Enterprise Standardization and Decision Support Unlock Major Gains for Laboratory Operations

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Fairview Health Services

- Not for profit integrated delivery system with corporate offices in Minneapolis, MN.
- Founded in 1906
- Merger with the University of Minnesota Medical Center in 1997
- Seven hospitals, 41 primary care clinic, 56 specialty clinics
- 2,500 licensed beds
- Over 19,000 employees
- Total operating revenue: $2.33 billion
Regions

• Metro Region
  – University of Minnesota
  – Metro Clinics

• Southwest Region
  – Fairview Southdale
  – Fairview Ridges
  – Clinics

• North Region
  – Fairview Lakes
  – Fairview Northland
  – Maple Grove

• Greater Minnesota Region
  – Fairview Mesabi
  – Fairview Red Wing
  – Future Outstate

Mission Statement

• Fairview's mission is to improve the health of the communities we serve. We commit our skills and resources to the benefit of the whole person by providing the finest in health care while addressing the physical, emotional and spiritual needs of individuals and their families. We further pledge to support the research and education efforts of our partner, the University of Minnesota, and its tradition of excellence.
Fairview Strategic Goas

- Exceptional clinical care
- Exceptional patient and family experience
- Effective and efficient use of resources
- Strategic growth

Functional Alignment
Fairview—“One Care System”

Patient Access Points

- Fairview Lakes Medical Center
- Fairview Northland Medical Center
- Fairview Ridges Hospital
- Fairview Southdale Hospital
- UMMC & UMCH
- Ambulatory care sites (clinics, pharmacies, etc.)
- Senior Services
- Range & Red Wing

Integration Points

- Integrated Clinical Service Lines (cardiovascular, mothers & children, oncology, orthopedics)
- Shared Clinical Services (home care, laboratory, pharmacy, imaging, rehabilitation)
- Shared Business Services (finance, HR, IT, legal, marketing/comm, philanthropy, public policy, research admin.)
- Integrated Group Practice (physicians and providers)
Laboratory Services

- 13.5 Million Billable Tests
- Greater than 205,000 Anatomic & Cytology Cases
- 52 Pathologists & Ph.D.s
  - Fairview employed
  - University of Minnesota Physicians (UMP)
- 950 plus FTEs
- Total Operating Revenue 2008: $537 million

Laboratory Mission and Vision

Mission
Fairview Diagnostic Laboratories supports the Fairview Health System and its partners as a premier integrated laboratory system by providing:
  - High quality, accessible, cost effective, comprehensive services
  - Innovative clinical laboratory practice
  - Educational resources for its healthcare practitioners
  - Accessible diagnostic information in response to customer needs
Recognized regionally and nationally, the laboratory offers a full range of testing capabilities from acute care support to unique reference diagnostic testing, with strong employee engagement, quality, accuracy and timeliness.

Vision
Fairview laboratories, a team of caring professionals that leads the way in quality and innovation and provides nationally recognized services. We have the best team, expertise, service and technology… TEST
Standardization Committees

- Chemistry
- Hematology
- Microbiology
- Blood Bank
- Phlebotomy
- Lean
- Centralized Services:
  - Histology
  - Cytology
  - Special Chemistry e.g. Protein, Endocrinology, Immunology/HLA
  - Cytogenetics
  - Cell Therapy
  - Research
  - Molecular
  - Flow Cytometry
  - Virology

Committee Responsibilities

- Empowered
  - Instrument selections
  - Workflows
  - Procedures
  - Quality Control Rules
  - Quality Assurance Policies
  - Testing
System Standardization

- Information systems: Sunquest, CoPath, Histotrack
- Hematology: Sysmex
  - WAM Middleware
- Blood gas: Radiometer
- Chemistry: Ortho Clinical Diagnostics Vitros & Eci
- Coagulation: Diagnostico Stago
- Urinalysis
  - Hospitals or Large Clinics: IRIS
  - Clinics: Bayer
- Blood Bank Manual: Ortho Clinical Diagnostics Gel
- Blood Bank Automation: Immucor
- Blood Drawing: Greiner
- Blood Glucose: LifeScan
- Microbiology: bioMerieux and BD Bactec

System Initiatives

- Hematology Middleware Installation
- System Orientation
- Reference Laboratory
  - Formulary
- Blood Conservation
  - Order Sets
  - Guidelines
  - Education
  - Communication
Hematology Standardization

**Phase I**
- Instrumentation Selection
  - Consistency in clinical practice
  - Five part differential
  - Reagent portability
  - Ease of operations
  - Fits in with our Lean environment
  - Improved LIS interfacing

- Implementation
  - Phased approach

**Phase II**
- Workflow efficiencies
  - Transplant patients
  - Bone marrow patients
  - Cell therapy patients
  - Common test reporting
  - Common reference ranges
  - Autoverification
    - Improved turnaround times
    - Decreased labor

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**Phase II: Work Flow Efficiencies**

- **LIS**
  - Didn’t have functionality needed to handle all of the exceptions

- **Middleware**
  - Enhanced LIS functionality
  - Tools to streamline data review
  - Reduce technologist workload
  - Easy to add or make changes
  - Standardization of data review/qualification
Hematology Standardization

Intelligent Automation:
- Decrease Turnaround Time & Increase Efficiencies
  - 75 – 90% of samples auto-validate with no tech review
  - STATs requiring review are released first
- Decrease Tech Workload
  - Decrease review rates to 10 -25%
- Enhance Quality & Patient Safety
  - Standardization of rules and processes across shifts and multiple sites
- Paperless
  - Instrument results, graphics, flas, and manual diffs in single database
  - 2 years data storage

Sysmex WAM

Organization Advantages
- IDN rule standardization
- Comparability of patient results from site to site
- Increased efficiency with auto-validation
- Comparability of QC results across the IDN
- Access to data by other sites
Sysmex WAM

- User-defined rules for auto-validation
- Automate repeat/reflex with user-defined criteria
- STAT samples sorted and viewed first
- Paperless review
- Centralized database for delta checking
- Concentrate instruments through single interface

Sysmex WAM

- Advanced Rule Engine
  - More complex rule combinations in ONE rule
  - More variables to create rules
  - More rules for sub-sites
- Higher level of result qualification than provided by LIS
- Less operator intervention; fewer errors
- Improved standardization and control across shifts and labs
Sysmex WAM Rules

- **Rules on the Order level**
  - Location, Unit, Requestor, Age, Sex, Priority
- **Rules on the Result level**
  - Present, outside/inside range, coded comment, flag
  - Check previous results/orders - % or absolute
  - Check result/absence/presence of another parameter
- **Rules for reruns**
  - First run, all run, group/single tests for runs
- **Action Rules**
  - Rules to create comments, operator alerts, add/delete tests

Examples

<table>
<thead>
<tr>
<th>Test</th>
<th>Rule</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC</td>
<td>If dimorphic population?</td>
<td>Reflex Smear and Hold ADIF</td>
</tr>
<tr>
<td>RBC</td>
<td>If RBC &lt; 3.0 and LOC = PEDs and age &lt; 2 years</td>
<td>Re-run</td>
</tr>
<tr>
<td>HGB</td>
<td>If HGB &gt; 16.0 and Requestor = Smith and no previous result</td>
<td>Reflex Smear and HOLD all tests</td>
</tr>
<tr>
<td>PLT</td>
<td>If PLT ABN distribution and retic ordered and PLT &lt; 80</td>
<td>Hold CBC and ADIF</td>
</tr>
</tbody>
</table>
Interface Review

- Orders/Results
- Reflex orders
- Patient demographics
- Codes: Instrument/User
- Comments: Order/Test
- Result types

Single Screen Consolidated View

- Stat highlight and priority
- Critical Results highlighted
- Initial and repeat sample data
- Previous patient results
- Graphical and numerical data
- Flagging data
The Manual Differential Screen

The manual differential screen overlays the main validation screen to allow all graphic data and flagging to be viewed as Man diff is performed.

CellaVision - results electronically sent to Sysmex WAM
Hematology Standardization

Implementation & Installation
• Standardization team decided on rules
• Used Sysmex as consultant to reduce time of installation

Hematology Standardization

Results:
• True autoverification: 70 – 80%
• Reviewed Special rules for BMT patients – All sites
  – Automatically performs optical platelet and nucleated rbc counts
    • No need for repeats
    • TAT much better up to 50%
• “Doing what we thought it would do”
  – Nancy Geier, Hematology Supervisor
System Orientation

Problems:
• Not standardized
• Often not done correctly at high volume sites
• Too stressful
• High turnover at high volume sites
• Taking longer than it should
• Productivity problems
• Overtime problems

System Orientation

• Standard training materials
  – Instruments
    • Stago
    • Vitros
    • Bayer
    • IRIS
    • Sysmex
  – Policies
  – Procedures
  – LIS
System Orientation

**Trial Results:**
- Train at smaller site
  - Decreased time by 3 weeks
  - Less stress on tech
  - Systemization of staff
  - Less turnover

Thank you!