VA HSR&D PACT CYBERSEMINAR

Effects of Clinical Resource Hubs on Primary Care Quality & Access in the Veterans Health Administration

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DISCLAIMER

The views expressed are those of the presenters and **do not necessarily reflect the position or policy of the VA or the US government**

OUTLINE OF PRESENTATION

1. **Describe the VA's national Clinical Resource Hub (CRH) initiative**
2. **Summarize study design and results from the evaluation of CRH and primary care access**
3. **Summarize study design and results from the evaluation of CRH and primary care quality**
4. **Discuss next steps in the quality evaluation**

CLINICAL RESOURCE HUBS – AN INTERVENTION TO ADDRESS STAFF SHORTAGES & IMPROVE PRIMARY CARE ACCESS

- Despite rising primary care demand, especially among aging baby boomers, primary care provider vacancies are projected to increase[1]
- Rural and other underserved areas are especially vulnerable to staffing shortage resulting in declines in Veteran access to primary care
- National CRH program launched in 2019 as part of VA's response to the MISSION Act
- CRH is a regional, primarily telehealth intervention that provides primary care and other services including mental health and specialty care using a Hub and Spoke model[2]

[1] Malayala SV, Vasireddy D, Atluri P, Alur RS. Primary Care Shortage in Medically Underserved and Health Provider Shortage Areas: Lessons from Delaware, USA. *J Prim Care Community Health*. 2021;12:2150132721994018 2150132721994018

[2] Burnett, K et al (2023). The Clinical Resource Hub Initiative First Year Implementation of the Veterans Health Administration Regional Telehealth Contingency Staffing Program. *J Ambul Care Manage, 46(3)*, 228 239.

WHAT IS A CLINICAL RESOURCE HUB?

- VISN-level directed resource providing **primary care**, mental health, and specialty staffing
- Each VISN employs providers and staff for the Hub
- Hubs deliver mostly virtual care synchronously to clinics not located near the Hub

WHAT IS A SPOKE SITE?

- A clinic experiencing a staffing deficit that is approved to receive Hub clinical services (can be either VAMC, CBOC, or Other Outpatient Services)

- Care provided by the Hub via telephone, video to the clinic, video to the Veteran's home, or in-person when a mobile deployment team has been sent

- Type of care provided is primary care, mental health care, pharmacy services, or specialty care

WHAT IS PRIMARY CARE?

Definition:

- High-quality primary care is the provision of whole-person, integrated, accessible, and equitable health care by interprofessional teams

- Interprofessional teams are accountable for addressing an individual's health and wellness needs across settings and through sustained relationships with patients, families, and communities

Starfields 4 C's: First contact, continuity, comprehensive, and coordinated care

National Academies of Sciences, Engineering, and Medicine. 2021. Implementing High Quality Primary Care: Rebuilding the Foundation of Health Care. Washington, DC: The National Academies Press. https://doi.org/10.17226/25983.

CLINICAL RESOURCE HUB NATIONAL EVALUATION[3]

- Evaluation coordinated by the Primary Care Analytics Team (PCAT) in Seattle
- The overall design of the evaluation is based on RE-AIM framework by Glasgow and colleagues
  - Reach, Effectiveness, Adoption, Implementation, and Maintenance
- Five CRH Evaluation Component Teams:
  - Implementation (Patient and provider experience)
  - **Access to care**
  - Cost and Utilization
  - **Quality of Care (effectiveness and maintenance)**
  - Mental Health Care

[3] Rubenstein et al (2023). Learning from national implementation of the Veterans Affairs Clinical Resource Hub (CRH) program for improving access to care: protocol for a six year evaluation. *BMC Health Serv Res. 23,790.*

CRH PRIMARY CARE ACCESS

CRH & PRIMARY CARE ACCESS – OBJECTIVES

CRH has important implications for access to primary care

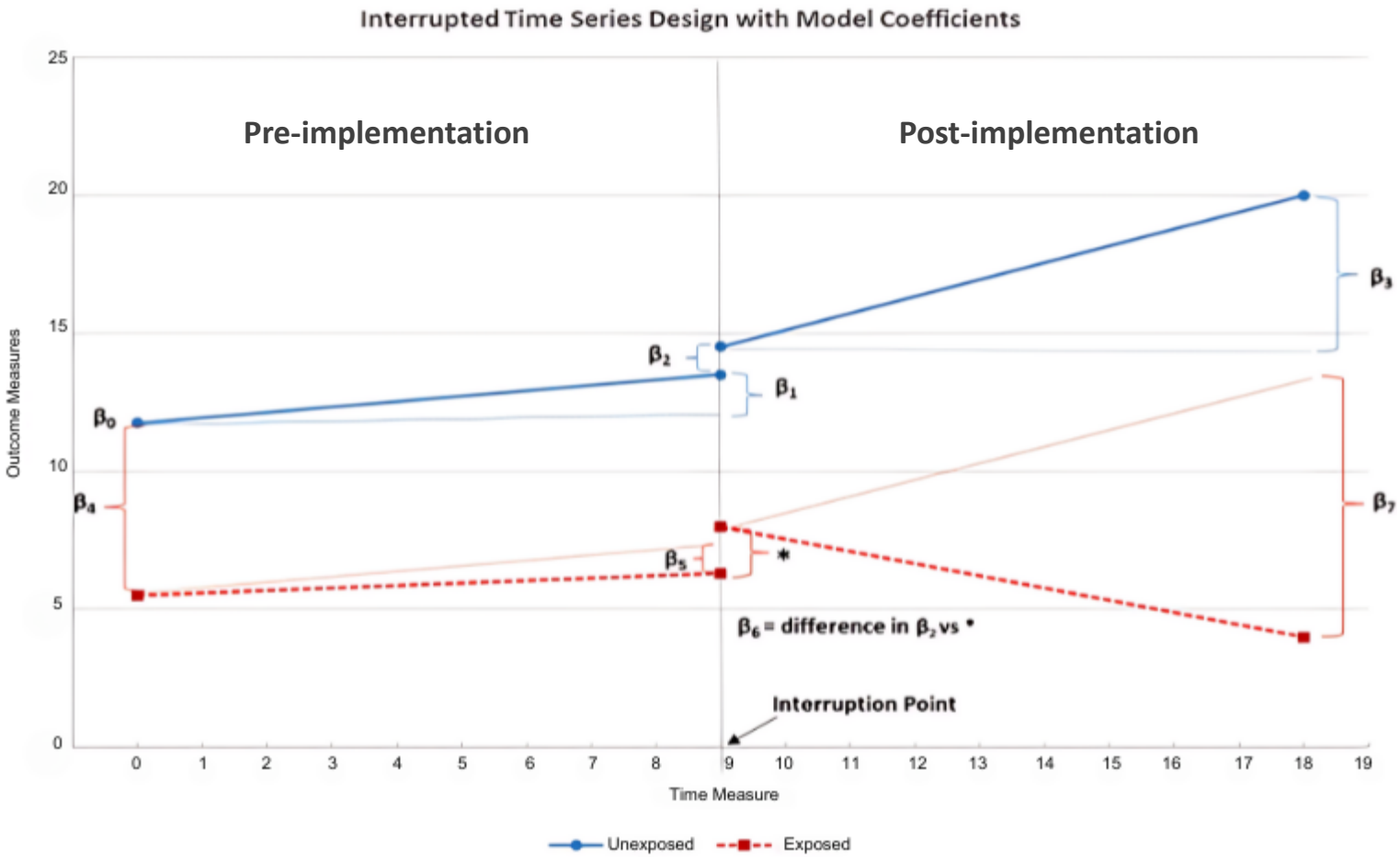
- To understand the impact of the CRH program on primary care access before and after implementation

- Will CRH services increase or decrease wait times in primary care?

STUDY **DESIGN**

- Retrospective, observational, longitudinal study
- Propensity-score matched CRH sites and control clinics
  - Facility Characteristics
  - Patient Characteristics
- Access metrics evaluated by comparative interrupted time series (CITS)
- Outcome measured at the clinic-month level

COMPARATIVE INTERRUPTED TIME SERIES (CITS)



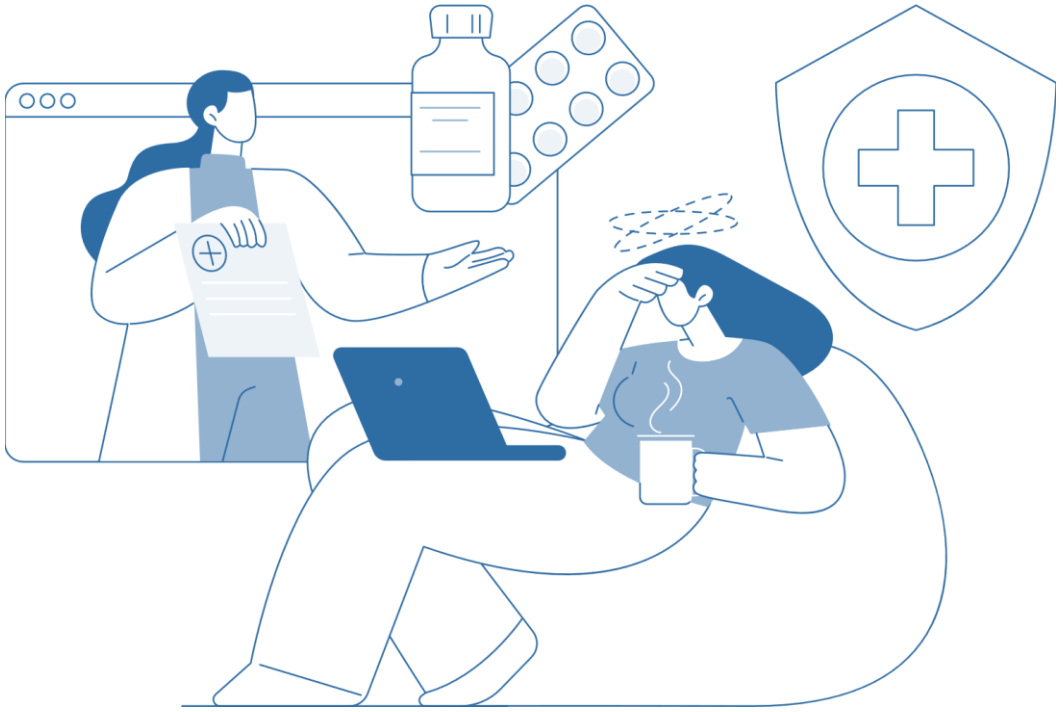
WHAT IS MEANINGFUL USE?

CRH User: Clinics completing ≥10 CRH visits per month for 2 consecutive months

Control: Clinics that never used CRH services for primary care during the study period

Note: Facilities using CRH but not meeting the minimum threshold to be a CRH user were excluded

Exclusions: Sites with <450 Enrollees

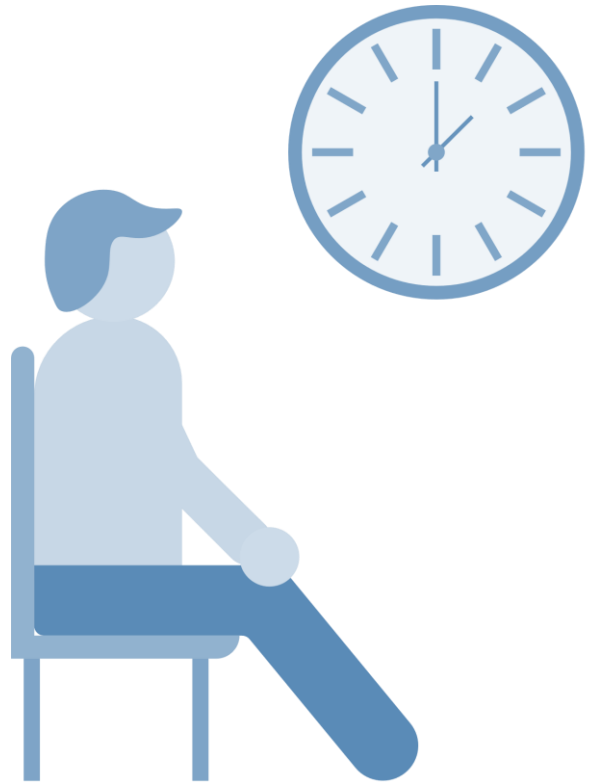


ACCESS TO CARE OUTCOMES

- **Established Patient Wait Time (EPWT):** Time from patient indicated date to completed appointment date

- **New Patient Wait Time (NPWT):** Time from date appointment created to date appointment completed

- **Third Next Available (TNA):** Measure of clinic capacity; average time to third open appointment in provider's clinical schedule



STATISTICAL **ANALYSIS**

- Step 1: Describe how much, who, and where CRH primary care visits were delivered
- Step 2: Among propensity matched clinics, develop comparative interrupted time series linear mixed effect models with random intercepts at clinic level

  Included two-way & three-way interactions of:

  1. **Treatment Status** (CRH user or control),
  2. **Intervention Status** (Pre- or Post-Implementation)
  3. **Time** in months

WHAT HAPPENED AMONG CRH USERS?

	CRH PC Visits	Non-CRH PC Visits	p-value*
Number of Visits	115,062	1,481,047	
Unique Patients Served	46,995	1,400,671	
Visits per Patient	2.45	1.06	
Site Type, N (%)			<0.001
Community-Based Outpatient Clinic	66.4%	49.0%	
VHA Medical Center / HCC‡	26.7%	49.4%	
Other Outpatient Services	6.9%	1.7%	
Categorized Clinic Size§, N (%)			<0.001
Small, 450-2,399	21.4%	4.8%	
Medium, 2400-9,999	60.8%	36.6%	
Large, 10,000+	17.8%	58.6%	
Rurality of Clinic, N (%)			<0.001
Rural	50.8%	18.6%	
Urban	49.2%	81.4%	

* p values determined by χ^2 test comparing CRH and non CRH visits delivered at "CRH User clinics

PATIENT **WAIT TIME**

Pre-implementation: Established & New Patient Wait Times were not significantly different among CRH users compared to controls

Post-implementation:

- CRH users & controls saw a decrease in established patient wait time, but the difference between groups was not statistically significant

- New patient wait times were not significantly different

Pre- to Post-implementation: Within treatment group differences before and after implementation were not statistically significant

THIRD NEXT AVAILABLE (TNA)

Pre-implementation: TNA worsened among CRH users, but not statistically different from control clinics

Post-implementation: TNA improved among CRH users and controls, but was not statistically different across group

Pre- to Post-implementation: Within treatment group differences were statistically significant, but not across group

POINTS TO CONSIDER: DIFFICULTIES IN EARLY ADOPTION

Hubs may not be agile enough to rapidly implement and impact access over the 5-month implementation period

- Mixed methods investigation showed only 11% of clinics met high levels of progress within the first year
- Relatively low number of CRH primary care visits; accelerated after current study
- Difficulties in early adoption likely explain decrease in TNA, but no appreciable difference in wait times

POINTS TO CONSIDER: BENEFITS FOR RURAL CLINICS

Ability to maintain access

- 50% of CRH encounters occurred at a geographically rural clinic (compared to 20% of standard primary care visits)
- CRH model may offer opportunity to improve access when discontinuity of care arises in vulnerable rural areas
- Care predominantly offered via telemedicine, which may not be achievable in some rural settings
- Offering care at clinic with reliable broadband to sufficiently access the CRH program is a key component of the model

LIMITATIONS

- Results from VHA clinics may not be generalizable to other healthcare systems using similar contingency staffing
- Study only examined access as measured by wait times and appointment availability
- Did not determine the quality of care or if the CRH visit successfully addressed the patient's concern

CRH & PRIMARY CARE **QUALITY**

CRH & PRIMARY CARE QUALITY – OBJECTIVES

CRH has important implications for quality of primary care delivery

- May improve access but will telehealth services provide sufficient continuity, coordinated, or comprehensive care?

- Will CRH services increase or decrease disparities in primary care quality?

EVIDENCE ON TELEHEALTH & QUALITY OF CARE

Prior evidence for telehealth and quality of primary care is mixed:

The rise in virtual care has led to a growing body of research reporting positive outcomes, including:

- high patient satisfaction[4,5]
- reduced travel costs[6]
- the successful management of chronic conditions from a distance[7]

However, virtual care may also be related to lower quality of care

- Increased hospitalization for ambulatory sensitivity conditions[8]
- Higher rates of unnecessary prescriptions of antibiotics[9]

4. Andrews E et al. Satisfaction with the use of telehealth during COVID-19: An integrative review. International Journal of Nursing Studies Advances. 2020;2:100008.
5. Nguyen M et al. A review of patient and provider satisfaction with telemedicine. Current Allergy and Asthma Reports. 2020;20(11):1-7.
6. Snoswell CL et al. Determining if Telehealth Can Reduce Health System Costs: Scoping Review. Journal of Medical Internet Research. 2020;22(10):e17298.
7. Aubert CE et al. Type 2 diabetes management, control and outcomes during the COVID-19 pandemic in older US veterans: An observational study. JGIM. 2022;37(4):870-877.
8. Li et al. Association between Primary Care Practice Telehealth Use and Acute Care Visits for Ambulatory Care-Sensitive Conditions During COVID-19. JNO. 2022
9. Shi, Zhuo, et al. "Quality of care for acute respiratory infections during direct-to-consumer telemedicine visits for adults." Health Affairs 37.12 (2018): 2014-2023.

QUALITY EVALUATION

CRH PC IS CARING FOR **MANY TYPES OF VETERANS**

	N = 142,041 Mean (SD) or %
Age (years)	70 (14)
Female Gender	6.8
Race/Ethnicity#	
American Indian/Alaska Native	1.2
Asian/Pacific Islander/Native Hawaiian	1.7
Hispanic	6.4
Multi-Race/Other	1.9
Non-Hispanic Black	10.5
Non-Hispanic White	73.8
Veteran Rurality	
Urban	43.6
Rural/Highly Rural	56.4
Number of CRH Encounters	
1	15.3
2	50.4
3	6.4
4	27.9

CRH IS PROVIDING CARE FOR COMMONLY MANAGED PRIMARY CARE CONDITIONS – TOP 5

ICD 10 Description	N	%
Essential (primary) hypertension	36,209	15
Type 2 diabetes mellitus	23,563	9.8
Counseling	15,566	6.4
Hyperlipidemia	8,169	3.4
Low back pain	7,922	3.3

ASSOCIATION OF CRH EARLY IMPLEMENTATION & PRIMARY CARE QUALITY MEASURES

- Used a comparative interrupted time series (CITS) design with propensity matched CRH sites and non-CRH sites to identify whether chronic disease quality measures at clinic sites that implement CRH are similar to sites that did not implement CRH
- Findings:
  - Primary care quality measures at CRH sites undergoing early implementation of the program are in most cases either no different or slightly better than matched comparator sites that have not implemented CRH
  - In the majority of cases, there are no differences in quality outcomes among sites that serve a high level of minority Veterans
- Provides early support that telehealth interventions like CRH can improve access to primary health care in a variety of settings, especially in clinics experiencing staff shortages without impacting the quality of chronic disease care

CURRENT & FUTURE ANALYSES FOCUS ON EXAMINING CRH & PRIMARY CARE QUALITY FROM MULTIPLE ANGLES

Aim 1: CRH utilization level and the association with Primary Care Quality

Hypothesis: Clinics that use a high proportion of CRH services (high engagement) will have similar PC quality outcomes compared to clinics that use a low proportion of CRH services (low engagement)

Aim 2: CRH utilization and the association with Primary Care Quality among Veterans with hypertension and/or diabetes mellitus.

Aim 2a: Veteran level comparison between Veterans with CRH utilization and Veterans with no CRH utilization

Hypothesis: Veterans diagnosed with hypertension and/or diabetes who receive CRH PC services, will have similar quality metrics as those who have not received CRH PC services

Aim 2b: Veteran level comparison between Veterans with a high level of CRH utilization and Veterans with a low level of CRH utilization

Hypothesis: Veterans with a greater proportion of CRH encounters (high CRH intensity) will have no difference in quality measures compared to Veterans with a lower proportion of CRH encounters (low CRH intensity)

CRH INTENSITY & ITS ASSOCIATION WITH PRIMARY CARE QUALITY AMONG VETERANS WITH **DIABETES & HYPERTENSION**

Objective: to evaluate how Veteran-level of engagement with CRH impacts clinical quality measures of diabetes and hypertension

STUDY **DESIGN**

- Retrospective, observational, longitudinal cohort study
- Study Period
  - October 1, 2022, through September 30, 2023
- Cohort
  - Veterans with at least 3 primary care encounters, with at least one of those encounters being a CRH primary care encounter

EXPOSURE: DEFINING CRH INTENSITY

- "CRH intensity" measures the level of Veteran engagement with CRH-delivered care
- CRH Intensity
  - # of CRH visits / # of total primary care visits
- Measured within the study period: 10/1/2022 - 9/30/2023
- CRH Intensity Tertile
  - Low: (1.3% - 21%)
  - Medium: (21% - 40%)
  - High: (40%-100%)
- Low CRH Intensity was used as the reference group in analyses

OUTCOME MEASURES

- The VA tracks performance HEDIS/CMS based quality measures using the Electronic Quality Measurement (eQM) platform
    - Disease specific measures that are derived from the electronic health record
- Used a subset available eQMs focused on:
    - Cover high priority primary care conditions
    - Have strong associations with patient outcomes
    - Are well established inside and outside of the VA as being core measures of PC clinical quality

CHRONIC & PREVENTABLE DISEASE MANAGEMENT MEASURES (EQMS) – PROCESS MEASURES

Measure	Disease Group	Preferred Score Direction	Measure Type
HgbA1c Annual Measurement	Diabetes	Higher is better	Process
Screening for nephropathy	Diabetes	Higher is better	Process
Statin therapy	Diabetes	Higher is better	Process
Statin adherence	Diabetes	Higher is better	Process

Abbreviations: HgbA1c, Hemoglobin A1c; BP, Blood Pressure

CHRONIC & PREVENTABLE DISEASE MANAGEMENT MEASURES (EQMS) – INTERMEDIATE OUTCOMES

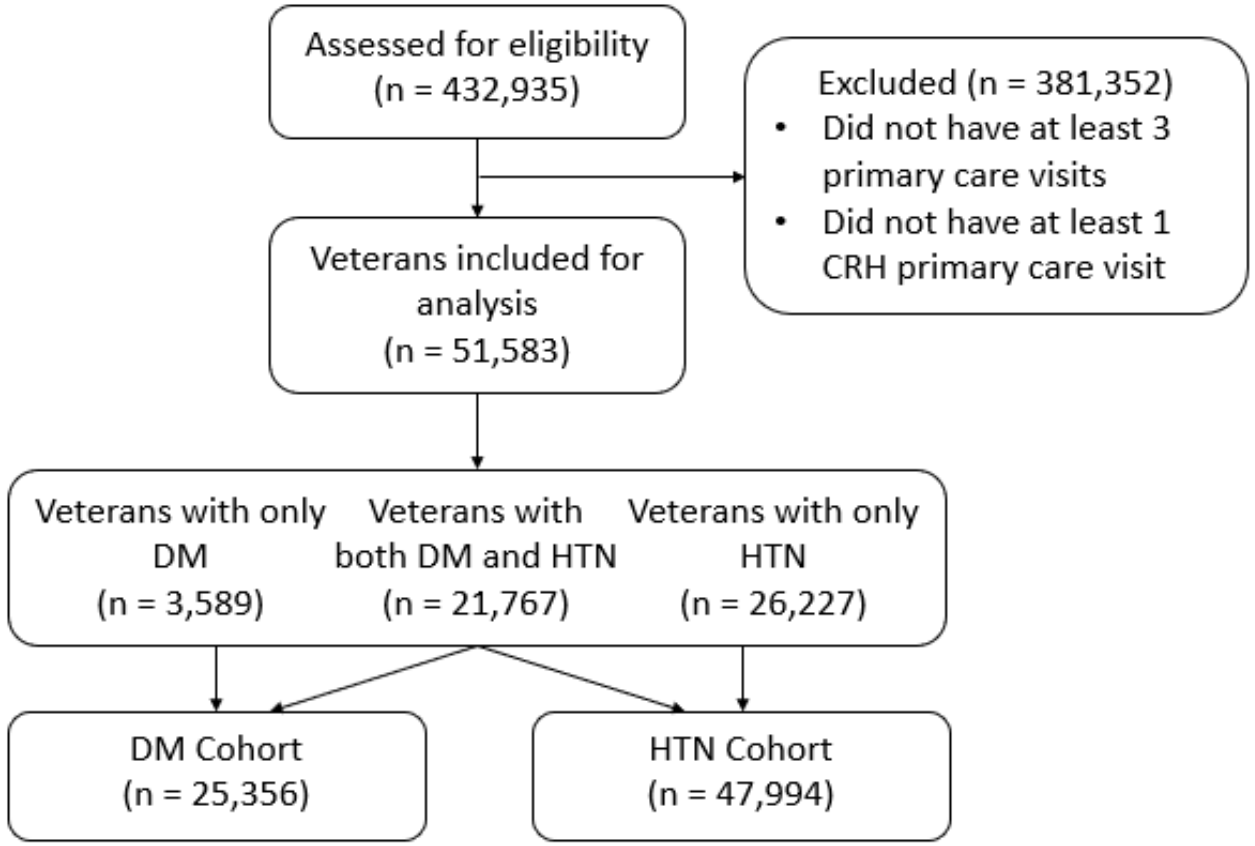
Measure	Disease Group	Preferred Score Direction	Measure Type
HgbA1c, poor control	Diabetes	Lower is better	Intermediate Outcome
BP less than 140/90	Diabetes	Higher is better	Intermediate Outcome
BP less than 140/90	Hypertension	Higher is better	Intermediate Outcome

Abbreviations: HgbA1c, Hemoglobin A1c; BP, Blood Pressure

STATISTICAL **ANALYSIS**

- Multivariable logistic regression to estimate associations between CRH intensity and clinical quality metrics in diabetes and hypertension
- Covariates: age, sex, race and ethnicity, marital status, rurality, drive distance to nearest VA primary care clinic, Gagne score, and SES index
- Outcomes are presented as the predicted probability of meeting the criteria for the corresponding quality measure at the end of the study period
- $p < 0.05$ was used to assess statistical significance

COHORT SELECTION



Abbreviations: DM, diabetes; HTN, hypertension

VETERANS HAD SIMILAR AGE, SEX, & RACE/ETHNICITY DISTRIBUTIONS ACROSS CRH INTENSITY

	High	Medium	Low	p-value*
Number of Veterans	9,967	8,020	7,369	
Age, mean (sd)	68.359 (9.395)	68.096 (9.650)	67.604 (9.927)	<0.001
Sex, N (%)				
Male	93.7%	94.5%	95.3%	<0.001
Female	6.3%	5.5%	4.7%	
Race and ethnicity, N (%)				
Non-Hispanic White	71.5%	70.5%	67.8%	<0.001
Non-Hispanic Black	16.7%	17.3%	18.3%	
Hispanic	5.6%	5.9%	5.7%	
Asian/Pacific Islander/Native Hawaiian	2.3%	2.5%	4.1%	
American Indian/Alaska Native	1.2%	1.4%	1.3%	
Multiracial or other	2.6%	2.4%	2.8%	

Diabetes Cohort

*p values determined by χ^2 test and t test

VETERANS WITH HIGH CRH INTENSITY TENDED TO HAVE **HIGHER COMORBIDITY SCORES & LIVE IN URBAN AREAS**

	High	Medium	Low	p-value*
Rurality, N (%)				
Urban	53.9%	51.7%	44.7%	<0.001
Rural	39.9%	42.3%	47.7%	
Highly Rural or insular islands	6.2%	6.0%	7.5%	
Drive distance to primary care miles, mean (sd)	17.737 (20.287)	18.987 (22.303)	21.495 (26.876)	<0.001
Gagne Score, mean (sd)	1.167 (1.956)	0.842 (1.681)	0.619 (1.501)	<0.001

Diabetes Cohort

*p values determined by χ^2 test and t test

HIGH CRH INTENSITY WAS ASSOCIATED WITH **IMPROVED CLINICAL OUTCOMES FOR PROCESS MEASURES**

Measure	High CRH Intensity Predicted Probability (95% CI)	Low CRH Intensity Predicted Probability (95% CI)	
HgbA1c Annual Measurement	74.4% (73.7% - 75.0%)	76.5% (75.8% - 77.2%)	
Screening for nephropathy	99.1% (98.8% - 99.3%)	98.4% (98.1% - 98.7%)	*
Statin therapy	89.9% (89.2% - 90.5%)	88.7% (87.9% - 89.5%)	*
Statin adherence	84.3% (83.5% - 85.2%)	83.3% (82.3% - 84.3%)	

Abbreviations: HgbA1c, Hemoglobin A1c; BP, Blood Pressure

HIGH CRH INTENSITY WAS ASSOCIATED WITH **POORER OUTCOMES FOR INTERMEDIATE OUTCOMES**

Measure	High CRH Intensity Predicted Probability (95% CI)	Low CRH Intensity Predicted Probability (95% CI)	
HgbA1c, poor control	20.9% (20.1% - 21.7%)	17.4% (16.6% - 18.3%)	*
BP less than 140/90	76.8% (76.0% - 77.7%)	79.4% (78.4% - 80.4%)	*
BP less than 140/90	74.4% (73.7% - 75.0%)	76.5% (75.8% - 77.2%)	*

Abbreviations: HgbA1c, Hemoglobin A1c; BP, Blood Pressure

LIMITATIONS

- Observational study that can only show associations, not causation

- Poorer quality in intermediate outcomes may reflect gaps in coverage that CRH is trying to fill, and may need a longer study period to more precisely measure effect of CRH

CONCLUSIONS

1. Early implementation of the CRH program did not worsen access to primary care; no significant impact on wait-times though appointment availability improved post-implementation among both CRH user and matched controls

2. At clinics that implement CRH, primary care quality metrics are similar to matched clinics that did not implement CRH. In addition, there are no differences in results among clinics that serve a high proportion of minority Veterans

3. Increased CRH intensity may be helpful for improving process outcomes, but more limited in improving intermediate outcome measures in Veterans

IMPLICATIONS

- CRH preserves informational continuity, but may not preserve interpersonal continuity in the short term
    - Informational continuity - having a patient's medical records available at the time a clinical encounter
    - Interpersonal continuity - having a continuous personal physician-patient relationship
- Understanding how CRH affects access and clinical quality can guide how it can be best deployed in supporting primary care

NEXT STEPS

Evaluation of Access in CRH Primary Care program

- Late Implementation / Maintenance
- Time-Varying Analysis modified by existing primary care provider gaps

Evaluation of Quality

- Sub-analysis to better explore Veteran level findings in primary care quality
- Evaluation of primary care quality as CRH program moves into late implementation/maintenance
- Evaluation of quality in CRH mental health program

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THANK YOU!

COMMENTS & QUESTIONS?

Contact PCAT@va.gov for more information

Prior CRH cyberseminars, presentations, and publications can be found on the PCAT SharePoint site: Primary Care Analytics Team (PCAT) - CRH Publications & Presentations - All Documents (sharepoint.com)