



TRANSLATING GUIDELINES TO PRACTICE

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Evidence To Practice

- Current practice of translation with and w/o an EHR
- Challenges to effective use of knowledge
- A look to the future

CPGs, EHR, and Computer Aided Clinical Decision Support (CDS)

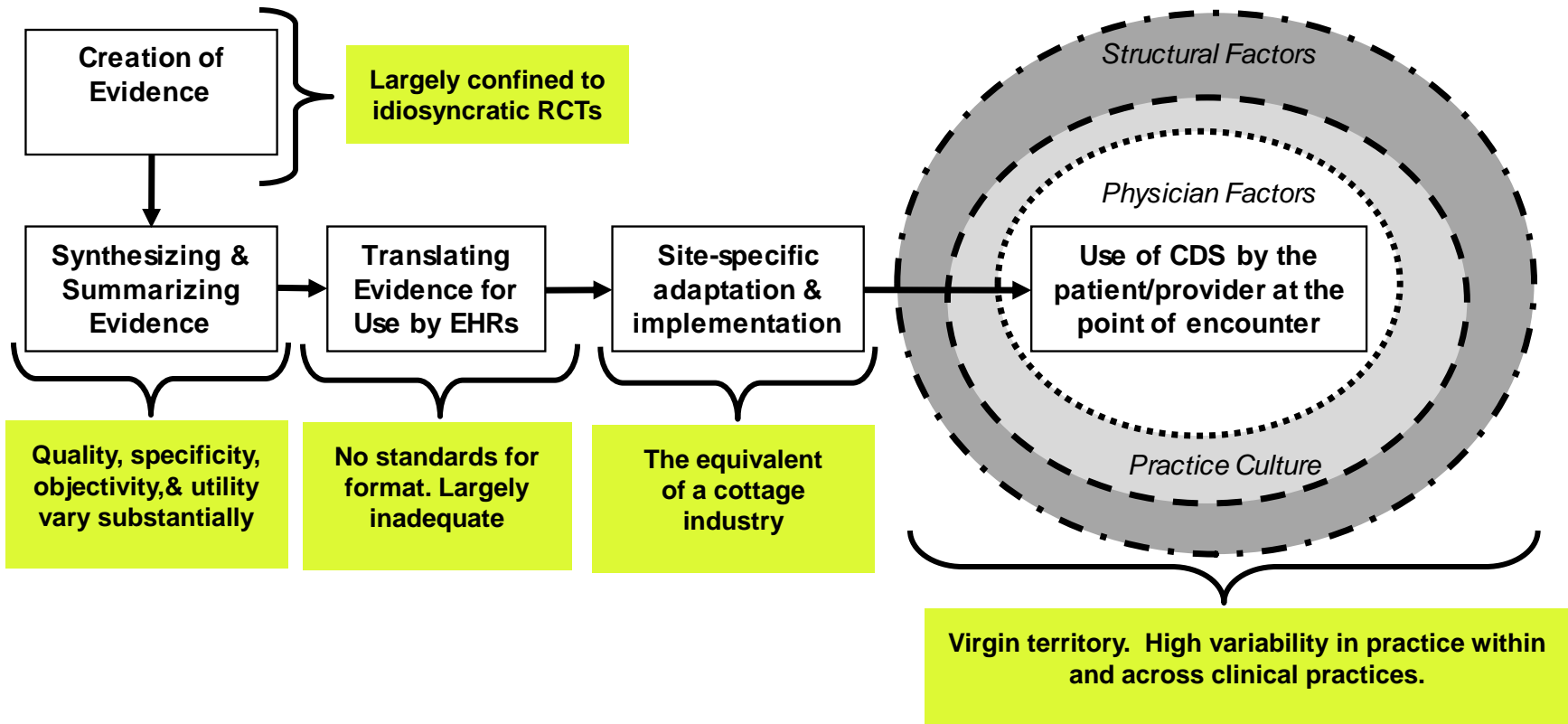
- Common applications of CDS
 - Diagnosis
 - Preventive care reminders
 - Disease management or protocols for bundles of reminders
 - Drug dosing/prescribing protocols
- 25% of studies are from 4 systems and not generalizable
- Simple point-of-care reminders or alerts
 - Rx or test orders, recommended care, documentation, avoidance of unnecessary care
 - <10% effective on process measures
- CDS alerts fail on the most basic measure of utility
 - Failure to use

CPGs, EHR, and Computer Aided Clinical Decision Support (CDS)

- Easy to blame the customer
 - “They are just not cooperating”
- Proximal causes of alert failure
 - Poorly designed, poor content
 - Designed for someone other than a physician (e.g., quality improvement)
 - Directed at the wrong person
 - Messages are burdensome
- Most evidence on CDS has not evaluated
 - Maintained by large delivery systems with years of experience using EHRs

Should There Be a CME Model for Learning During Practice Through the Use of CDS?

Translating Knowledge to Practice



Effective Use of Knowledge

- Requires more than simply learning knowledge
- Numerous other contextual and iterative cognitive processes
 - Understanding context
 - Gathering the right data
 - Accessing the right knowledge
 - Applying knowledge to data
 - Interpreting options
 - Communicating options

Digital Steps in Translating Knowledge to Practice

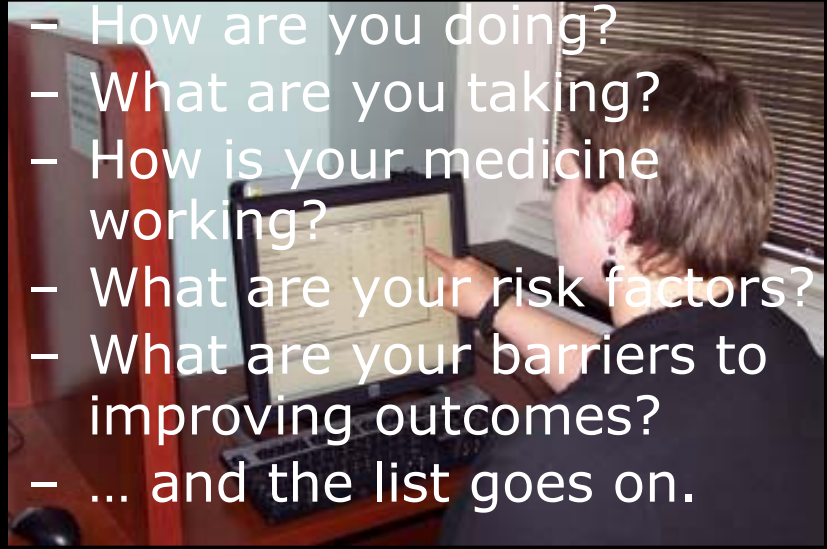
- **Trigger:** A decision to initiate a process
 - Usually requires preliminary and actionable data
- **Input data:** In a form that is actionable
 - Need to know more about the patient to tailor options
- **Apply rules to data to identify options**
 - Options should be presented in an intuitively understandable form
 - Score options in relation to patient preferences
- **Display of information**
 - The review of **Options** should be a shared process

Recent Efforts and Lessons Learned

- Clinical applications
 - Cardiovascular Risk Management in Primary Care
 - Headache management in primary care
 - Back pain management in primary care
 - Rheumatology practice web tools
 - Future: Oncology care
- Lessons Learned
 - Utility, utility, utility
 - Learning in practice

What The Patient Has to Say Matters a Lot, but...

- An evidence based personalized trigger requires patient input in the form of data
- Obtaining data is difficult
 - Not enough time
 - Patients respond differently when a doctor asks
 - The doctor may not know what questions to ask
- Even with the right questions...
 - Translation varies
 - Documentation varies
- Computer assisted data capture tools address these challenges

- 
- A photograph of a person with short brown hair, seen from the side, sitting at a desk and looking at a laptop. The person is wearing a dark top. The laptop screen displays some text or data. The background is slightly blurred, showing what appears to be an office or clinical setting.
- Why are you here?
 - What do you have?
 - What do you want?
 - How are you doing?
 - What are you taking?
 - How is your medicine working?
 - What are your risk factors?
 - What are your barriers to improving outcomes?
 - ... and the list goes on.

Patient Decision Aid and CVD Risk Management

- Web tool used by patients with elevated relative risk for heart attack
 - Focus is on modifiable risk factors
- Informed about options, risks, and benefits
- Patient makes decision before seeing the doctor
- Patient is able to make decision in real time
 - Prioritize benefits and risks
- Results communicated to doctor in real time

Physician accessed web tool only 20% of the time. Primary complaint was that it did not save time

Risk Factor	Value	Date	Recommendation	Patient Preferences	Most Preferred
BP	145/90			Drink less alcohol	
LDL			Consider reinforcing positive benefits of not	N/A	
		05/06/09	BMI over 25. Consider discussing dietary and daily exercise goals.	Dietician Exercise	Exercise
	8 average/day	05/14/09	Pt with "problem drinking". (Frequent/more than threshold number drinks/one sitting). Consider CBC and LFTs, Thiamine 100mg daily and Folic Acid 1mg daily. Consider offering referral to community resources for alcohol treatment.	Dietician Drink less alcohol	

Patient preferences along with expert guidance

Close

Complex Conditions for Primary Care Providers

- Complex conditions are common to primary care
 - Depression, anxiety, back pain, migraine, etc
- Conditions are complex to manage because:
 - Detailed patient data (what do you have, how are you doing, is the treatment working) is usually required to optimize treatment decision making
 - Need to merge patient data with detailed knowledge of treatment guidelines
- Somewhat unrealistic demand and expectation for primary care physicians
 - Inadequate care and Overuse of care

Primary Care Decision Aid

- Sophisticated patient questionnaire
 - Real time access of prescribed medications to create response options
- Requires extensive integration of databases
 - Patient data
 - Medications names
 - Evidence tables and more
- Rules engine processes patient data against codified guidelines
- Web table summary
 - Recommendation
 - Patient data

A	B	C	D	E	F	G	H	I
General Category	Questionnaire Categories	CDS Migraine Acute	CDS Tension Acute	CDS Prevention	Subclass	Med Names and Dose	Name to Patient	MedID
99	Rx Preventative prev_med	N/A	N/A	N/A	Venlafaxine (Effexor)	Effexor 50mg po tabs	Venlafaxine or Effexor	37508
00	Rx Preventative prev_med	N/A	N/A	N/A	Venlafaxine (Effexor)	Effexor 100mg po tabs	Venlafaxine or Effexor	37509
01	Rx Preventative prev_med	N/A	N/A	N/A	Venlafaxine (Effexor)	Effexor 75mg po tabs	Venlafaxine or Effexor	37510
02	Rx Preventative prev_med	N/A	N/A	N/A	Venlafaxine (Effexor)	Effexor 37.5mg po tabs	Venlafaxine or Effexor	37511
03	Rx Preventative prev_med	N/A	N/A	N/A	Lamotrigine (Lamictal)	Lamotrigine 100mg po tabs	Venlafaxine or Effexor	37579
04	Rx Acute ehr_opiarc	Narcotic Combination	Benzodiazepine or Narcotic Combination	N/A	Acetaminophen/Codaine (Tylenol, Tylox)	Acetaminophen/Codaine #3 300-30 mg po tabs	Acetaminophen/Codaine or Tylenol or Tylox	37844
05	OTC Acute N/A	OTC Aspirin or NSAID	OTC Aspirin or NSAID	N/A	Aspirin	Aspirin ECR1 po tabs	Aspirin	37929

CDS Freq/HA Prev Tx Advice: Only use this table if [use_Rx_prev = 1] and [ha_dx = migraine]

Headache	Headache	Using	Adherent	Effective	Current Rx	Recommendation

PATIENT DATA

PAROXYSMAL HEADACHE

- ▶ How many times has headache gone from no pain at all to very severe pain in an instant: 2-4/3 mo
- ▶ How long did it sudden onset headache last: Between 5-30 minutes

VALSALVA HEADACHE

- ▶ How many times has headache started immediately after coughing, sneezing, lifting, straining or orgasm: 0/3mo
- ▶ How long did it sudden onset headache last: n/a

INCREASED FREQUENCY OR SEVERITY HEADACHE

- ▶ How much has headache frequency changed in last 3 months: Not changed much
- ▶ How much has headache severity changed in last 3 months: Increased a little

INFECTION

Do you have cancer, AIDS, or a related disorder that decreases your ability to fight infection: No

Primary Care Management of Chronic Low Back Pain

- Patient assessment questionnaire
 - Pain experience
 - Psychological assessment (e.g., fear avoidance, depression, anxiety, etc)
 - Preferences
- Web Display of Expert Advice
 - Forecasts patient phenotype
 - Foster shared discussion of data
- Automation
 - Ordering
 - Progress notes

LOW BACK PAIN EXPERT ADVICE

CATEGORY	EXPERT ADVICE	PLACE ORDER	PROGRESS NOTE
PROBABLE DIAGNOSIS		<input type="radio"/>	<input type="radio"/>
SERIOUS CONCERN (RED FLAG)		<input type="radio"/>	<input type="radio"/>
EVALUATION		<input type="radio"/>	<input type="radio"/>
PROGNOSIS	(Score or image scale)	<input type="radio"/>	<input type="radio"/>
RECOMMENDED MANAGEMENT PLAN		<input type="radio"/>	<input type="radio"/>
MEDICATION(S)		<input type="radio"/>	<input type="radio"/>

Integrated Visual Display Tools

- EHRs do not offer sophisticated visual display capabilities
 - Rheumatology example
 - Internal growth in demand from all clinical specialties
- Web tool designed to interface with EHR
 - Patient reported data on outcomes during 90% of encounters
 - Outcomes tracking for shared discussion
 - Interactive tool that augments provider workflow
 - Automatically creating progress notes and patient after visit summary
 - Used by physician in more than 90% of visits

Diagnosis

Rheumatic

Rheumatic	Date of DX	Duration
733.00 Osteoporosis	05/13/2002	7.3 years
714.0 Rheumatoid Arthritis	03/07/2000	9.5 years

Medication

Current Meds Rheumatic

- Fosamax
- MTX Oral (dose in 2.5 mg)
- Prednisone

Current Meds Other

- ASPIRIN 81 MG PO TABS
- BD ULTRA-FINE LANCETS MISC
- FASTAKE TEST VI STRP
- FOLIC ACID 1 MG PO TABS
- GLIMEPIRIDE 4 MG PO TABS

Previous DMARDs

[Redacted]

Update Delete Insert

History

Med/Surg History

GI Bleed/PUD	no
Renal Insufficiency	no
Malignancy	no
Joint Replacement	no
Gastric Bypass	no

Social History

Work Status:	retired
Occupation:	former plant engineer
Home Status:	Spouse
Exercise:	1-2 times per week
Education Level:	14
ETOH:	No
Smoking:	Quit

Disparate EHR data displayed in a single, actionable view

Rheumatic Labs - Immune

Test	Result	Result Date
ANA	<40	02/01/2000

Rheumatic Labs - Immune

Test	Result	Result Date
ANA	<40	02/01/2000

Xrays and Ancillary Tests

Test	ResultDate
CXR	02/23/2000



Patient
JOHN DOE

Age
57

Sex
M

MRN
9878543

Insurance
Geisinger Health Plan

PCP
YOUNG, DARA

Today's Date
9/29/2009

OUTCOMES
GENERAL

OUTCOMES
COMPOSITE

MONITORING

DEMOGRAPHICS

BEST
PRACTICE

TODAYS VISIT
CONSTRUCTION

TODAYS VISIT
NOTE

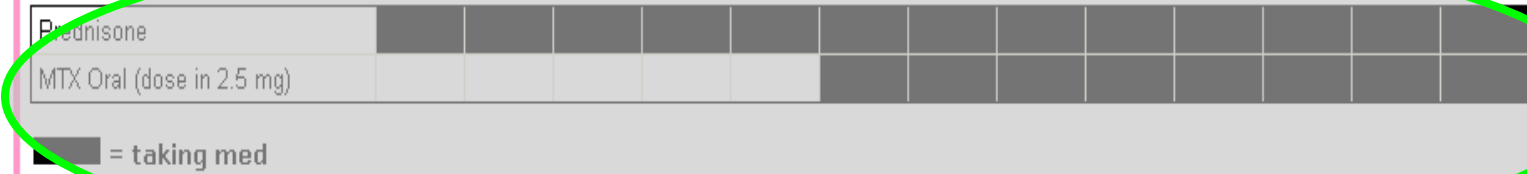
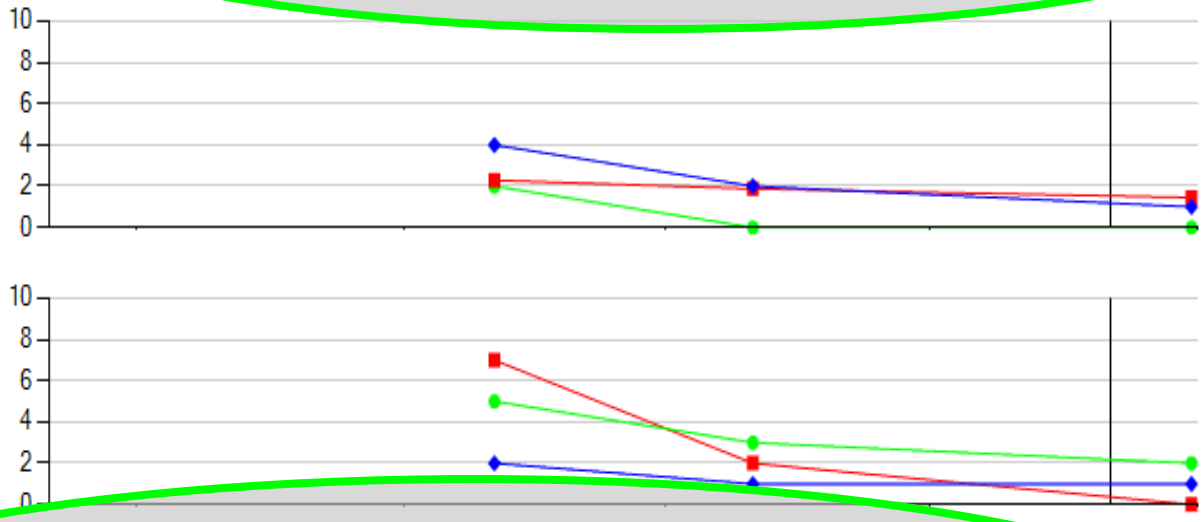
TODAYS VISIT
AVG

Trending

-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

Multiple info sources (patient, doctor, labs)

- MDHAQ
- Tender Joints
- Global
- Pain
- Fatigue
- Stiffness



Med exposure over time

OUTCOMES GENERAL

OUTCOMES COMPOSITE

MONITORING

DEMOGRAPHICS

BEST PRACTICE

TODAYS VISIT CONSTRUCTION

TODAYS VISIT NOTE

TODAYS VISIT AVS

Today's Visit

History:

JOHN DOE is a 57 years old MALE with Osteoarthritis

[Redacted]

Auto-population of documentation

Rheumatoid Arthritis & Inflammatory Polyarthritis [Redacted]

insert update delete

taking Prednisone, MTX Oral (dose in 2.5 mg), Fosamax. See med list below for dosing. All medical problems include

[Redacted]

[Redacted] (Max Limit - 40 Char)

insert update delete

Permanent History (Max Limit - 2000 Char)

Longstanding Rheumatoid Arthritis, but managed to w

[Redacted]

Information "feeds" clinic note and AVS



OUTCOMES
GENERAL

OUTCOMES
COMPOSITE

MONITORING

DEMOGRAPHICS

BEST
PRACTICE

TODAYS VISIT
CONSTRUCTION

TODAYS VISIT
NOTE

TODAYS VISIT
AVS

RHEUMATOLOGY FOLLOW-UP VISIT SUMMARY

For: John Doe

During my visit to the Geisinger Rheumatology Clinic on 9/29/2009, I saw Natasha Smith, RN. This note summarizes my rheumatic problems and how I am doing.

What Do I Have?

My medical record indicates that I have the following rheumatic conditions:

Rheumatoid Arthritis, or A chronic immune disease causing inflamed joints, and possibly affecting other body systems

Osteoporosis, or A disease of decreased bone strength and increased risk of fracture.

How Am I Doing?

We decide whether you are getting better by the measures summarized below that we decided were most important to you.

MHAQ - The MHAQ score tells me how well I am able to move and do my daily functions. This score ranges from a low of 0 to a high of 10. A value of 0 means I am doing very well. A value of 10 means I am functioning poorly.

Score Range: 0 to 10

My Goal: 1

My Score on 9/29/2009: 0.33

My Score on 5/1/2009: 0.33

Interpretation: My function score is about the same

Goal Met: yes

Pain - The Pain score tells me how much pain I am having. This score ranges from a low of 0 to a high of 10. A value of 0 means I am having no pain. A value of 10 means I am having a lot of pain.

Score Range: 0 to 10

My Goal: 3

My Score on 9/29/2009: 2

My Score on 5/1/2009: 3

Interpretation: My pain score is getting better

Goal Met: yes

What Should I Do?



Future Development: Oncology Care

- Growth in knowledge already expanding the capability of oncologists to keep up with the pace of change
- Best treatment options in the future depends on:
 - Cancer stage and biology
 - Patient genetics
 - Patient comorbidities and physiologic factors
- Data from multiple locations
- Best treatment options are often in locally available options for RCTs

Requires hours of work by the Oncologist and Nurse Oncologist.