Improving Health through Interoperability and Information Sharing

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Grady Health System
Disclosure

This presentation is sponsored by BD.
Grady Health System

- Located in **Atlanta, Georgia**
- **Largest safety-net health system** in the state of Georgia
- State’s largest teaching hospital
- **Our centers of excellence** – including best-in-class stroke, trauma, burn, cancer, and cardiac care
- **Busiest Nationally Accredited Level 1 Trauma Center** in Georgia
- **911 ambulance provider** for Metro Atlanta
- One of the country’s **largest infectious disease programs**
- World’s first 24 hour comprehensive sickle-cell center
Approximately 620,000 patient visits

Grady EMS responded to more than 125,000 911 calls

300 volunteers dedicated to helping patients and families

Grady is the largest hospital in Georgia with 953 licensed beds

25% of all Georgia physicians received some of their training from Grady

145,000+ patients treated in the Emergency Department

6 Grady Neighborhood Health Centers

More than 6,000 employees
Transformational Innovation
Atlanta Can’t Live Without + Grady
Atlanta Can’t Live Without + Grady
Interoperability for Grady Health

- Health Information Exchange
- Telemedicine
- SMART on FHIR
- Decision Support
- Population Health Tools
- Device Interoperability
Teled Radiology

Key Benefits

• Remote triage and consultation
• Rapid diagnosis
• Enhanced care team collaboration
• Reduced time to treatment
• Improved patient outcomes
Health Information Exchange

Key Benefits

- Improve patient safety by reducing errors
- Improve quality and outcomes at transitions of care
- Improve patient experience
- Reduce unnecessary redundant testing
- Reduce health related costs
We've exchanged patient records with organizations spanning 50 states.

We've exchanged patient records with more than:

- 1,490 Hospitals
- 1,449 Emergency Departments
- 34,936 Clinics

1,360,224 Patient Records Exchanged in 2017
Gaps with Unconnected Devices

Unconnected medical devices impact safety

- 60% of smart pump IV infusions have administration errors
- Only 28% of infusion-related medication errors can be averted with dose error reduction software alone


91% of nurses said medical devices take time from patients \(^4\)

93% of nurses agree devices should share data automatically \(^4\)

Delays in data entry can result in incorrect treatment and possible patient harm \(^5\)

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4. Gary and Mary West Health Institute. Missed Connections: A Nurses Survey on Interoperability and Improved Patient Care. La Jolla, CA: Gary and Mary West Health Institute; 2015.

5. Wrong-Record, Wrong-Data Errors with Health IT Systems. PSO Navigator. 2015;7(2):1-10.
Infusion Pump Interoperability

**BD Alaris™ System**

Brings pump and syringe infusions into BCMA workflow helping to protect more medications and patients.
75% of infusion-related medication errors are avoided with interoperability\(^3\)
- Brings pump and syringe infusions into BCMA workflow helping to protect more medications and patients
- Forces use of Guardrails\(^{TM}\) on every infusion and titration

Achievements to Date

- Linked the IV pump to the patient
- Established a connection between what the MD ordered and what was actually administered

- Right Time: 74% reduction in Good Catches
- Right Patient: 27% reduction in total GuardRail\textsuperscript{TM} Alerts
- Right Route: 60% reduction in Severe Harm events
- Right Medication: Established a connection between what the MD ordered and what was actually administered
Infusion Interoperability

Financial Improvements Related to Documentation

$1,272,333

$1,449,172

14% increase in charges
Infusion Interoperability

Financial Improvements Related to Reduction in Severe Harm Adverse Drug Events (PADE)

- 2015 2nd Qtr PADEs – 142
- 2017 2nd Qtr PADEs – 107
- Average cost of Preventable Adverse Drug Events - $8,750 (Institute of Medicine, 2016)
- Total cost avoidance – (35 x $8,750 x 4) = $1,225,000

$1,225,000 in cost avoidance due to reduction in Severe Harm Adverse Drug Events
Infusion Visibility

BD HealthSight™ Viewer

**Key Benefits**

- View infusion status in near real-time
- Improves pharmacy operational efficiency
- Reduces unused IV preparations
- Reduces medication delivery time
- Stat IV order reduction
BD Pyxis™ ES System
Interoperability
**BD Pyxis™**

**Med Link Queue and Waste module**

### Challenges
- Need to spend more time with patients
- Need to reduce non-value added steps
- Need to reduce interruptions and errors

### Value
- Patient-centric: brings workflow to patient bedside
- Efficient: streamlines nursing workflow
- Safe: helps minimize disruptions

### Features
- Remote queue medications
- Remote waste documentation
- Check station availability
- Dose request
BD Pyxis™ Med Link Integration with Epic

Key Benefits

• Single Sign On from Epic
• Access to Queue and Waste within EPIC eMAR
  • Via tab or hotlink
  • Directly to Patient Orders within ES module
• EPIC and ES Link co-visibility
Device Interoperability

Key Benefits

- Promotes real-time data entry
- Improves data accuracy
- Enhances medical decision making
- Increases clinician efficiency
eGlycemic Management System

Key Benefits

• Application launches and fully functions from within EMR (single sign-on)

• Patient’s insulin order set opens automatically

• Patient’s dashboard continuously refreshes with insulin infusion rate recommendations and other glycemic indicators
eGlycemic Management System

Proven Outcomes (Published Studies)

Hospital Length of Stay

- Manual: 7.86 days
- eGMS: 6.07 days

% Time in Target Glucose Range

- Manual: 31.5%
- eGMS: 63.7%

Key Benefits

Combines insights from a patient’s condition with the physician order

Potential impacts on improving:
- Length of stay
- Visibility into improved insulin management

Proven Outcomes (Published Studies)

Risk of Hypoglycemia During Insulin Infusion Directed by Paper Protocol Versus Electronic Glycemic Management System in Critically Ill Patients at a Large Academic Medical Center

Maria Rathmacher, PharmD, BCNSP, Jodie Smith, PharmD, BCNSP, Amy Dorr, PharmD, BCCCP, Wilma Gipe, PharmD, BCCCP, Karleen Conner, PharmD, BCCCP, Raymond McFarland, BS, and Barbara McLennan, MA, BN, LCNS-BC, NP-BC, FCCM
Cognitive Machine Interoperability
A Cornerstone of Population Health

Grady Health is applying a unique Eigen Space based cognitive machine that helps our providers:

- Incorporated into the workflow of Grady’s Mobile Integrated Health (MIH) program
- Clinician-embedded model that improves EMS use in high-risk populations
- Leveraging the patient-level risks and recommendations delivered by the cognitive machine
- MIH is better able to target home visits, remote monitoring and the actions that will decrease readmissions, 911 volumes, and ER visits
Interoperability with Cognitive Machine Learning

Key Benefits

- Improved productivity of nurses and case managers
- Smart rounding methodology
- Case managers are deployed based on complexity and likelihood of readmission
- Enhanced workload efficiencies
- Patient specific intervention recommendations that impact readmission reduction

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### Mobile Integrated Health Achievements 2016-2017

<table>
<thead>
<tr>
<th>May – Nov 2016 (7 months)</th>
<th>Jan-June 2017 (6 months)</th>
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<tbody>
<tr>
<td>189 MIH reported visits</td>
<td>220 MIH reported visits</td>
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<tr>
<td>17 Avoided Readmissions</td>
<td>45 Avoided Readmissions</td>
</tr>
<tr>
<td>Total Visit Cost = $37,500 (189 x $200 p/visit)</td>
<td>Total Visit Cost = $44,000 (220 x $200 p/visit)</td>
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<tr>
<td><strong>Total Jvion MIH ROI = $190,400 (503% ROI)</strong></td>
<td><strong>Total Jvion MIH ROI = $504,000 (1000% ROI)</strong></td>
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**Total 2016-2017 ROI = $694,400**

### Additional insights:
- Significant readmission reduction if MIH visit was within 5-10 days of discharge
  - Readmission rates decreased by more than 10% in those cohorts
- Readmission risk was reduced for future inpatient admissions after MIH visits
  - Impact lasts for several months (at least)

* Represents a cost of readmission as $11,200 according to AHRQ
Telemedicine & Diabetic Eyes

Diabetes Facts:

The #1 cause of preventable blindness

- 50% of patients that have had diabetes for more than 10 years will experience Diabetic Retinopathy
- 90% of patients that have had diabetes for more than 30 years will experience Diabetic Retinopathy

Problem

Overcapacity at the clinic & lack of insight regarding patients with pathology

Solution

PCP now conducts screening and refers patients with pathology
Outcomes of Early Detection

The earlier diabetic retinopathy is detected, the greater the number of treatment options that are available at much lower costs.

Key Benefits

- **Advanced:** Image enhancement technologies increase clarity and screening accuracy.
- **Proven:** Patented screening algorithms automatically detect potential pathology.
- **Human:** The enhanced retinal images are read and graded by IRIS reading center.

**Simple:**
- A fully automated FUNDUS retinal camera captures non-mydriatic images of the eye.
- Results exported back to patients chart next day.
On a Mission to End Preventable Blindness

6599 exams
133K Examined Nationally

Achievements to Date
Making a Difference Across the Entire Patient Population

What Grady has Achieved – Evidence-Based Outcomes

40% • Patients examined with detected Pathology
34%

25% • Patients diagnosed with Diabetic Retinopathy
17%

15% • Patients identified with vision-threatening, progressive disease
13%

25% • Increase in Risk Adjustment Eligible Diagnoses
17%

On a Mission to End Preventable Blindness

Evidence-Based Outcomes

- Patients examined with detected Pathology: 40%
- Patients diagnosed with Diabetic Retinopathy: 25%
- Patients identified with vision-threatening, progressive disease: 15%
- Increase in Risk Adjustment Eligible Diagnoses: 25%
SMART on FHIR
Improving Data Liquidity

A FHIR Future Burns Brightly for Population Health Management
As the healthcare industry warms up to FHIR, population health management and health data interoperability may be in for some significant improvements.

Key Benefits
- Increases patient engagement
- Supports population health management
- Bolsters clinical decision support
The Path Forward
Connecting the Digital Distribution of Healthcare
Interoperability

Summary Impact

Patient Care Delivery

- Clinician Efficiency
- Clinical Quality
- Cost Efficiency
- Patient Experience
- Patient Safety
Questions?

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