

How Has My KT Research Impacted Quality of Care and Outcomes?

Sumit R. Majumdar, MD MPH FRCPC FACP

Professor of Medicine,

Endowed Chair in Patient Health Management,

AHFMR and AI-HS Health Scholar,

**Faculties of Medicine and Dentistry and Pharmacy and
Pharmaceutical Sciences, University of Alberta**

Disclosures

I have no relationship that could be perceived as placing me in a real or apparent conflict of interest in the context of this presentation

Take Home Messages

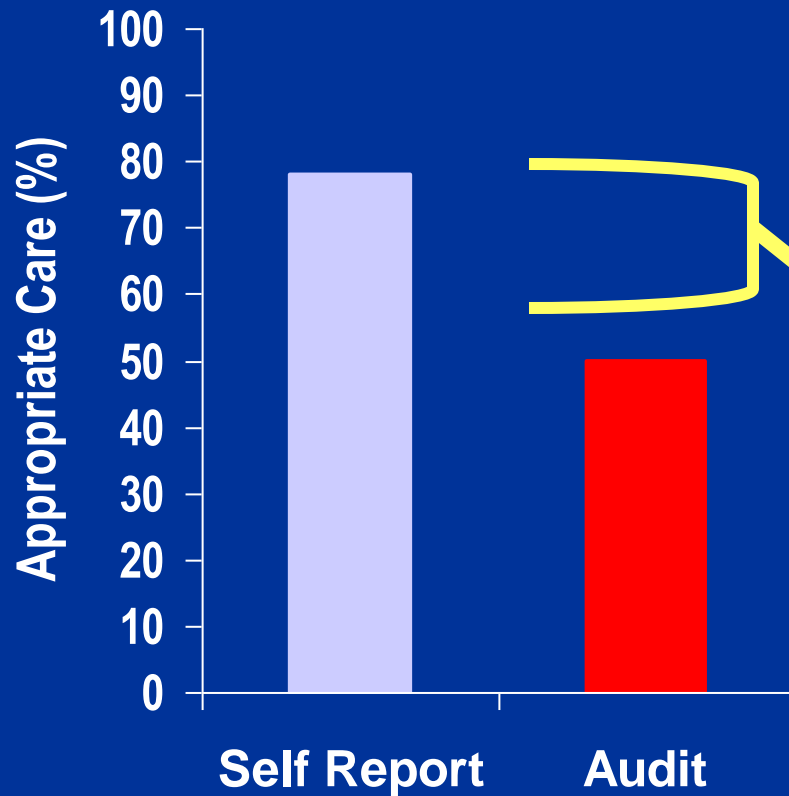
- **My KT research is about measuring, understanding and fixing “care-gaps”**
- **In theory all KT interventions work; in controlled trials many don’t and even when they do, the effects are modest**
- **Like drugs or devices, KT interventions need to be tested in controlled trials to establish their safety and effectiveness**

Knowledge Translation Research

- (T-1) = translating evidence from the basic sciences to produce new drugs, devices, and diagnostic tests
- (T-2) = *knowledge translation* = ensuring evidence we have is applied to those who will benefit most
- Quality improvement = degree to which interventions increase the likelihood of desired outcomes and are consistent with the best evidence
- Although overuse and misuse exist, fundamental problem in healthcare is the *underuse* of proven effective treatments (“care-gap”)

(Chassin et al. JAMA. 1998;280:1000 and Woolf. JAMA.2008;299:211)

(Under-Use) Care-Gaps are Pervasive



- Reviewed studies with both self-report and practice audits:

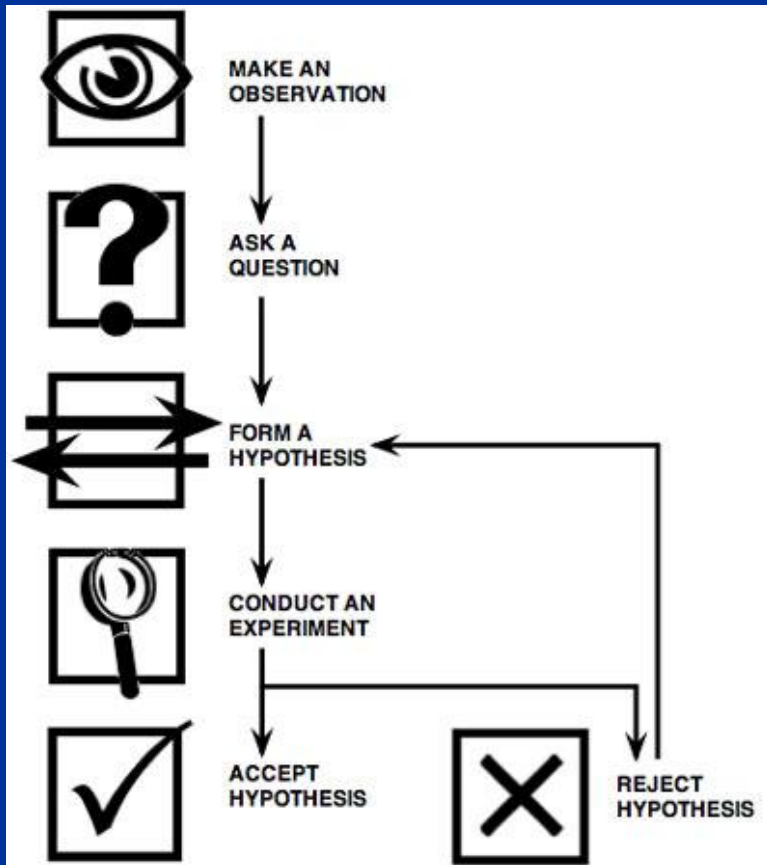
Median difference (care-gap) = 30%

- MDs overestimated their performance 90% of time

Why? Numerous Barriers to Achieving Best Practice

- **System level**
 - Lack of information systems (i.e., registries with real time reminders); access; reimbursement
- **Physician level**
 - Lack of knowledge; lack of time; clinical inertia
- **Patient level**
 - Lack of information; symptomatic vs preventive care bias; preferences, demands, expectations; non-adherence

Steps in the Scientific Method? Hypothesis then Experiment

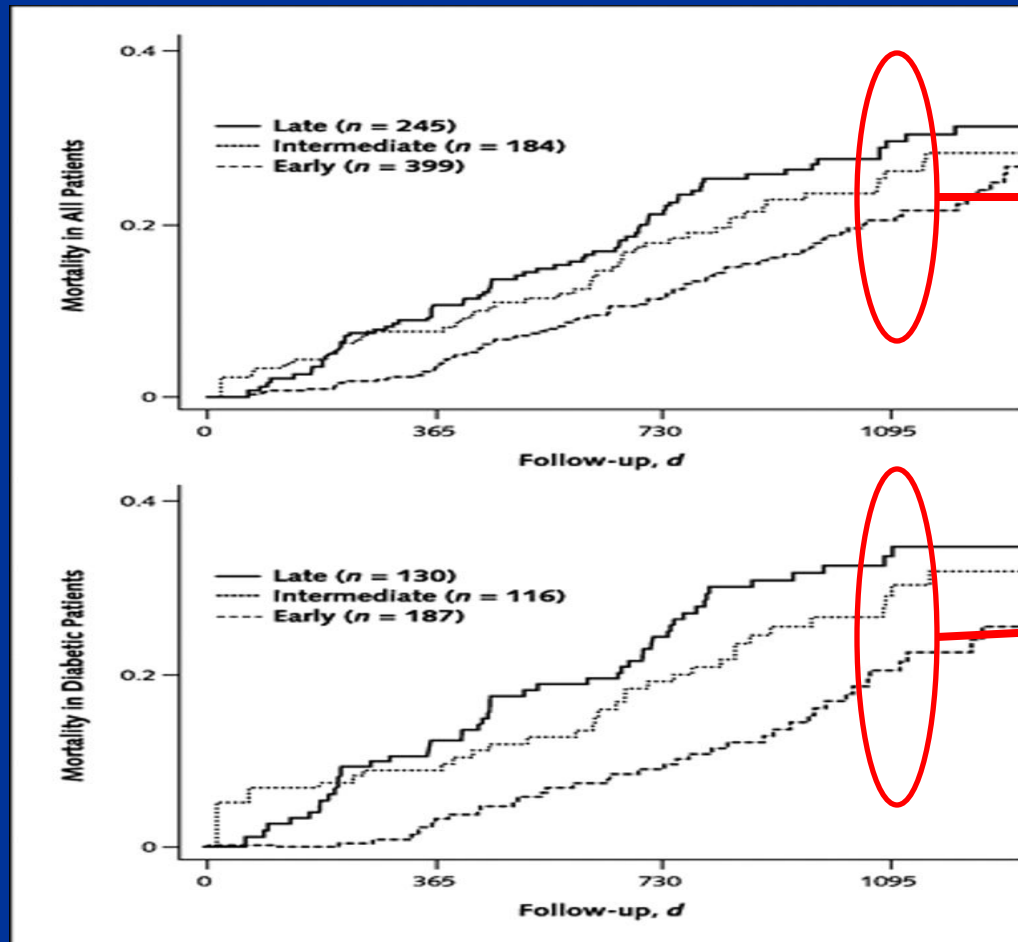


- Why experiment?
 - Chance
 - Selection bias
 - Measurement bias
 - Confounding
 - Regression to mean
 - Volunteer / Hawthorne
 - Secular trends
 - etc

EXCEPT For Knowledge Translation Research Because:

- 1. Can't wait**
- 2. Anything better than nothing**
- 3. Obvious it will work**
- 4. No harms or downsides**

Early vs Late Referral to Nephrology Specialist Care Reduces All-Cause Mortality



(Kinchen. Ann Intern Med. 2002;137:479)

DOB: 1918 Jan 12

SEX: F

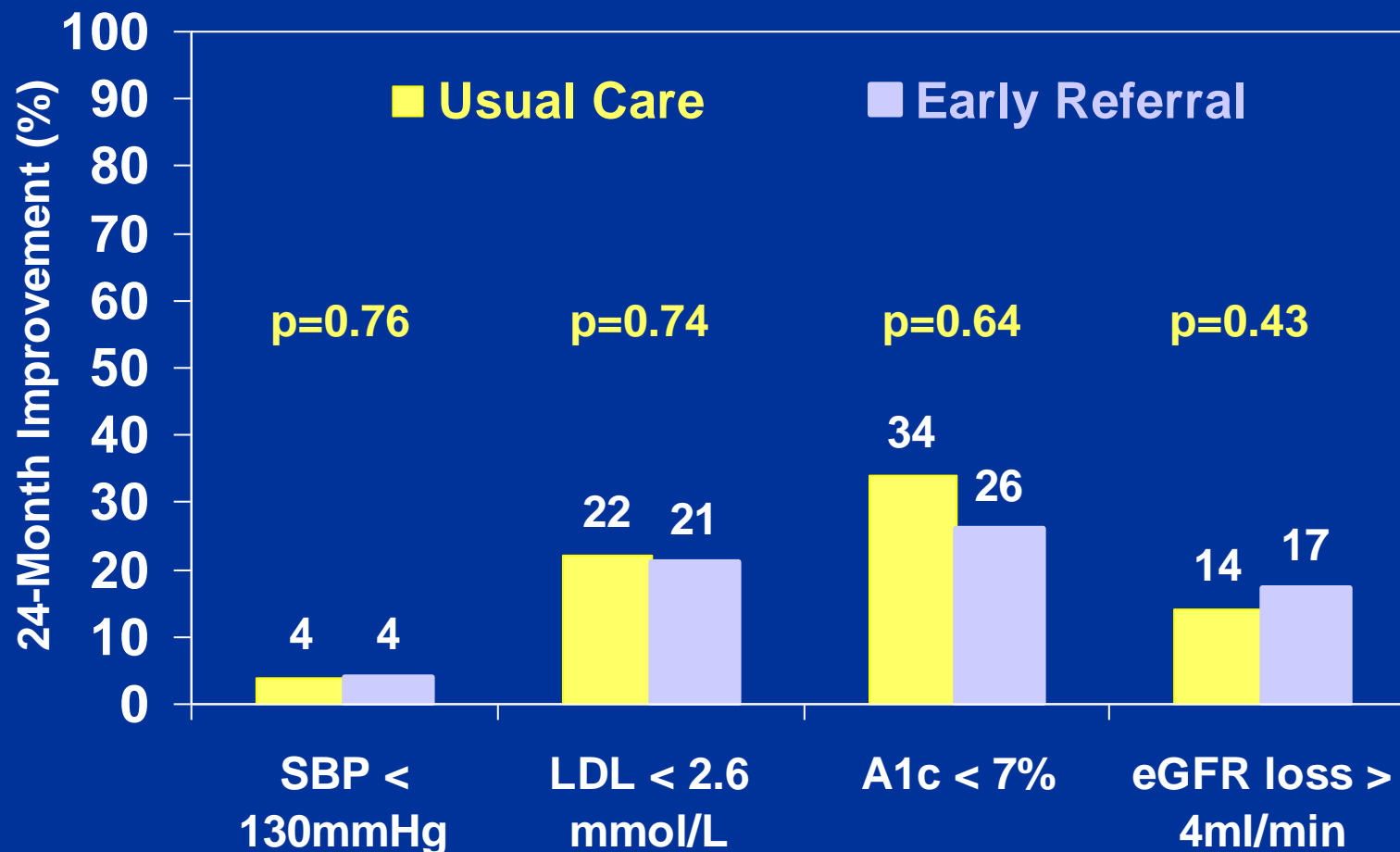
Results				
Test Name	Result	Units	Ref. Range	Abnormality
Creatinine	*166	umol/L	50-105	High
Calculated GFR	*25	mL/min/1.73m ²	>59	Low

In Outpatients, estimated GFR is a more accurate marker of kidney function than creatinine.

Chronic kidney disease is defined by eGFR <60 mL/min/1.73m² for 3 months or more.

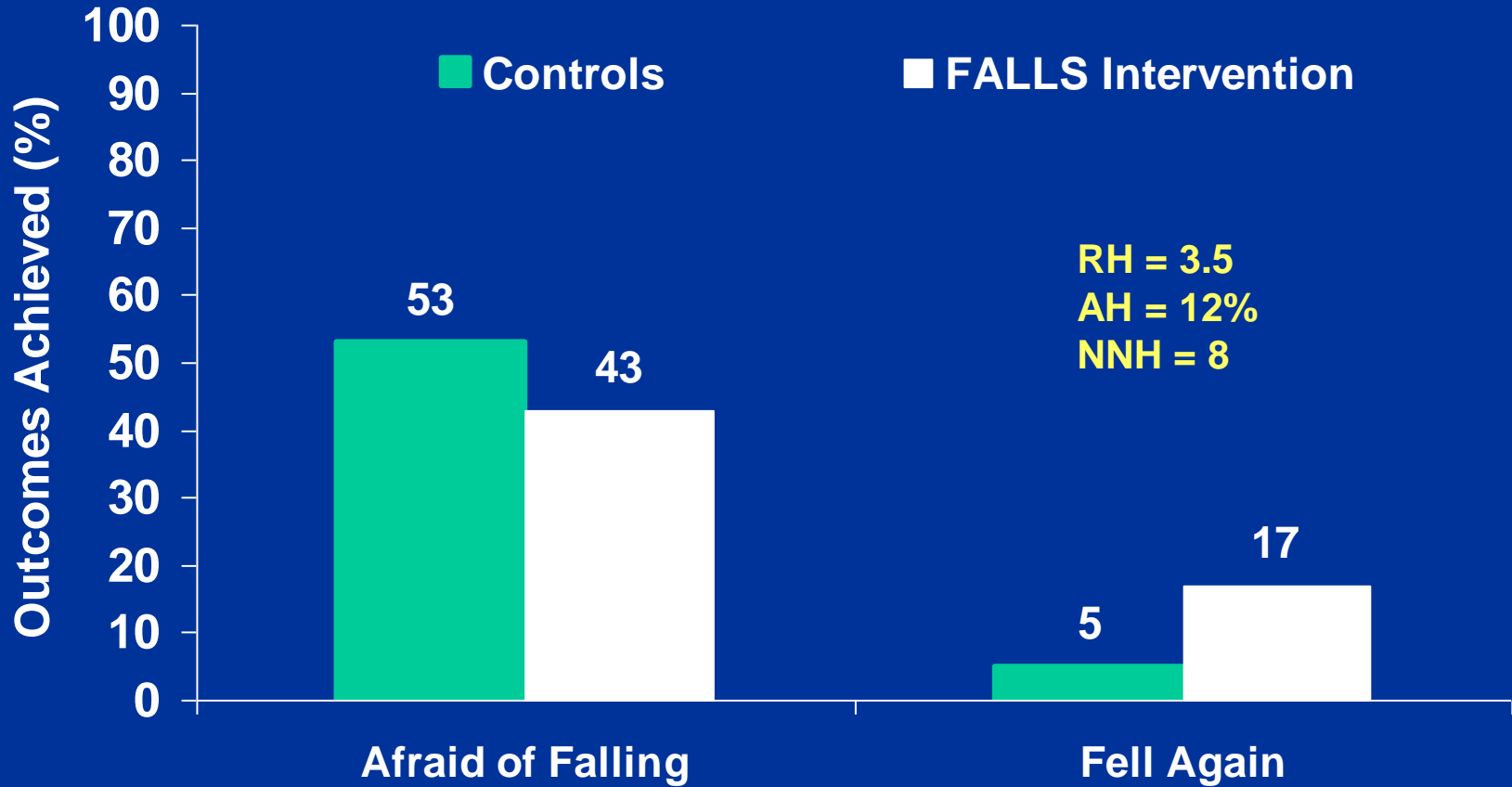
***Published guidelines recommend that patients with eGFR <30 ml/min/1.73 m² be referred to a Nephrologist. (see www.akdn.info)**

Randomized Trial of Early Nephrologist Referral vs Usual Care (N~500)



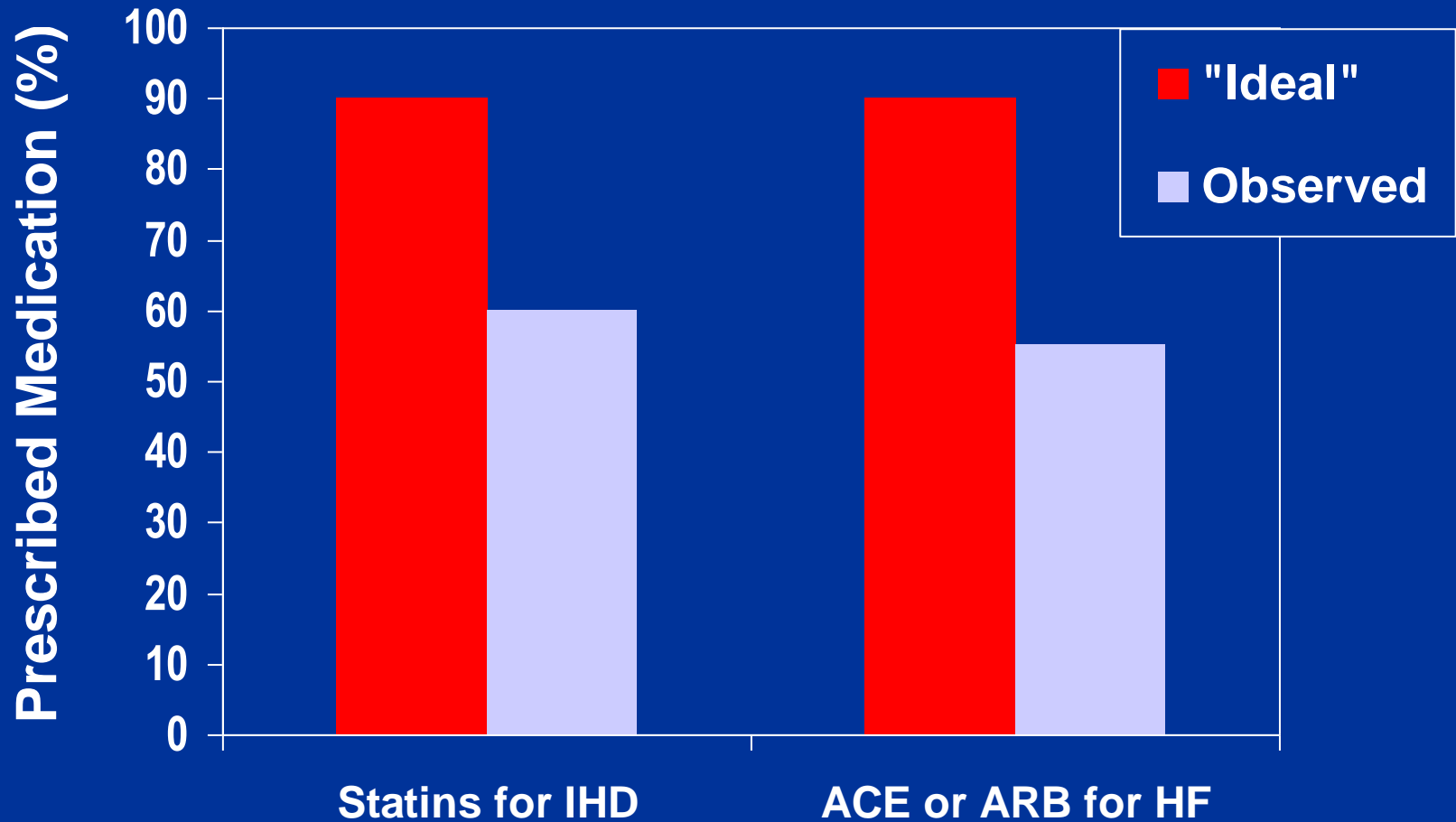
(Barrett. CANPREVENT Trial. Clin JASN. 2011;6:1241)

Educational Interventions to Prevent Falls After a Fracture



(Rucker et al. Preventive Med. 2006;42:316)

Care-Gap Between Evidence and Practice in Heart Disease

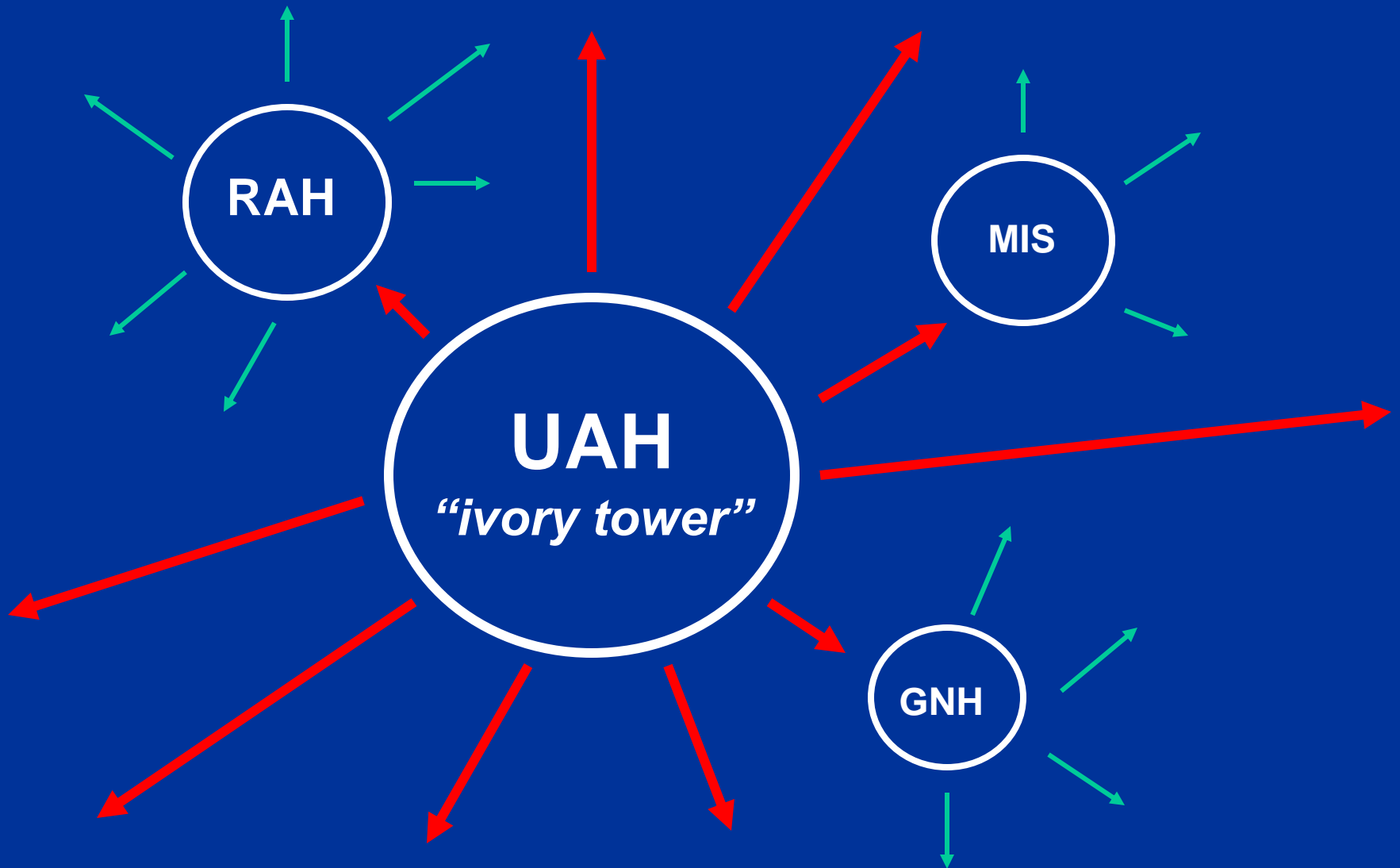


(Majumdar et al. Am Heart J. 2007;153:22)

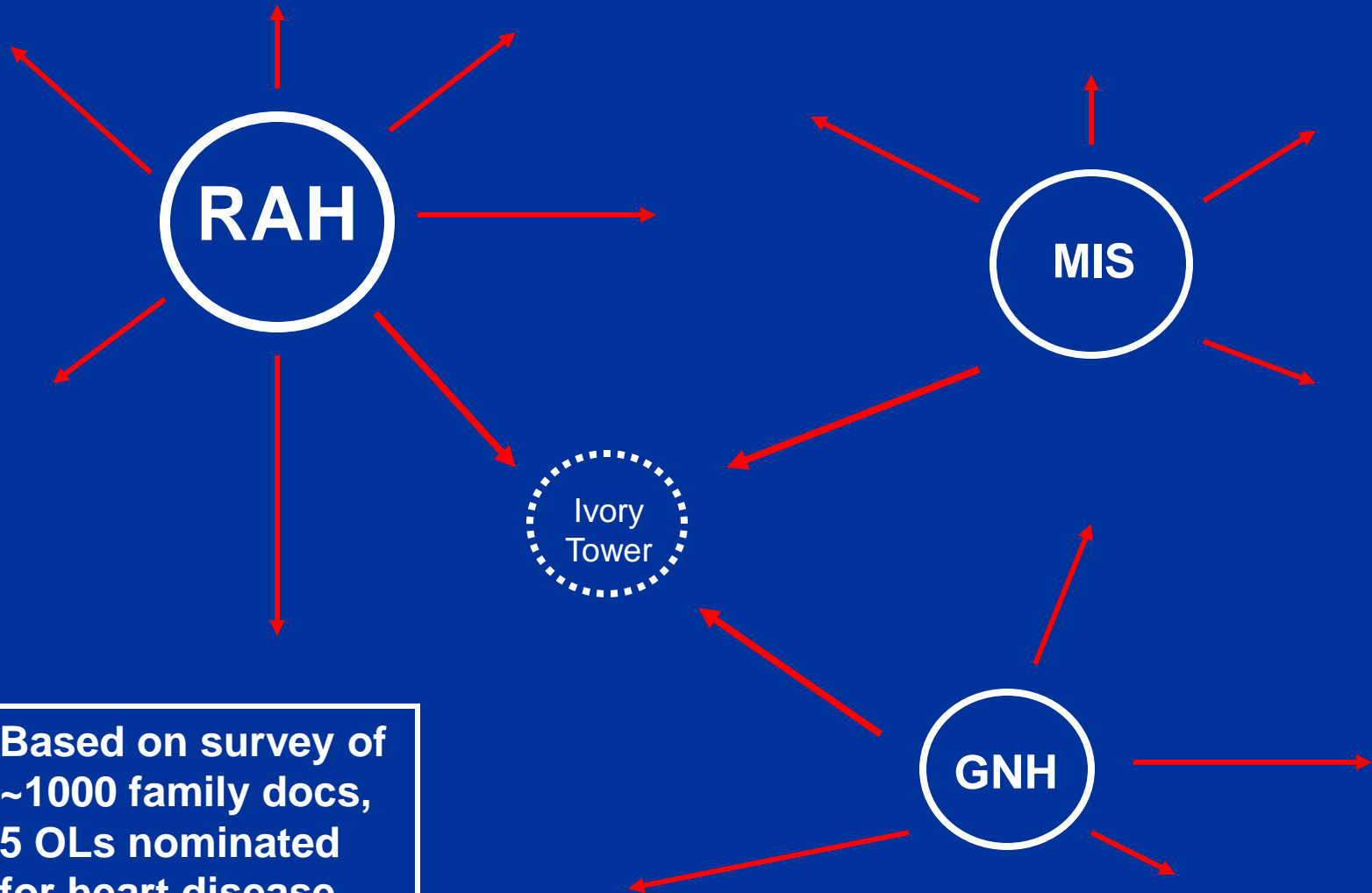
Influence of Local Opinion Leaders Can Overcome Barriers to Best Practice

- **local experts**
- **frequently asked for advice**
- **educationally influential**
- **competent and caring**
- **trusted to evaluate new practices**
- **well-integrated in the community**

Hypothesized Spheres of Influence for Local Opinion Leaders



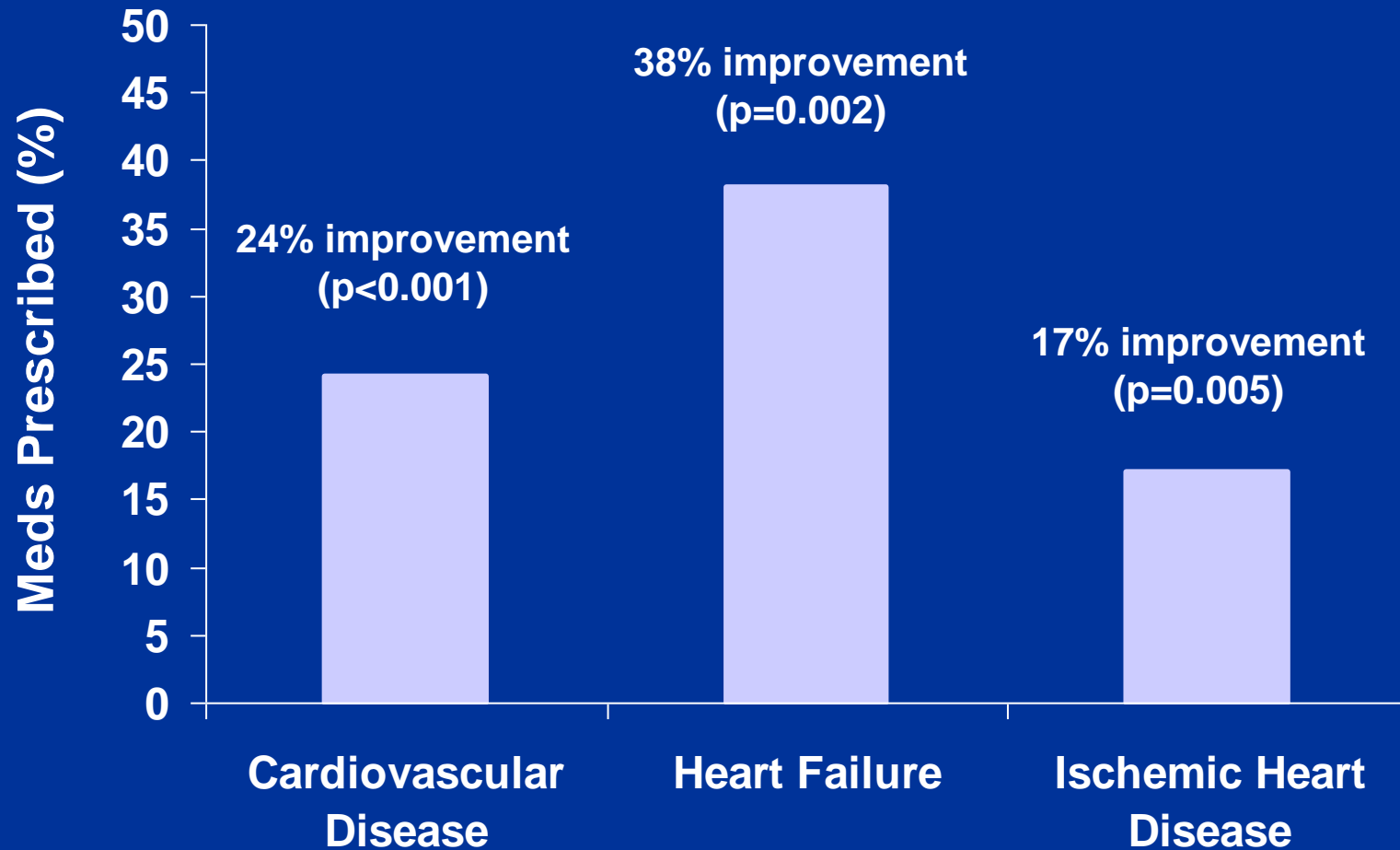
Observed Spheres of Influence for Local Opinion Leaders



Based on survey of
~1000 family docs,
5 OLs nominated
for heart disease

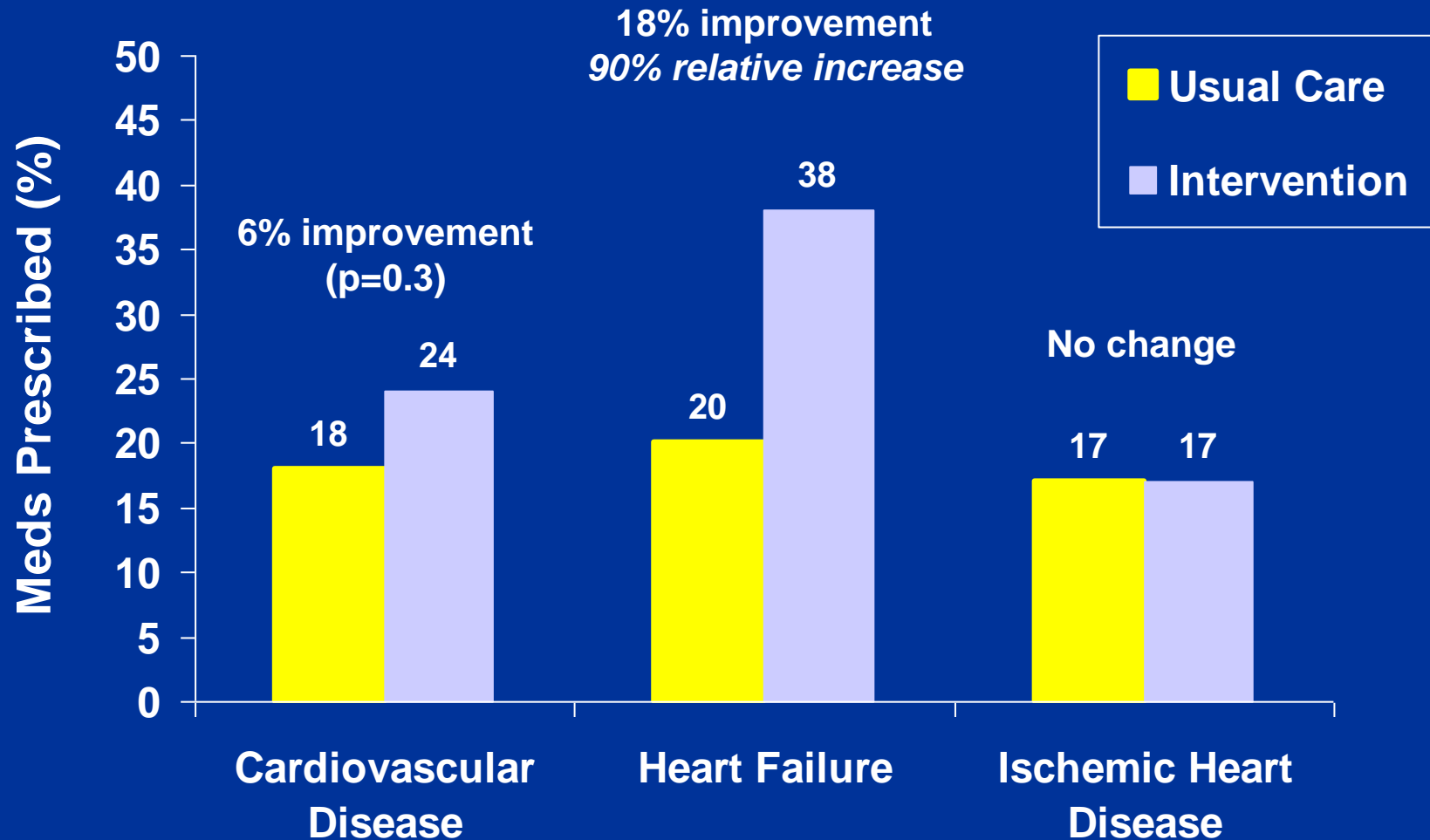
(Majumdar et al. Am Heart J. 2007;153:22)

Before-After Study of Opinion Leader Based Intervention for Cardiac Dz



(Majumdar et al. Am Heart J. 2007;153:22)

Randomized Trial of Opinion Leader Based Interventions for Cardiac Dz

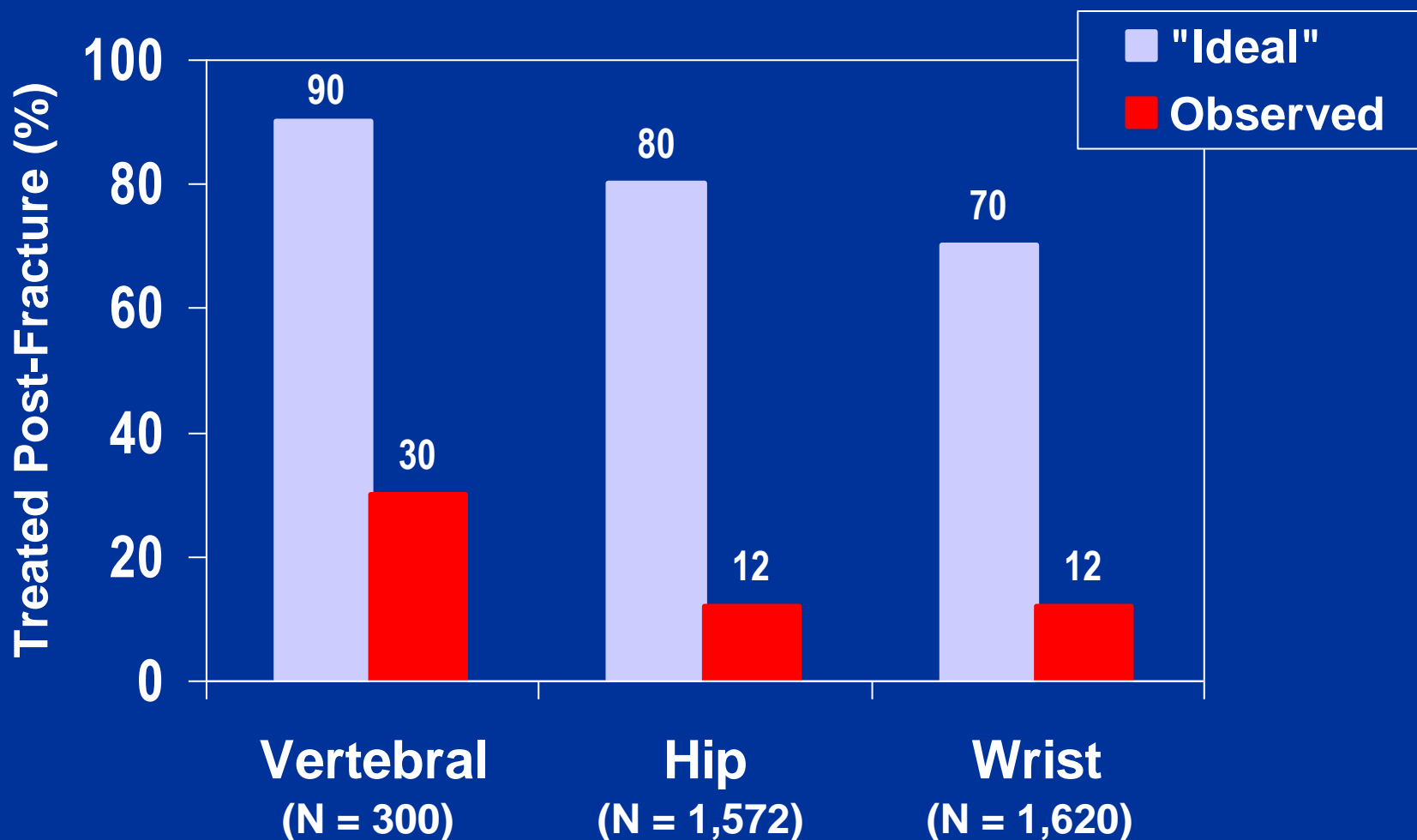


(Majumdar et al. Am Heart J. 2007;153:22)

Why Wasn't This More Effective?

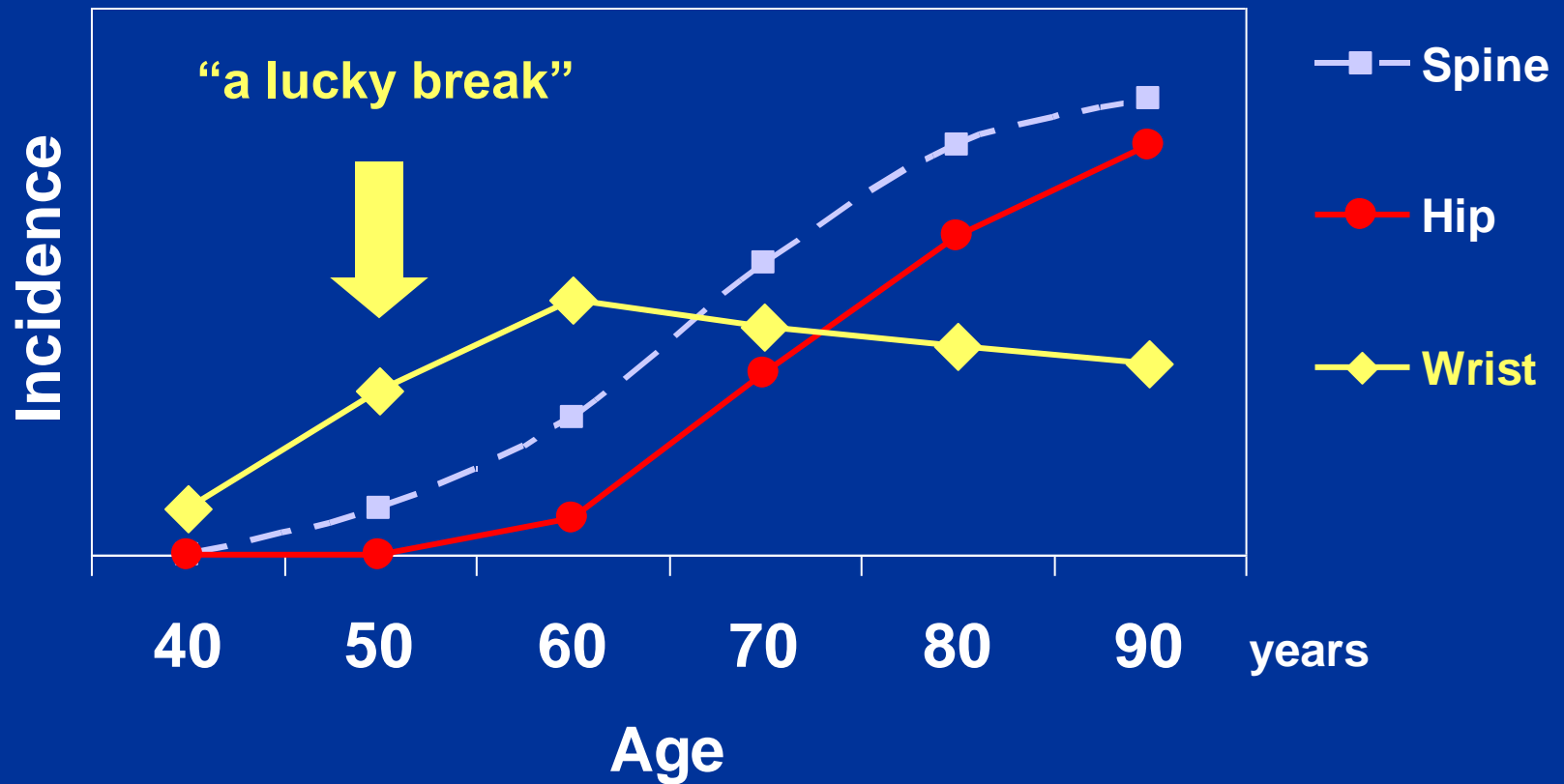
1. Too low a dose of intervention
2. Chronic stable diagnosis
3. No teachable moment
4. Patients not “activated”
5. *?Ceiling effects in cardiology?*

Care-Gap Between Evidence and Practice for Older Patients With Fractures



(Andrade, Majumdar et al. Arch Intern Med. 2003;163:2052)

Wrist Fractures Are a Lucky Break in the Natural History of Osteoporosis

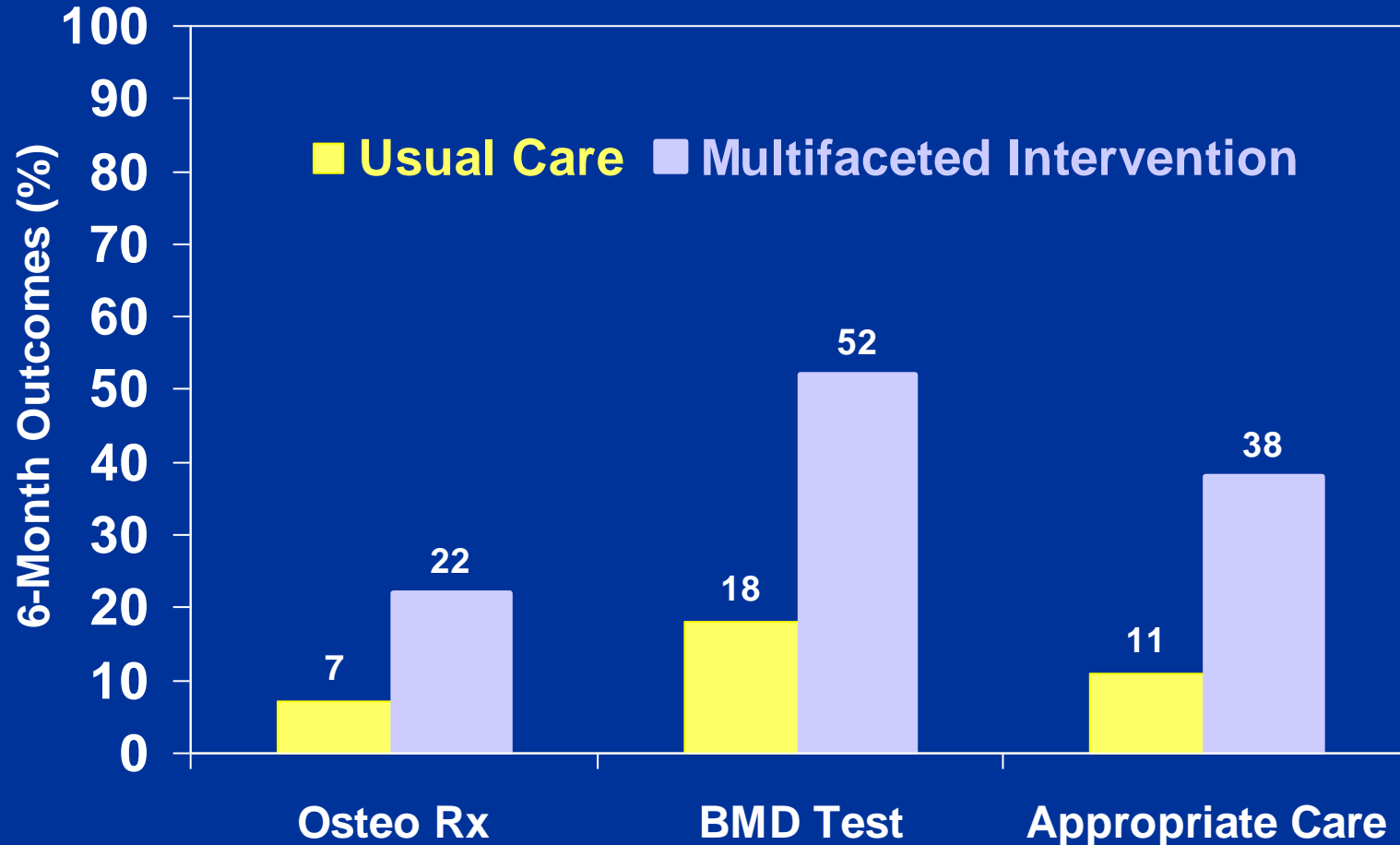


Adapted from Alffram (1964); Gay (1974); Owen (1982); Laurantzen (1993)

Multifaceted Osteoporosis Intervention for Patients with Wrist Fractures

- Directed at all older wrist fracture patients
 - Educational pamphlets
 - Phone counseling and MD visit prompt (~5 minutes)
- And their family physicians
 - One page patient-specific treatment guideline sent as an actionable reminder
 - Created, endorsed, signed by 5 locally nominated and persuasive osteoporosis “opinion leaders”
- Median 10 minutes (\$12) spent per patient

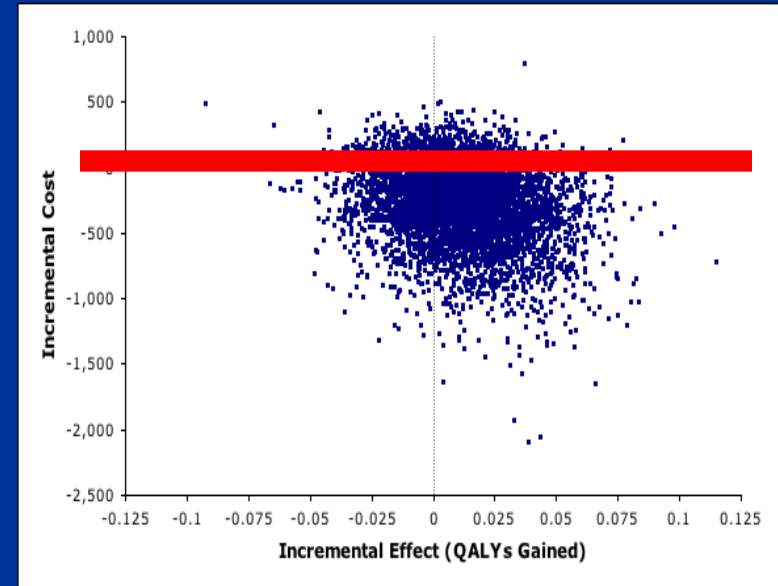
Randomized Trial of Multifaceted Intervention vs Usual Care for Patients with Wrist Fracture



(Majumdar et al. CMAJ. 2008; 178:569, based on Majumdar et al. Ann Intern Med. 2004;141:366)

Economic Analysis of the RCT of \$12 Per Patient Multifaceted Intervention vs Usual Care

- For every 100 patients getting the intervention:
 - 3 fractures (1 hip) avoided
 - 1 QALY gained
 - \$240 saved
- Dominates usual care
- Breaks even within 3 years of starting

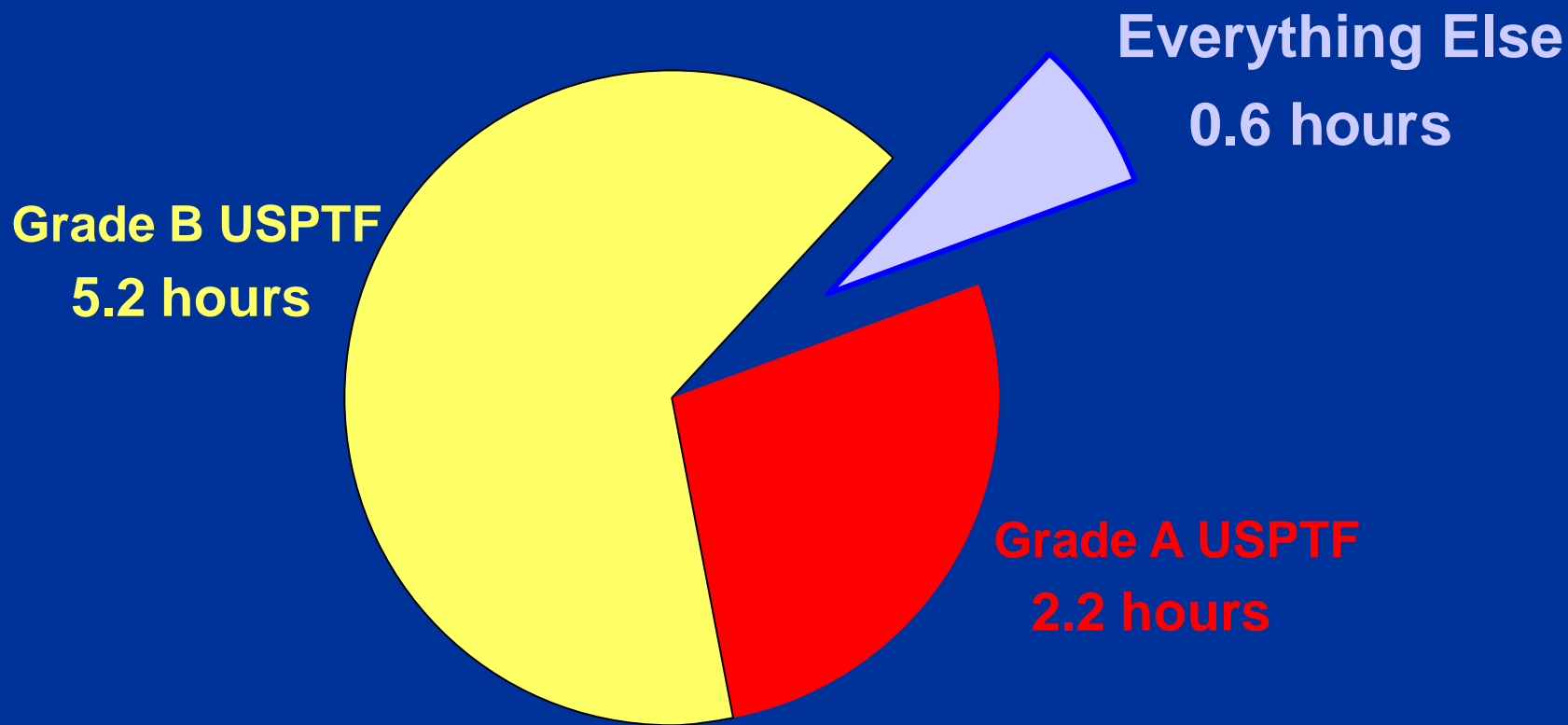


Probabilistic sensitivity analyses suggest cost-savings in 80% of 5000 simulations

Why Wasn't This More Effective?

1. Still too low a dose of intervention
2. Patients still not activated enough
3. Still needs primary care physician to initiate visit, arrange and interpret BMD tests, risk stratify patient, provide education and prescribe treatment i.e., wasn't time or effort neutral

Lack of Time to Do All That Needs to Be Done Every Day



(Yarnall et al. Am J Publ Health. 2003;93:635)

Conditions and Methods Studied With Other UofA Knowledge Translation Researchers

Conditions

- Osteoporosis
- Type-2 diabetes
- Pneumonia
- Obesity
- Hypertension
- Coronary disease
- Heart failure
- Stroke
- Atrial fibrillation
- Depression
- Asthma and COPD
- Injuries (falls, whiplash)

Methods Studied

- Patient decision aids
- Patient incentives
- Evidence summaries
- Critical pathways
- Academic detailing
- Opinion leaders
- Reminders
- Audit and feedback
- Computer decision support
- Case managers
- Lay healthcare workers
- Physician incentives (P4P)

Conclusions

- **My KT research is about measuring, understanding and fixing “care-gaps”**
- **In theory all KT interventions work; in controlled trials many don't and even when they do, the effects are modest**
- **Like drugs or devices, KT interventions need to be tested in controlled trials to establish their safety and effectiveness**

Questions or Comments?

