missing requisitions

CASE STUDY 1

CULTURE URINE, BACTI

MICG000051 🖨️ ✉️

Issue - Wrong transport container used

- Urine sample collected for Bacterial Urine Culture.
- Micro Lab received 50ml of urine in a sterile container
- Correct transport container = boric acid (grey top) tube

Resolution

- Specimen recollection
- Staff education

Ordering Collection Result Interpretation Administrative

Collect

URINE - Midstream clean catch or catheter urine ≥ 4 mL, submit in a Urine C&S Preservative - gray top tube.

Only when volume is less than 4 mL, submit in sterile urine cup on ice. Deliver to the laboratory immediately.

Indwelling Catheter

1. After proper site cleansing, use a syringe to enter the sampling port or 21-gauge needle and syringe if sampling port is not available. Withdraw approximately 10 mL of urine.
2. Place collected urine in a Urine C&S Preservative tube - gray top. If less than 4 mL collected, place urine in a sterile container and transport on ice immediately to the lab.

Clean-voided Urine

1. After proper site cleansing, grasp the collection cup on the outer surface only. Fingers should be kept away from the rim and inner surface of the container. Pass a small amount of urine into the toilet and then move the cup into the urine stream while urinating. Collect at least 15-20 mL or fill the cup half full.
2. Void remaining urine into the toilet. Securely close the cap of the container.
3. Place collected urine in a Urine C&S Preservative tube - gray top. If less than 4 mL collected, place sterile cup on ice and transport immediately to the lab.

For Infants

1. Collect urine specimens through a catheter or infant bag. Check the bag frequently so urine specimen can be collected immediately after it is voided. If the patient has not voided within 30 minutes, remove the bag, rescrub the patient and attach a new collection bag. Do not submit urine collected from diapers.
2. Place collected urine in a Urine C&S Preservative tube - gray top. Do not submit infant bag. If less than 4 mL collected, place in sterile cup on ice and transport immediately to the lab.

Notes

If culture and urinalysis are desired, order URINALYSIS AND CULTURE IF IND. Two separate urine samples must be submitted, one sample in a yellow-top Urinalysis tube and the other sample in a Urine C&S Preservative gray-top tube.

Ordering Collection Result Interpretation Administrative

Performed

Daily

Methodology

Standard reference procedures for aerobic bacterial culture and identification

Reported

Preliminary: 1 day

Final: (typically) 1-3 days

Synonyms

- URINE CULTURE



CASE STUDY 2

Issue - Mislabeled specimen

- UACII collected at the clinic, received in the clinical lab and test resulted at 1257 HRS.
 - Specimen clear, microscopic = culture not required.
- 1720 HRS the same day- a new specimen received **labeled with same order label number**, not batched to lab, WITH collection time 1115.
- Unknown where the second specimen came from (not batched).
- Second sample received was visibly different (turbid not clear) than the initial patient sample received
 - turbid specimens require microscopy.
- Lab had no ability to tell which specimen received was collected from the intended patient
 - Original results from day shift were amended as possible mislabel, and physician informed.
 - Client services notified to contact MD for new order and follow up with patient for recollection.

Resolution

- Clinic notified
- Specimen recollected

CASE STUDY 3

Issue - Specimen unlabeled and received in the lab greater than 24 hours after collection.

- Micro Lab received a swab for culture-collected at 1345 HRS on a Tuesday and not received until Thursday morning
 - Two labels were in the specimen bag with a comment "MA came down and labeled specimen 1315".
- It was unclear if the specimen was completely unlabeled, or if there was a question as to which label belonged on the specimen. If specimen was unlabeled, it is also unacceptable.
- *Specimens greater than 24 hours old are unacceptable for culture due to specimen degradation.*
- Sample canceled- and request for recollection made

Resolution

- Provider and MA notified of need to recollect
- Additional training provided to the back office (and float) teams-
 - Place samples in transport buckets to be picked up QUICKLY
 - Labeling and correcting labeling must take place at bedside- not after collection completed and sample placed in common area

CASE STUDY 4

Issue - Unauthorized Instrument operator

- When lab staff were addressing results flagged for interface to EPIC, a MRN discrepancy was discovered
- The operator documented in EPIC as running the patient sample in question, was contacted.
 - Clarified to pathology that she had only scanned her badge into the LIAT
 - Sample was run by another individual.
- All Point of Care instruments require training and competency. All appropriately trained staff will have access to Point of Care devices under their own badge.
- With further investigation, the staff that ran the test did not have complete training or skills assessment completion at the time of the incident to perform patient testing.

Resolution

- Incident discussed with clinic management and staff involved
- Issue sent to Compliance
- Staff educated on use of badge access

CASE STUDY 5- ENSURE ALL SAMPLES ARE CORRECTLY IDENTIFIED AND LABELED

Issue - Discrepant Order

- Surgical Pathology lab received a specimen container which did not match specimen source in EPIC(mislabeled sample).
- Ordering RN **entered** specimen D as, "**colon, CECUM-polyp x 2 biopsy forceps.**" & labeled samples the same
- Per GI fellow **EMR specimen** message- the correct designation for specimen D is "**rectum.**"
- Per policy, Unlabeled, Mislabeled, and Incomplete Requisitions/Sub-Optimal Specimens, "specimens submitted [...] with discrepant information may be returned to the submitting area for corrective action or held until discrepant information is corrected or resolved."

Resolution

- Re-education to staff placing orders to correctly order the specimens by selecting the appropriate source/laterality. Email reminder with reference to policy and Joint Commission National Patient Safety Goal sent to employee;
- Reminder to all staff to also verify the specimen container matches the accompanying requisition form.
- Specimen ID clarified via EMR message and processed.

CASE STUDY 6- TRANSPORT CONTAINER LABELED; TUBES UNLABELED

Issue - Lab received unlabeled sample tubes

- Ambry Kit with transport box labeled and paperwork included. Tubes were not labeled but loose in the transport box.

Resolution

- Unlabeled tubes may not be processed for testing- regardless if received in a clearly labeled box with completed paperwork.
- Reminder to verify all specimens are labeled, regardless if placed in a collection transport unit.
- Specimen were canceled and nursing notified of a required recollection.

CASE STUDY 7- TRANSPORT CONTAINER LABELED- TUBES UNLABELED

Issue- Wrong Label Used

- Break nurse was preparing to collect labs. Nurse was in the wrong chart and printed the wrong label. The nurse was unable to scan the label during collection.
- Rather than review the error, bypassed the *scan label* step resulting in the collected sample being sent to lab with the wrong label.
- The nurse realized their mistake before results were released. RN called the lab and requested the sample to be discarded, informing lab that it was mislabeled.

Resolution

- Always scan the label during the collection step. Do not bypass step of verifying patient label and do not push through or bypass scanning unless it's an emergency or during downtime. Scanning a wrong patient label during specimen collection with a Rover will generate a hard stop and will not allow collector to proceed with the process.

CASE STUDY 8- USING A CANCELED TEST LAB FOR A CURRENT LAB DRAW

Issue- cancel test label used for a required draw

- A Phenobarbital level was collected at 1356 and sent to lab using a specimen order that had previously been canceled by the clinician at 1116.
- The order had been released and label printed at 0846 by the RN, this order was now cancelled.
- This patient had a new current existing order requested at 1311. The sample sent to the lab with a cancelled label, printed by RN 5 hours earlier, was not processed.
- The RN was waiting for results not realizing they sent a “cancelled” specimen and the specimen was not being tested. Due to incorrect labeling, this timed therapeutic drug level was missed and recollected the following day.

Resolution

- Print order labels at time of draw instead of hours ahead to ensure proper order is printed and specimen is labeled correctly. Do not release multiple orders in advance to ensure the correct specimen accession is printed and placed on the collected sample.

CASE STUDY 9

REUSING A BARCODE FOR TWO SEPARATE DRAW TIMES

Issue- Reused specimen label

- A specimen was collected for a CBC and sent to the lab. The label used for this draw was a previously resulted CBC label.
- Labels may not be reused. The initial specimen was collected at the beginning of the OR case and results were released and posted.
- A second CBC was drawn, using the same barcode and sent to the lab for testing. This second CBC was after blood had been transfused to the patient. Upon receipt of this second specimen, lab noted this sample had a duplicate label and the second sample was filed as “completed”.
- No testing was performed on the second sample due to duplicate label.
- OR was waiting for the CBC results on the second specimen and called lab after noticing the unusual delay. Upon discovery of the issue and investigation, lab staff spoke with provider and was able to run the second specimen under the new requisition. This caused a delay in care.

Resolution

- Education was provided to staff on importance of labeling specimens with correct barcode by releasing and printing the correct order.



SAMPLE COLLECTION, SAMPLE LABELING, AND SAMPLE TRANSPORT

PENDING LABS – KARDEX

JD

John Doe

Legal: Travis Xxtestmytonomy
Male, 35yr, 11/18/1989
MRN: 9401283
Bed: D11T-11745-117452
Service: (A) Hospital Medicine
Faculty Service
Level of Care: Med/Surg
Code: Not on file
ACP Docs: None on file

Johl, Hershan S, MD
Attending

Allergies: Not on File

ADMITTED: 11/18/2024 (141 D)
Patient Class: Inpatient
No expected discharge
No active principal problem

No vital signs recorded for this encounter.

Summary

Kardex

Inf Ctl Micro Report 2 Yrs

Bedside Handoff Rpt

Transfer Report

Flowsheet hyperlink

72-Hour Summary

Discharge View

Order History

Active LDA's

UCD PATI

Lab and Blood Bank Orders to be Collected

Culture Urine, Bacti - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for Culture Urine, Bacti	Incomplete
Urinalysis and Culture if Ind - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for Urinalysis and Culture if Ind	Incomplete
Urinalysis-Complete - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for Urinalysis-Complete	Incomplete
CBC No Differential - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for CBC No Differential	Incomplete
Urea Nitrogen, Blood (BUN) - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for Urea Nitrogen, Blood (BUN)	Incomplete
Lactic Acid - ONCE, Prio: STAT, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for Lactic Acid	Incomplete
DIC Screen, Surgical - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 0945	Print Label for DIC Screen, Surgical	Incomplete

Diet Orders

(From admission to next 72h)

None

Expiring Orders

(From admission, onward)

None

PENDING LABS – MANAGE LABS

JD

John Doe

Legal: Travis Xtestmytonomy
Male, 35yr, 11/18/1989
MRN: 9401283
Bed: D11T-11745-117452
Service: (A) Hospital Medicine
Faculty Service
Level of Care: Med/Surg
Code: Not on file
ACP Docs: None on file

Johl, Hershan S, MD
Attending

Allergies: Not on File

ADMITTED: 11/18/2024 (141 D)
Patient Class: Inpatient
No expected discharge
No active principal problem

No vital signs recorded for this encounter.

←→

SnapShot

Order In...

Summary

Chart Re...

Results

Problems

History

Demograp...

Medications

Allergies

Implants

Patient ...

Manage O...

RN Admis...

RN Transfer

RN Disch...

Immuniza...

MAR

Intak

Manage Orders

ActiveSigned & HeldHome MedsOrder HistoryManage Labs

Manage Labs

Diagnostic / Lab / Blood Admin Orders Related Communication- Max 2000 Characters

Document Collection

Update Collection Status

NOTE:Cancel an individual lab collection by clicking the appropriate Discontinue hyperlink. Use the Discontinue link on the right-hand side of the screen associated with the specific lab that was not collected. Do not use the Discontinue

Lab Orders

Start	04/08/25 1000	▼ Culture Respiratory (Includes GS), Bacti ONCE	Collect Discontinue
Status:	Needs to be Collected		
References:	Test Information:		
Question		Answer	Comment
Specimen Type:		SPUTUM	
Suspect Coccidioidomycosis?		No	
Release to patient		Immediate	
Start	04/08/25 1000	▼ Culture Respiratory, AFB ONCE	Collect Discontinue
Status:	Needs to be Collected		
References:	Test Information:UCDHS TB IndicatorsAdult Patient TB Clinical Predictor Tool		
Question		Answer	Comment
Specimen Type:		SPUTUM	
What degree of suspicion do you have for pulmonary Mycobacterium tuberculosis?		Low/None	
Release to patient		Immediate	
Start	04/08/25 1000	▼ Culture Respiratory, Fungal ONCE	Collect Discontinue
Status:	Needs to be Collected		
References:	Test Information:		
Question		Answer	Comment
Specimen Type:		SPUTUM	
Suspect Coccidioidomycosis?		No	
Release to patient		Immediate	

PENDING LABS – ORDER INQUIRY

JD

John Doe

Legal: Travis Xxtestmytonomy

Male, 35yr, 11/18/1989

MRN: 9401283

Bed: D11T-11745-117452

Service: (A) Hospital Medicine

Faculty Service

Level of Care: Med/Surg

Code: Not on file

ACP Docs: None on file



Johl, Hershan S, MD

Attending

Allergies: Not on File

ADMITTED: 11/18/2024 (141 D)

Patient Class: Inpatient

No expected discharge

No active principal problem

No vital signs recorded for this encounter.

←→

SnapShot

Order In...

Summary

Chart Re...

Results

Problems

History

Demograp...

Medications

Allergies

Implants

Patient ...

Manage O...

RI

Order Inquiry

Refresh

Views

Current

History

All

Release

Collect Specimens

CC Results

Pat. Reports

Proc. Catalog

S..	Re...	Priority	P	Specimen Type	Specimens	Order	Lab Order Comments	Order Date	Q..
Lab									
		Routine		BLOOD		DIC Screen, Surgical		04/08/2025	
		STAT	↑	BLOOD		Lactic Acid		04/08/2025	
		Routine		BLOOD		Urea Nitrogen, Blood (BUN)		04/08/2025	
		Routine		BLOOD		CBC No Differential		04/08/2025	
		Routine		URINE		Urinalysis-Complete		04/08/2025	
		Routine		URINE		Urinalysis and Culture if Ind		04/08/2025	
Micro									
✓		Routine		SPUTUM		Culture Respiratory, Fungal		04/08/2025	✓
✓		Routine		SPUTUM		Culture Respiratory, AFB		04/08/2025	
✓		Routine		SPUTUM		Culture Respiratory (Includes ...		04/08/2025	✓
		Routine		URINE		Culture Urine, Bacti		04/08/2025	

SPECIMEN COLLECTION FUNCTIONALITY – KARDEX & MANAGE LABS

- All available tests relating to a specific specimen type will be pulled into the Collection Sequence
 - Example: Sample type = Urine

Collect specimens for Doe, John, Male, 35 yrs, MRN:9401283

Collection Sequence

x2 UR

Urinalysis and Culture if Ind
Urinalysis-Complete

UTT

Culture Urine, Bacti

URINE Specimens

x2 UR

Urinalysis and Culture if Ind Scheduled: 4/8/2025 1000
Label (1) Yellow-top. Label (2) Grey-top.
[See Test Menu](#)

Urinalysis-Complete Scheduled: 4/8/2025 1000
[See Test Menu](#)

UTT

Urine transport tube or sterile container. **SEE VOLUME INSTRUCTIONS**
>4mL collected: Transfer into a boric acid (gray top) urine transport tube (UTT) to the fill-line and transport to the lab at Room Temp.
<4mL collected: Transport urine in sterile container on ice, immediately to the lab.

OUTPATIENT COLLECTION ONLY: If changing source from what was indicated during order entry, please use the "Add Comment" button to enter reason.
[See Test Menu](#)

Culture Urine, Bacti Scheduled: 4/8/2025 1000

Lab: UCD PAVILION LAB

Collect Later

Collect Later

Lab: UCD SPECIALTY TESTING CTR

Collect Later

SPECIMEN COLLECTION FUNCTIONALITY – ORDER INQUIRY

- Only “check mark” the test(s) you want to collect.
- All un-checked tests will remain as pending labs for later collection



John Doe
Legal: Travis Xxtestmytonomy
Male, 35yr, 11/18/1989
MRN: 9401283
Bed: D11T-11745-117452
Service: (A) Hospital Medicine
Faculty Service
Level of Care: Med/Surg
Code: Not on file
ACP Docs: None on file

**Johl, Hershan S, MD**
Attending

Allergies: Not on File

ADMITTED: 11/18/2024 (141 D)
Patient Class: Inpatient
No expected discharge
No active principal problem

←→

SnapShot

Order In...

Summary

Chart Re...

Results

Problems

History

Demograp...

Medications

Allergies

Im

Order Inquiry

Refresh

Views

Current

History

All

Release

Collect Specimens

CC Results

Pat. Reports

Proc. C

S..	Re...	Priority	P	Specimen Type	Specimens	Order	Lab Order Con
Lab							
		Routine		BLOOD		DIC Screen, Surgical	
		STAT	↑	BLOOD		Lactic Acid	
		Routine		BLOOD		Urea Nitrogen, Blood (BUN)	
		Routine		BLOOD		CBC No Differential	
		Routine		URINE		Urinalysis-Complete	
✓		Routine		URINE		Urinalysis and Culture if Ind	
Micro							
		Routine		SPUTUM		Culture Respiratory, Fungal	
		Routine		SPUTUM		Culture Respiratory, AFB	
		Routine		SPUTUM		Culture Respiratory (Includes ...	

SPECIMEN COLLECTION FUNCTIONALITY – ORDER INQUIRY

- The test(s) you checked will be pulled into Collection Sequence

Specimen Collection

Collection Sequence

x2 UR & UTT-MICRO*

Urinalysis and Culture if Ind

URINE Specimens

x2 UR & UTT-MICRO*

Label (1) Yellow-top. Label (2) Grey-top.

[See Test Menu](#)

Urinalysis and Culture if Ind Scheduled: 4/8/2025 1000

Specimen Collection

Pre-collection Steps

Collection Sequence

✓ Answer collection questions

x2 {SPEC}*
Culture Respiratory, AFB
Culture Respiratory, Fungal
Culture Respiratory

SPUTUM Specimens

{SPEC}* (OTHER (SPECIFY IN ADDNL INFO))

Lab: SACTO. CO. PUBLIC HEALTH LAB

Send specimens on ICE. If Blood/CSF: AMBIENT
Swab specimens are inappropriate and will not be processed.
Specimens should not be placed in Anaerobic Transport Medium (ATM).
Refer to the Lab Test Directory for additional specimen collection instructions and acceptable specimen containers.
<https://www.testmenu.com/ucdavis>

Culture Respiratory, AFB Scheduled: 4/8/2025 1000

Collect Later

{SPEC}* (OTHER (SPECIFY IN ADDNL INFO))

Lab: UCD SPECIALTY TESTING CTR

Culture Respiratory, Fungal Scheduled: 4/8/2025 1000

Collect Later

Suspect Coccidioidomycosis?

Answer

No

Comment

Enter a comment

Culture Respiratory Culture Respiratory (Includes GS), Bacti Scheduled: 4/8/2025 1000

Collect Later

Suspect Coccidioidomycosis?

Answer

No

Comment

Enter a comment

Additional information – link to the Lab Test Directory

LAB TEST DIRECTORY

CULTURE RESPIRATORY, AFB SENDOUT

MICG000026  

Ordering

Collection

Result Interpretation

Administrative

Collect

NASOTRACHEAL ASPIRATE, SPUTUM, BRONCHIAL WASHINGS, SINUS, BRONCHOALVEOLAR LAVAGE, ENDOTRACHEAL ASPIRATE

Sputum - Collect only material brought up from the lungs after a productive cough. Do not collect sputum immediately after a mouth wash. A series of three daily early morning specimens, each submitted promptly to the lab after collection, is recommended. A minimum of 3mL is required. Do not pool specimens. For patients who have difficulty in producing sputum, specimens collected by inhalation of hypertonic saline induction may be used. Submit the specimen in a sterile, labeled container. Close lid tightly.

Type in specific specimen information in the comments field.

Unacceptable Conditions

Swab specimens are inadequate and will not be processed.
Frozen specimens

Storage/Transport Temperature

Specimen in a sterile, leak-proof container on ice. Place each specimen in an individual sealed bag.

Stability (from collection to initiation)

Room Temperature: 1 hr

Refrigerated or on ice: 24 hrs

INTERPRETING SPECIMEN LABELS



INTERPRETING SPECIMEN LABELS

Lab Location	
P	Pavilion Lab (Main hospital)
S	Specialty Testing Center
X	External Reference Lab

Clinical Pathology	
BB	Blood Bank
BG	Blood Gas
CC	Cancer Center Chemistry
CG	Coagulation
CP	Main Lab Chemistry
CS	Cocci Serology
EX	External Reference Lab
HC	Cancer Center Hematology
HP	Hematology
IM	Immunology
MI	Microbiology
MP	Molecular Pathology
SC	Special Chemistry
TX	Toxicology
UA	Urinalysis

Anatomic Pathology**	
SP	Surgical Pathology
CN	Cytology Non-GYN
CP	Cytopathology (pap smears)
FN	Fine Needle Aspirate
OC	Outside Consultation
OS	Outside Slide Consultation
HM	Bone Marrow

****Anatomic Pathology specimen collection labels will not have the above case mnemonics until the specimen is received by the respective lab section. See subsequent slides for details.**

SPECIMEN LABEL EXAMPLES

Additional
instructions

Specimen
Container
&
Transport
Conditions

Xctest, Clara Net 9400514 F/12 yrs SST.IC 22S-006MI0001.1*100026415 CRYPTOCOCCAL 1/6/22 11:46 AM Coll By:COLLECTED, *	Xctest, Clara Net 9400514 DOB: 7/31/2009 F SST.IC 22S-006MI0001.1*100026415 CRYPTOCOCCAL *Transport on Ice. CSF and/or blood specimens 22S-006MI0001.1*100026415 SST 1/6/22 11:46 AM
Xctest, Clara Net 9400514 F/12 yrs STERILE CONTAINER .R 22S-006MI0002.1*100026416 CULTURE LEG, CULTURE RESP 1/6/22 11:46 AM Coll By:COLLECTED, *	Xctest, Clara Net 9400514 DOB: 7/31/2009 F STERILE CONTAINER .R 22S-006MI0002.7*100026416 CULTURE LEG, CULTURE RESP 22S-006MI0002.7*100026416 STERILE CONTAINER 1/6/22 11:46 AM
Xctest, Clara Net 9400514 F/12 yrs {SPEC}.T 22S-006MI0003.1*100026417 CULT AEROBIC, CULT ANA 1/6/22 11:46 AM Coll By:COLLECTED, *	Xctest, Clara Net 9400514 DOB: 7/31/2009 F {SPEC}.T 22S-006MI0003.11*100026417 CULT AEROBIC, CULT ANA 22S-006MI0003.11*100026417 {SPEC} 1/6/22 11:46 AM

Specimen Containers

{SPEC} = Anaerobic
Transport Media (ATM),
Sterile Container,
Culture Swab

STERILE CONTAINER =
Sterile cup or tube

Transport Conditions

T = Room Temperature

IC = On Ice

R = Refrigerated

Pre-collection Steps

📄 Patient scan overridden

✓ Answer collection questions

Collection Sequence

STERILE CONTAINER

✓ 25S-098MI0005.1

📄 Specimen scan overridden

SPUTUM Specimens

STERILE CONTAINER 25S-098MI0005

✓ Collected on 4/8/2025 at 1052 by KINGSLEY, AMY in D11 TRAUMA NURSING UNIT

Time	Date	Collector	Department
1052	4/8/2025	KINGSLEY, AMY	D11 TRAUMA NURSING UNIT

Source
OTHER (SPECIFY IN AD...)

Draw Type
Non-blood Collection Non-blood Collection

📄 Add Lab Comments

Culture Respiratory Culture Respiratory (Includes GS), Bacti Scheduled: 4/8/2025 1000

Suspect Coccidioidomycosis?

Answer

No

Comment

Enter a comment

Add specimen comments

Collect specimens for Doe, John, Male, 35 yrs, MRN:9401283

Pre-collection Steps
Patient scan overridden

Collection Sequence
LTGRN
✓ 25P-098CP0001.1
Specimen scan overridden
LAV
! 25P-098HP0001.1
GRAY*
! 25P-098CP0002.1
LTBLU*
! 25P-098CG0001.1

Collection Details
Time: 1056 Date: 4/8/2025 Collector: KINGSLEY, AMY Department: D11 TRAUMA NURSING UNIT
[Document individually](#)

BLOOD Specimens

LTGRN 25P-098CP0001 ✓ Collected on 4/8/2025 at 1056 by KINGSLEY, AMY in D11 TRAUMA NURSING UNIT
[See Test Menu](#)
Source: BLOOD, VENOUS Draw Type: Venipuncture Venipuncture Arterial Puncture Capillary
[Add Lab Comments](#)
Urea Nitrogen, Blood (BUN) Scheduled: 4/8/2025 1000

LAV 25P-098HP0001 ! Scan label or click to document collection
[See Test Menu](#)
Source: BLOOD, VENOUS Draw Type: Venipuncture Venipuncture Arterial Puncture Capillary
[Add Lab Comments](#)
CBC No Differential Scheduled: 4/8/2025 1000

GRAY* 25P-098CP0002 ! Scan label or click to document collection
*DELIVER STAT ON ICE
[See Test Menu](#)
Source: BLOOD, VENOUS Draw Type: Venipuncture Venipuncture Arterial Puncture Capillary
[Add Lab Comments](#)
Lactic Acid Scheduled: 4/8/2025 1000 ! STAT

Post-collection Steps
Accept to save

No labels printed

[Reprint Labels](#) [Accept](#)

- Unable to complete collection for all samples?
- Click Accept to complete collection for what you were able to collect and follow the pop-up prompts.

Go Back and Finish Collecting Specimens

Consider collecting the remaining containers.

- LTGRN 25P-098CP0001
- LAV 25P-098HP0001
 25P-098HP0001.1 needs to be scanned.
- GRAY* 25P-098CP0002
 25P-098CP0002.1 needs to be scanned.
- LTBLU* 25P-098CG0001
 25P-098CG0001.1 needs to be scanned.

Go Back
Continue and Close

- Selecting “Continue and Close” will let you finish completing the collection for the specimens you were able to collect.
- NOTE: The tests you did NOT collect will fall off the Kardex Summary screen.

Summary
Kardex
Inf Ctl Micro Report 2 Yrs
Bedside Handoff Rpt
Transfer Report
Flowsh

Update Collection Status
Update Collection Status

PRN Labs & POC Orders
(From admission to next 72h)
None

Scheduled POC Orders
(From admission to next 72h)
None

Point of Care Orders to be Released
POC Orders to be Released

Lab and Blood Bank Orders to be Collected

Culture Respiratory, AFB - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 1000	Print Label for Culture Respiratory, AFB	Incomplete

Culture Respiratory, Fungal - ONCE, Prio: Routine, Needs to be Collected		
Scheduled	Task	Status
04/08/25 1000	Print Label for Culture Respiratory, Fungal	Incomplete

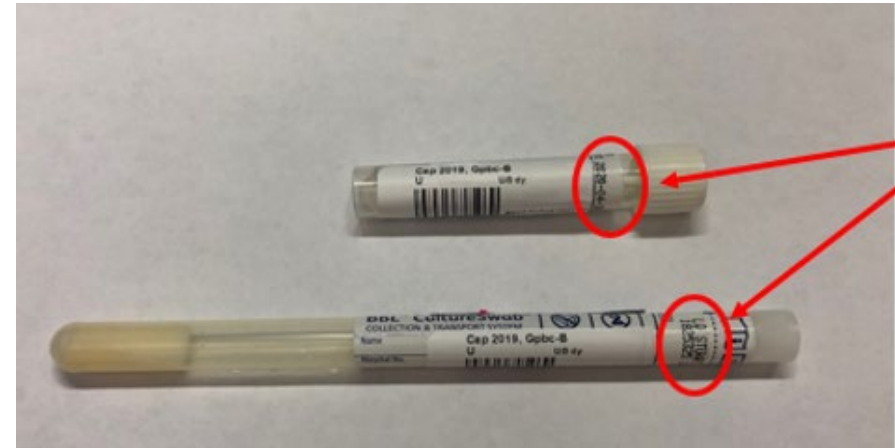
- Review the Work List or Manage Labs tab for tests that still need to be collected

Work List				
Add Task Labs 8 Today 0900 - 2200 Only Overdue Filter: My Discipline 1				
Time				
Time	Type	Task	Frequency	Priority
0900				
0945	U	Collect Culture Urine, Bacti	One Time	Routine
0945	U	Collect Urinalysis and Culture if Ind	One Time	Routine
0945	U	Collect Urinalysis-Complete	One Time	Routine
0945	U	Collect CBC No Differential	One Time	Routine
0945	U	Collect Lactic Acid	One Time	STAT

Manage Orders			
ActiveSigned & HeldHome MedsOrder HistoryManage Labs			
Lab Orders (24h ago, onward)			
04/08/25 1000	▼	Culture Respiratory (Includes GS), Bacti ONCE	
		Status: Collected (04/08/25 1052)	
		References: Test Information:	
		Question	Answer
		Specimen Type:	SPUTUM
04/08/25 1000	▼	Suspect Coccidioidomycosis?	No
		Release to patient	Immediate
		Culture Respiratory, AFB ONCE CollectDiscontinue	
		Status: Needs to be Collected	
		References: Test Information: UCDHS TB Indicators Adult Patient TB Clinical Predictor Tool	
		Question	Answer
		Specimen Type:	SPUTUM
		What degree of suspicion do you have for pulmonary Mycobacterium tuberculosis?	Low/None
		Release to patient	Immediate

SPECIMEN CONTAINER LABELING GUIDE

- Place the label so the barcode is parallel to the longest part of the tube or container
- Do not cover any manufacturer barcodes or expiration dates



Do not cover
lot # or
expiration
date



DO



DON'T



SPECIMEN LABELING



Do not cover
the
manufacturer
barcode or lot
information

Do not place
label on the
bottom of
bottle



Leave window open
for specimen volume
to be visible to lab
staff



DO NOT cover **BLACK** line on the
manufacturer label.

Black line indicates correct blood
volume.

CORRECT SPECIMEN HANDLING

- ❑ One specimen per biohazard zip lock bag
 - Okay to send multiple individually bagged patient samples for the same patient or surgical case together in one larger bag.
- ❑ Send under proper temperature conditions
 - Refer to the Lab Test Directory or specimen label
 - Use a secondary bag for specimens transported “on ice”. Do not add ice directly to same bag as the specimen or submerge the specimen in ice.
- ❑ Send promptly to the lab – delays can cause specimens to be rejected



ONE SPECIMEN – MULTIPLE TESTS

- WHAT TO LOOK FOR -

■ Example: CSF

- 42 available tests currently
- Multiple container and temperature requirements depending on test(s) ordered
- Review the Collection & Transport instructions available in the Lab Test Directory
- Look at the Transport Container and Temperature Requirements on the label(s)

UC DAVIS HEALTH | Department of Pathology and Laboratory Medicine

CSF

Results Found: 42

< 1 >

Test Number	Test Name	Performing Lab
LABHE00007	CELL COUNT, CSF Synonym: CSF STUDIES (CELL COUNT, CSF)	
MICG000032	CULTURE CSF , FUNGAL Synonym: CNS CULTURE, FUNGAL (CULTURE CSF, FUNGAL)	
LABP000587	ARBOVIRUS ANTIBODIES, IGG AND IGM, CSF Synonym: Eastern Equine Encephalitis Antibody, IgM CSF	ARUP
LABSD00241	IMMUNOGLOBULIN G, CSF Synonym: CSF IgG	
	CRYPTOCOCCUS ANTIBODY, IgG BY ELISA CSF	

Xxtest, Clara Net 9400514 F/H 2 yrs

SST .JC

22S-006MI0001.1*100026415 CRYPTOCOCCAL

1/6/22 11:46 AM Coll By: COLLECTED, *

Xxtest, Clara Net 9400514 DOB: 7/31/2009 F SST .JC

22S-006MI0001.1*100026415 CRYPTOCOCCAL

*Transport on ice. CSF and/or blood specimens

22S-006MI0001.1*100026415

SST

1/6/22 11:46 AM



MICROBIOLOGY SPECIMEN COLLECTION

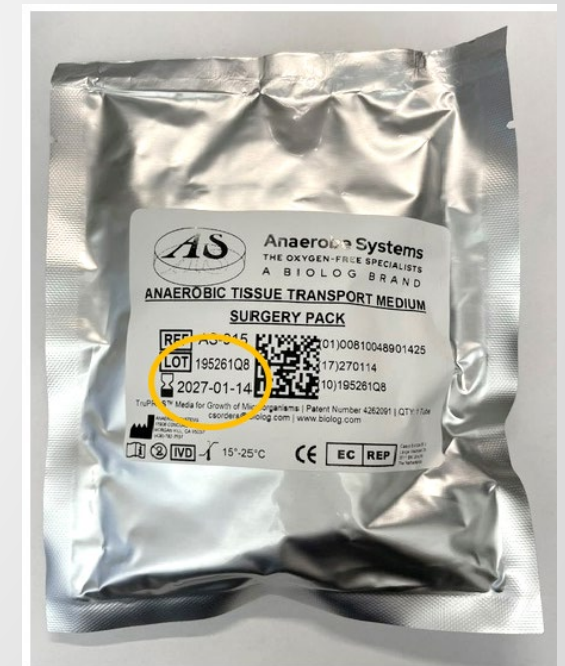


PURPOSE OF THE TRANSPORT CONTAINER

- STABILIZE THE SPECIMEN DURING TRANSIT TO THE LAB

SPECIMEN COLLECTION CONTAINER REGULATIONS

- ❑ Check transport container expiration date 
- ❑ Transport media expires
- ❑ CAP (regulatory agency) prohibits testing specimens that have been collected into expired transport containers
- ❑ NO EXCEPTIONS



MICROBIOLOGY SPECIMENS

Collection container matters:

- Use the correct collection container for the specimen and test ordered

RECTAL SWAB ONLY
C. diff Surveillance, ESBL Surveillance, VRE Surveillance
&
Carbapenem Resistance Surveillance



Aerobic & Fungal Cultures, MRSA Surveillance,
Candida Auris Surveillance ONLY



Anaerobic Cultures



- Use correct transport conditions for the test
- Correct specimen : preservative ratio
- Do not over or under fill containers
 - Blood cultures – low volume will not be canceled

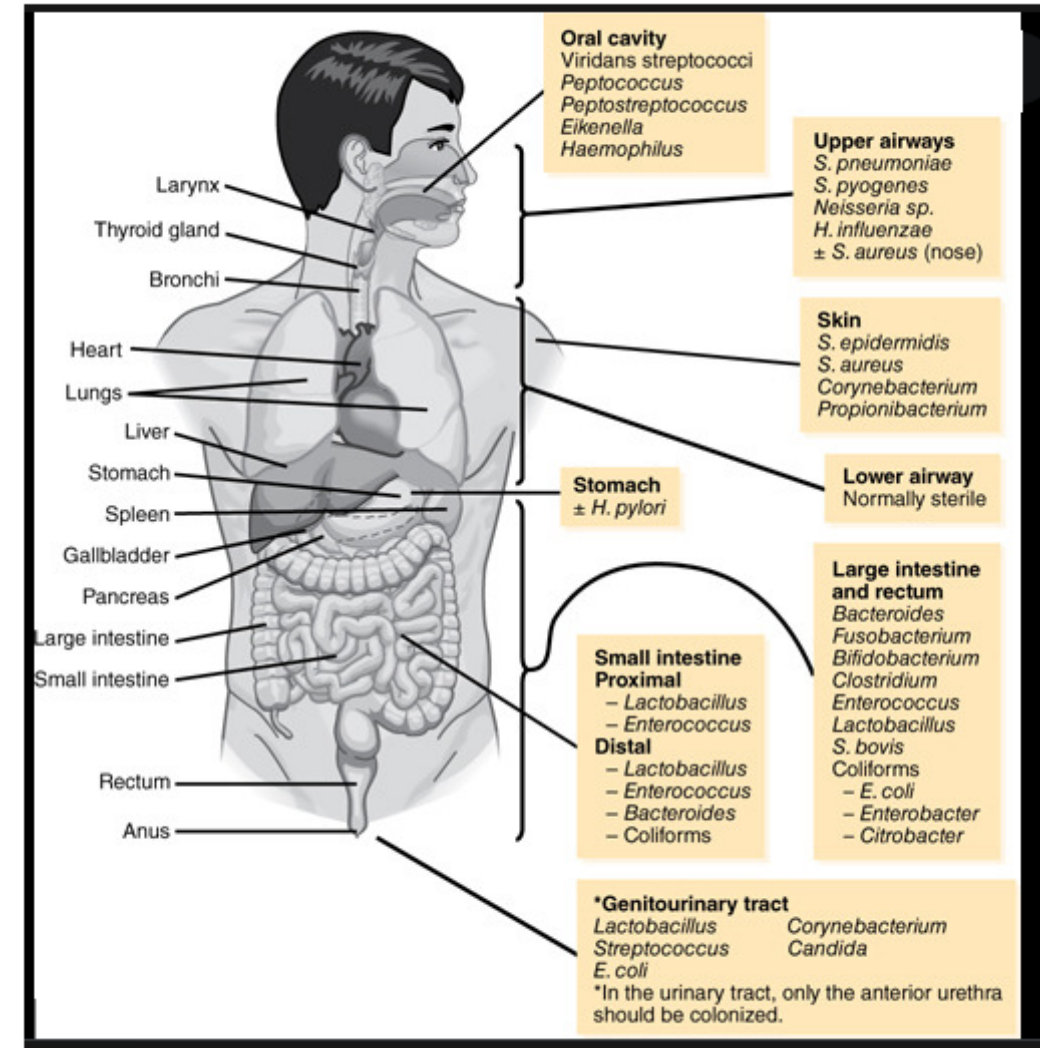
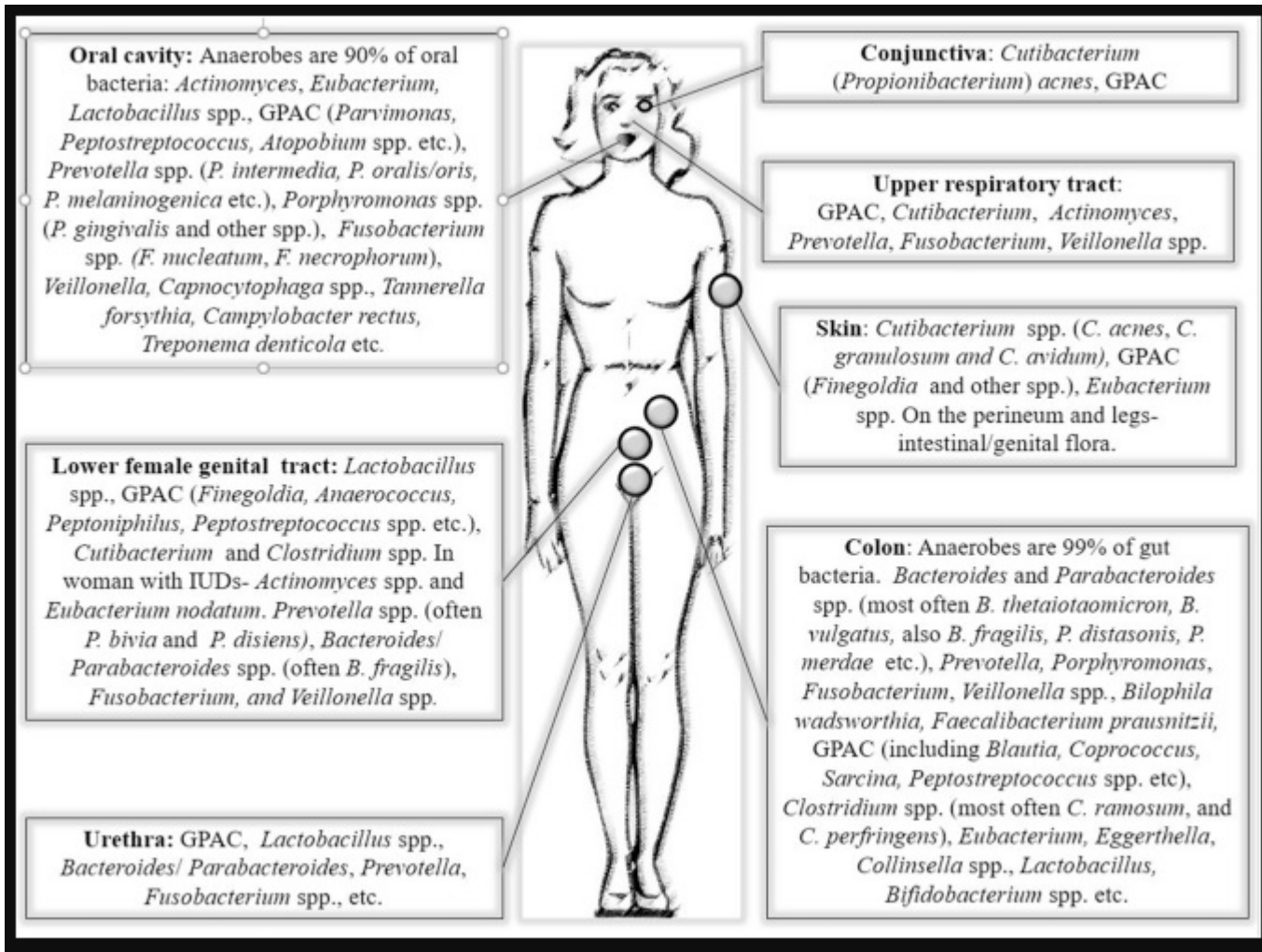
MICROBIOLOGY SPECIMENS

❑ Source of specimen is very important!

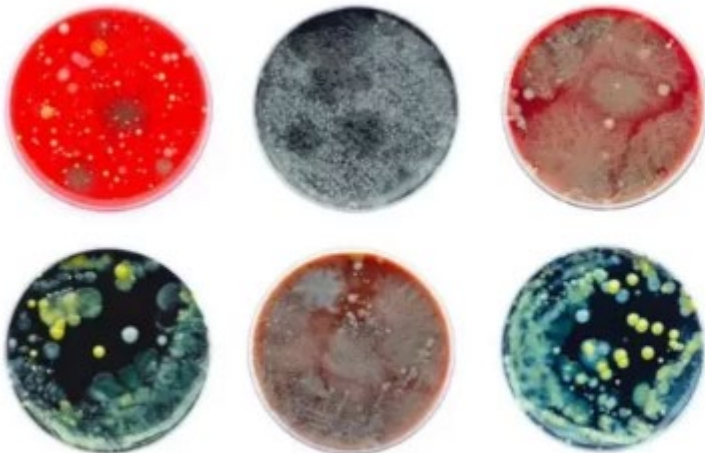
- Bacterial cultures are set up based on the anatomical location of the body from which the specimen was obtained
- We must know the source of the specimen to process it correctly



NORMAL BACTERIAL FLORA



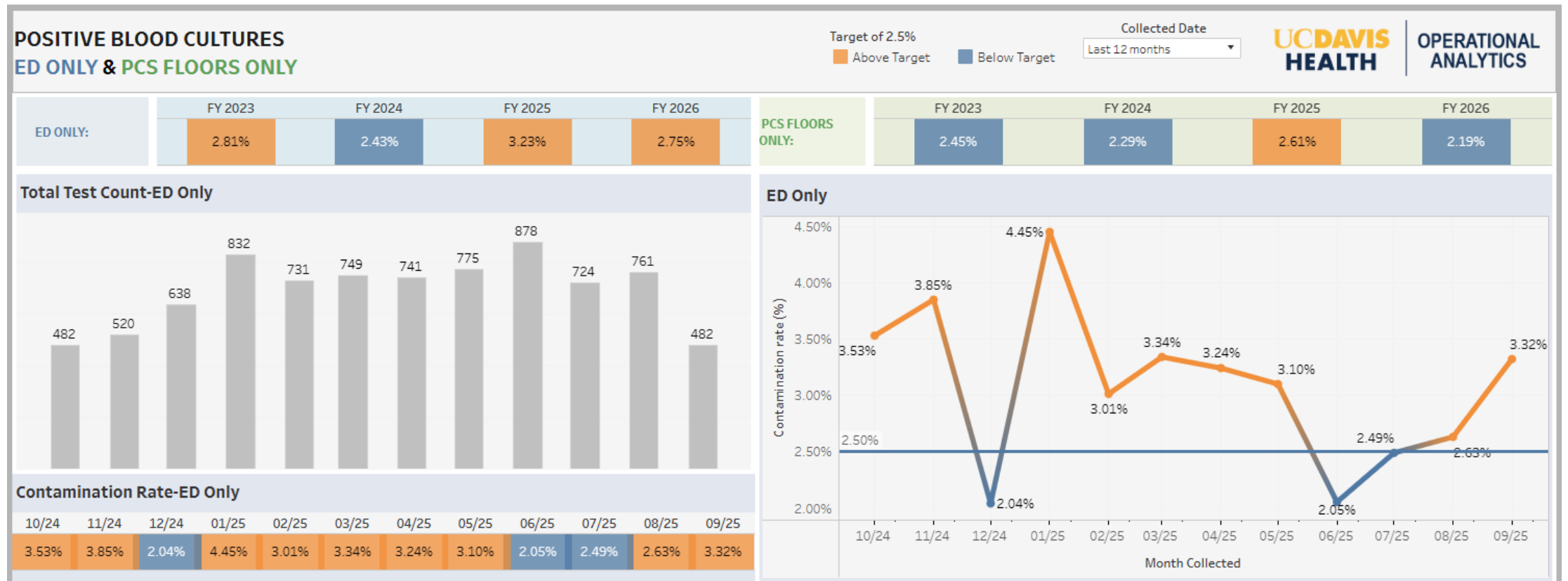
STANDARD AND SPECIALTY MEDIA



Medium	Composition	Uses
Nutrient agar	Nutrient broth, agar 2%	Routine culture
MacConkey medium	Peptone, lactose, sodium taurocholate, agar, neutral red	Culture of Gram-negative bacteria, such as <i>Escherichia coli</i>
Blood agar	Nutrient agar, 5% sheep or human blood	Routine culture, culture of fastidious organisms, such as <i>Streptococcus</i> spp.
Chocolate agar	Heated blood agar	Culture of <i>Haemophilus influenzae</i> and <i>Neisseria</i>
Deoxycholate citrate agar	Nutrient agar, sodium deoxycholate, sodium citrate, lactose, neutral red, etc.	Culture of <i>Shigella</i> spp. and <i>Salmonella</i> spp.
Thiosulfate citrate bile salt sucrose agar	Thiosulfate, citrate, bile salt, sucrose, bromothymol blue, thymol blue	Culture of <i>Vibrio cholerae</i>
Loeffler's serum slope	Nutrient broth, glucose, horse serum	Culture of <i>Corynebacterium diphtheriae</i>
Lowenstein-Jensen medium	Coagulated hen's egg, mineral salt solution, asparagine, malachite green	Culture of <i>Mycobacterium tuberculosis</i>

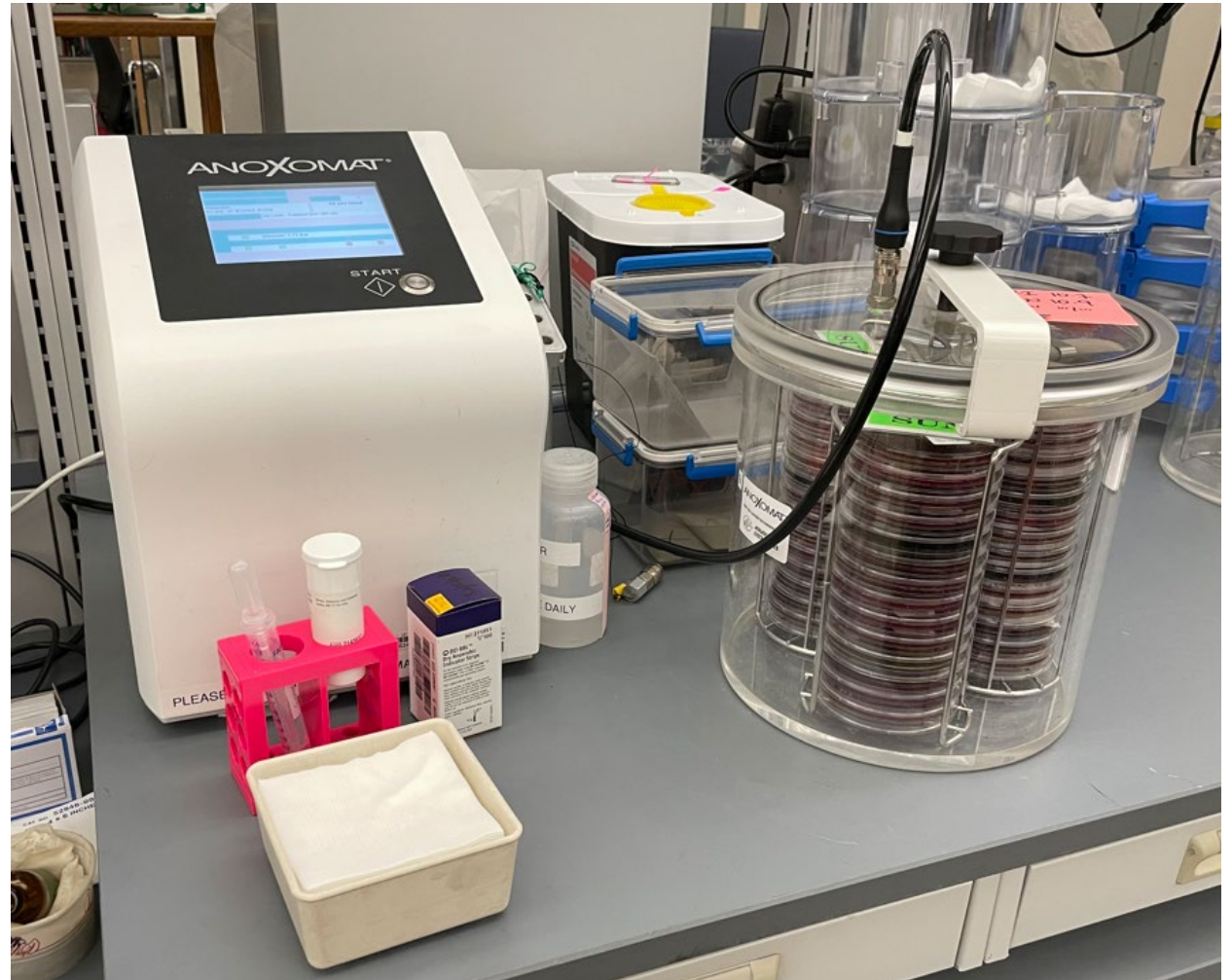
MICROBIOLOGY SPECIMENS – BLOOD CULTURES

- Follow specimen collection policies and instructions
 - **Policy 13015:** Blood Culture Collection
 - Thorough cleaning of the site is required to prevent contamination



AEROBIC VS. ANAEROBIC CULTURE

- Aerobic = with oxygen
 - Examples:
 - *Pseudomonas aeruginosa*
 - *Mycobacterium (AFB)*
- Anaerobic = without oxygen
 - Examples:
 - *Bacteroides fragilis*
 - *Clostridium perfringens*
- Facultative = with or without oxygen
 - Examples:
 - *Staphylococcus aureus*
 - *Escherichia coli*



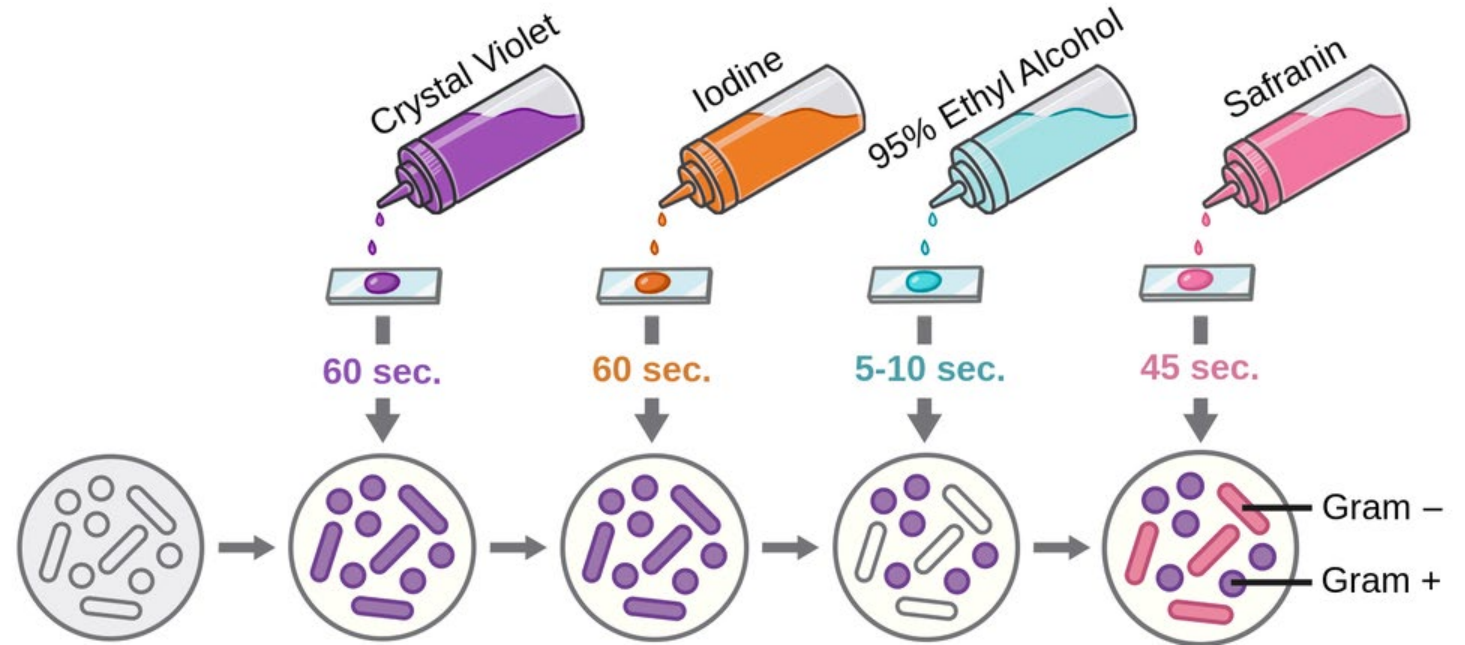
TESTS IN THE MICROBIOLOGY LAB

- Culture Tests
- Rapid or Spot Tests
- PCR Tests

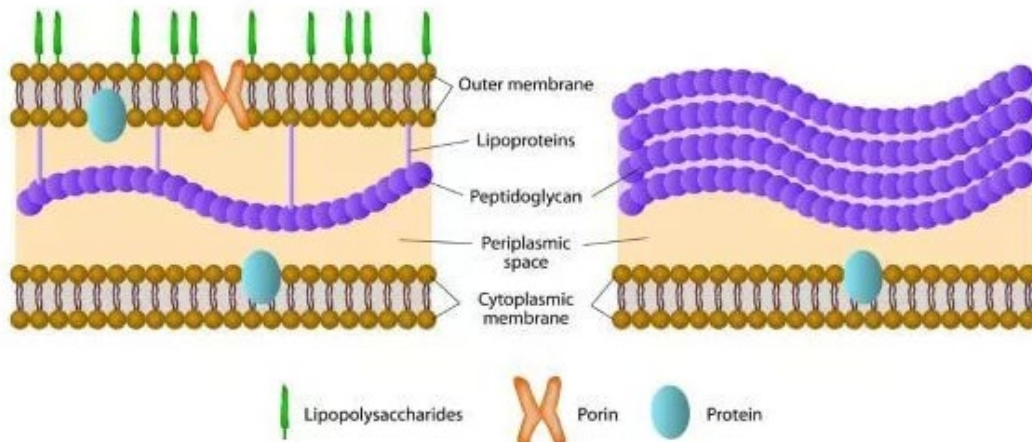


GRAM STAIN

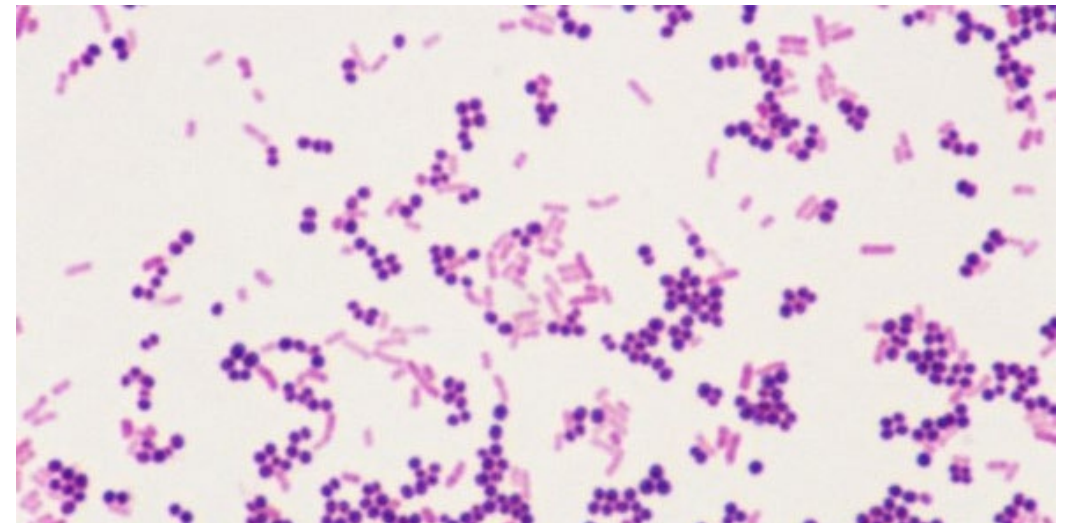
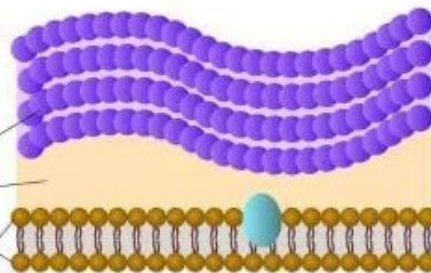
- Stains bacterial cell walls to differentiate between Gram-Positive and Gram-Negative bacteria



GRAM-NEGATIVE



GRAM-POSITIVE



CRITICAL VALUE NOTIFICATIONS

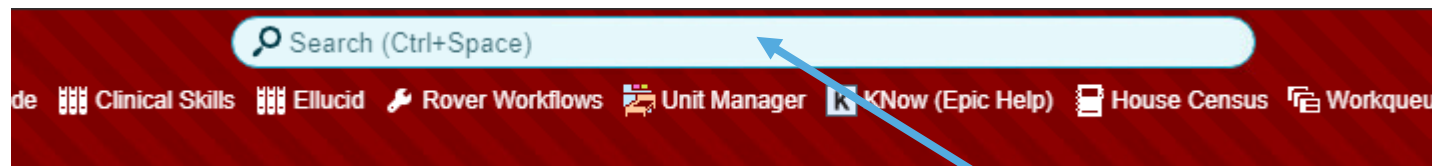
- Hospital Policy 2720
 - Lab staff will notify the appropriate party of the critical lab value
 - Person receiving the critical value will read back the result to the laboratory caller.

LAB TEST DIRECTORY USERS' GUIDE

WWW.TESTMENU.COM/UCDAVIS



* Search by analyte, specimen type, or test name



Also accessible from within EPIC - Type in Search Bar “**Laboratory Test Directory**”

UC Davis Health- Laboratory Test Directory



UC Davis Health Department of Pathology and Laboratory Medicine serves UC Davis Medical Center, Clinics, Primary Care Network Physicians, Researchers, as well as many Hospitals, Physicians, and Patients throughout Northern California and the West.

UC Davis Health Laboratory operates 24 hours a day 7 days a week providing physicians and patients both Anatomic Pathology and Clinical Pathology reports which render accurate, clinically relevant diagnosis in a timely fashion, in an academic and interactive setting.

UC Davis Health Department of Pathology and Laboratory Medicine is fully accredited by the College of American Pathologists (CAP), licensed by the State of California, the Clinical Laboratory Improvement Act (CLIA), and the Association for the Advancement of Blood and Biotherapies (AABB).

UC Davis Health; Department of Pathology and Laboratory Medicine specialties include:

Anatomic Pathology:

Autopsy
Cytopathology
Dermatopathology
Molecular Pathology
Neuropathology

Surgical Pathology:

Bone & Soft Tissue

[New\(1\)](#)[Updated\(75\)](#)[Blood Gas Lab\(26\)](#)[Chemistry SESP\(145\)](#)[Hematology\(43\)](#)[Immunology\(155\)](#)[Microbiology\(76\)](#)[Molecular Pathology\(26\)](#)[Point of Care\(30\)](#)[Sendouts\(923\)](#)[Special Chemistry STC\(95\)](#)[Special Coagulation\(26\)](#)[Toxicology\(19\)](#)[Transfusion Services\(13\)](#)

View tests by
performing
lab section

[Licenses and Accreditations](#)[Collection Labeling and
Requisition Instructions](#)[Phlebotomy Locations and
Service Hours](#)[Phlebotomy Order of Draw](#)[Stool Collection Guide](#)[Microbiology and POC-
Swab/Test Media Guide](#)[Specimen Collection
Container Guides](#)

Helpful links
to specimen
collection
swabs and
containers

MICROBIOLOGY / POC SWAB & TRANSPORT MEDIA GUIDE

Rectal Swab:

C. DIFF SURVEILLANCE
ESBL SURVEILLANCE
VRE SURVEILLANCE
CARBAPENEM RESISTANCE SURVEILLANCE

Preferred:

- **RED cap / RED label** Copan Transystem Swab
- Lawson #: 194519



*Use both swabs. Do not discard one of the swabs.

Alternative:

- **BLUE label** BBL CultureSwab
- Lawson #: 100816



Note: Copan and BBL swabs are ONLY for rectally collected Surveillance Tests. Use one collection kit per test.

CANDIDA AURIS SURVEILLANCE

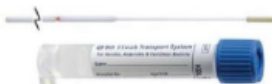
Preferred:

- BD ESwab **WHITE**-cap
- Lawson # 146106



Alternative:

- BD ESwab **BLUE**-cap
- Lawson #: 152835



VAGINAL PANEL BY PCR

- BD Molecular Swab Collection Kit
- Lawson #: 179882



MRSA SURVEILLANCE
BACTERIAL CULTURE (Aerobic Only)
FUNGAL CULTURE

Preferred:

- BD ESwab **WHITE**-cap
- Lawson #: 146106



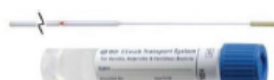
Alternative 1:

- Fisherbrand *Fisherfinest* Transport Swab
- Lawson #: 156086



Alternative 2:

- BD ESwab **BLUE** cap
- Lawson #: 152835



HSV 1 & 2 / VZV DNA Swab

- Transport **ON ICE**
- BD UTM
- Lawson #'s: 100983 & 153147



MICROBIOLOGY / POC SWAB & TRANSPORT MEDIA GUIDE

BACTERIAL CULTURE (Aerobic & Anaerobic)
FUNGAL CULTURE

Note: Swabs are NOT appropriate for Anaerobic culture

Preferred:

- Anaerobic Tissue Transport Medium (ATTM)
- Lawson #: 100666



Alternative:

- Anaerobic Transport Medium (ATM)
- Lawson #: 100664



URINE CULTURE

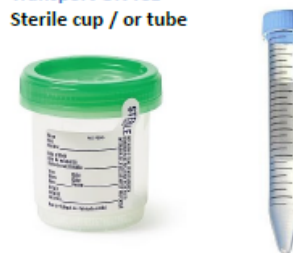
> 4 mL Urine Collected

- BD Vacutainer – Urine C&S Preservative



< 4 mL Urine Collected

- Transport **ON ICE**
- Sterile cup / or tube



POINT OF CARE: COVID, FLU A/B and RSV
POC LIAT SARS-CoV-2 ± FLU A/B
POC LIAT COVID PCR
POC LIAT FLU A/B + RSV

Preferred:

- BD UTM
- Lawson #'s: 100983 & 153147



Alternative:

- M4RT (Note: there are various options for M4RT)
- Lawson #'s: 154003, 154004 & 154357



POINT OF CARE: RAPID STREP A

Preferred:

- BD ESwab **WHITE**-cap
- Lawson #: 146106



Alternative:

- BD ESwab **BLUE** cap
- Lawson #: 152835



Please write NAME, DOB,
collected DATE AND TIME on all
samples

**GI (Gastrointestinal) Panel
C. Difficile Diagnostic Test
Viral Gastrointestinal Panel**

CONTAINER – Cary Blair C&S medium (Yellow or Orange top, red liquid)
COLLECTION – Transfer a portion of stool from collection container to C&S medium vial, up to the red fill line. Do not discard the red liquid in the vial. Mix specimen and preservative thoroughly. Tighten lid.
RETURN – Must be returned to the lab immediately, no later than 24 hours after collection.



Helminth OVA & LARVA (O&P) Test

CONTAINER – Ova and Parasite vials (Para-Paks)
Optimal collection is three separate stool specimens within a 7-10 day period.
COLLECTION – Transfer a portion of stool from collection container to each vial in the Para-Pak kit. Do not discard the liquid in each vial prior to filling. Only fill to the fill line and thoroughly mix the specimen.
RETURN – Must be returned to the lab within 3 days (72 hrs.) of collection.



3 day collection kits will need to be 24 hour apart

**Helicobacter Pylori Antigen, Fecal by EIA
Calprotectin
Pancreatic Elastase**

CONTAINER – Sterile Cup
COLLECTION – Collect at least 4 grams of stool. Make sure lid is securely tightened.
RETURN – **Must be placed on ice** and returned to the lab within 3 days (72 hrs.) of collection.



Stool Culture & E.coli SHIGA-LIKE TOXIN by EIA

CONTAINER – Cary Blair C&S medium (Yellow or Orange top, red liquid)
COLLECTION – Scoop stool into the container until the liquid reaches the red line on the label. Secure lid and gently shake to mix specimen.
RETURN – **Must be placed on ice** and returned to the lab within 1 day (24 hrs.) of collection.



SURGICAL PATHOLOGY

**SPECIMEN SUBMISSION
AND ORDERING
USING ORDER ENTRY**

SURGICAL PATHOLOGY SPECIMENS COLLECTED IN CLINIC



Note: Most Surgical Pathology tissue specimens are considered irretrievable and cannot be re-collected. Please ensure proper specimen ordering, collection, handling and labeling to avoid testing delays.

- **MUST** submit a separate order for fresh specimens to be submitted to Microbiology, Flow Cytometry, and/or Cytogenetics.
- **DO NOT** submit ancillary studies on the same order as the formalin fixed tissue.

SURGICAL PATHOLOGY ORDERING BASICS

- Surgical Pathology specimens collected within the same procedural encounter are placed on one Surgical Pathology order.
- Each specimen container is assigned an alphabetic letter designation
 - ex: A, B, C, D, etc.
- DO NOT order Surgical Pathology with any other pathology tests (e.g., Cytology, Dermatology Pathology, Flow Cytometry or Microbiology).
- Print Surgical Pathology order from Epic and submit with specimen(s).

ORDER ENTRY

Surgical Pathology ✓ Accept ✗ Cancel

Reference Links: • **Test Information:**

Process Instructions: For any SKIN SPECIMENS (or related sentinel lymph node or other specimens to be sent directly to Dermatopathology), MUST use "DERMATOLOGY PATHOLOGY" Order

Class: Back Office LAB Normal Historical **Back Office** LAB/AVS Hidden

Status: Normal Standing **Future**

Expected Date: 12/29/2022 Today Tomorrow 1 Week 2 Weeks 1 Month 3 Months 6 Months ☒ Approx.

Expires: 12/29/2023 1 Month 2 Months 3 Months 4 Months 6 Months **1 Year**

Priority: **Routine**

Specimen(s):

CERVIX- 2 O'CLOCK	
VULVA	Anterior
VULVA	Posterior

❗ Suspected Diagnosis:

❗ Clinical Information:

Special Requests:

Comments: abc ↶ ↷ ? ? + Insert SmartText ↶ ↷ ↵ ↶ ↷ 100%

❗ Next Required ✓ Accept ✗ Cancel

- Type **Surgical Pathology** in the Order Entry screen.
- Use the **"Specimen(s):"** field to indicate the source for **each** specimen container from the source list (e.g., "CERVIX – 2 O'CLOCK").
- For expanded source specificity or orientation, use the adjacent description field (e.g., "ANTERIOR").

View of Surgical Pathology order showing multiple sources and comments

SURGICAL PATHOLOGY ORDER COLLECTION ACTIVITY

INPATIENT ORDERS

- Inpatient orders are collected via the *Manage Labs* Activity.
- Select the *Collect* link next to the appropriate Surgical Pathology order to be collected.

Orders

Active Signed & Held Home Meds Cosign Order History **Manage Labs** Pathways

Manage Labs

Diagnostic / Lab / Blood Admin Orders Related Communication- Max 2000 Characters [Comment](#)

Document Collection
[Jump to Work List to document specimen collection](#)

Update Collection Status
[Update Collection Status](#)

NOTE:Cancel an individual lab collection by clicking the appropriate Discontinue hyperlink. Use the Discontinue link on the right-hand side of the screen associated with the specific lab that was not collected. Do not use the Discontinue link next to the name and frequency of the original order.

Lab Orders
(24h ago, onward) [Collapse](#) | [Hide](#)

Start	Order	
12/29/22 1015	12/29/22 1002	
▼	Surgical Pathology ONCE	Collect Discontinue
Status: Needs to be Collected		
References: Test Information:		
Question	Answer	Comment
Specimen(s):	CERVIX- 2 O'CLOCK	
Specimen(s):	VULVA	Anterior
Specimen(s):	VULVA	Posterior
Suspected Diagnosis:	DX	
Clinical Information:	CI	
Release to patient	Immediate	

View of Surgical Pathology order needing to be collected via Manage Labs

SURGICAL PATHOLOGY ORDER COLLECTION ACTIVITY

OUTPATIENT ORDERS

- Outpatient orders are collected via the Order Inquiry activity.
- Select the appropriate Surgical Pathology order and click *Collect Specimens* to launch the Specimen Collection activity.

The screenshot shows the 'Order Inquiry' interface. At the top, there are tabs: SnapShot, Chart Review, Order Inquiry (selected), Review Flowsheets, Results Review, Allergies, History, Problem List, Implants, and Demograph. Below the tabs, there are buttons: Refresh, Views, Collect Specimens (highlighted with a red box), CC Results, Pat. Reports, and Proc. Catalog. Below these buttons is a table with columns: S..., Status, Class, Priority, Order, Remai..., Standing Inter..., Last Perfor..., Expected, and Expires. The table has two sections: 'Genetic Somatic' and 'Path'. The 'Path' section contains one order with a checkmark in the first column.

S...	Status	Class	Priority	Order	Remai...	Standing Inter...	Last Perfor...	Expected	Expires
Genetic Somatic									
		Normal	Routine	FoundationOne Genom...					
Path									
✓	Future	Back Office	Routine	Surgical Pathology	1/1			~ 12/28/2022	12/29/2022.

SPECIMEN COLLECTION ACTIVITY

- The specimens entered in Order Entry will display along with any specimen specific comments/descriptions.
- Specimen sources and any specific comments/descriptions can be edited in this activity.
- Once all sources and descriptions are accurate, click the *Print Labels* button.

Specimen Collection

Collection Sequence: STERILE CONTAINER
Surgical Pathology

TISSUE Specimens

STERILE CONTAINER

Surgical Pathology Scheduled: 12/28/2022 1330

Lab: UCDH PATHOLOGY

Collect Later

Answer	Comment
Enter the source(s) for the specimen(s) you are collecting:	
CERVIX- 2 O'CLOCK	Enter a comment
VULVA	Anterior
VULVA	Posterior
	Enter a comment

Procedure Catalog

Print Labels

View of Specimen Collection activity for the Surgical Pathology order

SPECIMEN COLLECTION ACTIVITY

- Accurately label each specimen container with the associated specimen collection label.
- Confirm the accuracy of the Collection Details by updating the Collector and Collection date/time.
 - Each specimen must have a collection date/time recorded.
 - The Collector must be the name of the provider performing the specimen collection.
- For Inpatient, scan the label for each specimen to document collection information.
- For Outpatient, click the [Collect All](#) button to document collection information.

Specimen Label Placement



Specimen Collection

Collection Sequence

x3 STERILE CONTAINER
❗ 280879000-A
❗ 280879000-B
❗ 280879000-C

Collection Details

Time: Now Date: Today Collector: UCDNOLAN, KATHLEEN LICNRS-ANCSTF Department: OB/GYN GLASSROCK Document individually

TISSUE Specimens

STERILE CONTAINER

Surgical Pathology

A. CERVIX- 2 O'CLOCK

❗ Scan label or click to document collection

Source

CERVIX- 2 O'CLOCK

Add Specimen Description

Draw Type

Non-blood Collection

Non-blood Collection

B. VULVA

❗ Scan label or click to document collection

Source

VULVA

Specimen Description

Anterior

Draw Type

Non-blood Collection

Non-blood Collection

C. VULVA

❗ Scan label or click to document collection

Source

VULVA

Specimen Description

Posterior

Draw Type

Non-blood Collection

Non-blood Collection

Procedure Catalog

Reprint Labels

Collect All

Accept

Update Collector and
Collection Date/Time

For Inpatient orders, scan label
to document collection

For Outpatient orders,
click *Collect All*

View of Specimen Collection activity for the Surgical Pathology order after Print Labels has been selected

- Note the *Collection Sequence* lists each specimen collection ID number with the corresponding letter designation.
- *Reprint Labels* if a source was updated after Print Labels was selected.
- Click *Accept* to close the Collection Activity.

Specimen Collection

Collection Sequence
x3 STERILE CONTAINER
✓ 280712608-A
✓ 280712608-B
✓ 280712608-C

Collection Details

Time: 1720 Date: 1/18/2023 Collector: UCDECKELS, LISA F... Department: INFUSION ADULT I... [Document individually](#)

TISSUE Specimens

STERILE CONTAINER
Surgical Pathology Scheduled: 1/18/2023 1730

A. CERVIX- 2 O'CLOCK ✓ Collected on 1/18/2023 at 1720 by UCDECKELS, LISA FAC-PHY in INFUSION ADULT IV INFUSION CENTER CA CTR
Source: CERVIX- 2 O'CLOCK Draw Type: Non-blood Collection [Non-blood Collection](#)
[Add Specimen Description](#)

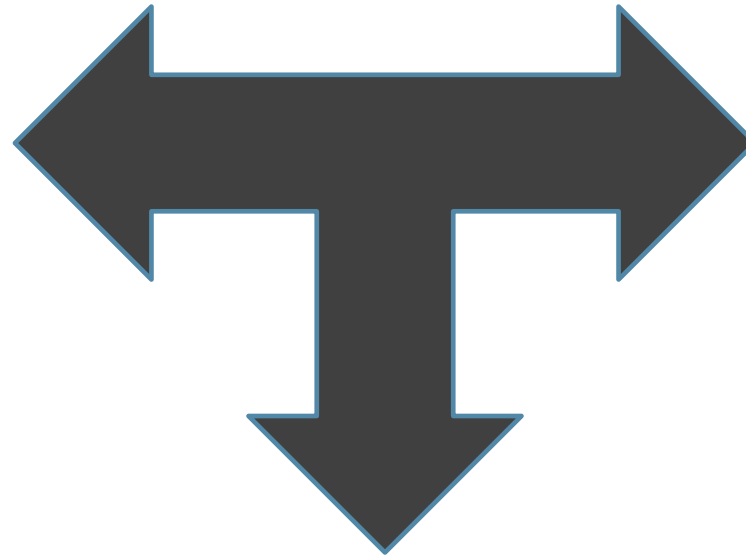
B. VULVA ✓ Collected on 1/18/2023 at 1720 by UCDECKELS, LISA FAC-PHY in INFUSION ADULT IV INFUSION CENTER CA CTR
Source: VULVA Draw Type: Non-blood Collection [Non-blood Collection](#)
Specimen Description: Anterior

C. VULVA ✓ Collected on 1/18/2023 at 1720 by UCDECKELS, LISA FAC-PHY in INFUSION ADULT IV INFUSION CENTER CA CTR
Source: Draw Type:

[Procedure Catalog](#) [Reprint Labels](#) [Collect All](#) [Accept](#)

👍 All collections documented!

**CLINICAL
TEAM**



**LABORATORY
TEAM**

**QUALITY
PATIENT CARE**

REVIEW – PATIENT IDENTIFICATION

- Do
 - Properly perform a two patient ID
 - Compare name and MR on ID bracelet and all labels
 - When possible, have patient state name and DOB
- Don't
 - State patients name and wait for patient to nod/agree

Failure to properly identify the patient may cause laboratory identification error that may lead to patient treatment and/or medication mismanagement.

REVIEW – TOURNIQUET APPLICATION

- Do
 - Apply tourniquet 3-5 inches from intended draw site
 - Dispose of tourniquet after each collection
 - If tourniquet on longer than 1 min, release and retie after 2 minutes.
- Don't
 - Leave tourniquet on for longer 1 minute
 - Hint: not longer than you can hold your breath

Prolonged tourniquet application alters the blood sample which may yield falsely elevated or falsely decreased lab test results (hemoconcentration).

REVIEW – VEIN SELECTION

- Do
 - Choose an appropriate site to perform venipuncture
- Don't
 - Draw a clinical lab specimen above an IV site
 - Draw through an existing hematoma

Drawing above an IV results in a diluted specimen, yields inaccurate test results.

REVIEW – DILATING THE VEIN

- Do

- Tie the tourniquet and palpate the vein
- May ask patient to tighten fist to dilate the vein
- May rotate hand to better position the vein

- Don't

- Ask patient to pump fist or hold fist while drawing a blood sample.

Fist pumping may increase K⁺ and ionized calcium levels, yields inaccurate lab results.

REVIEW – SITE CLEANSING

- Do
 - Use alcohol to clean site and allow to air dry
 - <1 minute
- Don't
 - Blow, fan or dry with cotton ball or gauze
 - Stick while alcohol is still wet

Alcohol cleans surface bacteria by desiccation- allow alcohol to dry to properly cleanse the site. Performing venipuncture while alcohol is still wet may cause hemolysis- leading to inaccurate results.

REVIEW – NEEDLE SELECTION

- Do
 - Use appropriate gauge needle
 - 21 or 23 gauge
- Don't
 - Use small gauge needle such as a 25 gauge unless small vein or baby/pediatric patient

Using too small of a needle has an increased risk of hemolysis.

REVIEW – SYRINGE COLLECTION

■ Do

- Pull gently on plunger
- Remove safety needle and dispose in a sharps container
- Attach transfer device to syringe and let vacuum fill evacuated tubes

■ Don't

- Apply excessive force while pulling back on the plunger
- Forcibly fill evacuated tubes with syringe
- Use needle to directly fill the tubes

Excessive pulling on the syringe plunger may cause the vein to collapse and hemolyze the sample.

REVIEW – TUBE INVERSION

- Do
 - Invert tubes end to end, immediately after collection 8-10 times
- Don't
 - Shake tubes
 - Not invert tubes

Shaking or not properly inverting tubes may cause hemolysis or clotting- resulting in recollection and delay in patient care.

REVIEW – SPECIMEN DELIVERY

- Do

- Label specimens at bedside
- Recheck patient ID and labeled specimens
- Bag single patient collection in one biohazard bag
- Tube the specimen bag to the lab in a timely manner

- Don't

- Label patient's specimens at the nursing station
- Bag more than one patients collected samples in a single bag
 - Two names in one bag- all samples are cancelled
- Delay tubing samples to the lab

Bagging multiple patients in one bag may result in identification errors and delay in specimen delivery will delay test results turnaround time and possibly inaccurate results for certain tests.