Converging Medical Device & Enterprise Networks

Medical Connectivity Consulting
Agenda

- Medical device system networks
- Convergence challenges
- Best practices
Medical Device Networks

- Private networks
- Tightly controlled by vendor
- Easier to support
- Lower R&D costs
- Entire system is regulated
- Ideal for departmental systems
Private Network Limits

- Create “islands of information”
- Sometimes include discontinued third party products
- Not kept current with evolving network/computer technology
- Proliferate widely
- Barrier to enterprise deployments
- Customer sees unnecessary complexity, duplication and cost

Bob Metacalf, Ethernet inventor holding ThickNet network cable
Medical Device As Information Appliance

- Enterprise-wide deployments
- Overlapping deployment of different devices
- Driven by patient safety applications
- Driven by EMR adoption
<table>
<thead>
<tr>
<th>Stage 7</th>
<th>Cumulative Capabilities</th>
<th>Q2 2008</th>
<th>Q3 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 6</td>
<td>Medical record fully electronic; HCO able to contribute CCD as byproduct of EMR; Data warehousing in use</td>
<td>0.0%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Stage 5</td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full R-PACS</td>
<td>0.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Closed loop medication administration</td>
<td>1.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Stage 3</td>
<td>CPOE, CDSS (clinical protocols)</td>
<td>1.8%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
<td>32.0%</td>
<td>32.9%</td>
</tr>
<tr>
<td>Stage 1</td>
<td>Clinical data repository, Controlled Medical Vocabulary, Clinical Decision Support System, may have Document Imaging</td>
<td>33.9%</td>
<td>33.2%</td>
</tr>
<tr>
<td>Stage 0</td>
<td>Ancillaries - Lab, Rad, Pharmacy - all installed</td>
<td>12.6%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

Total Hospitals: n = 5048

Data from HIMSS Analytics Database
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Network Variability

Network design and configuration
Authentication and encryption
Network vendor diversity
Network Management

Documentation
Network reliability & predictability
Test and change control
Emerging systems-of-systems problem
IEC 80001

One or more networked medical devices

Formal risk management process (ISO 14971)

Manage networks as medical devices

Responsibility Agreements with vendors

Complete in 2010
Service & Support

Losing control of network environment
Complexity diagnosing problems
Shortage of general IT expertise
Regulatory

Maintaining QSR on open networks
Adequate verification testing
Consolidate WW regulatory issues
IEC 80001 - Responsibility Agreement
Product Development

Supporting enterprise IT variability
Supporting multiple network vendors
Medical device coexistence
Verification - scalability, environment
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Networks are *Designed*

- New applications = new requirements = new design
- Get network specifications from medical device manufacturers
- Provider is responsible for ensuring network remains within specifications
Create a Technology Roadmap

Across clinical areas
Across technologies
Note specific solutions, integrations, and required infrastructure
Balance IT Standards with Clinical Needs

Core mission is *healthcare delivery* not IT delivery
Proactively disclose your standards to manufacturers
Be flexible
Monitor & Manage Networks

Maintain manufacturer’s specifications
Realistic test environment
Rigorous change control
Bibliography

IEC 80001 - An Introduction
IEC 80001 - To Impact Providers
Wi-Fi Device Drivers for Medical Devices
Medical Device Networks Trouble Industry
Can We Fix Wireless Healthcare?
Tim Gee
Medical Connectivity Consulting

Blog at:
www.medicalconnectivity.com