No Kidney Ages Alone: Studying MCC in People with Chronic Kidney Disease

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AGING initiative

HCSRN-OAICs

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Today’s Speakers

Kristi Reynolds  
PhD, MPH

Manjula Kurella Tamura  
MD, MPH

C. Barrett Bowling  
MD, MSPH
For questions about the AGING Initiative or today’s webinar, please contact:

Christopher.Delude@meyersprimary.org
Development of a Chronic Kidney Disease Discordance Index

C. Barrett Bowling, MD, MSPH
Durham VA GRECC
Duke Department of Medicine
@barrett_bowling

Kristi Reynolds, PHD
Department of Research & Evaluation
Kaiser Permanente Southern California
CKD patient perspective

“...all of us have multi-problems. You go to...the nephrology people...they don’t talk anything about diabetes or your heart or whatever the case may be.

Seems like there should be some coordination amongst them, ‘now wait a minute this guy has a heart problem too what are we gonna do we about this, or now since he has all three [conditions], what kind of instructions are we going to give him?’”
Why study CKD in older adults?

• High burden of CKD in older adults
• Prevalence increasing over time
• Aging population → more older CKD patients
• Older patients don’t have just CKD

Number of US adults ≥ 80 years old with reduced eGFR

US Population ≥ 80 years old (Millions)

Calculated eGFR, ml/min/1.73m²

<table>
<thead>
<tr>
<th>Calendar period</th>
<th>45 – 59</th>
<th>&lt; 45</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988 - 1994</td>
<td>2.5</td>
<td>0.9</td>
</tr>
<tr>
<td>1999 - 2004</td>
<td>4.0</td>
<td>2.7</td>
</tr>
<tr>
<td>2005 - 2010</td>
<td>4.6</td>
<td>2</td>
</tr>
<tr>
<td>2030</td>
<td>9.9</td>
<td>4.3</td>
</tr>
<tr>
<td>2050</td>
<td>8.9</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Bowling et al. JAMA. 2013
Bowling et al. AJMS. 2014
CKD-related multimorbidity

- Few studies have characterized CKD-related multimorbidity
- Multimorbidity framework
  - Concordant
  - Discordant
  - Unrelated
- Importance to CKD – drug-related kidney injury, restrictions in med use, limited treatment options

Concordant versus discordant comorbidities. Some conditions (e.g., diabetes and hypertension) are “concordant” because they represent parts of the same overall pathophysiologic risk profile and are more likely to be the focus of the same disease management plan. In contrast, unrelated or “discordant” conditions (e.g., diabetes and irritable bowel syndrome) are not directly related in either their pathogenesis or management and do not share an underlying predisposing factor (40). Because there is limited time to address all patient needs, diabetic patients may receive lower quality medical care for discordant conditions. For example, Redelmeier et al. (40) showed that women with diabetes were less likely than others to be prescribed hormone replace-

Piette and Kerr, Diab Care. 2006.
Step 1. Card sorting

- Concordant
- Hypertension
- Atrial Fibrillation
- Diabetes Mellitus
- Discordant
- Heart Failure
- Arthritis
- Unrelated
- Depression
- Dementia
- Parkinson’s Disease

Step 2. CKD clinical practice guidelines

KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease

VOLUME 3 | ISSUE 1 | JANUARY 2013
http://www.kidney-international.org
<table>
<thead>
<tr>
<th>CKD-Concordant</th>
<th>CKD-Discordant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>Arthritis</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>Cancer</td>
</tr>
<tr>
<td>Benign prostatic hypertrophy</td>
<td>COPD/Asthma</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>Dementia</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>Depression</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Epilepsy</td>
</tr>
<tr>
<td>Gout</td>
<td>GERD/Peptic ulcer disease</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>Heart failure</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Hypothyroid</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>Parkinson’s disease</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>Prostate cancer</td>
</tr>
</tbody>
</table>
Presence of 1+ CKD-discordant condition may account for an additional 336 hospitalizations and 570 ED visits per 1,000 person years

**CKD-Discordance is a major barrier to CKD self-management**

<table>
<thead>
<tr>
<th>CKD treatment advice</th>
<th>Comorbidity</th>
<th>Comorbidity treatment advice</th>
<th>Self-management situation</th>
<th>Examples of self-management conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid NSAIDs</td>
<td>Arthritis</td>
<td>Take NSAIDs</td>
<td>Discordant</td>
<td>“[L]ast week I had tremendous gout attack in my wrists, I mean it was swollen and I couldn’t, if I try to move my wrist that far, I was in excruciating pain, so I took some Aleve, which I’m not supposed to take, but it relieved the pain that I had, it was the only thing that I had that would relieve the pain”</td>
</tr>
<tr>
<td>Drink plenty of water</td>
<td>Heart failure</td>
<td>Avoid drinking water</td>
<td>Discordant</td>
<td>“One doctor says drink a lot of water. Another doctor says you’re drinking too much water. Well, what is it?”</td>
</tr>
<tr>
<td>Avoid protein</td>
<td>Gout</td>
<td>Avoid protein</td>
<td>Concordant</td>
<td>“I mostly just reduce the amount of meat. I have gout too like the gentleman number 5 here. Does anyone else have gout here? I just wondered how common it is with kidney problems. Anyhow, I just have to watch these kinds of foods with the gout too.”</td>
</tr>
</tbody>
</table>

HCSRN-OAIC Aging Initiative

• 1-year pilot to address multiple chronic conditions (MCC) in older adults with CKD
• Use prediction model approach to develop a CKD-Discordance Index
• Long-term goal: Integrate clinical data and present this to clinicians in an actionable format
Methods

• Retrospective cohort study
• Kaiser Permanente Southern California
• Adults aged ≥65 years with incident CKD (eGFR <45 ml/min/1.73 m²)
• Split-sample (development, validation, testing)
Step 1
• Developed a prediction model for 1-year risk of unplanned hospitalization
• Used prediction model to 1) guide inclusion of conditions in discordance index and 2) weight each discordant condition

Step 2
• Calculated CKD-Discordance Index that ranges from 0 to 1
• Tested associations of CKD-Discordance Index with hospitalizations, ED visits, and all-cause mortality
# Evidence of discordance in EMR

<table>
<thead>
<tr>
<th>Discordant conditions</th>
<th>Relevance</th>
<th>Data source/definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discordan conditions</td>
<td>HF, osteoarthritis, osteoporosis, hypothyroidism, epilepsy/seizure, Parkinson’s disease, dementia, gastroesophageal reflux disease (GERD)/peptic ulcer disease, depression, chronic obstructive pulmonary disease (COPD), and cancer</td>
<td>Inpatient and outpatient diagnoses codes (ICD9)</td>
</tr>
<tr>
<td>Medications</td>
<td>Contraindicated (metformin, glyburide, gemfibrozil, spironolactone, pentoxifylline) Dose reduction (ranitidine, atenolol, hydralazine, digoxin, rosuvastatin, and NSAIDS)</td>
<td>Pharmacy data, individual medications 1 year prior to and 30 days after the index date</td>
</tr>
<tr>
<td>Care continuity</td>
<td>Number of unique medication prescribers was used as a proxy for continuity of care</td>
<td>Pharmacy data, # prescribers between 1 year prior to and 30 days after the index date</td>
</tr>
</tbody>
</table>
Study design: Retrospective cohort study

Incident date:
Second eGFR < 45

Exposure: discordance

Primary outcome: Unplanned hospitalizations

1-year look back

Follow-up thru:
Primary outcome
Date of death
Initiation of RRT
Disenrollment
1-year

+ 30 days after incident CKD date
Results

Adult KPSC members having serum creatinine measured between 01/01/2008 and 6/30/2014
N=2,996,409

Adult CKD patients defined as at least two consecutive eGFR measures of <45 ml/min/1.73 m² separated by 90 days
N=53,680

Excluded:
1. Without at least one eGFR > 60 ml/min/1.73 m² prior to the first eGFR < 45 ml/min/1.73 m²
N=11,846
2. Had reported ESRD before: N=596

Incident CKD patients
N=41,239

Exclude those with missing BMI, SBP and DBP: N=603

Aged >=65 at CKD incident date (the second eGFR < 45 ml/min/1.73 m²)
N=30,932

Developing cohort
N=10,315

Validation cohort
N=10,304

Testing cohort
N=10,313
Results

- Mean (SD) age 77.9 (7.6)
- 55% female
- 59% white, 7% Asian, 12% Black and 20% Hispanic
- 9,869 (32%) had an unplanned hospitalized
<table>
<thead>
<tr>
<th></th>
<th>No Hospitalization (n=21,063)</th>
<th>Hospitalization (n=9,869)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>77.4 (7.5)</td>
<td>78.8 (7.7)</td>
</tr>
<tr>
<td>Female</td>
<td>56%</td>
<td>53%</td>
</tr>
<tr>
<td>White</td>
<td>59%</td>
<td>61%</td>
</tr>
<tr>
<td>African American</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>eGFR 30-45</td>
<td>91%</td>
<td>85%</td>
</tr>
<tr>
<td>eGFR 15-29</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Past hospitalization</td>
<td>26%</td>
<td>48%</td>
</tr>
<tr>
<td>Past ED use</td>
<td>24%</td>
<td>39%</td>
</tr>
<tr>
<td>≥ 4 prescribers</td>
<td>23%</td>
<td>39%</td>
</tr>
</tbody>
</table>
## Overall cohort by hospitalization

<table>
<thead>
<tr>
<th>Condition</th>
<th>No Hospitalization (n=21,063)</th>
<th>Hospitalization (n=9,869)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>91%</td>
<td>91%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>42%</td>
<td>45%</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>74%</td>
<td>74%</td>
</tr>
<tr>
<td>Heart failure (HF)</td>
<td>9%</td>
<td>22%</td>
</tr>
<tr>
<td>Osteoarthritis (OA)</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>COPD</td>
<td>7%</td>
<td>11%</td>
</tr>
<tr>
<td>Number discordant conditions, mean (SD)</td>
<td>0.9 (1.1)</td>
<td>1.3 (1.2)</td>
</tr>
<tr>
<td>2+ Contraindicated or dose adjusted meds</td>
<td>21%</td>
<td>23%</td>
</tr>
<tr>
<td>Variables</td>
<td>Full model</td>
<td>Simplified model</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>21</td>
</tr>
<tr>
<td><strong>Selected concordant, HR (95% CI)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.2 (1.1-1.3)</td>
<td>Diabetes</td>
</tr>
<tr>
<td>CAD</td>
<td>1.3 (1.2-1.4)</td>
<td>CAD</td>
</tr>
<tr>
<td>Stroke</td>
<td>1.3 (1.1-1.5)</td>
<td>Stroke</td>
</tr>
<tr>
<td><strong>Discordant, HR (95% CI)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF</td>
<td>1.3 (1.2-1.5)</td>
<td>HF</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>1.1 (1.0-1.2)</td>
<td>Osteoarthritis</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>1.0 (0.9-1.1)</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>Hypothyroid</td>
<td>1.0 (0.9-1.1)</td>
<td>Hypothyroid</td>
</tr>
<tr>
<td>Seizures</td>
<td>1.1 (0.7-1.4)</td>
<td>Seizures</td>
</tr>
<tr>
<td>Parkinson’s</td>
<td>1.0 (0.7-1.4)</td>
<td>Parkinson’s</td>
</tr>
<tr>
<td>Dementia</td>
<td>1.1 (0.9-1.2)</td>
<td>Dementia</td>
</tr>
<tr>
<td>GERD</td>
<td>1.2 (1.1-1.3)</td>
<td>GERD</td>
</tr>
<tr>
<td>Depression</td>
<td>1.1 (1.0-1.2)</td>
<td>Depression</td>
</tr>
<tr>
<td>COPD/Asthma</td>
<td>1.3 (1.2-1.4)</td>
<td>COPD/Asthma</td>
</tr>
<tr>
<td>Cancer</td>
<td>1.2 (1.1-1.4)</td>
<td>Cancer</td>
</tr>
<tr>
<td>&gt; 4 prescribers HR (95% CI)</td>
<td>1.2 (1.1-1.3)</td>
<td>1.2 (1.1-1.3)</td>
</tr>
<tr>
<td>C-statistic (95% CI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Validation</td>
<td>0.70 (0.69-0.71)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Validation</td>
</tr>
<tr>
<td>External Validation</td>
<td>0.69 (0.68-0.70)</td>
<td>0.69 (0.68-0.70)</td>
</tr>
</tbody>
</table>

Model calibration in the validation cohort
# CKD-Discordance Index

<table>
<thead>
<tr>
<th>Condition</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>29</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>7</td>
</tr>
<tr>
<td>Dementia</td>
<td>6</td>
</tr>
<tr>
<td>GERD/peptic ulcer disease</td>
<td>16</td>
</tr>
<tr>
<td>Depression</td>
<td>4</td>
</tr>
<tr>
<td>COPD/Asthma</td>
<td>23</td>
</tr>
<tr>
<td>Cancer</td>
<td>20</td>
</tr>
<tr>
<td>≥ 4 Prescribers</td>
<td>19</td>
</tr>
</tbody>
</table>

CKD-Discordance Index is calculated as an individual’s points divided by total possible points (total points = 124).

Example – Patient with HF and depression, **CKD-Discordance Index** = \(((29 + 4)/124)) = 0.27**
Association of CKD-Discordance Index with outcomes
Conclusions

• Inclusion of discordant conditions may be helpful for predicting unplanned hospitalizations

• Prediction model can be used to guide selection of conditions to be included a CKD-Discordance Index

• Higher CKD-Discordance associated with higher health care utilization and death
Possible next steps

• Validation in VA or other health system (multiple health systems in HCSRN)

• Further work to further refine discordance index – primary data collection with EHR data

• Intervention design
Thank you

Duke Pepper Center and KPSC Team

• Rasheeda Hall
• Hui Zhou
• Teresa Harrison
Why study CKD in older adults?

- High burden of CKD in older adults
- Prevalence increasing over time
- Aging population → more older CKD patients
- Older patients don’t have just CKD

Number of US adults ≥ 80 years old with reduced eGFR

- eGFR, ml/min/1.73m²
  - 45 – 59
  - < 45

<table>
<thead>
<tr>
<th>Calendar period</th>
<th>US Population ≥ 80 years old (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988 - 1994</td>
<td>1.6</td>
</tr>
<tr>
<td>1999 - 2004</td>
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<tr>
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<td>9.9</td>
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<tr>
<td>2050</td>
<td>15.8</td>
</tr>
</tbody>
</table>

Bowling et al. JAMA. 2013
Bowling et al. AJMS. 2014
CKD: a useful model for understanding vascular contributions to dementia

- What evidence links CKD, vascular disease, dementia?

- How do blood pressure interventions affect brain health in persons with CKD?
Prevalence of cognitive impairment in CKD

Kurella Tamura et al, AJKD 2008
Prevalence of cognitive impairment in CKD

Kurella Tamura et al, AJKD 2008
Kidney markers and risk for dementia

Risk for dementia in CHS with CKD (Cr > 1.5 mg/dL)

Risk for dementia in 3C study with albuminuria (ACR > 30 mg/g)

Seliger SL, et al., JASN 2004
Helmer et al. Neurology 2011
Subclinical brain lesions are increased in CKD

Lacunar infarcts

Cerebral microbleeds

White matter lesions

Bugnicourt et al., JASN 2013
Vascular lesions associated with white matter disease are analogous to vascular lesions in non-diabetic CKD.
Model for the pathophysiology of cognitive impairment.

Risk factors

Primary pathology

Vascular changes

End organ effects

Mediating factors

Behavioral outcome

Model for the pathophysiology of cognitive impairment.

- **Risk factors**
  - HTN, Diabetes, smoking, cholesterol, inflammatory

- **Primary pathology**
  - Atherosclerosis, arterial stiffness, endothelial dysfunction

- **Vascular changes**
  - Microvascular disease
  - Lg vessel stenosis
  - Cardiac failure

- **End organ effects**
  - Lacunar infarcts
  - strategic infarct
  - Chronic hypoperfusion
  - Loss of autoregulation
  - WML (brain)
  - Tubular atrophy (kidney)

- **Mediating factors**
  - Genetic

- **Behavioral outcome**
  - Other factors

**Cognitive and kidney function impairment**

How do blood pressure interventions affect brain health in CKD?
Model for the pathophysiology of cognitive impairment.

HTN, Diabetes, smoking, cholesterol, inflammatory

Atherosclerosis, arterial stiffness, endothelial dysfunction

Microvascular disease  Lg vessel stenosis  Cardiac failure

Lacunar infarcts  strategic infarct  Chronic hypoperfusion

Loss of autoregulation  WML (brain)  Tubular atrophy (kidney)

Genetic  Other factors

Cognitive and kidney function impairment
Model for the pathophysiology of cognitive impairment.

HTN, Diabetes, smoking, cholesterol, inflammatory

Atherosclerosis, arterial stiffness, endothelial dysfunction

Microvascular disease  Lg vessel stenosis  Cardiac failure

Lacunar infarcts  strategic infarct  Chronic hypoperfusion

Loss of autoregulation

WML (brain) Tubular atrophy (kidney)

Genetic  Other factors

Cognitive and kidney function impairment
Blood pressure and cognitive function in CKD

- Stage 1: Kidney damage, normal function
  - HTN Rx

- Stage 2: Kidney damage, mild loss of function
  - Dialysis Rx

- Stage 3: Moderate to severe loss of function

- Stage 4: Severe loss of function

- Stage 5: Kidney failure, need treatment to live
## Relationship between hypotension and cerebral ischemia during hemodialysis

<table>
<thead>
<tr>
<th>MAP threshold (mm Hg)</th>
<th>HD sessions with one or more hypotension episodes</th>
<th>Incidence of cerebral ischemia (% of episodes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>57%</td>
<td>6.8%</td>
</tr>
<tr>
<td>70</td>
<td>40%</td>
<td>7.8%</td>
</tr>
<tr>
<td>60</td>
<td>24%</td>
<td>10.8%</td>
</tr>
<tr>
<td>50</td>
<td>11.1%</td>
<td>29.8%</td>
</tr>
</tbody>
</table>

Macewen et al JASN 2017
HD initiation is associated with stroke and cognitive decline

Kurella Tamura et al., KI 2017

Murray et al JASN 2013
Cerebral blood flow and cognitive function in hemodialysis patients

**METHODS**

97 Hemodialysis patients

Prospective cohort study with 12 month follow-up

Correlating transcranial Doppler mean flow velocity (MFV), cognitive function during & out-with hemodialysis (HD) and cerebral MRI in 40 participants.

**RESULTS**

HD induces a transient decline in cerebral blood flow, correlating with intradialytic & longer-term cognitive dysfunction & associates with progressive cerebral white matter hyper-intensities.

**CONCLUSION**

Hemodialysis is capable of inducing transient cerebral stunning, offering one mechanism of cerebral injury in ESRD.
Cooled dialysate and effects on brain white matter

- RCT of 73 HD patients
- Randomized to cooled dialysate vs. standard tx
- Intervention improved hemodynamic stability during HD and reduced progression of WM disease
Albuminuria and decline in cognitive function: ONTARGET/TRANSCEND

- Secondary analysis of 2 RCTs
  - ONTARGET: 25,620 participants with vascular disease or DM, randomized to telmisartan, ramipril, or combination
  - TRANSCEND: 5926 participants randomized to telmisartan vs. placebo
- Cognitive function, assessed by MMSE, a secondary outcome
- Median follow up 56 months
- ~ 25% of participants had eGFR <60
Albuminuria and decline in cognitive function: ONTARGET/TRANSCEND
Albuminuria and decline in cognitive function: ONTARGET/TRANSCEND

- Treatment lowered SBP by 1-2.5 mm Hg in ONTARGET, and by 4 mm Hg in TRANSCEND, but no effect on cognition in either study.

- Treatment effect modified by albuminuria: among those with albuminuria >300 mg/g, treatment with ARB and/or ACEI reduced the odds of cognitive decline by >50%.
RCT of 9361 non-diabetic adults at high CV risk

Randomized to SBP target <120 mm Hg vs. <140 mm Hg

Kidney function and dementia were secondary outcomes

Median follow-up 3.3 years

SBP difference ~ 13 mm Hg
• ↑ incident CKD (HR 3.5)
• ↑ AKI (HR 1.7)

• ↓ MCI (HR 0.81)
• No significant effect on dementia
• ↑ incident CKD (HR 3.5)
• ↑ AKI (HR 1.7)

• ↓ MCI (HR 0.81)
• No significant effect on dementia
Effect of CKD on MCI outcome in SPRINT

<table>
<thead>
<tr>
<th></th>
<th>Intensive Treatment</th>
<th>Standard Treatment</th>
<th>Interaction</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No./Cases per 1000</td>
<td>Person-Years</td>
<td>No./Cases per 1000 Person-Years</td>
<td>Hazard Ratio (95% CI)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;75 years</td>
<td>125 / 8.4</td>
<td>172 / 11.8</td>
<td>0.74 (0.58 - 0.93)</td>
<td>0.22</td>
</tr>
<tr>
<td>75 years or older</td>
<td>182 / 33.5</td>
<td>181 / 38.8</td>
<td>0.89 (0.72 - 1.11)</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>185 / 14.6</td>
<td>235 / 18.7</td>
<td>0.79 (0.66 - 0.96)</td>
<td>0.78</td>
</tr>
<tr>
<td>Female</td>
<td>102 / 14.6</td>
<td>118 / 17.5</td>
<td>0.83 (0.64 - 1.08)</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>111 / 19.1</td>
<td>130 / 22.1</td>
<td>0.90 (0.69 - 1.16)</td>
<td>0.47</td>
</tr>
<tr>
<td>Non-Black</td>
<td>176 / 12.7</td>
<td>223 / 16.6</td>
<td>0.78 (0.64 - 0.95)</td>
<td></td>
</tr>
<tr>
<td><strong>History of CVD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>217 / 13.6</td>
<td>286 / 18.4</td>
<td>0.75 (0.63 - 0.90)</td>
<td>0.12</td>
</tr>
<tr>
<td>Yes</td>
<td>70 / 18.7</td>
<td>67 / 18.1</td>
<td>1.03 (0.73 - 1.46)</td>
<td></td>
</tr>
<tr>
<td><strong>Chronic Kidney Disease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>170 / 11.8</td>
<td>244 / 17.1</td>
<td>0.71 (0.58 - 0.86)</td>
<td>0.04</td>
</tr>
<tr>
<td>Yes</td>
<td>117 / 22.1</td>
<td>109 / 21.7</td>
<td>1.00 (0.77 - 1.31)</td>
<td></td>
</tr>
<tr>
<td><strong>Systolic BP tertiles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>132 mm Hg or less</td>
<td>94 / 13.8</td>
<td>106 / 16.4</td>
<td>0.83 (0.63 - 1.10)</td>
<td>0.72</td>
</tr>
<tr>
<td>&gt;132 and &lt;145 mm Hg</td>
<td>94 / 14.7</td>
<td>112 / 17.2</td>
<td>0.82 (0.62 - 1.09)</td>
<td></td>
</tr>
<tr>
<td>145 mm Hg or more</td>
<td>99 / 15.3</td>
<td>135 / 21.5</td>
<td>0.71 (0.55 - 0.93)</td>
<td></td>
</tr>
<tr>
<td><strong>Orthostatic hypotension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>259 / 14.2</td>
<td>327 / 18.2</td>
<td>0.79 (0.67 - 0.93)</td>
<td>0.30</td>
</tr>
<tr>
<td>Yes</td>
<td>26 / 19.5</td>
<td>26 / 19.4</td>
<td>1.41 (0.76 - 2.56)</td>
<td></td>
</tr>
</tbody>
</table>
To submit questions to today’s speakers:

- **Click the speech bubble icon** so that it is highlighted blue
- Then type your questions in the Q&A box:
For a recording of today’s webinar or to learn more about the AGING Initiative, go to:

https://theaginginitiative.wordpress.com

For questions about the AGING Initiative or today’s webinar, please contact:

Christopher.Delude@meyersprimary.org

As you leave, please fill out the brief survey with your thoughts and opinions on today’s webinar!