



NIH Collaboratory

Health Care Systems Research Collaboratory

Rethinking Clinical Trials™

Improving Chronic Disease Management with Pieces

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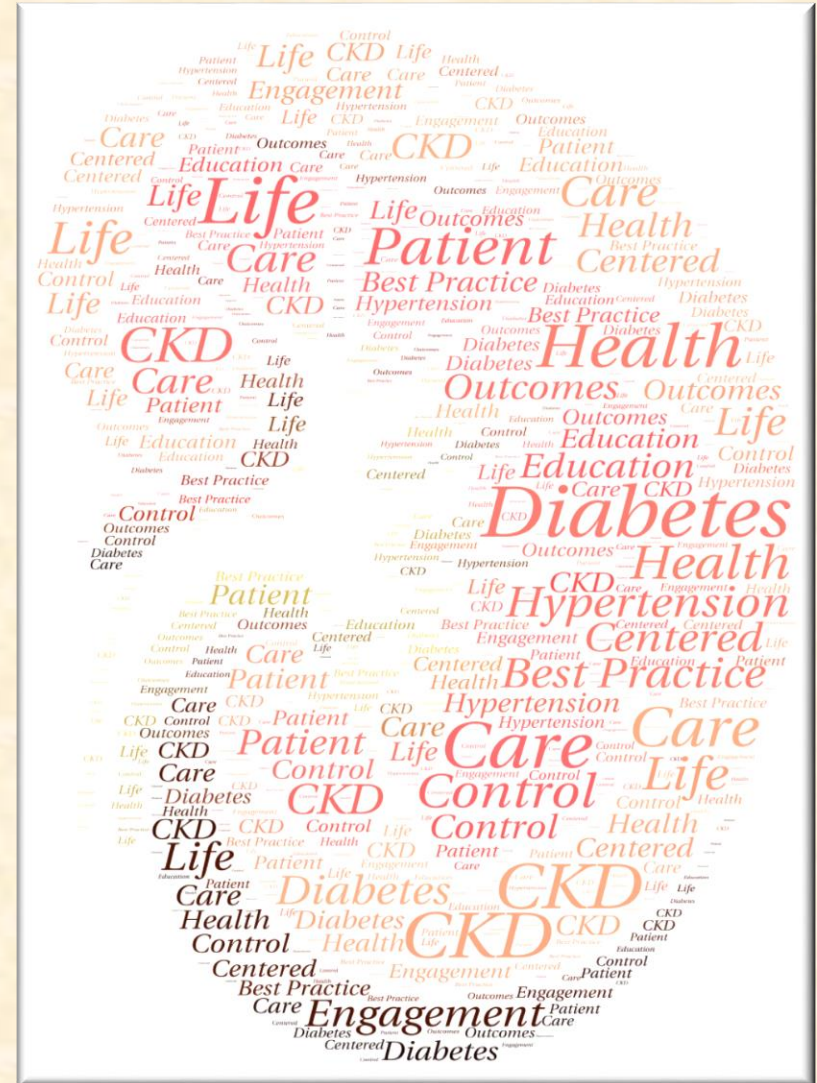
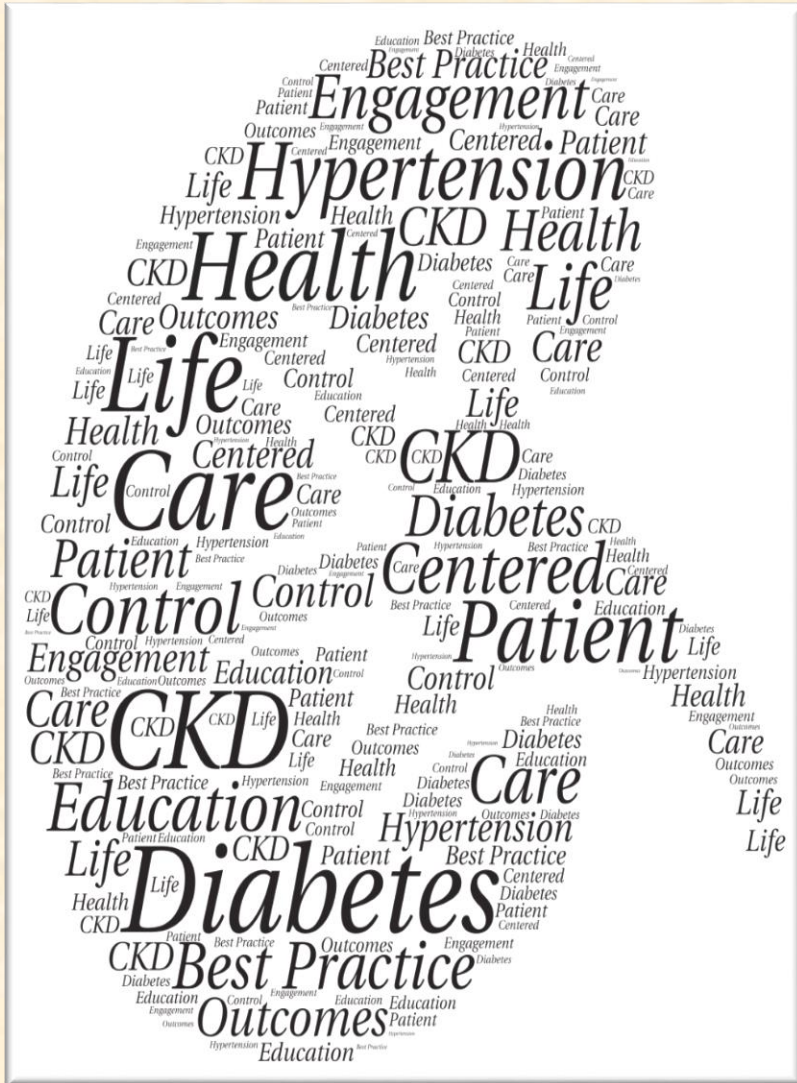
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(for ICD-Pieces Team)

Friday, September 23, 2016



ICD -Pieces: Pragmatic Clinical Trial in Patients with CKD, Diabetes and Hypertension



ICD- Pieces Overview

- **CKD, Diabetes and Hypertension**
 - Clinical consequences
 - Public health relevance
- **Trial Design and Planning**
 - Background to clinical trial
 - Challenges and protocol changes
- **Early Implementation**
 - Trial conduct
 - Milestones
 - Lessons we are learning

Organization ICD - Pieces

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Diabetes Core (Dr. Perry Bickel)
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Drs. Hedayati and Miller

Parkland

THR

VA

ProHealth

Drs. Velasco and Myers

Dr. Meehan and K. Pasquale

Clinical Relevance

Multiple Chronic Conditions

CKD

Diabetes

Hypertension

Excessive Cardiovascular morbidity/mortality
Progression to End Stage Renal Disease(ESRD)
Vulnerable populations
Gaps in clinical practice
Public health implications

ICD-Pieces Study Hypothesis

Patients who receive care with a collaborative model of primary care-subspecialty care enhanced by novel **information technology (Pieces)** and **practice facilitators (PF)** will have fewer hospitalizations, readmissions, ER visits, CV events and deaths than patients receiving standard medical care.

Specific Aims of ICD-Pieces Trial

- **UH2 – Planning Phase**

- Establish a Health Care Systems (HCS) Collaboratory
- Preparation for clinical trial

- **UH3 – Implementation Phase**

- Conduct a randomized pragmatic clinical trial of management of patients with CKD, diabetes and hypertension

Diverse Participatory Healthcare Systems and EHRs

HCS	Description	Location	EHR
Parkland	Safety-net public	Dallas County	EPIC
Texas Health Resources	Private non-profit	North Texas	EPIC/All Scripts
ProHealth	Private non-profit	Connecticut	All Scripts
VA North Texas	Federal	North Texas	CPRS

Design ICD-Pieces

- Stratified Cluster Randomization
- Stratum: Healthcare System
- Randomization Unit: Clinical practice (practitioner/ site)
- Sites randomized to either ICD-Pieces or standard care group.
- Every patient assigned to a practice receives the same intervention

Study Inclusion Criteria

Subject Inclusion Criteria

Patients 18-85 years of age with coexistent CKD, type 2 diabetes and hypertension.

CKD Inclusion Criteria (present at least ≥ 3 months apart)

Two or more eGFRs less than 60ml/minute **OR** two or more positive tests for albuminuria and/or proteinuria

Study Inclusion Criteria

Diabetes Inclusion Criteria

Only patients with type 2 diabetes will be enrolled in this study.

1. Random blood glucose greater than 200mg/dL
2. Hemoglobin A1C greater than 7.5%
3. Use of hypoglycemic agents **OR** Type 2 diabetes included in problem list

Hypertension Inclusion Criteria

1. SBP greater than 140mmHg on two occasions at least 1 week apart
2. DBP greater than 90mmHg on two occasions at least 1 week apart
3. Use of antihypertensive agents except thiazide diuretics **OR** Hypertension included in problem list

Outcomes

- **The primary outcome:**

1-year hospitalization rate for patients with a triad of CKD, diabetes and hypertension

- **The secondary outcomes:**

- 1) 30-day readmissions
- 2) Cardiovascular events
- 3) Deaths
- 4) Emergency room visits
- 5) Disease-specific hospitalizations
- 6) Safety events

Sample Size

(revised clusters)

Healthcare System	Number of Practices	Number Patients to be Enrolled
Parkland Healthcare Systems	25	3,367
Texas Health Resources	40	3,610
ProHealth Connecticut	50	3,181
North Texas VA	9	833
Total All Sites	124	10,991

Sample size estimate under revised clusters

- Assumption of $ICC=0.015$ comparing event rate 11% vs. 14% for primary outcome
- Total number of patients to be recruited will be 10,991 patients of 14,425 available patients , which comprises 76.2% ($=10,991/14,425$)
- Challenges
 - Variations in primary event rates among different HCS
 - Heterogeneity in cluster size
 - Workflows and risks cross-contamination

Regulatory issues (IRBs and Consent)

- Waiver of informed consent obtained from IRB at all sites
- Opt-out option (for intervention and/or use of data) offered to patients in implementation and control groups
- Different methods of Opt-out offered to patients by participating HCS
- Several layers of approval required at some HCS

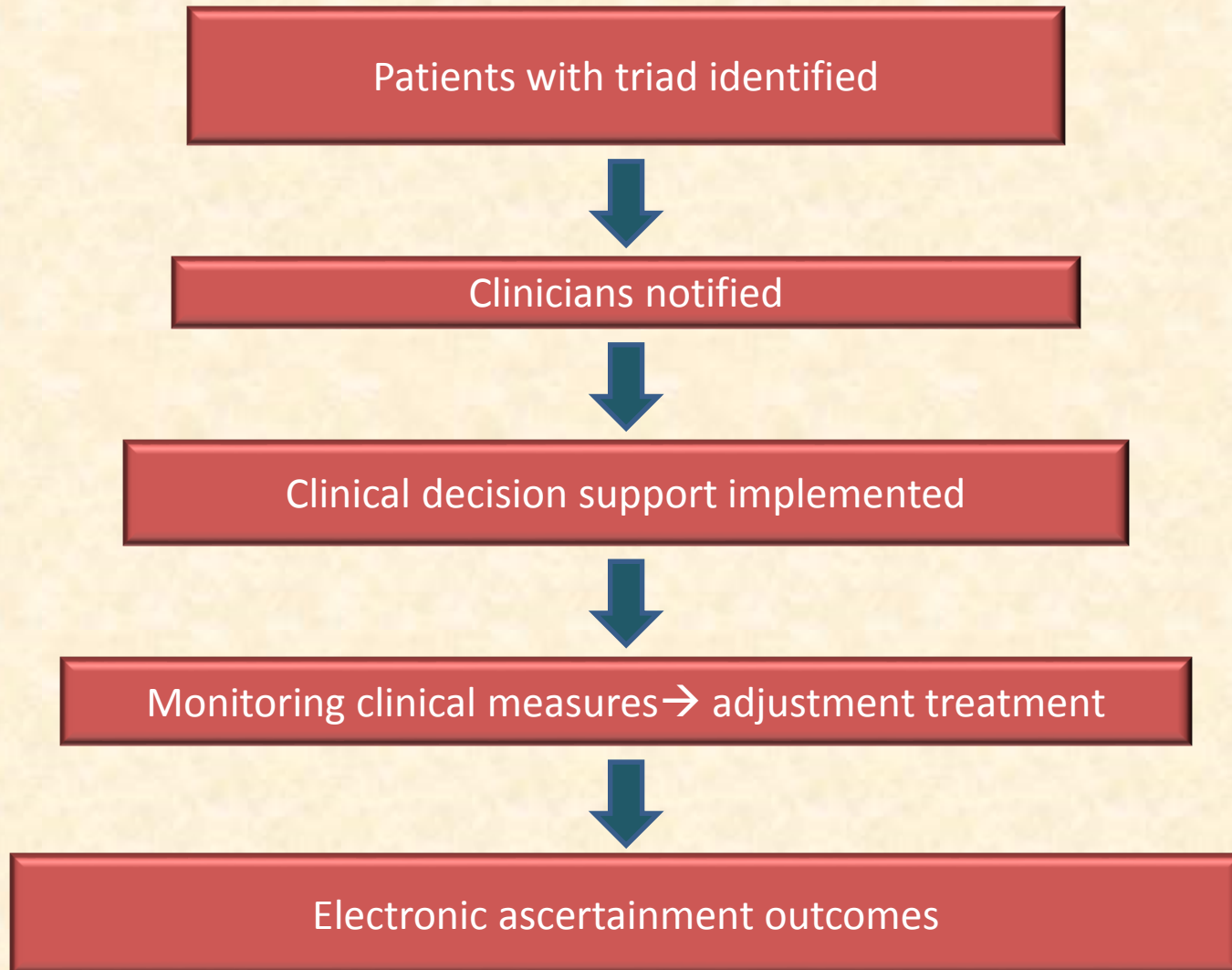


UH3-Implementation Phase

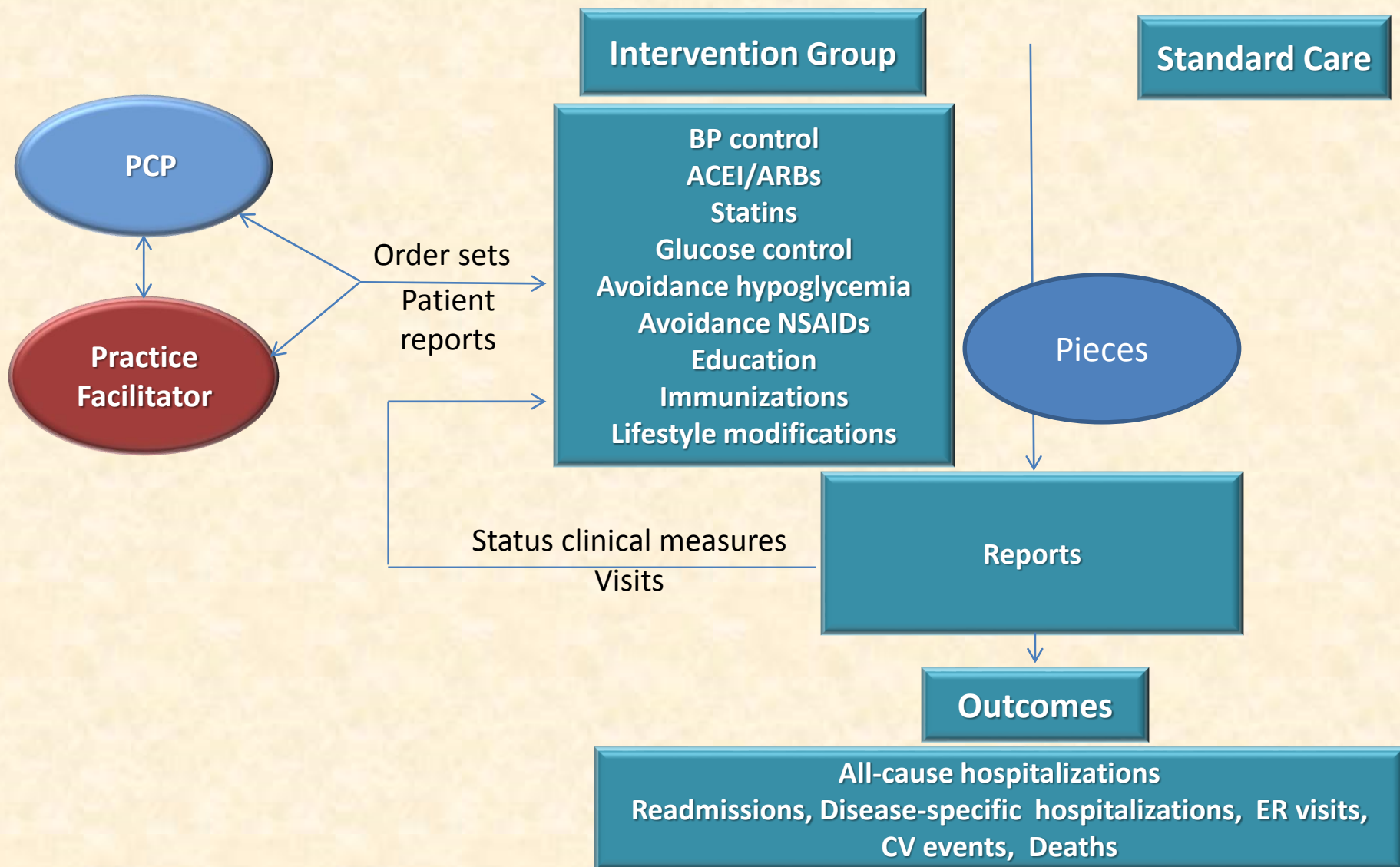
ICD- Pieces Study Implementation

- What happens in the study?
- How does it happen?
- What has been initial experience?
- What happens next?

What happens in the study?

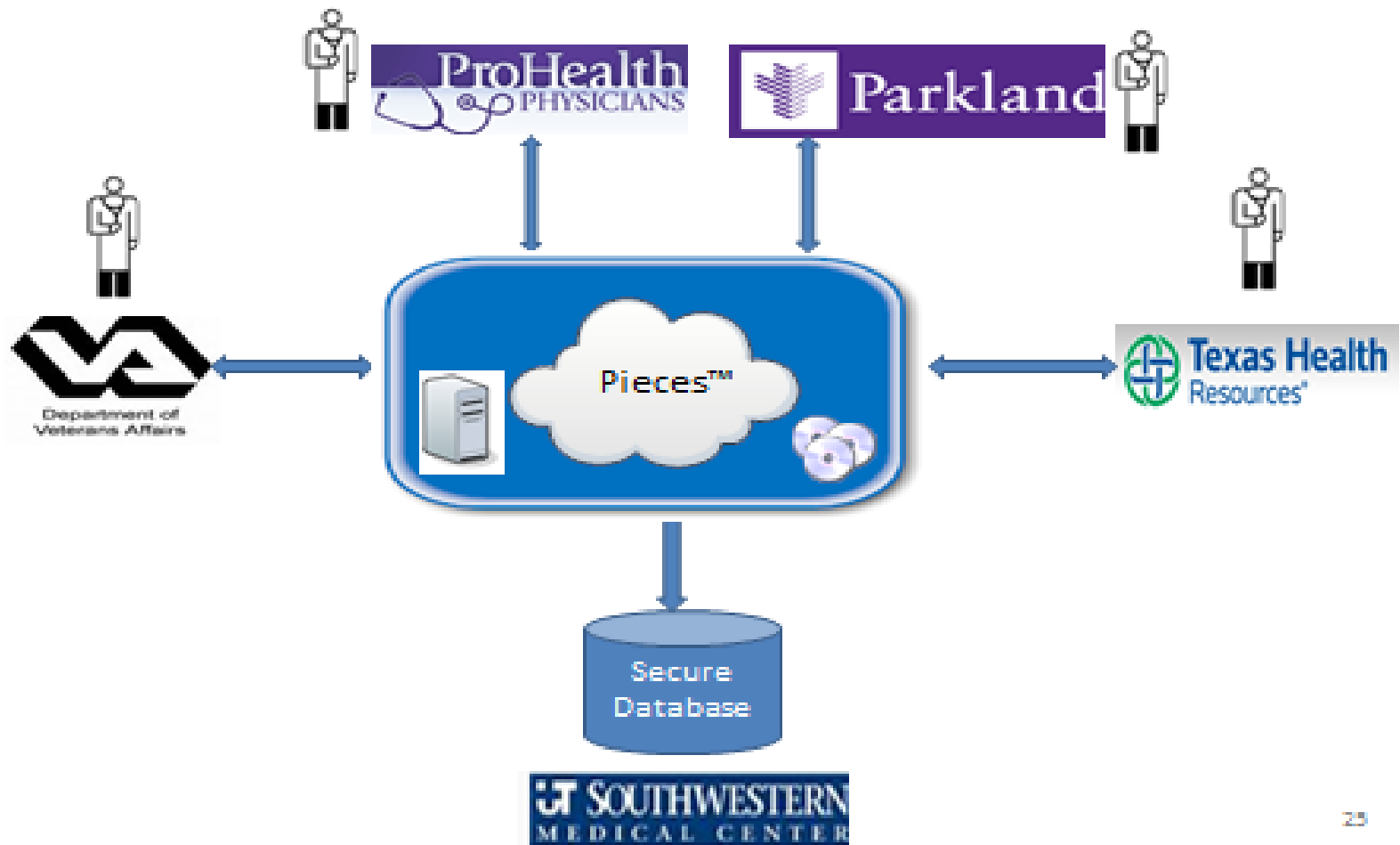


ICD-Pieces Patient Care Work Flow



Study Sites

Pieces™ Connects with Implementation Sites





Pieces™

Transitional Care

-
- Cloud Decision support platform
 - Standardizing patient selection with multiple clinical criteria including, coded problems, medication and lab based criteria
 - Helping identify the right interventions for the right people

ICD-Pieces

Standardized Patient Identification for DM,CKD,HTN

-
- Using Local Registry or database to store patients selected by centralized selection criteria
 - Leverage in house solutions for distributing the candidate patient lists augmented by local source of truth labs/visit dates
 - Copy database methods inside VA firewall
 - Central study database to aggregated DSMB data and final outcomes

OVERVIEW

- Letters
- Document List
- CDR LINK
- Cerner Rx Link
- Synergy Link
- Synopsis
- Notes
- Order Entry
- Immunizations
- Education
- Flowsheets
- Procedure Nav
- E-Consult
- Visit Navigator
- SmartSet**
- Customize

SmartSets

Search + Add

CKD Collaboratory Diabetes Smart Set

CKD Collaboratory HTN Smart Set

Right click on a SmartSet to add to favorites.

Open SmartSets Clear Selection

Associate Providers

Next

Pharmacy

Remove Pend Sign

CKD Collaboratory HTN Smart Set

- Discuss best practices with the patient regarding home blood pressure monitoring.
- Ensure that they have a means to measure their blood pressures several times per month and know the appropriate instructions for HOW to measure (i.e. after resting for 5 minutes, legs uncrossed, arm resting on surface, not talking, not having recent caffeine or tobacco, etc...).

[Link to CKD Hypertension Protocol](#)

EDUCATION AND LIFESTYLE MODIFICATION REFERRALS

Close

> Referrals

MEDICATIONS:

Close

ACE inhibitors or ARB agents should be considered as first line agents for patients with hypertension and diabetes.

> ACEI/ARB

> Diuretics

Patient Education

Education

Assessment Education

Clear Selections Active All

Hypertension

- Alcohol Moderation
 - Verbal counseling given for alcohol...
 - Alcohol Moderation
- Maintenance of optimal body weight
 - Diet Instructions
 - optimal body weight
- Substance abuse counseling centers
 - Community Resources
 - Substance abuse counseling cent...
- Nicotine Cessation
 - Verbal Smoking Cessation educa...
- CKD Education regarding potentially...
 - Verbal Chronic Kidney Disease e...
 - Verbal counseling given for poten...
- Exercise
 - Pamphlet given - exercise and di...
- Diabetes
 - Hypoglycemia
 - Importance of good diabetes man...

Hypertension

Alcohol Moderation

Verbal counseling given for alcohol r

Not started

Alcohol Moderation

Not started

Learners

- Patient
- Family
- Significant Other
- Caregiver
- Other

Method

- Booklet/Handout
- Demonstration
- Explanation
- Group
- Interpreter
- Literature
- Video

Readiness

- Eager
- Acceptance
- Nonacceptance
- Refuses

Response

- Verbalizes Understanding
- Demonstrates Understanding
- Needs Reinforcement
- No Evidence of Learning
- Refused Teaching

Taught by: IDIGO, OLIAKU 3/18/2016 1000

Enter a comment for all selected points

File (2) Cancel

Delete Resolve Mark Not Applicable Document

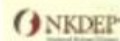
Patient Education

For People with Diabetes or High Blood Pressure
Get Checked for Kidney Disease



Chronic Kidney Disease and Medicines

What You Need to Know

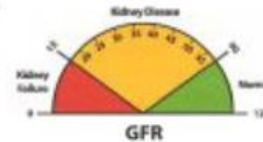


How well are your kidneys working?

Explaining Your Kidney Test Results

Your GFR result on _____ was _____.
Date

- A GFR of 60 or higher is in the normal range.
- A GFR below 60 may mean kidney disease.
- A GFR of 15 or lower may mean kidney failure.



What is GFR?

GFR stands for glomerular filtration rate. GFR is a measure of how well your kidneys filter blood.

Your urine albumin result on _____ was _____.
Date

- A urine albumin result below 30 is normal.
- A urine albumin result above 30 may mean kidney disease.

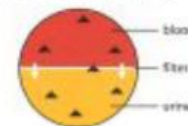
What is urine albumin?

Albumin is a protein found in the blood. A healthy kidney does not let albumin pass into the urine. A damaged kidney lets some albumin pass into the urine. The less albumin in your urine, the better.

Inside a healthy kidney



Inside a damaged kidney



Your blood pressure result on _____ was _____.
Date

Keeping your blood pressure below 130/80 may help to protect your kidneys.



Trust but verify. (at least with go live)

Lab based criteria to flag
included to build trust

Flag Pharma Consult for Jake Smith –

Patient	MRN	Confirmed Date
Smith, Joe	M	9/1/2016
Smith, Jill	L	9/1/2016
Smith, Jake	H	9/1/2016
Smith, Jen	L	9/1/2016
Smith, John	M	9/1/2016
Smith, Jon	L	9/1/2016
Smith, Jarred	L	9/1/2016
Smith, Joel	M	
Smith, Jane	L	9/1/2016
Smith, Jo	L	9/1/2016

Use of EHR Data to Generate Safety Reports

ICD9 CM	Text Description	ICD10 crosswalk
276.7	hyperkalemia	E87.5
276.1	hyponatremia	E87.1
780.2	syncope	R55
458.0,458.9	hypotension	I95.*
995.1	drug toxicity, ANGIOEDEMA	T78.3
584.9	acute kidney injury	N17.*
251.0-251.2	hypoglycemia	E16.0,E16.1,E16.2,
728.88	rhabdomyolysis	M62.82
729.1	myositis	M60.9, M60.8*
276.69	fluid overload	E87.7 *

IT Security

Necessary evils: 2Factor authentication, SFTP protocols, VPN

Be kind to in kind partners

Enrollment Status - HCS with active sites

- **Texas Health Resources**

- Patient registries and alerts operational
- Active and PF working as member health care delivery team

- **Parkland Health and Hospital Systems**

- PF: Population Nurse and Nurse Practitioner
- Registries, alerts and smart sets operational

Enrollment Status - HCS to be active soon

- **VA of North Texas**

- Multiple levels approval (IRB, PO, SO)
- Identified data stays behind VA firewall
- ICD-Pieces workflow replicated Quality Personnel

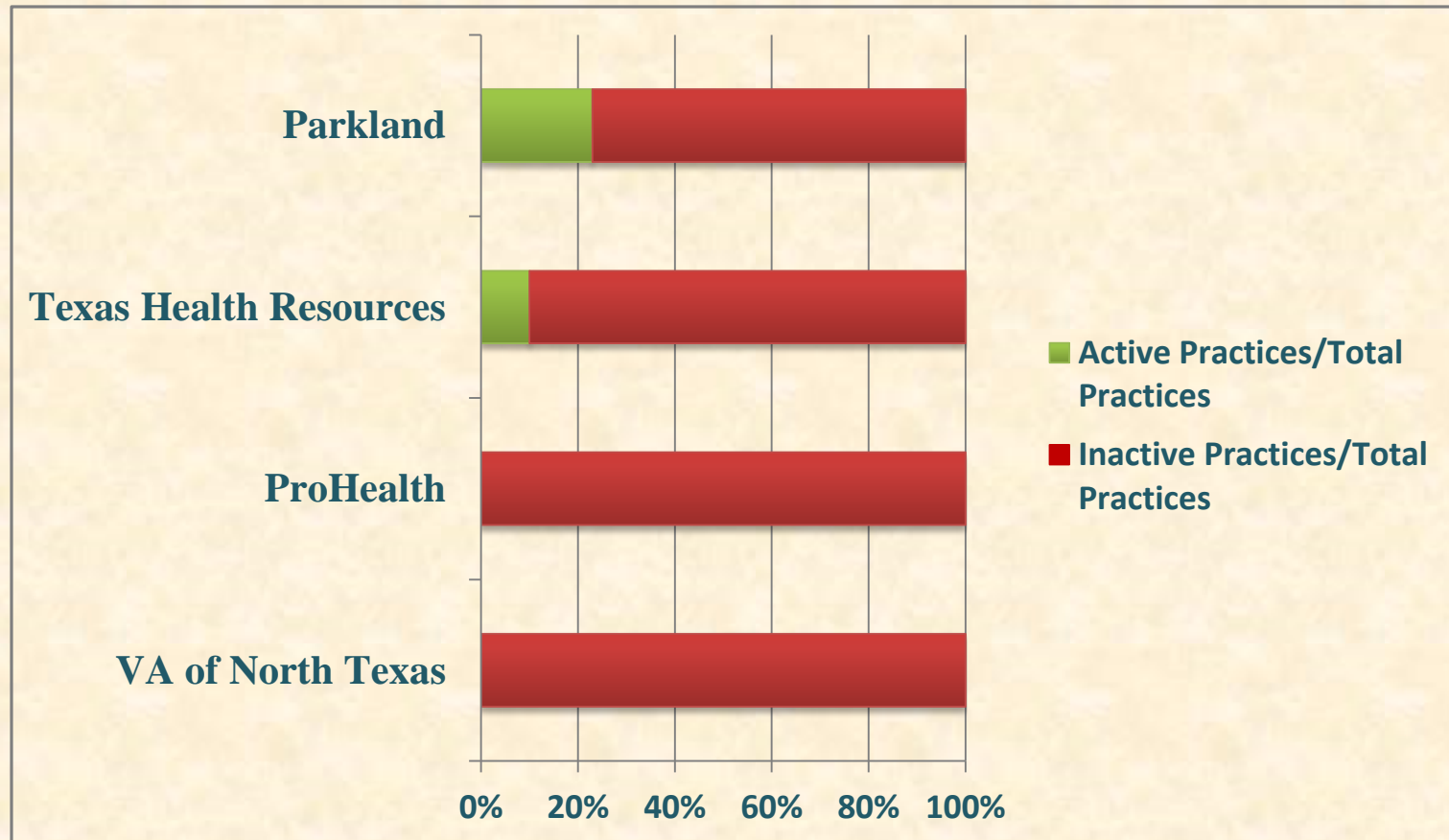
- **ProHealth**

- New team and governance (acquisition by Optum)
- Transmission encrypted data
- Plans for de-identified dataset linked to outcomes

Enrollment Status Implementation Arm

Healthcare System	Target # of Practices/Providers to be Enrolled	# of Practices Currently Enrolled	Target # of Patients to be enrolled	# of Patients Currently enrolled
Parkland Health and Hospital System	13 (out of 25)	3	1684 (3,367)	21
Texas Health Resources	20 (out of 40)	2	1805 (3,610)	14
ProHealth of Connecticut	25 (out of 50)	0	1591 (3,181)	0
North Texas VA	5 (out of 9)	0	417 (833)	0
Total Enrollment	63 (out of 124)	5	5,497 (10,991)	39

Percent of Practices Implementation Group with Actively Enrolled Patients





Progress Reports to NIH and DSMB

1. Primary outcome
2. Secondary outcomes
3. Safety events
4. Recruitment and targets
5. Primary event rates (at each HCS)

Milestones Update

- **Organizational**

- 2 out of 4 HCS active
- Steering Committee Sept 27, 2016
- Workflows with different types of visits

- **Study operation**

- Practice facilitators (different models) at 4 HCS
- Protocols developed at all sites

- **Informatics**

- Patient registries active
- Capture outcome data and safety events

- **Regulatory**

- Reports to NIH and DSMB—quarterly
- IRB updates and renewals

Early Lessons Learned

- **Providers**

- Inclusion and exclusion criteria
- Concerns burden of visits

- **Operations**

- Candidates vs confirmed patients
- Workflows with different types of visits

- **Informatics**

- Corrupt files—rapid turnaround and fix

- **Regulatory**

- Clarification waiver of consent and opt-out

ICD Pieces - Strengths

- Pragmatic design
- Use of novel technology and EHR
- Unique contribution **Practice Facilitators**
- Addresses complex chronic conditions
- Diversity health care systems
 - Safety net
 - Integrated
 - Regional providers
 - ACO
- Model for identification and ongoing care patients
- Applications model to other chronic conditions

Study Challenges

- Lengthy approval process protocols
- Multiple stakeholders at all sites
- Concerns about extra “burden” from study
- Ambitious recruitment goals
- Multiple interventions over extended period
- Personnel turnover
- Changing trends standard care
- Risks of cross-contamination control group
- Uncertainties event rates and heterogeneity clusters
- Success depends on collaboration HCS

Next steps

- Initiate recruitment 2 additional HCS
- Extend active study to all recruitment sites
- Review study procedures
- Reports to NIH and DSMB
- Review with CCC (Collaboratory) and Working groups
- Reassess sample size (based on event rates)-contingencies
- Prepare for capture PROs
- Prepare for sustainability interventions and future dissemination



Improving Chronic Disease Management with Pieces

