Evaluation of the West Virginia Cardiovascular Health Program (CVHP)

2013

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Background/Introduction:

The West Virginia Cardiovascular Health Program (CVHP) and the West Virginia University Office of Health Services Research (OHSR) work jointly with primary care centers to assist them in accurately tracking patient outcomes, benchmarking care against national standards, and modifying clinical policies and procedures for improved outcomes. This ongoing collaboration has occurred for over ten years. Our initial efforts were focused on recruiting willing collaborators from the federally qualified health centers and the free clinics of West Virginia, as these sites serve patient populations at high-risk for chronic health conditions. Initially we offered on-site education on chronic disease management, chronic disease self management training for providers and staff, as well as education more specifically targeting cardiovascular health on nutrition, physical activity, and the care and management of CVH conditions. As our work evolved, we recognized the need to more closely measure impact on patient outcomes, assess each site's ability to measure progress in meeting care and treatment goals, and support development of policies and procedures to help improve patient care. These aims are supported through a five-fold effort of:

1) promotion of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, or JNC-7, guidelines;
2) training on accurate blood pressure measuring;
3) support in use of electronic medical records and registries to monitor and target care;
4) provider/staff training and education on chronic disease prevention and management;
5) use of reports of clinical outcomes data for quality improvement.

The foundation created in our earlier efforts have allowed us to build a very broad based constituency of providers across the state, and across the country and internationally. Through support of the CVHP, and others, OHSR has become one of the leaders in the use of registries in

improving patient outcomes by enabling sites to actively use their own data to measure patient impact at the site and provider level.Through the efforts of the CVHP and OHSR we have created the West Virginia Chronic Disease Registry that currently contains records on over 220,000 patients. This registry continues to increase in size.

The content of the evaluation report focuses primarily on our success with the pilot intervention to address high blood pressure in three of our sites. These three sites were chosen to be representative of all of the sites we work with. We purposely chose these sites based on previous staging knowledge of each site. The following characterizes the three pilot intervention sites:

- Site 1 – An innovative, successful site with a strong history of successfully launching new initiatives, progressive in use of data for quality of care tracking, with a strong history of providing on-going education for providers and staff;
- Site 2 – A somewhat innovative site, with a history of occasional successful update of new initiatives, some limited use of data for tracking and reporting, and some level of buy-in for regular, ongoing education for providers and staff;
- Site 3 – A less innovative site in terms of a lacking history of successfully launching new initiatives, lack of standardized data tracking, and lack of procedures for monitoring patient outcomes.

As a result of the intervention by OHSR and the CVHP, a number of key changes have taken place in the pilot sites related to clinic practices and abilities:

- adoption of electronic health registries (patient tracking and registry tools);
- use of registries to target quality improvement efforts and measure the effectiveness of those efforts;
- increased abilities to accurately track outcomes over time, using higher quality data

- increased awareness of JNC-7 practice guidelines;
- improved abilities to accurately take blood pressure readings.

Since these changes have taken place, we see significant improvements in cardiovascular health measures including blood pressure, cholesterol, and other measures related to the Million Hearts™ Initiative, the Physicians Quality Reporting System, and the National Quality Forum. Cohort analyses within this report, as well as pre- and post-assessments of clinic practices related to cardiovascular care, provide detail on these improvements.

In addition to the findings in this report, OHSR has prepared an addendum that includes additional background information about their office, key findings related to the intervention approach and outcomes, and lessons learned during the intervention period. This addendum can be found in Appendix I attached to this report.

Patient Cardiovascular Health Outcomes

As a result of observed changes in clinics, it is expected that patient outcomes related to cardiovascular health would begin to show improvements. Table 1 provides cohort analysis results for blood pressure, total cholesterol, and LDL cholesterol outcomes in the three hypertension initiative pilot sites (i.e., Mercer Health Right, the Harrisville branch of Ritchie Regional Health Center, and the Scarbro branch of New River Health Association).

Cohort patients are those who received care prior to the start of the intervention (4/1/2010) and continued to receive care through the end of the evaluation period (3/31/2012). Across all diagnosis categories (i.e., patients with hypertension without diabetes, patients co-morbid hypertension and diabetes, and patients without a diagnosis of hypertension), we find improvements in blood pressure control (i.e., patients within a normal blood pressure range) and lipid control (i.e., patients within normal total cholesterol and normal LDL ranges). Since this cohort represents all patients in all three clinics who fell within these eligibility criteria, all results are significant. Areas highlighted in green represent improvements that we feel are important to highlight in the report.

Table 1: Pre/Post Results in the 3 Pilot Sites	4/1/2010 to 3/31/2011		4/1/2011 to 3/31/2012	
	Number	Percent	Number	Percent
Total patient count (age 18+)	3360		3360	
Active patients (1+ visits during reporting period)	3040	90.5 %	2649	78.8 %
Active patients with BP recorded	2962	97.4 %	2598	98.1 %
Patients with HTN (of Active patients)	1638	53.9 %	1393	52.6 %
Patients with HTN without DM	914		849	
BP <120/80	166	18.2 %	175	20.6 %
BP >=120/80 and <130/80	115	12.6 %	112	13.2 %
BP >=130/80 and <140/90	285	31.2 %	279	32.9 %
BP >=140/90 and <160/100	222	24.3 %	195	23.0 %
BP >160/100	101	11.1 %	75	8.8%
BP Unknown	25	2.7%	13	1.5%
Cholesterol <200	216	23.6 %	290	34.2 %
LDL < 100	105	11.5 %	176	20.7 %
Patients with HTN and DM	724		544	
BP <130 and <80	171	23.6 %	184	33.8 %
BP >=130/80 and <140/90	253	34.9 %	187	34.4 %
BP >=140/90 and <160/100	204	28.2 %	119	21.9 %
BP >160/100	86	11.9 %	43	7.9%
BP Unknown	10	1.4%	11	2.0%
Cholesterol <200	218	30.1 %	243	44.7 %
LDL < 100	140	19.3 %	174	32.0 %
Patients without HTN	1596		1256	
BP <120/80	507	31.8 %	423	33.7 %
BP >=120/80 and <130/80	282	17.7	215	17.1

		%		%
BP >=130/80 and <140/90	561	35.2 %	442	35.2 %
BP >=140/90 and <160/100	167	10.5 %	123	9.8%
BP >160/100	36	2.3%	26	2.1%
BP Unknown	43	2.7%	27	2.1%
Cholesterol <200	127	8.0%	154	12.3 %
LDL < 100	65	4.1%	84	6.7%

Notes: Results are benchmarked according to the JNC-7 guidelines. The normal (controlled) blood pressure range for patients with diabetes differs from patients without diabetes.

Physician Quality Reporting Aligning with the Million Hearts™ Initiative

Table 2 provides cohort analysis for Physician Quality Reporting System (PQRS) and National Quality Forum (NQF) outcomes in the three hypertension initiative pilot sites (i.e., Mercer Health Right, the Harrisville branch of Ritchie Regional Health Center, and the Scarbro branch of New River Health Association).These measures address the "ABCS" (i.e., aspirin, blood pressure, cholesterol, and smoking) of the Million Hearts ™ Initiative. The data presented below is from the West Virginia Chronic Disease Registry.

Cohort patients are those who received care prior to the start of the intervention (4/1/2010) and continued to receive care through the end of the evaluation period (3/31/2012). Across these time periods, we find improvements in:

- Blood pressure control among patients 18 -85 years of age with hypertension
- LDL control among patients age 18 and older with coronary artery disease
- Tobacco screening among patients age 18 and older
- Use of weight management plans among patients age 18 and older with cardiovascular disease who are overweight or obese
- Prescription of aspirin therapy among at-risk patients

- Numbers of patients identified as smokers

Areas highlighted in green represent improvements.

3 Pilot Sites Comparison	4/1/2010 to 3/31/2011			4/1/2011 to 3/31/2012		
	Numerator	Denominator	Percent	Numerator	Denominator	Percent
Adult patients, 18 -85 years of age, who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90)during the measurement year*(Reference: NQF Measure 0018)*	1291	1600	80.7%	1475	1714	86.1%
Adult patients age 18 years or older with coronary artery disease with last LDL less than 100 mg/dL*(Reference: NQF 0074; PQRI 197)*	104	429	24.2%	185	544	34.0%
Adult patients aged 18 years or older who have been seen for at least 2 office visits, who were queried about tobacco use one or more times within 24 months *(Reference: NQF 0028a)*	1203	2626	45.8%	2402	2978	80.7%
CVD patients aged 18 years and older identified as tobacco users within the past 24 months who received cessation intervention *(Reference: NQF 0028b)*	158	532	29.7%	224	834	26.9%
Adult patients aged 18 years and older with cardiovascular disease with a calculated BMI in the past six months or during the current visit documented in the medical record AND if the most recent BMI is outside parameters (i.e., >=25), a follow-up plan is documented *(Reference: NQF 0421; PQRI 128)*	562	2154	26.1%	1345	2982	45.1%
Adult patients age 18 and older with CAD, HTN, or hyperlipidemia with a current prescription for aspirin (*Reference NQF 0068, PQRI 204 -- Modified**)	573	1866	30.7%	615	1726	35.6%

*Note: The only PQRS measure addressing aspirin use focuses on patients with ischemic vascular disease, or IVD (Reference NQF 0068, PQRS 204). This measure was therefore modified for this particular analysis.

Additionally, the Cardiovascular Health Program has begun a statewide media campaign directed at increasing awareness of the Million Hearts ™ Initiative. This initiative began in May 2013 and is expected to reach West Virginians in all areas of the state. Due to the timing of this evaluation report, media evaluation data were not available. This builds on ongoing work by OHSR who were providing information directly related to the Million Hearts ™ Initiative to providers and patients at the clinic level.

Cardiovascular Pilot Project Results

Clinic Assessments

Activities by OHSR directly led to several key changes related to clinic cardiovascular practices. Pre-and post assessments were conducted in two of the pilot clinics by early January 2013. The assessments show important differences from pre- to post. Green highlights show key areas of improvement. These improvements are likely to result in greater patient outcomes, which are discussed below.

New River Clinic Assessment Results		
Question	**Pre**	**Post**
Familiar with JNC guidelines?	Yes	Yes
Do you have a copy?	No	Yes
What % of providers follow guidelines?	Unknown	100%
Does clinic have written policy for assessment or management of high blood pressure?	No	Yes
Typical Blood Pressure Measurements	From pre- to post- there was one change in the way BP is typically measured. At post, it was reported that caffeine, exercise, and smoking in the previous 30 minutes was assessed.	
Standard	UDS Standard	JNC7
BP readings considered pre-hypertension	Pre-hypertension not defined	120-139/80-89
BP readings considered stage 1 hypertension	Don't define	140-159/90-99
BP readings considered stage 2 Hypertension	Don't define	160+/100+
Procedures for follow-up	No changes from pre- to post-, follow-up at each visit or every two years	
Practices for using EMR for follow-up	At post- clinic reporting tracking performance measurement and improvement. Clinic also reported effective use of established clinical practice guidelines to manage and optimize care.	
Written Policy for assessment and management of cholesterol?	No	No
Standard practices or provider determines own?	Provider determines own	Provider determines own with NHLBI guidance
Does clinic use EMR to track decisions support for cholesterol?	No	No

Does clinic use EMR to provide alerts for cholesterol?	Yes	Yes
Does clinic use EMR to track prescriptions for cholesterol?	Yes	Yes
If patient had prehypertension, what would you prescribe?	Lifestyle modification	Lifestyle modification
Stage 1 hypertension?	Thiazide type diuretics, lifestyle mods	Thiazide type diuretics, lifestyle mods
Stage 2 hypertension?	Thiazide type diuretics, lifestyle mods	Thiazide type diuretics, lifestyle mods
If patient had diabetes and hypertension, what is goal BP?	<130/80	<140/90 or <130/80
Does clinic routinely note medical noncompliance in EMR?	No	No
Does clinic routinely note smoking?	Yes	Yes

Ritchie Clinic Assessment Results		
Question	**Pre**	**Post**
Familiar with JNC guidelines?	No	Yes
Do you have a copy?	No	No
What % of providers follow guidelines?	Unknown	Unknown
Does clinic have written policy for assessment or management of high blood pressure?	Yes	N/A
Typical Blood Pressure Measurements	From pre- to post- no changes were reported in the way blood pressure is measured.	
Standard	Written Clinic Policy	Provider
BP readings considered pre-hypertension	First BP elevated and 2nd normal	120-139/80-89
BP readings considered stage 1 hypertension	140-159/90-99	140-159/90-99
BP readings considered stage 2 Hypertension	160+/100+	160+/100+
Procedures for follow-up	No changes from pre- to post-, follow-up determined by provider	
Practices for using EMR for follow-up	No changes reported from pre- to post-	
Written Policy for assessment and management of cholesterol?	No	No
Standard practices or provider determines own?	Provider determines own	Provider determines own
Does clinic use EMR to track decisions	Yes	Yes

support for cholesterol?		
Does clinic use EMR to provide alerts for cholesterol?	Yes	Yes
Does clinic use EMR to track prescriptions for cholesterol?	Yes	Yes
If patient had prehypertension, what would you prescribe?	Lifestyle Modification	Lifestyle modification
Stage 1 hypertension?	ACEI, ARB, BB, CCB or combination, lifestyle mods	Thiazide type diuretics, lifestyle mods
Stage 2 hypertension?	Drug combination (usually Thiazide type diuretics and ACEI, ARB, BB, or CCB), lifestyle mods	Thiazide type diuretics, lifestyle mods
If patient had diabetes and hypertension, what is goal BP?	<130/80	<130/80
Does clinic routinely note medical noncompliance in EMR?	Yes	Yes
Does clinic routinely note smoking?	Yes	Yes

Mercer Clinic Assessment Results		
Question	**Pre**	**Post**
Familiar with JNC guidelines?	Yes	Yes
Do you have a copy?	Yes	No
What % of providers follow guidelines?	100%	100%
Does clinic have written policy for assessment or management of high blood pressure?	Yes	No
Typical Blood Pressure Measurements	From pre- to post- the clinic reported no longer using the auscultatory method, recent exercise and smoking were added to the assessment.	
Standard	Uphold and Graham	Provider
BP readings considered pre-hypertension	120-130/71-80	120-139/80-89
BP readings considered stage 1 hypertension	131-140/81-90	140-159/90-99
BP readings considered stage 2 Hypertension	140+/90+	160+/100+
Procedures for follow-up	At post, clinic reported follow-up procedures were determined by individual	

	providers.	
Practices for using EMR for follow-up	At post- clinic reported EMR follow-up was not determined by the provider	
Written Policy for assessment and management of cholesterol?	NHLBI Guidelines	No
Standard practices or provider determines own?	Provider determines own	Provider determines own
Does clinic use EMR to track decisions support for cholesterol?	No	Yes
Does clinic use EMR to provide alerts for cholesterol?	Yes	Yes
Does clinic use EMR to track prescriptions for cholesterol?	No	Yes
If patient had prehypertension, what would you prescribe?	Lifestyle modification	Lifestyle modification and keeping record of changes (diary)
Stage 1 hypertension?	Thiazide type diuretics	Thiazide type diuretics, lifestyle mods
Stage 2 hypertension?	Drug combination	Drug combination, lifestyle mods
If patient had diabetes and hypertension, what is goal BP?	120/70	<130/80
Does clinic routinely note medical noncompliance in EMR?	Yes	Yes
Does clinic routinely note smoking?	Yes	Yes

Training Modules

OHSR also trained individuals at the sites on various cardiovascular quality improvement efforts related to clinic policies and practices. Participants were given pre and post-tests to determine the effectiveness of these trainings. As shown below, these trainings produced higher scores at the post-test indicating the trainings were effective at educating practitioners and administrators regarding prior cardiovascular health issues.

New River QI Cardiovascular Training Modules				
Training 1 Date: 1-19-11	**Module:** Healthy Eating	**#Trained:** 11	**Avg. Pre-Score:** 74.6	**Avg. Post-Score:** 98.2
Training 2 Date: 1-19-11	**Module:** Carbohydrate Counting	**#Trained:** 11	**Avg. Pre-Score:** 60	**Avg. Post-Score:** 78.2
Training 3 Date: 7-20-11	**Module:** Cardiovascular Disease	**#Trained:** 12	**Avg. Pre-Score:** 54.6	**Avg. Post-Score:** 77.5

Mercer QI Cardiovascular Training Modules				
Training 1 Date: 10-6-11	**Module:** Cardiovascular disease	**#Trained:** 8	**Avg. Pre-Score: not reported**	**Avg. Post-Score: not reported**

Ritchie QI Cardiovascular Training Modules				
Training 1 Date: 5/10/12	**Module:** Carb Counting	**#Trained:** 13	**Avg. Pre-Score:** 36.9	**Avg. Post-Score**: 78.4

In addition to these trainings at the pilot sites, additional trainings were held at other locations to help strengthen blood pressure measurement. These trainings took place at Sistersville Hospital and the Wirt County clinic. These trainings received overwhelmingly positive reviews by participants who filled out an evaluation form after the training. Below are the results of those training modules.

Sistersville Hospital QI Cardiovascular Training Modules				
Training 1 Date: 11-8-12	**Module:** Blood Pressure Measurement	**#Trained:** 13	**Avg. Pre-Score: 51**	**Avg. Post-Score: 75**

Wirt County QI Cardiovascular Training Modules				
Training 1 **Date:** 12-3-12	**Module:** Blood Pressure Measurement	**#Trained:** 5	**Avg. Pre-Score:** 60	**Avg. Post-Score:** 80

Conclusions

As demonstrated by the data presented above, the partnership between the CVHP andOHSR has been successful in demonstrating improvements in clinic practices and utilization of electronic health registries for cardiovascular health. Clinics have also demonstrated a commitment to quality improvement and shown changes in the level of knowledge and adherence to recognized standards. Perhaps more importantly, we see that patient outcomes have significantly improved over the intervention period. Patients are showing improvements in clinical measures related to both hypertension and cholesterol. These strong results suggest evidence in support of expanding current efforts in the future to include more sites.

Supplemental Information

Other than these direct evaluation efforts presented above that show the effectiveness of the pilot project, there are a number of other indicators that demonstrate changes related to clinic quality improvement. These are reported in the following supplemental sections:

Assessment of Chronic Illness Care (ACIC)

The ACIC scores help measure the strengths and weaknesses in clinic ability to provide quality care for cardiovascular disease. All three pilot sites saw a general increase in ACIC scores as the intervention progressed. Green shading represents improvements, pink decreases in ACIC scores.

ACIC Scores

Clinic	Health Care Organization		Community Links		Self-Management		Decision Support		Delivery System Design		Clinical Information System		Average ACIC	
	Yr1	Yr2	Yr1	Yr2	Yr1	Yr2	Yr1	Yr2	Yr1	Yr2	Yr1	Yr2	Yr1	Yr2
Mercer	6.2	8.4	10.0	10.5	9.5	10.0	4.8	7.5	9.2	9.7	5.0	8.6	7.4	9.1
Ritchie	4.4	8.6	9.5	9.3	6.3	7.5	3.5	6.5	3.8	9.2	2.0	8.8	4.9	8.3
New River	6.8	8.4	6.3	6.0	7.0	6.0	3.0	5.5	4.8	5.5	6.0	8.8	5.7	6.7

Policy/Practice Changes

The sites involved with this cardiovascular pilot project implemented several policy and practice changes related to a number of the ACIC areas that should result in improved cardiovascular care and outcomes. The following table summarizes the number of changes made by each clinic, each of which has its own measurement and follow-up plan.

Policy/Practice Changes						
Clinic	**Organization of healthcare delivery**	**Linkages to community resources**	**Self-mgmt support**	**Decision support**	**Delivery system design**	**Clinical Information System**
Mercer	4		1	2	1	3
New River			2	3	6	3
Ritchie	1			3	2	

Medical Home

Mercer Health Right is not currently pursuing medical home status. New River and Ritchie County have applied and been recognized and are listed in the following table. Of note, both these clinics have chosen hypertension as a chronic disease focus area.

Clinic	Level	Chronic Disease Focus Areas
Ritchie	2	Hypertension, Diabetes, Asthma
New River	3	Hypertension, Diabetes, Asthma

Staging

Over the course of the pilot program, the sites have made improvements in their CIS and educational staging. CIS staging is reported on a level from 1 to 7 with a higher number representing a more advanced stage. A letter represents educational staging from A to G with later levels being more advanced stages. These staging changes represent improved capacity

for the clinics to utilize health registries for cardiovascular health. The following table summarizes these changes:

CIS Staging		
Clinic	**CIS Staging Year Baseline**	**CIS Staging Present**
Mercer	4 – Sharing de-identified data/limited	5 – CIS Champion/Working with OHSR on reporting/More use of data for QI
New River	7 – Operationalizing/Practice Change	7 – Operationalizing/Practice Change
Ritchie	3 – Memorandum of Understanding in place	6 - Use of CIS for monitoring patient care/Institutionalized use of data
Education Staging		
Clinic	**Education Staging Year Baseline**	**Education Staging Present**
Mercer	A- Not Offered	D – Scheduled
New River	F - Completed	G – Maintenance
Ritchie	G – Maintenance	G - Maintenance

Additional OHSR Activities

In addition, OHSR performed a number of activities in order to make sure clinics were well trained and able to utilize health registry data. OHSR traveled to the three pilot sites to train them on the use of registry data for quality improvement efforts. These on-site trainings

covered several areas of data use and prepared clinics to use the registry in their efforts to improve cardiovascular care. The following table summarizes these trainings:

Using Data for QI		
Clinic	**Type of Trainings**	**# Trained**
Mercer	1. Explaining how to read reports and use data for QI 2. Reviewing reports with clinic staff 3. ID group/individual direct Q 4. Other	4 5 0 0
New River	1. Explaining how to read reports and use data for QI 2. Reviewing reports with clinic staff 3. ID group/individual direct Q 4. Other	3 10 0 0
Ritchie	1. Explaining how to read reports and use data for QI 2. Reviewing reports with clinic staff 3. ID group/individual direct Q 4. Other	4 18 2 2

Also, OHSR was contacted by a number of methods (e-mail, telephone, and in-person) in order to provide technical assistance to clinics on an as-needed basis for health registry implementation and utilization. The following tables summarizes contacts related to the health registry technical assistance over the implementation period in the three pilot sites:

Clinic	Email TA	Telephone TA	In-Person TA
Mercer	9	2	2
New River	29	7	6
Ritchie	18	1	5