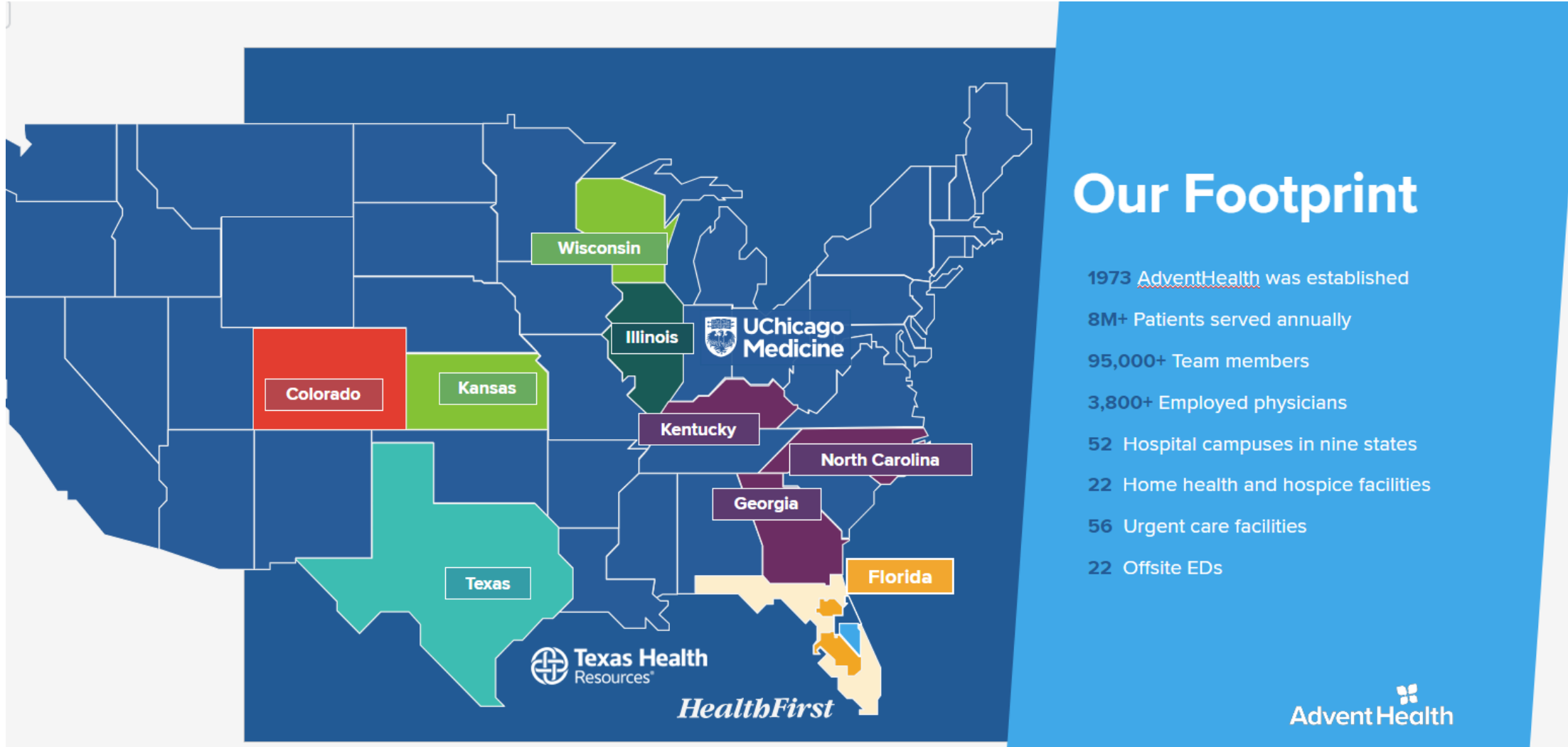


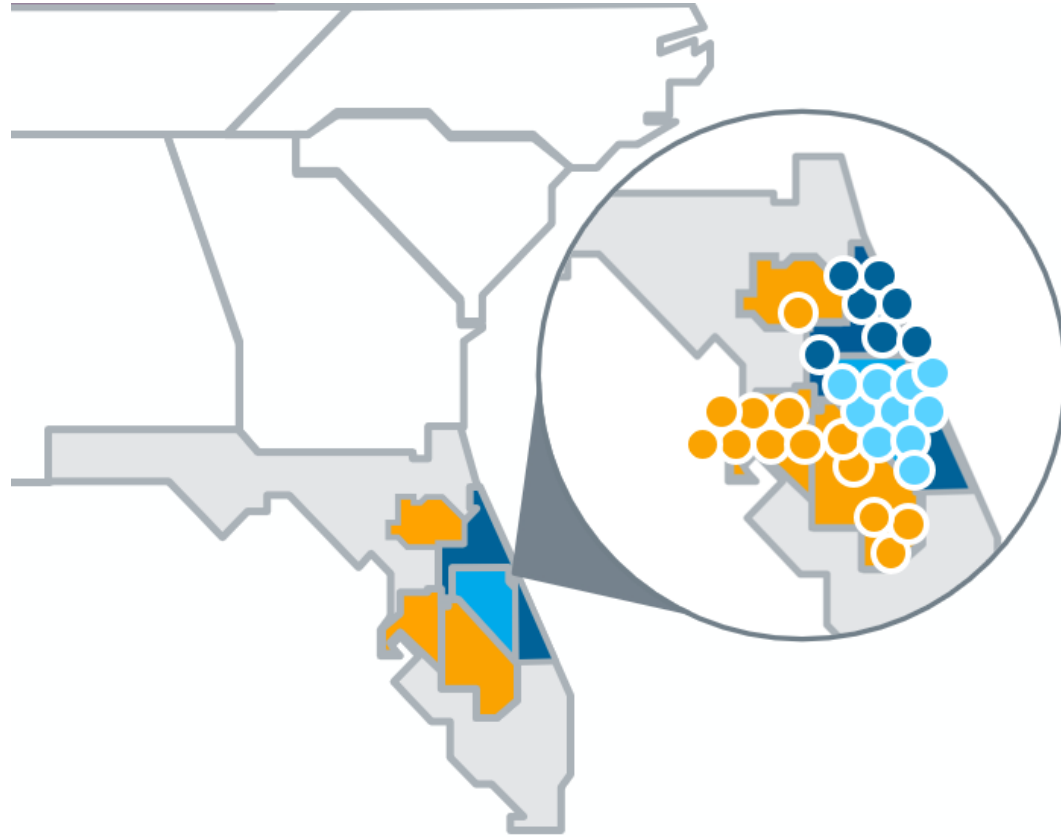


Autonomous Robots in the Lab: Freeing FTEs and Shortening Lab Test Turnaround Times while Improving Quality and Patient Care

Presented by: Sarah Province and Cory Eldon

Who is AdventHealth





AdventHealth Orlando Laboratory serves as a Core Lab for Central Florida Division

- 3.4M patient visits/yr.
- 8 hospitals
- 7 Infusion Centers
- 21 PSCs
- 9 free standing ERs
- 25 Urgent Care centers

Quaternary Specialty Care



AdventHealth for Children:

- Specialized pediatric care for our youngest patients.
- Expertise in treating childhood illnesses, surgeries, and developmental needs.

AdventHealth for Women:

- Comprehensive women's health services.
- Obstetrics, gynecology, and breast health.

Cancer Institute:

- World-class cancer care.
- Advanced treatments and research.

Diabetes Institute:

- Specialized care for diabetes management and prevention.
- Education, counseling, and innovative therapies.

Digestive Care:

- Expertise in gastrointestinal disorders.
- Endoscopy and minimally invasive procedures.

Heart, Lung & Vascular Institute:

- Nationally recognized cardiovascular care.
- Heart surgery, cardiac rehabilitation, and lung health.

Neuroscience Institute:

- Advanced neurology and neurosurgery.
- Treatment for brain, spine, and nervous system conditions.

Orthopedic Institute:

- Comprehensive orthopedic care.
- Joint replacement and sports medicine.

Transplant Institute:

- Nationally recognized transplant program.
- Kidney, liver, and pancreas transplantation.

AdventHealth Orlando Lab



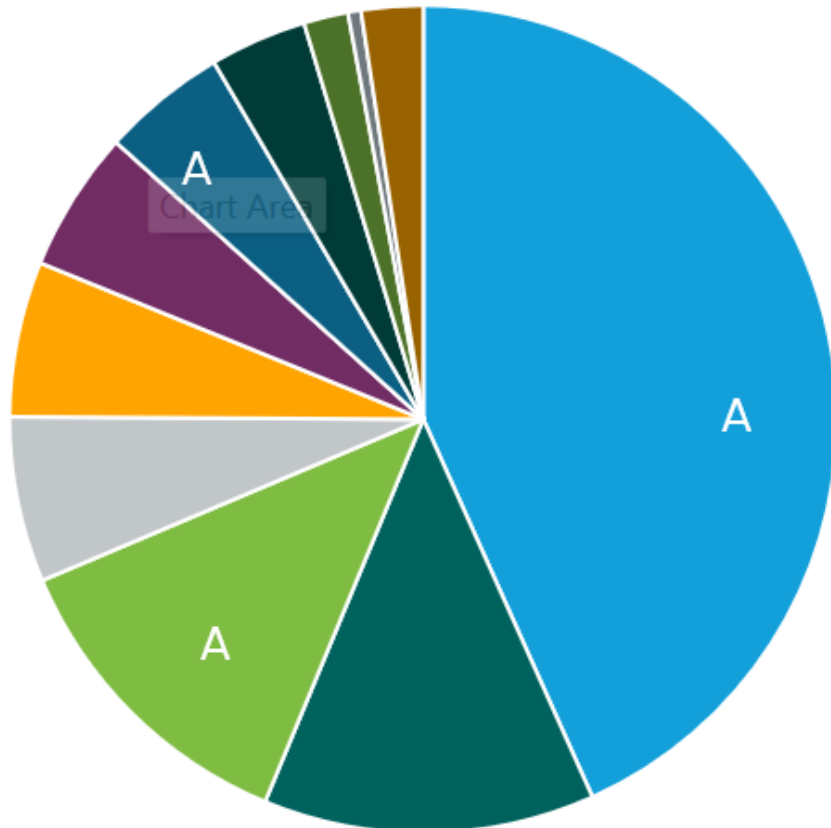
- 450 FTEs
- 163,000 specimens received each month
- 57,068 blood products given
- 476,984 pathology specimens
- 6.67M performed last year
- 1 Lab in 3 locations

Test Volume Details

Annualized Test Volume 2024

Department	Annualized Test Volume 2024
Chemistry (A)	2403764
POC	1214080
Microbiology	718928
Hematology (A)	687748
Serology	358816
Histology	336892
Blood Bank	305676
Coagulation (A)	271184
Flow Cytometry	210172
Urinalysis	96560
Special Coag	68436
Surgical Lab	54516
Cytology	28148
HLA Lab	7080
Molecular Diagnostics	3860

Annualized Test Volume 2024



- Chemistry
- Histology
- Urinalysis
- Microbiology
- Blood Bank
- Cytology
- Hematology
- Coagulation
- Specialty Esoteric
- Serology
- Flow Cytometry

A = on automation line in Core Lab

Specimen Delivery Robot - History

2000 trial – CCRI
RoboCart¹



2006 – Swisslog
SpeciMinder



2019 - Aethon TUG

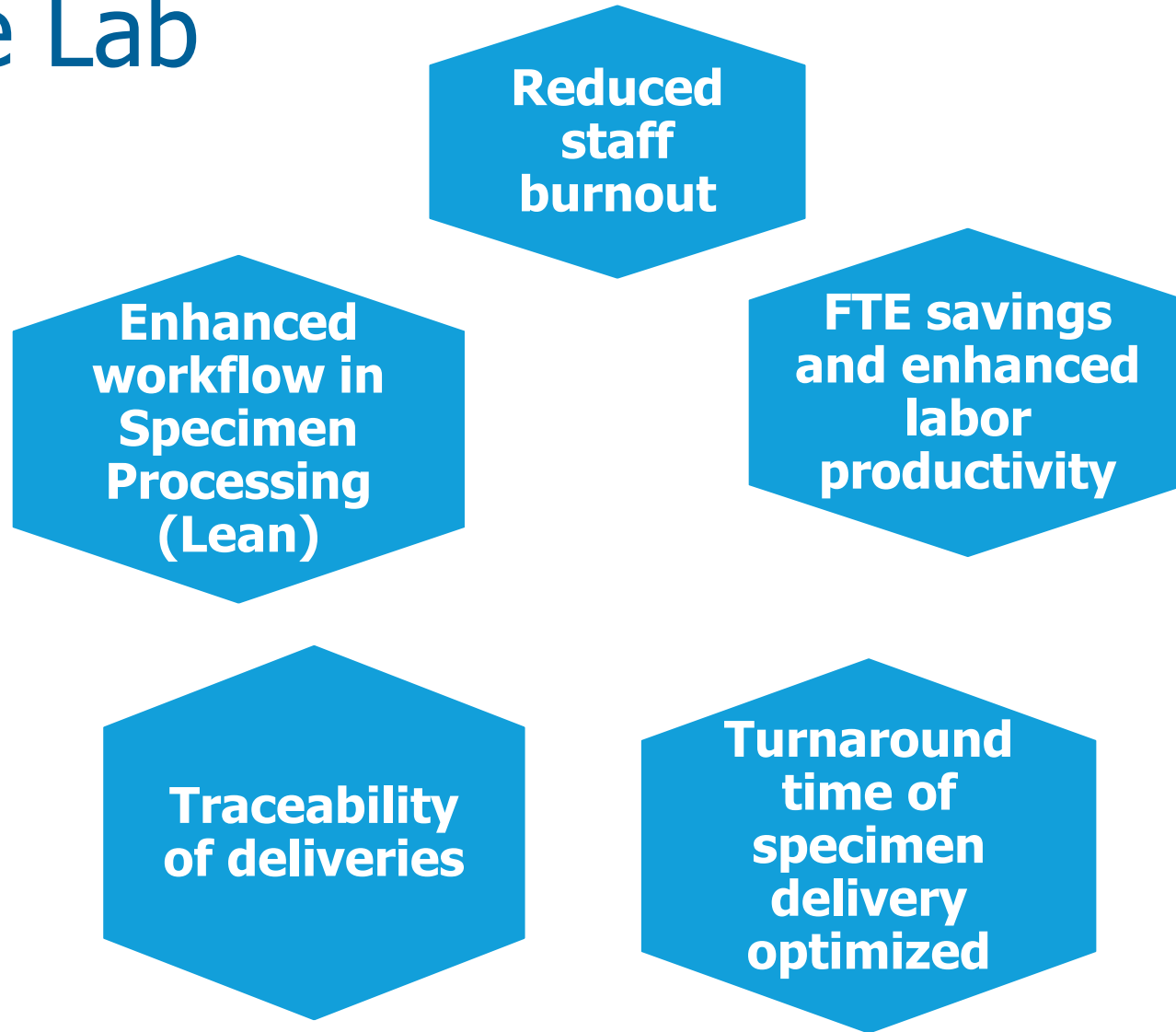


¹[Transporting with Mobile Robots - Robin A. Felder, 1996 \(sagepub.com\)](https://www.sagepub.com)

Meet Rosie the Robot

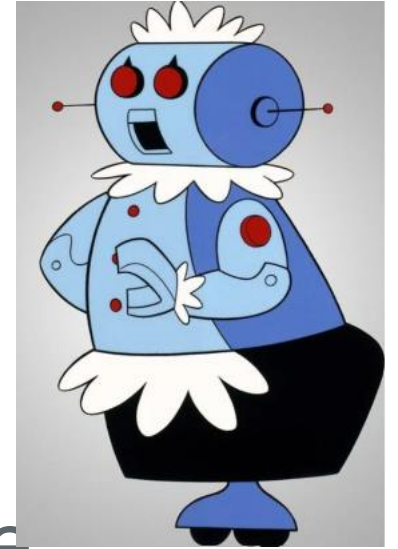


Value for the Lab



Staff impact

1. Welcome from day one
2. Contest to name the robot – “Rosie”
3. HR badge for our new “team member”
4. Short training for all staff for programming and use
5. Makes deliveries every 20 minutes
6. We miss her when she’s sick



Justification and ROI – labor savings

- Average Lab assistant salary per hour is \$17 (not including benefits).
 - Weekly salary of a lab assistant is \$680.
 - $\$680 \times 4.2 \text{ FTEs} = \2856
 - Annual salary for needed FTEs is \$148,512
- Cost of Aethon TUG
 - \$65,000 for robot
 - \$15,000 for installation and service contract.
- Capital Approval
 - Submit SBAR (Situation, Background, Assessment, and Recommendations)

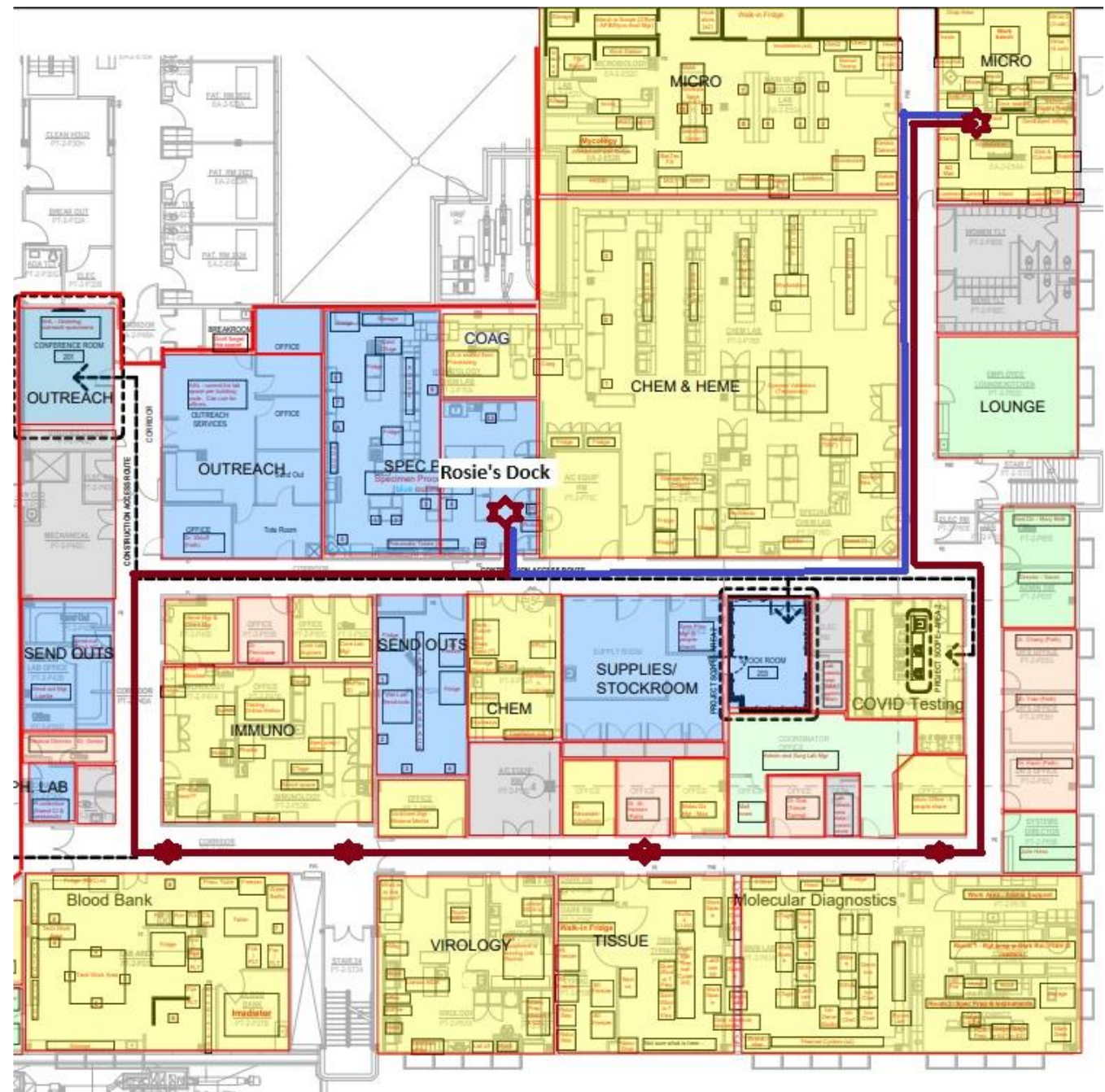
TUG T2RX “Rosie” Specifications and Features

- Speed—The speed is adjustable. Typical speed in a hospital environment is 2.0 feet per second.
- Size—The TUG is 48.1” tall and 22” wide. It weighs 70 pounds.
- Organization - Compartments available
- Security - Code entry for bin access
- 24/7 Help desk support
- Auto-docking w/ charging
- Multi-stop - Allows for multiple secure deliveries per run.
- Live location map
- Doorbell alerts
- Automatic door opener

Rosie's Route

- Specimen Processing
- Blood Bank
- Serology/Virology
- Tissue Typing
- Molecular Diagnostics
- Microbiology

27,100 sq. ft.



Available Reports

- Wait Time Summary
- Destination Wait Times
- TUG Usage by Time
- Destination Summary
- Destination Details
- Trip Details
- Robot Summary

Robot Summary Report

Time Period: 2024-03-01 to 2024-03-31

Tug: All Tugs

Sender: All Senders

Destination: All Destinations

Include Deliveries with Blank Times: Yes

Robot	Total Deliveries	Avg Deliveries per Day per Robot	Avg Delivery Time	Total Trips	Avg Trips per Day per Robot	Avg Trip Time	Total Trip Time	Avg Wait Time	Longest Wait Time	Miles Traveled
Rosie	3747	120.9	00:06:05	2020	65.2	00:09:54	333:40:33	00:00:35	00:05:01	237.8
Totals:	3747	120.9	00:06:05	2020	65.2	00:09:54	333:40:33	00:00:35	00:05:01	237.8

Metrics

- 2020 trips per month
 - 65 trips per day
- 3747 deliveries per month
 - 121 deliveries per day
- Average total trip time 333 hours per month
 - Average trip time 9 m 54s
- Average distance traveled per month is 237.8 miles



FTE Savings

- Estimated savings of 4.2 FTEs for 24/7 runner coverage.
- 65.2 trips per day
- 7.7 miles travelled
- 15,400 steps per day
- 11 hours of trip time per day



Reliability, Service and Awards

- Minimal downtime since installation.
- Minimal maintenance.
- 24/7 hotline support.
- Onsite service support.
- Won “Most Deliveries Made for a Single Robot” 2023 with 37,342 deliveries.



Summary

1. The specimen delivery robot is an essential part of the pre-analytical transport process
2. Staff acceptance of robotics is very high
3. Reliability and efficiency creates in labor savings
4. Plan for replacement like any employee
5. What's next? More automation and robotics in a future
Regional Central Lab

Thank You!

Questions?

Resources

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