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# HRSA Health Information Technology and Quality Webinar

**“Using Clinical Decision Support in Safety Net  
Provider Settings”**

**March 22, 2013**

U.S. Department of Health and Human Services  
Health Resources and Services Administration

# Office of Health Information Technology and Quality

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Additional HRSA Health IT and Quality Toolboxes and Resources,  
including past Webinars, can be found at:

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<http://www.hrsa.gov/quality>

Additional questions can be sent to the following email address:

[HealthIT@hrsa.gov](mailto:HealthIT@hrsa.gov)

U.S. Department of Health and Human Services  
Health Resources and Services Administration

# Upcoming HRSA Health IT and Quality Announcements

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- Next HRSA Health IT and Quality Webinar, “Using an EHR for Health Information Exchange and Interoperability,” Friday, April 26, 2pm EST. Register Now.
- ONC Releases New Interoperability and Health Information Exchange Basics Online Course <http://www.healthit.gov>
- Coming Soon! New HRSA Health IT Workforce Modules for Health Centers
- HRSA TXT4Tots Library Now Live – <http://www.hrsa.gov/healthit/mhealth>
- Two New HRSA Grantee Spotlights
  - HRSA Health IT Web site: “Marshfield Clinic Research Foundation – Using mHealth to Support Heart Health”
  - HRSA Quality Improvement Web site: “Project Renewal – Increasing Access to High-Quality HealthCare for the Homeless”
- New CMS Meaningful Use Interactive Resource on Stage 2 and the 2014 Clinical Quality Measures

# Introduction

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## Presenters:

- **Clinical and Quality Leaders, Community Health Center Inc., Middletown, CT**
  - Daren Anderson, MD, Chief Quality Officer
  - Veena Channamsetty, MD, Associate Chief Medical Officer
  - Bernadette Thomas, APRN, Chief Nursing Officer
- **Lisa Gall, DNP, RN, CFNP, LHIT-HP**  
Family Nurse Practitioner,  
HIT Consultant MN/ND REACH (REC),  
Subject Matter Expert,  
Stratis Health/REACH, Bloomington, MN



# Using Data to Drive Improvements

## Improving Care for the Underserved With Clinical Decision Support

Daren Anderson, MD ♦ VP/Chief Quality Officer

Veena Channamsetty, MD ♦ Associate Chief Medical Officer

Bernadette Thomas, APRN, DNP, MPH ♦ Chief Nursing Officer





# Community Health Center, Inc.

**Our Vision:** Since 1972, Community Health Center, Inc. has been building a world-class primary health care system committed to caring for underserved and uninsured populations and focused on improving health outcomes, as well as building healthy communities.

## CHC Inc. Profile:

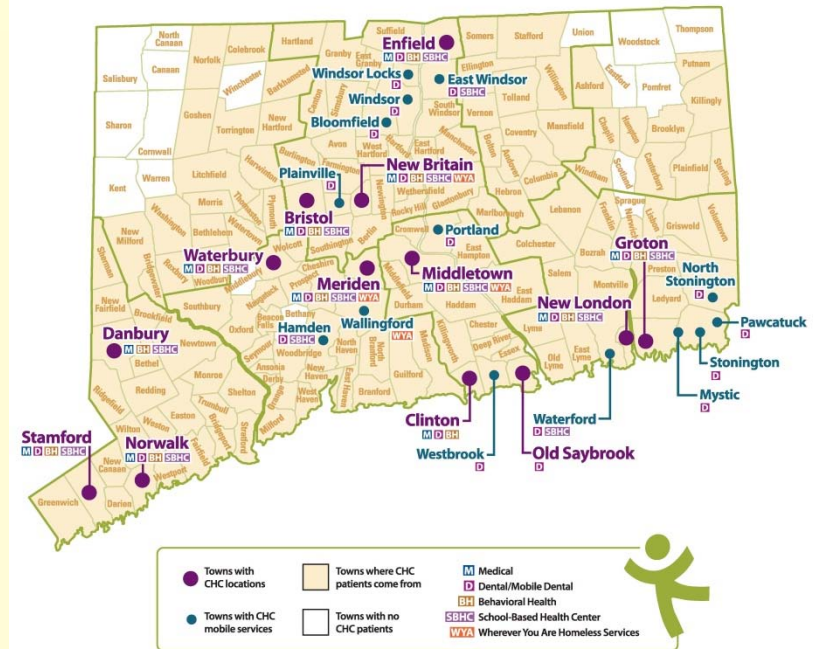
- Founding Year – 1972
- Primary Care Hubs – 13
- No. of Service Locations – 218
- Licensed /Total SBHC locations – 26/175
- Organization Staff – 600

## Innovations

- Integrated primary care disciplines
- Fully integrated EHR
- Patient portal and HIE
- Extensive school-based care system
- “Wherever You Are” Health Care
- Centering Pregnancy model
- Residency training for nurse practitioners
- New residency training for psychologists



## CHC Locations in Connecticut



## Three Foundational Pillars

Clinical Excellence  
Research & Development  
Training the Next Generation

# EHR Decision Support

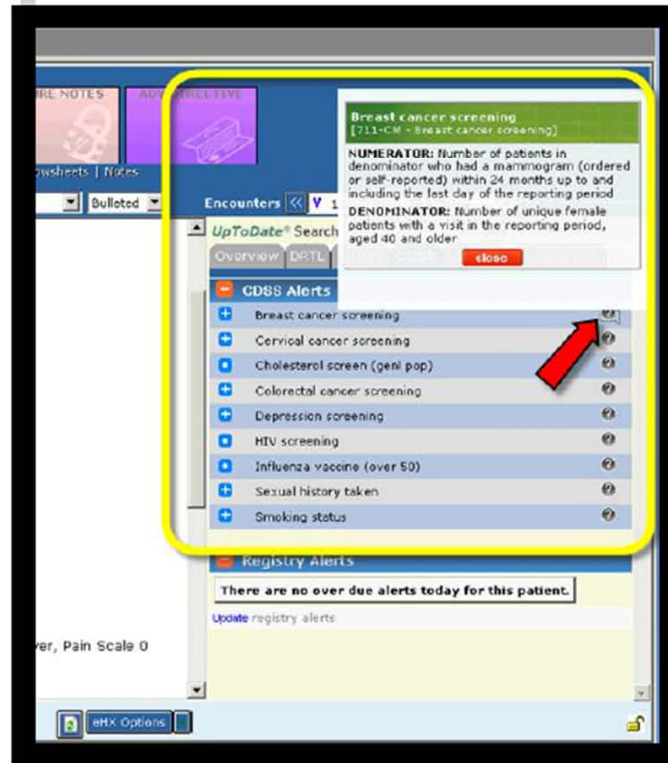
## Clinical Decision Support

- Clinical decision support (CDS) is the use of health IT to provide clinicians and/or patients with clinical knowledge and patient-related information, intelligently filtered or presented at appropriate times, to enhance patient care.
- Clinical knowledge of interest could include simple facts and relationships, established best practices for managing patients with specific disease states, new medical knowledge from clinical research, and many other types of information.



# Training Is Critical

## The Clinical Decision Support System (CDSS) Tab

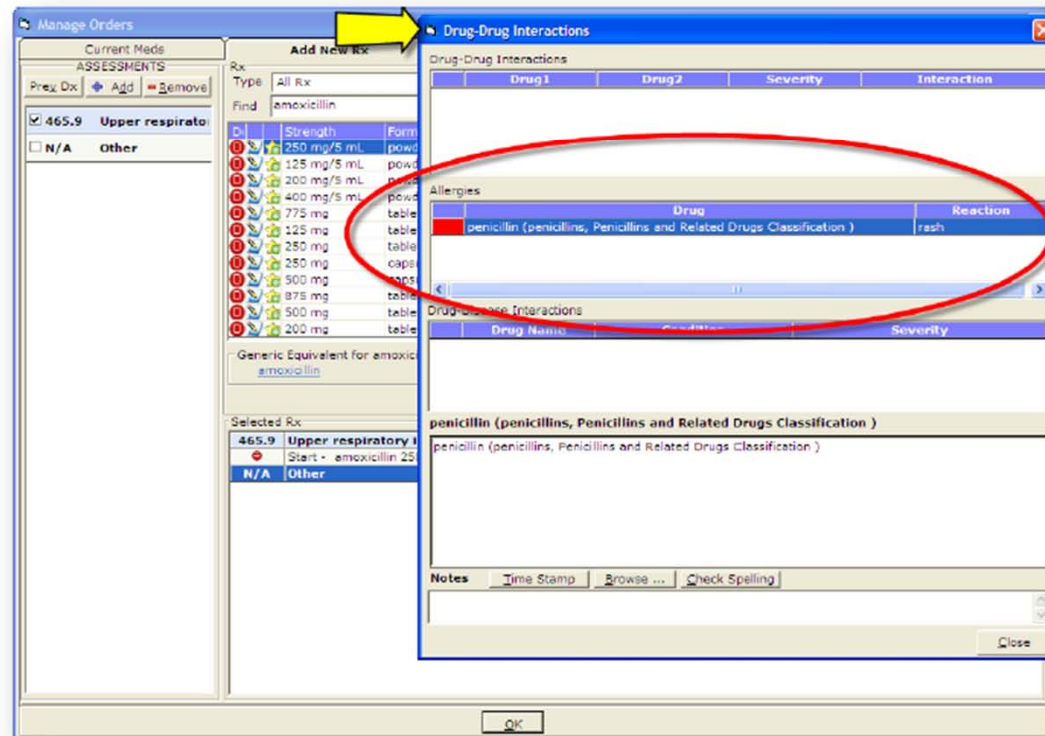


- From the **Right Panel**, select the **CDSS** tab. The **Clinical Decision Support System Alerts** are designed to automatically generate Healthcare Maintenance Reminders based on the age and medical history of the patient.
- The **CDSS Alerts** are to be monitored regularly by the entire clinical staff, especially for **Initial and Well visits**. They are also one of the tools used for the team huddles.

# CDS: Drug Interactions

## Severe Interaction Alerts

As a result of setting the default for the **Drug-Drug Interactions** window to **Severe**, the window will pop up in the **Manage Orders** window after the medication is selected and the **OK** button is clicked to return to the **Treatment** window:



# CDS: Order Sets

<input type="checkbox"/>	Description	Date	Status	<input type="checkbox"/>	Description	Date	Status
<input type="checkbox"/>	Basic Metabolic Panel w/eGFR	-	Other Actions ▾	<input type="checkbox"/>	EKG	-	Other Actions ▾
<input type="checkbox"/>	Comp Metabolic Panel w/eGFR	-	Other Actions ▾	<input type="checkbox"/>	Retinal Screening	-	Other Actions ▾
<input type="checkbox"/>	C-Peptide	-	Other Actions ▾				
<input type="checkbox"/>	TSH w/Free T4 rfx	-	Other Actions ▾				
<input type="checkbox"/>	Insulin	-	Other Actions ▾				
<input type="checkbox"/>	Hemoglobin A1c w/Calculation	-	Other Actions ▾				
<input type="checkbox"/>	Microalbumin,Rand Ur (w/creat)	-	Other Actions ▾				
<input type="checkbox"/>	Lipid Panel	-	Other Actions ▾				
<input type="checkbox"/>	Cortisol,Free 24 Hour Urine	-	Other Actions ▾				
<input type="checkbox"/>	Vitamin B12,Serum	-	Other Actions ▾				
<input type="checkbox"/>	CBC (Includes Diff/Plt)	-	Other Actions ▾				

## Procedures

Order

Browse

<input type="checkbox"/>	Description	Date	Status
--------------------------	-------------	------	--------

## Immunizations

Order

## Smart Forms

<input type="checkbox"/>	Name	Dose	Date	Status	<input type="checkbox"/>	Name	
<input type="checkbox"/>	Influenza CHC ( 36 Mos and above with preservative)	0.5mL	-	Other Actions ▾	<input type="checkbox"/>	PHQ2	<input type="checkbox"/>
<input type="checkbox"/>	PPV 23 (Adults and high risk children over 2)	0.5 ml	-	Other Actions ▾	<input type="checkbox"/>	PHQ9	<input type="checkbox"/>
<input type="checkbox"/>	Tdap > 18 Years old	0.5 ml	-	Other Actions ▾	<input type="checkbox"/>	Tobacco Control	<input type="checkbox"/>
<input type="checkbox"/>	Herpes Zoster (Shingles)	0.65mL	-	Other Actions ▾			

## Appointments

Order

## Referrals

Order

<input type="checkbox"/>	<input type="checkbox"/>	Follow-Up In:	4W	<input type="checkbox"/>	Outgoing Referral for:	CHC-BH Groups
<input type="checkbox"/>	<input type="checkbox"/>	Follow-Up In:	2M	<input type="checkbox"/>	Outgoing Referral for:	CHC-Meriden PharmD
<input type="checkbox"/>	<input type="checkbox"/>	Follow-Up In:	3M	<input type="checkbox"/>	Outgoing Referral for:	CHC-CDE
<input type="checkbox"/>	<input type="checkbox"/>	Follow-Up In:	1 week with RN for insulin titration	<input type="checkbox"/>	Outgoing Referral for:	CHC-Dental
				<input type="checkbox"/>	Outgoing Referral for:	Ophthalmology
				<input type="checkbox"/>	Outgoing Referral for:	CHC-Podiatrist
				<input type="checkbox"/>	Outgoing Referral for:	Podiatry - Surgical Chiropody
				<input type="checkbox"/>	Outgoing Referral for:	CHC-SRP
				<input type="checkbox"/>	Outgoing Referral for:	CHC-Nutrition
				<input type="checkbox"/>	Outgoing Referral for:	CHC-Mental Health

# Alert Fatigue?

Patient Hub (test, cdss1)

**test, cdss1** Sel Info

635 Main street  
Middletown, CT-06457  
DOB: **01/24/1951**  
Age: **62 Y** Sex: **F**  
Advance Directive:  
WebEnabled: **Yes**  
Account No: **872033**

Home:  
Work:  
Cell:  
Email: [shanti@chc1.com](mailto:shanti@chc1.com)  
Insurance:  
PCP: **Anderson, Daren**  
Rendering Pr:

Patient Balance: **\$0.00** Collection Status:  
Account Balance: **\$0.00** Assigned To:

Labs:	0	Tel Enc:	0
DI:	1	Web Enc:	0
Referrals:	0	Documents:	0
Actions:	0	P2P:	0

Last Appt: 06/04/2011 07:15 AM Facility: 144:New London Medical  
Next Appt: Facility:  
Bumped Appts: **NONE** Case Manager Hx:

**New Appt** **New Tel Enc** **Print Label** **Billing Alert** **Patient Docs**  
**Letters** **Encounters** **Medical Summary** **Rx** **Progress Notes**  
**eCliniForms** **Devices** **Problem List** **Medical Record** **Send eMsg**  
**Account Inquiry** **Guarantor Bal.** **Consult Notes** **Letter Logs** **Fax Logs**  
**New Action** **New Web Enc** **Flowsheets** **Billing Logs**  
**eHX Consent** **Export eHS** **Export Labs** **Export Documents** **ePrescription Logs**

Close

**Overview** **DRTLA** **History** **CDSS** **Alerts**

**test, cdss1 62 Y, F as of 03/14/2013**

**CDSS Alerts**

There are no over due alerts today for this patient.

**Practice Alerts**

- [G] VZV adult: (Herpes Zoster (Shingles))
- [G] Lipids women: (Lipid Panel)
- [G] physical exam: (physical exam)
- [G] Tdap booster: (Tdap > 18 Years old)

**Registry Alerts**

There are no over due alerts today for this patient.

**MU Clinical Measures Exclusions**

- Influenza Immunization for Patients 50 Years Old **ACTIVE**
- Diabetes: Hemoglobin A1c Poor Control **ACTIVE**
- Diabetes: Blood Pressure Management **ACTIVE**
- Diabetes: Low Density Lipoprotein (LDL) Management **ACTIVE**
- Adult Weight Screening and Follow Up **ACTIVE**



# Combining Data With Supporting Systems

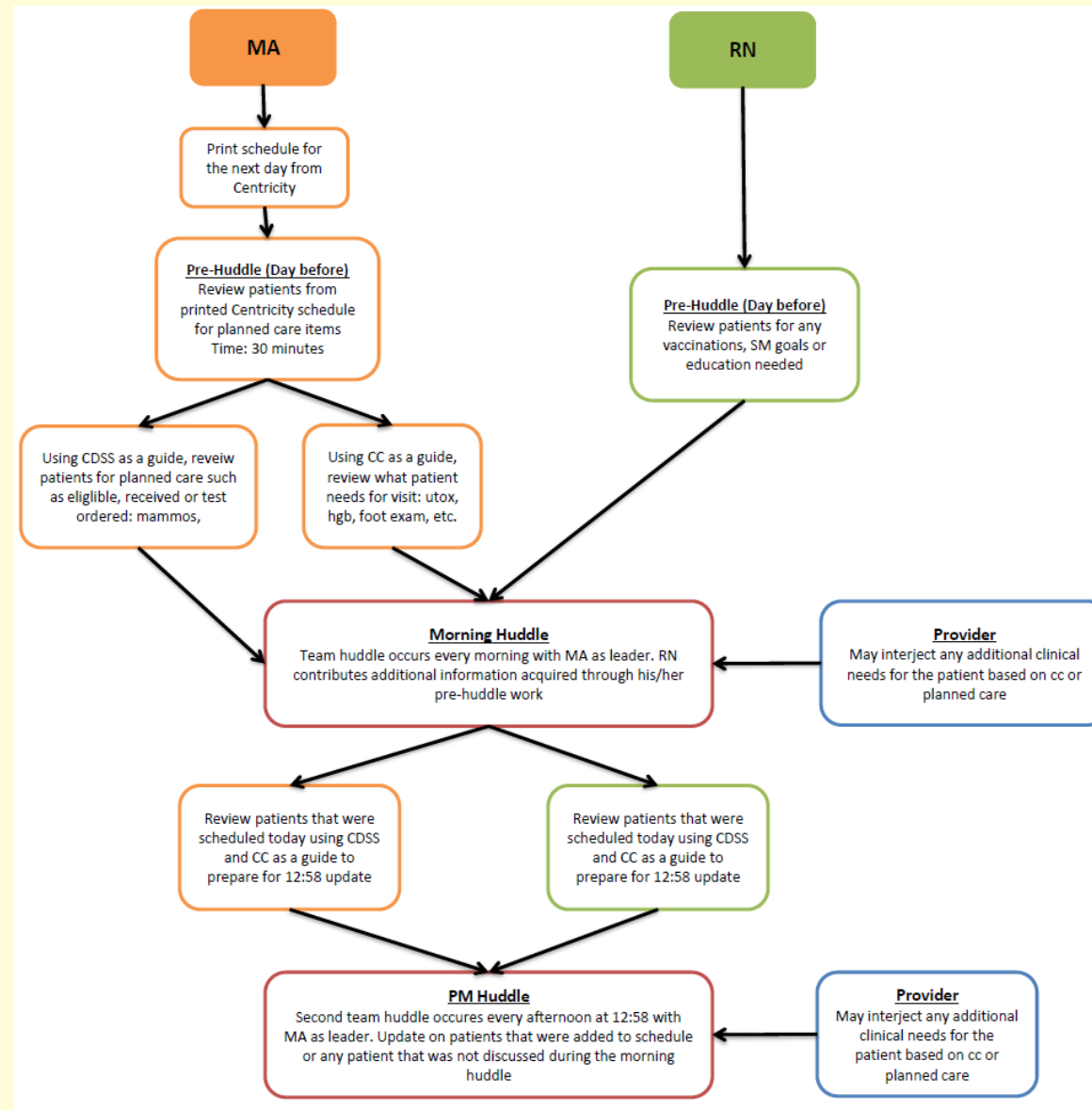
Reducing missed opportunities for screening



# Basic Process

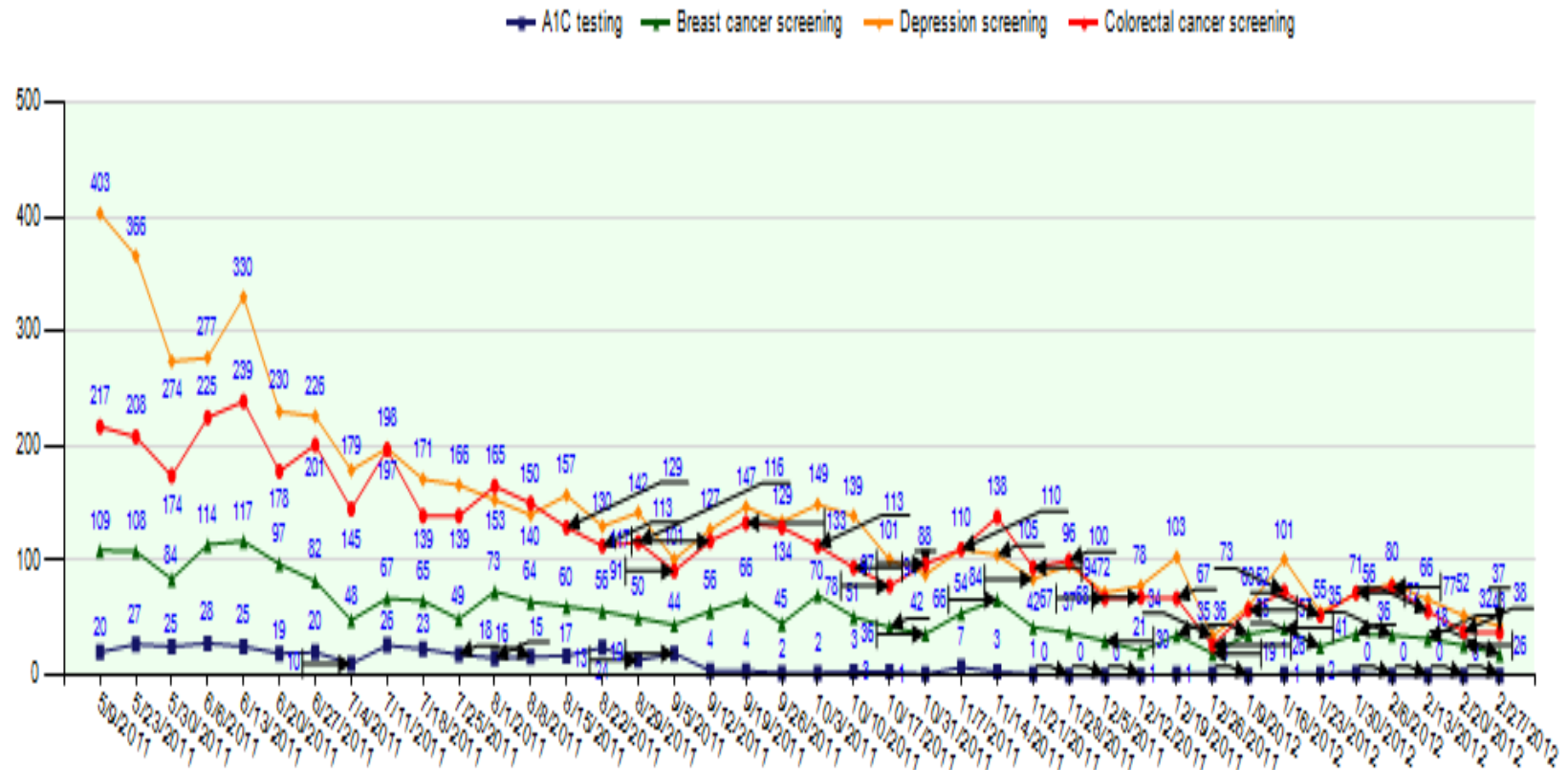
- **Pre-huddle**
  - MA reviews CDSS for scheduled visits next day
  - MA notes things that are due on a paper copy of the schedule
  - RN reviews patient schedule for vaccine needs/  
SM needs/other disease management needs
- **Huddle**
  - Booked into schedule each day
  - MA convenes huddle 5 minutes before start of patient schedule
  - Brief review by team of what is due, discussion of plan for complex cases

# Morning Huddle Process Map



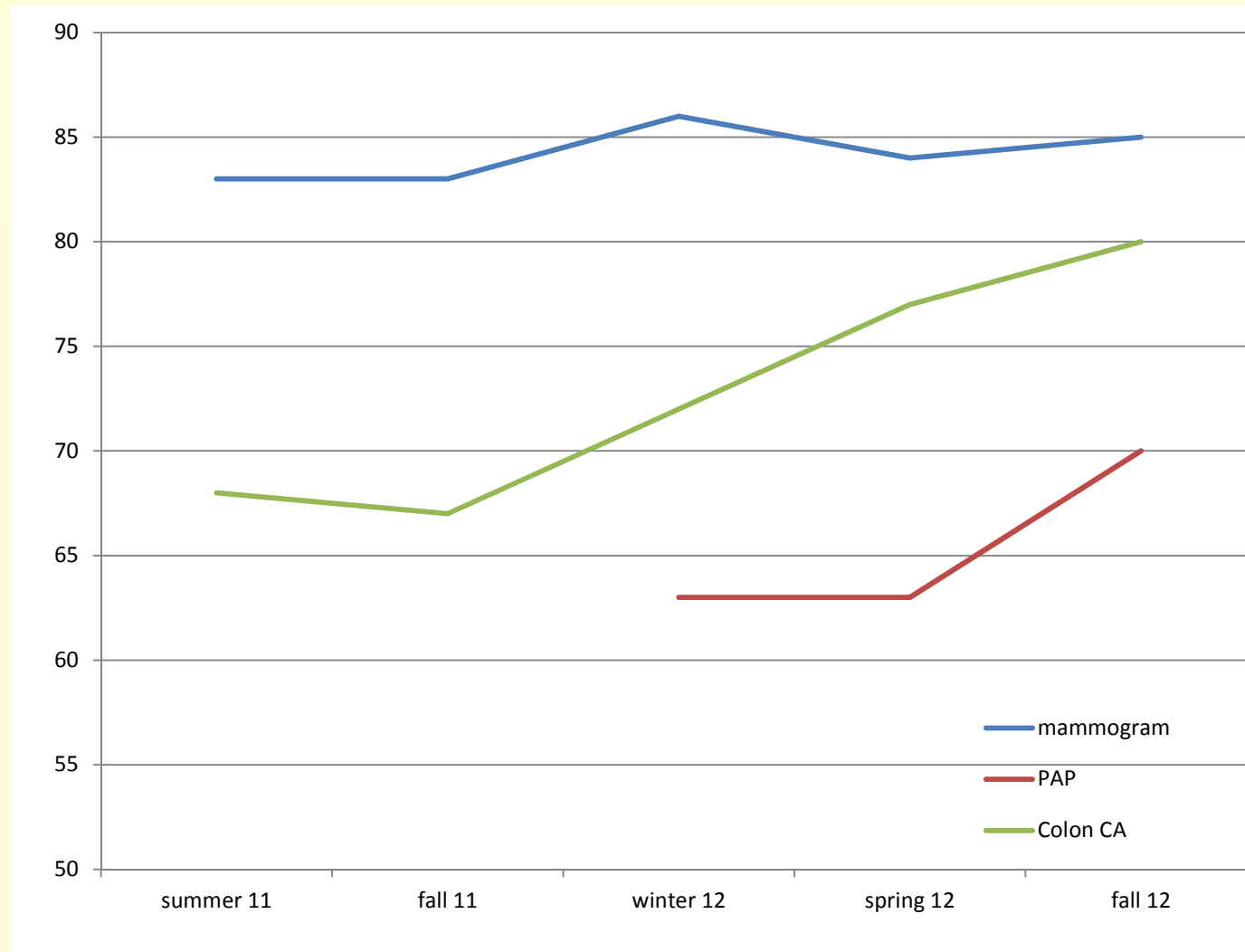
# Reduction in Screening Missed Opportunities With New Huddle Process

Missed Opportunities: Agency-Wide





# Cancer Screening Trends Post-Huddle Process



# Opioid Dashboard

Reporting Services - rptC... x Google

Home > CHC Data > Site Assets

Actions | 1 of 1 | Find Next | 100%

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## Chronic Opioid Patients

Data as of: 5/23/2012

	Total of Chronic Opioid Patients	Total Current Opioid Patients	Panel Size (12-mon)	% of Panel on Chronic Opioids	Total of 1-Utox Patients (6-mon)	% Utox Completed	Total of Contract Patients (ever)	% of Opioid Contract (ever)	Total of Contract Patients (12-mon)	% of Opioid Contract (12-mon)	Total of Survey Patients (3-mon)	% of Survey Patients (3-mon)	Patients Not Seen within 3-mon	% Not Seen within 3-mon
Anichini APRN, Jane	2	2	94	2.13%	1	50.00%	2	100.00%	1	50.00%	0	0.00%	0	0.00%
Barrow MD, Alvin	48	48	1054	4.55%	17	35.42%	32	66.67%	16	33.33%	1	2.08%	6	12.50%
Blankson APRN, Mary-FP	82	82	1033	7.94%	50	60.98%	66	80.49%	54	65.85%	29	35.37%	10	12.20%
Borgonos MD, Ovanes-FP	51	51	1083	4.71%	25	49.02%	30	58.82%	22	43.14%	0	0.00%	4	7.84%
Bravo MD, Teresa-FP	4	4	760	0.53%	2	50.00%	1	25.00%	1	25.00%	0	0.00%	0	0.00%
Butler MD, Danielle-FP	56	56	1195	4.69%	32	57.14%	35	62.50%	22	39.29%	0	0.00%	6	10.71%
Channamsetty MD, Veena-FP	12	12	826	1.45%	6	50.00%	7	58.33%	4	33.33%	1	8.33%	0	0.00%
Coury MD, Pamela	2	2	511	0.39%	1	50.00%	1	50.00%	1	50.00%	0	0.00%	0	0.00%
Czel APRN, Diana	9	9	239	3.77%	6	66.67%	7	77.78%	7	77.78%	0	0.00%	0	0.00%
Decker APRN, Patricia-FP	115	115	1070	10.75%	81	70.43%	102	88.70%	99	86.09%	0	0.00%	7	6.09%
DeMarco APRN, Rachel-FP	13	13	719	1.81%	5	38.46%	6	46.15%	4	30.77%	0	0.00%	3	23.08%
Doerwaldt MD, Hartmut-FP	29	29	1181	2.46%	12	41.38%	22	75.86%	19	65.52%	0	0.00%	4	13.79%
Dresden APRN, Debra	9	9	845	1.07%	5	55.56%	6	66.67%	2	22.22%	1	11.11%	1	11.11%
Eddinger APRN, Ann-FP	19	19	998	1.90%	5	26.32%	12	63.16%	9	47.37%	0	0.00%	4	21.05%
Gellrich MD, Gabriella-FP	22	22	1162	1.89%	6	27.27%	9	40.91%	3	13.64%	2	9.09%	3	13.64%
Haddad MD, Marwan-FP	13	13	188	6.91%	8	61.54%	6	46.15%	1	7.69%	0	0.00%	0	0.00%
Hassan MD, Syed	3	3	894	0.34%	1	33.33%	1	33.33%	0	0.00%	0	0.00%	0	0.00%
Huddleston MD, Matthew-FP	84	84	1063	7.90%	31	36.90%	61	72.62%	51	60.71%	0	0.00%	15	17.86%
Kamat MD, Leena	48	48	586	8.19%	17	35.42%	24	50.00%	21	43.75%	9	18.75%	10	20.83%
Knoeckel APRN, Sarah	23	23	790	2.91%	14	60.87%	13	56.52%	7	30.43%	0	0.00%	4	17.39%

# Opioid Missed Opportunities Report

Home > CHC Data > Site Assets

Actions | 1 of 1 | Find Next | 100%

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## Chronic Pain Missed Opportunities

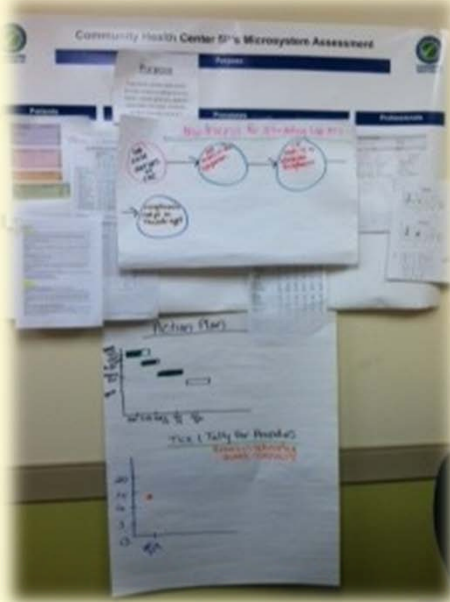
Data as of: 7/20/2012 11:51:05 AM

Provider	Total Current Chronic Opioid Patients with visit last week	Total Missed Utox (Last 6-month)	Total Missed Opioid Agreement (last 12-month)	Total Missed CommScore/Survey (last 3-month)	# of completed surveys
<a href="#">Anderson MD, Daren</a>	0	0	0	0	0
<a href="#">Anichini APRN, Jane</a>	0	0	0	0	0
<a href="#">Ayubcha MD, Soussan-FP</a>	0	0	0	0	0
<a href="#">Barrow MD, Alvin</a>	2	1	2	2	0
<a href="#">Black APRN, Tracy</a>	0	0	0	0	0
<a href="#">Blankson APRN, Mary-FP</a>	4	2	1	3	8
<a href="#">Borgonos MD, Ovanes-FP</a>	10	2	3	7	1
<a href="#">Butler MD, Danielle-FP</a>	5	2	4	4	1
<a href="#">Channamsetty MD, Veena-FP</a>	0	0	0	0	0
<a href="#">Chardavoyne APRN, Alexis</a>	0	0	0	0	0
<a href="#">Czel APRN, Diana</a>	2	0	1	2	0
<a href="#">Decker APRN, Patricia-FP</a>	19	1	1	19	0
<a href="#">DeMarco APRN, Rachel-FP</a>	0	0	0	0	0
<a href="#">Diotalevi APRN, Lynn-FP</a>	0	0	0	0	0
<a href="#">Doerwaldt MD, Hartmut-FP</a>	5	2	0	5	0
<a href="#">Dresden APRN, Debra</a>	0	0	0	0	0
<a href="#">Dudley MD, Robert-PD</a>	0	0	0	0	0
<a href="#">Eddinger APRN, Ann-FP</a>	0	0	0	0	0
<a href="#">Eleck MD, Rebecca</a>	0	0	0	0	1
<a href="#">Farb MD, Alan-PD</a>	0	0	0	0	0
<a href="#">Gallish MD, Gabriela-FP</a>	2	2	2	2	0

Parameters  
run For Week: 7/9/2012 12:00:00 AM

Apply

# Next Steps With “Lean”



- Gaps in screening process remain
- Lean tools used to develop new process to manage abnormal results



The flowchart illustrates the proposed methodology, starting with data collection from various sources (e.g., 'Data collection from various sources', 'Data collection from various sources', 'Data collection from various sources'). It then proceeds through several stages of data processing, including data cleaning, data normalization, and data splitting. The process involves multiple decision points, such as 'Is the data balanced?', 'Is the feature set optimal?', and 'Is the model performance satisfactory?'. The final output is a 'Proposed model' which is evaluated against 'Actual model performance'.

# Summary

- CDS are not created equal.
- Workflows and teamwork are essential for maximizing the utility of CDS and managing alert fatigue.
- Practices may need to choose which CDS to prioritize.
- CDS monitoring improves compliance, team performance, and patient care.



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# Clinical Decision Support in Action: A Case Example



Regional Extension Assistance Center for HIT (REACH)

Lisa Gall, DNP, RN, CFNP, LHIT-HP  
Family Nurse Practitioner  
HIT Consultant MN/ND REACH (REC)  
SME for Stratis Health





# Session Goals

**Demonstrate how one clinic used the EHR and Clinical Decision Support Tools to**

- ✓ Improve patient care
- ✓ Improve workflows, information flow
- ✓ Enhance patient engagement
- ✓ Address performance incentives and initiatives
- ✓ Challenges, Resolutions, Tips in CDS

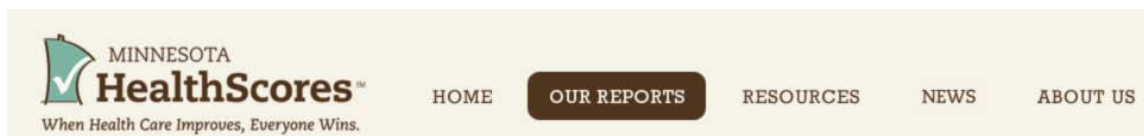


# Leveraging CDS and the EHR to Improve Care: A Case Example

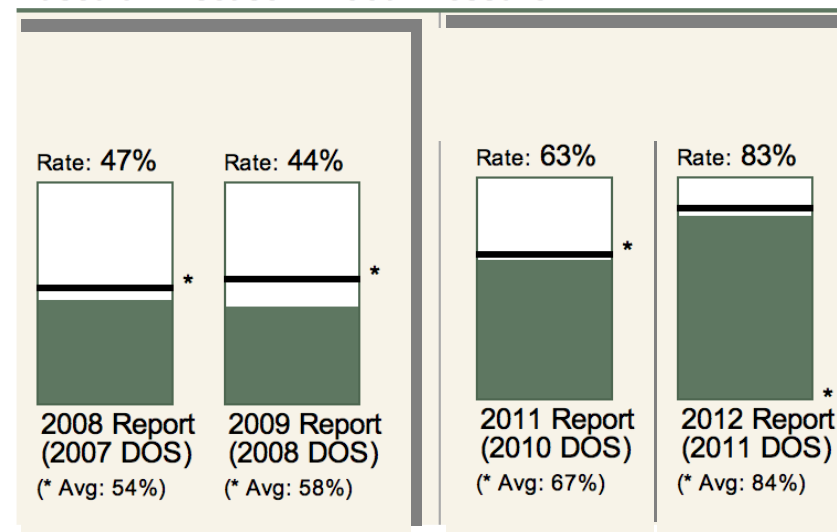
- Rural critical access hospital
- 1 main clinic – 9 providers
  - MD, NP, PA
  - FP, IM, OB/GYN
- 3 satellite clinics – 1-2 providers
- Primary care, convenience care
- EHR implemented in 2010



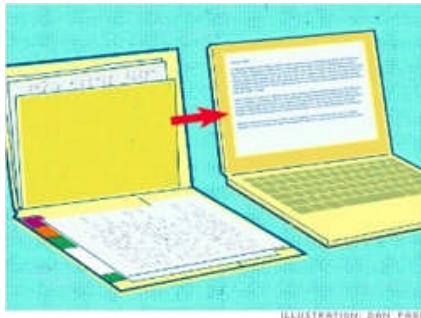
# Choosing a Target



## Vascular Disease - Blood Pressure



# Targeting Key Clinic Processes To Improve Care



## People

1. Preferences
2. Attitudes, skills

## Technology

1. EHR capabilities

## Key clinical processes

1. Patient flow in clinic
2. Order entry
3. Documentation
4. Results review
5. Flow sheets
6. Alerts, reminders
7. Appointment scheduling
8. Clinical summaries
9. Patient education
10. Clinical references



# Leveraging the EHR to Improve Care: BP Monitoring and Control

Barriers	How we met challenge
BP rechecks	<ul style="list-style-type: none"><li>• Educate nurses</li><li>• Clinic protocols</li></ul>
Stakeholder buy-in	<ul style="list-style-type: none"><li>• Early involvement</li><li>• Communication</li><li>• Best Practices</li></ul>

# Leveraging the EHR to Improve Care: BP Monitoring and Control (cont.)

Barriers	How we met challenge
Access to clinical information	<ul style="list-style-type: none"><li>• “Smart” Face sheet</li></ul>
Documentation inefficiency	<ul style="list-style-type: none"><li>• HTN templates</li></ul>
Order sets	<ul style="list-style-type: none"><li>• Optimized order sets</li></ul>
Flow sheets not user friendly	<ul style="list-style-type: none"><li>• Redesigned flow sheets</li></ul>
Access to home BP logs	<ul style="list-style-type: none"><li>• Flow sheet column</li></ul>

**\* Leverage providers and key stakeholders**



# Tools to Improve Care Delivery

- What do you have now?
  - Flow sheet, order sets, templates, etc.
  - How can it be improved?
- Revise, build or customize?
  - You or Vendor?
  - Standardize for organization/specialty
  - Customized by provider???
- How can you use it to improve care?
  - Engage patients?

# Leveraging the EHR to Improve Care: BP Monitoring and Control (cont.)

Barriers	How we met challenge
Inconsistent, inefficient workflows <ul style="list-style-type: none"><li>• Duplicate results</li></ul>	Standardize workflows <ul style="list-style-type: none"><li>• Results review</li></ul>
Appointment scheduling	After-visit (clinical) summary
Pop-up alerts	VS in red/bold Pop-ups only for patient safety <ul style="list-style-type: none"><li>• Medications</li></ul>

***Use pop-up alerts sparingly!***



# Leveraging the EHR to Improve Care: BP Monitoring and Control (cont.)

Barriers	How we met challenge
Patient understanding, compliance	Verbal, printed, electronic
Clinical references	Provider education

# Leveraging the EHR to Improve Care: Patient Education and Engagement

## Provider Challenges

1. Trust
  - “Paper” favorites
2. Knowledge
  - Where to find content
  - How to use and print
3. Time

## Resolutions

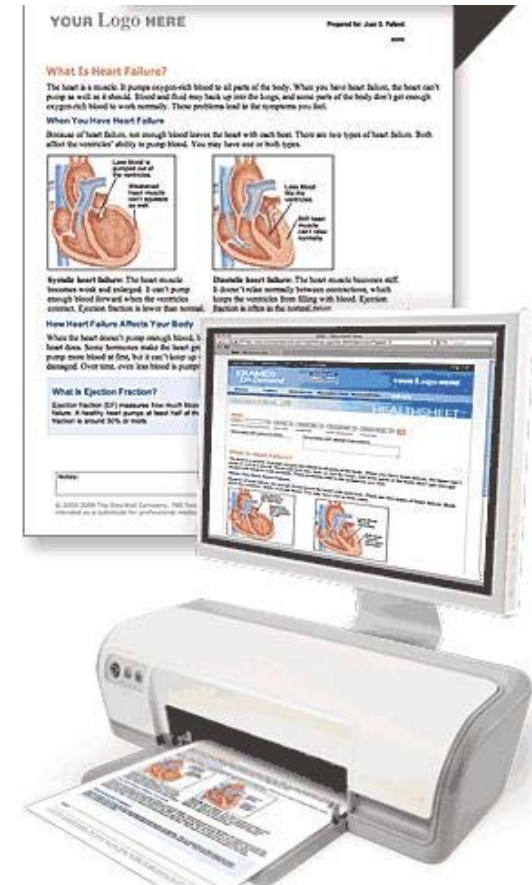
1. Inform
  - What (resources)
  - Why (sources)
  - How to access
  - Add to favorites
2. Practice
  - Electronic vs. paper
3. Optimize
  - Order sets
  - Utilize staff



# Leveraging the EHR to Improve Care: Patient Education and Engagement (cont.)

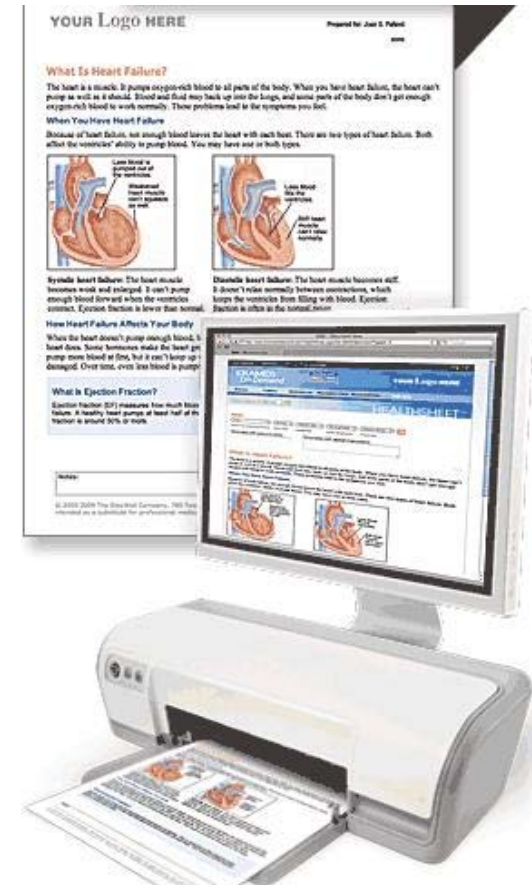
- **Provider Benefits**

- Picture is worth 1,000 words
- Saves time, quick access
- Up-to-date reliable information
- Modifiable and easy to print



# Leveraging the EHR to Improve Care: Patient Education and Engagement (cont.)

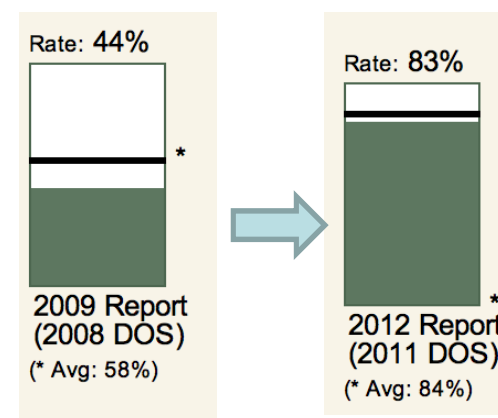
- **Patient Benefits**
  - Patient-specific plan of care
  - Clinical summary
  - Patients more involved
  - Enhances follow-up care



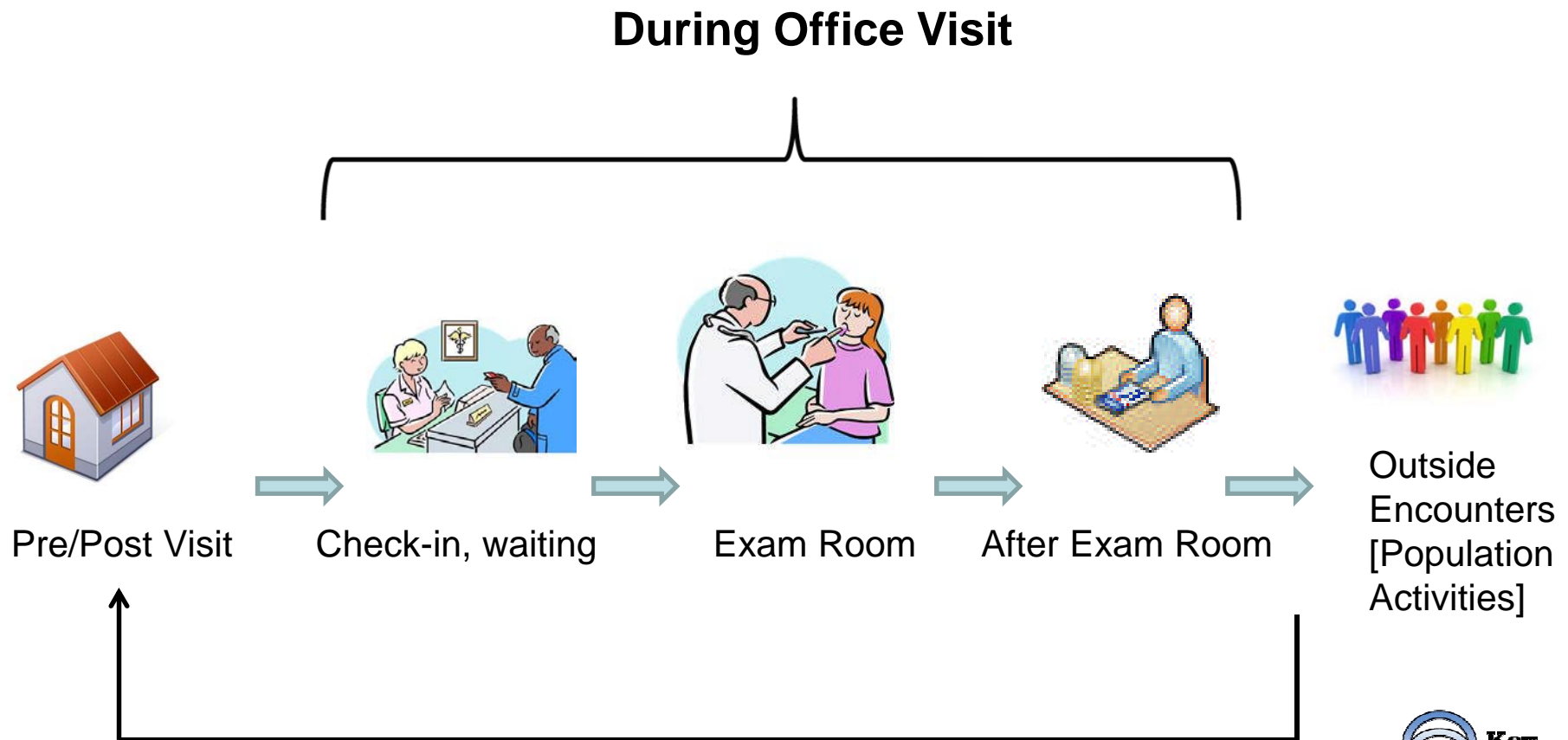
# Overview of CDS Strategy

1. **Abnormal VS** displayed in bold red letters
2. **Key clinical data** displayed on EHR face sheet
3. **Flow sheets** for key clinical information, links from main screen
4. **Smart order sets:** recommended labs, diagnostics, medications
5. **Medication classes and interactions** with dosing calculations
6. **Patient education:** written, verbal, electronic
7. **Clinical (after visit) summary**
8. **Schedule follow-up** appointment
9. **HTN Documentation** templates

**Target Measure: 80% of patients 18-85, BP<140/90**

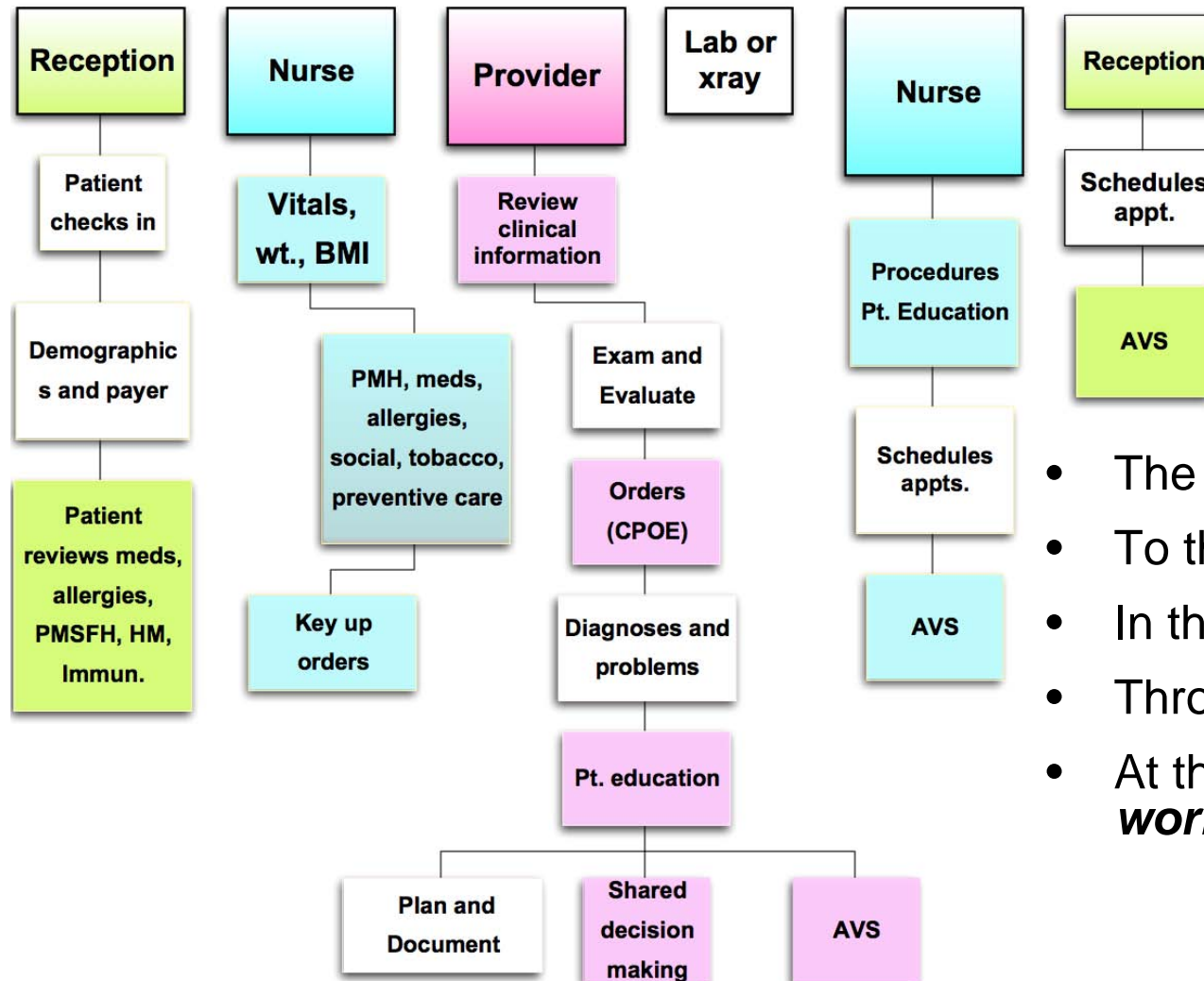


# Understanding and Improving Workflows



*Learning and Action Network, Webinar presentation 2/20/2013*

# Apply the “CDS 5 Rights” to Improve Care



- The *right information*
- To the *right people*
- In the *right intervention*
- Through the *right channels*
- At the *right points in workflow*

# Presentation Summary

- Rural hospital and clinic
- Leveraged CDS and EHR to improve care
- Chose quality improvement targets for CDS
  - Improved BP control rates
  - Improving patient education and engagement
- ID key clinical processes to improve efficiency
- Challenges and Resolutions
  - Continuous quality and process improvements
- CDS tools and tips
  - People, processes, and technology



# References

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- Osheroff, JA, Teich, JM, Levick, D, Saldana, L, Velasco, FT, Sittig, DF, Rogers, K, Jenders, RA (2011). Improving Outcomes with Clinical Decision Support: An Implementer's Guide, Second Edition. Chicago, IL: Healthcare Information and Management Systems Society.

# Q&A

- ▶ Any questions from the case study?



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# Clinical Decision Support Resources

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- Health Resources and Services Administration (<http://www.hrsa.gov/healthit>)
  - Health IT Adoption Toolbox
  - HIV/AIDS Toolbox
  - Rural Health Toolbox
  - Meaningful Use and Quality Webinars
- Centers for Medicare and Medicaid (<http://www.cms.gov/ehrincentiveprograms>)
  - Meaningful Use Resources
- Office of the National Coordinator for Health IT (<http://www.healthit.gov>)
  - Professionals and Providers
  - Policy Researchers and Implementers
- Agency for Healthcare Research and Quality (<http://healthit.ahrq.gov/>)
  - Healthcare Information
  - Health IT