Creating Perfect Places to Heal
Enhancing Patient Experiences & Operating Results While Reducing Costs & Timelines
Learning Objectives

1. Understand how to improve patient experiences & outcomes, enhance staff experiences and improve operating results.

2. Learn how integrated solutions, IoT technologies and digital services can be used to create smart hospitals

3. Understand approaches to creating perfect places to heal
Topics For Our Discussion

- Key Healthcare Trends
- Smart Hospital Vision
- IoT and CyberSecurity
- Integrated Technology Design, Development & Deployment
Key Trends - Healthcare & Technology
Factors Affecting Healthcare

- Patient experience / HCAHPS
- Engaging patients & families
- Preventing falls & reducing HAI’s
- Enterprise systems - EMR, nurse call, RTLS
- Shifting revenue streams
- Enabling the Continuum of Care
- Consolidation and standardization
- Shortage of skilled team members
Site of Care Volume – Growth Projection 2014-2024

Source: Sg2 Healthcare Intelligence, Impact of Change
Healthcare is Changing

**DRIVING FORCES IN HEALTHCARE**

- Data Analytics can be used
- Clinicians need better processes
- Recovery factors can be controlled
- Improved discharge decreases readmission

**DRIVING FORCES IN TECHNOLOGY**

- 1 Trillion voice searches per month
- Facial recognition will be 99% accurate
- There will be a 10x increase in connected IoT devices
- Americans will use 200GB of data monthly
Creating Perfect Arrival Experiences

- Wayfinding with graphical directions
- Most convenient entry point
- Guidance to specific office
Creating Perfect Patient Rooms

- Ideal Environmental Conditions
- Circadian Rhythm Lighting
- Education & Medicine Facts
- Control of Heating & Air Conditioning
- Meal Ordering
- Video Visits & Conferencing
- Clinical Team Information
- Entertainment
Giving Patients Control Today

Patients can control anytime
Reduced calls to clinical and facilities teams
Reduced likelihood of patient falls
Giving Patients Control with Smart Glass

- Eliminate fabric shading and blinds - reduce potential HAI’s
- Control via pillow speaker & wall devices
- Integrated with building automation for precision control

Source: YouTube Video posting by Coouge on 6-14-18 about Science World at Telus World of Science
Putting Control at the Patients Fingertips
Giving Patients Control with Voice

- Contact an attendant
- Request information
- Television
- Housekeeping
- Emergency broadcasts
- Meals
- HVAC
- Shades
- Lighting

For more information, contact an attendant.
Creating the Perfect Surgical Suite

- Physician preferences
- Energy savings
- Patient comfort
- Reduced clinical workload
- Integration with data sources
Enabling Processes with IoT Technologies

- Better Space Utilization
- Improved Patient Experience
- Improved Asset Tracking
- Increased Staff Efficiency
- Faster Patient Throughput
- Enhanced Safety
Creating Perfect Places with More Accurate Space Utilization

Dashboard highlights

Data-driven actions

Space analysis

How much is space actually being used?

Peak times for waiting rooms?

Where are conflicting flows of people?

How much food does the cafeteria need to prepare?
Creating Smart Healthcare Facilities where Networks & Data are Secure in the age of Digitalization

45% of ransomware attacks in 2017 targeted healthcare organizations

The **cost of an average cyber attack** on healthcare facilities now exceeds **$5 million**

Source: Becker’s Health IT & CIO Report
Creating Perfect Healthcare Facilities with Power Reliability and Efficiency

What happens when the lights go out?

Smart Hospital Electrical Systems

- Power Generation
- Critical Loads
- Low Voltage Distribution
- Non-Critical Loads
Integrated Solutions
Providing Visibility and Giving Control

Security
Facility Management
Hospital Management
Maintenance & Support Staff
Doctors
Patients
Nursing Personnel
Integrated Solutions for Efficiency
Saving Energy and Improving Patient Experiences

- Unoccupied mode after patient discharged
- Room put into occupied mode when patient arrives:
  - Consistent arrival experience
  - Reduced calls to clinical & facilities teams
- Removed need for installation of occupancy sensors – driven by data (ADT/ HL7)
- Annual energy savings: $150,000
Visibility and Control

Community Based Care
- Physician Clinic/MOB
- Urgent Care Center
- Outpatient Lab
- Ambulatory Procedure Center
- Diagnostic Imaging Center

Acute Care
- Medical Center Campus
- Community & Regional Hospitals

Post Acute Care
- Inpatient Rehab Center
- Skilled Nursing Facility
- CCRC
- Outpatient Rehab Center
Eliminating Downtime
Using Data for Faster Resolution & Reduced Costs

- Depth of data-driven insight

**Value**
- Decreased Cost
- Faster response
- Increased Performance

**Remote Actions**
- Experts acting quickly

**Data-driven Prevention**
- Insights based on system health data

**Rules-based Actions**
- Proactively identify faults before they become bigger issues

**Statistical-based Actions**
- Foresight to predict maintenance needs

**Simulation-driven**
- Predictive analysis and decision making

**Autonomous Actions**
- Self-learning and automated actions

**SIEMENS**
Ingenuity for life
Reducing Costs
Network Topology

SIEMENS
Ingenuity for life

Lighting
Data
Security
Fire
Shades

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Integration Platform - Open Architecture & Scalable

Clinical & Operational Applications
HL7 & Web Services Integration

Building Analytics Layer

Navigator

IBMS

INTEGRATION TO CLINICAL AND OPERATIONAL SYSTEMS

APPLICATIONS

INTEGRATION TO BUILDING SYSTEMS

Building Controls E³ Network

HVAC  Shade  Lighting  Fire  Power  Security  Mass Notification  Partner Ecosystem  Other Building Controls

Mobile Apps

Graphics

Dashboard
Advanced Room Configuration

- Reduced complexity
- Unified interface
- Out of the box integration
Eliminating Wires
Embedded Technologies
Preconstructed Units
Innovative Air Valves

**Lower Minimum Flows**
- Target: 100:1 turndown

**Lower Minimum Operating Pressure Drop**
- Lower duct velocities => lower pressure drops save fan energy

**Lower Sound Power**
- Reduce or eliminate need for sound attenuation

**Reduce Construction Complexity with Fewer Sizes**
Engaging Early
Early Collaboration

Graphic courtesy of Patrick MacLeamy AIA/HOK

- Ability to impact cost and functional capabilities
- Cost of design changes
- Traditional design process
- Collaborative design process

Managing the Process

Preconstruction
- Prelim
- Workshops
- Device Research
- Testing and Spec
- Solution Submission
- Solution Decision
- Point Mapping/Graphics

Construction
- Under Construction
- Solution Commissioning
- Owner Acceptance
- Maintenance and Service

Post Construction
Summarizing

- Patient experiences can be improved
- Operational savings can be achieved
- Integrated solutions are key
- Construction savings can occur
- Engage early
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