

Acute Kidney Injury

The Nephrologist's Responsibility in Ordering Dialysis Treatments

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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 Vfibr, 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 inotropic 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

Shared Decision-Making in the Appropriate Initiation of and Withdrawal from Dialysis

Clinical Practice Guideline
Second Edition



RPA
Renal Physicians Association

Rockville, Maryland
October 2010

- 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

#5,#6

- Making decisions about initiating and discontinuing dialysis

#2,#3

- Informing patients

#7,#8

- Resolving conflicts about which dialysis decisions to make

#4

- Facilitating advance care planning

#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

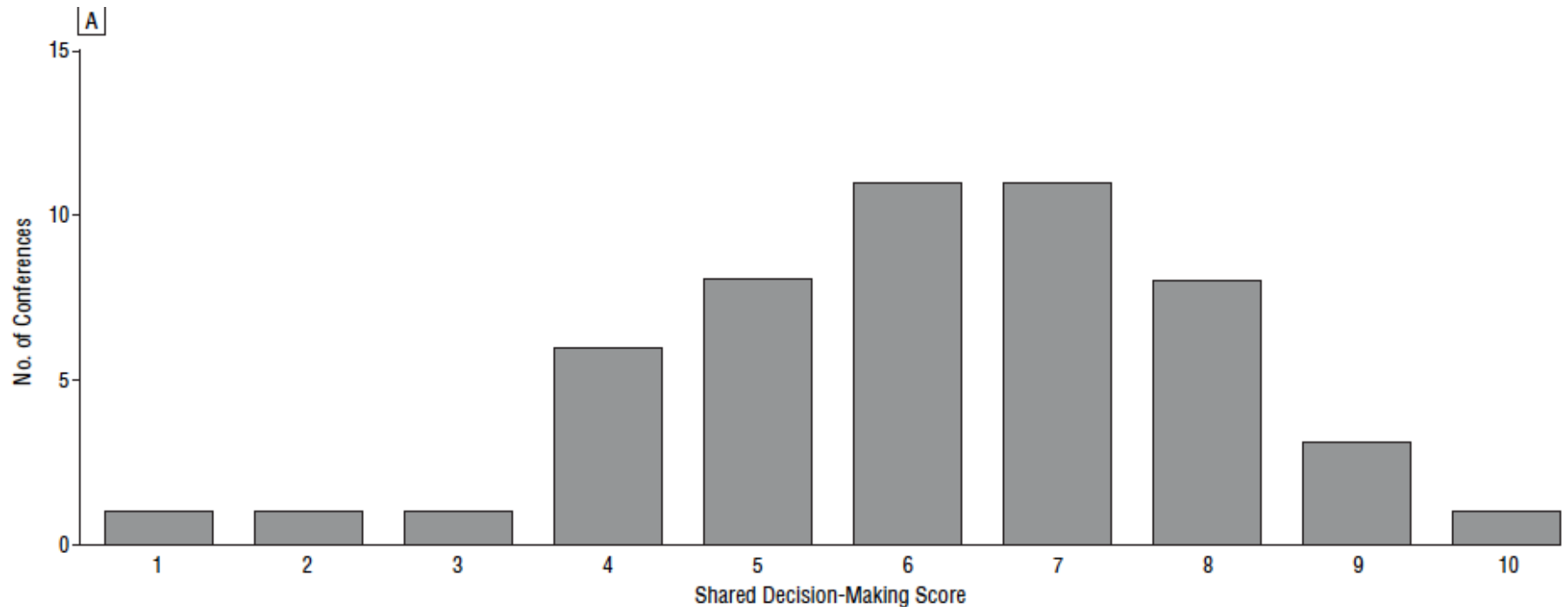


- Often lack MDM ability
 - Frequently have MSOF cared for by a primary service and other specialists with organ focus
 - May already have had or potentially require discussions about other life-sustaining treatments
 - Have a bedside ICU Nurse that spends a great deal of time with family/friends and 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

51 audiotaped EOL discussions



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

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

<http://rcc.simpal.com/RCEval.cgi?RCID0iaLo3>

**Our Case:
Calculated
80% 60 day
Mortality**

**Does this score help
inform the decision
makers?**

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

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**

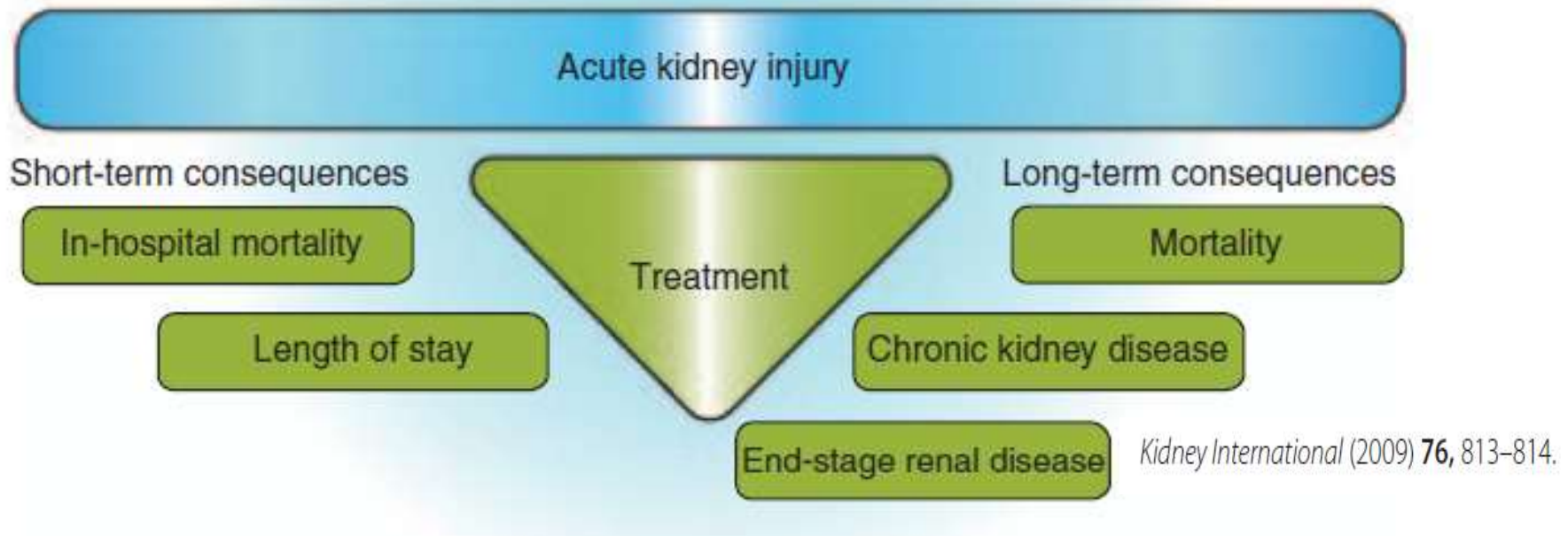
- AKI plus ICU admit- 81% hosp mortality (Fang- NDT 2008)
- 35% of Oltx candidates on RRT survive to Oltx (Wong, Kid Int, 2005)
- <30% mortality rate in those with pre-OLTX AKI-RRT (raley, Kid Int, 1998)
- Use of MELD score

- **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?



A blue rectangular sign with rounded corners is mounted on a light-colored wooden door. The sign features the text "Long Term Acute Care Hospital" in a bold, white, sans-serif font, arranged in three lines. The door's wood grain is visible to the left of the sign.

**Long Term
Acute Care
Hospital**

Dialysis

Outcomes of Hemodialysis Patients in a Long-term Care Hospital Setting: A Single-Center Study

Charuhas V. Thakar, MD,^{1,2} Margaret Quate-Operacz, MD,² Anthony C. Leonard, PhD,³ and Mark H. Eckman, MD²

- 110 Patients with AKI-RRT from an acute hospitalization
- Also included ESRD pts
- 70% of Acute Patients → ESRD

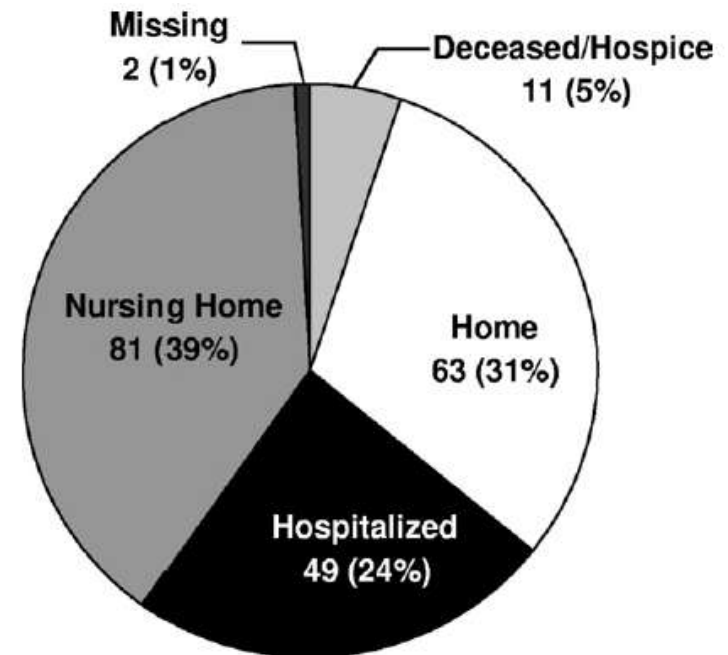


Figure 1. Disposition/outcomes of hemodialysis patients from long-term care hospitals.

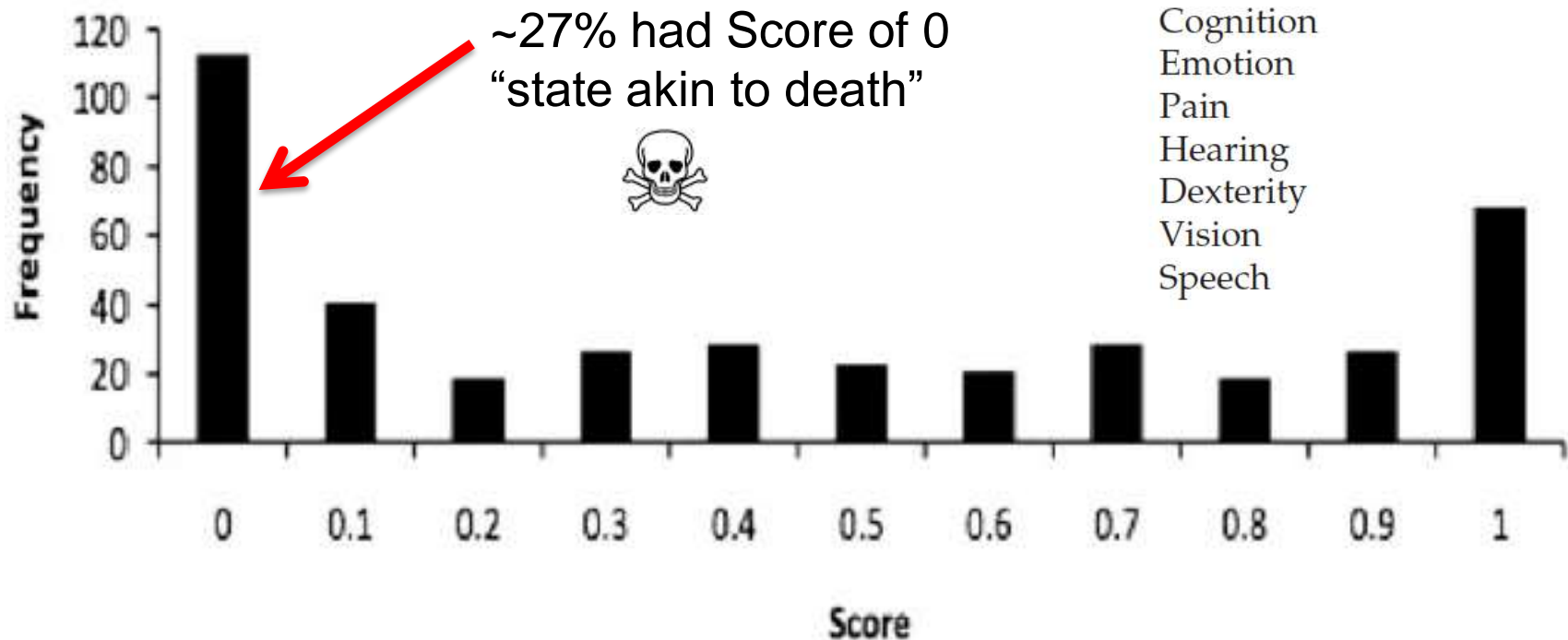
Predictors of Health Utility among 60-Day Survivors of Acute Kidney Injury in the Veterans Affairs/National Institutes of Health Acute Renal Failure Trial Network Study

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



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”

POLST

physician orders for life-sustaining treatment

- For seriously ill and tenuous patients
- Checking of boxes rather than vague language of living will
- Stays with the patient
- Executed as physician order

2012

RESEARCH LETTER



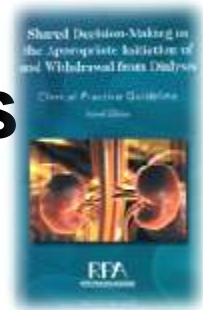
POLST Registry Do-Not-Resuscitate Orders and Other Patient Treatment Preferences

HIPAA PERMITS DISCLOSURE OF POLST TO OTHER HEALTH CARE PROVIDERS AS NECESSARY			
Physician Orders for Life-Sustaining Treatment (POLST) FIRST follow these orders, THEN contact physician, nurse practitioner or PA-C. This is a Physician Order Sheet based on the person's medical condition and wishes. Any section not completed implies full treatment for that section. Everyone shall be treated with dignity and respect.		Last Name	
		First/Middle Initial	
		Date of Birth	
A	CARDIOPULMONARY RESUSCITATION (CPR): Person has no pulse and is not breathing.		
	Check One <input type="checkbox"/> CPR/Attempt Resuscitation <input type="checkbox"/> DNR/Do Not Attempt Resuscitation (Allow Natural Death)	When not in cardiopulmonary arrest, follow orders in B, C and D.	
B	MEDICAL INTERVENTIONS: Person has pulse and/or is breathing.		
	Check One <input type="checkbox"/> COMFORT MEASURES ONLY Use medication by any route, positioning, wound care and other measures to relieve pain and suffering. Use oxygen, oral suction and manual treatment of airway obstruction as needed for comfort. Patient prefers no transfer: EMS contact medical control to determine if transport indicated.		
	<input type="checkbox"/> LIMITED ADDITIONAL INTERVENTIONS Includes care described above. Use medical treatment, IV fluids and cardiac monitor as indicated. Do not use intubation, advanced airway interventions, or mechanical ventilation. Transfer to hospital if indicated. Avoid intensive care if possible.		
	<input type="checkbox"/> FULL TREATMENT Includes care described above. Use intubation, advanced airway interventions, mechanical ventilation, and cardioversion as indicated. Transfer to hospital if indicated. Includes intensive care.	Additional Orders: (e.g. dialysis, etc.) _____	
C	ANTIBIOTICS:		
	Check One <input type="checkbox"/> No antibiotics. Use other measures to relieve symptoms. <input type="checkbox"/> Determine use or limitation of antibiotics when infection occurs, with comfort as goal. <input type="checkbox"/> Use antibiotics if life can be prolonged.	Additional Orders: _____	
D	ARTIFICIALLY ADMINISTERED NUTRITION: Always offer food and liquids by mouth if feasible.		
	Check One <input type="checkbox"/> No artificial nutrition by tube. <input type="checkbox"/> Trial period of artificial nutrition by tube. (Goal: _____) <input type="checkbox"/> Long-term artificial nutrition by tube.	Additional Orders: _____	
	E SUMMARY OF GOALS AND SIGNATURES		
Discussed with: <input type="checkbox"/> Patient <input type="checkbox"/> Parent of Minor <input type="checkbox"/> Health Care Representative <input type="checkbox"/> Durable Power of Attorney for Health Care <input type="checkbox"/> Court-Appointed Guardian <input type="checkbox"/> Other: _____		Patient Goals/Medical Condition:	
Print Physician/ARNP/PA-C Name		Phone Number	Patient/Resident or Legal Surrogate for Health Care Signature (mandatory)
Physician/ARNP/PA-C Signature (mandatory)		Date	Date

SEND FORM WITH PERSON WHENEVER TRANSFERRED OR DISCHARGED

Use of original form is strongly encouraged. Photocopies and FAXes of signed POLST forms are legal and valid

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}

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

APPROPRIATE TO SAY “NO”



- 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

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 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%

REFERENCE:Cohen LM, Ruthazer R, Moss AH, Germain MJ. Predicting Six-Month Mortality for Patients who are on Maintenance Hemodialysis Clin J Am Soc Nephrol. 2009 Dec 3

[Supporting data table](#)

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

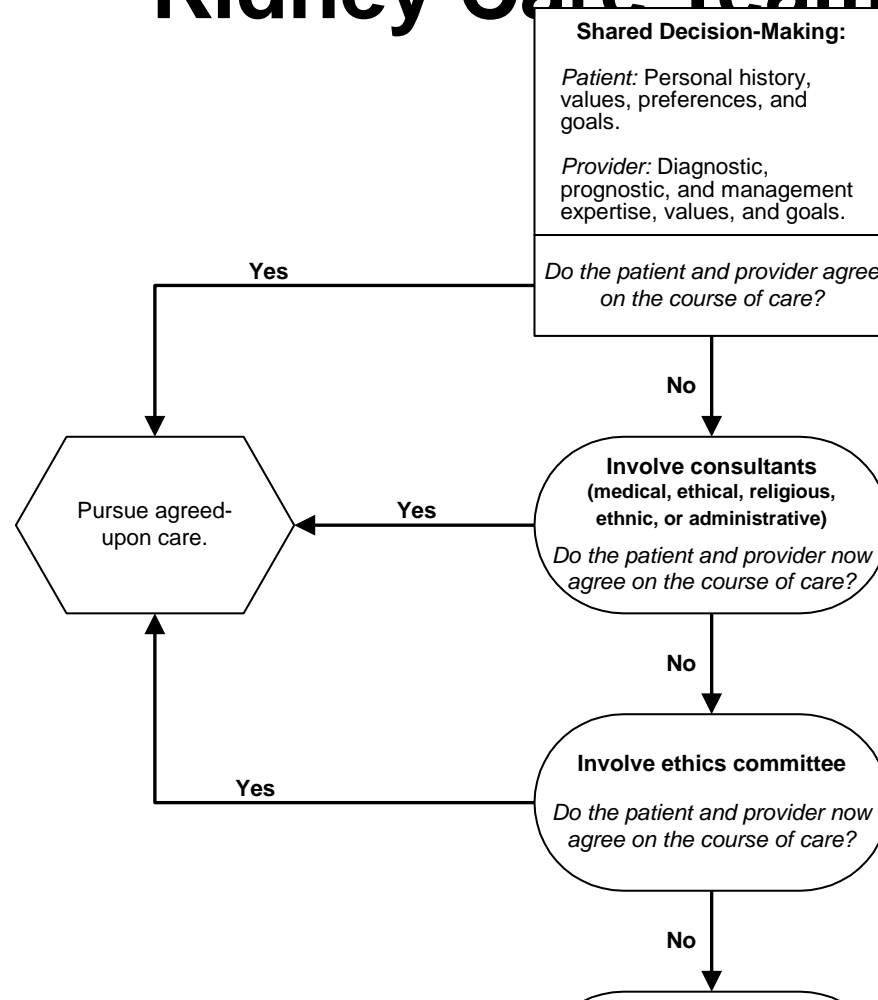
- Agree in advance on:
 - Length of the trial (e.g.: several days to 2 weeks)
 - Parameters to be assessed during and at the completion of trial
 - Consider putting in writing

Establish a Process for Conflict Resolution



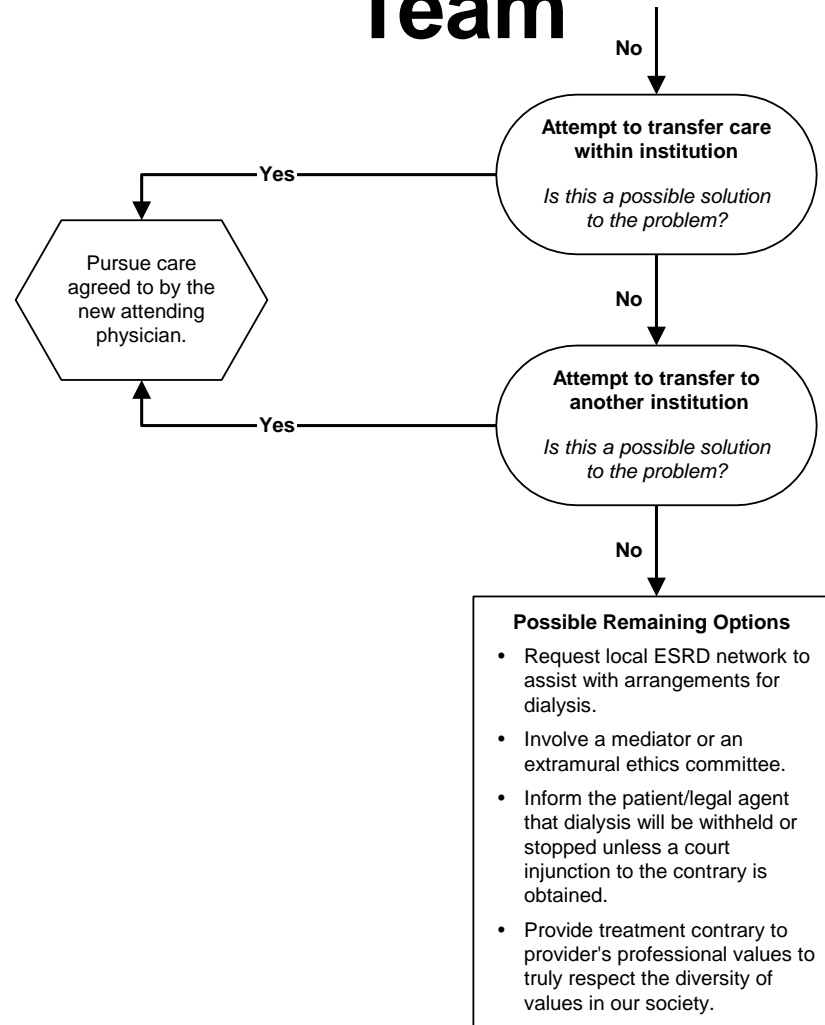
- When Disagreement Happens:
 - Understand views of other party
 - Provide data to support your Recommendation
 - Correct misunderstandings and miscommunications
- This is almost NEVER an overnight Process!!
- If dialysis is indicated emergently, it should be provided while pursuing conflict resolution, provided the patient or legal agent requests it

Systematic Approach to Resolving Conflict between Patient/Family and Kidney Care Team



RPA guideline for Shared Decision-Making , 2nd ed. 2010

Systematic Approach to Resolving Conflict between Patient/Family and Kidney Care Team



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

Clinical Algorithm & Preferred Medications to Treat Pain in Dialysis Patients



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, 2006)
 - ABCDE (Vandekieft Am Fam Phys, 2006)



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;

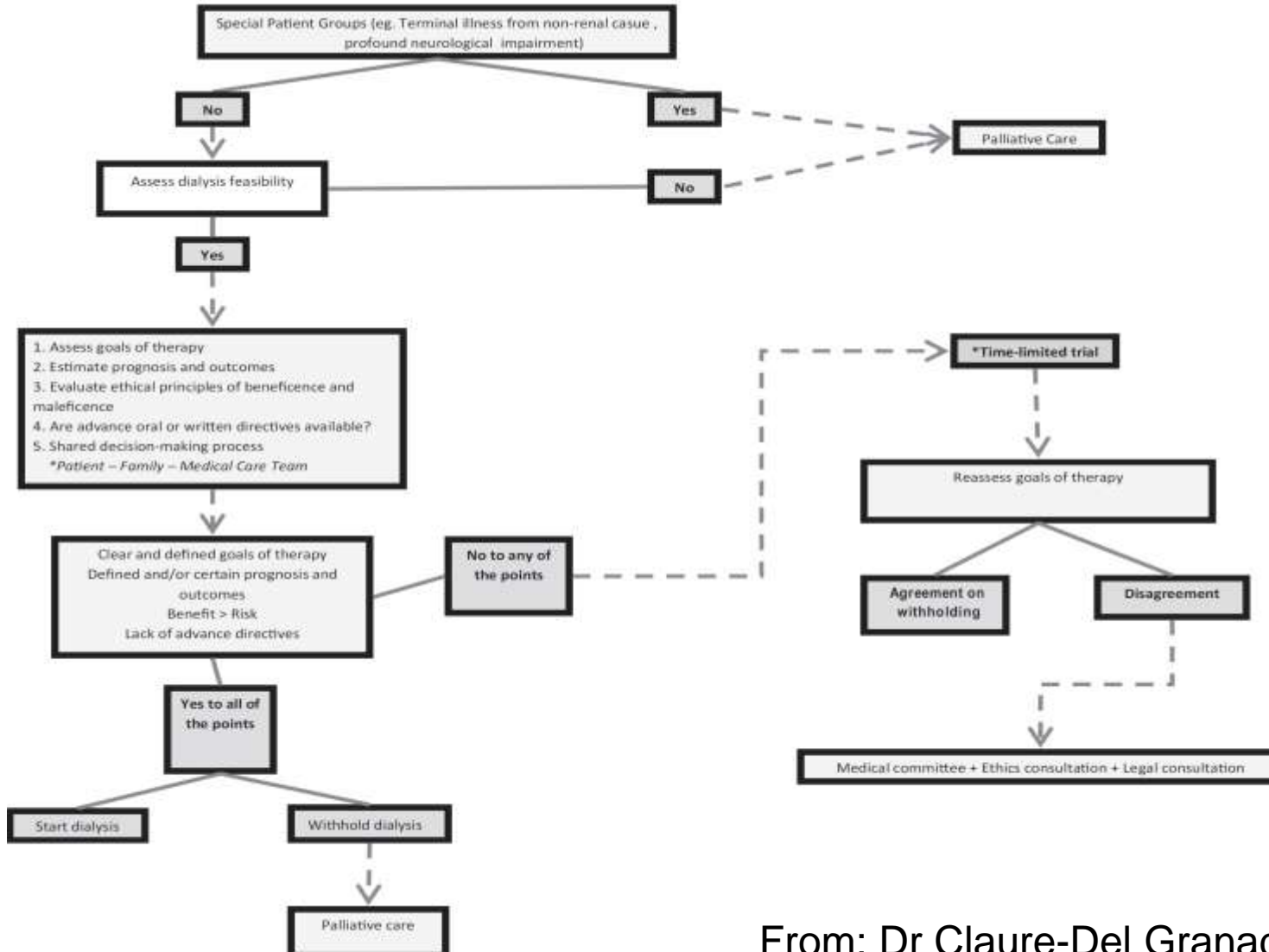
^bThe Toronto-Sunnybrook Regional Cancer Centre, Toronto, Ontario, Canada

S-Setting	Private, Sit Down, Beeper off
P-Patient's perception	Ask, then Tell
I-Invitation	How would you like the Information?
K-Knowledge	Thoughtful Presentation of Data
E-Exploring/Empathy	"use the CT-scan" Recognize Emotion
S-Strategy/Summary	Clear Plan

Withholding and Withdrawing Renal Support in Acute Kidney Injury

Rolando Claire-Del Granado and Ravindra L. Mehta

Division of Nephrology and Hypertension, Department of Medicine, University of California San Diego, San Diego, California



From: Dr Claire-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

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