



Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

Primary Care Development Corporation, Inc.

Using EMR-enabled CDS to Manage Hypertension in a Community Health Center: The Providers' Perspective

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Director

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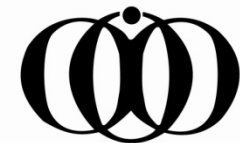
June 3, 2010

Our Team

Westchester County, NY



PRIMARY CARE
DEVELOPMENT
CORPORATION



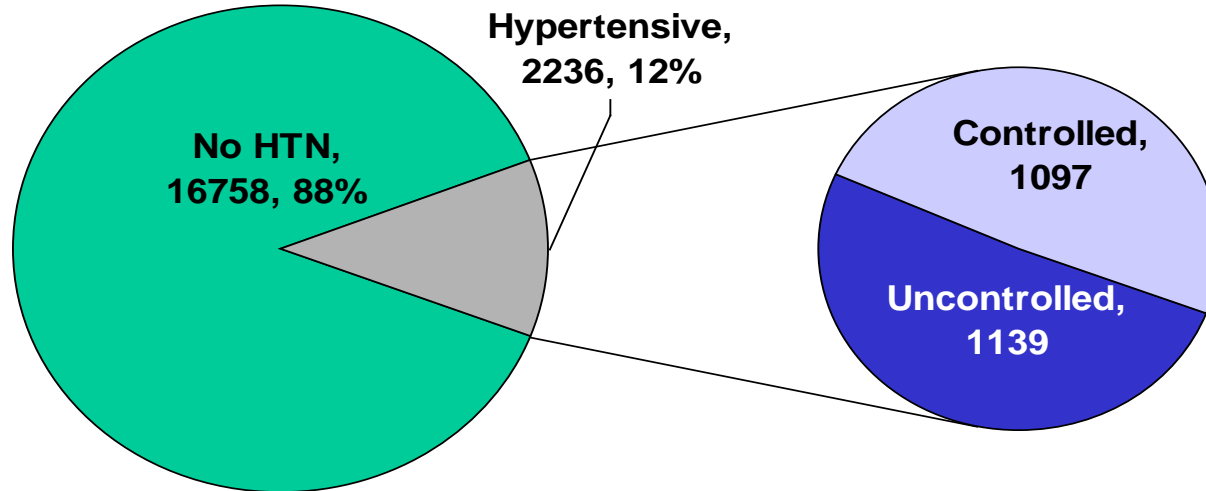
OPEN DOOR
FAMILY MEDICAL CENTERS

New York University



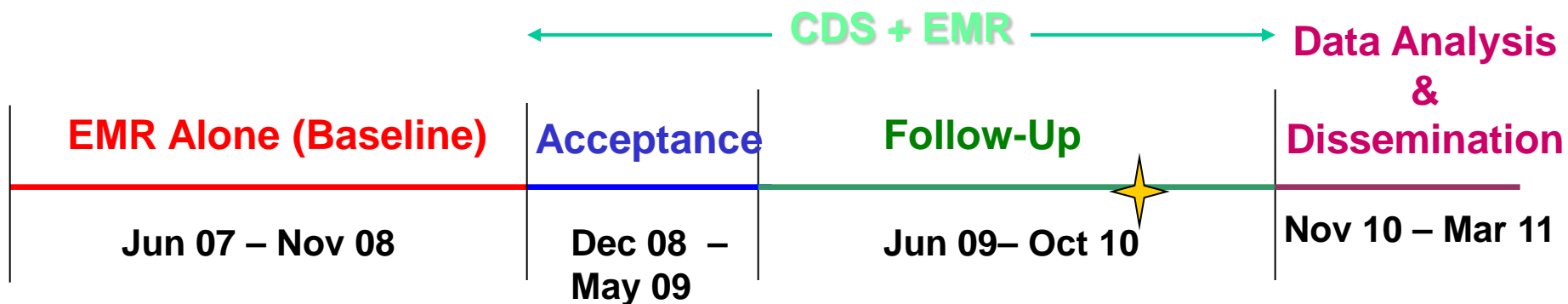
Columbia University
MAILMAN SCHOOL
OF PUBLIC HEALTH

HTN Control at Baseline



Patients with ≥ 2 visits, June 2007 – October 2008

Project Timeline



What is the Intervention?

- ✓ OD Guidelines: Management of Hypertension
- ✓ [Re] training and support on care processes
- ✓ Enhanced patient support
- ✓ Provider performance feedback



CDS + EMR (vs. EMR alone)



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Hypertension Template

testLabcorp, Self, 37 Y, F [Sel](#) [Info](#) [Hub](#)

☐ 55 park lane
Franklin, MA 01234
H:508-882-1111
DOB:12/26/1971

☒ **Allergies**
Billing Alert

Wt: 162 lbs.
Appt(L): 01/28/09
PCP: AAA,
Indian
(includes
Hindi &
Tamil)
Language: Tamil
Translator: Yes

Ins: Self Pay
Acc Bal: \$20.00
Guan: Self
Gr Bal: \$20.00
Ren: Willis MD,

[CLICK TO EDIT](#)

[SECURE NOTES](#)

[ADV DIRECT](#)

SF Rel Bulleted Encounters << 01/28/2009

Address: 55 park lane, Franklin, MA-01234
Encounter Date: 01/28/2009 **Provider:** Mt Kisco Advocate

Subjective:
[Chief Complaint\(s\):](#)
[HPI:](#)
[Hypertension](#)
Med compliance misses frequently. Med side effects dizziness. Diet and exercise: runs, does treadmill. Cardiac symptoms: none.
[Current Medication:](#)
[Medical History:](#)

- asthma
- Hypertension

[Allergies/Intolerance:](#)
[ROS:](#)

Objective:
[Vitals:](#)
Staff Name and title: pf, Pain scale (0-10) 0, BP 150/90 left arm, 210/76 right arm
[Past Results:](#)
[Examination:](#)
[General Cardiology](#)
GENERAL APPEARANCE: pleasant, NAD, HEENT: unremarkable, CAROTID UPSTROKE: normal, no bruit, JVD: flat, HEART:

[Print](#) [Fax](#) [Record](#) [Lock](#) [Details](#) [Scan](#) [Templates](#) [Claim](#) [Letters](#) [Ink](#)



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Medication Adherence Smart Form

eClinicalWorks (Ferrari RN,Pam)

File Patient Schedule EMR Billing Reports Fax Tools Community Lock Workstation Help

eClinicalWorks 8.0

E 0 S 0 D 1 R 0 T 6 L 0 M 0

Admin Progress Notes

T, TEMPLATES, 39 Y, M [Sel Info Hub]

114 turnpike road
Westborough, MA
H:508-836-2700
DOB:01/01/1970

Allergies
Billing Alert

Appt(L): 05/16/01
Language: No
Translator:

Ins: Self Pay
Acc Bal: \$0.00
Guar: TEMPLATES
Gr Bal: \$0.00

CLICK TO EDIT

SECURE NOTES

ADV DIRECT

Medical Summary | CDSS | Labs | DI | Procedures | Growth Chart | Immunization | Encounters | Patient Docs | Flowsheets | Notes

SF [] Rel [] Bulleted [] Encounters [] 04/11/2001 -Hyperten

HPT:
Hypertension
Med compliance as prescribed. Med side effects none. Diet and exercise: remains compliant with low fat/salt meals and physical activities. Cardio

Current Medication:
Medical History:
Allergies/Intolerance:
ROS:

Objective:
Vitals:
Past Results:
Examination:
General Cardiology
GENERAL APPEARANCE: normal, no bruits. JVD: flat. HEART
SOUNDS: regular, normal S1, S2. NO murmurs. Lungs: clear. Abdomen: soft, no hepatomegaly, no masses felt.
EXTREMITIES: no leg edema.

Assessment:
Assessment:
Hypertension - 401.9 (Primary)

Print [] Fax [] Record [] Lock [] Details [] Scan [] Templates [] Claim [] Letters [] Ink []

start 6 Micr... Cancer ... BridgeIt... eClinica... Microso... 2 Micr... 3:10 PM

feet dorsum
back view
whole body
Eyes
face front view

Order Set

Order Sets

Labs

Order Browse

	Description	Date	Status	
<input type="checkbox"/>	-CBC With Differential/Platelet	-	Other Actions	
<input type="checkbox"/>	-Lipid Panel	07/16/2007	Other Actions	
<input type="checkbox"/>	-CMET Comp. Metabolic Panel (14)	-	Other Actions	

Diagnostic Imaging

Order Browse

	Description	Date	Status	
<input type="checkbox"/>	* ECG without ECW interface	-	Other Actions	
<input type="checkbox"/>	* ECG with ECW Welch Allyn interface	-	Other Actions	
<input type="checkbox"/>	* ECG with Midmark interface	-	Other Actions	

Procedures

Order Browse

	Description	Date	Status
--	-------------	------	--------

Immunizations

Order

	Name	Dose	Date	Status
<input type="checkbox"/>	FLU VACCINE (Adult)	0.5 ml	-	Other Actions
<input type="checkbox"/>	Pneumovax 23 (Adult)	0.5 ml	-	Other Actions

Smart Forms

Name	
BMI	
Tobacco Control	

Appointments

Order

<input type="checkbox"/>	Follow-Up In: 4W for uncontrolled Stage 1
<input type="checkbox"/>	Follow-Up In: 2W for uncontrolled Stage 2
<input type="checkbox"/>	Follow-Up In: 3M for controlled blood pressure
<input type="checkbox"/>	Follow-Up In: schedule with Patient Advocate
<input type="checkbox"/>	Follow-Up In: schedule with Nutritionist

Referrals

Order

Physician Education

PDF	
WEB REFERENCE	

Patient Education

PDF	Order
WEB REFERENCE	Order

CDS Reminders

eClinicalWorks (Ferrari RN,Pam)

File Patient Schedule EMR Billing Reports Fax Tools Community Lock Workstation Help

eClinicalWorks 8.0

E 0 S 0 D 1 R 0 T 6 L 0 M 0

Admin Practice

testLabco

Medical Sur

SF

Patien E

Anderson MD,C...

Arraiano PA,Nic...

Bhatty DDS,Ne...

Bozzone DMD,J...

Brodkin DMD,E...

Registry

Referrals

Messages

Documents

Billing

Progress Notes

CDSS Alerts

CDSS - Clinical Decision Support System

Show All Alerts

Measure Name	Fq	Status	Orders
Alcohol use screening	12 M	NON-COMPLIANT	Audit-C Other Actions
Breast cancer screening	24 M	NON-COMPLIANT	OD-Screening Mammogram
Cholesterol screen (genl pop)	60 M	NON-COMPLIANT	-Lipid Panel Other Actions
Depression screening	12 M	NON-COMPLIANT	PHQ2 Other Actions
Patients see assigned PCG	12 M	NON-COMPLIANT	Patients see assigned PCG
Sexual history taken	12 M	NON-COMPLIANT	Sexual History Other Actions
BP control in HTN (140/90)	12 M	SNOOZED	Hypertension - Control
Body Mass Index	24 M	COMPLIANT	BMI Other Actions
Influenza vaccine (over 50)	6 M	COMPLIANT	zzzINFLUEN Other Actions
Pneumococcal vaccine	60 M	COMPLIANT	Pneumovax 23 (Adult) Ordered
Smoking cessation intervention	12 M	COMPLIANT	Smoking Cessation
Smoking status	12 M	COMPLIANT	Tobacco Control Other Actions

Treatment Billing

90732 Pneumovax 23 (Adult).

Print Fax Record Lock Details Scan Templates Claim Letters Ink

start 2 M... 3 I... 2 A... 2 W... Micro... eClni... Hype... 4:41 PM

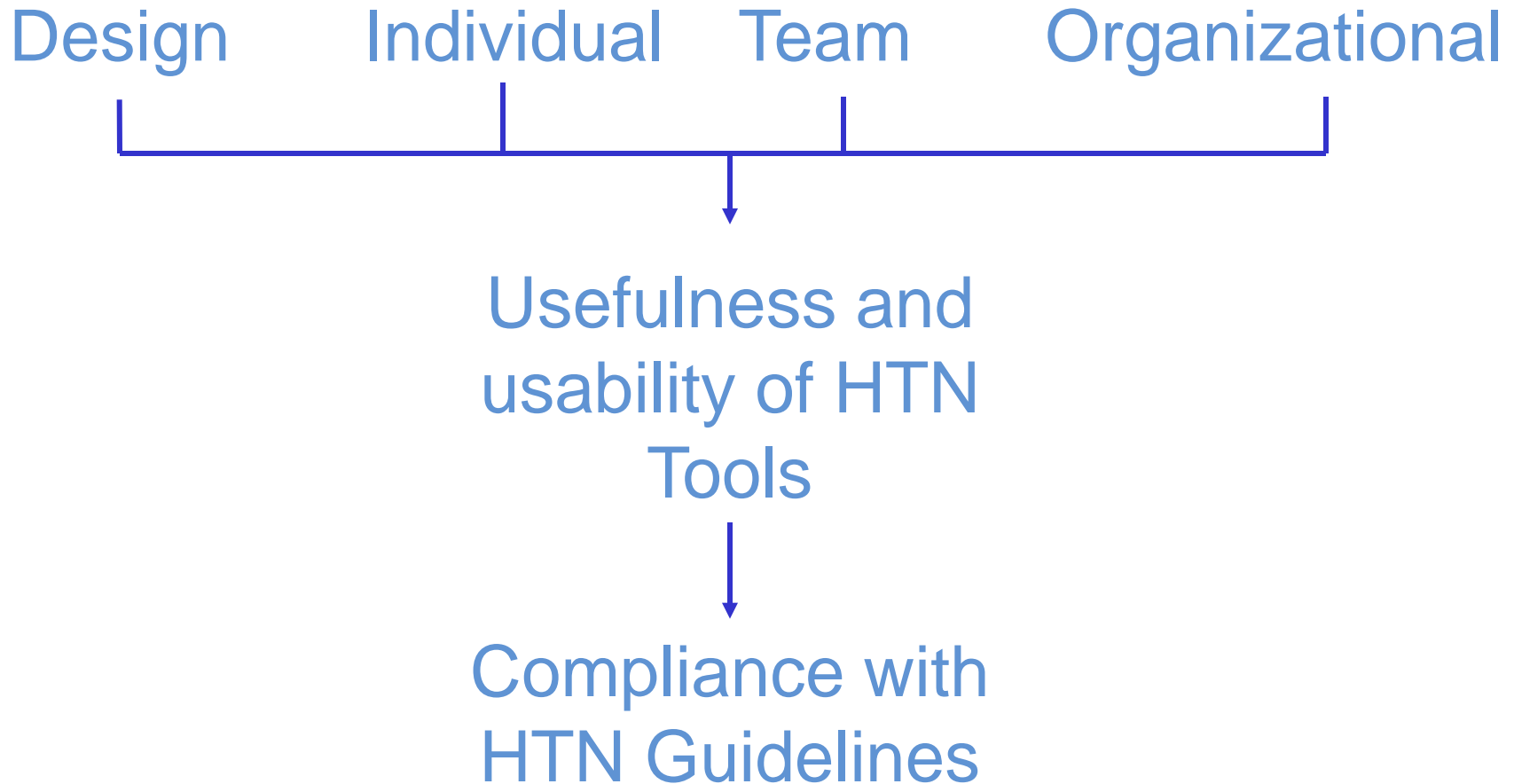


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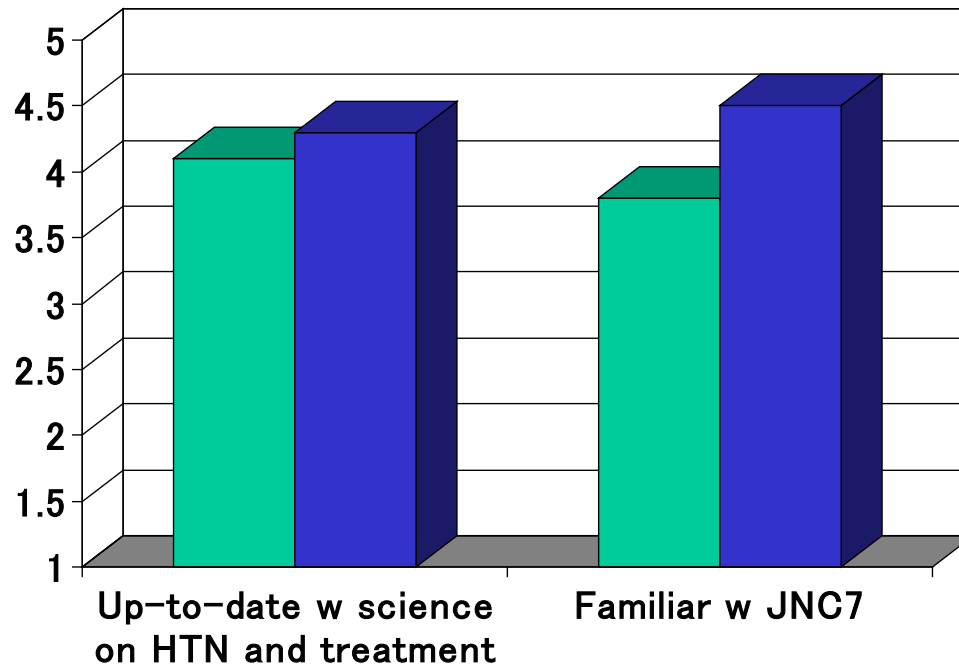
Provider Feedback Reports

Provider	1	2	3	4	5
Total # Hypertensive Patients	36	60	12	21	43
% DM BP Controlled <130/80	9.00%	30.00%	25.00%	10.00%	50.00%
Hypertension not Well Controlled <140/90	55.00%	52.60%	36.40%	70.00%	50.00%
# of patients Order Sets Used	0	19	1	4	8
% of patients with order Set Used	0.00%	31.67%	8.33%	19.05%	18.60%

Conceptual Model for Study



Attitudes towards HTN and JNC7 Guidelines



Mean ± S.D.		
Baseline	Follow-up	P (paired t-test)
4.1 ± .54	4.3 ± .65	.17
3.8 ± .60	4.5 ± .52	.01*

N=11

Frequency of Use

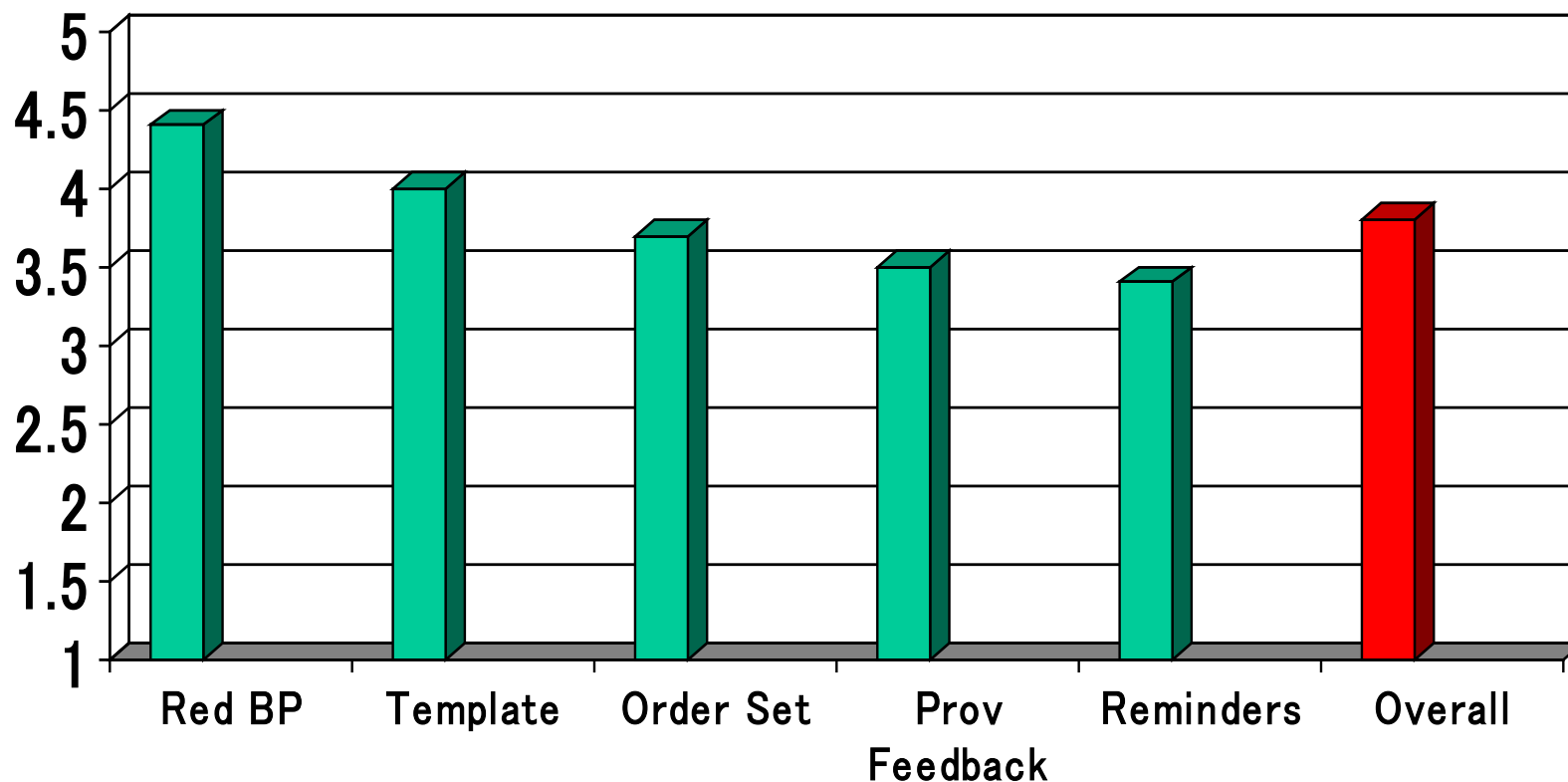
	Order Set	Template
Daily	3 (18%)	9 (53%)
1x/Wk to several times a week	6 (35%)	5 (29%)
Occasionally, less than 1x/wk	4 (24%)	2 (12%)
I tried but don't use it anymore	4 (24%)	1 (6%)
Never		



Usefulness of Each Component

	Alerts (Red BP)	Order Set	Template	Reminders	Prov Feedback
Very Useful	14 (78%)	6 (35%)	10 (63%)	3 (23%)	7 (38%)
Moderately Useful	2 (11%)	9 (52%)	4 (25%)	7 (54%)	5 (28%)
A Little Useful	2 (11%)	2 (12%)	2 (13%)	3 (23%)	3 (17%)
Not at all Useful					3 (17%)

Satisfaction with Each Component



Provider Comments @ Follow-Up

“ CDS has increased my awareness of hypertension . . . “

“ . . . [templates and order sets] make everything more systematic”

“ . . . CDS sometimes interferes with workflow; if I’m busy, the questions can be too long. If the patient has multiple problems, [it asks for] too many details. . . ”

Value of CDS Evaluation

People with Hypertension: Better BP control through increased provider awareness of the problem (elevated BP), and the solution (adherence to guidelines)

HTN is the #1 reason for doctor visits; most uncontrolled hypertensives have access to healthcare.

Clinics Seeking to Achieve Goals through HIT:

Development of tools to assess barriers to and facilitators of success in implementing EMRs and CDS

System design, staff expertise and attitudes, and implementation factors may contribute to the success of using HIT to support goals.