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EVALUATION ADDENDUM

A brief addendum to the evaluation of the hypertension quality of care improvement initiative of the West Virginia Cardiovascular Health Program and the West Virginia University Office of Health Services Research
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Background

ABOUT THE WEST VIRGINIA UNIVERSITY OFFICE OF HEALTH SERVICES RESEARCH

Mission: The West Virginia University Office of Health Services Research (WVU OHSR) is a broad-based organization serving the threefold mission of a land-grant university -- service, research, and education. Our primary goal is to facilitate improvement in the health and health care of West Virginians by providing quality improvement support, applied research, planning and resource development, analytical data management, and other consultative services for health and social service agencies.

OHSR has a thirty-eight history of involvement in health-related research activities. Our office was founded in 1975 as a branch of the Regional Medical Program to meet the need for technical assistance in primary health and health planning. For several years it was a part of the WVU Office of Rural Health, and today is an office within the WVU School of Public Health.

OHSR is a **long-time funded partner with the West Virginia (WV) Bureau for Public Health** to support chronic disease quality of care improvement in primary care centers state-wide. OHSR s primarily funded by the **WV Bureau for Public Health's Division of Health Promotion and Chronic Disease** to support state-wide primary care centers in chronic disease quality of care improvement. The specific programs at the WV Bureau for Public Health are the WV Cardiovascular Health Program, the WV Diabetes Prevention and Control Program, and the WV Asthma Education & Prevention Program.

OHSR assists primary care centers in accurately tracking patient outcomes, benchmarking care against national standards, and modifying clinical policies and procedures for improved outcomes. This effort focuses on **support in use of electronic health records and registries to monitor and target care, use of clinical outcomes data for quality improvement, and provider/staff training and education on chronic disease prevention and management** – all of which occur in context of national efforts in reductions in risk factors and quality of care improvement such as the Patient Centered Medical Home and meaningful use of electronic health record (EHR) data.

As of 2013, OHSR is working with over 50 primary care sites in quality assurance and improvement efforts. We tailor our efforts to meet the needs of each individual site, recognizing the uniqueness of each care site.

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Intervention approach

Key findings: OHSR works with primary care centers to determine the quality of care for patients with hypertension and other chronic health conditions such as cardiovascular disease, stroke, diabetes, and asthma. We meet quarterly, and in some cases monthly, with administration, medical directors, and provider/nursing staff to review outcomes data specific to each site and ensure those data are applied to patient care. Remote and telephone support are used in-between these meetings for ongoing project implementation and progress. These sites are demonstrating increased capacity to use clinical data for quality improvement, and use those data to inform practice and policy changes. These efforts are **made more sustainable** by the sites' interest in applying for and achieving Patient Centered Medical Home recognition and achieving meaningful use of their EHRs. The work led by the WV Bureau for Public Health and OHSR received **national recognition by the Association of Clinicians for the Underserved** as innovative in the development of methods to form long-term, sustainable quality improvement partnerships with primary care centers. See: http://wvuhealthcare.com/wvuh/Content/Media/News-Releases/2013/MAR/WVU-Office-of-Health-Services-Research-earns-natio

A case study on our three-way partnership between the WV Bureau for Public Health, OHSR, and primary care centers in facilitating quality of care improvement and outcomes improvement is available at: http://commune.studentorgs.wvu.edu/r/download/129155. As noted in the article, three critical factors help this collaboration. These factors are: **1) practice-driven redesign; 2) shared expertise; and 3) allowance for change**.

OHSR obtained signed memorandums of understanding with three pilot primary care centers, comprising 10 care delivery sites, for participation in the **hypertension pilot**. These agreements also outline each organization's willingness to share de-identified data with OHSR and the WV Cardiovascular Health Program. The three pilot organizations span a continuum of high to lower-level quality improvement implementation. One objective of our work was to **empower the sites to become higher functioning**.

- Of the three organizations, we had immediate success in one in assisting the clinic in identifying patients and moving to an intervention. This site has a history of successful quality improvement initiatives and the leadership necessary to transform projects into sustainable practice and policy driven efforts which become the standard of care.
- In the second organization, we discovered a gross under-diagnosis of hypertension. This discovery was made by importing the site's EHR data into the Chronic Disease Electronic Management System (CDEMS) for data verification and analysis. OHSR was able to identify a large percent of patients with chronic high blood pressure with no documented diagnosis of the condition. Working with the administrator, provider, and nurses, the medical records were reviewed and appropriate diagnoses were made in over 100 cases. We then moved to the intervention phase.
- In the third clinic OHSR discovered a systematic error in the way they were coding hypertension diagnoses. This issue was brought to the attention of the clinic administrator and provider/nursing staff. While it took significant time and effort to understand the problem and how to correct it, the coding error has since been resolved. This allowed us to start the hypertension intervention with an accurate view of the target patient population.

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Intervention Outcomes

Key findings: OHSR has been successful in providing technical support and coaching in **achieving five domains** necessary in improving the care of patients with hypertension. These domains are:

1. Analysis of electronic health record data using CDEMS to measure population data (at the clinic level) to improve patient outcomes

2. Improved identification of patients with hypertension using CDEMS through analysis and verification of code-based and free-text based diagnoses plus analysis of blood pressure results

3. Improved accuracy in documenting diagnosis of hypertension using CDEMS

4. Increased percent of patients meeting JNC-7 guidelines for controlled hypertension

5. Decreased percent of patients at stage 1 and stage 2 hypertension according to JNC-7 guidelines

OHSR conducted a cohort analysis of the three pilot organizations. 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

Please see **Appendix** A for the full report on this cohort analysis.

Our collaborative effort resulted in interventions that resulted in improvements in **National Quality Forum measure 0018 -** Controlling high blood pressure among thirty-four primary care center partners. See **Appendix B** for a copy of this report. Additionally, OHSR has developed a hypertension clinical decision tree whereby patients with cardiovascular health conditions, cardiovascular health conditions and diabetes, diabetes only, and other chronic conditions are staged in terms of blood pressure control. This tree allows for identification of problem areas, such as patients with uncontrolled hypertension not on blood pressure medication and patients without a diagnosis of hypertension but with abnormally high blood pressure readings. **Appendices C and D** present these analyses for two 12-month time periods.

Some of these improvements are also supported by our recent publication in *Perspectives in Health Information Management*. This paper, focused on the importance of EHR data quality in the ability to accurately measure, track, and target care of patients with hypertension, is available at: http://perspectives.ahima.org/identifying-patients-with-hypertension-a-case-for-auditing-electronic-health-record-data/#.UXbDS8p4-0k

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The medication adherence pilot conducted in conjunction with the West Virginia University School of Pharmacy resulted in some initial lessons learned. This pilot was conducted at a free clinic serving patients who are uninsured, transient, and some who are homeless. The project centered on administration of surveys to patients while in the waiting room to identify and understand barriers to medication compliance. During the project period, 44 surveys were administered to patients by pharmacy students. While these data are limited in terms of generalizability, results indicate that simply forgetting to take medications (31.8%) is the most common reason for not adhering to medications as prescribed. The second most common reason among this sample is having a busy schedule (18.2%). The reasons for these findings from the pilot initiative need to be closely examined and better understood.

OHSR would like to continue these efforts in medication adherence and refine them. We would like to discuss with the WV Cardiovascular Health Program the potential to focus medical adherence efforts around the well-established problem of health literacy. Health literacy, or the capacity to obtain, process, and understand basic health information, is an especially important concern among patients served by free clinics and federally qualified health centers. Equally important are the abilities of health care providers and medical staff to appropriately communicate with patients on medication adherence. We see opportunity for training and coaching to providers and medical staff on this very important topic central to ultimate improvements in patient care and health outcomes.

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Lessons Learned

Key findings: From these efforts in cardiovascular quality of care improvement, OHSR offer the following in terms of lessons learned:

1. The current environment of primary care sites is characterized by pressure to make multiple changes at one time. In order for our work to be successful, we needed to make the hypertension initiative **applicable to other concurrent efforts taking place in the clinic**; most notably, the Patient-Centered Medical Home. While these demands could be perceived as *competing*, the efforts of our hypertension project directly aid and support efforts in application and implementation of the Patient-Centered Medical Home as well as meaningful use of electronic health record data. Flexibility in working with the sites and integration of their own ideas on how to create and sustain change is important and encourages success given the frequent push from external agencies to take part in new efforts.

2. Communication among the entire care team within primary care sites is essential to true project buy-in, implementation, and sustainability. We find that **sites with the most robust quality improvement plans and care teams are those with the highest degree of communication**. These findings come from an exploratory review of data from primary care center staging and Assessment of Chronic Illness Care annual surveys conducted by OHSR with partnering sites. Encouraging team building aids in the sustainability of our quality improvement efforts, and helps offset loss of momentum in the event of turn-over among providers and medical staff. This is especially important in light of the myriad of initiatives in which they are expected or encouraged to take part.

3. While health centers at times have information technology (IT) staff as part of their team, these individuals are **not necessarily equipped to handle the data and reporting demands of quality improvement efforts** or those of initiatives such as the Patient-Centered Medical Home. We have found ample opportunity to partner with health center IT staff and help to coach them in working with the care team to establish essential procedures such as monthly or quarterly data reviews at medical staff meetings. The linkages between the CDEMS registry and the EHR data at the sites has been instrumental in helping to provide health center staff with new knowledge, skills, and abilities in working with and understanding the use of clinical data in quality of care improvement.

Appendix A

Key findings: WV Heart Disease and Stroke Prevention Initiative: Cohort Analysis Results from the Hypertension Initiative Pilot

The table and graph below provides cohort analysis for Physicians Quality Reporting Initiative and National Quality Forum outcomes in the three hypertension initiative pilot sites. These measures address the "ABCS" (i.e., aspirin, blood pressure, cholesterol, and smoking) of the Million Hearts TM Initiative. The data presented below are from the West Virginia Chronic Disease Registry.

The West Virginia Cardiovascular Health Program and the West Virginia University Office of Health Services Research 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 is a five-fold effort: 1) promotion of JNC-7 guidelines; 2) training on accurate blood pressure measuring; 3) support in the use of electronic medical records and registries to monitor and target care; 4) provider/staff training and education on chronic disease prevention and management; and 5) use of reports of clinical outcomes data for quality improvement.

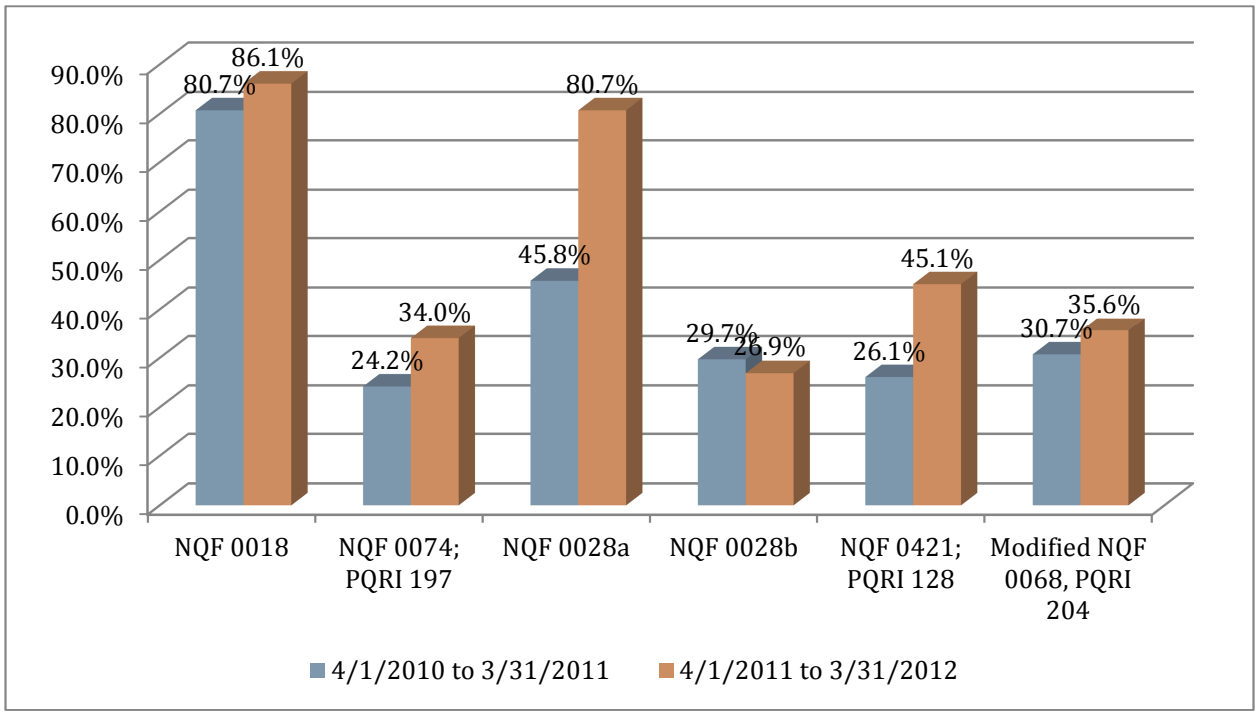
Cohort patients are those who received care prior to the start of the intervention (4/1/2010) and continued to receive care through the end of the evaluation period (3/31/2012). **Across these time periods, we find improvements in**:

- 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

Areas highlighted in green represent improvements we feel are important to highlight.

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



*See the table above for the reporting reference numbers and definitions.

Appendix B

Key findings: Cross-Sectional Analysis for National Quality Forum Measure 0018: Controlling High Blood Pressure

The table below provides cross-sectional analysis for **National Quality Forum measure 0018: Controlling high blood pressure**. This measure examines the percentage of patients 18-85 years of age who had a diagnosis of hypertension and whose last blood pressure was adequately controlled (<140/90) during the measurement year. The data presented are from the West Virginia Registry for Prevention & Control of Chronic Disease, through de-identified data sharing agreements between primary care centers and the West Virginia University School of Public Health – Office of Health Services Research. Thirty-four primary care centers are included in this analysis. Data from multiple electronic health records have been standardized into one common registry format to permit consistency and reliability in measuring findings across sites.

Across the three 12-month periods included in this analysis, we find **consistent improvement** in the percent of patients 18-85 years of age who had a diagnosis of hypertension and whose last blood pressure was adequately controlled (<140/90) during the measurement year (79.7% in 2010 to 82.9% in 2012).

Overall	1/1/2010 to 12/31/2010			1/1/2011 to 12/31/2011			1/1/2012 to 12/31/2012		
Measure	Num	Denom	Percent	Num	Denom	Percent	Num	Denom	Percent
0018 Controlling High Blood Pressure	11043	13848	79.7%	12866	15726	81.8%	13086	15792	82.9%

Appendix C

Key findings: Hypertension Decision Support Analysis from the WV Registry for Prevention & Control of Chronic Disease **(7/1/2011 to 6/30/2012)**

Using this decision support tree, OHSR first looks at the difference between the total number of active patients in the registry and the number of active patients who have actually had an office visit during the time period. This gives us opportunity to do some quality improvement work with the sites on using their data to identify the specific patients in need of a visit, generate reminder letter, send those letters to the patients, etc. We also look at the percent of patients with a documented blood pressure reading. Lower than expected results indicate the need to evaluate policies and procedures in documentation of data in the EHRs. This tree also provides a break-down of hypertension and diabetes prevalence among the overall patient population.

Also using this decision support tree, we can start discussion on proportion of patients with any cardiovascular health condition and focuses attention on blood pressure control among patients with hypertension. The tree provides information on proportion of patients in control, not in control (Stage 1 and Stage 2), and how many patients in Stage 1 and Stage 2 have documentation of appropriate medications. It also allows us to identify patients with high blood pressure readings but do not have a diagnosis of high blood pressure. This is another significant opportunity for quality improvement.