

Family Medicine Grand Rounds
University of Washington

**The role of clinical pathways in primary
care: a conceptual framework**

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UW family medicine residency

Continuing Medical Education credit

This live series activity, UW Family Medicine Grand Rounds, is under review for 1 Prescribed Credit by the American Academy of Family Physicians.

Attendees should claim only the credit commensurate with the extent of their participation in the activity.

Learning Objectives:

By the end of the session, participants will be able to:

- Describe how clinical pathways differ from other clinical decision support tools
- Evaluate a conceptual framework for the role that clinical pathways might play in primary care
- Analyze preliminary data on usability of clinical pathways for chronic conditions

Disclosures: conflicts of interest

Andrew Gomez - Neither I, nor any immediate family member has any financial relationship with, or interest in, any commercial interest connected with this presentation.

Richard Waters - Consulting for Google - no direct relevance to clinical pathways

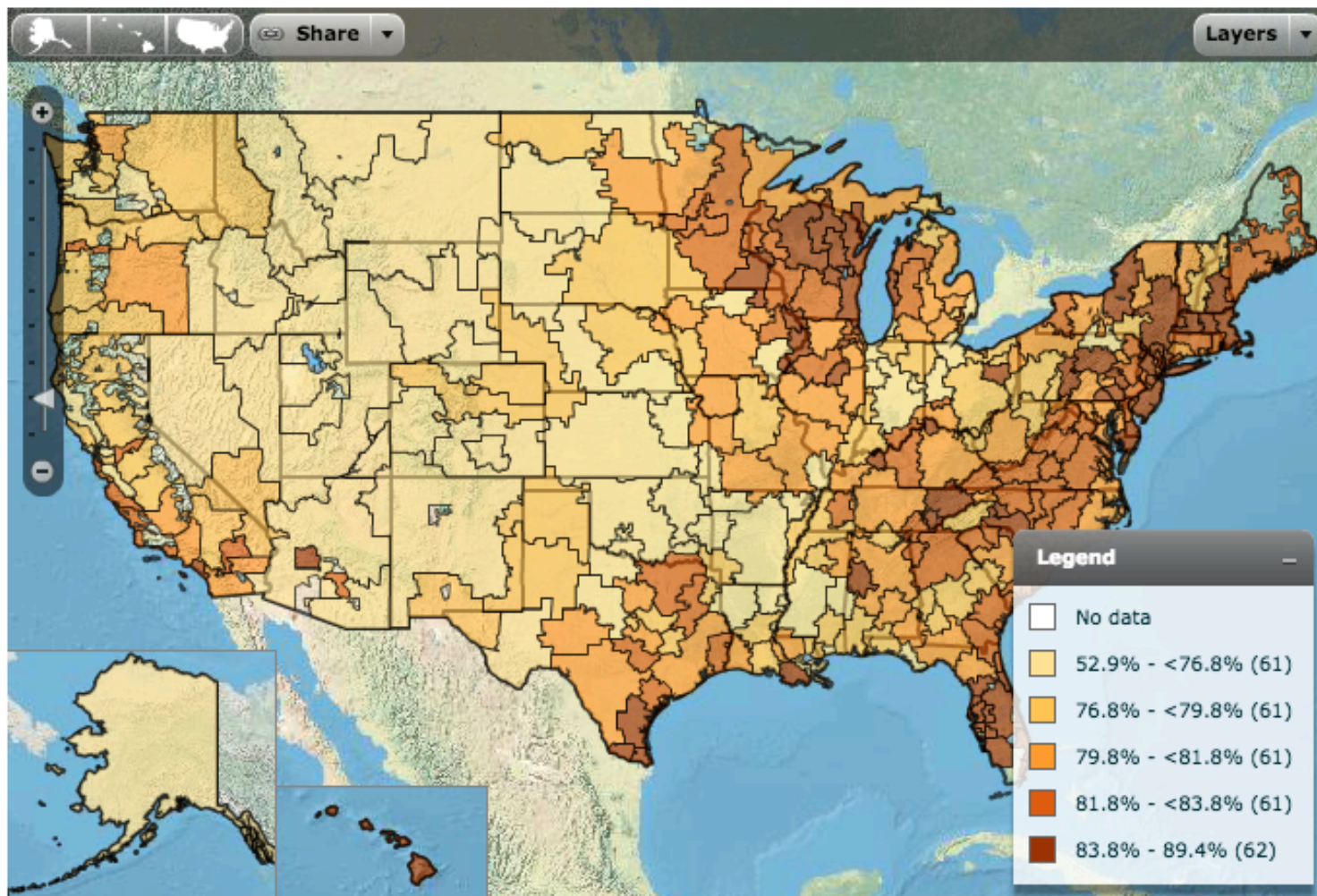
Adam Drechsler - Has owned in the past year, currently owns, or plans on purchasing in the next three months the following stocks: BIIB, GILD, REGN - no direct relevance to clinical pathways

Disclosure of Off-Label Drug Use

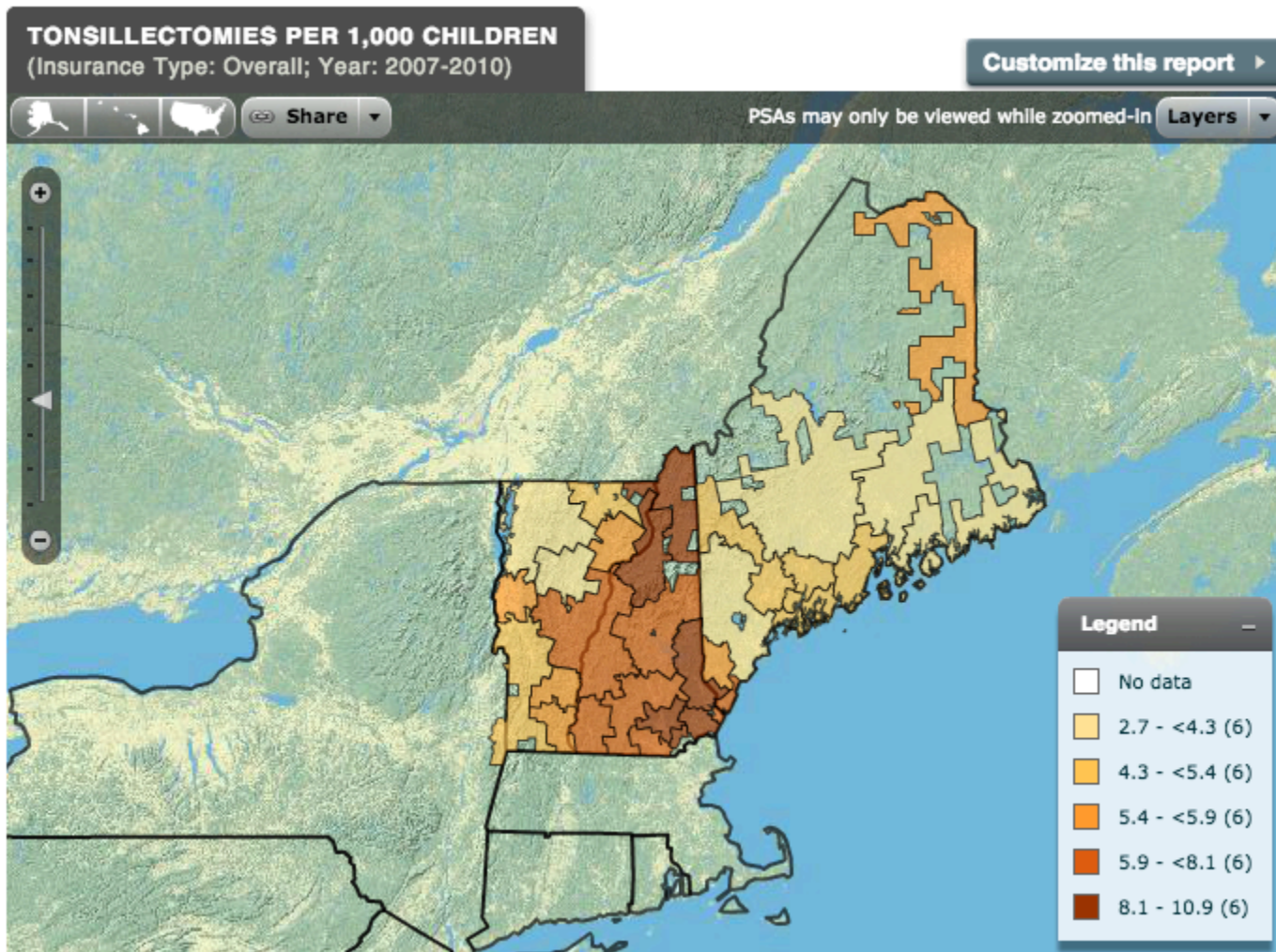
The of material in this CME activity will not include discussion of unapproved or investigational uses of products or devices.

Starting observations:

Regional variability in care & costs

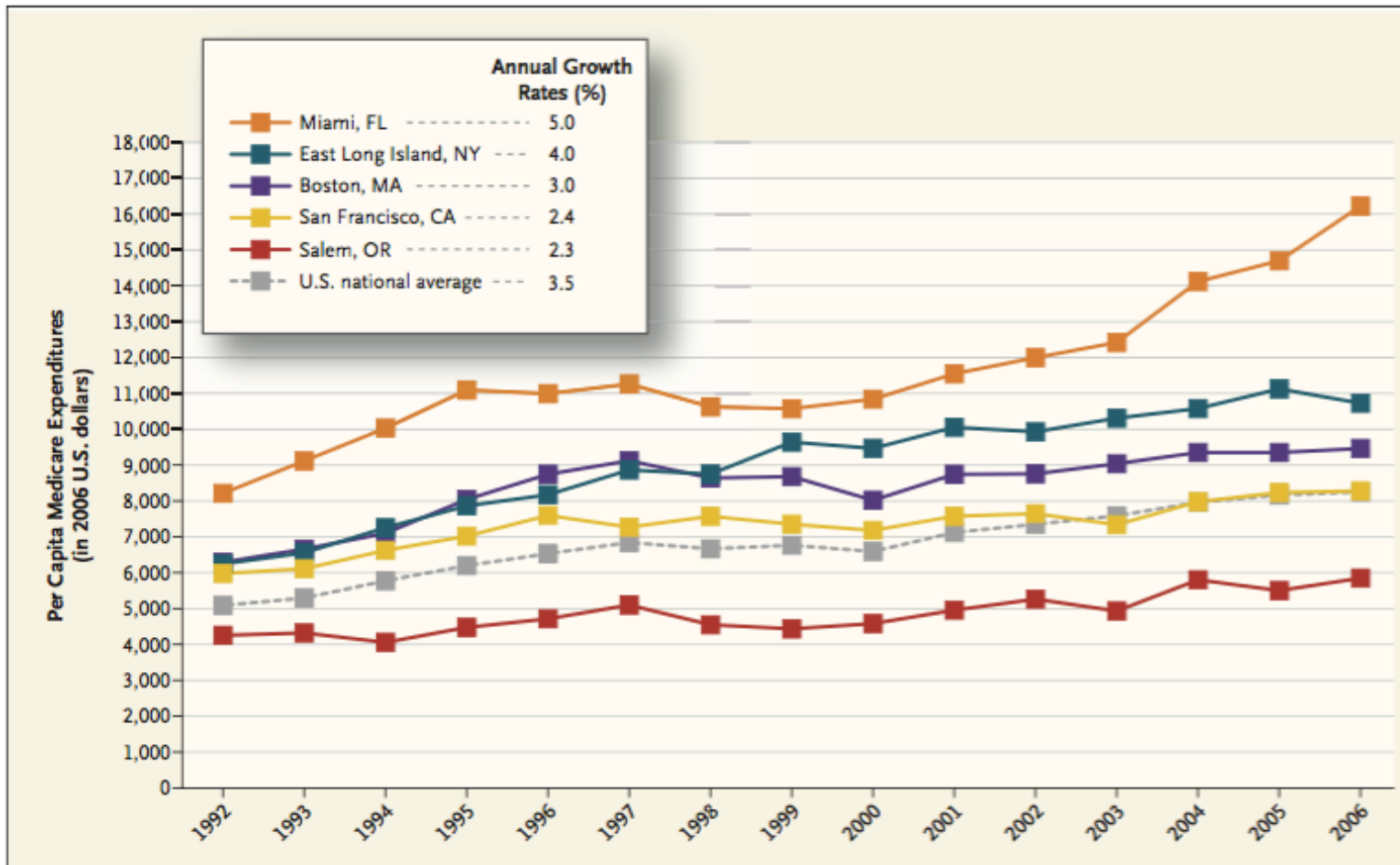


Process measures of diabetes care in the US. <http://www.dartmouthatlas.org/>



Tonsillectomies per 1,000 children in New England. <http://www.dartmouthatlas.org/>

Fisher, NEJM
2009; 360:849

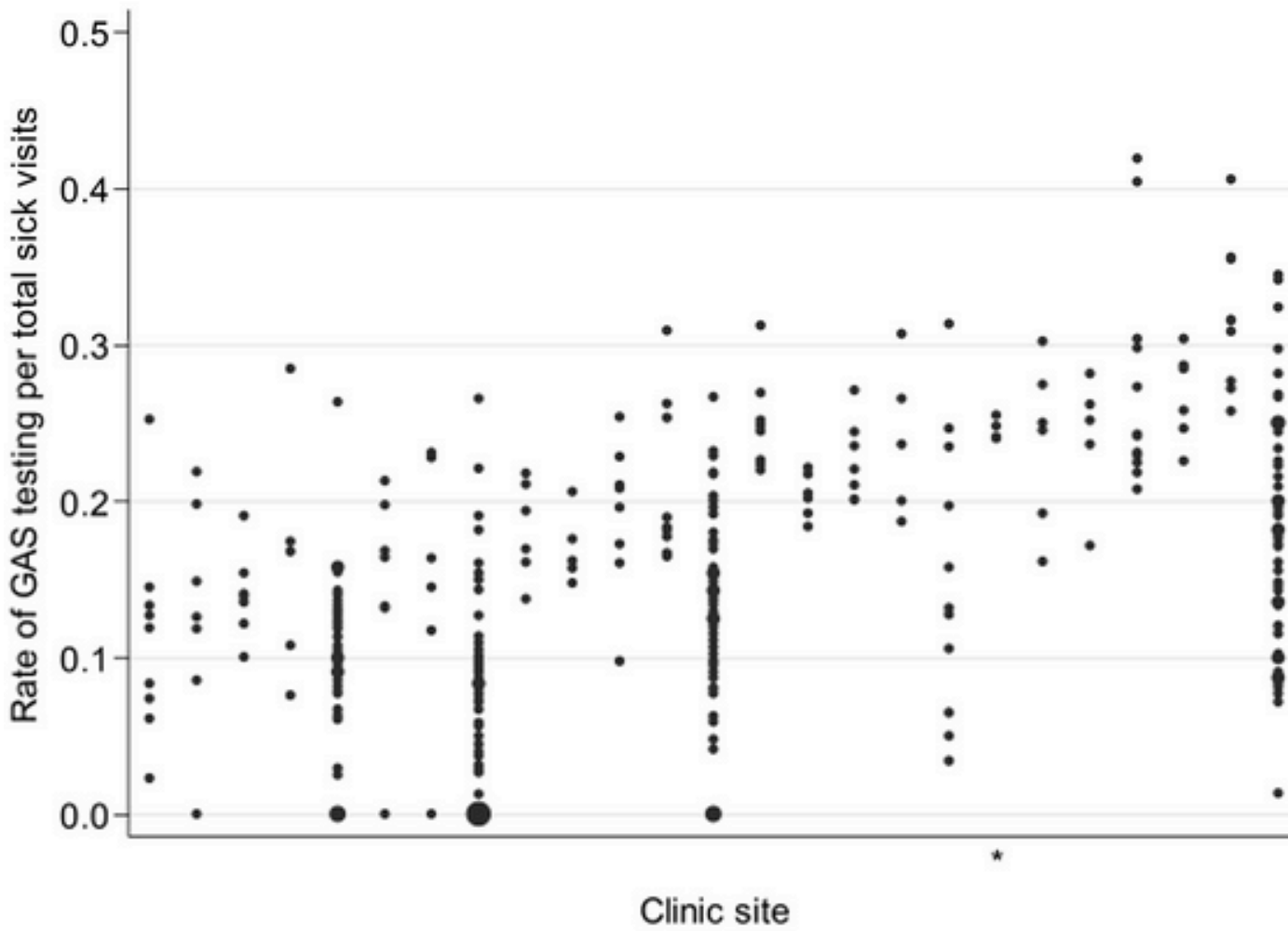


Annual Growth Rates of per Capita Medicare Spending in Five U.S. Hospital-Referral Regions, 1992–2006.

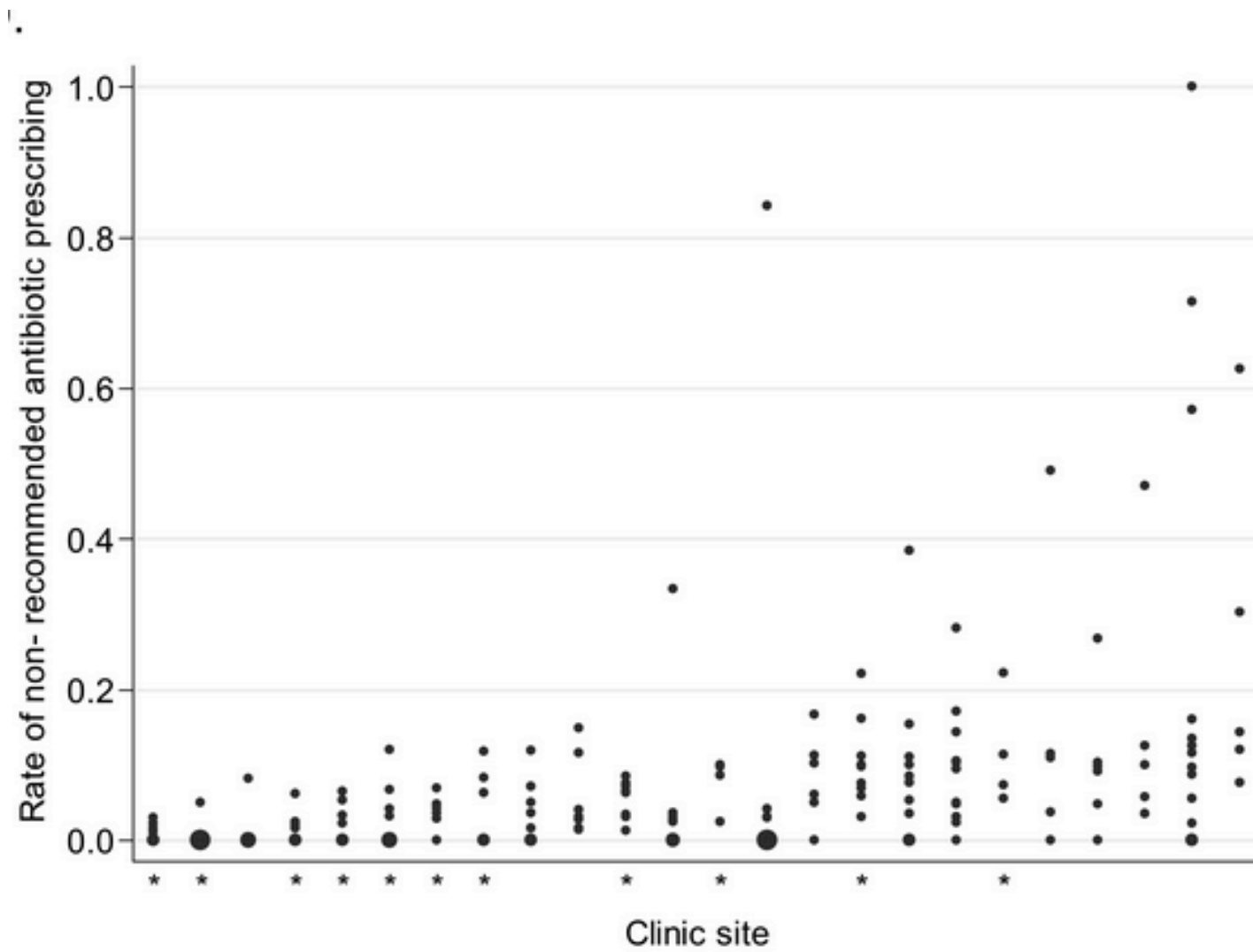
Data are in 2006 dollars and were adjusted with the use of the gross domestic product implicit price deflator (from the Economic Report of the President, 2008) and for age, sex, and race. Data are from the Dartmouth Atlas Project.

Starting observations:

Provider- and clinic-level variability in care & costs



Fierro, Infect Control
Hosp Epidemiol 2014;
35 S3:S79



Fierro, Infect Control
 Hosp Epidemiol 2014;
 35 S3:S79

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THE COST CONUNDRUM

What a Texas town can teach us about health care.

BY ATUL GAWANDE



It is spring in McAllen, Texas. The morning sun is warm. The streets are lined with palm trees and pickup trucks. McAllen is in Hidalgo County, which has the lowest household income in the country, but it's a border town, and a thriving foreign-trade zone has kept the unemployment rate below ten per cent. McAllen calls itself the Square Dance



OVERKILL

An avalanche of unnecessary medical care is harming patients physically and financially. What can we do about it?

BY ATUL GAWANDE



It was lunchtime before my afternoon surgery clinic, which meant that I was at my desk, eating a ham-and-cheese sandwich and clicking through medical articles. Among those which caught my eye: a British case report on the first 3-D-printed hip implanted in a human being, a Canadian analysis of the rising volume of emergency-room visits by children who have ingested magnets, and a Colorado



About

Lists

In Action

Resources

Videos



Lists

See which tests and procedures should be questioned

Starting observations:

Existence of an evidence-to-practice gap

McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, et al. The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003;348(26):2635-45.

Table 3. Adherence to Quality Indicators, Overall and According to Type of Care and Function.

Variable	No. of Indicators	No. of Participants Eligible	Total No. of Times Indicator Was Met	Percentage of Recommended Care Received (95% CI)*
Overall care	439	6712	98,649	54.9 (54.3–55.5)
Type of care				
Preventive	38	6711	55,268	54.9 (54.2–55.6)
Acute	153	2318	19,815	53.5 (52.0–55.0)
Chronic	248	3387	23,566	56.1 (55.0–57.3)
Function				
Screening	41	6711	39,486	52.2 (51.3–53.2)
Diagnosis	178	6217	29,679	55.7 (54.5–56.8)
Treatment	173	6707	23,019	57.5 (56.5–58.4)
Follow-up	47	2413	6,465	58.5 (56.6–60.4)

* CI denotes confidence interval.

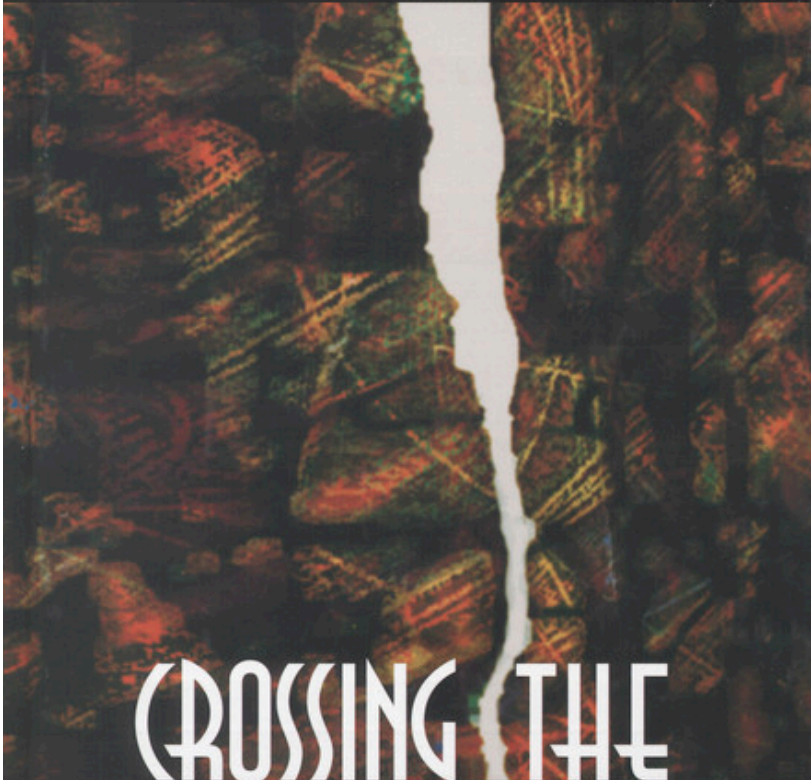
McGlynn, NEJM 2003; 348:2635

Table 5. Adherence to Quality Indicators, According to Condition.*

Condition	No. of Indicators	No. of Participants Eligible	Total No. of Times Indicator Eligibility Was Met	Percentage of Recommended Care Received (95% CI)
Senile cataract	10	159	602	78.7 (73.3–84.2)
Breast cancer	9	192	202	75.7 (69.9–81.4)
Prenatal care	39	134	2920	73.0 (69.5–76.6)
Low back pain	6	489	3391	68.5 (66.4–70.5)
Coronary artery disease	37	410	2083	68.0 (64.2–71.8)
Hypertension	27	1973	6643	64.7 (62.6–66.7)
Congestive heart failure	36	104	1438	63.9 (55.4–72.4)
Cerebrovascular disease	10	101	210	59.1 (49.7–68.4)
Chronic obstructive pulmonary disease	20	169	1340	58.0 (51.7–64.4)
Depression	14	770	3011	57.7 (55.2–60.2)

McGlynn, NEJM 2003; 348:2635

I N S T I T U T E O F M E D I C I N E



CROSSING THE QUALITY CHASM

A New Health System for the 21st Century

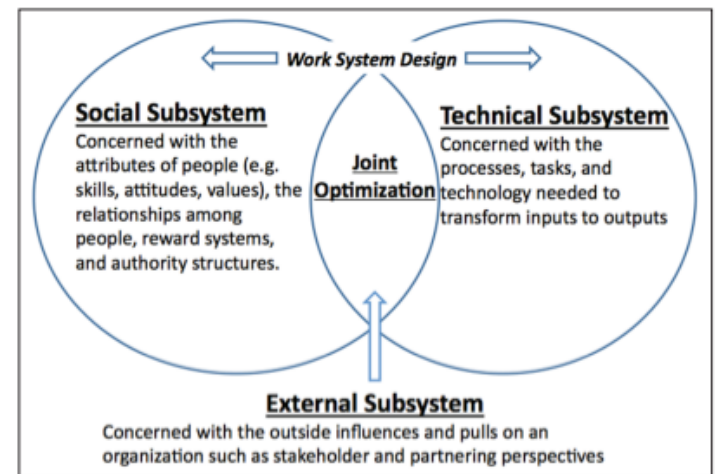
IOM 2001: Crossing the quality chasm

10 rules for re-design:

1. Care is based on continuous healing relationships
2. Care is customized to patient needs and values
3. The patient is the source of control
4. Knowledge is shared & information flows freely
5. Decision making is evidence-based
6. Safety is a system property
7. Transparency is necessary
8. Needs are anticipated
9. Waste is continuously decreased
10. Cooperation among clinicians is a priority

Sources of Variability in Primary Care

- Environmental
 - Clinic staffing
 - Time with patients / Pace
 - Resources
 - Provider experience
- Social
 - Perceptions of decision support tools
 - Technology use during encounters
- Technical
 - Availability of decision support
 - Access to clinical data

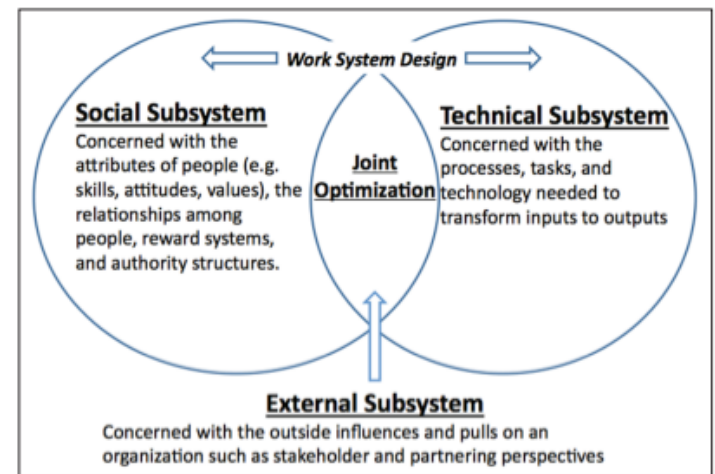


* Within same patient population

Militello, Health Informatics J 2014;20:35

Sources of Variability in Primary Care

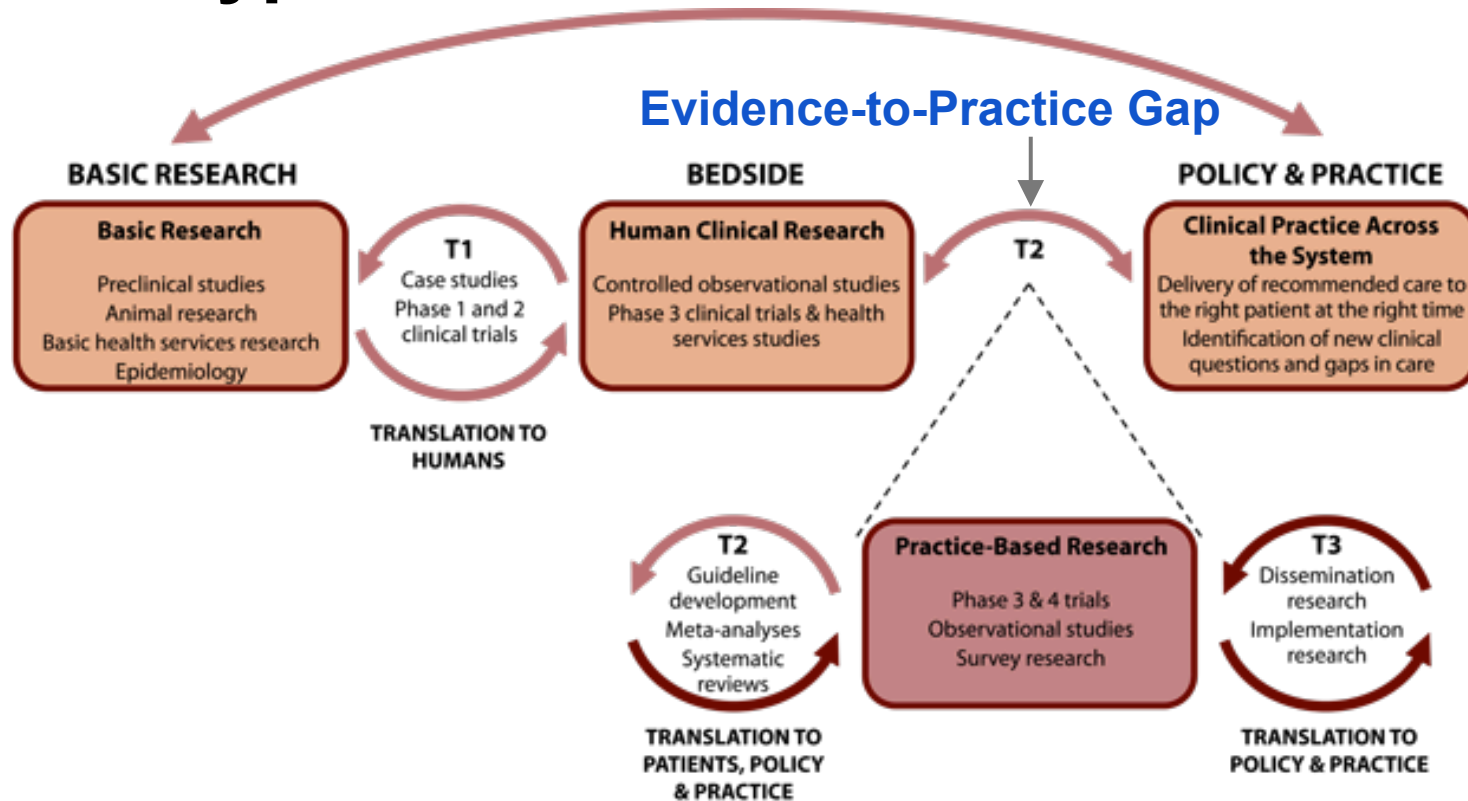
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* Within same patient population

Militello, Health Informatics J 2014;20:35

Type 2 Translational Research



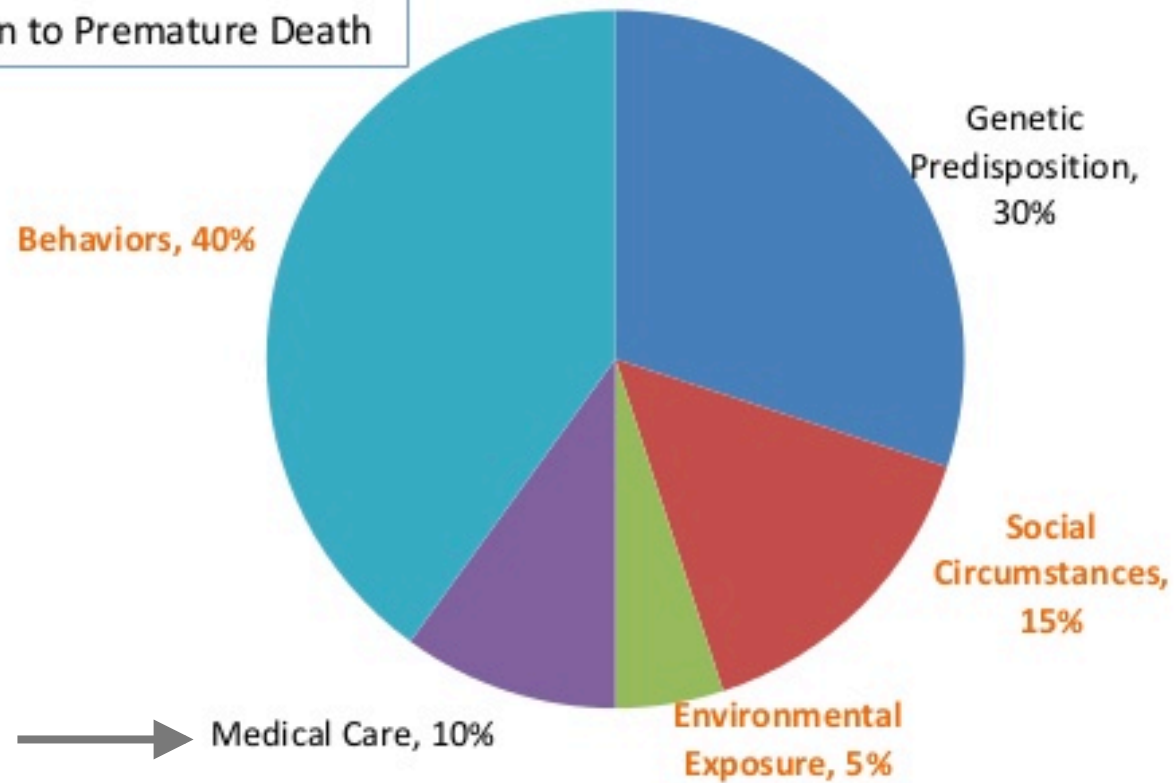
Westfall et al. Practice-based research – “blue Highways” on NIH roadmap. JAMA. 2007; 297(4): 403–406 (adaptation).

NSW Health and Medical Research Strategic Review 2012. NSW Ministry of Health. Page 4 (adaptation).



What Creates Health?

Determinants of Health and Their Contribution to Premature Death



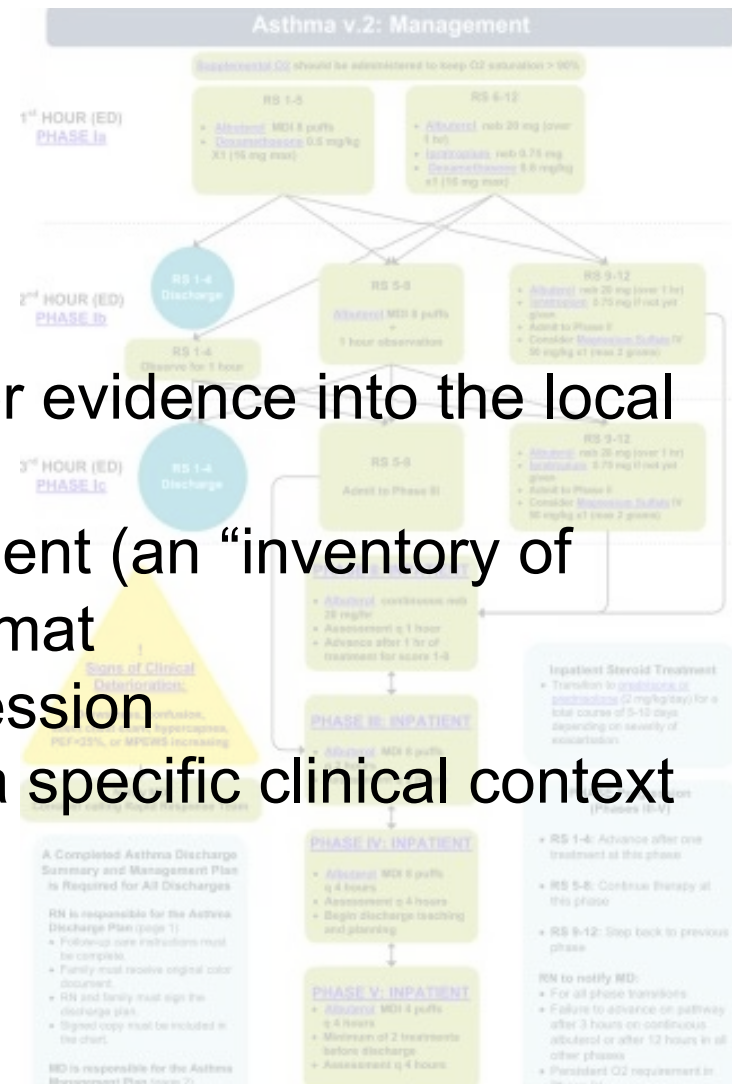
Adapted from McGinnis JM, Foegen WH. Actual causes of death in the United States. JAMA 1993; 270:2207-2212.

Clinical Decision Support Tools

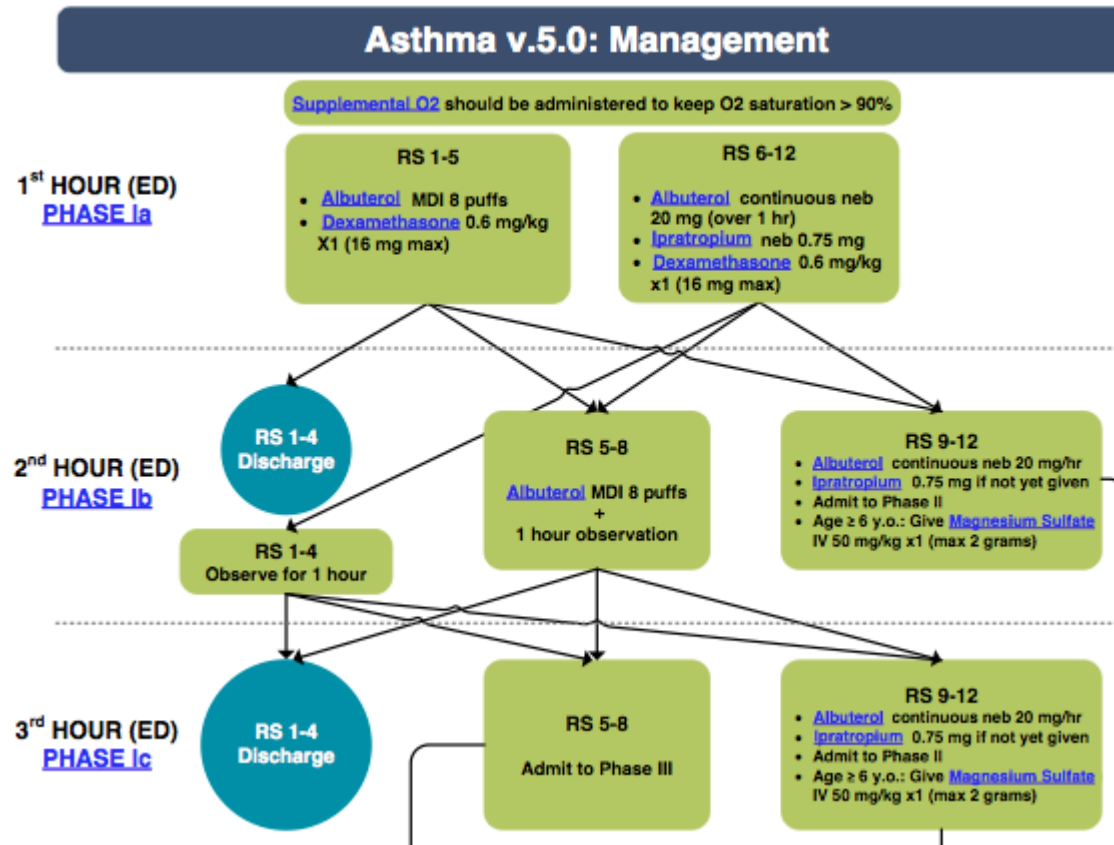
- Clinical practice guidelines (CPGs)
- Clinical pathways
- Health care maintenance tab
- Best practice alerts
- Lab alerts
- Powerplans / Smart Sets
- UpToDate
- Dynamed
- Static vs Dynamic

Clinical Pathways

- Structured plan of care
- Used to translate guidelines or evidence into the local healthcare settings
- Details the steps in management (an “inventory of actions”) in a manageable format
- Includes criteria-based progression
- Aims to standardize care for a specific clinical context

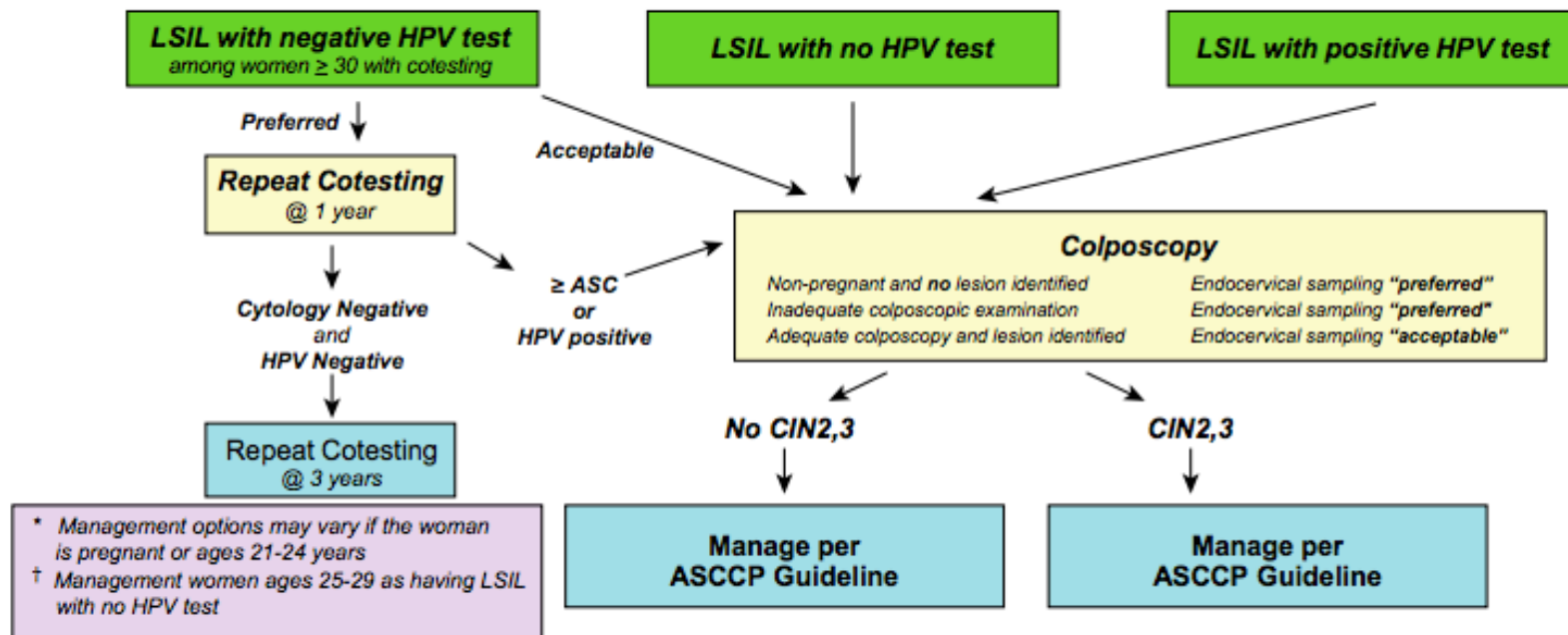


SCH Pathway Examples

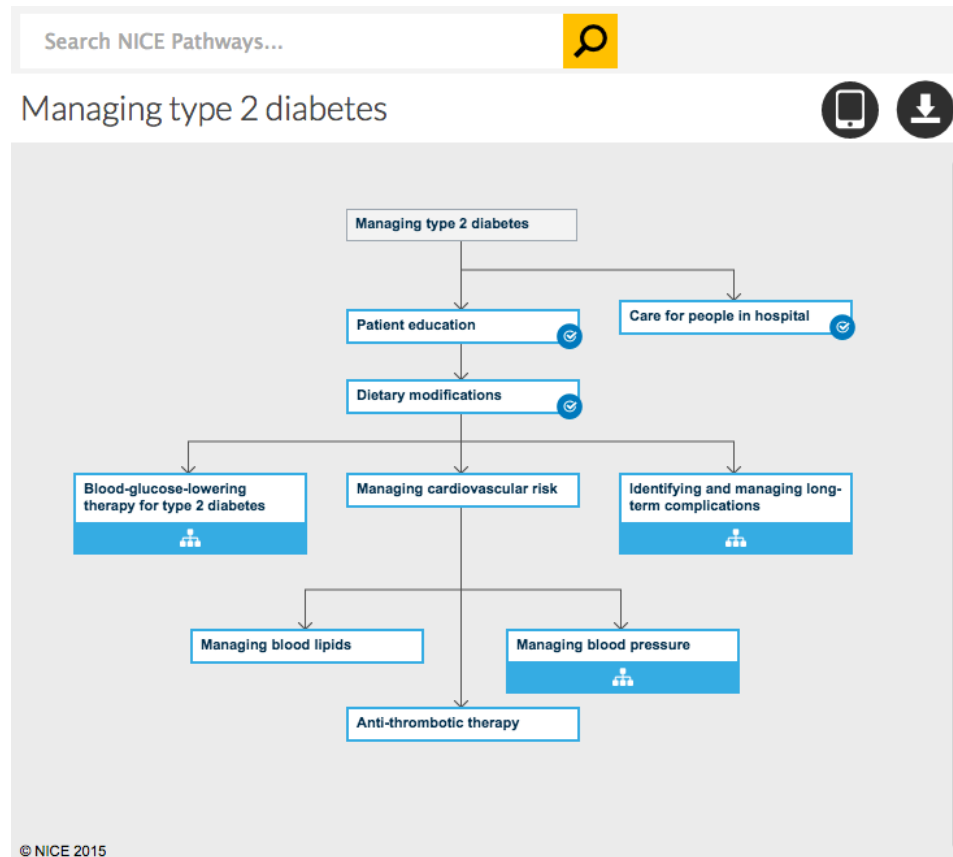


ASCCP

Management of Women with Low-grade Squamous Intraepithelial Lesions (LSIL)^{*†}



NICE pathway examples



CPs inpatient:

reduced complications
(0.58 odds ratio)

Lower cost / decreased
LOS

Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs (Review)

Rotter T, Kinsman L, James EL, Machotta A, Gothe H, Willis J, Snow P, Kugler J



Cochrane Database of Systematic
Reviews 2010; 3:CD006632

CPs inpatient

	Condition				
	Chest pain	Arterial switch operation	Hypertrophic cardiomyopathy	Aortic stenosis treated in clinic	Aortic regurgitation
NUMBER OF EPISODES					
Control	406	158	99	51	107
SCAMP	399	188	226	83	111
AVERAGE COST PER EPISODE OF CARE					
Control (\$)	1,506	2,384	1,638	5,406	2,064
SCAMP (\$)	1,200	2,111	1,306	2,661	1,464
Reduction with use of SCAMP (%)	20	11	20	51	29

SCAMP = Standardized clinical assessment and management plan

Questions raised:

Why, and when, might CPs be beneficial in primary care?

Any theoretical benefit compared with existing clinical practice guideline documents?

For whom are pathways designed, and can they be designed for different audiences?

Clinical Guidelines vs. Clinical Pathways in Primary Care

Clinical Guidelines:

- Important because they include systematic reviews of all available evidence.
- Main benefit: Synthesis and dissemination of vast amounts of information.
- Enhance patient care by reviewing benefits/harms/alternatives of treatment options.
- Clinical Pathways have a similar goal but the approach is different.

Pitfalls of clinical guidelines:

- Lengthy multi-page documents
- Insufficient time for physicians to sort through guidelines
- Not always directed toward primary care

Clinical Pathways

- Translate existing recommendations/guidelines into an easily navigated format
 - Visual formats
 - Algorithmic formats
- Meant to be less time consuming, typically one to two page charts
- Only relevant information for guidelines are utilized and tailored to the target clinical setting, i.e. primary care.

Bioscience Theories of Learning

Cognitive Theory of Multimedia Processing

Verbal, written, and pictorial information processing

Multiple formats increases uptake

Cognitive Load Theory

↓ extraneous material

Manage essential material; segment

Increase generative processing: words + pictorial representation

CP's can empower physicians and non-physicians

- Expanding protocols for nurse-based triage
- Further assist any team member in chronic care management
-i.e. Diabetes educators
- Help engage patients and their families in the care process

Patient centered pathways

- A similar visual/algorithmic format that the patient can reference when not with the clinician.

 - For example, asthma action plan

- Give patient some autonomy in managing their own chronic condition

- Help forecast expected monitoring, highlight warning signs, describe treatment rationale

Other Benefits of Clinical Pathways

- More time with patients and better anticipatory guidance.
- “Smart” EHR

Limitations

Conflicts of interest

Single-entity

Strength of recommendations

Require baseline knowledge

Questions/comments at this point?

Health care provider survey on CPs

What decision support tools are being used?

What is the perceived usability of CPs for patient care?

As a learning / recall tool?

Preference for flow design vs segmented design?

Methods

Internet-based survey

Convenience sampling

Inclusion criteria:

- MD, DO, ARNP, PA, clinical pharmacist
- In primary care
- Residents or attendings (MD/DOs)

Voluntary, no compensation

Outcomes (1)

Prevalence data, by provider type

- Types of clinical decision support tools used
- Use of clinical guidelines
- Use of clinical pathways

Perceptions of clinical pathways

- Before vs after working with a CP

Outcomes (2)

Usability of two design types of CPs

Flow design vs segmented design

Conditions used: chronic Gout, chronic COPD

Primary outcome:
Score

System Usability

Secondary outcomes:

Question set score

Question set confidence



System Usability Scale (SUS)

The System Usability Scale (SUS) provides a “quick and dirty”, reliable tool for measuring the usability. It consists of a 10 item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree. Originally created by John Brooke in 1986, it allows you to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications.

Benefits of using a SUS

SUS has become an industry standard, with references in over 1300 articles and publications. The noted benefits of using SUS include that it:

- Is a very easy scale to administer to participants
- Can be used on small sample sizes with reliable results

System usability score: measuring user experience

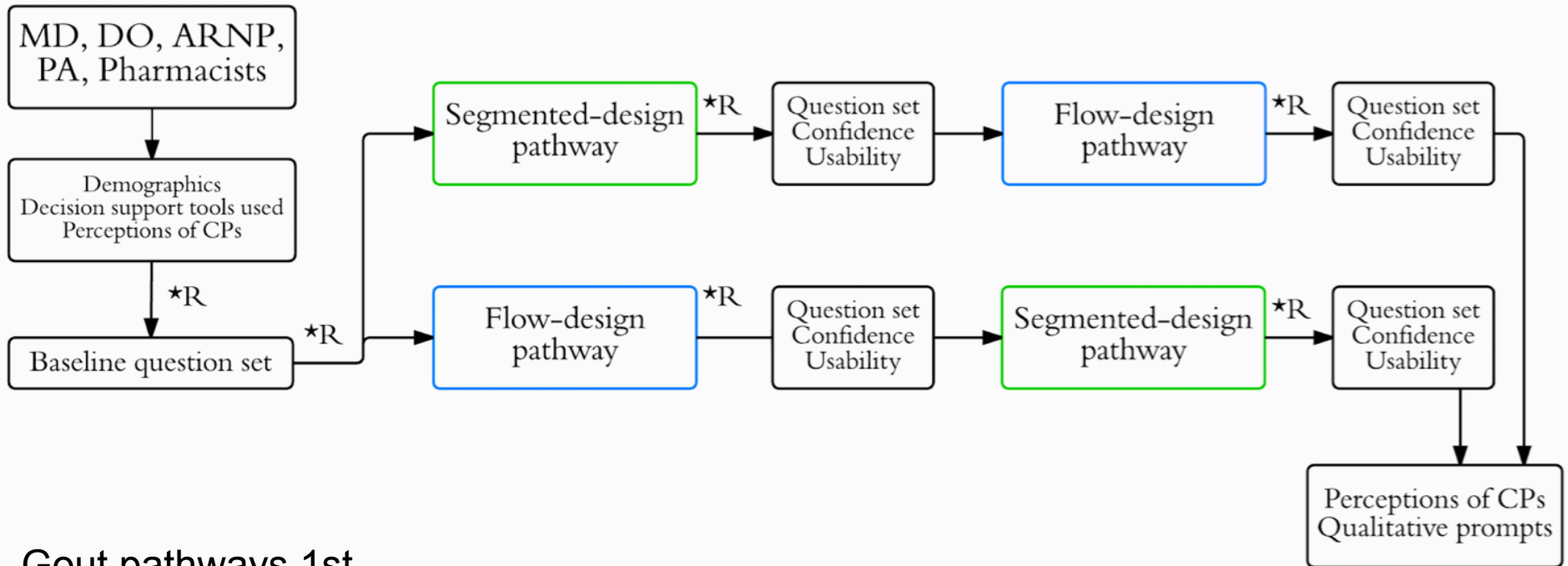
Validated assessment of perceived usability.

10-item scale, each assessed by 5-point Likert scale

Calculated score between 0 -100
but not a percentage

Brooke J. SUS-A quick and dirty usability scale. Jordan PW, Thomas B, Weerdmeester BA, McClelland IL, eds. Usability Evaluation in Industry. London: Taylor and Francis, 1996:189–94.

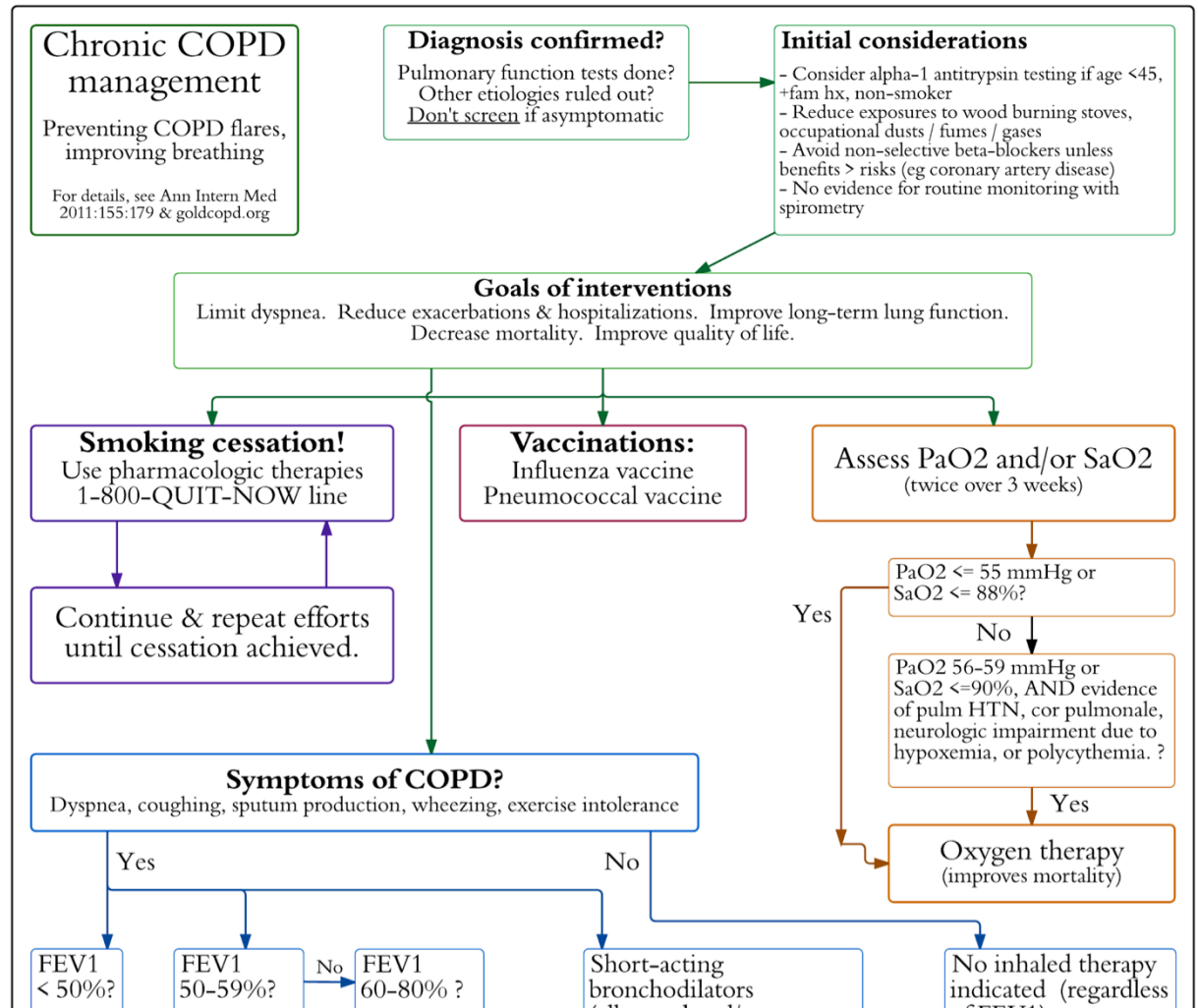
Survey design



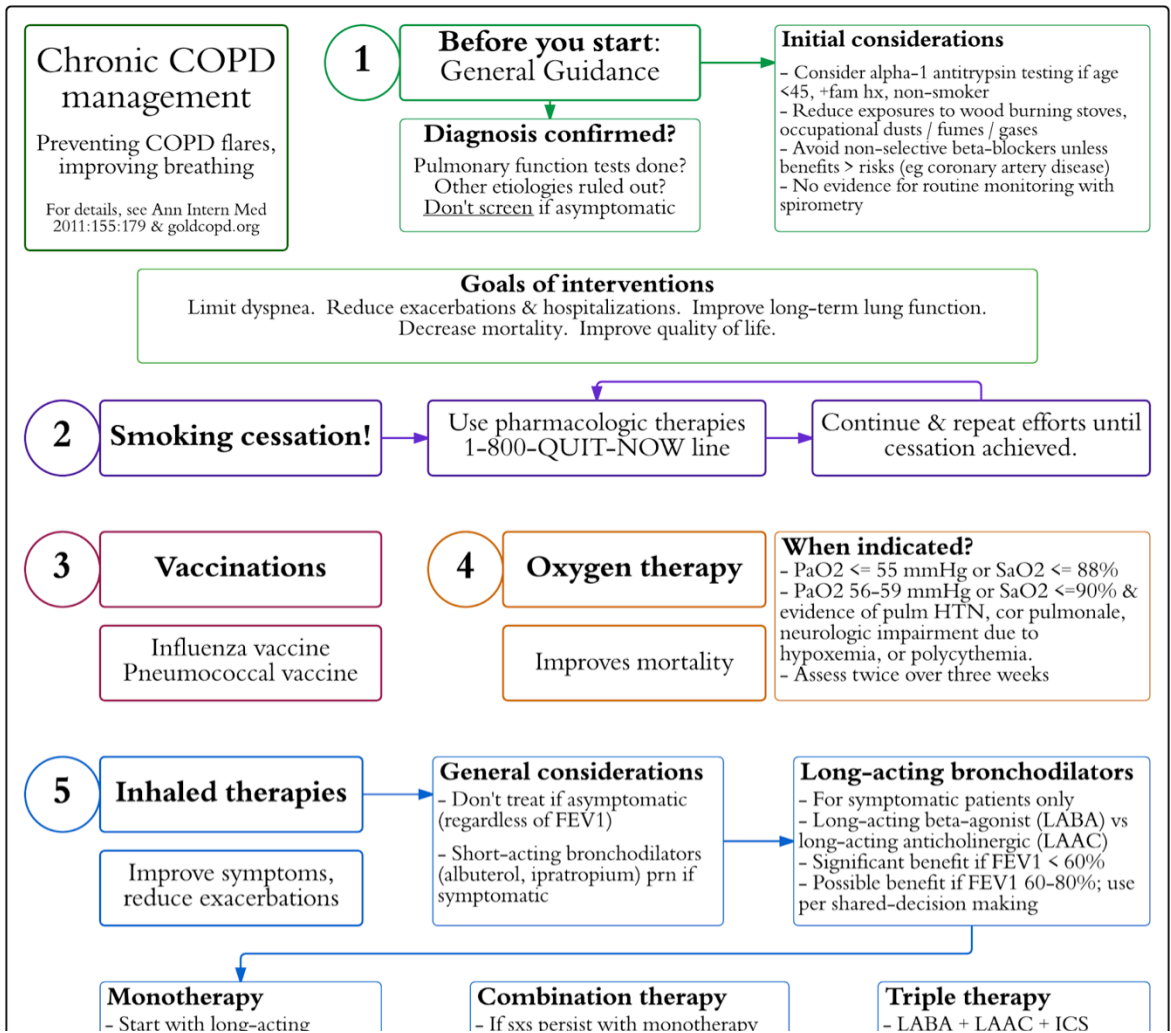
Gout pathways 1st
Optional COPD pathways 2nd

*R = randomization

Flow-design



Segmented design



Preliminary results

35 respondents

17 attendings

12 residents

3 clinical pharmacists

3 ARNPs

Preliminary results

Clinical decision support tools used

UpToDate			100%
Phone applications		71%	
Clinical practice guidelines	54%		
Books			54%
Dynamed			26%
Wikipedia			22%
Clinical pathways		14%	
EHR			14%

Guidelines: 48% use guidelines weekly; 22% rarely or never

Usability: chronic Gout pathways

System usability score:

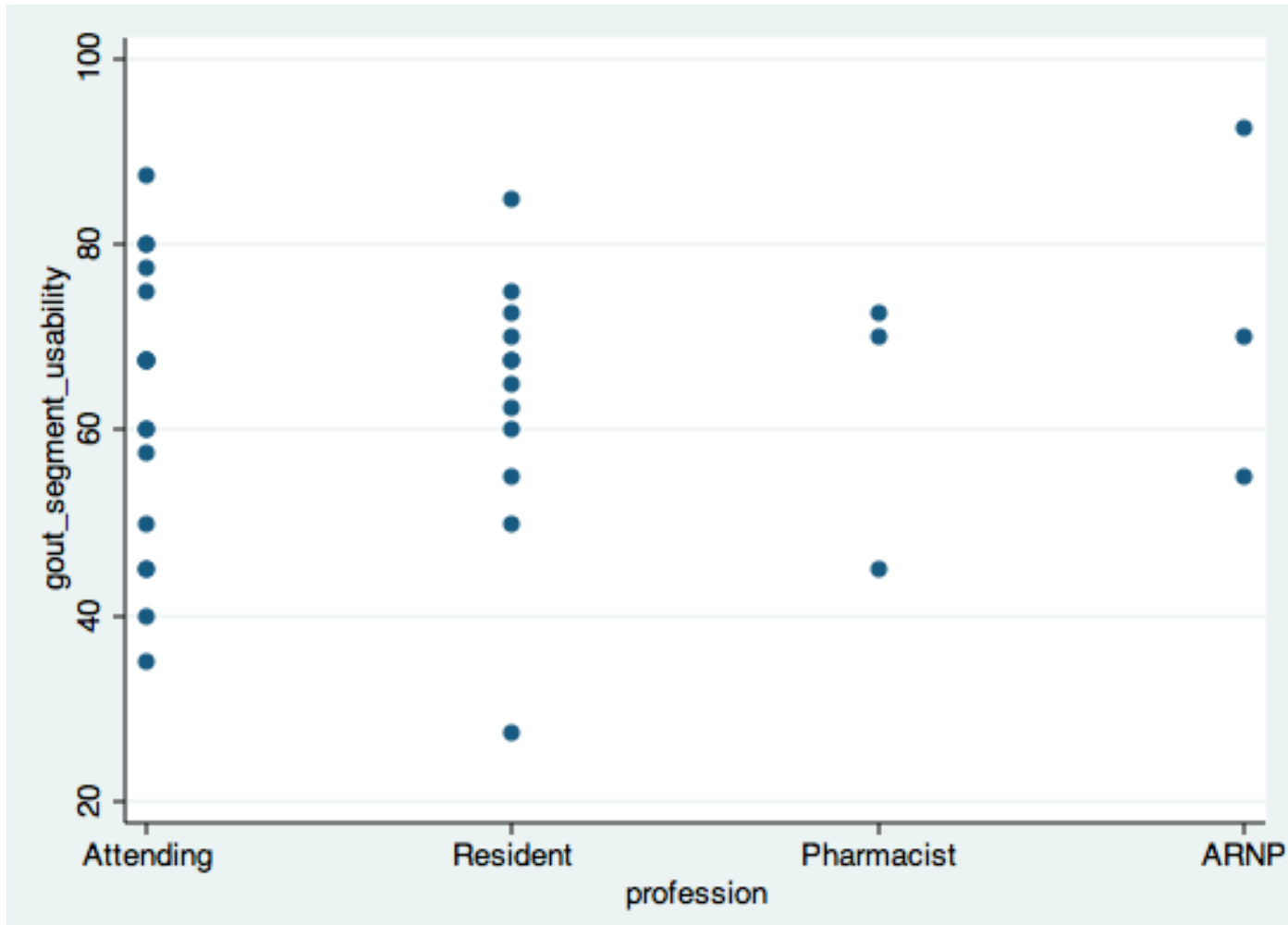
Flow-design: 53

Segmented-design: 64

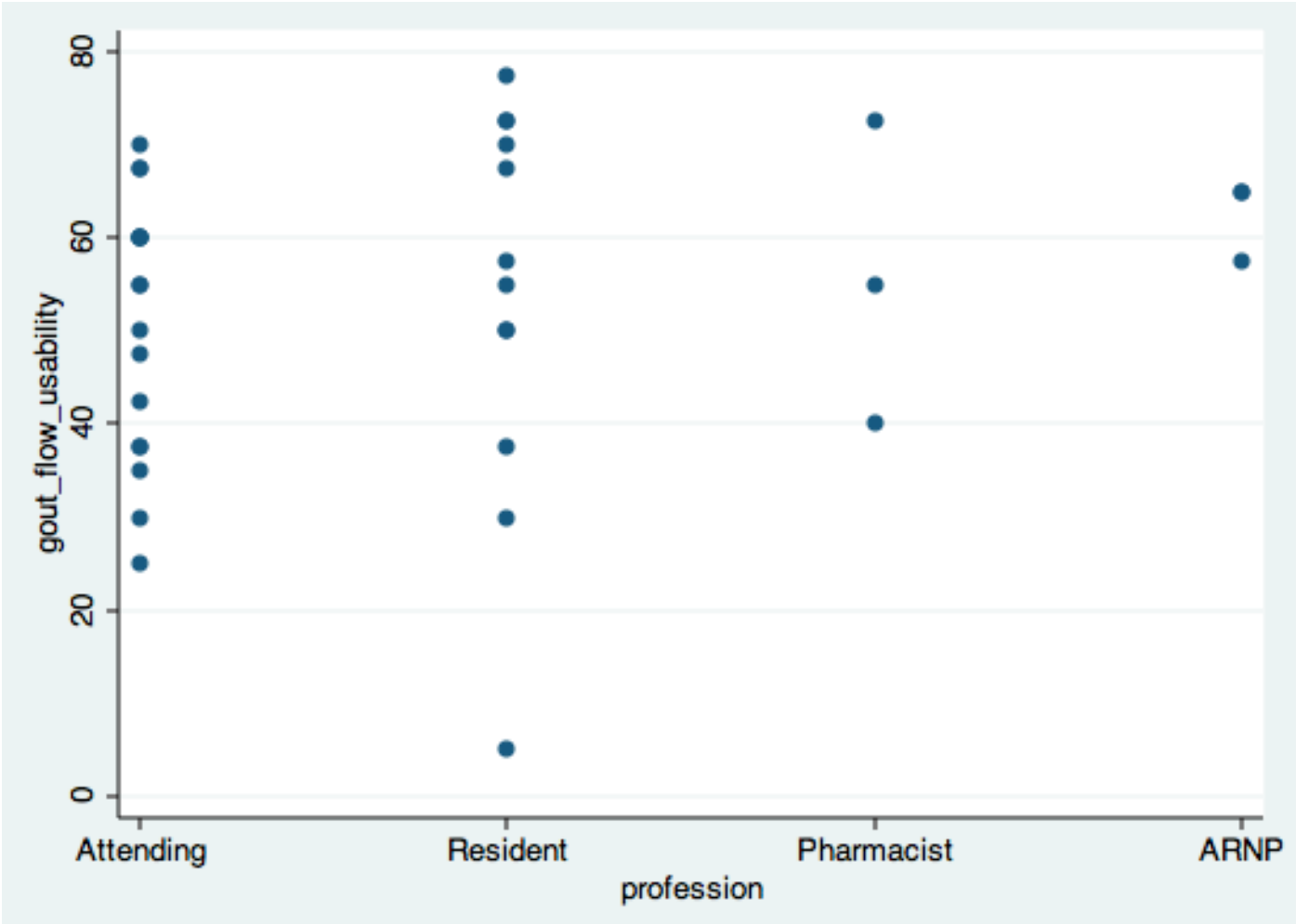
$p = 0.007$

No difference by attending/resident status

Flow-design dependent on order appeared



System usability scores by profession: chronic gout segmented pathway



System usability scores by profession: chronic gout segmented pathway

Chronic Gout pathways

Baseline question set correct: 39%
Baseline confidence (1-5):
2.4

Flow-design question set correct: 82%*
Flow-design confidence:
3.8*

Segment-design question set correct: 85%*
Segment-design confidence:
4.0*

Perceptions of CPs

No change pre- and post-working with pathways.

71% Use daily or weekly for patient care

85% Use daily, weekly or monthly as learning tool

Preliminary conclusions?

Diversity of decision support tools use

Segment-design preferred

?? Improved performance ??

Interest in CPs present

Acknowledgements

Jennifer Toy, PharmD - PGY-2 ambulatory care
@ HMC

Freddy Chen, MD, MPH @ HMC family
medicine

Questions?

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