Robotic Automation Blood Testing System with Artificial Intelligence & Quality Checking Technology

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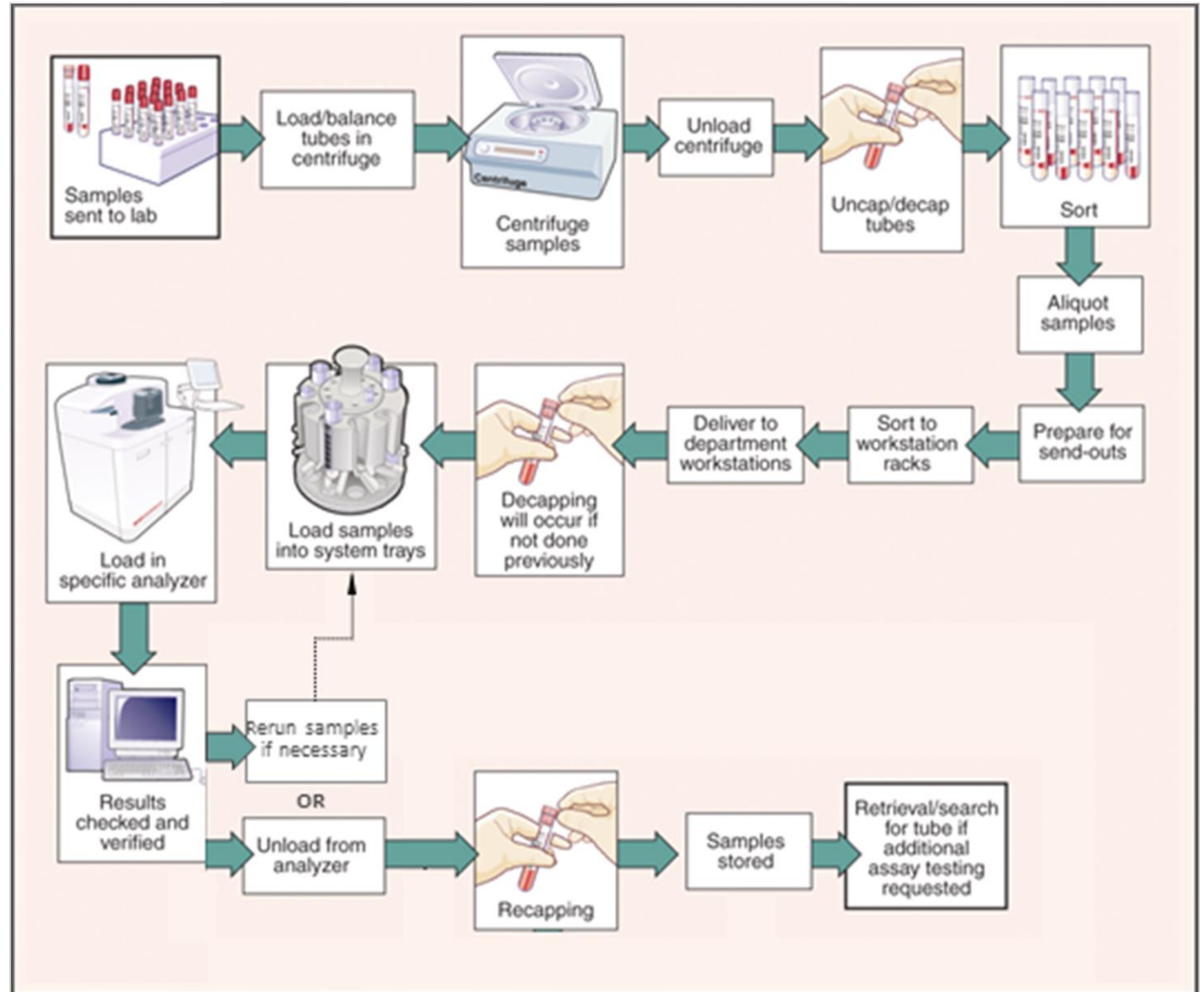
Director & Consultant Biochemist
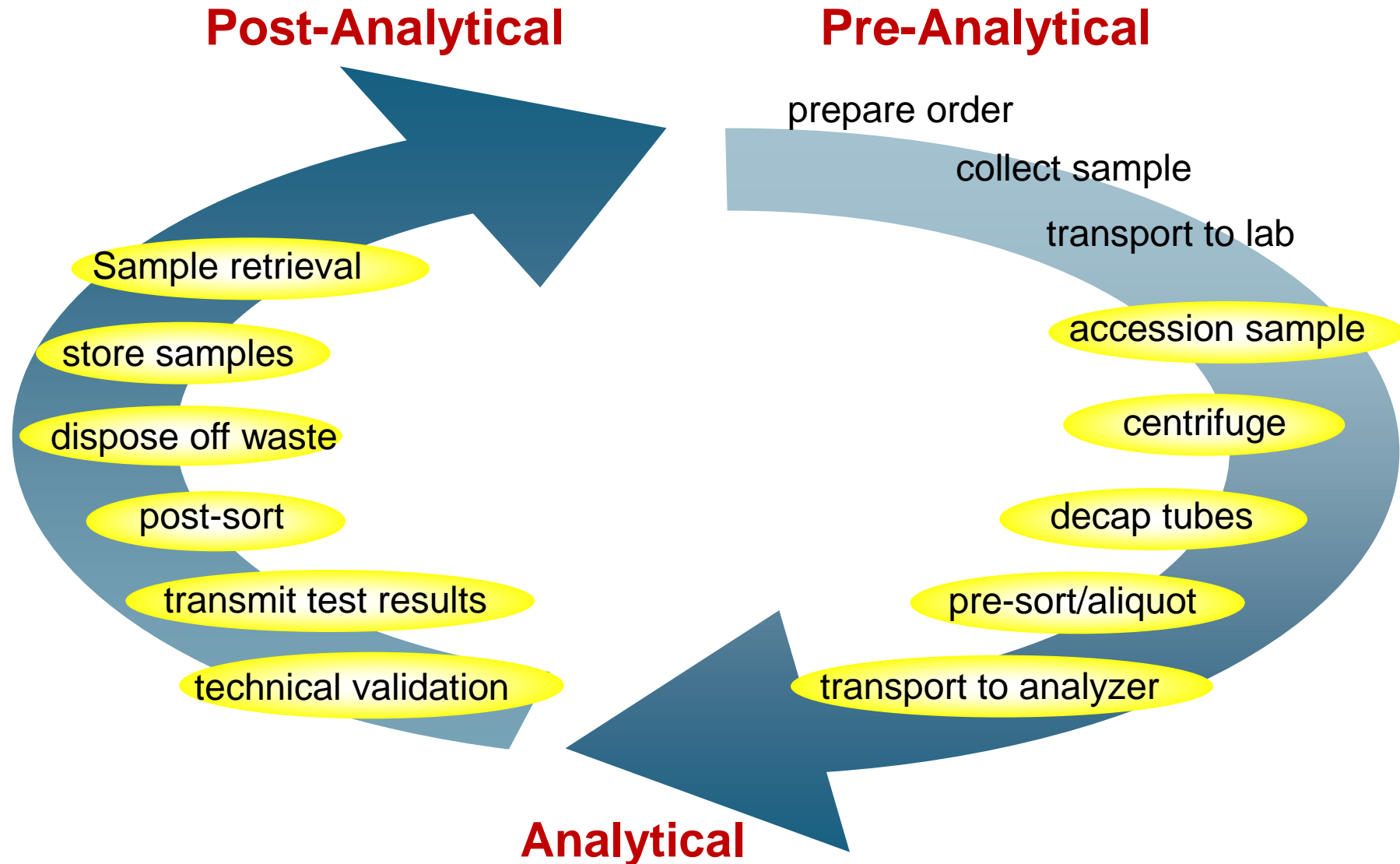
Quality Director- Laboratory
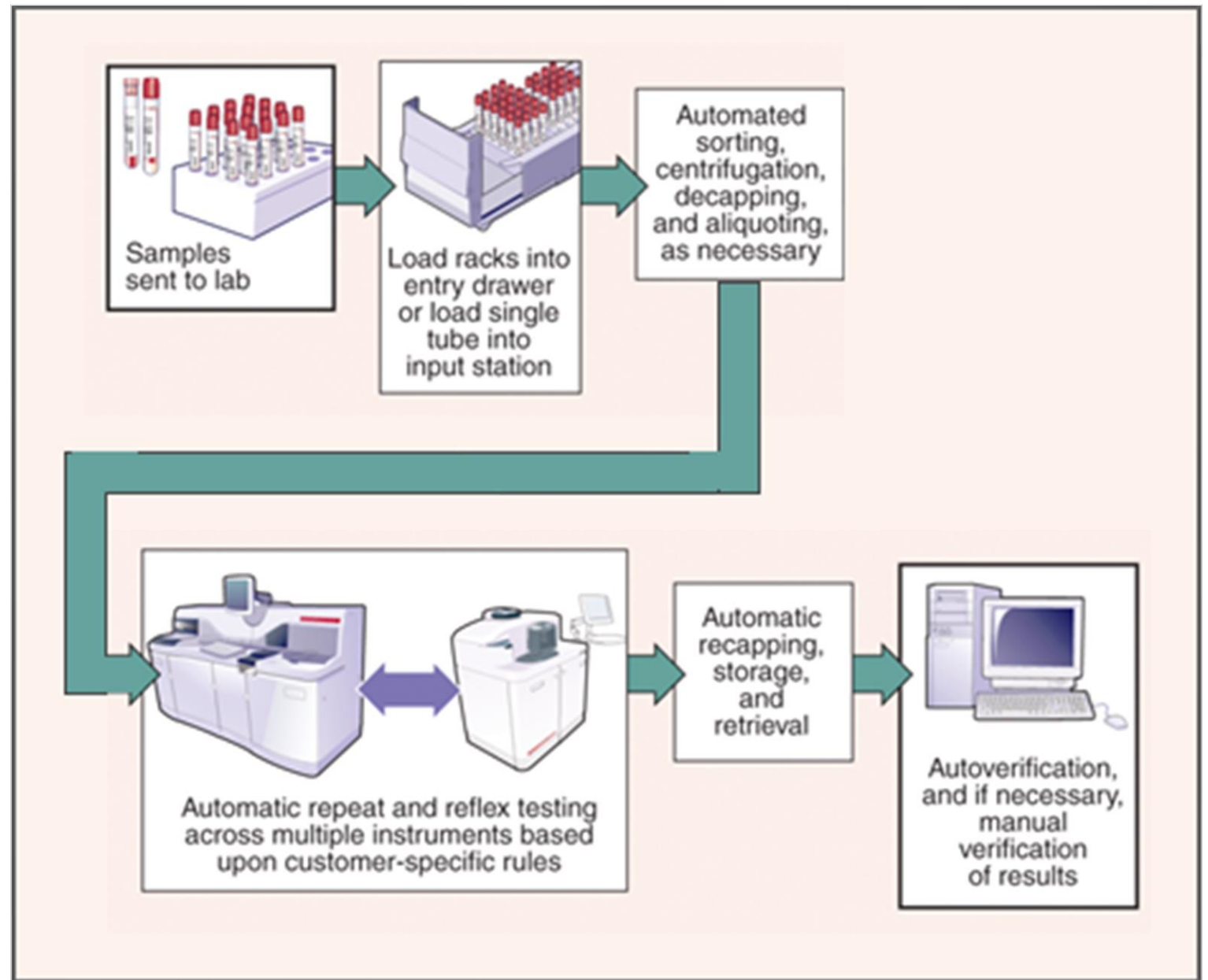
Sri Ramakrishna Hospital (Multi- Speciality)

Automated labs: A few years back

STEPS THAT CAN BE AUTOMATED IN THE LABORATORY WORKFLOW

Post-Analytical

Pre-Analytical

prepare order

collect sample

transport to lab

Sample retrieval

accession sample

store samples

centrifuge

dispose off waste

decap tubes

post-sort

pre-sort/aliquot

transmit test results

technical validation

transport to analyzer

Analytical

3

Automated labs: Current evolving work pattern

Laboratory Process

Laboratory Challenges

Results Turnaround Time Delays

Sample "variable wait" time until personnel is available to move sample to next process step

Potential Medical Errors

Process steps that provide opportunities for misidentification or other erroneous result reporting mistake

Potential Biohazard Exposure

Process steps which expose workers to infectious agents or physical injury

Laboratory Goals

➢ **Increase Productivity**
- Reduce **Process Steps**
- Reduce **Bottlenecks**
- Increase **Test Volume**
- Menu & Workstation **Consolidation**
- Improve **Allocation of Resources**

➢ **Improve Quality**
- Standardize **Results Validation**

➢ **Eliminate Medical Errors**
- Eliminate **Sample Mismatch**

➢ **Reduce Turn Around Time**

Highlight concerns laboratories want to solve with automation

Reliability improvements
- Reduction of human errors
- Control and management of errors
- Total data management

Quality Control
- International standard of QC

Gain of time
- Provide timely results to patients
- Achieve TAT Goal
- Increase capacity and grow

Ease of use
- Minimize number of analyzer
- Minimize maintenance time

Staffing issues
- Staff reduction
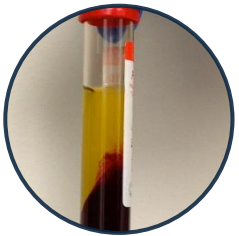- Staff reallocation

Expandable service
- High productivity
- Serve growth
- Expand to special menu

Results matter.

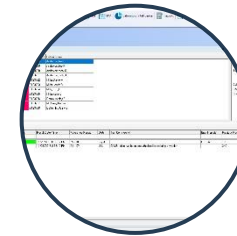# Summary & Benefits of automation solutions

Benefits of pre analytical

- Human intervention and error reduction
- Reduction of aliquoting
- Reduction of biohazard exposure
- Standardization of process
- Reallocation of qualified staff

Benefits of analytical

- Improved performance with load balancing
- Improved reagent management
- Reduction of non-value-added tasks
- Detection and management of errors
- Reallocation of qualified staff

Benefits of post analytical

- Post analytical sorting
- Reduction in sample retrieval time
- Reduction in touch points
- Auto verification
- Reallocation of qualified staff

What patient goals did we meet

- ***Quick*** patient identification
- ***Rapid*** sample transport
- ***Direct loading*** onto the pre-analytical module and sorting
- ***Automated*** analysis
- ***Autoverification***
- ***Faster*** turnaround
- ***Rapid*** error detection in the preanalytical phase
- ***Redundancy***
- ***Remote*** monitoring

THANK YOU