Title: Improving the Identification of Women at Increased Risk for Stroke in an Urban Medical Center

Principal Investigator and Team Members:

Seemant Chaturvedi, MD: Professor of Neurology, WSU SOM, near the completion of the project, Dr. Chaturvedi left WSU to accept a position as Professor and Vice Chair of Neurology at the University of Miami Health System. Dr. Chaturvedi has continued his participation in the WSU project via email and conference calls.

David Pieper, PhD: Assistant Dean for CME at WSU SOM. Dr. Pieper managed the administrative aspects of the project as well as participating as an experienced researcher and statistician.

Lavoisier Cardozo MD: Medical Director of the Rosa Parks Geriatric Clinic. Dr. Cardozo is a Professor of Internal Medicine at the WSU SOM and Chief of Medicine for Detroit Receiving Hospital and the University Health Center and a Core Faculty Member for the Detroit Medical Center Geriatrics Fellowship.

Diane Levine MD: is Associate Professor and Vice Chair for Education in the Department of Internal Medicine at Wayne State University

Neelima Thati MD: Assistant Professor in the WSU Department of Internal Medicine and Associate Program Director of our internal medicine residency program.

Ramesh Madhavan, M.D. Associate Professor of Neurology in the Wayne State University School of Medicine; Director of Telemedicine; Neurology Residency Program Director and Associate Chief Medical Officer, Informatics of the Physician Group.

Maribeth Mateo MD: Family Medicine Faculty and Director of Practice Initiatives for Wayne State University Physician Group.

Maria Young: Pharmacist for the General Medicine Ambulatory Clinic.

Organization: Wayne State University School of Medicine

Inclusive Dates of Project: January 13, 2013 to August 30, 2015

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Structured Abstract

Purpose: The main aim of our intervention is to heighten the awareness of stroke risk in women among primary care providers in an urban medical center. Along with education on which women are at increased risk for stroke, we provided guideline recommended methods to reduce the number of strokes in women at increased risk.

Scope: Education of primary care providers on which women are at increased risk for stroke. This effort focused on analyzing the presence of risk factors such as hypertension and atrial fibrillation (AF) as well as targeting inadequately treated risk factors.

Methods: Patient demographics and stroke related patient care metrics were assessed before and one year after a series of educational interventions. In a separate but related endeavor, we completed a patient survey to assess stroke literacy.

Results: Analysis of the data indicated that only 56% 152/173 of women over 40 (58% African American) with prior stroke or TIA were on antiplatelet therapy before the intervention and 72.1% (44/61) of women with a prior stroke or TIA were on antiplatelet therapy after the intervention ($p < 0.05$). However other parameters did not show a statistically significant improvement. A higher percent of the patients in the GMAP, Rosa Parks and Med-Peds clinics received appropriate therapy than the two Family Medicine clinics.

261 patients completed the stroke literacy survey . The brain was correctly identified as the site where a stroke occurs by 57.2% of respondents, whereas the heart and extremities were incorrectly identified by 10.7% and 11.4% respectively. Dysarthria was the best-recognized stroke symptom (82.1%), closely followed by numbness and paralysis of the extremities (78.8% and 75.1% respectively). Chest pain was incorrectly identified as a symptom of stroke by 37.5% of respondents. When asked whether "young people" have strokes, 66.7% (30/45) of those 50 years old and younger answered "True" compared to 37.5% (9/24) of those 80 and over ($p < 0.05$).

SCOPE:

The following two tables give the demographic information in the 5 clinics included in our educational intervention.

Numbers in Black: Before the educational intervention April – June 2013

Numbers in Red: After the educational intervention April – June 2014

Table 1: Comparison of Age, BMI and Payor

	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
	N = 166	N = 425	N = 506	N = 415	N = 303	N = 1815
	N =629	N=284	N=703	N=815	N=186	N = 2617
Mean Age (yrs)	57.0	56.4	57.8	77.4	57.1	61.7
	61.0	57.2	57.5	77.4	57.3	64.5
Mean BMI	29.4	32.0	32.7	30.4	33.9	31.9
	29.2	32.9	33.1	29.9	33.3	31.2
Percent Medicare	23.5%	20.7%	32.4%	77.4%	33.3%	
	33.9%	18.7%	27.6%	76%	31.7%	

Table 2: Comparison of Race by Clinic

Clinic Name	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
African American	29/166 (18%)	251/425 (59%)	447/495 (90.3%)	338/415 (81%)	277/303 (91%)	1015/1815 (56%)
	54/629 (8.6%)	140/284 (49%)	476/703 (68%)	677/815 (83%)	170/186 (91%)	1517/2617 (58%)
Asian	16/166(9.6%)	19/425 (4.5%)	4/506 (0.8%)	4/415 (1.0%)	0	39/1815 (2.1%)
	24/629 (3.8%)	1/425 (0.4%)	2/703 (0.3%)	5/815 (0.6%)	1/186 (0.5%)	32/2617 (0.12%)
Caucasian	97/166 (58%)	122/425 (29%)	22/506 (4.3%)	41/415 (10%)	17/303 (5.6%)	258/1815 (14%
	333/629 (53%)	22/284 (7.7%)	28/703 (4%)	79/415 (9.7%)	0	396/2617 (15%)
Hispanic	2/166 (1.2%)	7/425 (1.5%)	5/506 (1.0%)	2/415 (0.5%)	2/303 (0.7%)	16/1815 (0.9%)
	14/629 (2.2%)	1/284 (0.4%)	5/703 (0.7%)	6/415 (0.7%)	1/186 (0.5%)	27/2617 (1.0%)

 The Rosa Parks clinic is a geriatrics clinic located in downtown Detroit, close to the GMAP and Med-Peds clinics. The Southfield and Rochester Family Medicine clinics are located in suburban Detroit.

Table 3: Comparison of Risk Factors

Clinic Name	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
HTN DX	108/166 (65.1%)	281/425 (66.1%)	437/506 (86.4%)	318/415 (76.6%)	249/303 (82.2%)	1393/1815 (76.7%)
Diabetes DX	31/166 (18.7%)	92/425 (21.6%)	169/506 (33.4%)	96/415 (23.1%)	102/303 (33.7%)	490/1815 (27%)
Hyperlipid DX	72/166 (43.4%)	189/425 (44.5%)	284/506 (56.1%)	198/415 (47.7%)	151/303 (49.8%)	894/1815 (49.3%)
A Fib Cond	2/166 (1.2%)	6/425 (1.4%)	13/506 (2.6%)	20/415 (4.8%)	7/303 (2.3%)	48/1815 (2.6%)
CAD DX	1/166 (0.6%)	2/425 (0.5%)	27/506 (5.3%)	44/415 (10.6%)	7/303 (2.3%)	81/1815 (4.5%)
Prior Stroke or TIA	2/166 (1.2%)	17/425 (4%)	18/506 (3.6%)	41/415 (9.9%)	21/303 (6.9%)	99/1815 (5.5%)

The patient stroke literacy survey was done in the GMAP and Rosa Parks Clinic only.

Methods

The main aspect of this project was to compare the treatment of women at risk of stroke before and after education in 5 clinics. The practitioners in the Med-Peds clinic were not included in the intervention in order to serve as controls. Only women over the age of 40 were included in the study and in spite of the clinic name, a large number of patients meeting this criteria visit the Med-Peds clinic. A data mining tool was used to abstract information from the medical record from five primary care practices. Data pertaining to treatment of conventional risk factors (HTN, prior stroke, atrial fibrillation) was collected. The "Pre" assessment was for patients visiting the clinics from April-May of 2013 and the "Post" for patients visiting the clinics from April-May 2014. For patients with multiple visits, only data from their first encounter was recorded in our assessments.

Project was deemed "Exempt" by WSU IRB.

A Pre-Test and Post-Test was conducted using Survey Monkey. The questions, answers and rational are attached at the end of this document.

The educational intervention consisted of a series of live and web based lectures.

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Table 4: Lecture schedule

DATES	TOPICS	SPEAKERS
7/25/2013	Guidelines for **hyperlipidemia** evaluation and treatment	Candice Garwood, PharmD
9/12/2013	**Atril Fibrillation** (AF) and stroke	Seemant Chaturvedi, MD
9/26/2013	Guidelines for **hypertension** evaluation and treatment	Neelima Thati, MD
10/10/2013	Asymptomatic **carotid stenosis** and stroke	Seemant Chaturvedi, MD
10/24/2013	Guidelines for **diabetes** screening and treatment	Neelima Thati, MD
11/7/2013	Stroke **risk stratification tools**	Kumar Rajamani, MD
11/21/2013	Smoking cessation	Helen Burlie, MD
12/5/2013	Causes and evaluation of **secondary hypertension**	John Flack, MD, MPH
1/9/**2014**	Guidelines for diabetes screening and treatment-Part 2	Neelima Thati, MD
1/23/2014	**Atril Fibrillation** (AF) 2 and stroke	Seemant Chaturvedi, MD
2/13/2014	Oral Contraceptives and Stroke	Diane Levine, MD
2/27/2014	**Heart failure** and stroke	Issa Alesh, MD
3/13/2014	Treatment of **resistant hypertension** and HTN in the elderly	Lavoisier Cardozo, MD
3/27/2014	Stroke as a Cause of Vascular Cognitive Impairment	Ramesh Madhaven, MD
4/10/2014	**Dietary approaches** to improving vascular health	Joel Kahn, MD
4/24/2014	When Prevention Fails: Acute Stroke Therapy Options	Ramesh Madhaven, MD
5/8/2014	**Obesity** and physical activity	Manmeet Singh, MD
5/22/2014	Post-Menopausal Hormones and Vascular Disease	Diane Levine, MD

Live lectures were recorded and made available on the web for CME credit.

In addition to the live and online lectures, weekly email reminders were sent to the residents and faculty regarding appropriate measures for patients at risk for stroke. Here are examples of the reminders:

- Keep systolic blood pressure <140
- Keep diastolic blood pressure <90
- Keep LDL <100 or <70 if patient is high risk for vascular disease
- If your patient is an active smoker, please advise on smoking cessation
- Consider anticoagulation for atrial fibrillation
- If not on anticoagulation for A FIB, is there a contraindication?
- Use antiplatelet therapy if history of coronary artery disease
- Use statin if history of coronary artery disease
- Use statin if history of ischemic stroke
- If patient is >50 years, reminder that estrogen can increase vascular events
- Advise your patient to exercise regularly
- Advise your patient to avoid fast foods

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The attendees included 98 Internal Medicine residents, 20 Family Medicine residents and the faculty for those programs plus the employed physicians and nurse practitioners in the Rose Parks clinic.

Twenty-seven of our IM and FM faculty signed up to participate the project as a 20 credit Performance Improvement CME (PICME) activity.

Results of the Intervention

Black = Before Educational Intervention
Red = After Educational Intervention

Table 5: Patients on Antiplatelet RX (includes aspirin)

Clinic Name	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
Total patients on Antiplatelet RX	35/166(21.1%) 82/629 (13%)	93/425 (21.8%) 68/284 (23.9%)	208/506 (41.1%) 275/703 (39.1%)	198/415 (47.7%) 247/815 (30.3%)	115/303 (38.0%) 63/186 (33.9%)	649/1815 (35.8%) 735/2617 (28.1%)
Antiplat RX if Prior Stroke or TIA	8/25 (32%) 1/2 (50%)	30/66 (45.5%) 8/8 (100%)	61/92 (66.3%) 16/21 (76.2%)	19/39 (48.7%) 15/24 (62.5%)	34/51 (66.7%) 4/6 (66.7%)	152/273 (55.7%) 44/61 (72.1%)
Antiplat RX if AFib	1/2 (50%) 2/8 (25%)	2/6 (33.3%) 0/1	8/13 (61.5%) 9/12 (75%)	9/20 (45%) 11/40 (27.5%)	6/7 (85.7%) 2/4 (50%)	26/48 (54.2%) 24/65 (36.9%)
Antiplat RX if CAD and under 70yo	1/1 (100%) 2/4 (50%)	2/2 (100%) 1/5 (20%)	17/19 (89.5%) 26/28 (92.9%)	6/6 (100%) 3/8 (37.5%)	5/6 (83.3%) 3/4 (75%)	31/34 (91.2%) 35/49 (71.4%)
Antiplat RX if CAD and 70 yo or over	0/0 1/5 (20%)	0/0 0/0	8/8 (100%) 6/7 (85.7%)	23/38 (60.5%) 33/65 (50.8%)	1/1 (100%) 1/1 (100%)	32/47 (68.1%) 41/78 (52.6%)
Antiplat if DM	17/31 (54.8%) 28/86 (32.6%)	39/92 (42.4%) 29/65 (44.6%)	109/166 (65.7%) 143/231 (61.9%)	57/96 (59.4%) 92/245 (37.6%)	54/105 (51.4%) 29/54 (53.7%)	276/490 (56.3%) 321/681 (47.1%)

In patients with prior stroke or TIA, there was an improvement in the percent of patients on antiplatelet medications after the intervention ($p < 0.05$). However we are not sure why the percent of patients with prior stroke or TIA decreased in the post intervention group. The GMAP and Med-Peds clinics had a higher percent of patients on appropriate antiplatelet therapy than the other three clinics.

Table 6: Patients on Statins

Clinic Name	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
Total Patients on Statins	61/166 (36.7%)	149/425 (35.1%)	272/506 (53.8%)	144/415 (34.7)	141/303 (46.5%)	767/1815 (42.3%)
	165/629 (26.2%)	76/284 (26.8%)	291/703 (41.4%)	212/815 (26%)	74/186 (39.8%)	818/2617 (31.3%)
Statin RX if Prior Stroke or TIA	10/25 (40%)	38/66 (57.6%)	69/92 (75%)	13/39 (33.3%)	36/51 (70.6%)	166/273 (60.8%)
	0/2	6/8 (75%)	17/21 (81%)	13/24 (54.2%)	3/6 (50%)	39/61 (63.9%)
Statin RX if DM	23/31 (74.2%)	63/92 (68.5%)	142/169 (84.0%)	46/96 (47.9%)	72/102 (70.6%)	346/490 (70.6%)
	40/86 (46.5%)	37/65 (56.9%)	154/231 (66.7%)	80/245 (32.7%)	37/54 (68.5%)	348/681 (51.1%)
Statin RX if CAD	1/1	2/2	25/27 (92.6%)	22/44 (50%)	7/7	57/81 (70.4%)
	3/9 (33.3%)	2/5 (40%)	28/35 (80%)	25/73 (34.2%)	5/5 (100%)	63/127 (49.5%)

There was not a significant improvement of the percent of patients on statins after the intervention. The GMAP and Med-Peds clinics had a higher percent of patients on appropriate statin therapy.

Table 7: Patients on Aspirin

Clinic Name	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
Total patients on Aspirin	33/166 (19.9%)	85/425 (20.0%)	202/506 (40.0%)	189/415 (45.5%)	109/303 (36.0%)	616/1815 (33.9%)
	74/629 (11.8%)	64/284 (22.5%)	261/703 (37.1%)	221/815 (27.1%)	58/186 (31.2%)	678/2617 (25.9%)
Aspirin RX if Diabetes	16/31 (51.6%)	35/92(38%)	104/169 (61.5%)	56/96 (58.3%)	52/102 (51%)	263/490 (53.7%)
	23/86 (26.7%)	29/65 (44.6%)	132/231 (57.1%)	85/245 (34.7%)	28/54 (51.9%)	297/681 (43.6%)

There was not a significant improvement in the percent of patients on aspirin after the intervention.

Table 8: Patients on Estrogen

`	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
Total Patients on Estrogen	9/166 (5.4%) 42/629 (6.7%)	38/425 (8.9%) 31/284 (10.9%)	17/506 (3.3%) 27/703 (3.8%)	5/411 (1.2%) 7/815 (0.9%)	28/303 (9.2%) 18/186 (9.7%)	97/1815 (5.3%) 125/2617 (4.8%)
Estrogen RX if CAD	0/1 0/9	0/2 0/5	0/27 1/35 (2.9%)	2/44 (4.5%) 1/73 (1.4%)	1/7 (14.3%) 0/5	3/81 (3.7%) 2/127 (1.6%)
Estrogen if Prior Stroke or TIA	0/25 0/2	5/66 (7.6%) 3/8 (37.5%)	6/92 (6.5%) 2/21 (9.5%)	0/39 0/24	8/51 (15.7%) 1/6 (16/7%)	19/273 (7%) 6/61 (9.8%)

A low percent of our patients were on estrogen.

Table 9: Patients on Anticoagulants

Clinic Name	FM Rochester	FM Southfield	GMAP	Rosa Parks	Med-Peds	Total
Total patients on Anticoagulants	0/166 4/629 (0.6%)	10/425 (2.4%) 9/284 (3.2%)	35/506 (6.9%) 36/703 (5.1%)	25/415 (6.0%) 52/815 (6.4%)	13/303 (4.3%) 8/186 (4.3%)	83/1815 (4.6%) 52/815 (6.4%)
Anticoag RX if AFib	0/2 1/8 (12.5%)	1/6 (16.7%) 1/1 (100%)	10/13 (76.9%) 7/12 (58.3%)	16/20 (80%) 28/40 (70%)	5/7 (71.4%) 1/4 (25%)	32/48 (66.7%) 38/65 (54.3%)

There was not a significant improvement in the number of patients on anticoagulants.

Table 10: Comparison of PICME participants to non-PICME providers

PICME	Yes	No	Total
Total patients on Antiplatelet RX	144/532 (30.6%) 326/1165 (28%)	505/1283 (39.4%) 409/1452 (28.2%)	649/1815 (35.8%) 735/2617 (28.1%)
Antiplat RX if Prior Stroke or TIA	31/68 (45.6%) 12/23 (65.2%)	79/138 (57.2%) 29/38 (76.3%)	152/273 (55.7%) 44/61 (72.1%)
Antiplat RX if AFib	2/8 (25%) 8/33 (24.2%)	24/40 (60%) 16/32 (50%)	26/48 (54.2%) 24/65 (36.9%)
Antiplat RX if CAD	9/11 (82%) 44/78 (56.4%)	54/70 (77%) 32/49 (65.3%)	
Antiplat if DM	71/133 (53.4%) 126/297 (42.4%)	205/357 (57.4%) 195/384 (51%)	276/490 (56.3%) 321/681 (47.1%)

There was no significant difference in the percent of patients on antiplatelet therapy between the providers in the PICME activity compared to providers not involved in the PICME. Other medication data were similar.

The data for each provider participating in the PICME project were sent individualized data on their performance before and after the education.

Pre-Test and Post-Test:

The test questions are available as an attachment under the "Additional Final Materials". Thirty-five participants completed the pre-test but only 6 completed the post-test.

Question	Pre-Test % correct	Post-Test % correct
1	59.5	83.3
2	31.4	33.3
3	97.1	100
4	65.7	60.0
5	61.8	80.0
6	84.9	80.0
7	52.9	80.0
8	92.1	100
9	63.6	100
10	29.0	40.0

There seemed to be an improvement in the percent answered correctly after the educational intervention but the results are complicated by the poor response rate in the post-test.

PICME

Twenty-eight participants signed up to participate in the Performance Improvement CME project, completed the first stage and received individualized data related to their performance metrics such as patients at risk for stroke on anti-platelets, anti-coagulants or statins. However only a few of these physicians completed the attestation and reflection form to receive the 20 credits of CME.

Summary of Results: Analysis of the data indicated that only 56% 152/173 of women over 40 (58% African American) with prior stroke or TIA were on antiplatelet therapy before the intervention and 72.1% (44/61) of women with a prior stroke or TIA were on antiplatelet therapy after the intervention ($p < 0.05$). However other parameters did not show a statistically significant improvement. A higher

percent of the patients in the GMAP and Med-Peds clinics received appropriate therapy than the two Family Medicine clinics. Despite their proven value for secondary prevention, antiplatelet therapy and statins were underutilized in women with prior stroke or TIA. Strategies to intensify vascular disease prevention in high risk urban women and particularly women under 70 are needed.

Barriers and Limitations: A large amount of time and resources were spent on the "data-mining" aspect of the project. One of the major problems was that some of the clinics (UPG) were using the NextGen EMR system and others (DMC) were using CERNER. In addition, the Rosa Parks clinic was just converting to EMR and the methodology was not consistent before and after the intervention. The data we were able to pull from the systems was not in an analyzable format and had to be extensively massaged in order to be analyzable. We also had to try to obtain more patient history information which was not consistently available in the EMR.

At the beginning of the project, 28 practitioners expressed an interest in participating in the PICME, but enthusiasm seemed to subside by the end and only a few physicians completed all 4 stages of PICME. There may be a variety of reasons for the drop off including the practitioners at a large academic medical center having many opportunities for CME, and the length of the project.

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Patient Survey Methods

After IRB approval, the stroke literacy survey was done in the GMAP and Rosa Parks clinics. A group of trained volunteers conducted an in-person closed-ended questionnaire based survey structured in a largely African American (AA) population over 40 years old. The survey consisted of 15 questions modified from a similar study done in Harlem (Willey et al, Neurology 2009).

Questionnaire for Stroke in Women Study

1. What is the first letter of your last name.
2. What is your month and year of birth.
3. Please select the best description of your race:
     a. African-American b. Caucasian c. Hispanic d. Asian e. Other
4. Have you ever been diagnosed with high blood pressure?
     a. yes b. no
5. Have you ever had a stroke or transient ischemic attack (TIA)?
     a. yes   b. no   c. not sure
6. Where in the body does stroke occur?
     a. Heart   b. Arms and legs   c. Brain   d. Other   e. Don't know
7. Which of these symptoms are warning signs of a stroke? (Check all that apply)
     a. Pain in the chest
     b. Blurry or loss of vision in one or both eyes
     c. Weakness or paralysis on one side of the body
     d. Difficulty speaking
     e. Numbness on one side of the body
8. Which of the following conditions increase your risk of stroke (check all that apply)?
     a. Age
     b. High blood pressure
     c. Diabetes
     d. Obesity
     e. Cocaine abuse
     f. Tobacco smoking
     g. Arthritis
     h. A family history of stroke
     i. Pneumonia
     j. Car accident
9. Arriving in the hospital as soon as possible is critical for stroke treatment. Is it…
     a. True
     b. False
     c. Don't know.
10. Young people don't get strokes. Is it…
     a. True
     b. False

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c. Don't know.
11. If someone is having the worst headache of their life they may be having a stroke. Is it…
    a. True
    b. False
    c. Don't know.

12. Treatment of acute stroke within 3 hours of onset of symptoms may result in decreased handicap or disability. Is this statement…
    a. True
    b. False
    c. Don't know.
13. If someone in your family was having stroke warning signs, the best course of action is to:
    a. Call the doctor
    b. Call 911
    c. Lie down and rest until symptoms go away
    d. Call other family members for help
14. Please check below that best indicates how much you trust the healthcare system.
    No Trust   Somewhat   Moderate   Strong   Complete

Patient Survey Results

261 respondents completed the survey with 78.8% female. AA comprised 81.2% of the survey cohort. The brain was correctly identified as the site where a stroke occurs by 57.2% of respondents; 10.7% identified the heart and 11.4% identified the extremities as the site of stroke. Chest pain was incorrectly identified as a symptom of stroke by 37.5% of respondents: 61.5% considered diabetes as risk factor for stroke. When asked whether "young people" have strokes, 66.7% (30/45) of those 50 years old and younger answered "True" compared to 37.5% (9/24) of those 80 and over ($p < 0.05$).

Conclusions from Patient Survey: Our survey revealed that awareness of stroke symptoms was generally good but awareness of stroke risk factors such as diabetes was suboptimal. Our study suggests a need for continued patient education about stroke and stroke risk factors to further improve patient efficacy and knowledge.

Secondary Outcomes and Future Endeavors

There was a lot of positive feedback regarding this project from our GME faculty leadership. They very much appreciated the integration of quality improvement projects with GME and CME and between the disciplines. The project helped them meet ACGME CLER guidelines for quality improvement, cultural diversity and scholarly activity. All of the co-investigators appreciated the opportunity for research and scholarly activity and expressed interest in pursuing similar projects in the future. For the physicians that did complete the PICME reflection form, the comments were very positive.

Review of the data spurred WSU to develop an initiative (summary of preventative Measures) that is now mailed to all practitioners prior to their patient's scheduled visit. This program focuses on prevention. After seeing the data from the "Pfizer stroke project" we will now suggest that some of these measures are added to the summary.

The quality measures reflect important opportunities to deliver guideline concordant care. Unfortunately, there are many missed opportunities where we did not deliver this care. Each opportunity is a real patient. We need to find a mechanism where such measures of personal performance and group performance are fed back on a regular basis. Data drives performance.

REFERENCES

Chaturvedi, S, D. Pieper , D. Levine MD, N. Thati, R. Madhavan, M. Mateo, L. Cardozo. M. Lepczyk. Quality Assessment of Vascular Disease Prevention Practices in High Risk Urban Women, American Academy for Neurology, Washington DC, April 2015. (Poster Presented; PPT of poster attached in reconciliation).

Jasleen Kaur Bhanot, Diane L Levine, David Pieper, Neelima Thati, Lavoisier Cardozo, Mary Beth Lepczyk, MariaYoung, Seemant Chaturvedi. Knowledge of Stroke Symptoms and Risk Factors in Elderly Patients Seen in Inner-City Detroit Clinics. Submitted to International Stroke Conference 2016 to be held in Los Angeles February 17-19, 2016. (Full copy of abstract attached in reconciliation; similar abstract also submitted to Michigan ACP Meeting for May 2016.)

There are two journal articles being drafted based on the outcomes of the patient treatment data and the stroke literacy data to be submitted to the journal Stroke or JAMA.