Shall We Dialyze Grandma?
The Technological Imperative vs. the Moral Imperative

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DISCLOSURES
Nothing to Disclose
“The boomers are coming”

William Frey, Brookings Institution
New York Times 12/02/11

CKD is Common in the U.S.

Figure legend: Percent with CKD among adult U.S. population by age, sex, and race/ethnicity.

www.cdc.gov
An Older Woman with CKD

- 84 year old Caucasian female with hypertension, Type 2 diabetes, atrial fib
- Meds: Lisinopril; metoprolol; glipizide; warfarin
- BP = 146/62 mmHg
- Cr = 1.2 mg/dl; eGFR = 45 ml/min/1.73m², stable x 4 years; nonproteinuric

Decline in GFR and ERPF with Aging
Davies DF, Shock NW. JCI 29:496, 1950

Inulin Clearance cc/ml/1.73m²

Diodrast Clearance cc/ml/1.73m²
Decline in GFR and ERPF with Aging
Davies DF, Shock NW. JCI 29:496, 1950

“Although a number of alternative hypotheses may be advanced . . . we do not yet have the crucial data to decide what mechanisms are involved in the process.”

“A man is as old as his arteries.”

– Thomas Sydenham, MD (1624-1689)
Risk Factors for Elevated SCr in Aging
Fox CS, et al. JAMA 291:2819, 2004

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>2.36</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2.6</td>
</tr>
<tr>
<td>HTN</td>
<td>1.57</td>
</tr>
<tr>
<td>Smoking</td>
<td>1.42</td>
</tr>
<tr>
<td>HDL</td>
<td>0.8</td>
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</table>

Stage 3 CKD in the Era of Precision Medicine

- 84-year old Caucasian female
- 35-year old African-American male

<table>
<thead>
<tr>
<th>Age</th>
<th>eGFR 45 ml/min/1.73m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>84-year old Caucasian female</td>
<td></td>
</tr>
<tr>
<td>35-year old African-American male</td>
<td></td>
</tr>
</tbody>
</table>
Progression Risk Calculator

- 84 year old female with eGFR 45, nonproteinuric
- Risk of progression to ESRD:
  - Over 2 years: 0.4%
  - Over 5 years: 1.4%

**IF NOTHING ELSE HAPPENS**

www.qxmd.com
Questions

- Will diagnosis and treatment of early CKD in older persons confer benefit (survival, CVD, CKD)?
- Do the benefits > the harms of diagnosis and treatment?

- Over-diagnosis and related overtreatment are major problems
- “Positive” average results from treatment trials can mask situations where patients at low risk may receive no benefit

Most older patients with CKD do NOT need ACEI/ARBs

PLOS Medicine 11(7):e1001655, 2014
Over-diagnosis and related overtreatment are major problems

“Positive” average results from treatment trials can mask situations where patients at low risk may receive no benefit

Evaluation of diagnostic tests usually looks at how well they detect presence or absence of disease, but not how well they detect clinically meaningful stages of disease

Changes to disease definitions often do not involve evaluation of potential harms of over-diagnosis – and are often conducted by heavily conflicted panels

What About Number Needed to Harm?

A possible solution is to separate adverse effects into several grades:
– Number needed to kill
– Number needed to disable
– Number needed to make you ill
– Number needed to annoy

The concept of attaching a price list to the therapeutic agent should not stop at the cost of the pills
Concerns re CKD G3A

• Why is eGFR < 60 considered abnormal at all ages?
  – This may be 50% of “normal” GFR for young adults, but not older adults
• ¾ of CKD3A patients have no albuminuria
• In older patients, is this really a disease, or medicalization of the normal aging process?
An Older Woman with CKD

- 84 year old Caucasian female with hypertension, Type 2 diabetes, atrial fib
- Meds: Lisinopril; metoprolol; glipizide; warfarin
- BP = 146/62 mmHg
- Cr = 1.2 mg/dl; eGFR = 45 ml/min/1.73m², stable x 4 years; nonproteinuric
- She develops hip pain, for which she takes naproxen. When seen by her PCP, Cr = 2.2 mg/dl

Normotensive Ischemic AKI
Abuelo JG. NEJM 357:797-805, 2007
Normal Perfusion Pressure

Decreased Perfusion Pressure

Increased vasodilatory prostaglandins

Increased Ang II

Decreased vasodilatory prostaglandins

Decreased Ang II

Normal GFR

Normal GFR Maintained

Decreased perfusion pressure in presence of NSAIDs

Decreased perfusion pressure in presence of ACEI

Low GFR

Low GFR

What is her prognosis?

An Older Woman with CKD

- 84 year old Caucasian female with hypertension, Type 2 diabetes, atrial fib
- Cr = 1.2 mg/dl; eGFR = 45 ml/min/1.73m², stable x 4 years; nonproteinuric
- She develops hip pain, for which she takes naproxen. When seen by her PCP, Cr = 2.2 mg/dl
- ACEI and NSAIDs are stopped. Her serum Cr settles at 1.8 mg/dl [eGFR 22 ml/min/1.73m²]
An Older Woman with CKD

• She is referred to a nephrologist
• A brief discussion introduces the topic of dialysis, with plan to further explore goals of care in subsequent visits
Talking about Dialysis is like Talking about Cancer

- Patients and families would prefer not to think about it and wish it would go away
- Providers would prefer not to talk about it
- Discussions are difficult
- But – patients want the information; they expect their physicians to initiate the conversation; and they want to know all their options

* Provider Perspectives on Advance Care Planning for Patients with Kidney Disease: Whose Job Is It Anyway?*  
* Ann M. O’Hare,† Jackie Szarka,‡ Lynne V. McFarland,§ Janelle S. Taylor,∥ Rebecca L. Sudore,¶ Ranak Trivedi,** Lynn F. Reinkes,† and Elizabeth K. Vigg

CJASN 11:855, 2016
An Older Woman with CKD

- She is referred to a nephrologist
- A brief discussion introduces the topic of dialysis, with plan to further explore goals of care in subsequent visits
- Subsequent discussions are inconclusive
- Over the next year, her renal function declines to Stage 5; it’s time to make a decision
Should we dialyze grandma?

**Ethics of Chronic HD in the Elderly**

- Overall benefit is modest at best for frail elderly patients with multimorbidity

**Table 1. Six commonly articulated goals of care**

1. Be cured
2. Live longer
3. Improve or maintain function/quality of life/independence
4. Be comfortable
5. Achieve life goals
6. Provide support for family/caregiver

Adapted from reference 8, with permission.*

Retrospective analysis of 28,568 veterans with eGFR < 15 ml/min/1.73m²

Table 3. Characteristics associated with each treatment group for advanced kidney disease (n=28,368)

<table>
<thead>
<tr>
<th>Characteristics at Cohort Entry</th>
<th>Received Dialysis by Chart Review</th>
<th>Discussing or Preparing for Dialysis</th>
<th>Decision against Dialysis</th>
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</thead>
<tbody>
<tr>
<td>Age, yr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;65</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>65-74</td>
<td>1.65 (1.29 to 2.11)</td>
<td>1.32 (1.07 to 1.63)</td>
<td>2.08 (1.65 to 2.63)</td>
</tr>
<tr>
<td>≥75</td>
<td>1.44 (1.11 to 1.86)</td>
<td>1.46 (1.19 to 1.80)</td>
<td>5.83 (4.74 to 7.17)</td>
</tr>
</tbody>
</table>

Age differences in treatment decisions and practices for advanced kidney disease

Proportion of patients

- Decision against dialysis*
- Discussing and/or preparing for dialysis*
- Received dialysis*
- Enrolment in USRDS or had a dialysis procedure code in Medicare of VA files

Susan P.Y. Wong et al. CJASN 2016;11:1825-1833

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International Differences in Use of RRT in Advanced CKD

Prognosis: Elderly Patients on Hemodialysis

- Used registry to examine all 3702 U.S. nursing home residents starting HD 1998-2000
Dementia, Alzheimer’s Disease, and Mortality after Hemodialysis Initiation

Mara A. McAdams-DeMarco,1,2 Matthew Daubresse,3 Sunjoe Bae,1 Alden L. Gross,2,3 Michelle C. Carbon,3,4 and Dorry L. Segal5,2

Abstract
Background and objectives Older patients with ESKD experience rapid declines in executive function after initiating hemodialysis; these impairments might lead to high rates of dementia and Alzheimer’s disease in this population. We estimated incidence, risk factors, and sequelae of diagnosis with dementia and Alzheimer’s disease among older patients with ESKD initiating hemodialysis.

CJASN 13:1339, 2018

Who is at risk for dementia and Alzheimer’s disease among older ESKD patients initiating hemodialysis?

Methods and Cohort
- No. 356,668 Incident HD patients
- Age 50+ years
- USRDS linked to Medicare data
- Estimate risk of diagnosis of dementia and Alzheimer’s disease
- Estimate risk of subsequent mortality

Results
- Age 50+ years
- Black race
- Female sex
- Institutions

Risk Factors
- Dementia
  - HR (95% CI): 2.11 (1.84-2.41)
- Alzheimer’s Disease
  - HR (95% CI): 2.11 (1.84-2.41)

Subsequent mortality
- HR (95% CI): 2.14 (2.07-2.22)

Conclusions
Older hemodialysis patients are at substantial risk of being diagnosed with dementia and Alzheimer’s disease, and carrying these diagnoses is associated with a 2.14-fold higher mortality.

Mara A. McAdams-DeMarco, Matthew Daubresse, Sunjoe Bae, Alden Gross, Michelle Carbon, and Dorry Segal. Dementia, Alzheimer’s Disease, and Mortality after Hemodialysis Initiation. CJASN 2018;13:1339-1347

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Intensity of Care During the Final Month of Life

Table. Intensity of Care During the Final Month of Life

<table>
<thead>
<tr>
<th>Intensity of Care</th>
<th>Dialysis (Present Study)</th>
<th>Cancer 7</th>
<th>Heart Failure 8,9</th>
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<tbody>
<tr>
<td>Hospitalization, %</td>
<td>76.0</td>
<td>61.3</td>
<td>64.2</td>
</tr>
<tr>
<td>Days hospitalized, mean</td>
<td>9.8</td>
<td>5.1</td>
<td>NA</td>
</tr>
<tr>
<td>Intensive care unit admission, %</td>
<td>48.9</td>
<td>24.0</td>
<td>19.0</td>
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<tr>
<td>Days in an intensive care unit, mean</td>
<td>3.5</td>
<td>1.3</td>
<td>NA</td>
</tr>
<tr>
<td>Any intensive procedure, %</td>
<td>29.0</td>
<td>9.0</td>
<td>NA</td>
</tr>
<tr>
<td>Hospice use, %</td>
<td>20.0</td>
<td>55.0</td>
<td>39.1</td>
</tr>
<tr>
<td>Death in a hospital, %</td>
<td>44.8</td>
<td>29.0</td>
<td>35.2</td>
</tr>
</tbody>
</table>

Data Source: Special Analyses, USRDS ESRD Database. Denominator is all decedents with Medicare Parts A and B throughout the last 90 days of life. ICU admission was identified using ICU revenue center codes in Medicare Institutional claims. Abbreviations: ESRD, end-stage renal disease; ICU, intensive care unit. www.usrsds.org
Important Caveats:
- Functional status often declines after starting dialysis
- Up to 75% of any time gained is likely to be "medical contact time" (time in dialysis, in hospital, or appts addressing care related to dialysis)
More Challenges
Zijin C, Hsu C. JAMA IM 178:664, 2018

• While a deliberate process of shared decision-making is the goal, more than half of incident ESRD patients start dialysis during a hospitalization
• Patients may be acutely ill, vulnerable, and cognitively impaired
• Momentum and pressure build from various sources, including other specialties, to “do something”
• So shared decision-making is hard to achieve
An Older Woman with CKD

• She is then admitted to the MICU with pneumonia, sepsis, and oligo-anuric AKI
• The MICU team tells the patient and family that “she needs dialysis; we’ll call nephrology”
• What will be the outcome if we dialyze her?

Original Investigation

Functional Trajectories Among Older Persons Before and After Critical Illness

Lauren E. Ferrante, MD; Margaret A. Pisani, MD, MPH; Terrence E. Murphy, PhD; Evelyne A. Gahbauer, MD, MPH; Linda S. Leo-Summers, MPH; Thomas M. Gill, MD

CONCLUSIONS AND RELEVANCE  Among older persons with critical illness, more than half died within 1 month or experienced significant functional decline over the following year, with particularly poor outcomes in those who had high levels of premorbid disability. These results may help to inform discussions about prognosis and goals of care before and during critical illness.

JAMA Intern Med. 2015;175(4):523-529
Published online February 9, 2015.
The Ethics of Offering Dialysis for AKI to the Older Patient: Time to Re-Evaluate?

Sana Akbar and Alvin H. Moses

- A major consequence of the biomedicalization of aging is . . . the relatively unquestioned provision of dialysis for AKI to older patients
- Nephrologists should not automatically recommend dialysis for older patients
- In those who can be predicted to do poorly, recommending against dialysis upholds the Hippocratic maxim to be of benefit and do no harm
- [We] challenge the automatic transformation of the technological imperative into the moral imperative for such patients

CJASN 9:1652, 2014

An Older Woman with CKD

- She is then admitted to the MICU with pneumonia, sepsis, and oligo-anuric AKI
- The MICU team tells the patient and family that “she needs dialysis; we’ll call nephrology”
- What will be the outcome if we dialyze her?
- After discussions among the patient, her family, the treatment teams, and the palliative care service, she was transitioned to comfort care, and passed away peacefully
A technopoly is founded on the belief that technique is superior to lax, ambiguous and complex human thinking and judgment.
Predicted probability of antihypertensive intensification by inpatient and outpatient blood pressure (BP).
CONCLUSIONS
One in seven older adults admitted to hospital for common non-cardiac conditions were discharged with intensified antihypertensive treatment. More than half of intensifications occurred in patients with previously well controlled outpatient blood pressure. More attention is needed to reduce potentially harmful overtreatment of blood pressure as older adults transition from hospital to home.

Primary Care Providers – First Line of Defense against CKD

- PCPs: significant role in early diagnosis, treatment, and patient education
- Therapeutic interventions for CKD are similar to those required for optimal cardiac care
  - Control of glucose, blood pressure, and lipids; smoking cessation, avoidance of nephrotoxins
- In goals of care discussions with older patients with advanced CKD – please talk about dialysis!

CKD is Part of Primary Care
Thank you!

A Day in the Hospital
Jose S. Perez