Practical Issues in Automating Clinical Practice: Perspectives from the Small Office to the IDN

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IT Issues: Setting the Stage

- The Clinical Maelstrom
- IT Penetration in provider settings
- What are the challenges?
- What are the leverage points?

Examples of Overuse, Underuse, Misuse, and Waste

- Overuse – Unnecessary or Inappropriate services
  - Up to 30% of 600,000 Hysterectomies/yr[1]
  - 25% of 1,000,000 cardiac catheterizations/yr[2]
  - 23% of 500,000 typanostomy procedures/yr[3]
  - 40% of 110,000,000 office based antibiotic Rx/yr[4]

[1] Chassin MR, 1987 JAMA
[2] Chassin MR, 1993 JAMA
[3] Kleinmann LC 1994 JAMA
[4] McCaig LF 1995 JAMA

Examples of Overuse, Underuse, Misuse, and Waste

- **Underuse (all should be 100%)**
  - Medicaid patients with heart attack – 65% receive beta blocker acutely, and 72% at discharge[1]
  - Female Medicaid patients aged 52 to 69 – only 55% receive screening mammogram[1]
  - Commercial HMOs – 30% children receive chicken pox vaccination[2]
  - Commercial HMOs – 20% diabetics without HbgA1c, and 50% without eye exam[2]

[1] Asch SM 2000 JAMA
[2] NCQA

Examples of Overuse, Underuse, Misuse, and Waste

- **Misuse**

  - Diagnostic error: 20% pts dying in an ICU had wrong ante-mortem diagnosis. 44% of these would have different therapy with correct dx[1]

  - Surgical error: including all error types more than 1 error per case, and 14% of errors result in serious injury[2]

[1] Tai DY. 2001 Chest
[2] Andrews LB 1995 Amer Bar Found

Examples of Overuse, Underuse, Misuse, and Waste

- ## Waste
  - Complex billing requirements: Northwestern Mem Hosp 38,400 labor hrs, or 20 FTE/yr understanding Medicare billing requirements[1]
  - Utilization review: United Healthcare spent $108M on UR of 85M claims – even though physician decision upheld 99% of the time[2]
  - Nursing time: 50% time spent on administrative activities[3]
  - Avoidable delays in treatment and in adequate staffing result in 20% of errors[4]
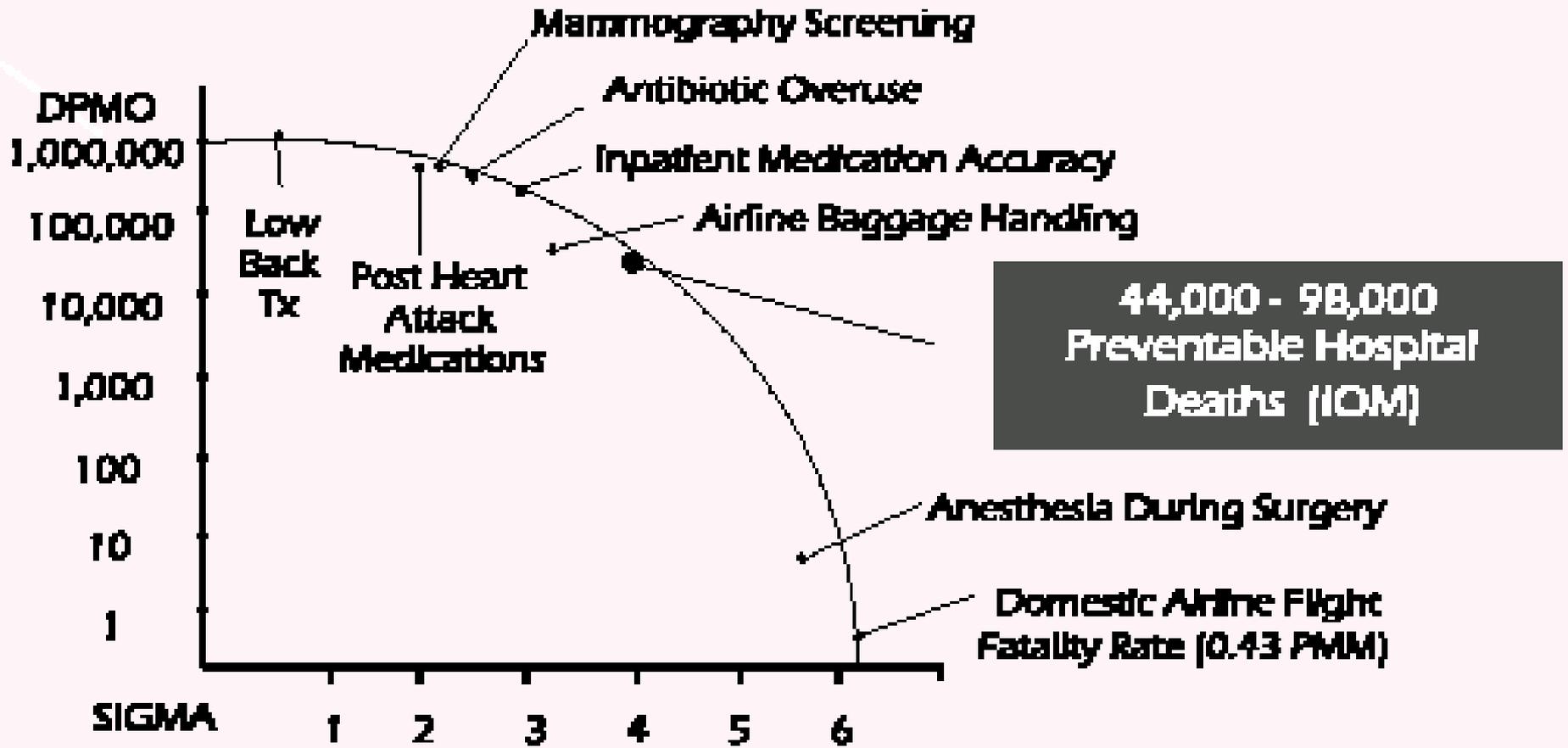
[1] Sparks D. 2000 AHA News
[2] Shapiro JC 1999 US News & World Rpt
[3] Juran Institute/D Berwick
[4] Leape LL 1991 NEJM

Defect Rates in Select Health Care Processes
[Defects per million opportunities (DPMO)]

Source: Robert Galvin, General Electric
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Midwest Business Group on Health

- Employer costs of healthcare
  - 2002 $4,900 per employee
  - Costs of poor quality are approx $1,700-$2,000 or approx. 1/3 of total healthcare expenditure
    - when opportunity costs are included
- 30 cents of every dollar spent in healthcare due to administrative inefficiencies, and overuse, under use, and misuse of medical services

Healthcare Cost – and Poor Quality – Explosion
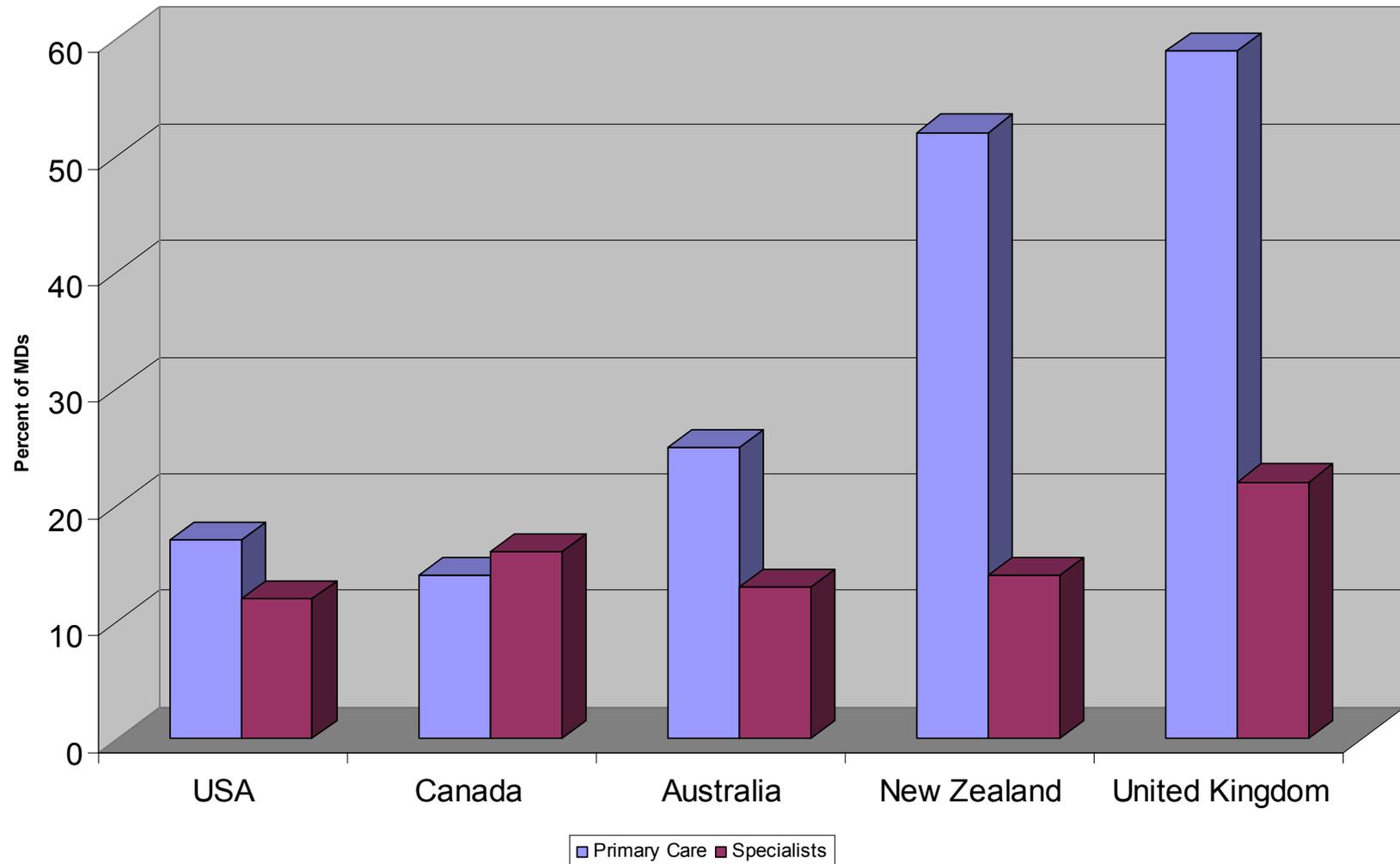
- US Healthcare (CMS):
  - 2001 $1.42T
    - 14% GDP
  - 2011 $2.82T
    - 17% GDP
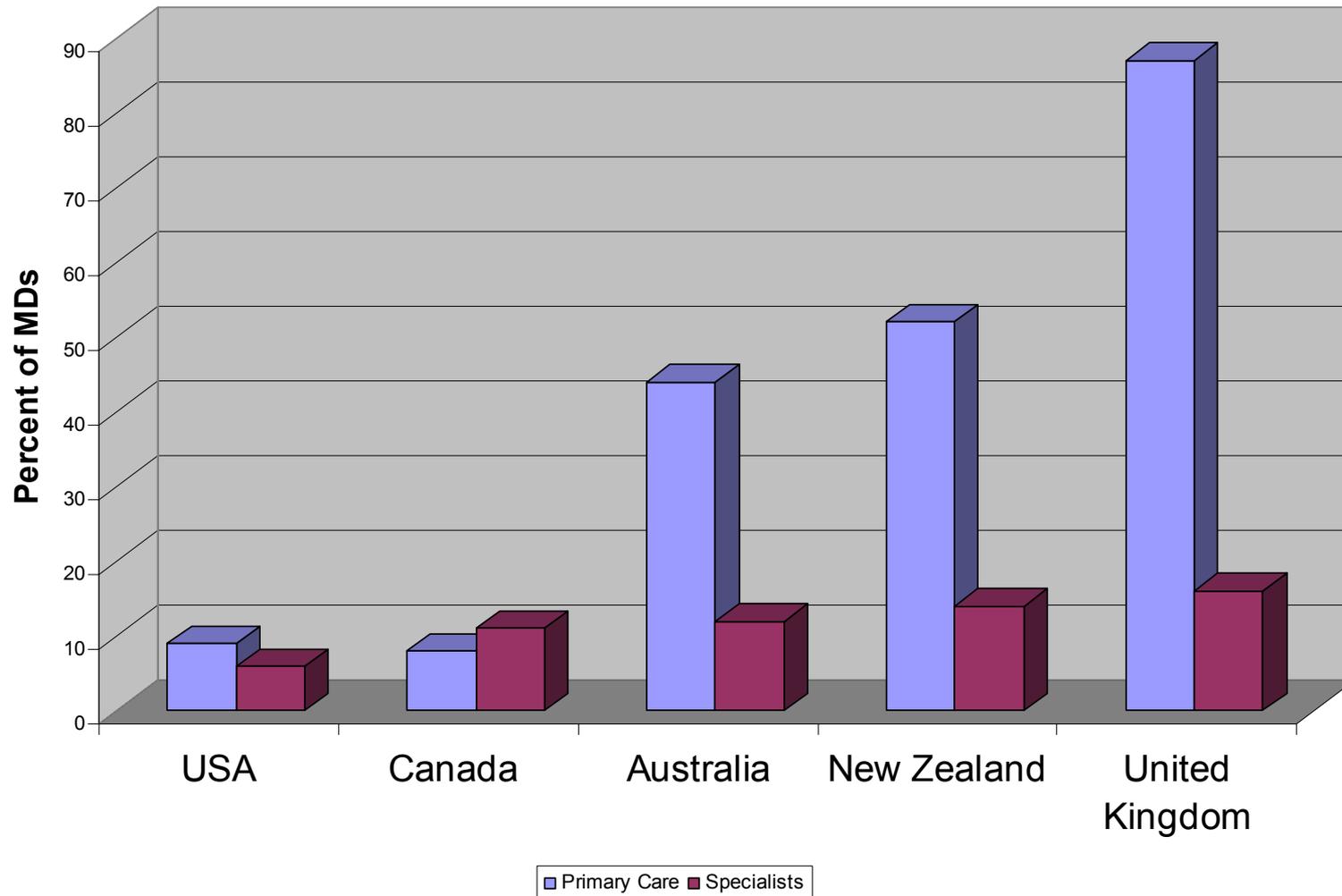 - By 2011, costs of poor quality likely to exceed $1T, or 6% of GDP

Dilbert Wisdom…

Physician Use of EMR

Physician Use of Electronic Rx

Partners Healthcare: Scale of the Integration Effort

- 55,000 email accounts
- 4,000 simultaneous users
- 35,000 paging transactions / day
- 2,900,000 patients EMPI
- 3,200 users of the LMR (1,200 attendings); 33 practices
  - 3,700,000 visits captured
- 75,000,000 images online

Scale of the Integration Effort

- 480,000,000 results in the CDR
  - growing at a rate of 100,000 transactions/d
  - 700 GB allocated
- 25 million specimens on file
- 8 million Radiology reports
  - 75,000,000 images archived
- 2+ million Pathology reports
- 1+ million Operative notes
- 1+ million Discharge summaries
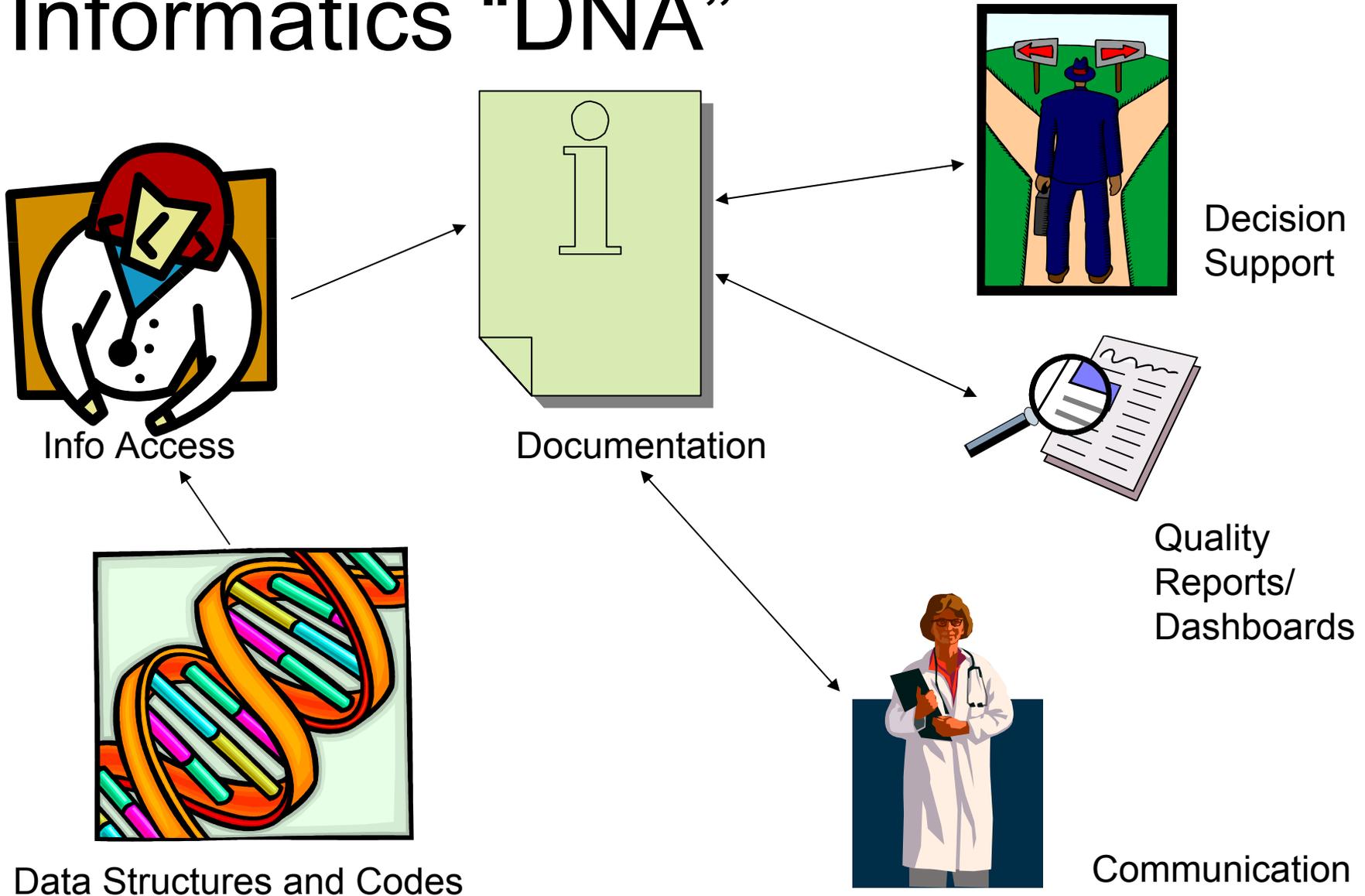- 2+ million Microbiology Specimens

PHS Systems Integration Components
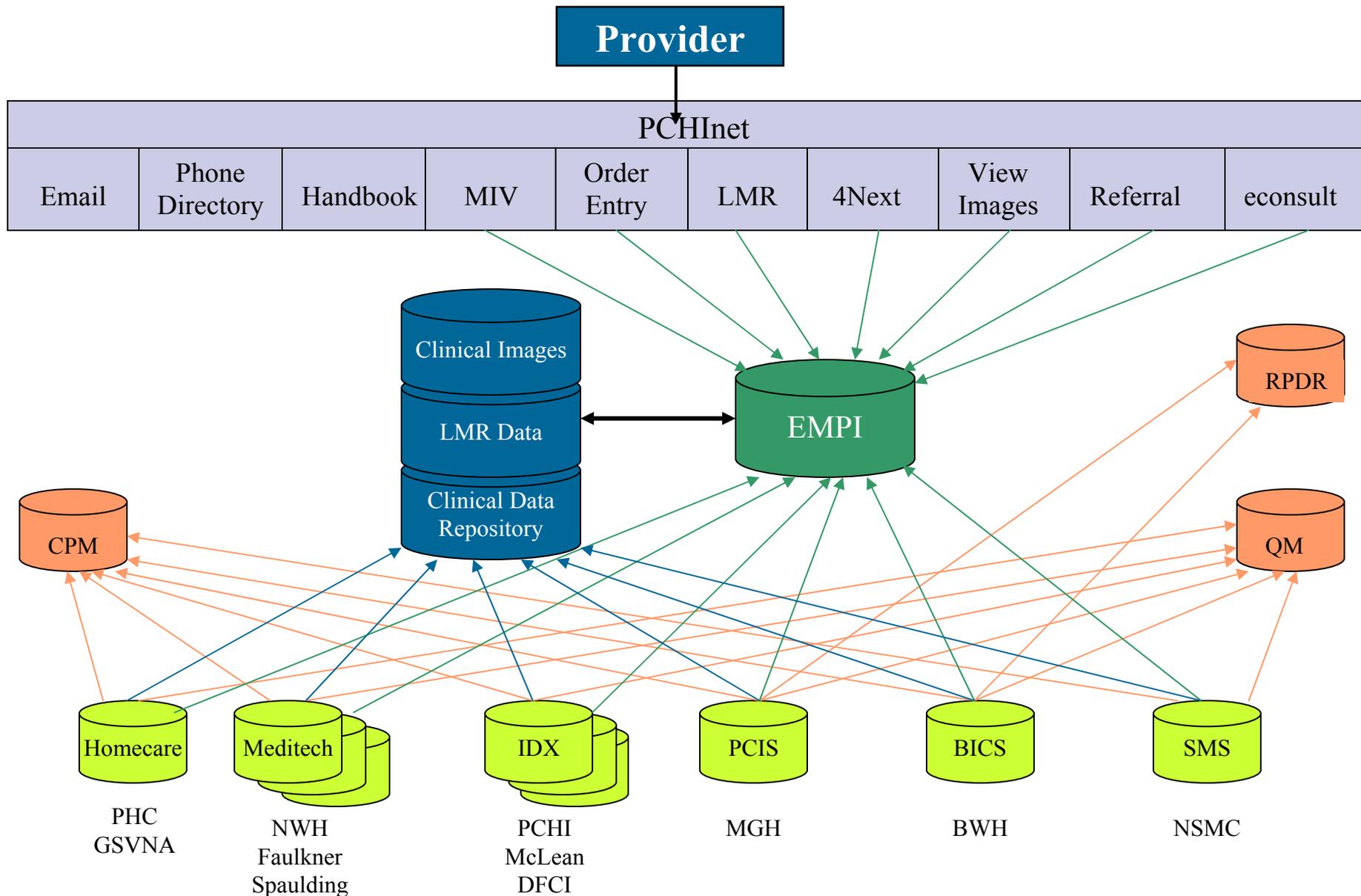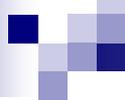
Phased Interoperability

- "Basic" interoperability
  - □ Point-to-point, pre-HL7
- "Structured" interoperability
  - □ HL7+Reference Information Model
- "Semantic" interoperability
  - □ HL7 + RIM
  - □ Controlled Medical Terminology (SNOMED CT)

Informatics "DNA"

Info Access

Documentation

Decision Support

Quality Reports/ Dashboards

Data Structures and Codes

Communication

Challenges

- Balance between structured data capture and system usability

- Matching concepts: term definitions, granularity, intended use

- Interoperability between systems and between organizations/enterprises

- Lacking reference information model

- No defined set of pre-coordinated terms for user interface terminology

- Lacking national identifiers

B. Middleton NCVHS Testimony
Oct 14, 1999
http://ncvhs.hhs.gov/991014tr.htm

Additional Challenges

- Just starting to pay for quality… but incentives still largely misaligned
- Lacking public mandate to protect public good of patient safety (enabling policy for 'safe' interoperability)
- Little capital in the majority of provider settings
- Inadequate knowledge-base on IT best practices
- Inadequate specification of minimal clinical data set
- Inadequate library of knowledge elements (rules & alerts) for implementation in clinical systems
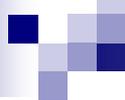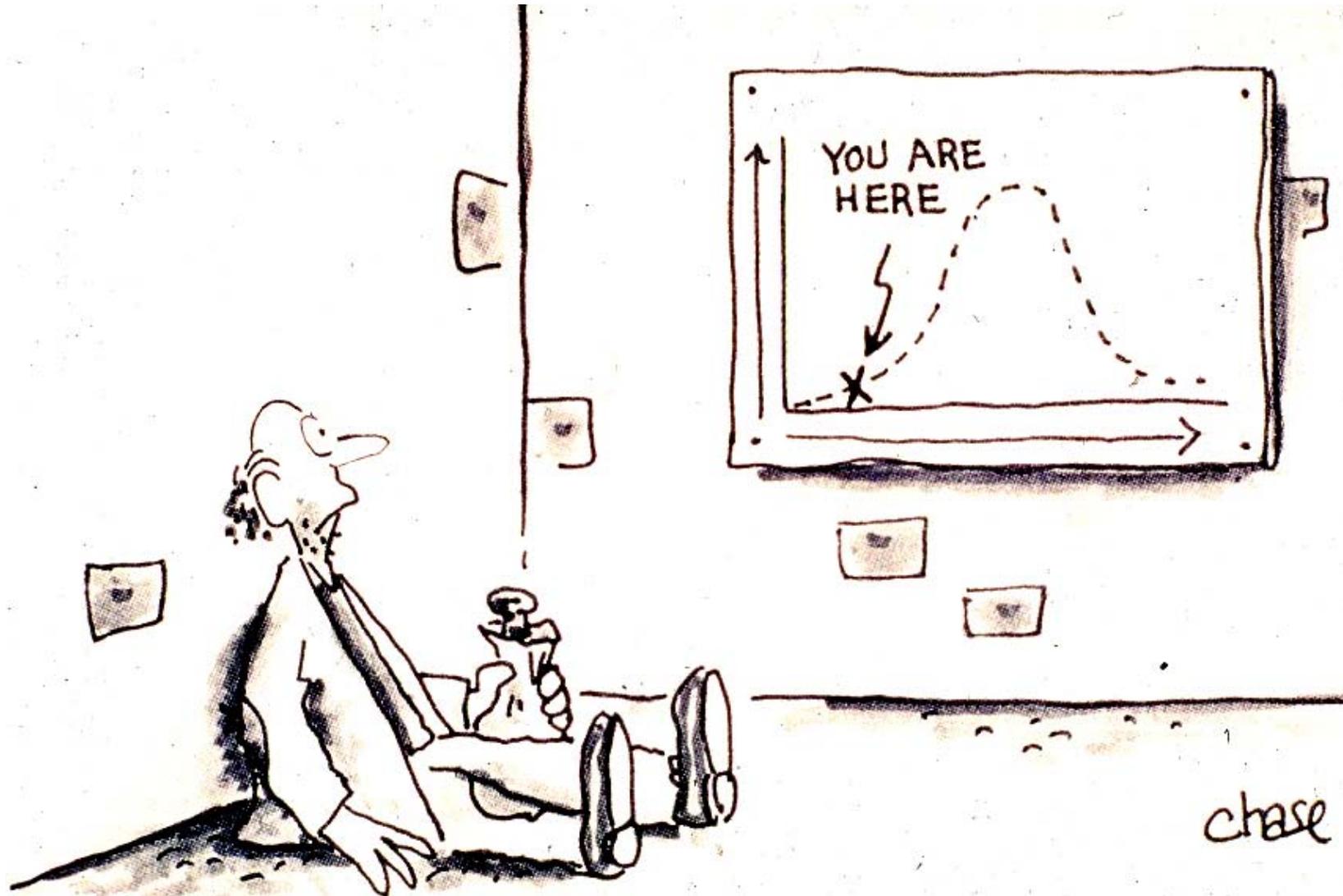
Leverage Points

- Healthcare Critical Infrastructure Technology Investment Fund
- Standards Acceleration
- Payer Quality Mandates (e.g. Leapfrog)
- Reimbursement Reform
- Consumer Pressure

National Healthcare Information Infrastructure
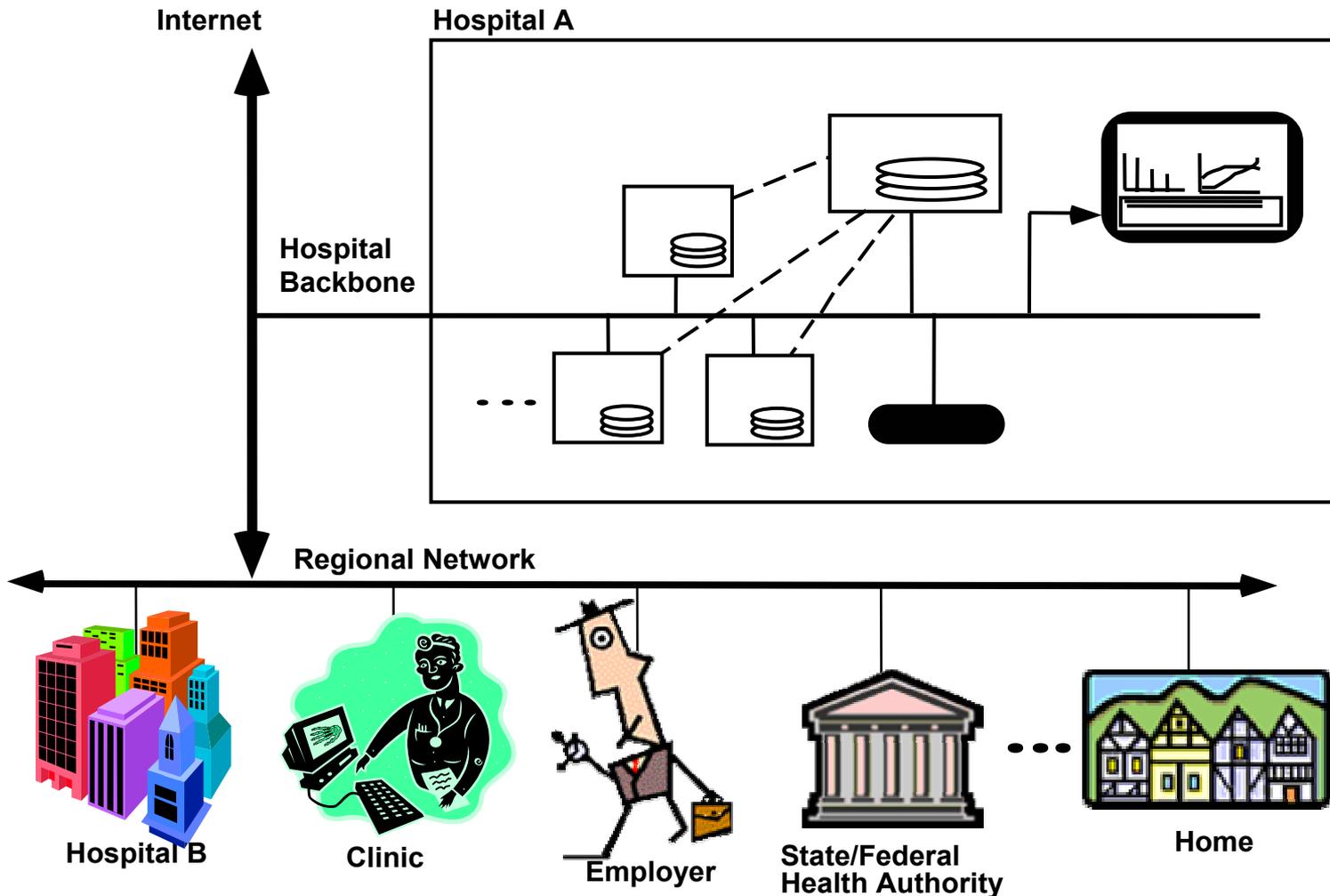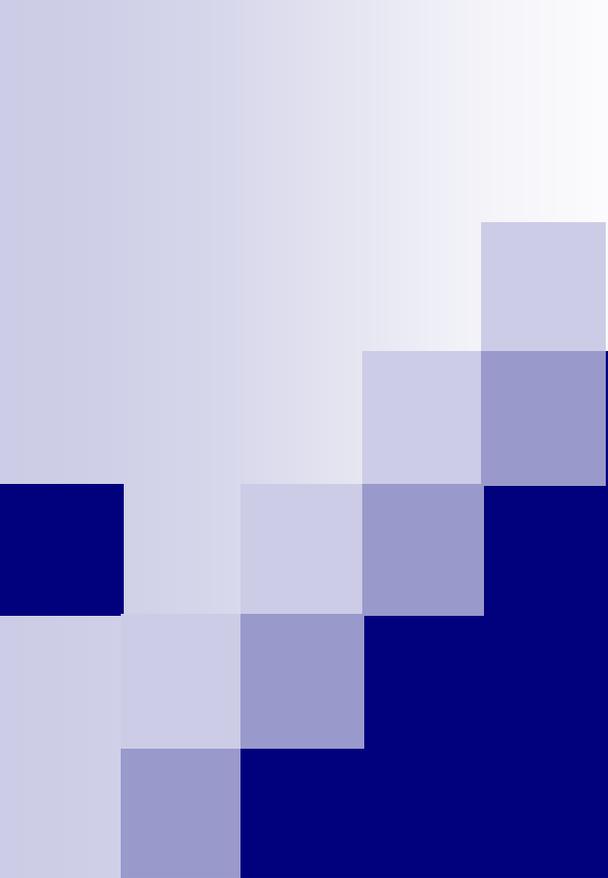
Where are we?

Leadership and IT

Leadership is the capacity to hold a shared vision of that we wish to create.

– Peter Senge

Thank you!

Blackford Middleton, MD

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