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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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Background



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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.



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“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.



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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

2 Patient Chart: Parker, Janet

Janet Parker Next Appointment: N/A

Sex: F ID: 998
Age: 35 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: Last Appt: N/A
Work: Acct Type: INS
Cell:

Acct Plan 1: BCBS Acct Plan 3
Acct Plan 2: Acct Plan 4:

Add notes:

Close Refresh Exit Care All Search



Chart Summary Screen

Chart Summary: SMITH, MARGARET

Margaret Smith Next Appointment: N/A
Sex: F ID: 100-1
Age: 67 years 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 | Contro | |
| HYPERLIPIDEMIA | 272.4 | 10/29/00 | Good | |
| DIABETES MELLITUS | 250.00 | 10/29/00 | May r | |

| Medication | | | | | |
|------------|----------|-------|------|-----|----|
| Name | Size | Take | Freq | Dur | |
| DIGOXIN | | | | | |
| COUMADIN | 2.5MG | 1 TAB | QD | | 30 |
| GLUCOTROL | 10MG | 1 TAB | QAM | | 30 |
| LOTENSIN | 10MG | 1 TAB | QD | | 30 |
| ASPIRIN | 325MG | 1 TAB | QD | | 30 |
| ZOCOR | 20MG | 1 TAB | QHS | | 30 |
| PREMPRO | .625/2.5 | 1 TAB | QD | | 28 |

| 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 |

| Most Recent Lab | |
|-----------------|------------------|
| Date | Lab Names |
| 09/29/08 | ALT (SGPT) |
| 08/14/08 | POTASSIUM |
| 08/14/08 | 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 [Web View](#)



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Methods



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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



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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”



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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



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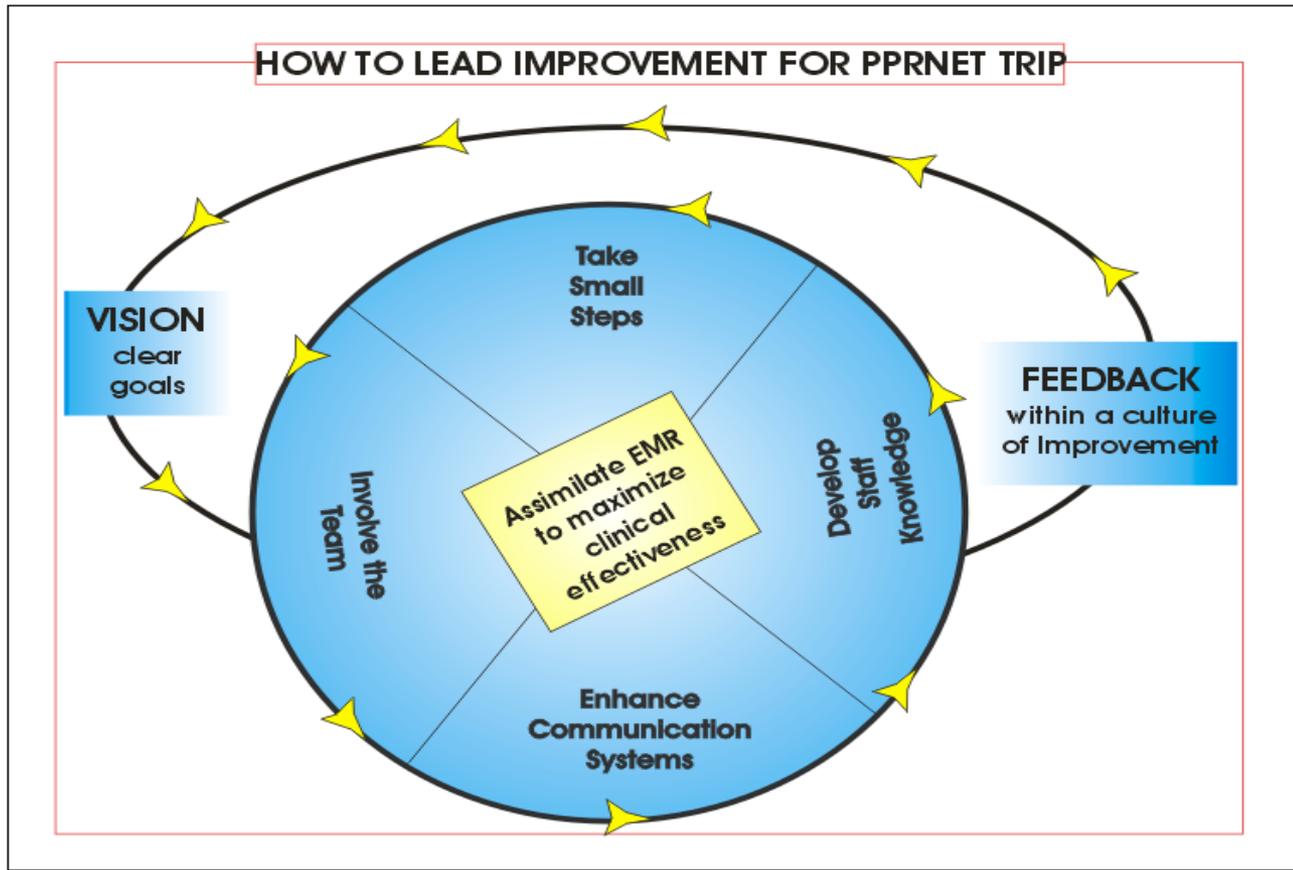
PPRNet-TRIP Improvement Model

Prioritize Performance
Involve All Staff
Redesign Delivery System
Activate the Patient
Use EMR Tools

***5 concepts used with
maximum flexibility***



Practice Development Model





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.



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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 |
| | | <i>Total</i> | 66104 | 74 |



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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



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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-SYMP TOM

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.



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

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 publication 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



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Patient Letter Template

Health Maintenance for Adam Ttest

Thursday, August 13, 2009

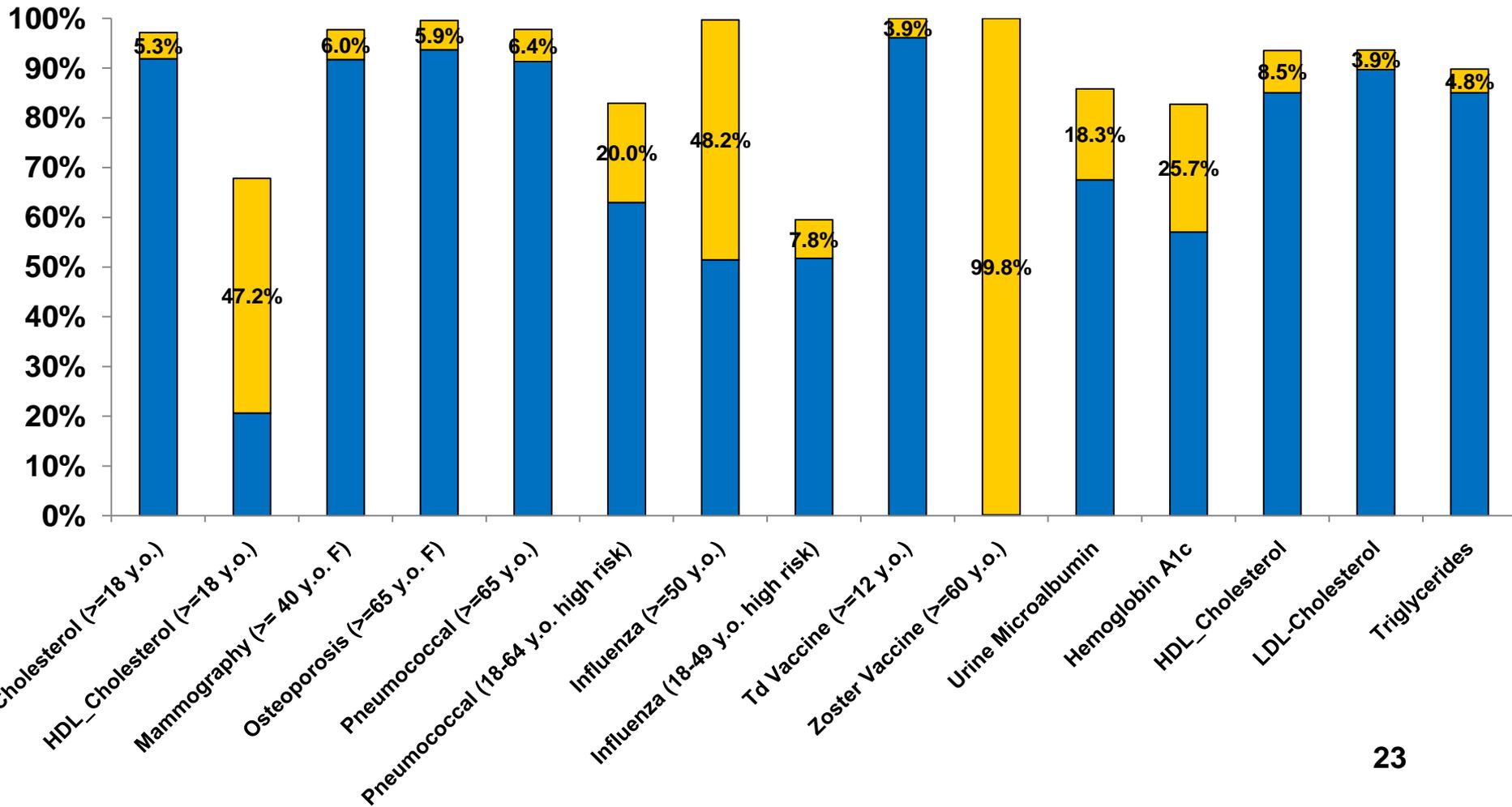
At Fulton Family Health, we place a great deal of importance on health maintenance. These are the discussions and tests which have been shown to improve your health. What is needed for one person is not necessarily needed by another; the list individualized based on your age, sex, medical conditions,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

Please review this list and discuss with your provider.

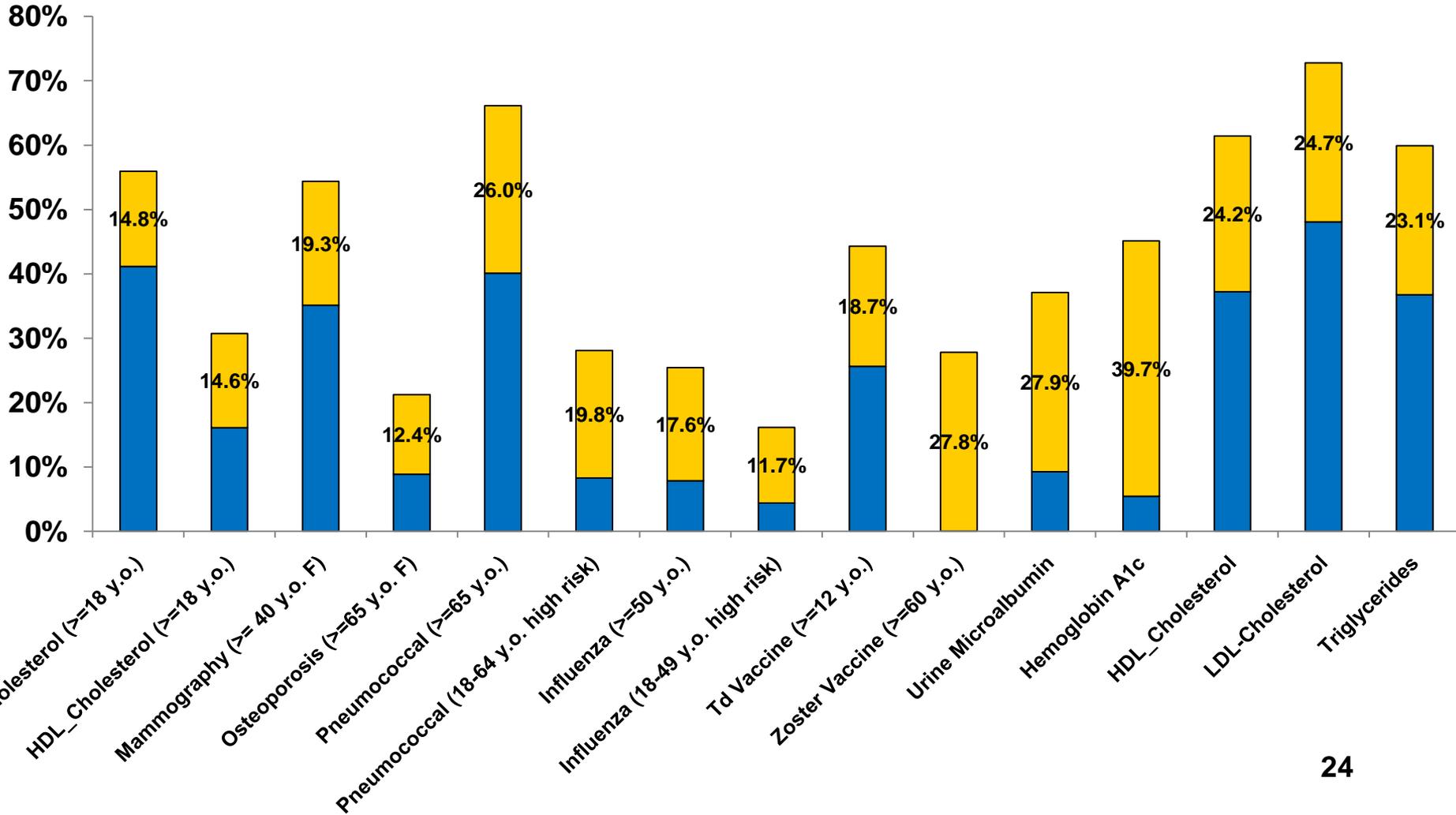
You may be overdue for a **hemoglobin A1c** test. This is a blood test to see how well your diabetes is controlled. It tells us your average blood sugar over the past 2 to 3 months.

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

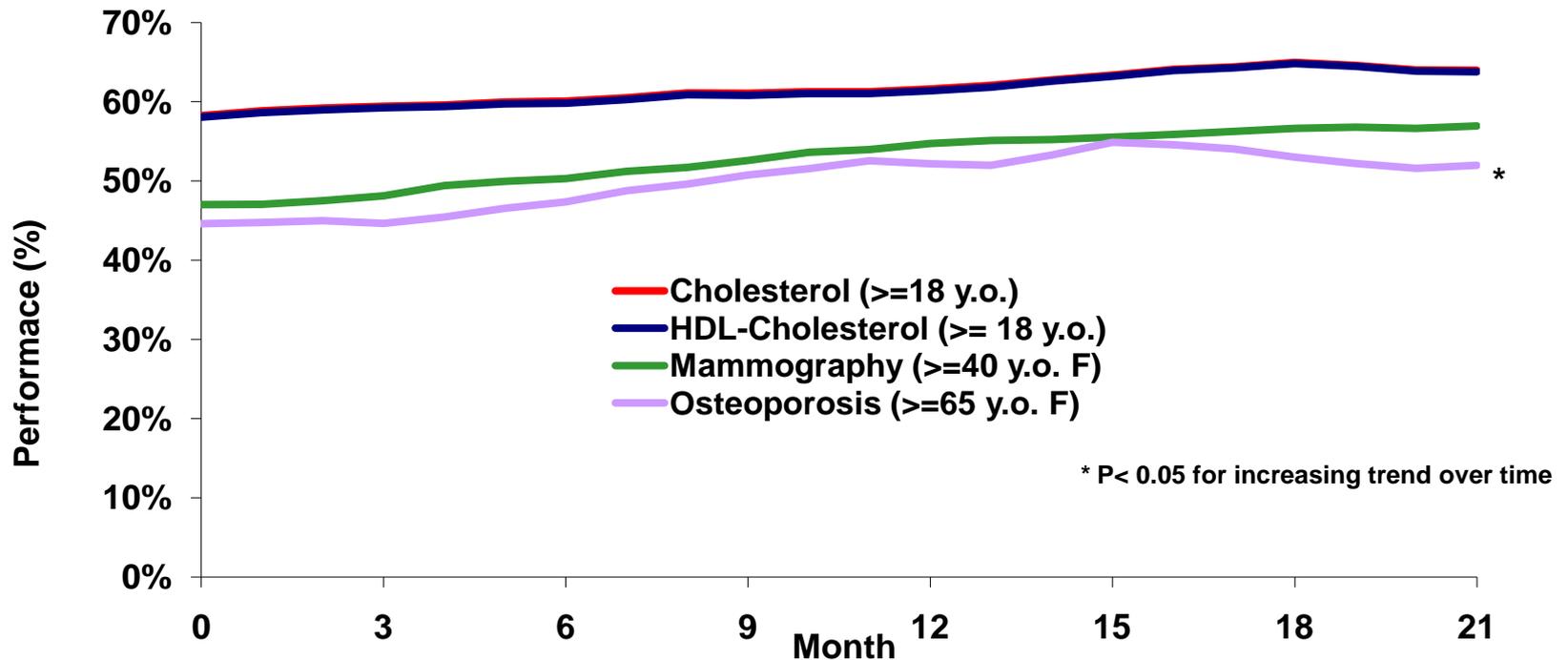


Process: Median Percent of Pts with HM Template Entry

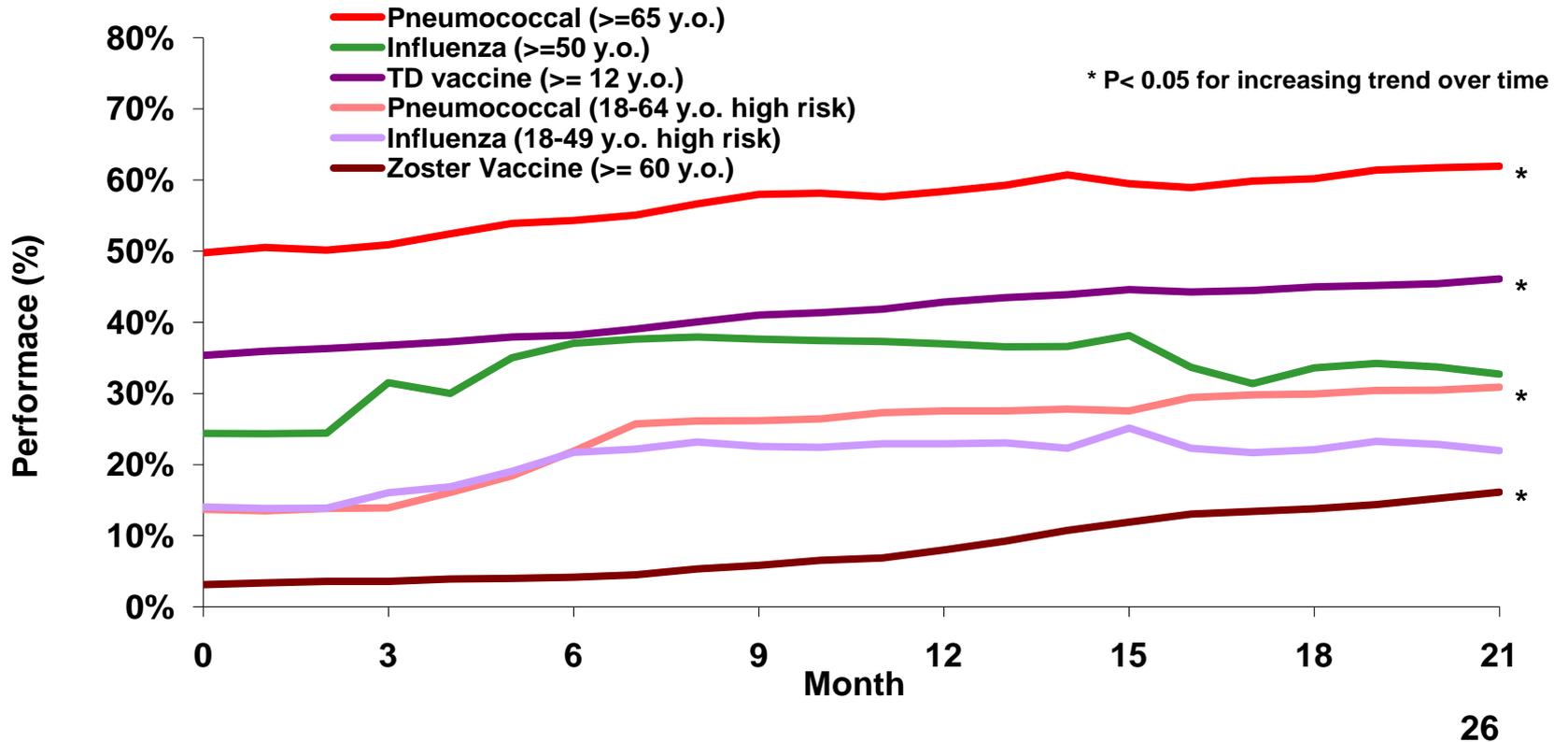




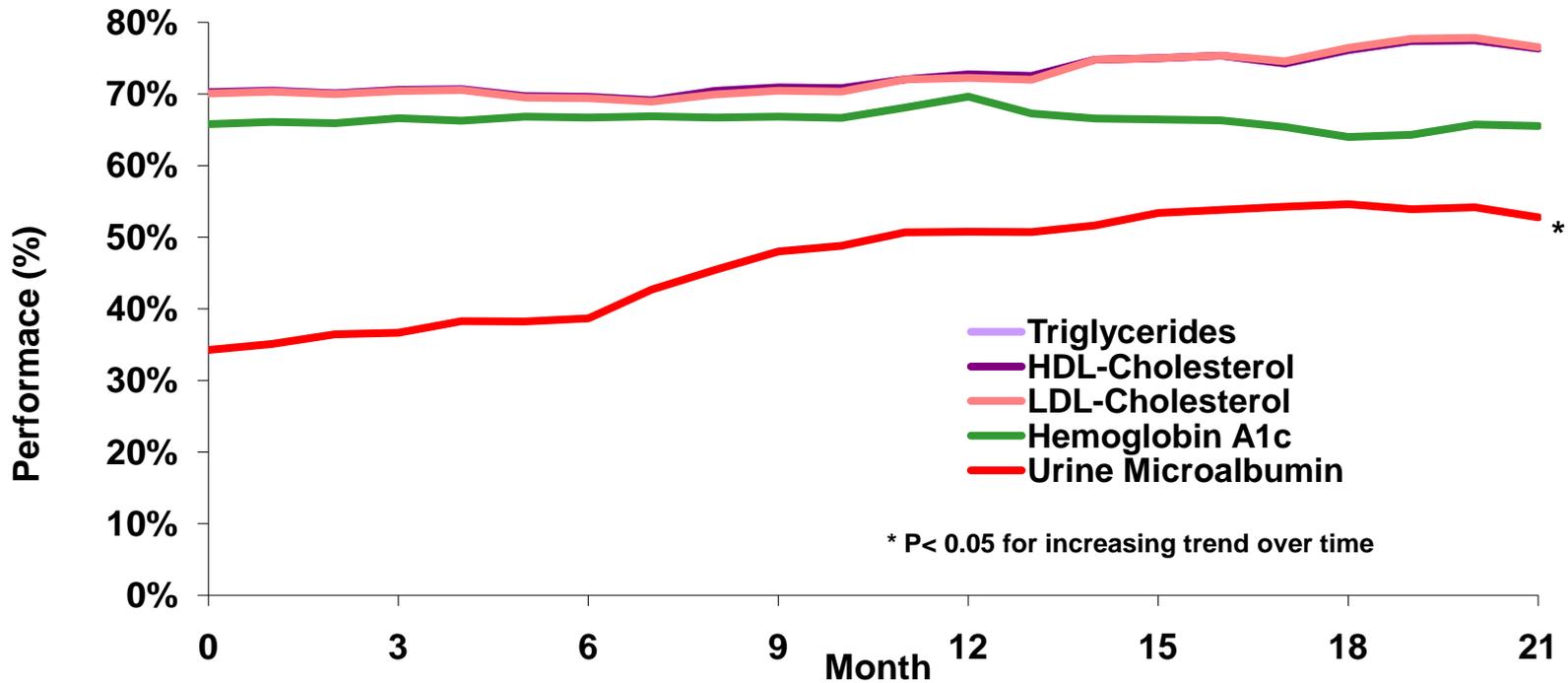
Outcome: Screening-Monthly Medians



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% |



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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



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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



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Discussion



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-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



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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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Thank You