Agency for Healthcare Research and Quality
Advancing Excellewnce in Health Care

Practice Partner Research Network (PPRNet)

Implementation and Evaluation of Electronic Standing Orders in Primary Care (Standing Orders-Translating Research into Practice: SO-TRIP)

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June 2, 2010

Funded by AHRQ
Contract No. HHSA290 2007 10015

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Background

Value

-Time constraints and competing obligations in primary care practice contribute to inadequate delivery of clinical preventive and disease monitoring services.

-Standing orders for practice staff using reminder systems embedded in EHR systems may help overcome some of these deficiencies.

"SO-TRIP" Project Aims

1. Facilitate the adoption of an EHR based standing order protocol for selected preventive services, adult immunizations, and diabetes monitoring measures in 8 primary care practices using a validated quality improvement intervention.
2. Identify effective strategies and barriers to the adoption of this protocol.
3. Document changes in the use of the protocol and delivery of the study measures.

Health Maintenance Table

Health Maintenance Summary: Williams, susan

	Recommend For	Due (seq.#)	05/02/2009	04/30/2009	04/10/2009		
Alcohol	50-64 YEAR OLD FE	04/10/2011			X		
Aspirin Therapy	Multiple						
BP	Multiple	11/09/2009			X		
Cholesterol	50-64 YEAR OLD FE	05/24/2002					
Colonoscopy	50-64 YEAR OLD FE						
Creatinine	ACE INHIBITOR	09/11/2008					
Depression	50-64 YEAR OLD FE	05/24/2002					
Diet Counseling	DIABETES MELLITU	05/02/2010	X				
Exercise Counsel	DIABETES MELLITU	05/02/2010	X				
Eye exam	DIABETES MELLITU	11/09/2009					
F.O.B.	50-64 YEAR OLD FE	04/30/2010		X			
Flex Sig	50-64 YEAR OLD FE						
Foot Exam	DIABETES MELLITU	11/09/2009					
Glucose,Fasting	50-64 YEAR OLD FE						
HDL Cholesterol	Multiple	05/24/2002					
Height	50-64 YEAR OLD FE	05/02/2014	X				
Hemoglobin A1C	DIABETES MELLITU	11/09/2009	X				
Influenza vaccine	Multiple	05/24/2002					
LDL Cholesterol	Multiple	05/24/2002					
Mammogram	50-64 YEAR OLD FE	05/24/2002					
Microalbumin, Ur	DIABETES MELLITU	11/09/2009					
Pap Smear	50-64 YEAR OLD FE	04/10/2012			X		
Pneumococcal poly.	DIABETES MELLITU	11/09/2009					
Potassium	ACE INHIBITOR	05/03/2009	X		X		
Smoking Counseling	Multiple	11/09/2009					
Tdap	50-64 YEAR OLD FE	05/24/2002					
Triglycerides	Multiple	05/24/2002					
Weight	50-64 YEAR OLD FE	05/02/2011	X				
Zoster	50-64 YEAR OLD FE	05/24/2002					

Health Maintenance Pop-Up Reminder

Patient Chart: Parker, Janet

Janet Parker
Sex: F
Age: 35

Next Appointment: N/A
ID: 998
DOB: 07/05/1974

Active

REMINDER - the following are overdue for: Parker, Janet

Alcohol	HDL Cholesterol
BP	Height
Chlamydia	LDL Cholesterol
Cholesterol	Pap Smear
Depression	Sexual Counseling

Close | HM | Help

Chart Summary
Progress Notes
Past Medical History
Social History
Family History
Consults
Hospital Reports
Letters
Messages
Flow Charts
Clinical Elements
Orders
Misc Info / Documents

EKG
Pathology
Special Studies
Attending Notes
Misc Info / Documents
HIPAA
Prenatal
Patient Msg

Home:
Work:
Cell:
Last Appt: N/A
Acct Type: INS
Acct Plan 1: BCBS
Acct Plan 2:
Acct Plan 3
Acct Plan 4:

Add notes:

Close | Refresh | Exit Care

All | Search

Chart Summary Screen

Chart Summary: SMITH, MARGARET

Margaret Smith
Sex: F
Age: 67 years

Next Appointment: N/A
ID: 100-1
DOB: 03/12/1943

Visits

Date	Title
03/03/09	HIGH RISK DRINKER
03/03/09	DRINKS PER WEEK (AVERAGE) 30
03/03/09	ALCOHOL SCREENING
03/03/09	ALCOHOL DISORDER
09/13/07	TEST
03/28/06	OPEN WOUND TOE COMPL
03/28/06	OFFICE VISIT

Major Problem

Problem	Code 1	Date	Note
HYPERTENSION	401.9	10/29/00	Contr
HYPERLIPIDEMIA	272.4	10/29/00	Good
DIABETES MELLITUS	250.00	10/29/00	May r

Medication

Name	Size	Take	Freq	Dur	A
DIGOXIN					
COUMADIN	2.5MG	1 TAB	QD		3(
GLUCOTROL	10MG	1 TAB	QAM		3(
LOTENSIN	10MG	1 TAB	QD		3(
ASPIRIN	325MG	1 TAB	QD		3(
ZOCOR	20MG	1 TAB	QHS		3(
PREMPRO	.625/2.5	1 TAB	QD		2(

Allergy

PENICILLIN G BENZATHINE

HM Needed

Beta blocker	Creatinine	Eye exam
Bone Mineral Dens.	Depression	F.O.B.
BP	Diet Counseling	Flex Sig
Cholesterol	Echocardiogram	Foot Exam
Colonoscopy	Exercise Counsel	Glucose,Fasting

M st Recent Lab

Date	Lab Names
09 29/08	ALT (SGPT)
08 4/08	POTASSIUM
08 4/08	CREAT
07 28/08	TRIGLYCERIDES
07 28/08	MICROALBUMIN, UR
07 28/08	LDL, DIRECT
07 28/08	HDL-CHOL

Close

Summary | Chart | Prog Notes | Rx / Meds | Recent Lab | Lab Tables | Vitals | Hlth Maint | Prob List | Flow Chart

100-1 | 67y | Female | Operator: PMSI | Provider: ABC | WebView

Methods

Design and Setting

Design: Pilot demonstration project from July 1, 2008 to April 1, 2010 using framework PPRNet-TRIP QI Model

Setting: 8 primary care practices in 8 states

Intervention

Quarterly audit and feedback on use of PP HM features and adherence with study measures

2-3 practice site visits by study investigators (LN, SO) to help adopt HM features and SO protocol

Two annual network meetings with all practice liaisons and study investigators to share “best practice approaches”

Qualitative Methods

Data Collection

- Interviews
- Observation
- Correspondence

Analyses

- Identify approaches, facilitators, and barriers to adoption of SO protocol

Quantitative Methods

Data Collection

- Quarterly EHR extract

Analyses

-Presence of study measure on HM template

-Entry on HM template for study measure

-Percent of patients up to date with each study measure

-Pre and post-intervention comparison of summary measure

PPRNet-TRIP Improvement Model

Prioritize Performance

Involve All Staff

Redesign Delivery System

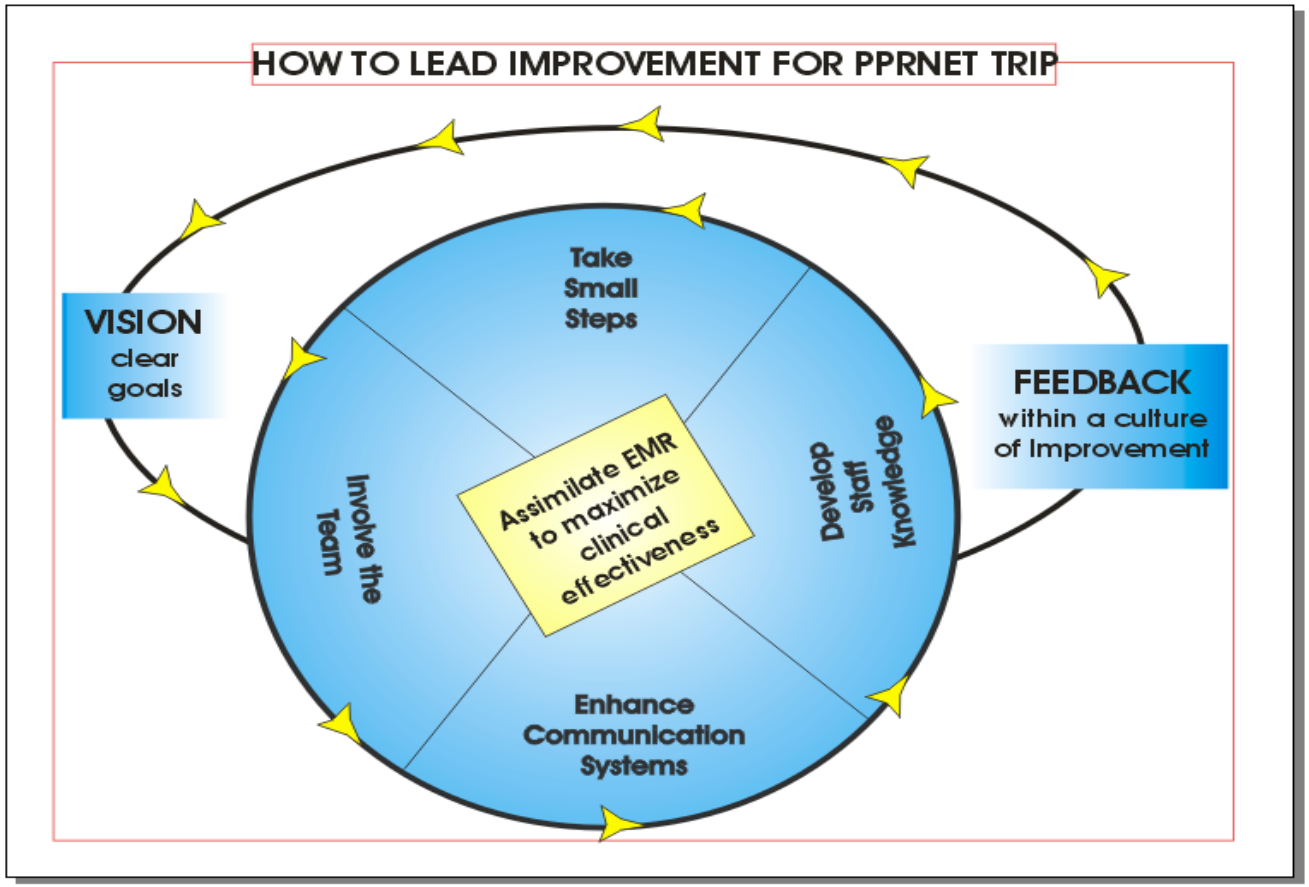
Activate the Patient

Use EMR Tools

5 concepts used with maximum flexibility

Jt Comm J Qual & Safety, August 2004, 30(8):432-441

Practice Development Model



Implementation *Science* 2008, **3:**3

Measures

Screening*	Adult Immunizations**	Diabetes***
Cholesterol	Tetanus (Td or Tdap) ≥12 yrs	Urine microalbumin
HDL-Cholesterol	Pneumococcal ≥65 yrs	HgbA1C
Mammogram ≥40 yrs	Pneumococcal (18-64 yrs high risk patients)	HDL-Cholesterol
Bone Mineral Density≥ 65 yrs Females	Influenza ≥50 yrs	LDL-Cholesterol
	Influenza (18-49 yrs high risk patients)	Triglycerides
	Zoster vaccine ≥60 yrs	

*U.S. Preventive Service Task Force recommendation ** Center for Disease Control Advisory Committee on Immunization Practices guideline*** Expert consensus or clinical experience, AHRQ National Healthcare Quality Report and American Diabetes Association current guidelines.

Results

Practice Characteristics

State	Location	Specialty	Adult patients (n)	Providers (n)
ID	Urban	Family Practice	1224	2
TX	Urban	Multi -Specialty	28893	25
MD	Urban	Family Practice	3578	3
NY	Urban	Internal Medicine	10400	11
NC	Urban	Family Practice	11057	14
CT	Urban	Family Practice	3767	4
WA	Rural	Multi-Specialty	3872	11
MO	Rural	Family Practice	3313	4
		Total	66104	74

Approaches to Adoption of SO Protocol

-Regular meetings to support implementation, reach consensus, and provide feedback

-Establish formal policies/protocols approving staff to act upon the electronic SO's

-Adapt EHR tool to include patient and staff in adoption of SO protocol

Patient Info Update

Our records show that you have had the following interventions. Please correct as needed.:
If you have had any done somewhere else, please indicate when.

Adacel Done on 09/01/05 Td Done on 09/01/05

No Influenza vaccine recorded

No shingles vaccine recorded

Mammogram Done on 08/01/08

Bone Mineral Dens. Done on 06/01/09

Last cholesterol test: LDL, DIRECT: 100 on 07/30/2009
Last urine protien testing: ALBUMIN/CREA RATIO: <30 on 07/30/2008 MICROALBUMIN, UR: <30 on 07/30/2008
Last Hemoglobin A1C test for sugar: HGB A1C: 7.5 on 07/01/2009

This is our list of the medications you are currently taking. Please cross out any you are **NOT** taking, and **ADD** any we do not have on our list. **If you need a refill**, put a check next to the medication you need.

Current Medications:
Rx: LIP BALM
Rx: LIPITOR 20MG 1 TAB QHS
Rx: METFORMIN HCL 1000mg 1 BID
Rx: MOTRIN
Rx: TYLENOL ALLERGY MULTI-SYMPTOM

This is our list of you allergies. Please add any we do not have listed and cross out any that are wrong.
(NKA or NKDA means "No Known Allergies"
Allergies:
AMOXICILLIN (Skin Rash)

What are you here for today? Please state any concerns you have to help us organize your visit.

Printed using Practice Partner

Progress Note From Note Template (example)

Progress Notes

Name: Mouse, Minnie

09/01/09 : 08:31am
Checkup
Mammogram Done on 08/01/08
Mammogram ordered
Health Maintenance: Mammogram O

Bone Mineral Dens. Done on 06/01/09

No influenza vaccine recorded in health maintenance section
Influenza vaccine .5cc administered IM to left right deltoid
Manufacturer: Novartis
Lot number: 96030, expiration date 5/2010
Vaccine information sheet given to the patient/parent
VIS publicaton date: 07/16/07
Consent form signed

Adacel Done on 09/01/05 Td Done on 09/01/05

Urine was collected for microalbumin testing

Chief complaint: Diabetes checkup

Patient Letter Template

Health Maintenance for Adam Ttest

Thursday, August 13, 2009

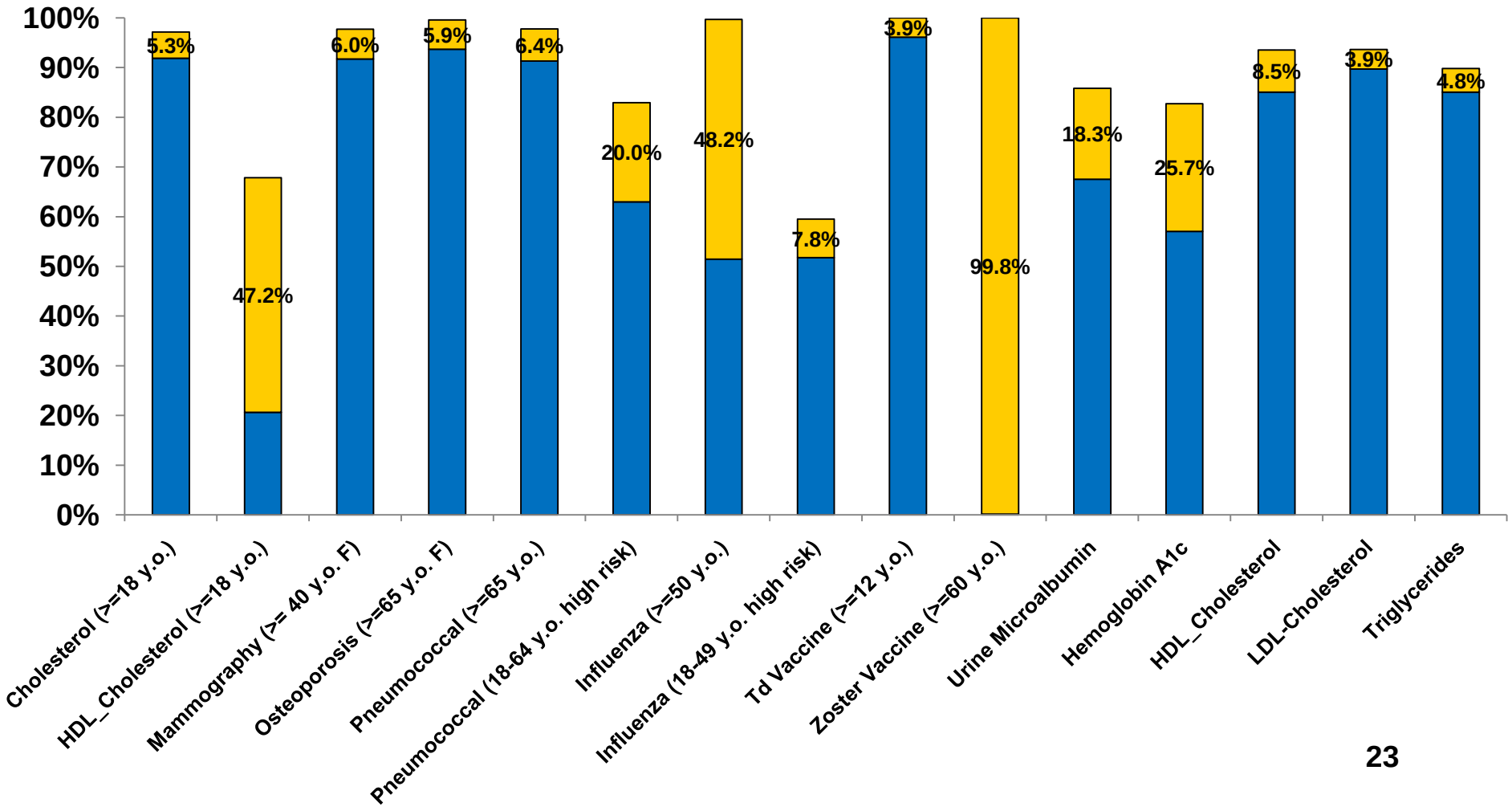
At Fulton Family Health, we place a great deal of importance on health maintenance. These are the discussions and tests which have been shown to improve your health. What is needed for one person is not necessarily needed by another; the list individualized based on your age, sex, medical conditions, medications, family history, and other things.

Please review this list and discuss with your provider.

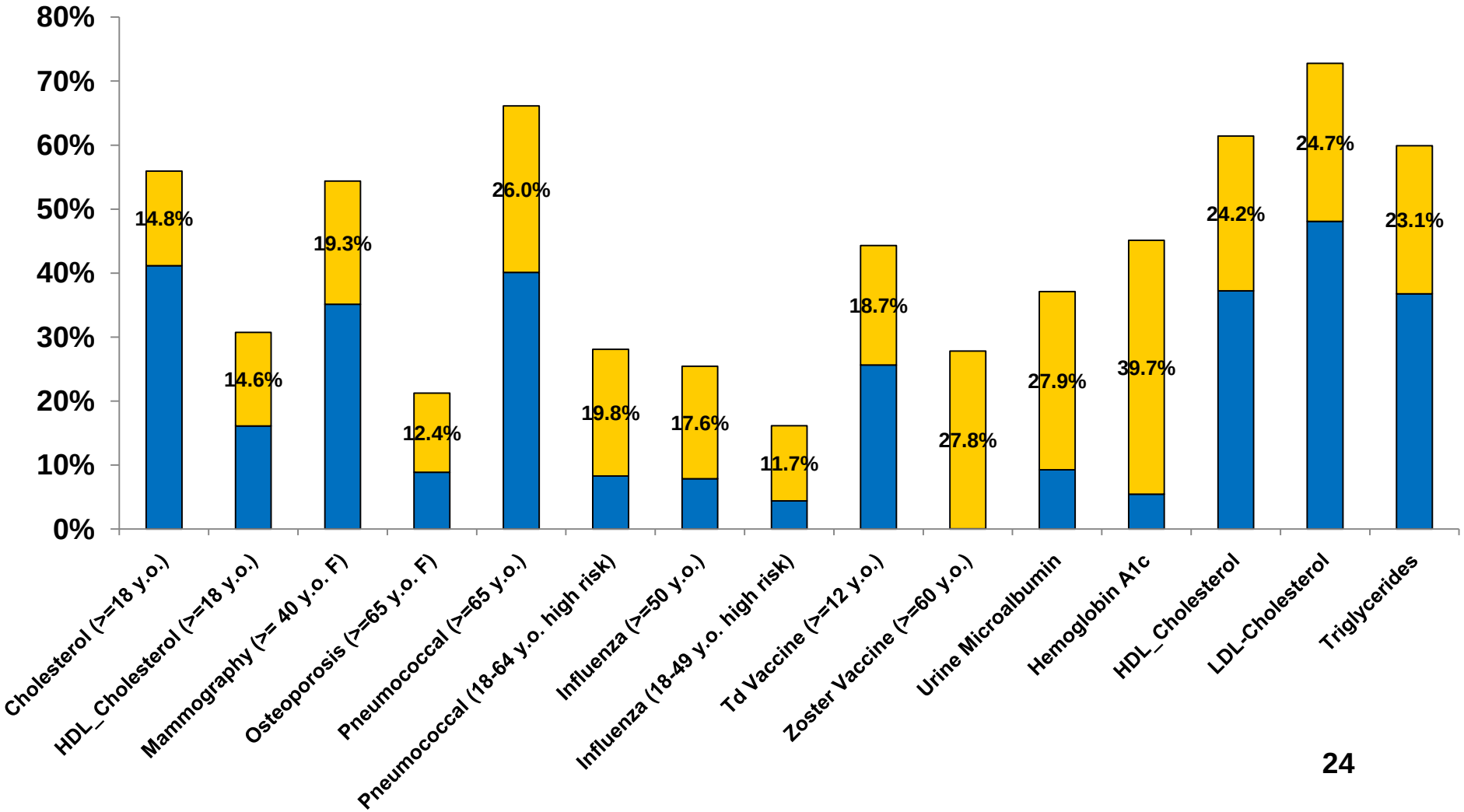
You may be overdue for a **hemoglobin A1c** test. This is a blood test to see how well your diabetes is controlled. It tells us your average blood sugar over the past 2 to 3 months.

You may be due for an **eye exam**. An annual dilated eye exam is needed in persons with diabetes in order to find and treat early diabetic eye damage. If you have had this exam done in the past year, let us know when and whether it was normal.

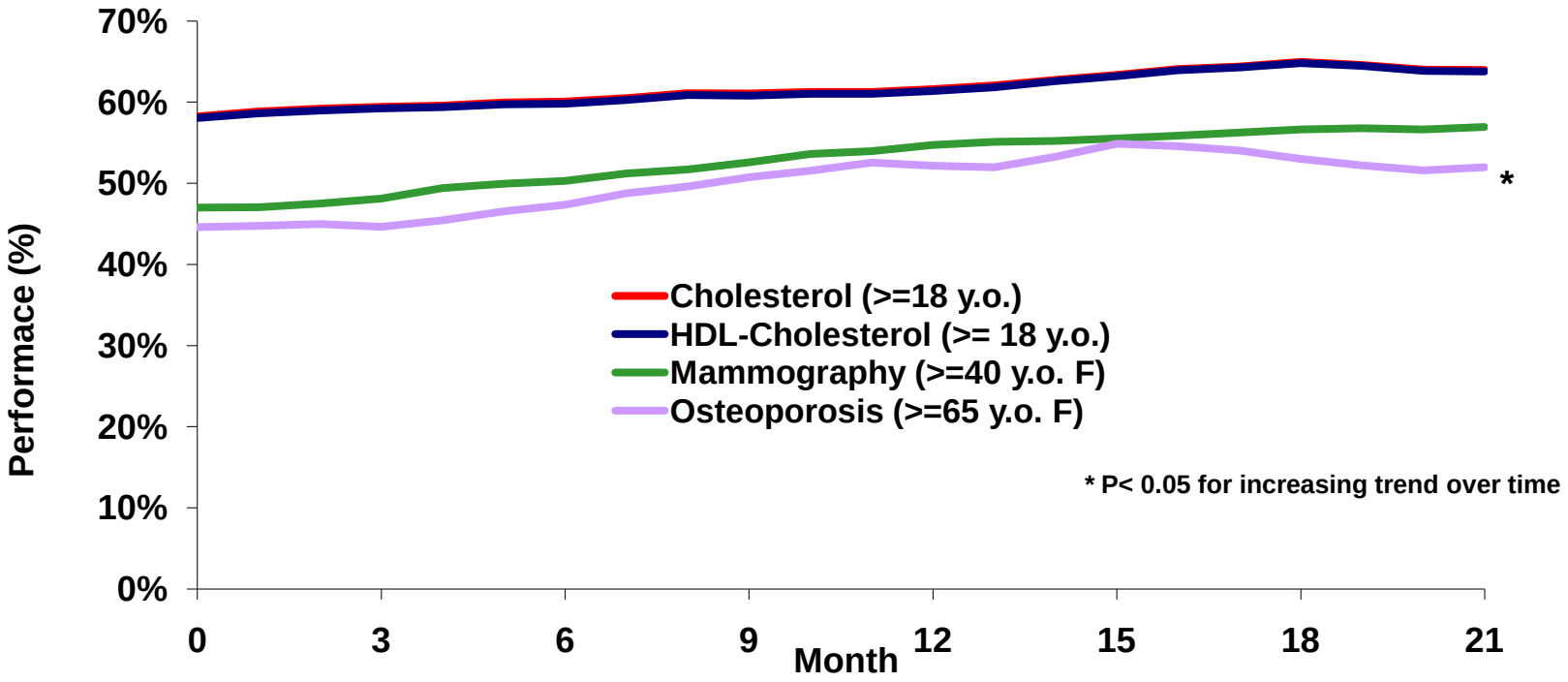
Process: Median Percent of Eligible Pts with Measure on HM Template



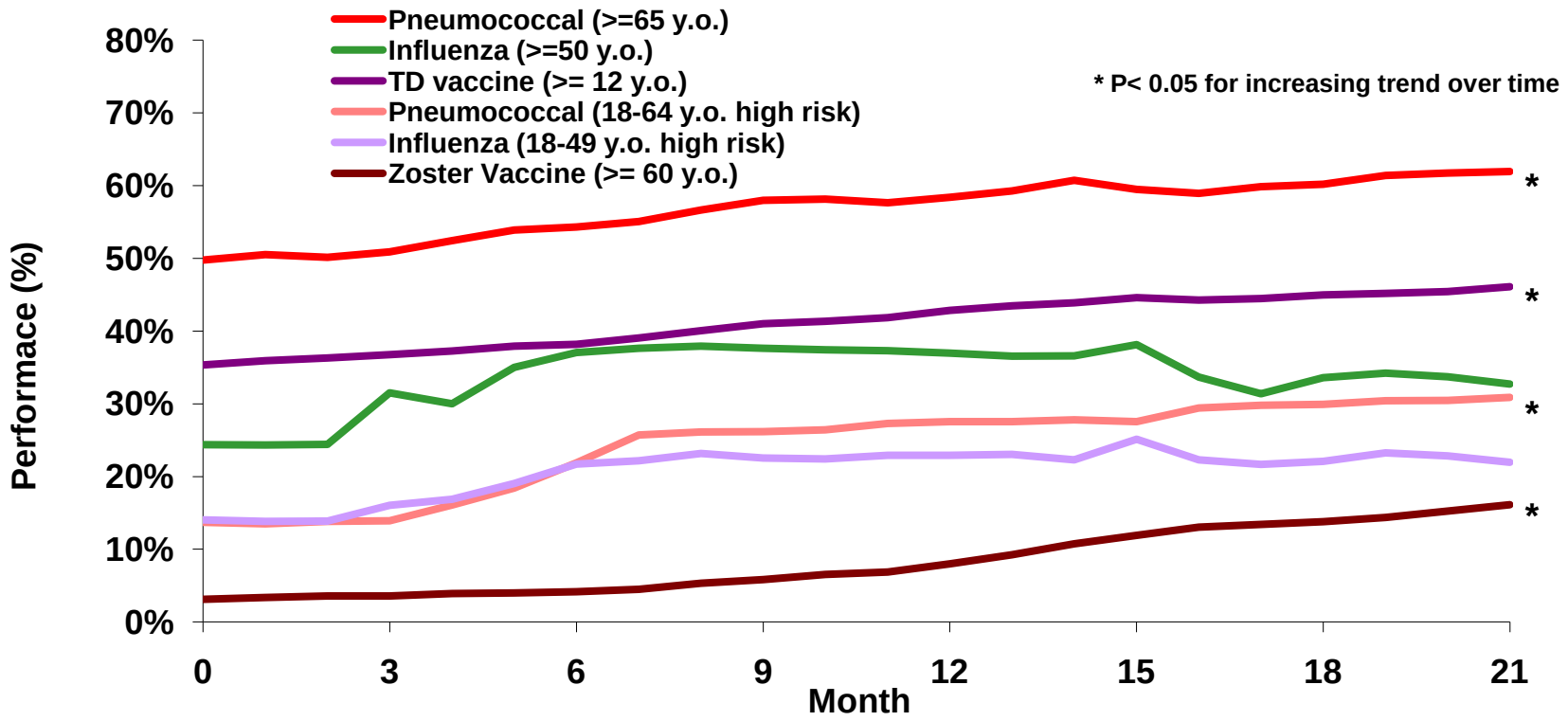
Process: Median Percent of Pts with HM Template Entry



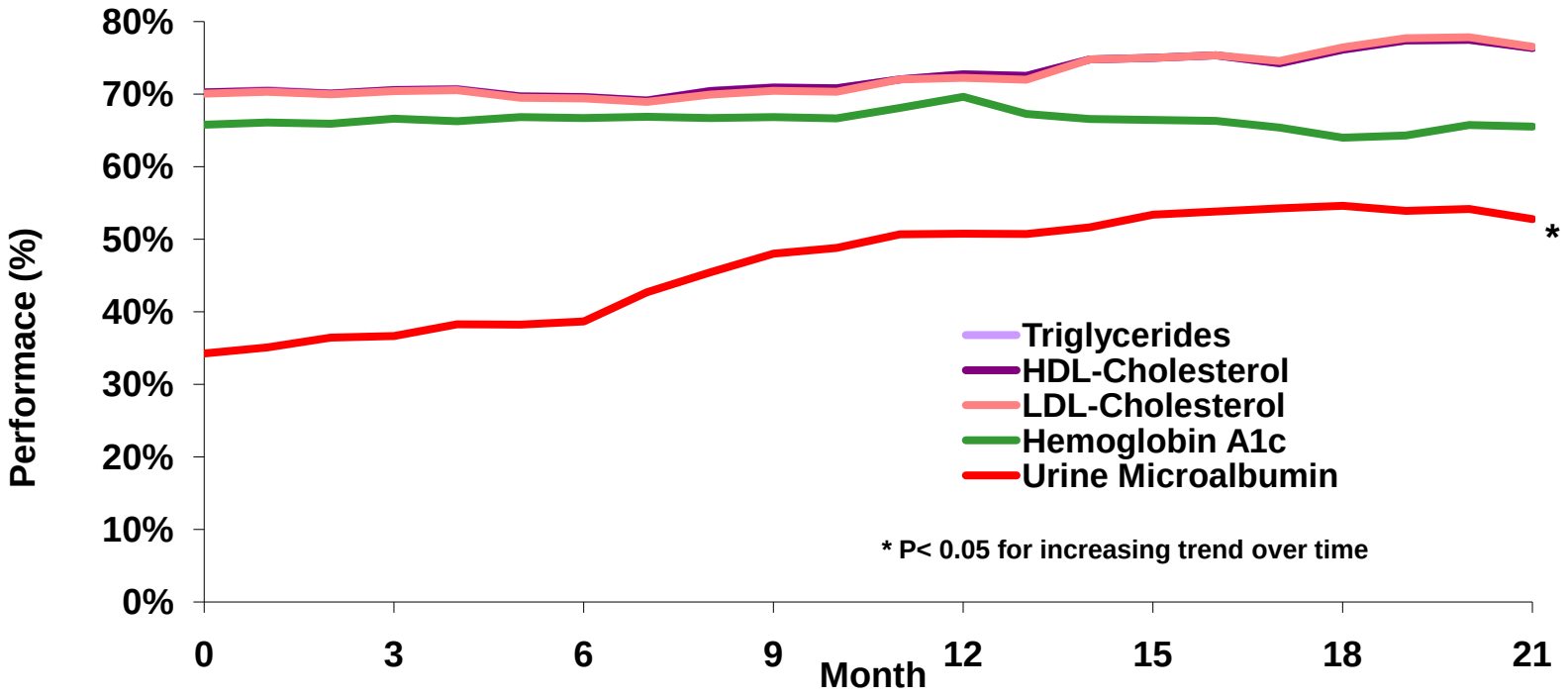
Outcome: Screening-Monthly Medians



Outcome: Immunizations- Monthly Medians



Outcome: Diabetes-Monthly Medians



Summary Performance

Practice	July 1, 2008	April 1, 2010	Improvement
1	52.8%	62.8%	10.0%
2	35.9%	62.8%	26.9%
3	49.4%	55.6%	6.2%
4	42.9%	51.3%	8.4%
5	37.9%	47.9%	10.0%
6	39.0%	45.5%	6.5%
7	45.2%	40.1%	-5.1%
8	29.1%	31.6%	2.5%

Facilitators of SO Protocol Adoption

- Tech savvy leaders helped create tools that made process easy for staff and helped activate patients
  - Nursing note templates
  - Electronic patient update forms help collect patient information on services due
- Leaders redesigned systems for a more efficient patient flow
- Staff that were non-supportive of the changes left practices and were replaced by staff “buying-in”

Barriers to SO Protocol Adoption

- Spread
  - Getting all staff to implement SO's
  - Staff selectively implementing only some SO's
  - Some providers uncomfortable with SO's
- Staff perceptions
  - Time management: SO's slowing patient flow
  - Need to double check with provider re: SO
  - Need for decision-making re: screening lipids (fasting or non-fasting) or for additional labs; mammogram without breast exam

Barriers to SO Protocol Adoption

- Staff education or follow up on project plans limited
- Practice reimbursement, patient funding or lack of availability limits implementing some vaccine SO's
- Patient refusals or disinterest
- Technical issues with EHR; use of HM tools/utilities
- Competing priorities: new facility/merged providers

Discussion

-Despite barriers, all but one or two practices in this pilot project were able to successfully adopt the SO protocol and demonstrated meaningful improvement on the summary measure.

-Improvements on individual measures were noted for most immunizations, BMD screening and urinary microalbumin in DM

-Staff in successful practices felt empowered and for the most part were able to incorporate new activities without significant time burdens

Conclusions

Technical competence/leadership are needed to optimally adapt and use the EHR reminder tools

More research is needed to evaluate effectiveness of an EHR based standing order protocol in a broader sample of practices and to identify which clinical measures are best suited for inclusion in such protocols

Questions and Discussion

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