Case Study: Histology Workflow Successes at Sonora Quest Laboratories

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Histology Workflow Successes at Sonora Quest Laboratory

Who We Are

- Large Integrated Laboratory System
- Joint venture between Banner Health and Quest Diagnostics
- Contracted partnership with Pathology Specialists of Arizona
- LEAN / Six Sigma Company
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**What We Do**

- Centralized Histology Lab
  - Tissue processing for Commercial and Hospital cases
  - Routine/Special Staining
  - Immunohistochemistry
  - Transcription

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**What We Do**

- Multi-site Specimen Collection
  - Hospital Surgical Pathology
  - Clinics/Surgery Centers
  - Doctor’s office
- Multi-site Slide Distribution
  - By client and specialty
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Challenges

- Staffing
  - Shortage of trained HT/HTL
  - Diverse experiences and skill sets
  - Training
  - High volume of non-value added work performed

Challenges

- Pathologists
  - Demand large batch Workload
  - Wide variation in expectation/tolerance of slide preparation
  - Reluctant to adjust work schedule to workflow/load
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Challenges

- Workflow
  - Multiple bottlenecks
  - Inadequate Automation
- Performance
  - Quality issues at technical benches
  - Case Turnaround Time (TAT) >5 days

Solutions

- Lean/Six Sigma
  - Standardized Tasks
  - Reduced Variation/Defects/WASTE
  - Reduced Batch Size
- Automation
  - Continuous Process Flow
  - Reduced manual steps
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Implementation

- Standardization
  - Combine performance/production expectations
  - Demand Continuous Process Improvement
  - Use control metrics to monitor process
  - Demand personal responsibility of all

- Automation
  - Continuous small batch workflow processing
  - Standardized sample selection
  - Reduced solution use/waste
  - Reduced process steps
  - Reduced result variation
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**Implementation**
- Automation
  - Sakura Tissue Tek Xpress 120
  - Sakura Tissue Tek Prisma/Film
  - Ventana BenchMark XT
  - Dako Autostainer +
  - Dako Artisan

**Results**
- Staffing
  - Hire AA/BS degreed individuals
  - Task specific Competency Evaluations
  - Cross-trained for all technical tasks
  - Quality/Production minimum standards
  - Reduced staff turnover
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Results

- Pathologists
  - Small batch distribution of workload
  - Daily QC by defined categories
  - Adjustment of scheduling remains a challenge

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Results

- Workflow
  - Small batch processing
  - Continuous flow processing
  - First-in–First-out
  - Continuous case distribution
  - Automation is critical to success
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Results

- Performance
  - Reduced Turn Around Time ≤ 2 days
  - Reduced defects/errors to Pathologist
  - Increased Production
  - Workload leveling
  - Increased employee satisfaction

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Results

- Performance
  - TAT for >14,000 cases/month
    - Average TAT for all cases/specimen types = 1.7 days
    - TAT at ≥85% of all cases = 2.3 days
      (includes all routine, recuts, IHC, special stains and internal consults)
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Results

- Performance
  - Technical Task Defect/Error Rate
    - Combined $>4.4 \sigma$; $\approx 1900$ Defects Per Million Opportunities (DPMO)

Next Process Improvement Steps

- Need Connected Automation
- Need Automation for Microtomy
- Need Robotics between instruments
- Need Cost Effective Digital Solution
- Want Standard Sample (i.e. ThinPrep)
- Bar Coding