Septic AKI: a widespread molecular lesion
Septic tubular vacuoles

Tran, et al. JCI 2011
Septic tubular “vacuoles”
Human sepsis in the kidney

Takasu, et al. AJRCCM 2013
Catching AKI earlier...biomarkers

AKI like AMI

ECG
Biomarkers

PCI

?
Oncology’s example: CML

Mechanistic “Biomarker”  Breakthrough therapy

[Diagram of chromosomal abnormalities related to CML and the Gleevec tablet]
Outline

• Impacts of AKI
  – Global
  – Attributable morbidity/mortality

• “Avoid nephrotoxins...”
  – Is there even a pathway or process to target?

• Clinical management
  – Not too little, but then what?
Acute limb ischemia due to a perioperative type B (distal) thoracic aortic dissection develops in a 90-kg, 20-year-old man with Marfan's syndrome who is admitted to the hospital for elective aortic-valve replacement. On postoperative day 1, he undergoes endovascular repair of the thoracic aorta. On postoperative day 4, his urine output decreases to 420 ml over a 24-hour period. He requires mechanical ventilation with a fraction of inspired oxygen (FiO2) of 0.70; his mean arterial pressure is 74 mm Hg with vasopressor support. He has had a positive fluid balance of 9.8 liters since admission. The serum creatinine level has increased from a baseline of 0.6 mg per deciliter (53.0 μmol per liter) to 4.4 mg per deciliter (389.0 μmol per liter). The bicarbonate level is 19 mmol per liter despite bicarbonate infusion, and the potassium level is 6.1 mmol per liter. The creatine kinase level has increased to 129,040 U per liter.
Waikar, et al. JASN 2006
Outcomes

Chertow, et al. JASN 2005
Costs

Chertow, et al. JASN 2005