Hospital-Acquired Infections: EHR Tools to Enable Nurses to Conduct Real-Time Risk Monitoring and Prevention

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Track C – EHRs, Cyber Security, Clinician Burnout, and More
INTRODUCTIONS

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Piedmont Healthcare: Who We Are

WHAT WE OFFER
Piedmont provides a wide variety of services including, but not limited to:

- Heart
- Cancer
- Transplant
- Primary Care
- Neurology
- Women’s Services
- Brain Tumor
- Urology
- Emergency
- Bariatrics
- Breast Health
- Diabetes
- Imaging
- Orthopaedic
- Rehabilitation
- Respiratory
- Robotic Surgery
- Sixty Plus
- Sleep
- Spine
- Surgical
- Urgent Care
- Wound Care and Hyperbaric

11 Hospitals
21 Urgent Cares
28 Quick Care Locations
527 Piedmont Clinic Practice Locations

- Piedmont Athens Regional
- Piedmont Atlanta
- Piedmont Columbus Regional – Midtown
- Piedmont Columbus Regional – Northside
- Piedmont Fayette
- Piedmont Henry
- Piedmont Mountainside
- Piedmont Newnan
- Piedmont Newton
- Piedmont Rockdale
- Piedmont Walton
Quality and Safety Transformation

Strategic Framework

PURPOSE: WHY DO WE EXIST?
To make a positive difference in every life we touch.

VISION: WHERE ARE WE GOING?
We are transforming healthcare, creating a destination known for the best clinicians and a one-of-a-kind experience that always puts patients first.

Stewardship
• Highly effective and efficient operations with a focus on elimination of waste
• Consistent execution, predictable and strong fiscal performance
• Philanthropy as an important vehicle to ensure our long-term success

2026 Goal: Aa3 Rating; Target 5% margin

Talent
• Passionate clinician and administrative “owners”
• Physician leadership and alignment
• Employer of choice for a top-tier and diverse workforce
• A culture of accountability and continuous process improvement

2026 Goal: Top decile retention & engagement

Quality, Safety, Service
High-quality, patient centered care: The Piedmont Way
• Market leader in outcomes and “top of mind” market share for quality and safety
• Transformational, next generation access and a unified hassle-free experience

2026 Goals: Zero harm; Market leading Net Promoter Score; NRC Best Overall Quality

Strategic Growth
• Big enough to have relevance in Georgia
• Piedmont Clinic as the main portal to our system
• Comprehensive care close to home: “hub and hub” model
  - Distinguished community based hospital and ambulatory services
  - Broad primary care base
  - Destination for key service lines to include Cardiovascular, Cancer, Transplant services

2026 Goal: 2.5M unique patients
Quality, Safety, and Medical Staff Integration

**Philosophy**

- A coordinated, collaborative approach is necessary for a smooth transition into the Piedmont Quality, Safety, and Medical Staff Structure.
- This approach establishes expectations and prioritizes initiatives for a successful integration.
- Integration of new facilities into the Piedmont Quality, Safety, and Medical Staff Structure furthers our organization in the journey to Zero Harm.

**OUR VISION**

We are transforming healthcare, creating a destination known for the best clinicians and a one-of-a-kind experience that always puts patients first.
NORDIC OVERVIEW

SERVICE OFFERINGS

IMPLEMENTATION

AFFILIATE SOLUTIONS

MANAGED SERVICES

OPTIMIZATION SOLUTIONS

DATA & ANALYTICS

SATISFIED CONSULTANTS

800
Total W-2 Consultants

SUCCESSFUL CLIENTS

220
Total clients

30+
Academic Organizations

13 of the 20 U.S. News & World Report Best Hospitals are Nordic Clients

KLAS VALIDATED

2018 Trusted Partner for Healthcare Consulting and Services

2017 & 2018 Clinical Optimization, Revenue Cycle Optimization

2016 Optimization Services

2016 Epic IT Advisory Report &

2016 Comprehensive Healthcare IT Advisory

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The Problem...
The Clinical Data Feedback Loop

**Phase I**
- **i.e. Monthly Scorecards**
  - Data → QSS Scorecard → Nurse Manager → Department Meeting → Nurse
  - Time: 30 + Days

**Phase II**
- **i.e. Tableau Dashboards**
  - Data → Nurse Manager → Management Reports 48 to 72 Hours → Nurse
  - Time: 36 to 48 Hours

**Phase III**
- Data → Aggregate Data Close to Real Time → Nurse → Nurse
  - Close to Real Time

**Phase IV**
- Data → Nurse
  - Predictive Analysis

Compiled by PHC Quality Department
Promise Package – One Stop Shop

What?

Who?

Why?

How?

Where?
Promise Package – One Stop Shop

- Reason for standardization
- Roles and Responsibilities
- Outcome and process metrics
- Policy and procedure
- Educational resources
- Visual representations of standard work
- Potential barriers and resolutions
- Performance Tracking Measures

- Why?
- Roles and Responsibilities
- Outcome and process metrics
- Reason for standardization
- Educational resources
- Performance Tracking Measures
- Visual representations of standard work
- Potential barriers and resolutions
## Engagement Overview

### Schedule

<table>
<thead>
<tr>
<th>Initiation</th>
<th>Current State</th>
<th>Design</th>
<th>Build, Test, Validate &amp; Pilot</th>
<th>Pilot</th>
<th>Rollout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection</td>
<td>Project kickoff</td>
<td>Design &amp; validate draft recommendations</td>
<td>Complete all system build to</td>
<td>Pilot tools in the CCU for 2</td>
<td>Big-bang/system-wide rollout to</td>
</tr>
<tr>
<td>Known opportunities &amp; challenges</td>
<td>Interview key stakeholders</td>
<td>system build to support new workflows</td>
<td>months to validate tools</td>
<td>2 weeks to validate tools</td>
<td>all 6 hospitals</td>
</tr>
<tr>
<td>Existing build and tools</td>
<td>On-site hospital interviews and observations</td>
<td>Conduct design workshops to discuss prevention tools</td>
<td>Validate build with stakeholders</td>
<td>Minor issue resolution</td>
<td>Provided command center and at-the-elbow support for 1 week period</td>
</tr>
<tr>
<td>Existing references, protocols, policies &amp; procedures</td>
<td>Draft initial findings</td>
<td>Develop prioritized list of functionalities to develop in Epic to support pilot</td>
<td>Pilot tools on CCU</td>
<td>Decision to keep tools in place after 2 week pilot period completed</td>
<td>60-day post-live and stabilization period</td>
</tr>
<tr>
<td>Industry best practices for infection risk detection and prevention</td>
<td>Design &amp; validate draft recommendations</td>
<td>Complete prioritized updates and improvements</td>
<td>Develop training tools and update relevant policies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Compiled by PHC Quality Department
Future State Workflow Design

Role-Based HAI Prevention Workflow

- Real-time, role-based, workflow-centric decision support to reinforce policies and best practices and drive process and performance metrics focused on infection prevention and early detection/management

Roles by Workflow Step

- **Patient Presents & Evaluated**
  - Identification of high risk patients

- **Orders Entered, Care Provided & Documented**
  - Use of required documentation for bundle-related items

- **Patient Monitoring**
  - Patient Lists to notify staff of progress on process metrics (bundles)

- **Patient Discharged**
  - Document existence & removal of lines

**Roles by Workflow Step**

- **PCT, PICC & Bedside Nurse**
  - Notification & documentation of lines present on admission (POA)

- **Charge Nurse**
  - Patient Lists, Reporting Workbench, & Radar Dashboard reports

- **Nurse Manager / Director / CNO**
  - Patient Lists, Reporting Workbench, & Radar Dashboard reports
  - Access existing Tableau dashboards into Epic

- **Infection Prevention**
  - Identification of high risk patients
  - Patient Lists, Reporting Workbench, & Radar Dashboard reports
  - Access existing Tableau dashboards into Epic
Future State Workflows

Nurse Workflow

- Leverage existing Shift Required Doc patient summary report and columns to prompt nurses to complete bundle documentation each shift and ensure infection preventative measures taken
Future State Workflows

Nurse Workflow

• Improve visibility and management of LDA upon admission to reduce risk of missing care and accurate representation of patient care needs
Future State Workflows

PCT Workflow

• Patient list columns that indicate whether patient has central line or urethral catheter to reinforce necessity of appropriate hygiene interventions
Future State Workflows

Charge Nurse & Nurse Manager Workflow

- Patient Lists corresponding to each bundle allowing for real-time monitoring of compliance to drive HAI prevention
- Radar dashboard report for unit-specific overview and drill down of bundle compliance and other metrics pertinent to HAI prevention
Future State Workflows

PICC Nurse Workflow

- Develop System List and reporting toolset that allows PICC nurses to manage preventative care for all patients house-wide with central lines
Future State Workflows

Nurse Director & CNO Workflow

• Facility-level Radar dashboard report that provides overview and drill down of bundle compliance and other metrics pertinent to HAI Prevention
Future State Workflows

Infection Preventionist & Surveillance Workflow

- Facility-specific Reporting Workbench report that provides a calculated risk per infection based on modifiable and non-modifiable factors.
Pilot Results

Control Chart (Laney P Chart)
Patient Safety Check
Pilot Data CCU
Total Opportunity Compliance*

Statistical Significance!
- Rule 1: 1 or more points outside the control limits
- Rule 2: 2 of 3 successive points on the same side of the central line and more than 2 sigma units away
- Rule 3: 4 of 5 successive points on the same side of the central line and more than 1 sigma unit away.

Rate

Jan-17  Feb-17  Mar-17  Apr-17  May-17  Jun-17  Jul-17  Aug-17  Sep-17  Oct-17  Nov-17  Dec-17  Jan-18  Feb-18  Mar-18

- 3 sigma lower
- 2 sigma lower
- 1 sigma lower
- Series7
- Series8
- 3 sigma upper
- 2 sigma upper
- 1 sigma upper

66.11%  75.06%  73.55%  70.67%  78.71%  84.28%  93.49%  96.28%  95.97%  95.35%  95.06%  93.65%

*Total Opportunity Compliance = [All infection prevention bundle numerators] / [All infection prevention bundle denominators]

Compiled by PHC Quality Department
The HAI Risk Report identified a patient with a chronic Foley as high risk for a CAUTI. The unit staff and infection prevention worked together as a clinical team to review this patient's Foley care and formulate a plan to prevent a CAUTI in this patient. The tools help Infection Prevention rounds more purposeful. Patient Safety Check is more than a list of tasks, it's our way of validating that each patient gets the same standard of care throughout Piedmont Healthcare.

- Manager of Infection Prevention, PFH
Rollout Results

Patient Safety Check has been a helpful one-stop-shop tool to identify non-compliance in real time, specifically for the central line insertion bundle. We no longer need to go into every patient record to search for documentation. Instead, a red X appears if components of the bundle are missing. We can use this information to escalate and coach our co-workers.

- IMCU RN Manager, PFH

Patient Safety Check has been instrumental in ensuring we provide better care to our patients. It has raised the level of reliability of standard care. The proof is in rounding to validate the process measures and in the lower number of negative outcomes (less HAIs).

- Infection Preventionist, PNtH
Patient Safety Check has been a fabulous tool for the patient care techs to use during report. It immediately allows them to see who has a Foley or central line and who needs a CHG bath for the day. It has made their workflow much easier.

- Director of Quality and Safety Integration, PMH

*Clean 4 You: Clean Patient Compliance = Patient received daily CHG bath

**Clean 4 You: Clean Bed Compliance = Patient received daily linen change
SUCCESS

I love the Patient Safety Check tool!! It provides real time feedback for staff and more importantly, helps with ensuring we are providing evidence-based quality care to our patients. It helps with prioritization and for me personally, it provides the information I need to help coach leaders. I can’t say enough about the tool!!
-CNO

This is the best thing we’ve done for our front line staff. This is true leadership – providing staff with tools that allow them to do their jobs!
- Staff RN

Patient Safety Check is a very quick overview that has truly increased my ability to monitor in real time. I love it!
- RN Manager

Having the real-time data has helped us impact our performance because we can affect it now
- RN Manager

It makes doing the right thing easy!
- Director of Inpatient Services

As a traveler, this helps me greatly because I don’t know the bundle metrics as well as others. So, the tools help me complete what is needed without having to remember or look it up.
- Traveler RN

This is the first time I’ve felt that they actually listened and built what I asked for.
- Staff RN

This was a true collaboration between the quality department and frontline nurses. The result is a real-time, easy to use tool to drive bundle compliance and reduce HAIs and improve outcomes for our patients.
- Director of Nursing Practice & Governance

It makes doing the right thing easy!
- Director of Inpatient Services
Key Takeaways & Lessons Learned

• External Epic experts who knew Epic in a way that current resources didn’t know
  – Allowed for more innovation
  – Outside perspective with knowledge/learnings across clients

• Renegades & Evangelists
  – Coca-Cola learnings from Coke Freestyle machine
  – Cross section of nursing staff across all hospitals

• Involvement of front line nurses in the design
  – Representation from all hospitals
  – Included PCTs and staff RNs as well as RN leadership

• Limited variety of feedback during pilot
  – ICU vs. Med-Surg units
  – Some processes not accounted for
Next Steps

• Addition of other harm prevention standard work to the tools
  – Sepsis, Restraints, Pain Management

• Developing Patient Safety Check for ED & OR
  – Prompt identification for reassessment of level 2 ED patients

• Risk reporting
  – Development of Infection Prevention staffing model that targets rounding for high risk patients
  – Further iterations of the HAI Risk Algorithm
  – Regression modeling to ensure process measures are affecting outcomes
Questions?
CONTACT INFORMATION

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Appendix
### Future State Workflow

#### Epic Tools to Meet User Needs

<table>
<thead>
<tr>
<th>Tool</th>
<th>Targeted User</th>
<th>Use Cases &amp; Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDA Navigator Section in Admission Navigator</td>
<td>Bedside Nurse</td>
<td>Reconcile existing lines; Identify and discontinue lines that are no longer active &lt;br&gt;More accurately represent line days and eliminate outliers that skew metrics</td>
</tr>
<tr>
<td>Required Documentation for HAI Prevention Bundles</td>
<td>Bedside Nurse</td>
<td>Alert nurses to assessment documentation required each shift and daily &lt;br&gt;Allow for rapid navigation of required documentation in flowsheets &lt;br&gt;Increase awareness, compliance, accountability for bundle process documentation &amp; metrics</td>
</tr>
<tr>
<td>Patient List Columns, System Lists, and MyList Templates</td>
<td>Bedside Nurse</td>
<td>Easily view status of required documentation for each day &amp; shift to improve compliance on bundle process metrics for patients</td>
</tr>
<tr>
<td></td>
<td>PICC Nurse</td>
<td>Easily view central line and infection prevention status for each day &amp; shift to improve compliance with bundle process metrics and reduce central line use for all patients in a given department</td>
</tr>
<tr>
<td></td>
<td>Charge Nurse</td>
<td>Easily view status of required bundle documentation for each day &amp; shift to improve compliance with bundle process metrics for all patients in a given department to prioritize care and follow-up with individual nurses and patients</td>
</tr>
<tr>
<td></td>
<td>Nurse Manager / Director / CNO</td>
<td>Easily view status of required bundle documentation and infection risk for all patients in a given department or across the entire facility or system &lt;br&gt;Prioritize care and follow-up with individual nurses to drive infection prevention</td>
</tr>
<tr>
<td></td>
<td>Infection Prevention</td>
<td>Easily view status of required bundle documentation and infection risk for all patients ; Prioritize care and follow-up for specific patients at greatest risk of infection ;Ensure appropriate screening occurs for patients with suspected C.diff to prevent transmission</td>
</tr>
<tr>
<td>Radar Dashboards &amp; Reporting Workbench</td>
<td>Nurse Manager / Director / CNO</td>
<td>Quickly view real-time infection prevention related process metrics at department or hospital level, drill down into patient and line level details, and prioritize follow-up</td>
</tr>
<tr>
<td></td>
<td>Infection Prevention</td>
<td></td>
</tr>
</tbody>
</table>
# CLABSI Odds Ratio

Data from January 2017 – January 2018

<table>
<thead>
<tr>
<th>CLABSI</th>
<th>Negative Outcome</th>
<th>Positive Outcome</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliant</td>
<td>5</td>
<td>2939</td>
<td>2944</td>
</tr>
<tr>
<td>Non-Compliant</td>
<td>48</td>
<td>5772</td>
<td>5820</td>
</tr>
</tbody>
</table>

Odds at Negative Outcome with Compliance: 0.104
Odds at Positive Outcome with Compliance: 0.509

Odds Ratio: 0.205

99.83% of compliant cases has a positive outcome.

90% Confidence Intervals: 0.095 and 0.443
95% Confidence Intervals: 0.081 and 0.514
99% Confidence Intervals: 0.061 and 0.685

Odds Ratio < 1 implies that being compliant with process measures has a positive impact on the outcome.

If the confidence interval includes 1, there is not enough statistical evidence to say that compliance helps with the outcome.

This test is statistically significant at a 99% confidence interval.

**Compliant with Process Measures if:**

1. Maintenance Bundle = 100%  
   AND
2. Insertion Bundle = 100%  
   OR  
   Insertion Bundle = Null (we did not insert line)