Acute Kidney Injury
The Nephrologist’s Responsibility in Ordering Dialysis Treatments

Benjamin Freda, DO
Assistant Professor of Medicine
Tufts University School of Medicine
Baystate Medical Center, Renal Division
Western New England Renal and Transplant Associates Springfield, MA
Disclosure

• I have no financial disclosures to report that may be relevant to this presentation.
Case
Anuric AKI after Cardiac Arrest

67 year old Male Admitted from home with 3-4 weeks of general decline, cough, weakness, B/L LE edema, loose BM…..bedbound last 2 weeks

PMHx: COPD, ETOH Abuse (1-2 pints/d for years), “Non-compliance with PCP visits”. No Meds

LAB: WBC 9.3, Plat 60, Scr 2.2 (no baseline), ALT 300, Bili 3.0, Albumin 2.8, INR 2.3, Lytes fine, TnT 0.04, NT-proBNP 31,000, ABG 7.31/44/80/21

Course: Hypothermic, Alert/Oriented, cool extremities, Afib HR 156, BP 110/58, 2+ B/L LE edema, CXR B/L Pleural effusions. Given Cardizem and isotonic saline in ER. HR to 100. Transferred to Medical Floor. BP 120/70. Extremities cyanotic. Given more fluid bolus and cardizem. HR 100. Renal US no hydronephrosis

5 hours later developed PEA. Received Epi, CPR 5 minutes. Then Vfib, shock x 1 → NSR and hypotensive. Intubated, started on levophed. In ICU, UOP 0-5 cc/hr over next 10 hours, Levo and dobutamine continued, K+ 6, ScvO2 35, Lactate 3.6, Echo with EF 10% and severe dilated Biventricular failure

Medical Resident consults Renal to start CRRT
What To DO?

• Should CRRT Be initiated?
• What factors are important to make this decision?
• Who should be involved in this decision?
• Who should be communicating with the decision makers?
• What if there is disagreement among those involved in the decision?
• Is there any EBM/Literature/Guidelines that might help?
Option #1

“Just Do it”

• The ICU medical resident explains to the patient’s daughter that the patient has a high potassium and no urine output and will die without CRRT

• The daughter does not want him to die and tells the resident to do whatever is needed to make his kidneys better so he does not die

• The cardiology fellow tells the resident “dialysis is futile for this guy” and recommends continued ionotropic support and placement of a swan ganz catheter

• What happened here?
Option #2

"Look Before you Leap"

- Dialogue is opened up among nephrology consult team and daughter, generating many questions on both ends:
  
  Will he need dialysis for the rest of his life?
  How long will it take for the dialysis to help his kidneys?
  Will the dialysis hurt him?
  Would he have wanted short or long-term dialysis?
  What are his chances of surviving with and without dialysis?
  If he has to stay on dialysis, how will that affect his life?
  
- The ICU fellow pages the nephrology fellow and asks when will CRRT start. The patient may be transferred to the CICU.
  
- The nephrology fellow asks the attending how to be sure we are addressing the issues and making the right decision.
• Evidence-based
• Externally Reviewed
• 10 adult recommendations
• Rationales and strategies for implementation for each
• Tool kit of validated instruments

Available from RPA online store
www.renalmd.org
10 GUIDELINE STATEMENTS

#1 • Establishing a shared decision-making relationship

#2,#3 • Informing patients

#4 • Facilitating advance care planning

#5,#6 • Making decisions about initiating and discontinuing dialysis

#7,#8 • Resolving conflicts about which dialysis decisions to make

#9,#10 • Providing effective palliative care
Shared Decision Making
Establish The Decision Makers/Discussants

- Where are we in our current case?

- Goal of SDM is to address ethical principles of respect for patient autonomy, beneficence, and nonmaleficence:
  1) fully inform patients about the risks and benefits of treatments
  2) ensure that patients’ values and preferences play a prominent role

- At a Minimum, SDM should include the Patient and the Physician, but can include other family members and friends with patients consent
Shared Decision Making
Challenge in ICU-AKI Patients

- Often lack MDM ability
- Frequently have MSOF cared for by a primary service and other specialists with organ focus
- May already have had or potentially require discussions about other life-sustaining treatments
- Have a bedside ICU Nurse that spends a great deal of time with family/friends and other Clinical team members
- Have no mention of need for RRT in advanced care planning
- May have had or are in process of having discussions with many nurses, clinicians…..hearing many (sometime, conflicting) perspectives

• The pool of decision makers can grow…..along with complexity
Toward Shared Decision Making at the End of Life in Intensive Care Units

Opportunities for Improvement

Only 2% of discussions covered all 10 key elements of SDM
Higher levels of SDM were associated with greater family satisfaction

White, Archives of Internal Medicine, 2007
Fully Inform The Patient

Diagnosis, Prognosis, and Treatment Options

• Approach like enrolling a study subject
  – Informed consent as a dialogue…not just a paper
  – The Informer (s) have to be informed themselves

• Communicate diagnosis

• Discuss prognosis

• Communicate Options

• Assess level of Understanding
AKI-HD Prognosis

Broad View of Dead or Alive

• Contemporary Mortality Rates for AKI-HD
  – ATN Study: 60-Day ~50%
  – RENAL Study: 90-Day ~45%

• What About Those Excluded from these Studies?
  Non-candidacy for renal replacement therapy, Moribund state, Patient not expected to survive 28 days because of underlying terminal chronic medical condition, Comfort-measures-only status, Death is imminent (<24 hours), Any other major illness that, in the investigator’s judgment, will substantially increase the risk associated with the subject’s participation in this study

• SUPPORT Study
  – Prospective Registry
  – Median Survival From HD initiation = 32 Days
  – 6 months Later, Only 27% were alive
### Predictive Risk Model for Mortality

In Critically Ill Patients with AKI Requiring Dialysis-VA/NIH ATN trial

http://rcc.simpal.com/RCEval.cgi?RCID0iaLo3)

#### Demirjian, CJASN 2011

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mechanical ventilation</td>
</tr>
<tr>
<td>Chronic hypoxemia</td>
<td>FiO2 greater or equal to 0.60</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>Arterial pH</td>
</tr>
<tr>
<td>Malignancy</td>
<td>Arterial oxygen partial pressure (mmHg)</td>
</tr>
<tr>
<td>Immunosuppressive therapy</td>
<td>Serum creatinine (mg/dL)</td>
</tr>
<tr>
<td>Ischemic AKI</td>
<td>Serum bicarbonate (mmol/L)</td>
</tr>
<tr>
<td>Post surgery</td>
<td>Serum phosphate (mg/dL)</td>
</tr>
<tr>
<td>Heart rate (beats/minute)</td>
<td>Serum albumin (g/dL)</td>
</tr>
<tr>
<td>Mean arterial pressure (mmHg)</td>
<td>Total bilirubin (mg/dL)</td>
</tr>
<tr>
<td>Urine output (mL/day)</td>
<td>International normalised ratio (INR)</td>
</tr>
<tr>
<td></td>
<td>Platelet count (K/uL)</td>
</tr>
</tbody>
</table>

#### Our Case:

Calculated 80% 60 day Mortality

Does this score help inform the decision makers?
Prognostic Models/Scoring Systems

- Many of them in Critical Care, Some specific to Acute RRT

- Most Developed During Clinical Trial or Multi-Center Registry and Require Broader Validation

- Issues of “less than perfect” discriminating availability even in those patients with worst prognosis

- Need to consider sequential application of score to generate more accurate assessment

- Need to start with a little of something rather than a bunch of nothing…..realizing limitations

Patel, CJASN 2008
Gabbay, NDT 2009
Torres Costa e Silva, Kid Int, 2009
Prognosis of AKI-HD
Specific Populations

• **CANCER**
  – Hematologic Malignancy (Park, J Crit Care 2011)
    • 77% ICU Mortality at Median 4d after RRT (2-20d)
    • 23% of the survivors required RRT after ICU discharge
  – BMT (Hahn, Bone Marrow Transpl, 2003)
    • 90% Mortality by day 100 after BMT, all died by day 132
    • Very limited HD frequency (only couple HD rx right at the end)
  – Mixed (75% Heme, no BMT- Darmon, Int Care Med, 2007)
    • 51% in hospital Mortality, 63% 6-month Mortality

• **CIRRHOSIS**
  – AKI plus ICU admit- 81% hosp mortality (Fang- NDT 2008)
  – 35% of Oltx candidates on RRT survive to Oltx (Wong, Kid Int, 2005)
  – <30% mortality rate in those with pre-OLTX AKI-RRT (raley, Kid Int, 1998)
  – Use of MELD score

• **Others: Post Cardiac Arrest, Post Cardiac Surgery**
AKI-HD Prognosis
Beyond Immediate Death…..

Uremic memory: the role of acute kidney injury in long-term outcomes

- Overall Renal Recovery Rates (off RRT) 70-90% of Survivors
- ? Role of Pre-Morbid CKD, comorbidities, pre-morbid functional status and Ongoing Insults
What does Survival Mean after AKI-HD?
Long Term Acute Care Hospital
110 Patients with AKI-RRT from an acute hospitalization

Also included ESRD pts

70% of Acute Patients $\rightarrow$ ESRD
Predictors of Health Utility among 60-Day Survivors of Acute Kidney Injury in the Veterans Affairs/National Institutes of Health Acute Renal Failure Trial Network Study

Kirsten L. Johansen,* Mark W. Smith,† ‡ Mark L. Unruh,§ Andrew M. Siroka,† Theresa Z. O’Connor,‖ and Paul M. Palevsky,§‖ for the VA/NIH Acute Renal Failure Trial Network

415 Survivors of the ATN study
Mean Score 0.4
Overall
Ambulation
Cognition
Emotion
Pain
Hearing
Dexterity
Vision
Speech

~27% had Score of 0 “state akin to death”
Facilitating Advanced Care Planning

How Does it Apply to AKI?

• Purpose of ACP
  – help the patient understand his/her condition
  – identify his/her goals for care
  – prepare for the decisions that may have to be made as the condition progresses over time

• Avoid the “Out of Nowhere” Syndrome in populations at risk for AKI
  – CKD (~30% of ARF population in BEST Study, 2005), Cirrhosis, Cardiac/Vascular Surgery (in process…..), High Risk Patient with Dye Study

• Introduce concept of “time-limited trial” if AKI-HD were to occur

• Identify and include legal agents and participants if patient incapacitated

• Allows education on the nature of acute and chronic dialysis and provides chance to “demystify”
For seriously ill and tenuous patients
• Checking of boxes rather than vague language of living will
• Stays with the patient
• Executed as physician order
Withholding and Withdrawing Dialysis

**APPROPRIATE TO SAY “NO”**

**PATIENT SAYS “NO” DIRECTLY**
- Patients with decision-making capacity, who being fully informed and making voluntary choices, refuse dialysis or request that dialysis be discontinued

**PATIENT SAYS “NO” INDIRECTLY**
- Patients who no longer possess decision-making capacity who have previously indicated refusal of dialysis in an oral or written advance directive

**PROXY SAYS “NO”**
- Patients who no longer possess decision-making capacity and whose properly appointed legal agents/surrogates refuse dialysis or request that it be discontinued

**PROVIDERS SAY “NO”**
- Patients with irreversible, profound neurological impairment such that they lack signs of thought, sensation, purposeful behavior, and awareness of self and environment.\(^1\),\(^2\)

From: Alvin Moss, MD

Withholding and Withdrawing Dialysis

APPROPRIATE TO SAY “NO”

• Patient who has a terminal illness from non-renal cause or whose medical condition precludes the technical process of dialysis
  – If Estimated Survival is < 6 months even in absence of renal failure (and not transplant candidate)
  – End-stage cirrhosis with hepatorenal syndrome
  – Severe congestive heart failure
  – Widely metastatic cancer unresponsive to chemotherapy
  – End-stage pulmonary disease
  – End-stage acquired immunodeficiency syndrome
  – Bone marrow transplant recipients with multiorgan failure
  – Advanced neurodegenerative diseases
Withholding and Withdrawing Dialysis

• Medical condition precludes the technical process of dialysis
  – Unable to cooperate (e.g., advanced dementia patient who pulls out dialysis needles)
  – Condition too unstable (e.g., profound hypotension)
  – Patency of Dialysis circuit
Withholding and Withdrawing Dialysis

APPROPRIATE TO SAY “NO”

• Stage 5 CKD older than age 75 years
  AND

• Two or more of the following:
  1) clinicians’ response of “No, I would not be surprised” to the surprise question
  2) high comorbidity score
  3) significantly impaired functional status (e.g., Karnofsky Performance Status score less than 40)
  4) severe chronic malnutrition (i.e., serum albumin less than 2.5 g/dL using the bromcresol green method)

Apply to Temporary Dialysis in AKI
HD MORTALITY PREDICTOR

Programmed by Stephen Z. Fadem, M.D., FASN

SERUM ALBUMIN

3.5 g/dL

SURPRISE QUESTION

☐ I would NOT be surprised if my patient died in the next 6 months.
☐ I would be surprised if my patient died in the next 6 months.

AGE 85 years

DEMENTIA

☐ My patient HAS dementia.
☐ My patient does NOT have dementia.

PERIPHERAL VASCULAR DISEASE

☐ My patient HAS peripheral vascular disease.
☐ My patient does NOT have peripheral vascular disease.

XBETA: -154.59
Predicted Six Month Survival: 89%
Predicted Twelve Month Survival: 74%
Predicted Eighteen Month Survival: 60%


Supporting data table

© 2008-10, Interoperable Software Corporation. All rights reserved. No part of this application may be duplicated without
Resolving Conflicts about What Dialysis Decisions to Make

• Consider a *time-limited trial* of dialysis when:
  – uncertain prognosis or
  – consensus cannot be reached about providing dialysis

• Agree in advance on:
  – Length of the trial (e.g.: several days to 2 weeks)
  – Parameters to be assessed during and at the completion of trial
  – Consider putting in writing
Establish a Process for Conflict Resolution

- When Disagreement Happens:
  - Understand views of other party
  - Provide data to support your Recommendation
  - Correct misunderstandings and miscommunications

- This is almost NEVER an overnight Process!!

- If dialysis is indicated emergently, it should be provided while pursuing conflict resolution, provided the patient or legal agent requests it
Systematic Approach to Resolving Conflict between Patient/Family and Kidney Care Team

Possible Remaining Options

Ÿ Request local ESRD network to assist with arrangements for dialysis.

Ÿ Involve a mediator or an extramural ethics committee.

Ÿ Inform the patient/legal agent that dialysis will be withheld or stopped unless a court injunction to the contrary is obtained.

Ÿ Provide treatment contrary to provider's professional values to truly respect the diversity of values in our society.

Involve consultants (medical, ethical, religious, ethnic, or administrative)

Do the patient and provider now agree on the course of care?

Pursue agreed-upon care.

Shared Decision-Making:

Patient: Personal history, values, preferences, and goals.

Provider: Diagnostic, prognostic, and management expertise, values, and goals.

Do the patient and provider agree on the course of care?

INVOKE ETHICS COMMITTEE

Do the patient and provider now agree on the course of care?

Yes

No

Pursue agreed-upon care.

Yes

No

Attempt to transfer care within institution

Is this a possible solution to the problem?

No

Yes

Attempt to transfer to another institution

Is this a possible solution to the problem?

No

Yes

Pursue care agreed to by the new attending physician.

Pursue agreed-upon care.

Yes

No

RPA guideline for Shared Decision-Making, 2nd ed. 2010
Systematic Approach to Resolving Conflict between Patient/Family and Kidney Care Team

RPA guideline for Shared Decision-Making, 2nd ed. 2010
Providing Effective Palliative Care

- Pain management algorithms
- Overview of the essentials of pain management
- Instructions for neuropathic and nociceptive pain treatment
- How to manage opioid adverse effects
- Preferred medications in renal insufficiency

- www.eperc.mcw.edu
- www.kidneyeol.org
Palliative medicine referral in patients undergoing continuous renal replacement therapy for acute kidney injury.

Okon TR, Vats HS, Dart RA.
Department of Palliative Medicine, Marshfield Clinic, Marshfield, WI 54449, USA.
okon.tomasz@marshfieldclinic.org

BACKGROUND:
Referral patterns for palliative medicine consultation (PMC) by intensivists for patients requiring continuous renal replacement therapy (CRRT) have not been studied.

METHODS:
We retrospectively analyzed clinical data on patients who received CRRT in a tertiary referral center between 1999 and 2006 to determine timeliness and effectiveness of PMC referrals and mortality rate as a surrogate for safety among patients receiving CRRT for acute kidney injury.

RESULTS:
Over one-fifth (21.1%) of the 230 CRRT patients studied were referred for PMC (n = 55). PMC was requested on average after median of 15 hospital and 13 intensive care unit (ICU) days. Multivariate regression analysis revealed no association between mortality risk and PMC. Total hospital length of stay for patients who died after PMC referral was 18.5 (95% CI = 15-25) days compared with 12.5 days (95% CI = 9-17) for patients who died without PMC referral. ICU care for patients who died and received PMC was longer than for patients with no PMC [11.5 (95% CI = 9-15) days vs. 7.0 (95% CI = 6-9) days, p < 0.01]. CRRT duration was longer for patients who died and received PMC referral than for those without PMC [5.5 (95% CI = 4-8) vs. 3.0 (95% CI = 3-4) days; p < 0.01].

CONCLUSIONS:
PMC was safe, but referrals were delayed and ineffective in optimizing the utilization of intensive care in patients receiving CRRT. A proactive, "triggered" referral process will likely be necessary to improve timeliness of PMC and reduce duration of non-beneficial life-sustaining therapies.
Systematic Approach to Communication

- Diagnosis
- Prognosis
- Treatment Options
- Goals of Care

- Many Tools
  - ASK…..Tell…..ASK
  - SPIKES (Baile, The Oncologist, 2001)
  - ABCDE (Vandekieft Am Fam Phys, 2001)
SPIKES—A Six-Step Protocol for Delivering Bad News: Application to the Patient with Cancer

WALTER F. BAILE, a ROBERT BUCKMAN, b RENATO LENZI, a GARY GLOBER, a ESTELA A. BEALE, a ANDRZEJ P. KUDELKA b

aThe University of Texas MD Anderson Cancer Center, Houston, Texas, USA;
bThe Toronto-Sunnybrook Regional Cancer Centre, Toronto, Ontario, Canada

S-Setting
P-Patient’s perception
I-Invitation
K-Knowledge
E-Exploring/Empathy
S-Strategy/Summary

Private, Sit Down, Beeper off

Ask, then Tell

How would you like the Information?

Thoughtful Presentation of Data

“use the CT-scan”

Recognize Emotion

Clear Plan
Withholding and Withdrawing Renal Support in Acute Kidney Injury

Rolando Claure-Del Granado and Ravindra L. Mehta
Division of Nephrology and Hypertension, Department of Medicine, University of California San Diego, San Diego, California

Special Patient Groups (e.g., Terminal illness from non-renal causes, profound neurological impairment)

No

Yes

Assess dialysis feasibility

No

Yes

1. Assess goals of therapy
2. Estimate prognosis and outcomes
3. Evaluate ethical principles of beneficence and maleficence
4. Are advance oral or written directives available?
5. Shared decision-making process
   *Patient – Family – Medical Care Team

Clear and defined goals of therapy
Defined and/or certain prognosis and outcomes
Benefit > Risk
Lack of advance directives

No to any of the points

Yes to all of the points

Start dialysis
Withhold dialysis

Palliative care

Reassess goals of therapy

Agreement on withholding
Disagreement

*Time-limited trial

Medical committee + Ethics consultation + Legal consultation

From: Dr Claure-Del Granado
Challenges in AKI and Future Issues

- Very compressed time frame….Possibility to recover from AKI
- Patients/HCP may see acute illness as reversible and in isolation from comorbidities
- Lack of Medical Decision making ability and need to involve multiple parties in decision making process
- Our ability to predict “futility” is imprecise in AKI
- Incomplete understanding of Quality based metrics after AKI “survival”
- Improve ACP in Patients at Risk for AKI-HD, as decision makers come to this “break point” with little or no concept of the nature of the intervention
- Underutilization of Palliative services
- See Shared Decision Making, 2nd ed 2010 for AKI-Future Issues Discussion
Conclusions

- The decision to withhold or withdraw RRT in AKI is complex and develops over a relatively short time frame.

- Shared Decision Making provides clinicians with an evidence-based, peer-reviewed guideline outlining an approach to the key aspects.

- AKI imposes specific challenges, but many aspects of the SDM guideline are directly applicable and useful.

- Time-limited trials (well-defined) of RRT may be helpful and require further study.

- Palliative Care is a Key (likely underutilized) component of an effective plan.