Chronic Kidney Disease
A Team-Based Quality Improvement Project
Implementing The EMR
Participants

- Attending Physician: John Malaty, MD
- Resident Physician Investigators:
  - John George, MD
  - David Kramer, DO
  - Dale Taylor, MD
- Study Coordinators:
  - Paulette Blanc, MPH
  - Alyson Listhaus, MPH
Other Participants

– Sapna Amin, MD
– Loumarie Colon, MD
– Jeffrey Costain, MD
– Anjalee Dave, MD
– George Eldayrie, MD
– Sally Hinman, MD
– Kim Lynch, MSHI
– Jessica Prince, MD
– Keiran Shute, MD
– Jacob Szereszewski, MD

Team Delta Force

Quality Initiative Project

UF CHFM on Main Street

And of course all of our wonderful nursing and front office staff!
Disclosures

• None
After attending this session, you will be able to:

• Perform a practical, team-based QI project in your own residency program or practice
• More effectively utilize technology to automate processes to efficiently manage chronic diseases by improving adherence to guidelines
• Discuss the national guidelines for chronic kidney disease (CKD) management
Why QI? Why EMR? Why Team-Based?

• It is important to:
  – use quality markers and national guidelines to improve patient care
  – integrate technology into practice and utilize your EMR to improve patient care
  – work as a team to evaluate and manage patients
  – manage an efficient and effective healthcare team
Why CKD?

• Stage 3 or 4 CKD affects 8.05% of the US population, as measured from 1999-2004
• Patients with CKD have increased morbidity and a two-fold risk of all-cause mortality
• Patients with CKD have decreased quality of life and increased cost of care
• Patients don’t complain of CKD during visits
Roles of the Healthcare Team

- Researched national guidelines and recommendations
  - Kidney Disease Outcomes Quality Initiative (KDOQI), Joint National Committee
  - American College of Physicians (ACP)
- Created an EMR template addressing pertinent aspects of care with the ability to reproduce data from smartlists
- Generated daily reports of clinic patients to identify those with depressed eGFRs
- Flagged encounter forms of those with depressed eGFRs
- Used the template and collected data

Improved Patient Care!
QI Aims

• Primary Aim:
  – Achieve BP < 140/90 in Stage III-IV CKD patients

• Secondary Aims:
  – Identify and stage patients with CKD
  – Optimize DM management
  – Reduce ASCVD risk with statin therapy
  – Improve renal protection with ACE-I/ARB therapy
  – Vaccinate against influenza
CKD definition: abnormalities of kidney structure or function present for >3 months with health implications or eGFR < 60 mL/min/1.73m² for >3 months.
1) eGFR
   a. Is calculated GFR < 60 for greater than 3 months? Yes -
   b. Stage of CKD: [Stage:32788]
   c. Is CKD on the problem list? [Yes/No:20691]

2) Blood Pressure
   @LASTBP(1)@
   a. Is most recent BP < 140/90? [{BP:32789}]

3) Hemoglobin A1C
   @BRIEFLAB(HGBA1C)@
   a. Was HbA1c evaluated in past 12 months? [{A1c:210032790}]

4) Statin
   @BRIEFLAB(CHOL,HDL,LDL,LDLCALC,TRIG,CHOLHDL)@
   @CKDSTATINMEDS@
   Is patient on a Statin?
   {Statin Started:20692}

5) ACE/ARB
   @CKDACEARBMEDS@
   @BRIEFLAB(malbcreatrat)@
   a. Has urine microalbumin:creatinine ratio been checked in past 12 months? [{Micro/Cr Ratio:210032792}]

6) Influenza Vaccination
   @IMM@
   There is no immunization history on file for this patient.
   a. Did the patient receive the influenza vaccine? [{UFP AMB CHFM FLU VACCINE RECOMMENDED:210032793}]
Our EPIC Template

1) eGFR
   a. Is calculated GFR <60 for greater than 3 months? Yes -
   b. Stage of CKD: CKD Stage III
   c. Is CKD on the problem list? [Yes/No:20691]

2) Blood Pressure
   @LASTBP(1)@
   a. Is most recent BP <140/90? :{BP:32789}

<table>
<thead>
<tr>
<th>GFR Category / Stage of CKD</th>
<th>eGFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>≥ 90</td>
</tr>
<tr>
<td>Stage II</td>
<td>≥ 60</td>
</tr>
<tr>
<td>Stage III</td>
<td>≥ 30</td>
</tr>
<tr>
<td>Stage IV</td>
<td>≥ 15</td>
</tr>
<tr>
<td>Stage V</td>
<td>&lt; 15</td>
</tr>
</tbody>
</table>
Our EPIC Template

2) Blood Pressure
@LASTBP(1)@
   a. Is most recent BP <140/90? : BP >=140/90 today - UFP AMB CHFM BP
      >=140:210032789

3) Hemoglobin A1C
@BRIEFLAB(HGBA1C)@
   a. Was Hba1c evaluated in past 12 months? {A1c:210032790}

JNC8 Recommendation: target blood pressure for patients with CKD is < 140/90 mmHg for all ages

KDOQI Recommendation: target blood pressure for patients with CKD without albuminuria is ≤ 140/90 mmHg and for patients with CKD and albumin excretion ≥ 30mg/24hr is ≤ 130/80 mmHg
KDOQI Recommendation: target HbA1c for patients with CKD is ~7% to prevent or delay microvascular complications of diabetes mellitus (higher target acceptable for those with limited life expectancy, comorbid conditions, or risk of hypoglycemia)
KDOQI Recommendation: statin therapy is recommended for patients with CKD who are not treated with dialysis in the setting of DM, CAD, TIA/CVA, ASCVD 10-year risk >7.5%, or age ≥ 50
KDOQI Recommendation: ACE-I/ARB therapy is recommended for patients with CKD who have urine albumin excretion > 300mg/24 hrs or have diabetes mellitus

ACP Recommendation: screening for proteinurinua should not be performed in those already on ACE-I/ARB therapy
KDOQI Recommendation: influenza vaccination is recommended for all patients with CKD unless otherwise contraindicated.
QI Review

• Primary Aim was met:
  – Improvement of BP in CKD patients was noted

• Secondary Aims:
  – More patients with CKD have been identified
  – More patients on statin therapy to reduce ASCVD risk
  – More patients needing ACE-I/ARB therapy identified
  – DM control has not improved but those needing HbA1c measurement are better identified
  – Flu vaccine rates have not improved but those needing vaccination are better identified
Primary Aim: BP < 140/90

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Goal (BP &lt; 140/90)</td>
<td>12, 52%</td>
<td>62, 79%</td>
</tr>
<tr>
<td>Not at Goal (BP ≥ 140/90)</td>
<td>11, 48%</td>
<td>16, 21%</td>
</tr>
</tbody>
</table>

P-value = 0.001
Identification of CKD

2015

- CKD on Problem List: 58, 74%
- CKD NOT on Problem List: 20, 26%

Stage of CKD

<table>
<thead>
<tr>
<th>Year</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td></td>
<td>10</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>10</td>
<td></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
Statin Therapy

KDOQI guidelines for statin therapy changed and simplified after 2013-2014 data collection.

<table>
<thead>
<tr>
<th>2014 Evaluated Lipids?</th>
<th>2015 Statin Therapy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Already On Statin</td>
<td>Yes, On Statin</td>
</tr>
<tr>
<td>LDL &lt;100, TG &lt;150</td>
<td>No, Added Statin</td>
</tr>
<tr>
<td>LDL &gt;100, Add Statin</td>
<td>No, Statin Refused</td>
</tr>
<tr>
<td>Statin LDL &gt;100, TG &gt;150</td>
<td>No, Contraindication</td>
</tr>
<tr>
<td>No Lipid Panel</td>
<td>No, Address Statin Later</td>
</tr>
</tbody>
</table>

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ACE-I/ARB Therapy

![Pie charts showing percentage of patients on ACE-I/ARB therapy in 2014 and 2015.]

2014
- On ACE-I/ARB: 18, 78%
- On ACE-I/ARB Added: 4, 18%
- Contraindicated: 1, 4%

2015
- On ACE-I/ARB: 40, 51%
- Alb:Cr < 30, Did not check: 14, 18%
- Alb:Cr > 30, Not on therapy: 14, 18%
- Alb:Cr to be ordered in future, Not on therapy: 11, 14%
- Alb:Cr ordered, Not on therapy: 10, 13%

<table>
<thead>
<tr>
<th>2014 On ACE/ARB?</th>
<th>2015 Microalbuminuria?</th>
</tr>
</thead>
<tbody>
<tr>
<td>On ACE-I/ARB</td>
<td>On ACE-I/ARB</td>
</tr>
<tr>
<td>ACE-I/ARB Added</td>
<td>Alb:Cr &lt; 30, Did not check</td>
</tr>
<tr>
<td>Contraindicated</td>
<td>Alb:Cr &gt; 30, Not on therapy</td>
</tr>
<tr>
<td></td>
<td>Alb:Cr to be ordered in future, Not on therapy</td>
</tr>
<tr>
<td></td>
<td>Alb:Cr ordered, Not on therapy</td>
</tr>
</tbody>
</table>
ACE-I/ARB Therapy

2015

- On ACE-I/ARB: 15, 94%
- Not on therapy: 1, 6%

UF Health
University of Florida Health
Diabetes Control

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c &lt; 7</td>
<td>22, 96%</td>
<td>59, 76%</td>
</tr>
<tr>
<td>HbA1C ≥ 7 - Addressed</td>
<td>1, 4%</td>
<td>19, 24%</td>
</tr>
<tr>
<td>HbA1C ≥ 7 - Higher Goal</td>
<td>- Addressed</td>
<td>- Higher Goal</td>
</tr>
<tr>
<td>HbA1c not checked</td>
<td>- Addressed</td>
<td>- not checked</td>
</tr>
</tbody>
</table>

P-value = 1.996113
Influenza Vaccination

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu Vaccine Received</td>
<td>1,4%</td>
<td>21,27%</td>
</tr>
<tr>
<td>Flu Vaccine Refused</td>
<td>22,96%</td>
<td>57,73%</td>
</tr>
<tr>
<td>Flu Vaccine Contraindicated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address Flu Vaccine Later</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P-value = 1.997585
References

  – Including all Updates and Commentaries published by The National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF KDOQI) which can be found at:
  – https://www.kidney.org/professionals/guidelines/guidelines_commentaries


