Closed Loop HealthCare: From Home to Hospital to Home

1. Fall Detected at home
   Randall doesn’t get up
   - Robot: Randall needs Medical help alerts 911

2. Home Monitor
   - Datalogger
   - Robot dispatch And 911
   - EHR

3. ER - Smart alarms utilize cloud data and EHR

4. Surgery – all data available
   - PCA pain meds: risk of injury Reduced; reduce alarm fatigue
   - Safety Certification of interoperability

5. Home Monitor
   - Device/Genomic
   - Prescription CDS

6. Real-time blue button

7. HOME

8. Discharge

9. HOME
Robot: Randall needs Medical help alerts 911

ER - Smart alarms utilize cloud data and EHR

Surgery – all data available

Pain meds: Reduce risk of injury and false alarms

Device/Genomic Prescription CDS

NOTE: this graphic depicts a mix of current and planned capabilities.
Fall Detection and analysis …
Can change the course and outcome of the event

1. Fall Detected at home Randall doesn’t get up
2. Robot dispatch performs triage alerts 911
3. 911 dispatch
Hospital has standards-based “Integrated Clinical Environment”. Enables full data interchange, device coordination, closed-loop control, black box recorder … “IoT for Health Care”

Emergency Department

Randall’s data from home helps avoid un-necessary head CT scan
Nationally - $30B in wasted MRI/CT imaging
$2,000 each head scan. Radiation equivalent to 30 chest x-rays

Retrieving data from remote EHR
Starting Safe Pain Management system
Transferring all clinical data to OR for emergency surgery
Genomic basis for fall identified – medication adjusted
Reduce false alarms will reduce alarm fatigue
Safer, more effective pain control
Real-time blue button data available to family and staff

Pain Medication-related Injuries Could be prevented with Medical CPS:
• Over 6000 patients severely injured/killed each year
• Up to $145M impact
• Untreated pain
• PREVENTABLE!

Safe Interoperability enabled by MCPS
Patient is discharged … to a smarter home

- Bathroom/Toilet Floor Sensor
- Motion Sensors
- Bed Sensor
- Fall Detection – Kinect
- Auto Light Control
- Capsule Robots
- Real-time blue button
- Wearable sensors
- Home Gait Analysis – Kinect

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