At the Quality Crossroads: Integrating Electronic Health Records and Patient Portals

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Outline

- Electronic health record (EHR) system as prerequisite for patient safety
- Physicians' information needs
- Patients' information needs
- Integrating patient portals with EHRs
- Experience at Palo Alto Medical Foundation

Pilot's Information System

Information Systems Support of ***Patient*** Safety

The Status Quo

Clinician's Information System

In Healthcare

Result of Information Deprivation on Patient Safety

Adverse Events in Hospitals
Harvard Medical Practice Study

- 30,195 randomly selected records from 51 NY hospitals in 1984
  - Definition of Adverse Events: injuries caused by medical management, and led to prolonged hospitalization or disability at discharge
  - 3.7% of hospitalizations had adverse events
  - 14% fatal
  - Extrapolation ➲ IOM's 98,000 annual deaths
  - 58% preventable (=error)

Brennan,NEJM 1991; 324:370

Adverse Events in Hospitals
Harvard Medical Practice Study

- Physician errors
  - Errors of commission (examples)
    - Inappropriate or outmoded therapy
    - Technical surgical error
    - Inappropriate medication
    - Error in dose or use of medications
  - Errors of omission (examples)
    - Failure to take precautions
    - Failure to use indicated tests
    - Avoidable delay in diagnosis
    - Failure to act on results of tests or findings
    - Inadequate follow up of therapy

Leape, NEJM 1991; 324:377

Errors of *Omission*
Healthcare

- Beta blockers prevent deaths after MI (1981)
  - 34% of Medicare pts received beta blockers (1998)
- Hypertension causes strokes, heart failure, deaths (1980s)
  - <25% had BPs < 140/90 (1998)
  - 40% of HTN pts had BPs >160/100 despite >6 visits/yr
- 55% overall adherence to recommended care (2003)

NEJM 1998; 339: 489-97;1957-63
NEJM 2003; 348:2635

Assessing Physicians' Information Needs
Methods

- Audio recorded 168 case presentations
- Brief structured interviews about encounter
- Analyzed transcripts for evidence (questions) of missing data (data deficit units)
- Grouped DDUs into categories of *prototypical questions*

Tang, et al. AMIA, 1994: 575-579

Physicians' Information Needs Study

Problem of Missing Patient Information

- 81% of return visits plagued by missing information
- Mean number of DDUs/case=3.7 (range 1-20)
- Coping strategies ineffective
- Chart available 95%; finding problem

Tang, et al. AMIA, 1994: 575-579

Prototypical Questions
Results of Tests and Procedures

Resident: “The information from one month ago would have been useful to me... that I didn’t even know existed until I wanted to repeat it and the patient said, `What about this stuff from last month, doctor?’”

Prototypical Questions
Results of Tests and Procedures

Resident: "... actually, you know, that's a good point. A chest x-ray had been ordered in December and I was assuming that it had been checked and was okay, but actually, it's not in here [the chart]."

Prototypical Questions
Medications

Resident: "... he's on one med he says for ... he's not even sure what it's for. He takes one in the morning, one in the evening. I can't even find here what the drug even is, but I think it's probably for hypertension, which he has."

Prototypical Questions
Active Problems

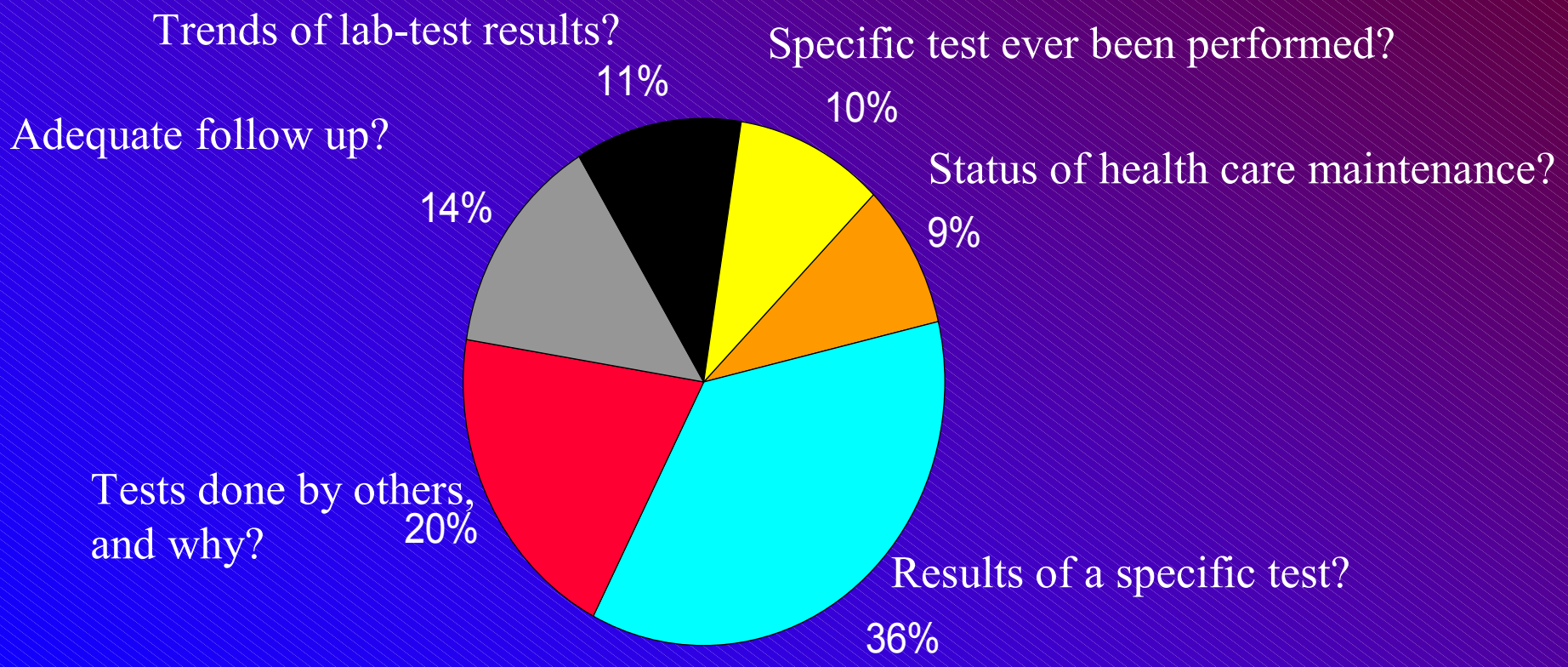
Resident: [Re: pelvic exam in the ER] "She was told that it was negative, and she was started on tetracycline, but she was told that it was for yeast. It doesn't make sense."

Physicians' Information Needs

The "Artificial Horizon"

Prototypical Questions

Results of Tests and Procedures

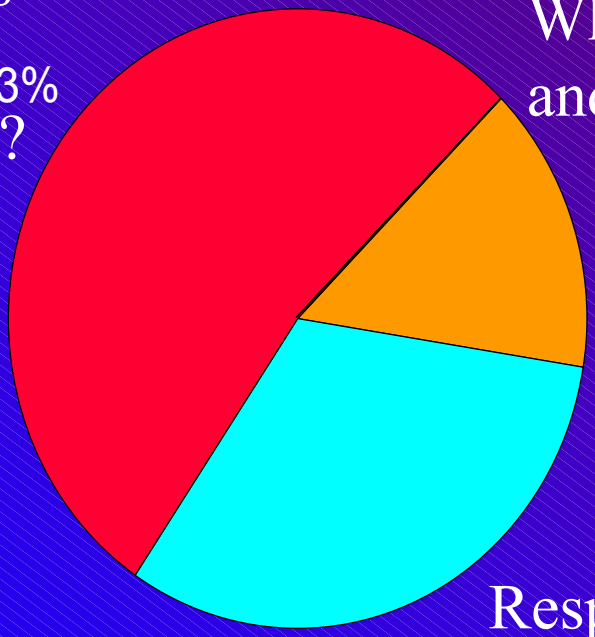


Tang, et al. AMIA, 1994: 575-579

Prototypical Questions

Medications and Treatments

What medications prescribed? By Whom? Why?



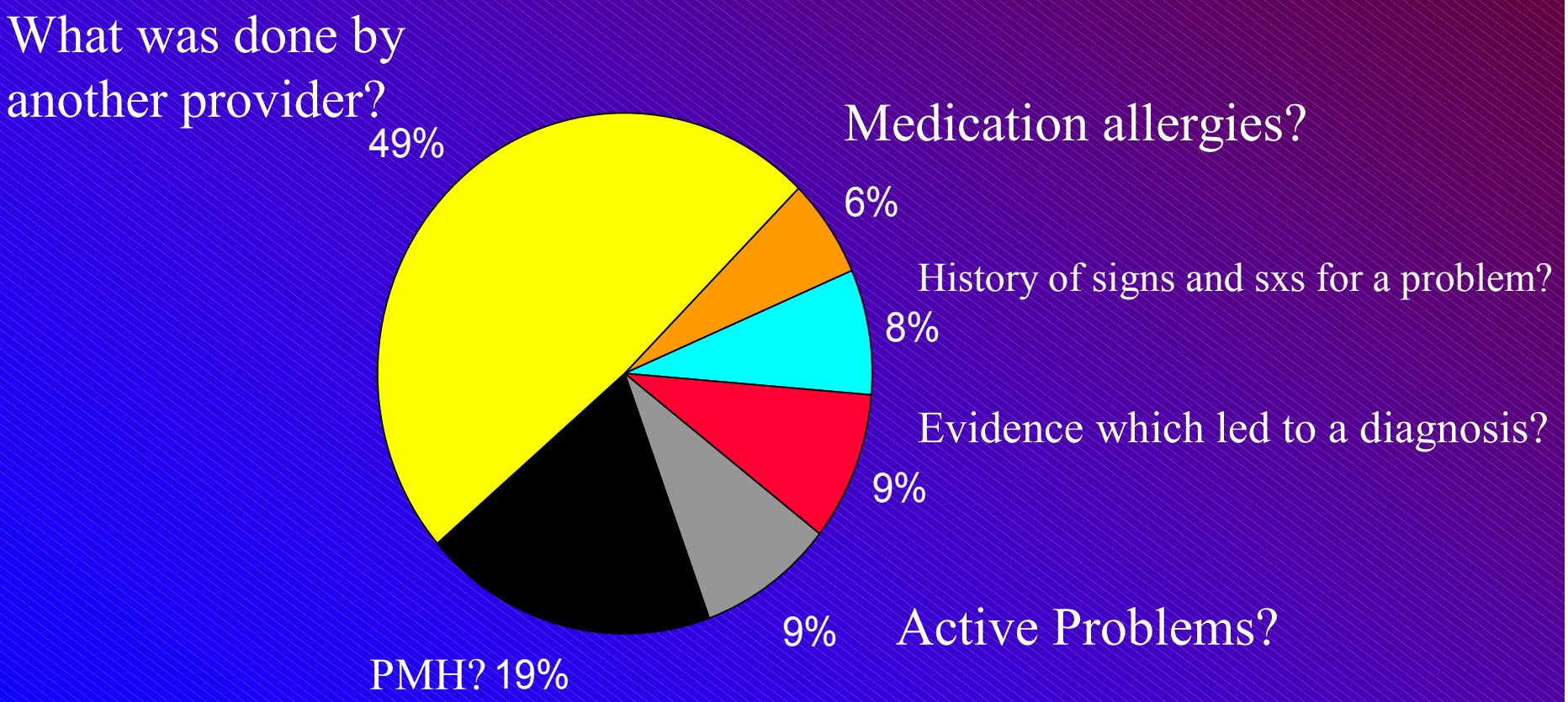
What are the current medications and dosages?

Responses to meds in the past?

Tang, et al. AMIA, 1994: 575-579

Prototypical Questions

Active Problems and Past History



Tang, et al. AMIA, 1994: 575-579

The Solutions

3 Options

Option 1: Minimal Change Required

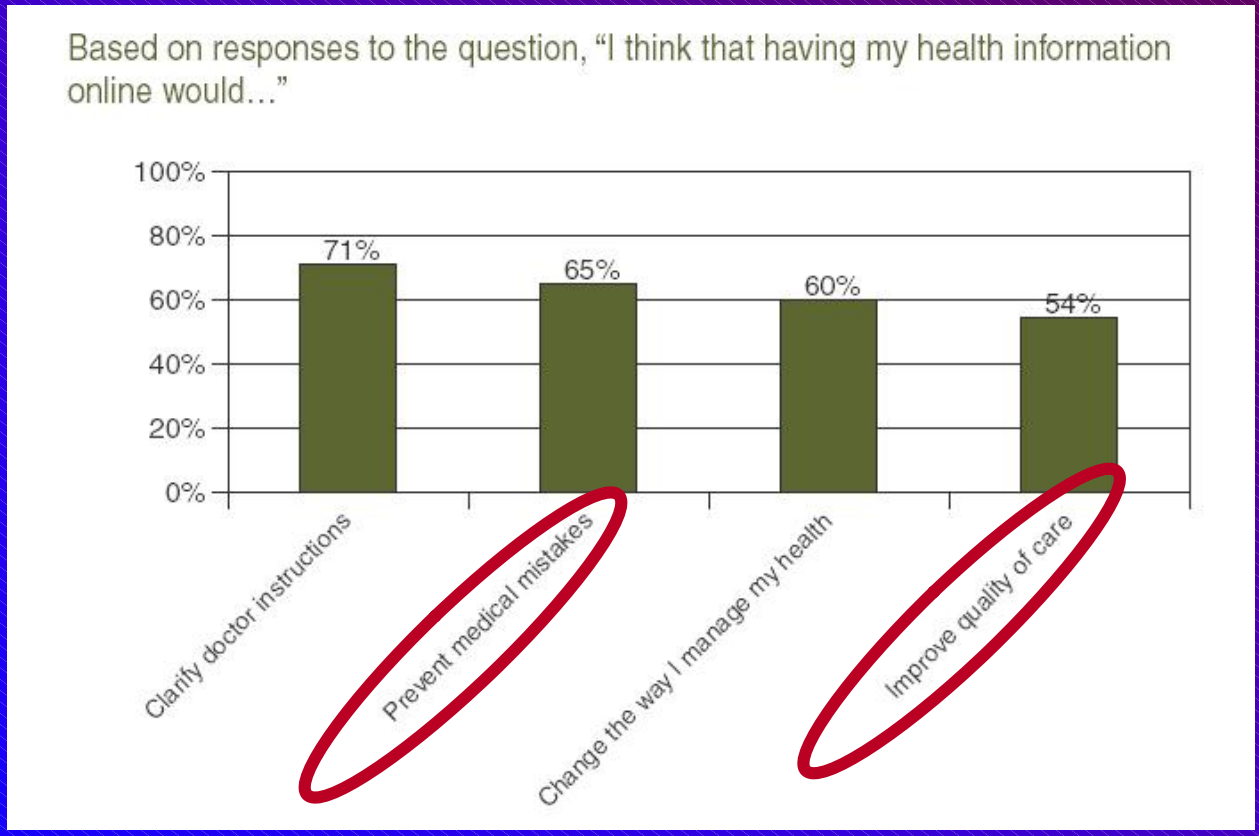
Informed Consent for Medical Care

Warning: our physicians and nurses have good intentions, but they are merely humans using manual record-keeping systems in tertiary care settings in an attempt to deliver a complex set of services without error. We had hoped that by now we would have adopted computers, being a prestigious institution and all, but they haven't arrived yet. Moreover, because RCTs demonstrate the deleterious effects of overwork, fatigue, and failure to coordinate your overall care, we thought that you should know as well. By signing this consent you acknowledge that it's up to ***you*** to take full responsibility for the consequences of their and your actions. It is the best we have to offer…

Inspired by Dan Masys, MD

Option 2: Personal Health Records
Patients' Self Defense

40% of survey respondents keep medical records at home



Markle Foundation, Connecting for Health survey
1,246 representative online users, June, 2003

Option 3: Institute of Medicine
2004 Patient Safety Report

"Americans should be able to count on receiving health care that is safe [freedom from errors of commission *and* omission].

To achieve this, a new health care delivery system is needed – a system that both *prevents* errors and learns from them when they occur.

This requires, first, a commitment by all stakeholders to a culture of safety, and, second, improved information systems."

2004, IOM: Patient Safety: Achieving a New Standard of Care

Electronic Health Record Systems
Sec. Thompson Requested IOM Report

- Secretary Thompson:
  - "Grocery stores are more automated than healthcare."
- Wanted HHS to incent providers to use EHR systems to deliver high quality care
- Requested IOM report defining key capabilities of EHR system that lead to quality improvements and patient safety

Definition of an EHR System

Institute of Medicine

- An Electronic Health Record system includes:
  - longitudinal collection of electronic health information for and about persons…
  - immediate electronic access to person- and population-level information by authorized users…
  - provision of knowledge and decision support that enhance the quality, safety, and …
  - support of efficient processes for health care delivery
- Critical building blocks:
  - EHR maintained by providers
  - PHR (personal health records) accessed by individuals

2003 IOM Letter Report on *Key Capabilities of an Electronic Health Record System*
http://books.nap.edu/html/ehr/NI000427.pdf

EHR System

IOM 8 Key Capabilities Areas

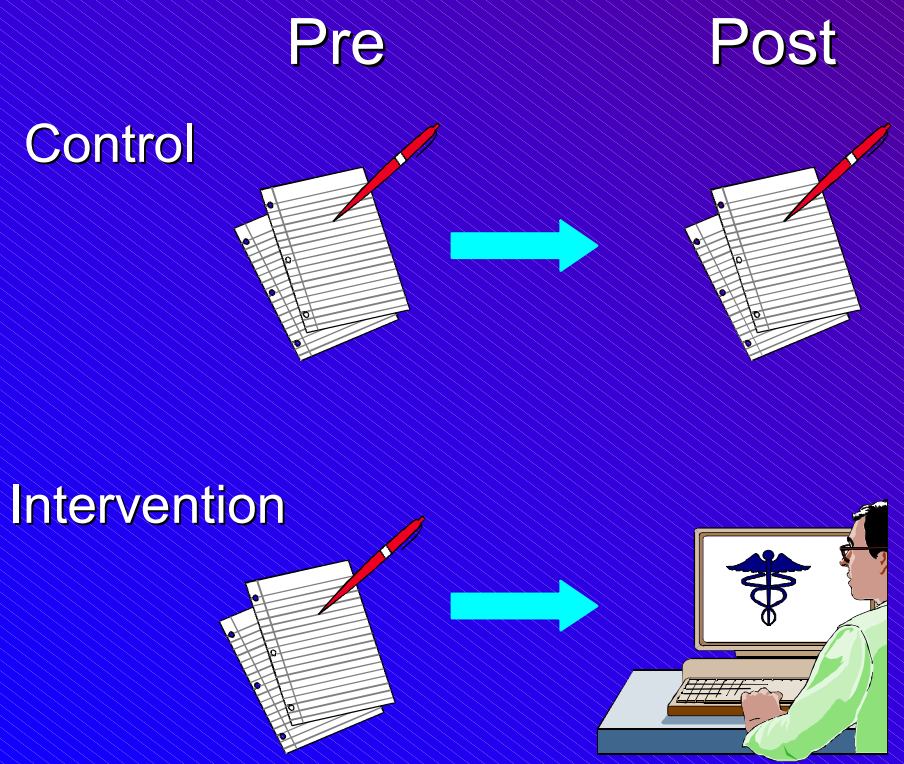
- Health information and data
- Results management
- Order entry / order management
- Decision support
- Electronic communication and connectivity
- Patient support
- Reporting and population management
- Administrative processes

2003 IOM Letter Report on *Key Capabilities of an Electronic Health Record System*
http://books.nap.edu/html/ehr/NI000427.pdf

Benefits of Using Decision Support in an EHR

Evaluation Studies at Northwestern

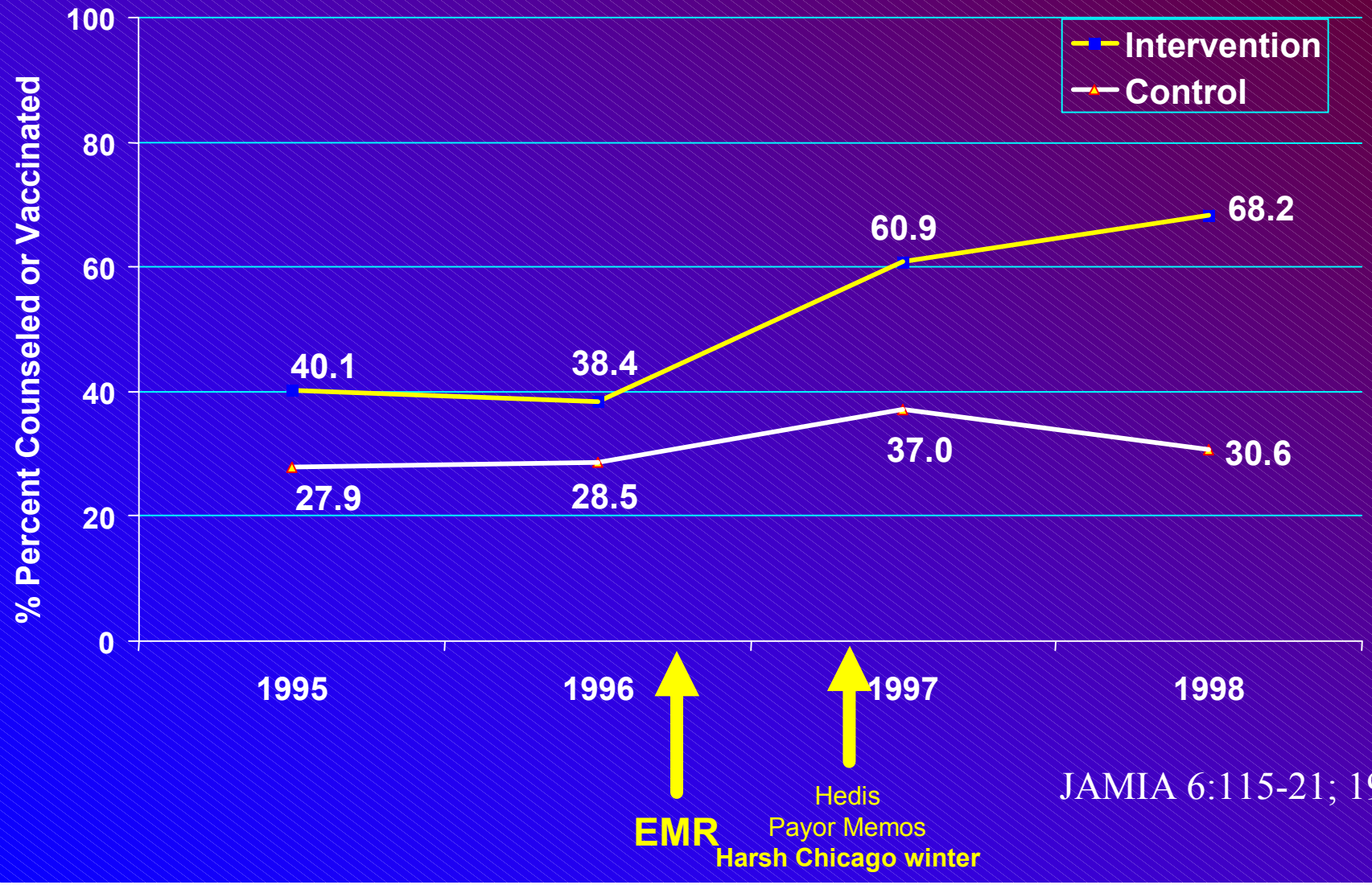
Impact on Quality, Cost, Satisfaction



- Availability of record
- Completeness of record
- Compliance with guidelines
- Cost-effectiveness
- Impact on pt-MD communication
- Satisfaction
  - Provider
  - Patient

Flu Vaccine/Counseling Rates

Intervention vs. Control



JAMIA 6:115-21; 1999.

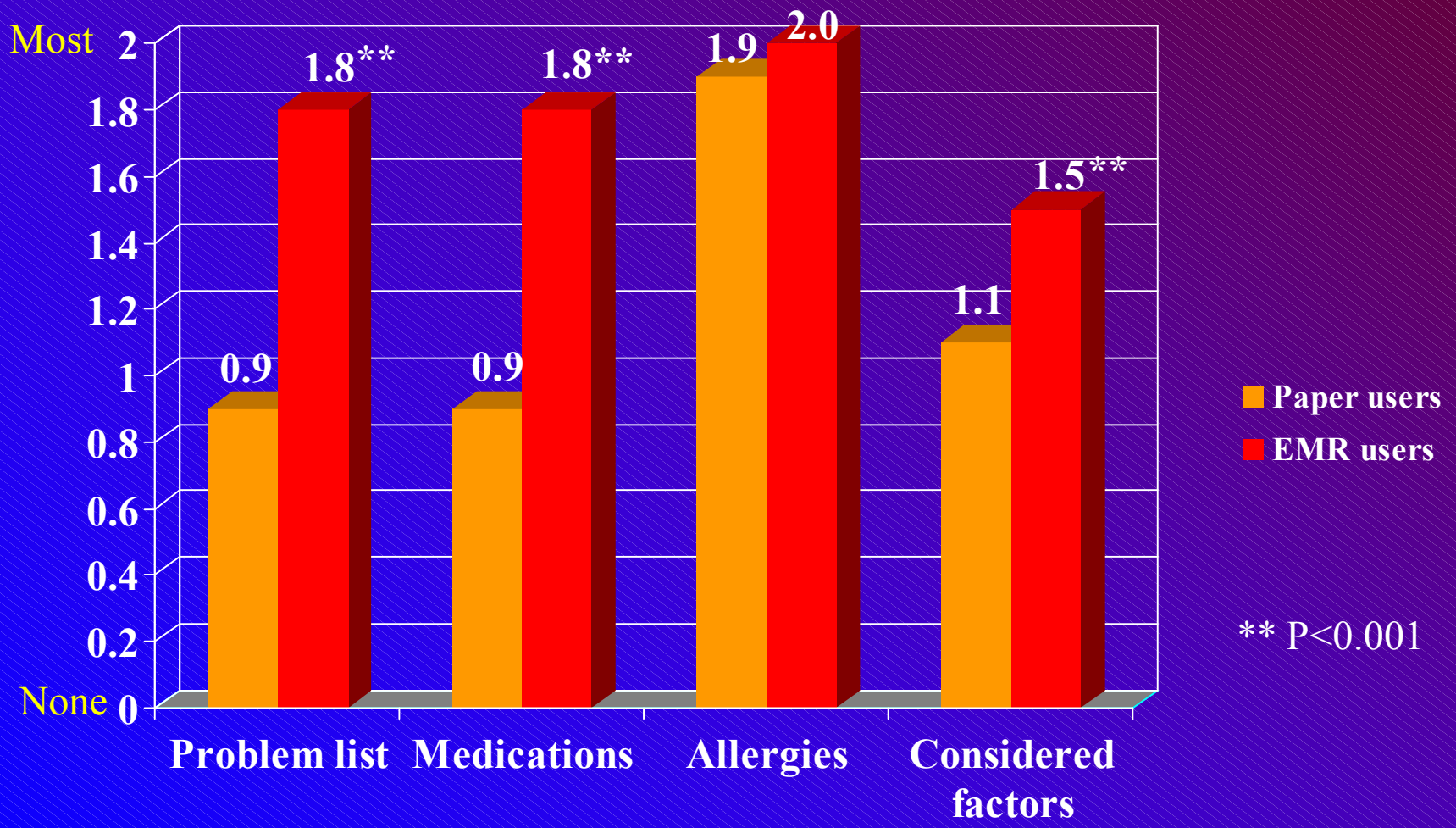
Appropriateness of Decisions
Evaluation

- Randomly selected records of patients of EHR users and paper-record users
  - Created typed mini-record in standard format
    - Face sheet
    - Recent 4 progress notes
    - Intervening labs
  - Patients with chronic diseases
- Blinded expert review panel
  - Board-certified internists, ave 28 yrs in practice
  - No project affiliation

Tang, et al., JAMIA 6:245-51; 1999.

Completeness of Documentation

Results

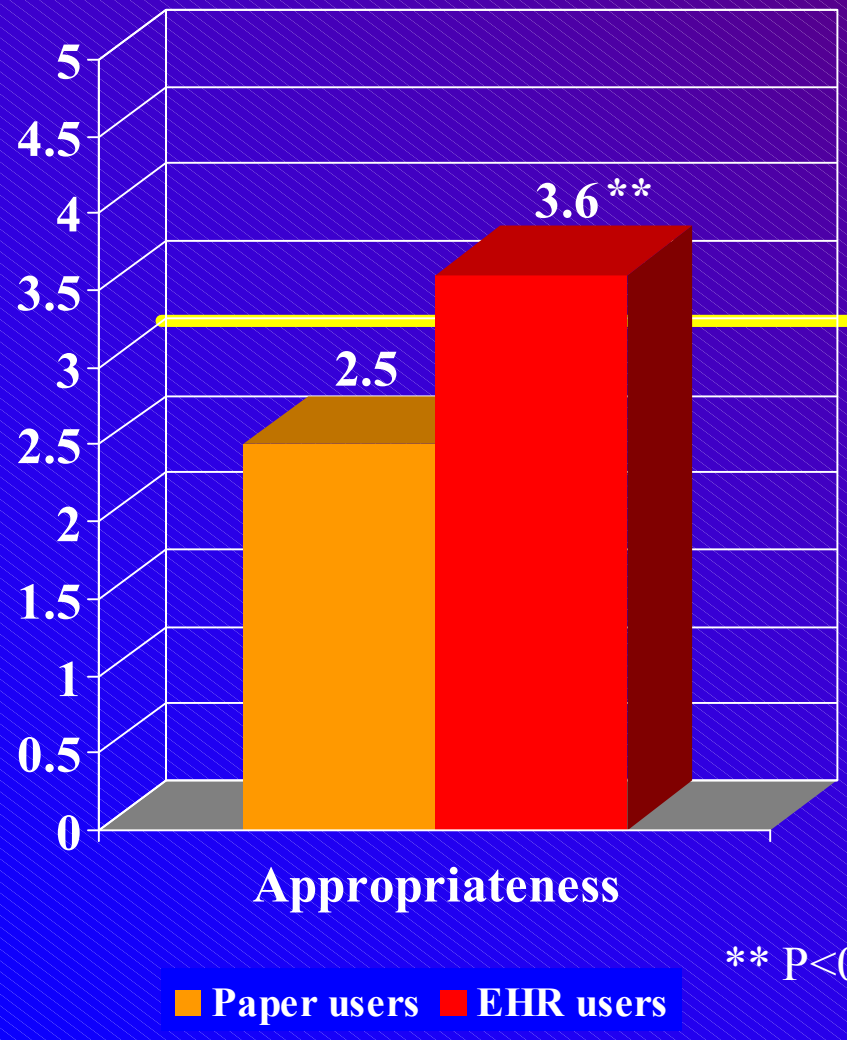


** P<0.001

Tang, et al., JAMIA 6:245-51; 1999.

Appropriateness of Decisions

Assessments and Plans



- Scale 0-5
  - 0 = "completely inappropriate"
  - 3 = neutral
  - 5 = "completely appropriate"
- Decisions of EHR users were significantly more appropriate

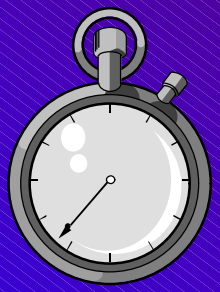
Tang, et al., JAMIA 6:245-51; 1999.

Personal Health Records

At the crossroads of patient care

Current Status of Patient Communication and Education

Information Sharing with Patients



Patient Education by Physicians

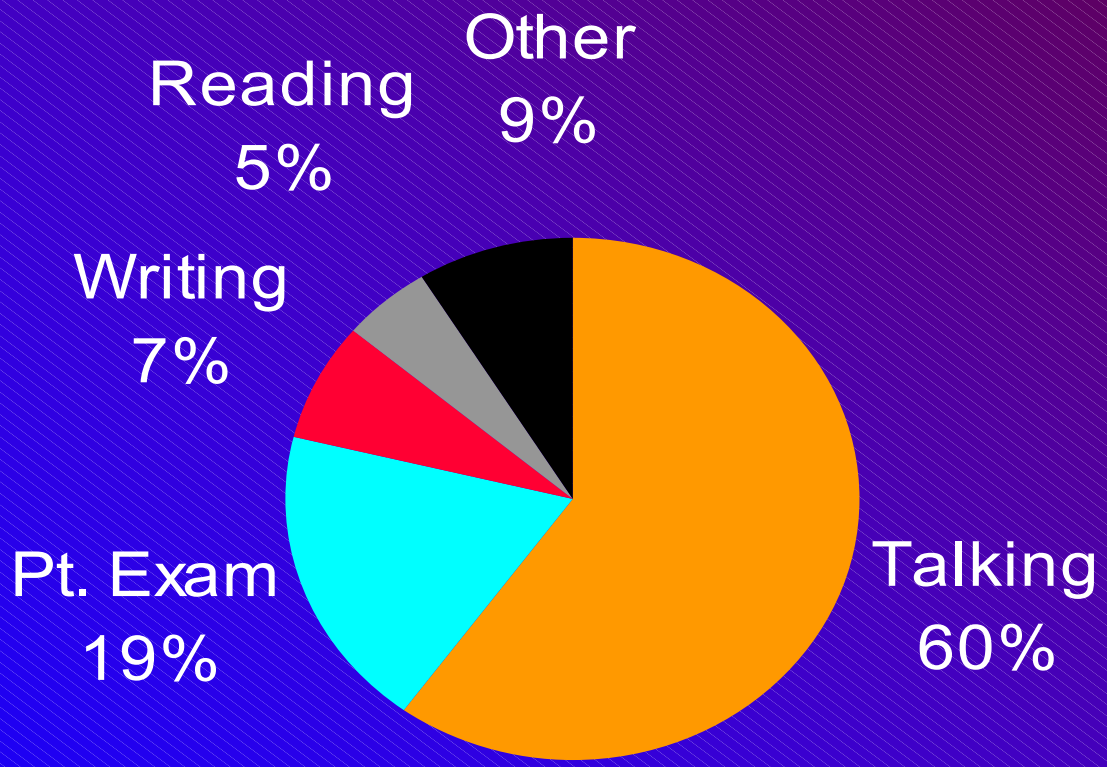
Time Allocation Methodology

- 38 clinicians shadowed for 2 hours
- Activities recorded at 1 minute intervals
- 159 encounters observed
- 4541 observed minutes

Tang, et al. AMIA 1996: 12-16

Information Activities During Encounter

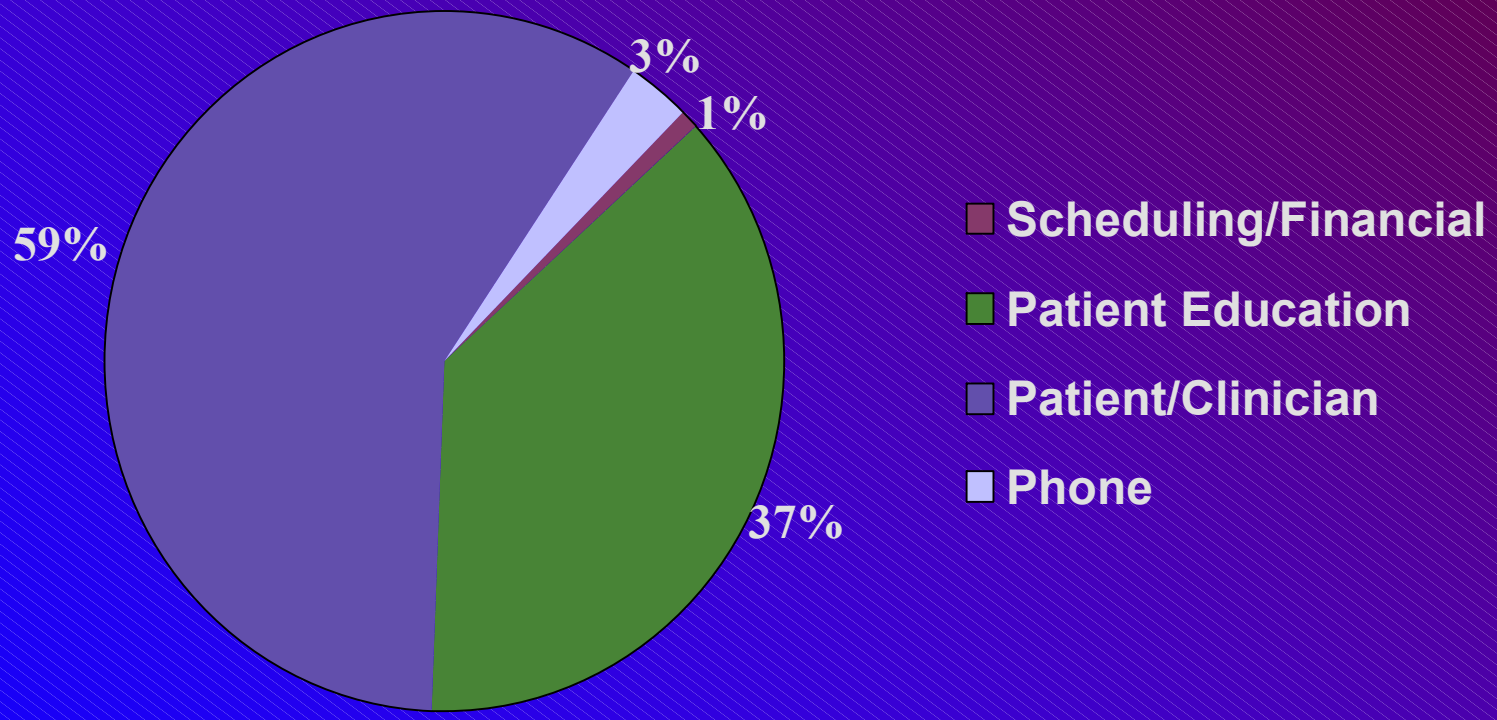
Average Across Diverse Practices



Tang, et al. AMIA 1996: 12-16

Sub-Categories of Talking Time

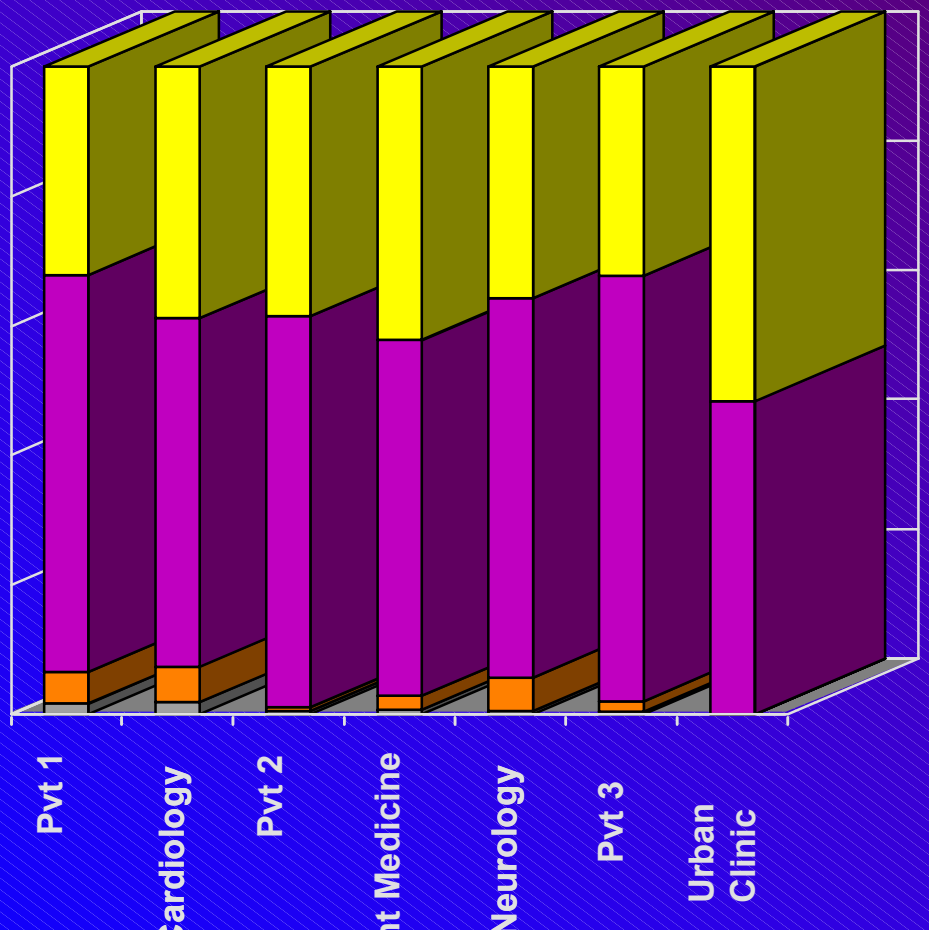
Average Across Diverse Practices



Tang, et al. AMIA 1996: 12-16

Observed Talking Activities

Subcategories, All Sites



Tang, et al. AMIA 1996: 12-16

Outcome of Patient Education
Understanding of Discussion

- 57 Mayo internists; 458 visits, 2.7 prob/visit
- Post-visit questionnaires to MD and patient
  - Major health problems and other problems
- Patients failed to report 68% of problems
- Missed 54% of "most important health problem" according to MDs

Scheitel, et al. Mayo Clinic Proceedings, 1996

Patient Education Focus Groups
Methodology

- Independent market research firm
- Random selection of patients seen within 2 months in 5 clinics
- 24 patients in 2 focus groups
- One-way mirror

Tang, et al. JAMIA 1998; 5:563-570

Patient Information Needs

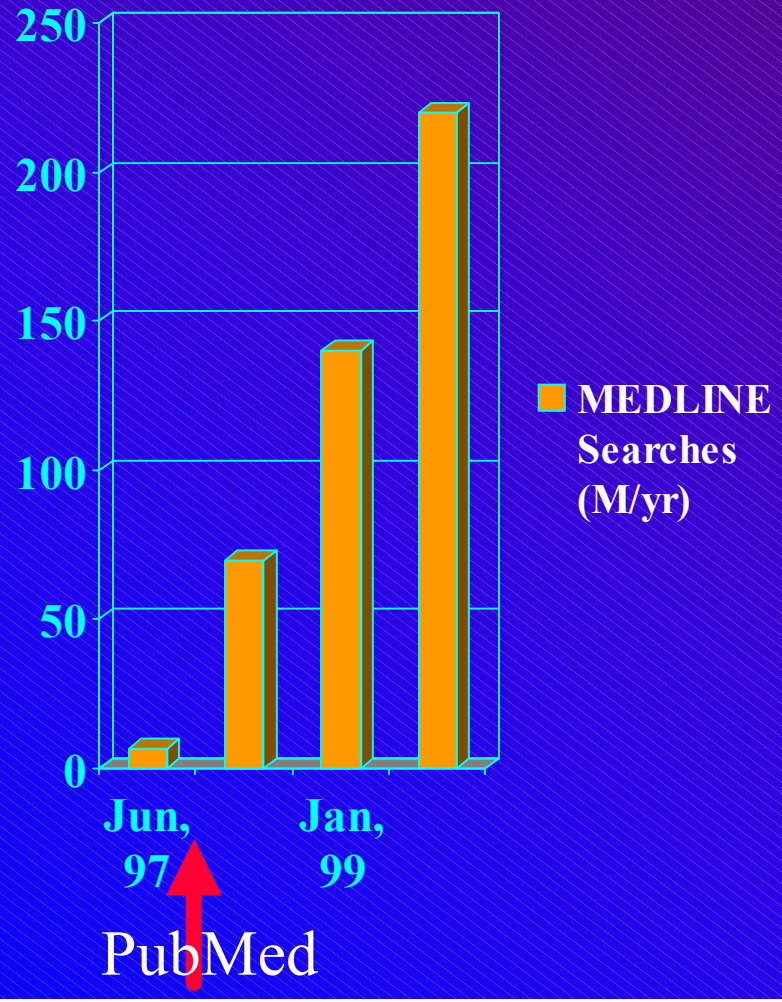
Focus Group Results - Themes

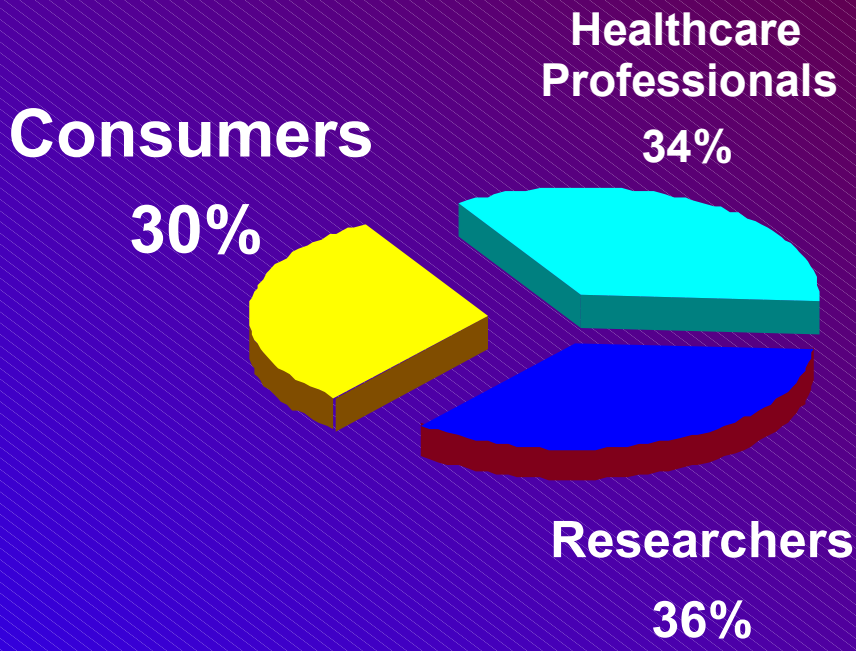
- Patients *do* seek information about diagnosis and treatment plan (including alternatives)
  - Friends, relatives
  - Libraries, Internet, pharmacy inserts

Tang, et al. JAMIA 1998; 5:563-570

Consumer Information-Seeking Behavior

Accesses to MEDLINE





Patient Information Needs

Focus Group Results – Themes II

- Patients prefer custom-tailored information
  - *Their* own data (lab results, findings)
  - Information on *their* problem and possible solutions
- Need for their physician endorsement
  - Physician endorse material as relevant to them
  - Physician should briefly review with them

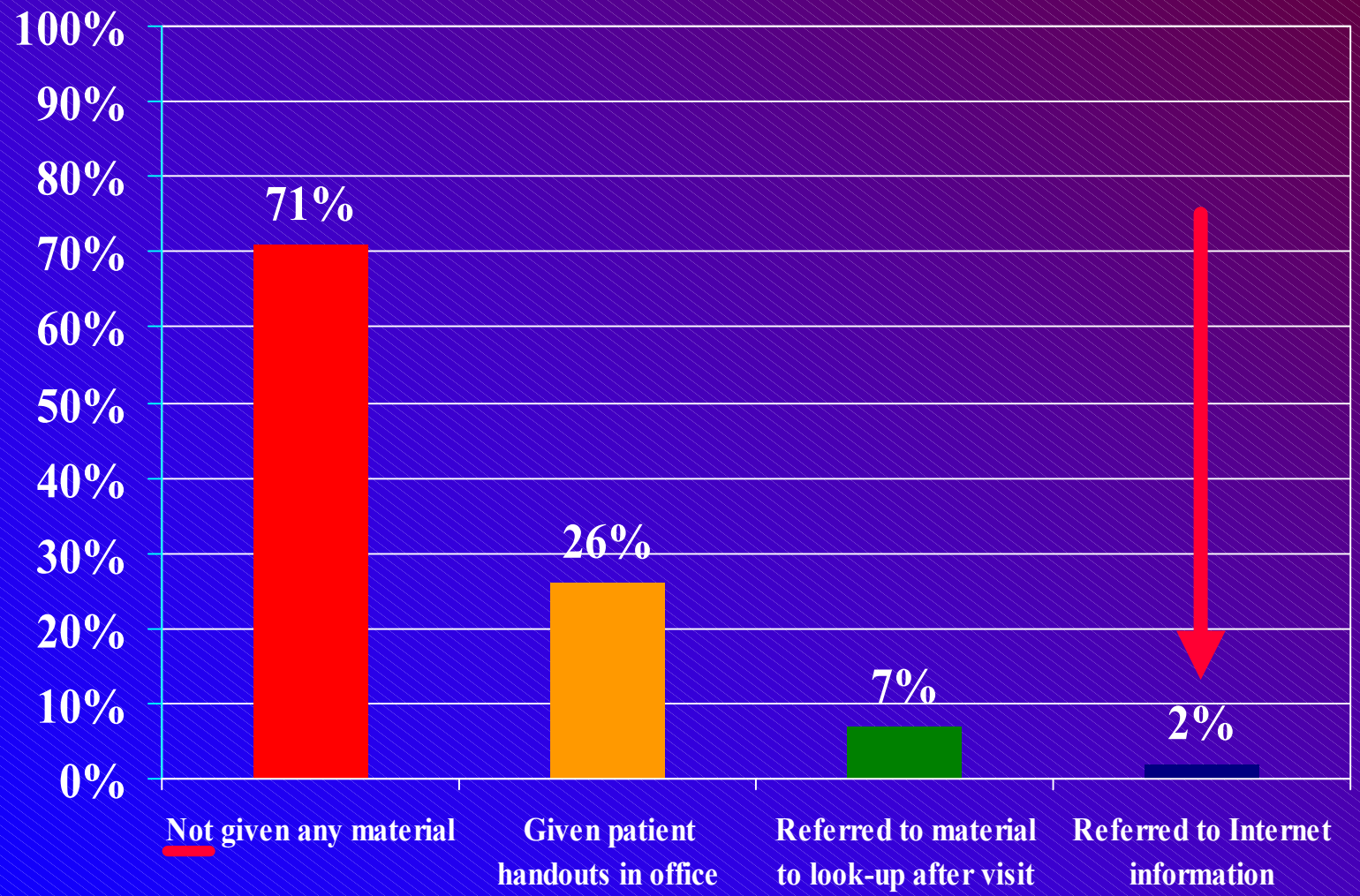
Tang, et. al., JAMIA 1998; 5:563-570

Patient Information Needs
Focus Group Results – Themes III

- Timing should be when the *questions* arise
  - Not in the exam room!
  - At home, with friends and family

Tang, et. al., JAMIA 1998; 5:563-570

Information Given at Last Office Visit



*Percentages do not add up to 100 percent due to total mentions

VHA, 1999 Clinical Office Practice

Personalized Health Care

The Patient Side of EHRs

PAMFOnline - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media

Address https://mychart.sutterhealth.org/pamf/default.asp?action=logout Links

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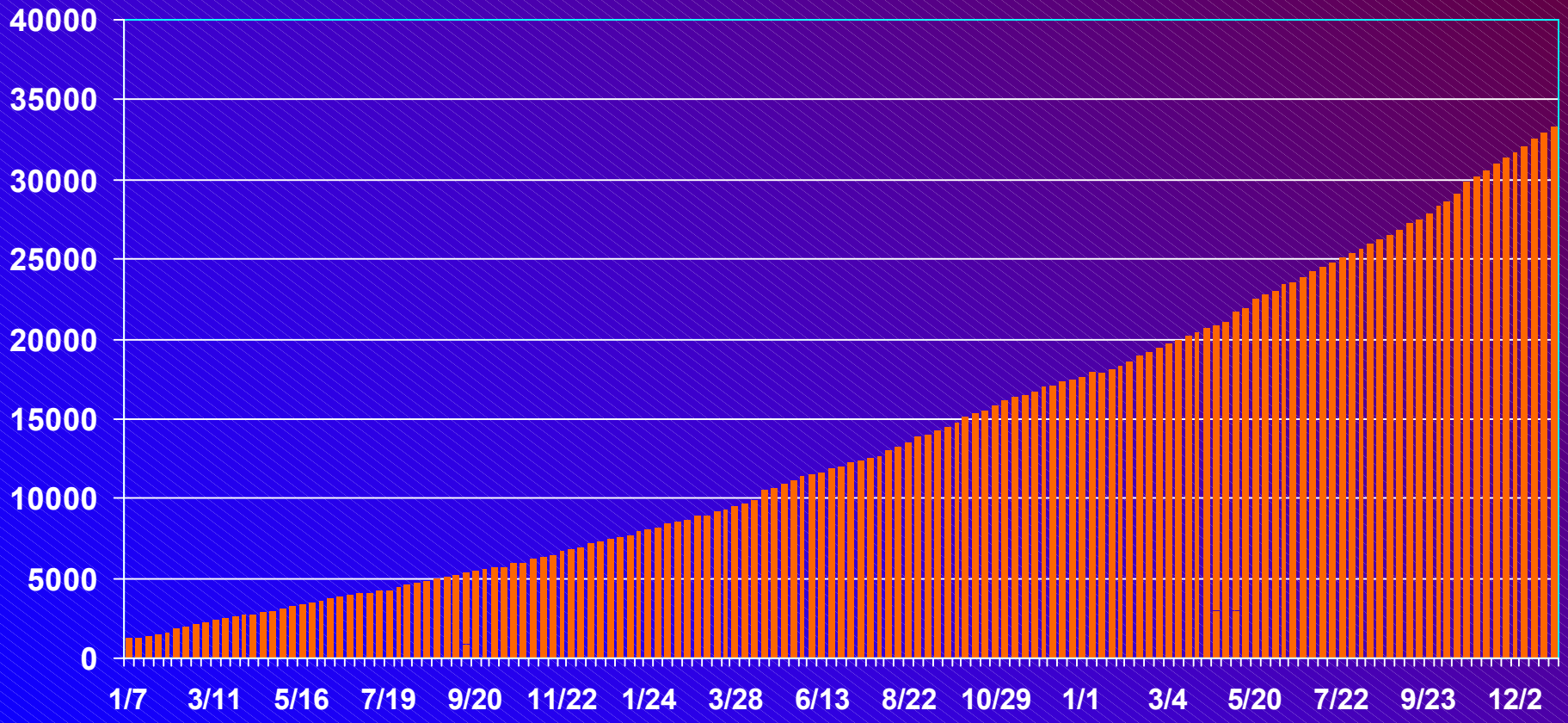
Internet

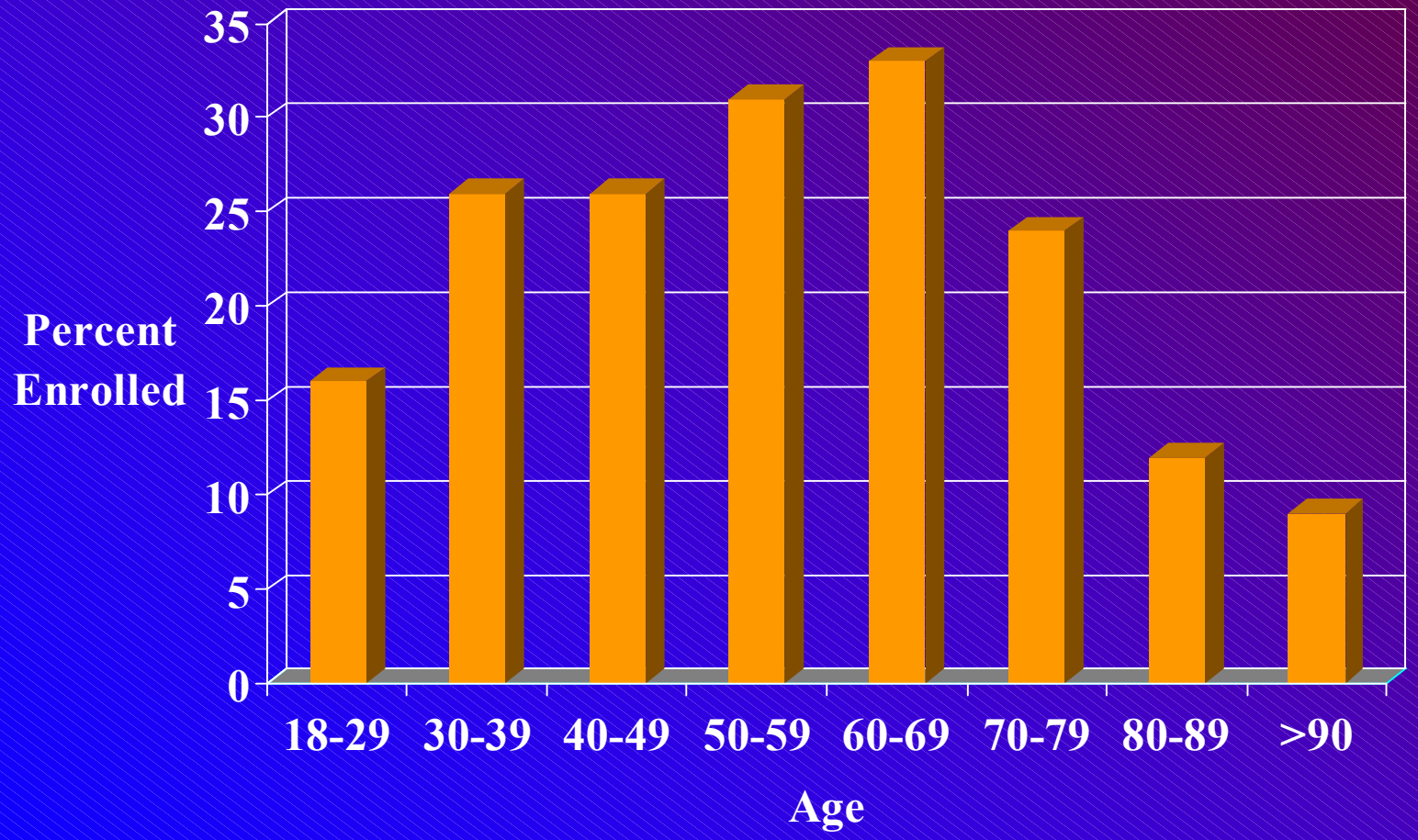
PAMFOnline

Enrollment



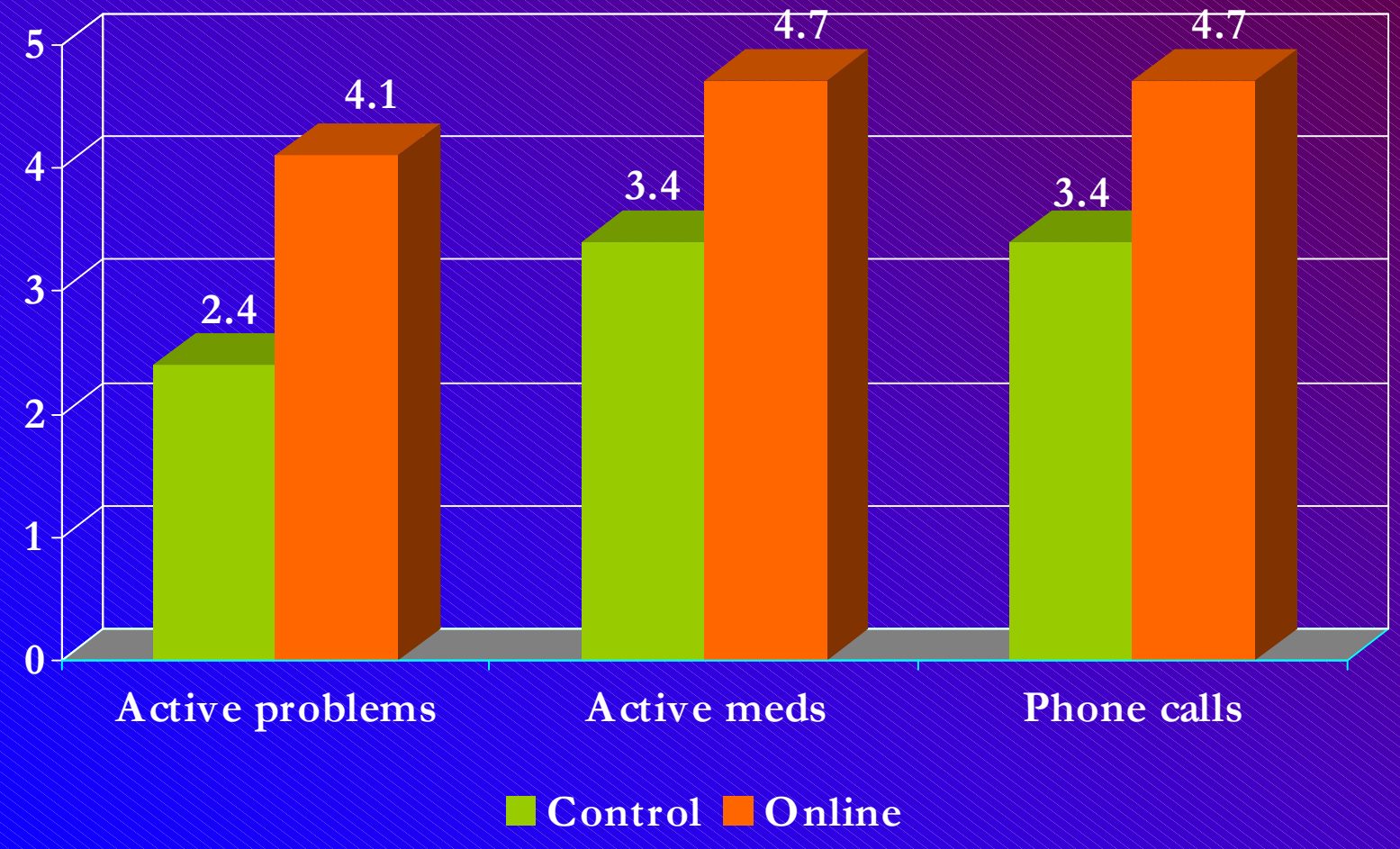
PAMFOnline Patients

Adoption Rate by Age



Patient Profile

Baseline



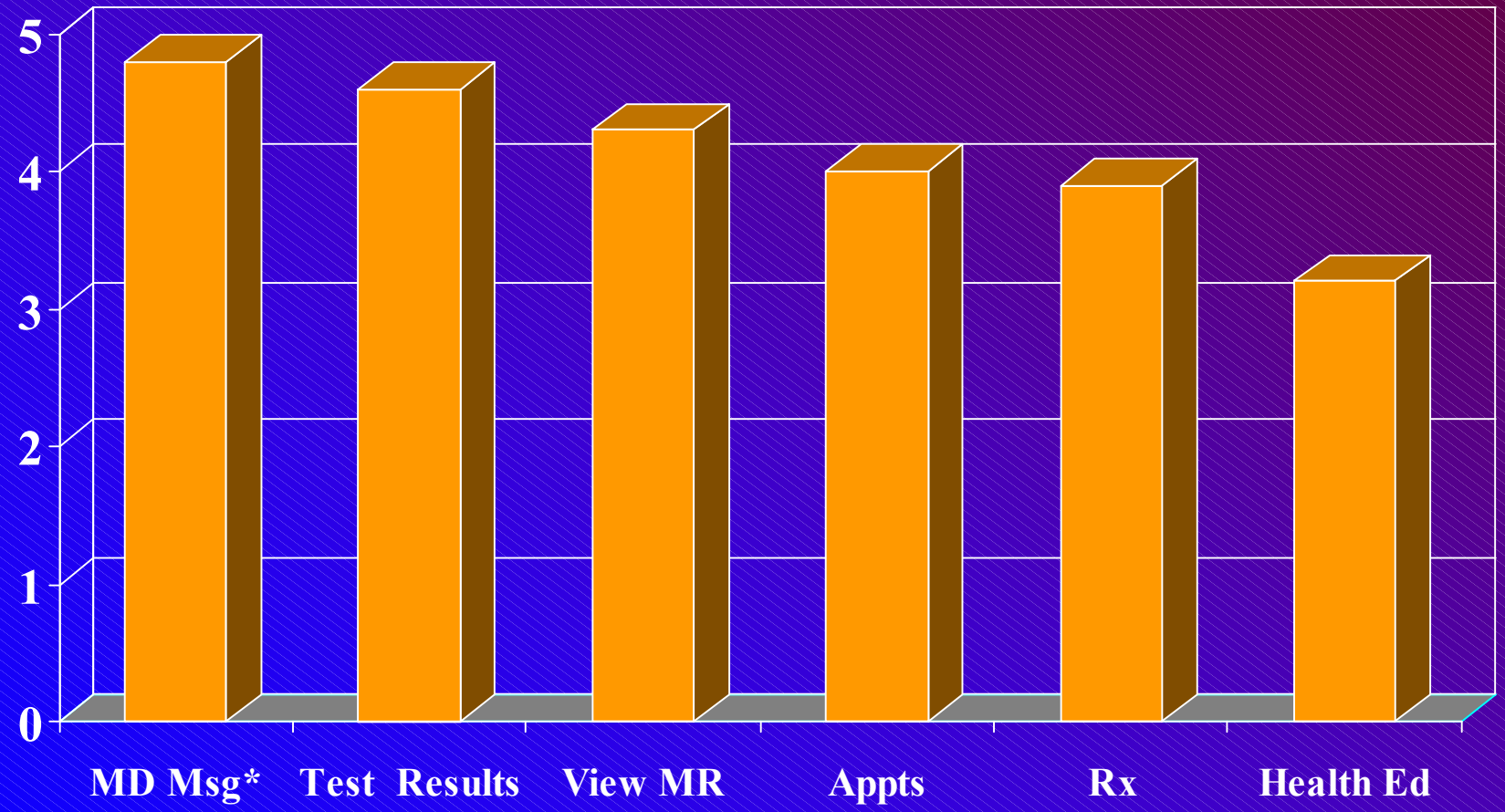
2004 Patient PAMFOnline Survey

"Overall Satisfaction with PAMFOnline"

- 90% satisfied or very satisfied with PAMFOnline
- Average rating 4.3/5.0

PAMFOnline Patient Survey

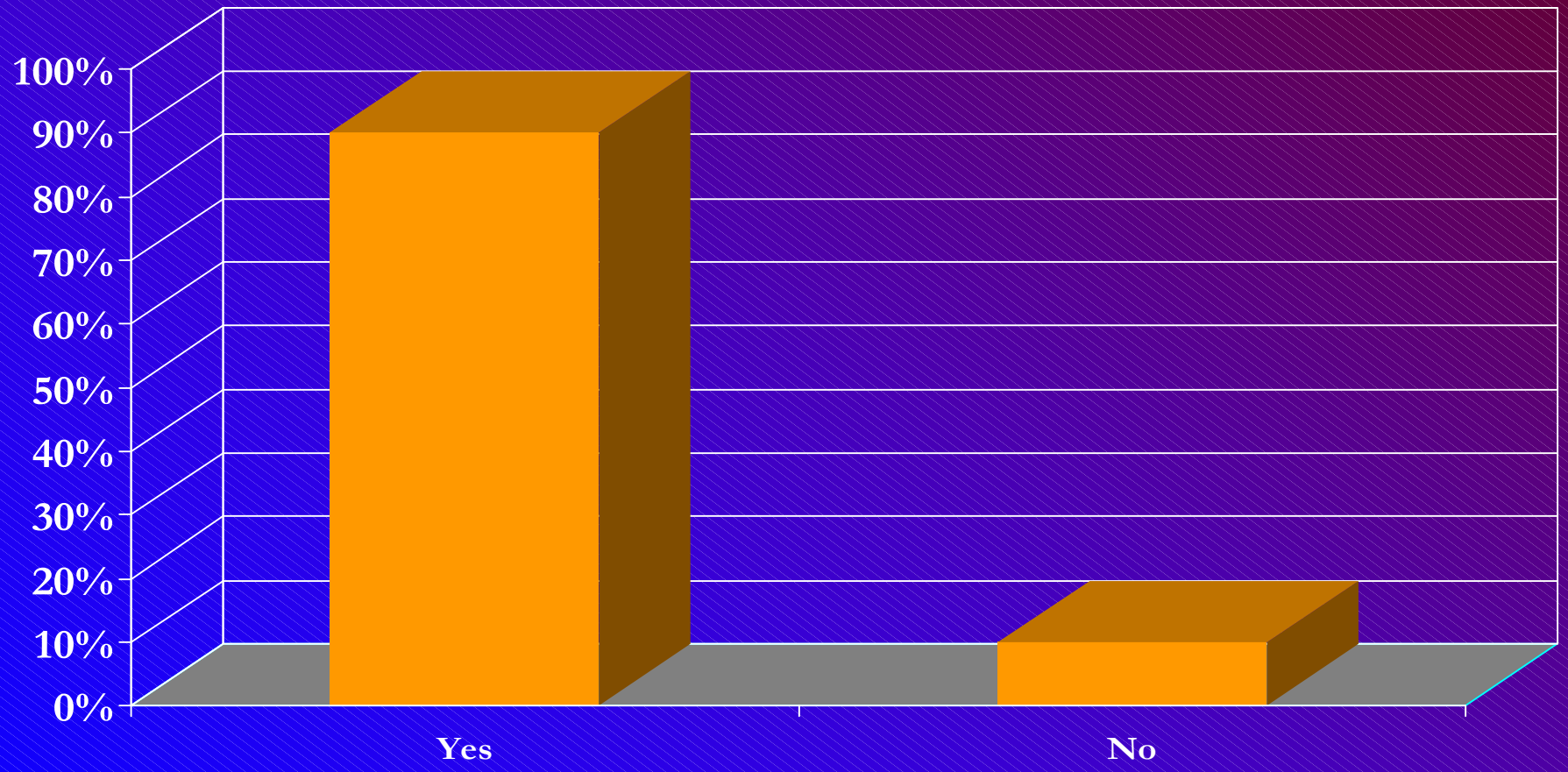
Valued Services



*Subscribers only

2003 Physician PAMFOnline Survey

"Are you satisfied with PAMFOnline?"



Physicians with 100+ PAMFOnline patients

Creating *Continuous Care*

Summary

Achieving a New Standard of Care

- The status quo is unacceptably unsafe and inefficient
- Electronic health record systems *essential* to making patient safety a standard of care
- Integrated personal health records facilitate patients becoming more active participants in their care