

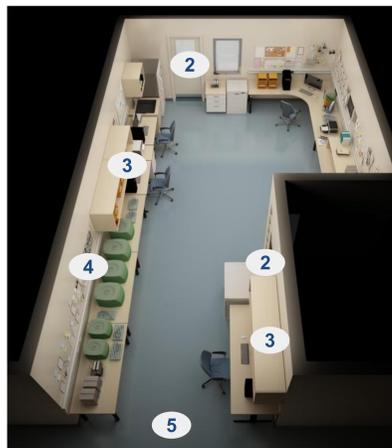
# Improving Hospital Laboratory Specimen Handling

Faculty Advisor: Dr. Niyousha Hosseinichimeh  
Client Contact: Dr. Moira Larsen

Team Members:  
Bruce Xu,  
Erica Cheng,  
Aidan Darragh,  
Stephanie Imbriaco

## Specimen Receiving Lab

- 01 Nurses collect specimens of blood, urine, tissues, or fluids from patients
- 02 Send to lab via manual drop off or pneumatic tube
- 03 Scan into computers
- 04 Run through centrifuge
- 05 Send to Chemistry for testing

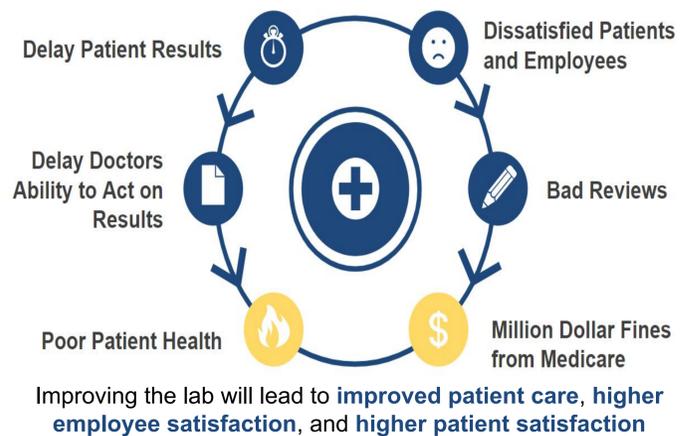


Current Lab Layout

## Problems Addressed

- Misplaced specimens** cause delays in processing time or require recollects from patients
- Lab layout** is not optimal to promote standard & organized work
- Diverse handling practices** used by staff causes errors
- Construction plans** requested by client to enlarge footprint of lab (to be implemented ~2021)

## Potential Consequences



## Goals

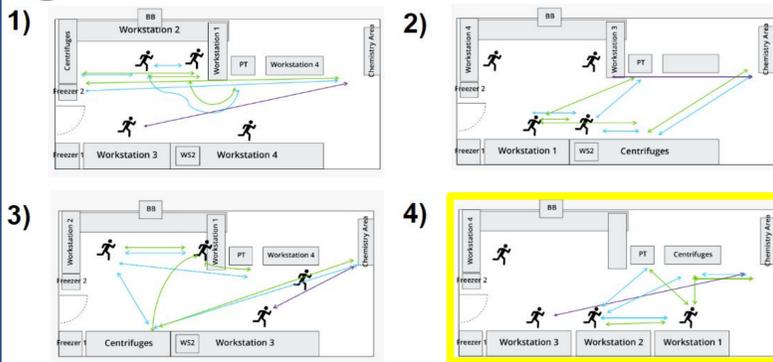
- Misplaced Specimens**  
Decrease number of misplaced specimens by 25%
- Lab Layout**  
Reduce staff walking distances in the lab by 15%
- Handling Practices**  
Create and implement standardized work procedures

## Construction Plans Solution



We recommend option 5 as it provides the most linear workflow, efficient use of space, and increased footprint

## Lab Layout Solution

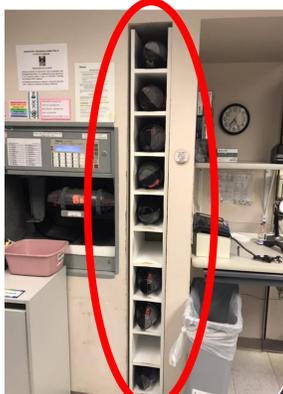


Distances Walked per Worker (meters) & Crossed Paths

	Worker 1	Worker 2	Worker 3	Total Walking Distance	Total # of Crossed Paths
Original	2.29	5.79	3.60	11.68	4
Layout 1	7.12	9.05	2.46	18.63	2
Layout 2	6.34	3.74	1.96	12.03	1
Layout 3	6.95	5.31	0.96	13.22	1
Layout 4	2.77	3.73	2.47	8.97	5

We recommend changing the lab setup to match Layout 4, this minimizes walking distances, thus speeding up specimen processing time

## Handling Procedures Solutions



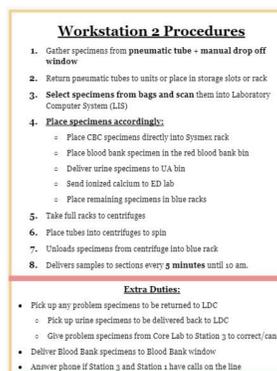
Pneumatic Tube Storage Slots



Example of Storage Rack



Drop-Off Window in Lab



Example Posted Procedures

Recommend a **pneumatic tube storage rack** that can fit under the counter and fold up when not in use

Utilize **manual drop off window** with sign-in sheet, drop bin, and bell for time sensitive specimens

Post updated **standardized procedures** at each workstation

## Handling Procedures Solutions



Example Specimen Bin

Example Specimen Rack

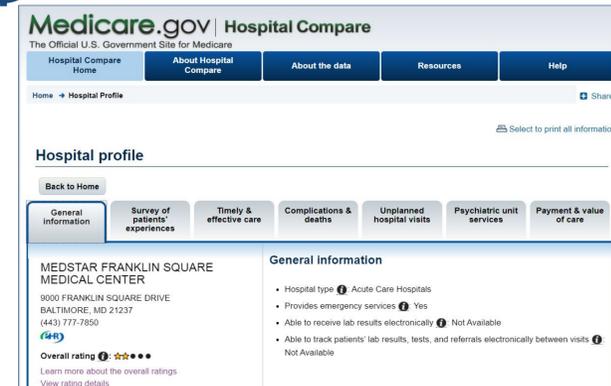
Only use **racks to store specimens**, instead of bins, to minimize lost specimens and keep work organized

## Misplaced Specimens Solution

Misplaced Specimen Tracking Sheet

Initiate **misplaced specimen tracking sheet**, and recommend purchase of 3 **table bumper kits** (\$60) to prevent specimens from continuing to roll off countertops

## Impact



Medicare runs patient survey of hospitals to provide hospitals ratings which can **affect clientele** and, if negative, **lead to million in fines**

## Covid-19 Impact

- We understand Medstar and all healthcare providers are very busy at this time
- Because of this, there is no 'post implementation' data available to study the impact of our work
- We are also unable do analysis on the construction plans due to a lack of data on the room dimensions for walking distance calculations