Converging Medical Device & Enterprise Networks
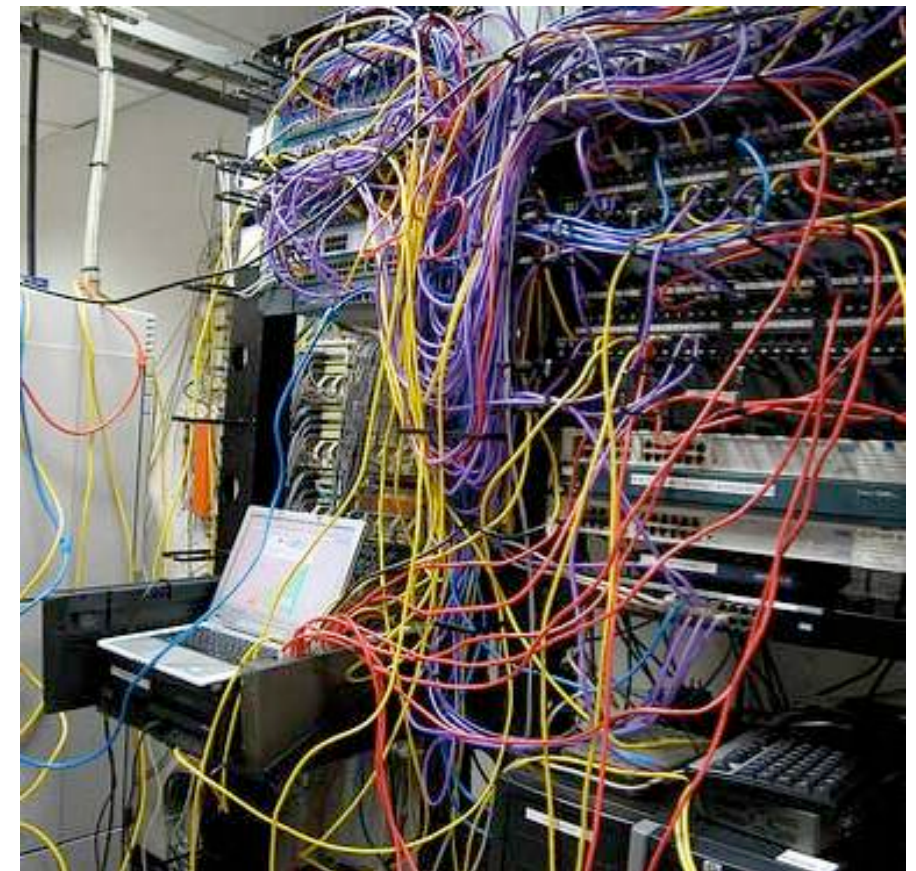
Medical Connectivity Consulting
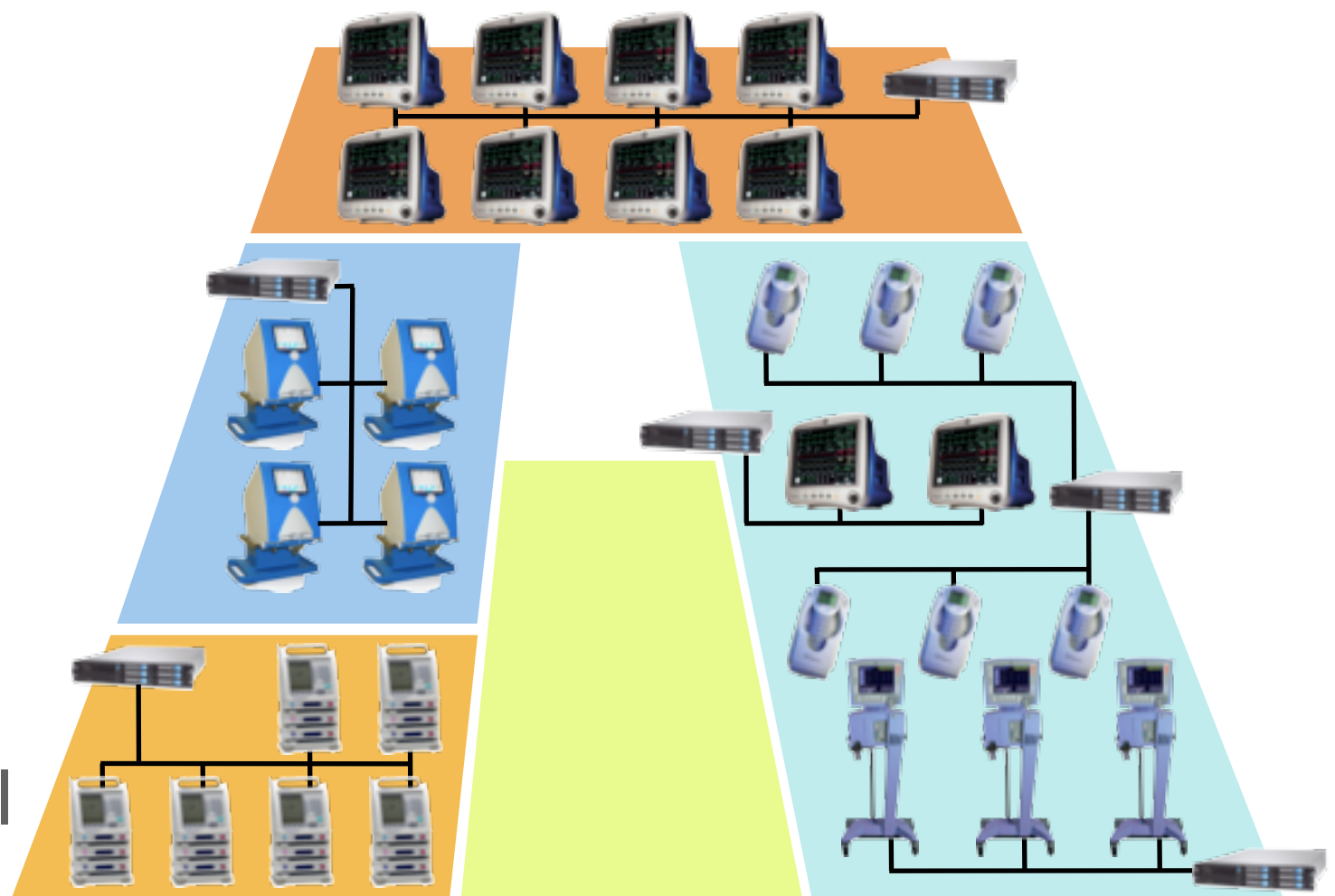
Agenda

▶ 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
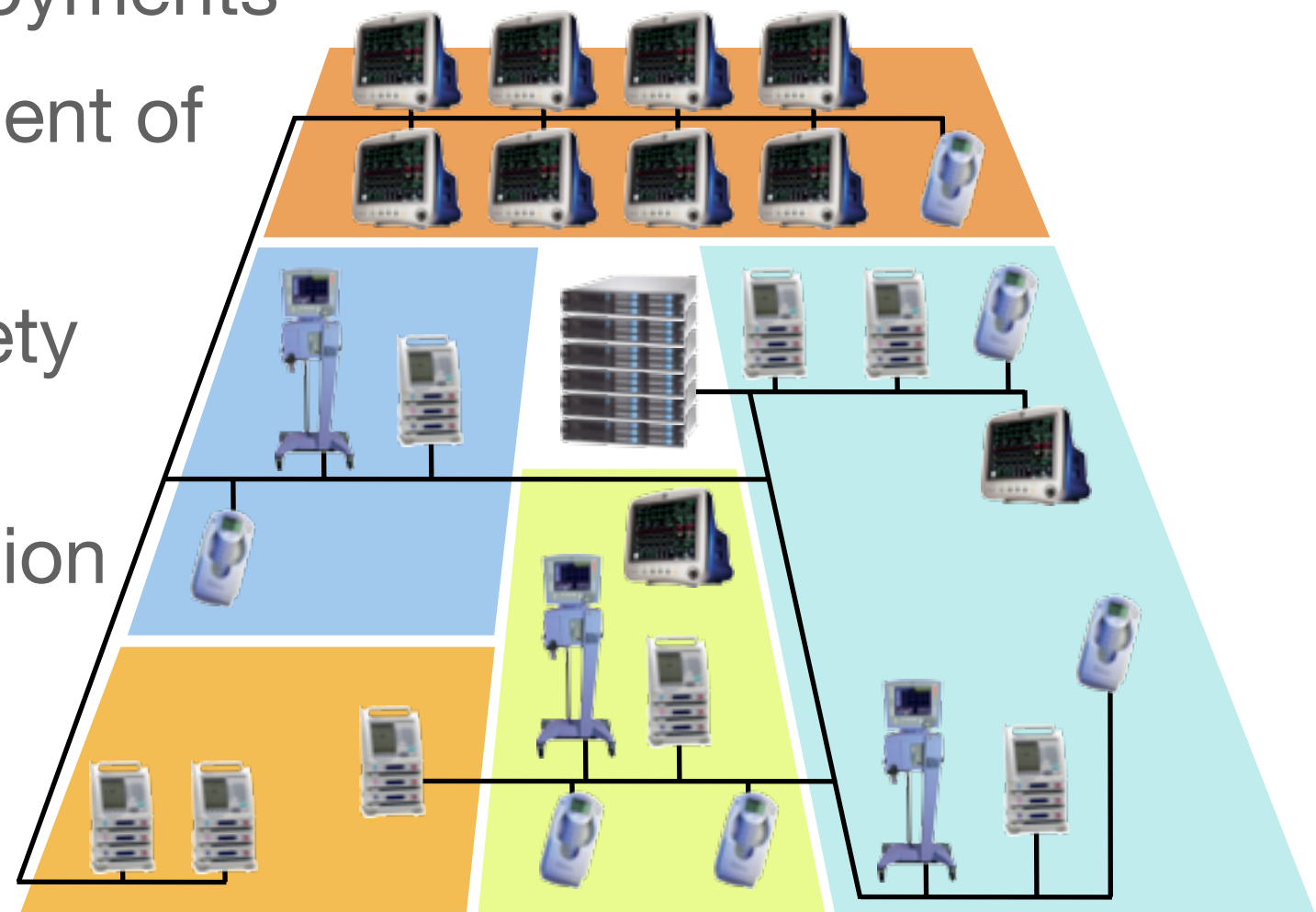
EMR Adoption Model

|	Cumulative Capabilities	Q2 2008	Q3 2008
Stage 7	Medical record fully electronic; HCO able to contribute CCD as byproduct of EMR; Data warehousing in use	0.0%	0.1%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	0.9%	1.0%
Stage 5	Closed loop medication administration	1.0%	1.3%
Stage 4	CPOE, CDSS (clinical protocols)	1.8%	1.9%
Stage 3	Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	32.0%	32.9%
Stage 2	Clinical data repository, Controlled Medical Vocabulary, Clinical Decision Support System, may have Document Imaging	33.9%	33.2%
State 1	Ancillaries - Lab, Rad, Pharmacy - all installed	12.6%	12.5%
Stage 0	All three ancillaries not installed	17.7%	17.1%
	Total Hospitals	n = 5048	n = 5050

Data from HIMSS Analytics Database

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Network Variability

Network design and configuration

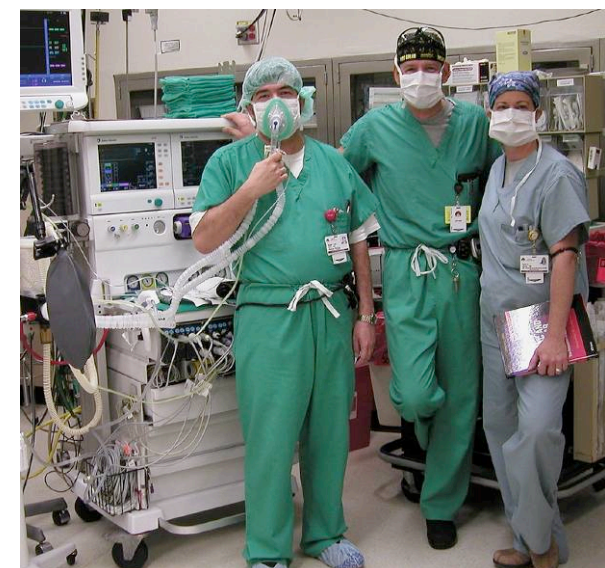Authentication and encryption

Network vendor diversity
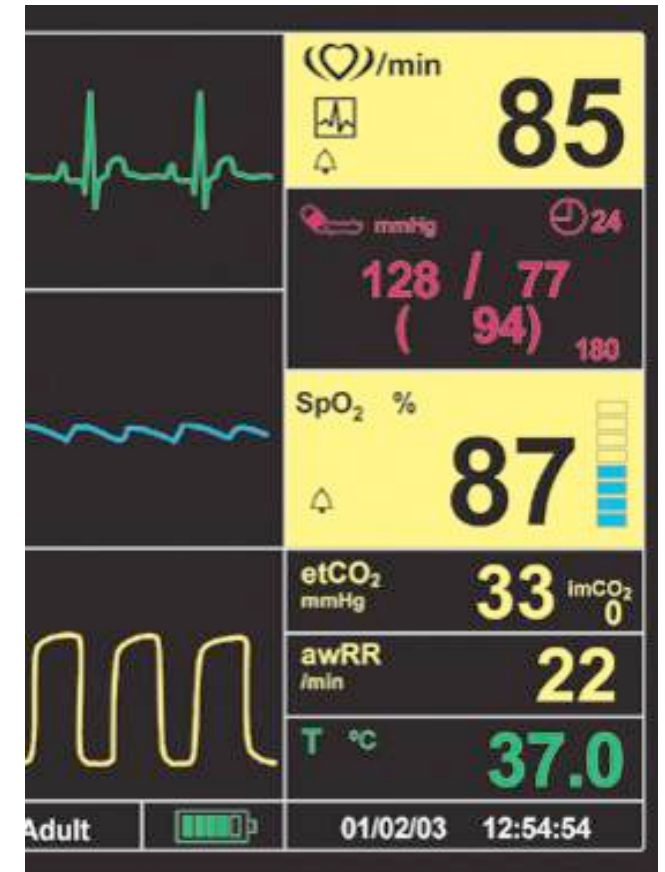
Network Management

Documentation

Network reliability & predictability

Test and change control

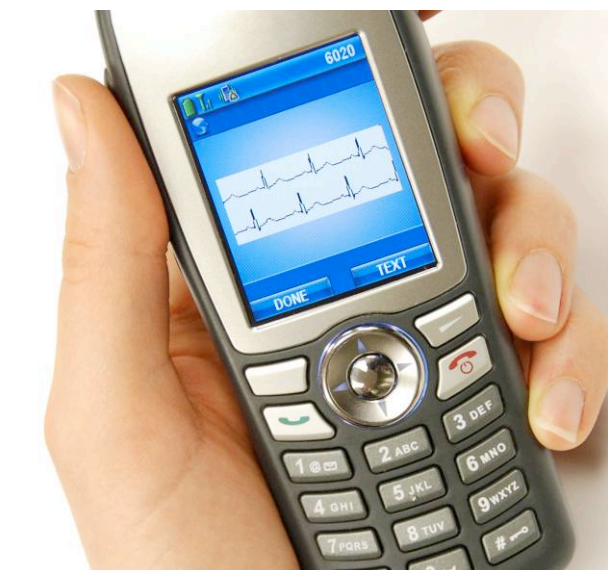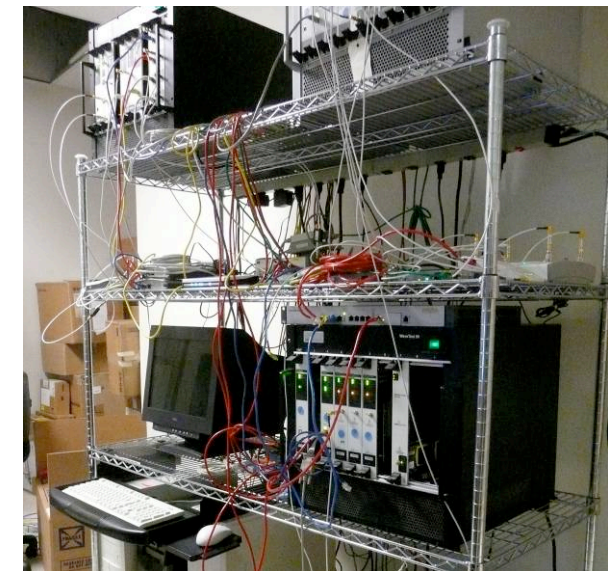Emerging systems-of-systems problem

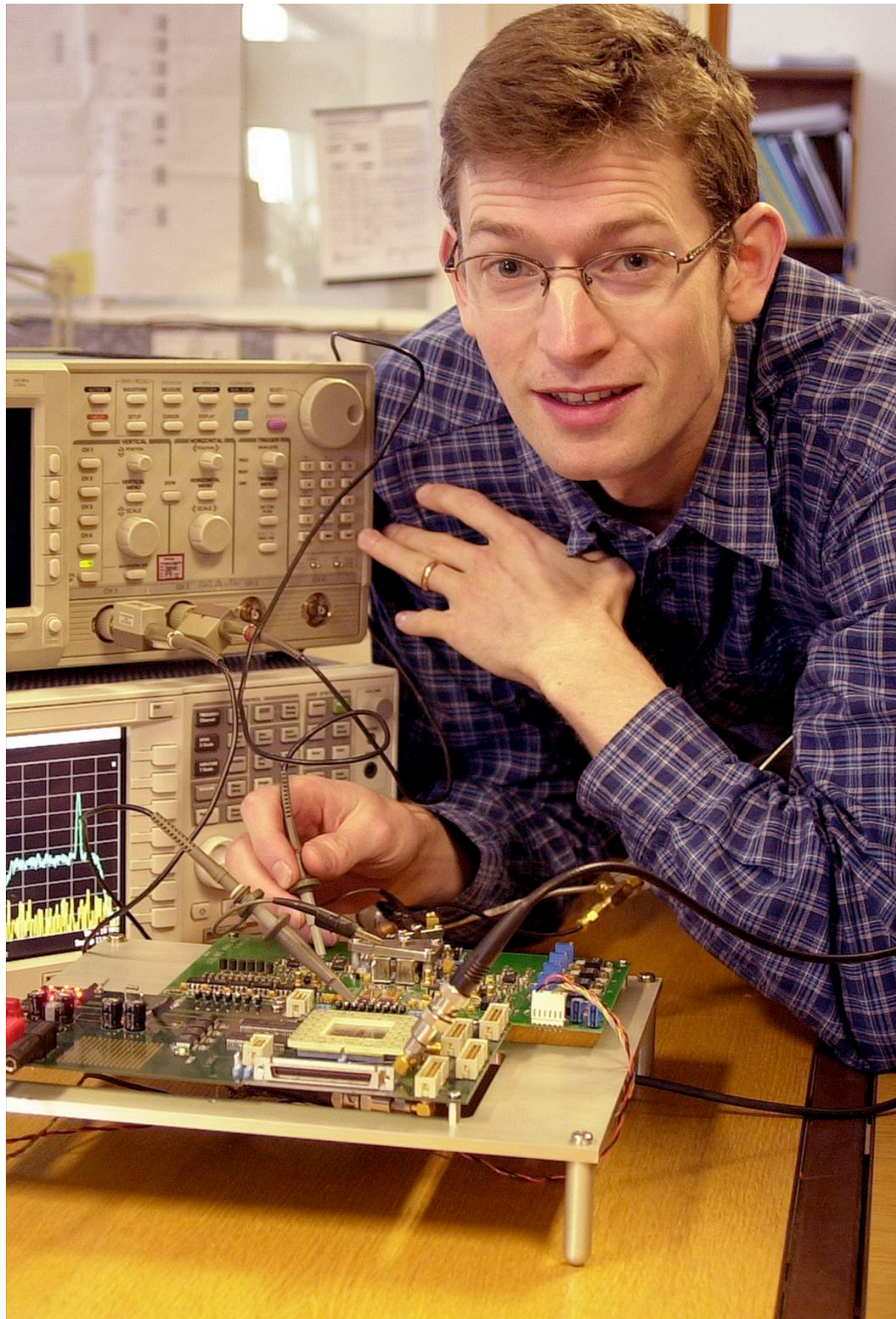# IEC 80001

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

Philips Research

Regulatory

SDC-CF20G
802.11g Compact Flash
Radio Module

Maintaining QSR on open networks

Adequate verification testing

Consolidate WW regulatory issues

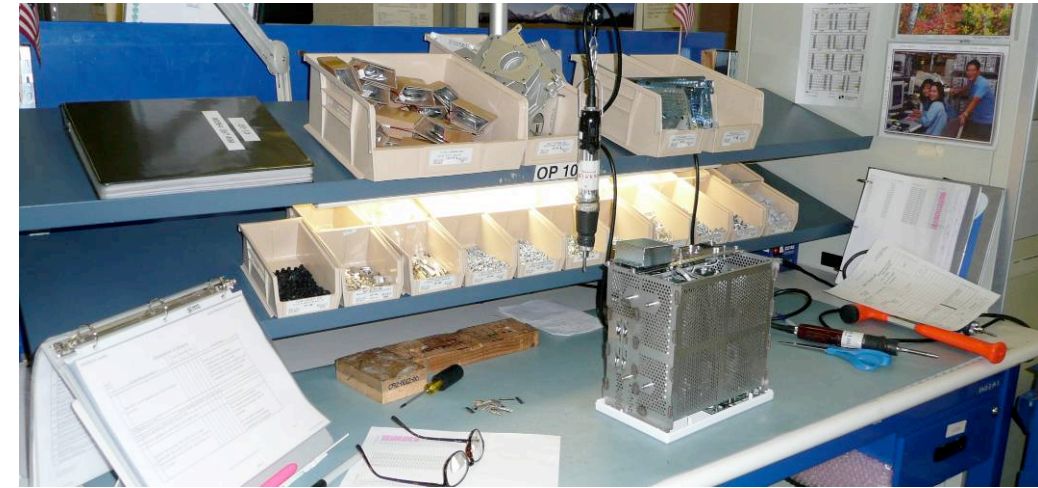IEC 80001 - Responsibility Agreement

Product Development

Supporting enterprise IT variability

Supporting multiple network vendors

Medical device coexistence

Verification - scalability, environment

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Communications

Phones   Pagers   PDAs

Computers on wheels   Overhead pages

Nurse call

Medical Devices

PoC diagnostics

Ventilators

Patient monitors

IV pumps

Telemetry packs

Spot vital signs monitors

Tasks

Patient care

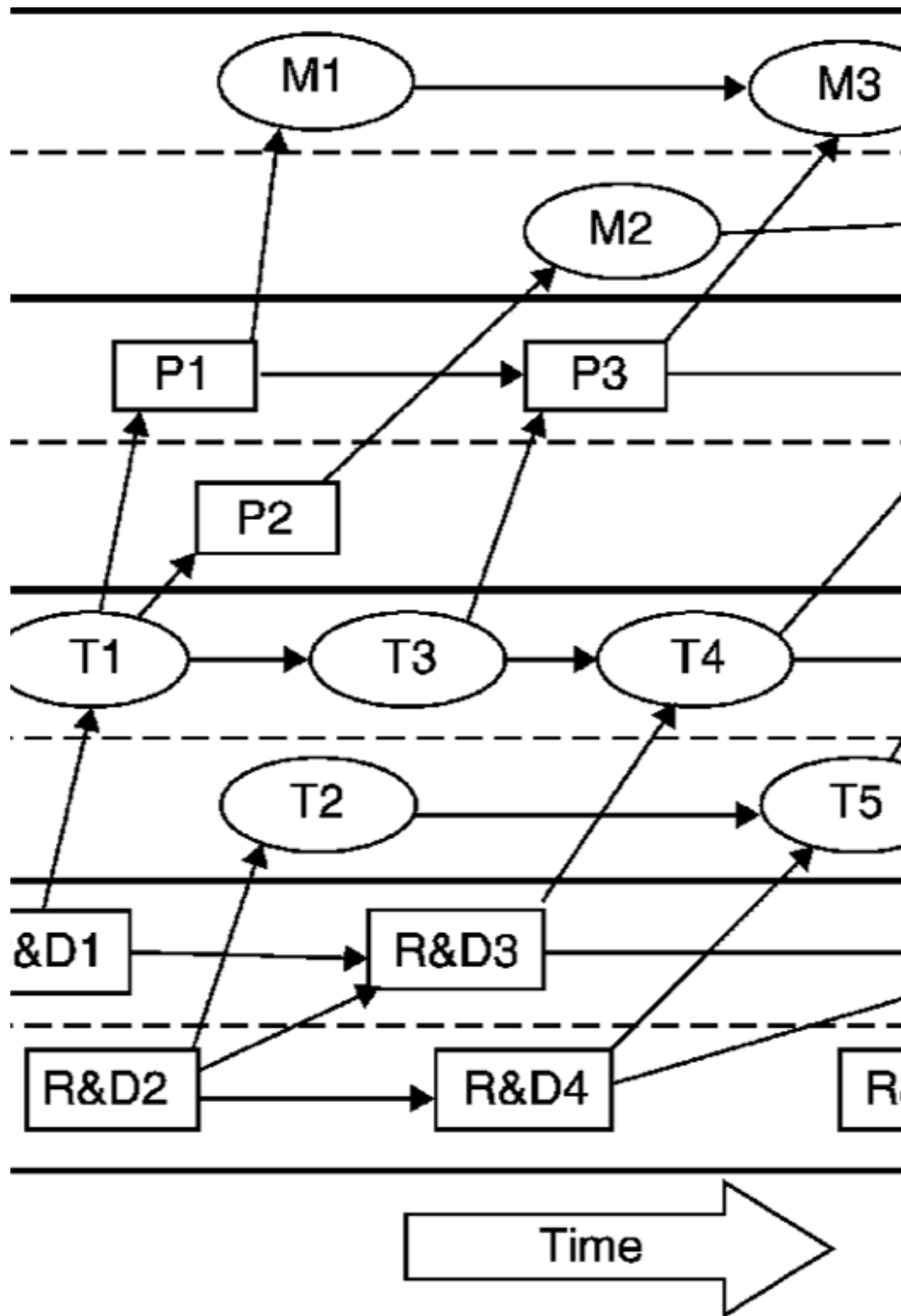Patient assessments

Alarms

Meds administration

Documentation

Coordinating care

Patient education

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
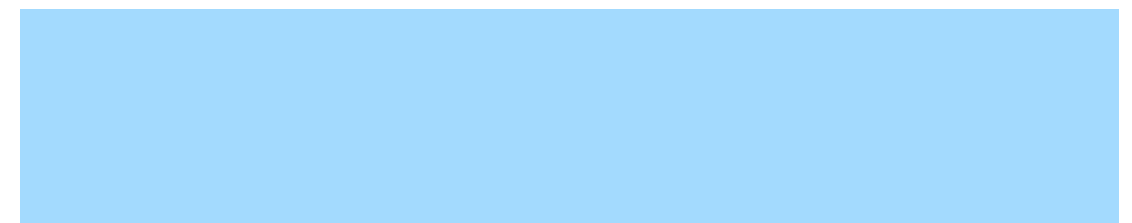
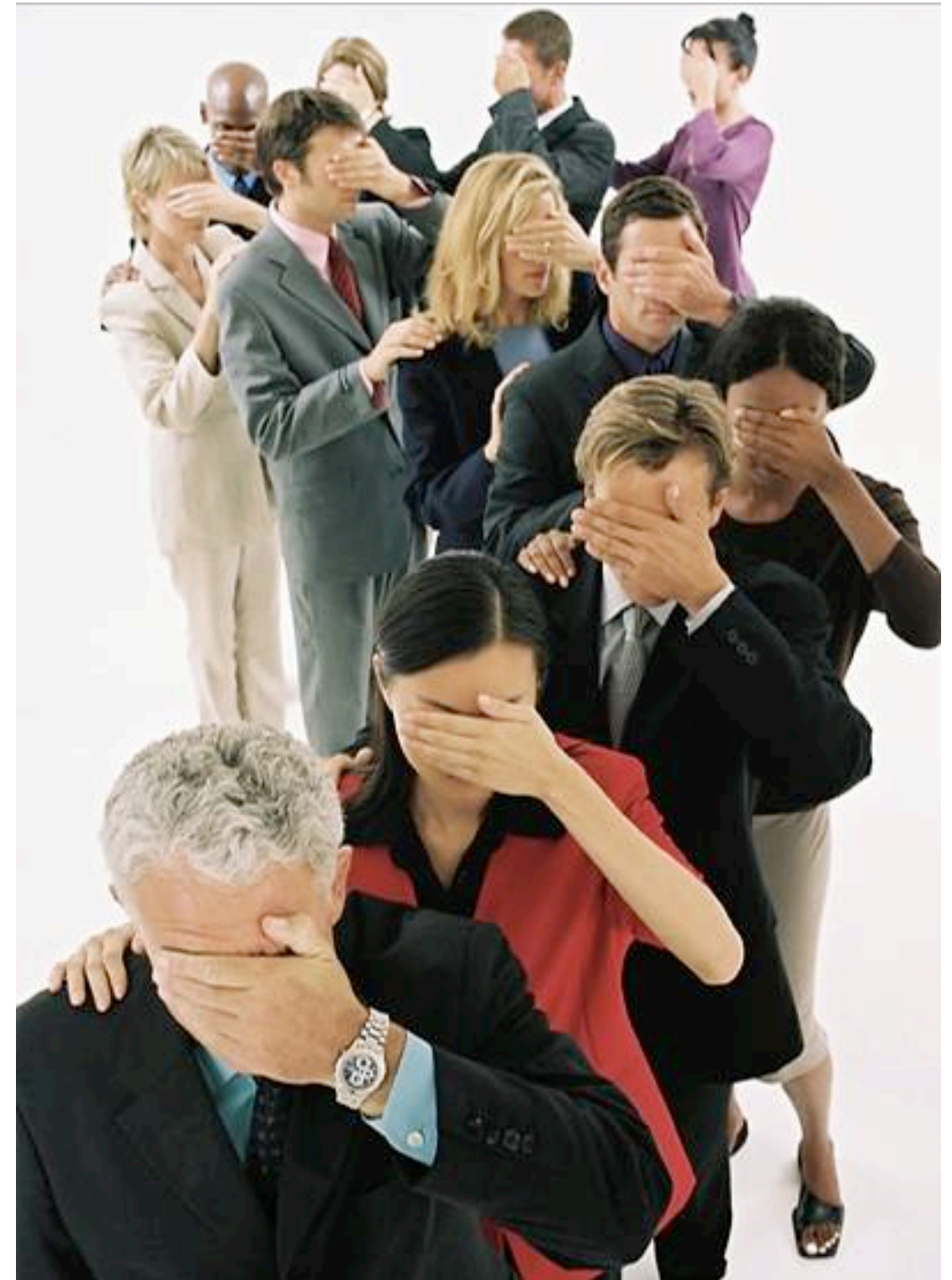Across clinical areas

Across technologies

Note specific solutions, integrations, and required infrastructure

Balance IT Standards with Clinical Needs

Core mission is *healthcare delivery* not IT delivery

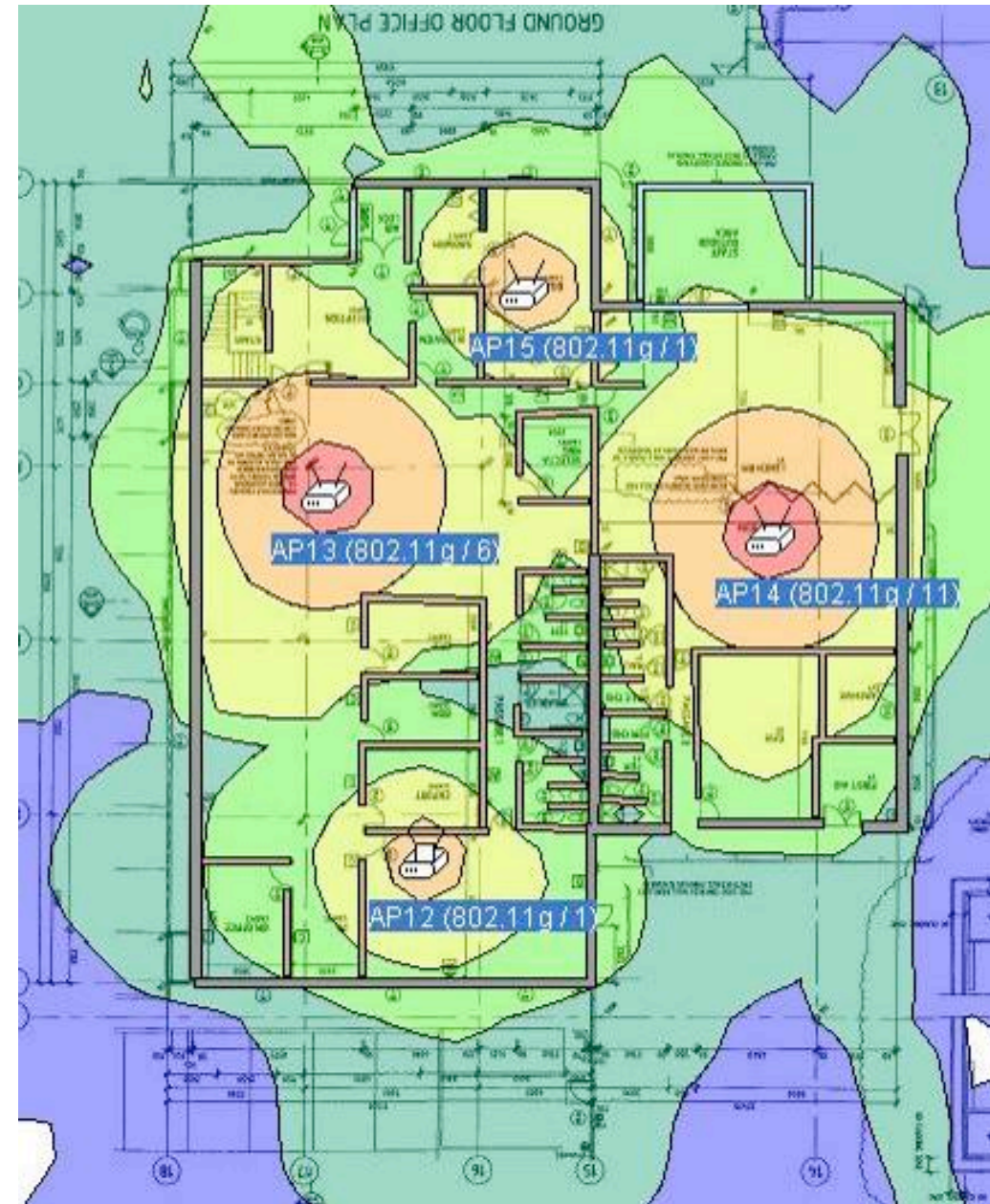Proactively disclose your standards to manufacturers

Be flexible

Monitor & Manage Networks

Maintain manufacturer's specifications

Realistic test environment

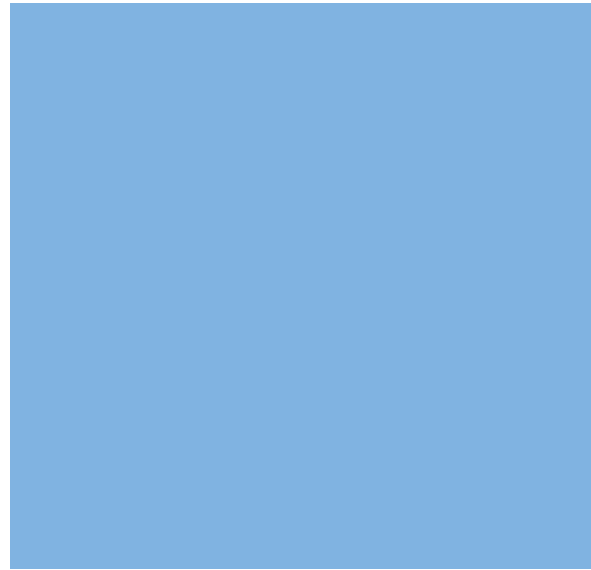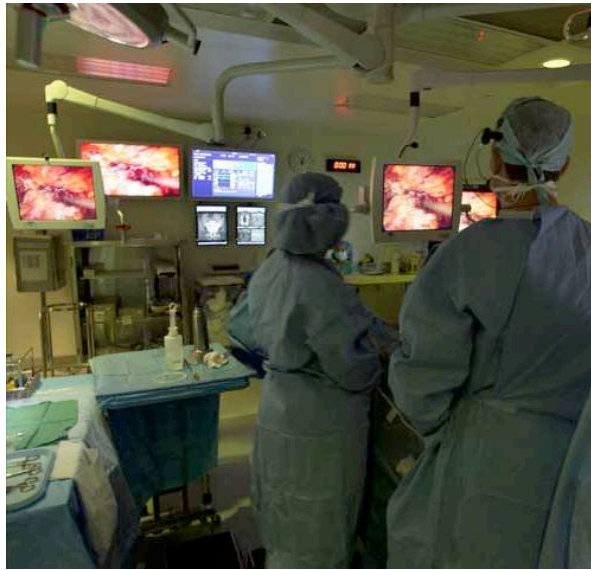Rigorous change control

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