ROADMAP FOR IMPROVING ROUTINE CHEMISTRY QUALITY CONTROL

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Geisinger Health System
Danville, PA
Organized EHR, LIS, and Middleware

- Secure, well integrated IT system
- WAN routers connect to:
  - Data Center
  - “Rack & Stack” Virtual Client Servers
- 28 virtual Clinical System apps
  - including Bio-Rad, Data Innovations
Strategic Motivation for QC Design

Standardize QC policy and practice
- multiple CAP accredited sites
- harmonized analytical platforms

Simplify and “lean” operations
- high volume workstations
12 Step Program for System Sigma Analysis

4 Sets of Activities

Standardize & Measure

Monitor & Evaluate
12 Step Program for System Sigma Analysis

1. Standardize platforms doing Chemistry testing
2. Standardize connectivity via middleware to LIS
3. Standardize lot number of QC material
12 Step Program for System Sigma Analysis

4. Aggregate monthly peer comparison statistics

   *Unity RealTime® 2.0*

5. Calculate Sigmas from Westgard Advisor in

   **URT**

   \[
   \text{Sigma} = \frac{\text{TEa} - (\text{Instrument mean} \ - \ \text{Peer mean})}{\text{CV}}
   \]

6. Survey Sigmas of routine chemistry tests
12 Step Program for System Sigma Analysis

7. Monitor Sigma as Westgard rules are modified

8. Create simple Sigma dashboard in Excel

9. Document rule changes on network drive
12 Step Program for System Sigma Analysis

10. Tabulate site and system avoidance rate of false QC rejections from baseline month to comparable month

11. Monitor peer comparisons, CAP Proficiency for ongoing QA.

12. Expand Sigma approach to Hematology & Coag (Harrison et al, poster 2013 AACC)
Steps 1-3: Standardize Platforms, Connectivity, QC (Single Lab)
Steps 1-3: Standardize Platforms, Connectivity, QC (Enterprise)
Steps 4-6: Calculate and Survey Sigmas

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Steps 7-9
Excel Dashboard Monitoring Sigmas

Glucose

Sigma Value

July Aug Sept Oct Nov Dec Jan Feb Mar Apr May June
Steps 7-9
Excel Dashboard Monitoring Sigmas

Amylase

Sigma Value

July Aug Sept Oct Nov Dec Jan Feb Mar Apr May June
Steps 7-9
Excel Dashboard Monitoring Sigmas

Sodium

Sigma Value

July Aug Sept Oct Nov Dec Jan Feb Mar Apr May June
### Steps 10-12
Determine QC Rejection Rate

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<th>March (baseline)</th>
<th>August</th>
<th>September</th>
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<td>Reduction (%)</td>
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Summary

- Project was accomplished in 6 months with minimal hands on time

- Time reduction due to unnecessary QC repeats was substantial, decreasing disruption at high volume work stations
Summary

• Enterprise Sigma approach was expanded to Hematology and Coagulation areas of lab

• Additional opportunities are being explored for use of sigma (e.g. blood gas, whole blood chemistry, EIA, HbA1c, etc).
Sigma Metrics is Beneficial

Time savings via sigma – based QC standardization substantial to the enterprise

Win – win for lab management, lab staff, and patients