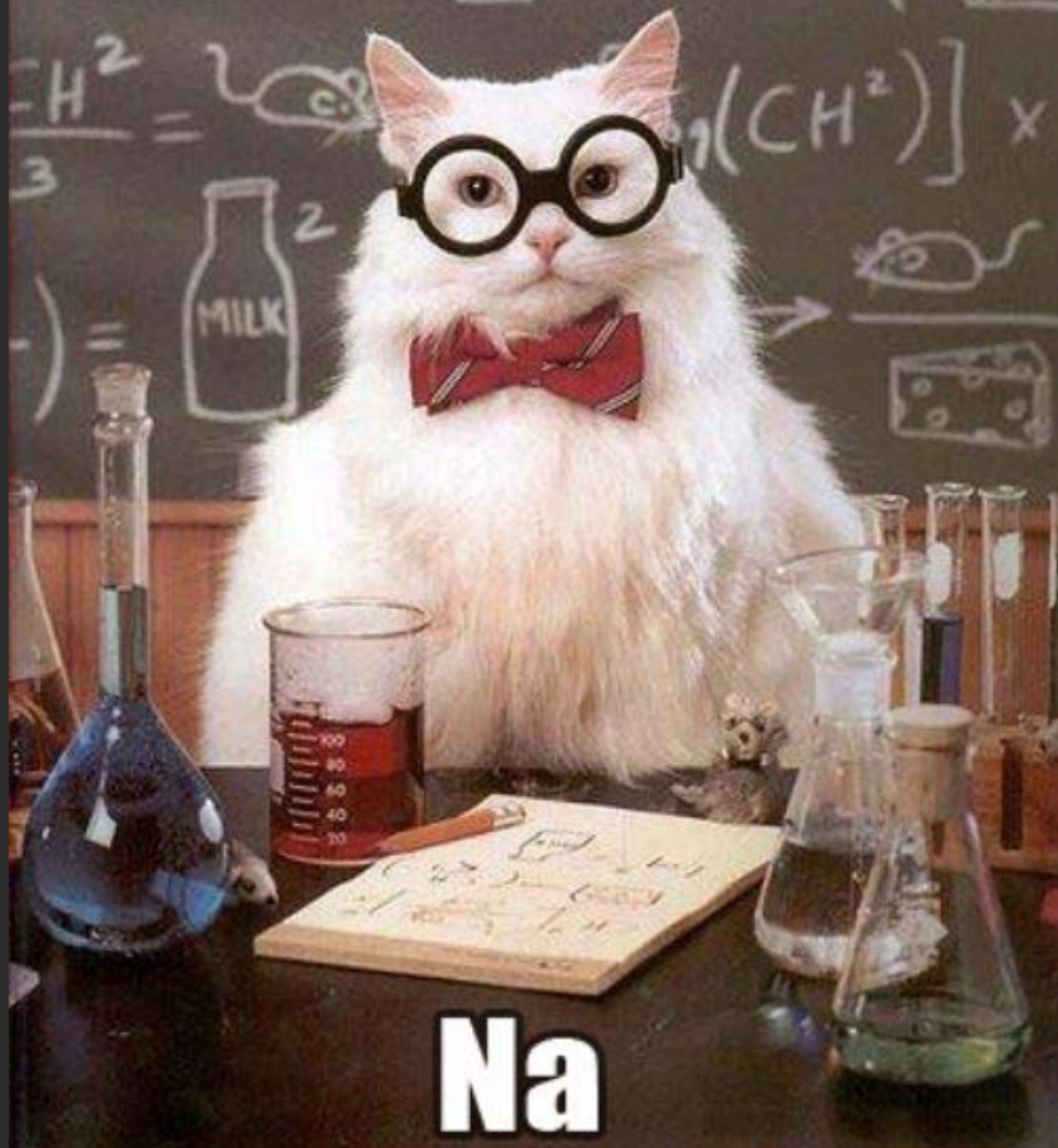


Test I Wish Was Never Ordered

Renal Artery Study

**DO I KNOW ANY JOKES ABOUT SODIUM?**



**Na**

# Hypertension CKD Case

63 yo man admitted for cardiac cath and PCI LAD  
in 2006

At the time of cath he is found to have  
thrombosed R kidney and 60% stenosis L renal  
artery

PMH – DM II, HTN (4 meds, BP > 160/),  
dyslipidemia, CKD (GFR 45-50)

Social - +tobacco, retired tap room owner

# Hypertension CKD Case

Because of uncontrolled hypertension , solitary kidney, and decreased GFR, we were asked about PCI of L renal artery

Should we open renal artery?

# Hypertension CKD Case

We said yes because:

It's nice to be asked

An open artery is better than a closed artery

We hoped his BP would improve and GFR stabilize (our job is to protect the kidney)

With PCI, his GFR did not change but BP now 140/ on less meds

## Sensitivity and Specificity of Tests for Renovascular Hypertension

<b>Test</b>	<b>Sensitivity (%)</b>	<b>Specificity (%)</b>
<b>Doppler flow ultrasonography</b>	<b>80</b>	<b>80</b>
<b>Magnetic resonance angiography</b>	<b>90</b>	<b>90</b>
<b>CT Angio</b>	<b>90</b>	<b>90</b>

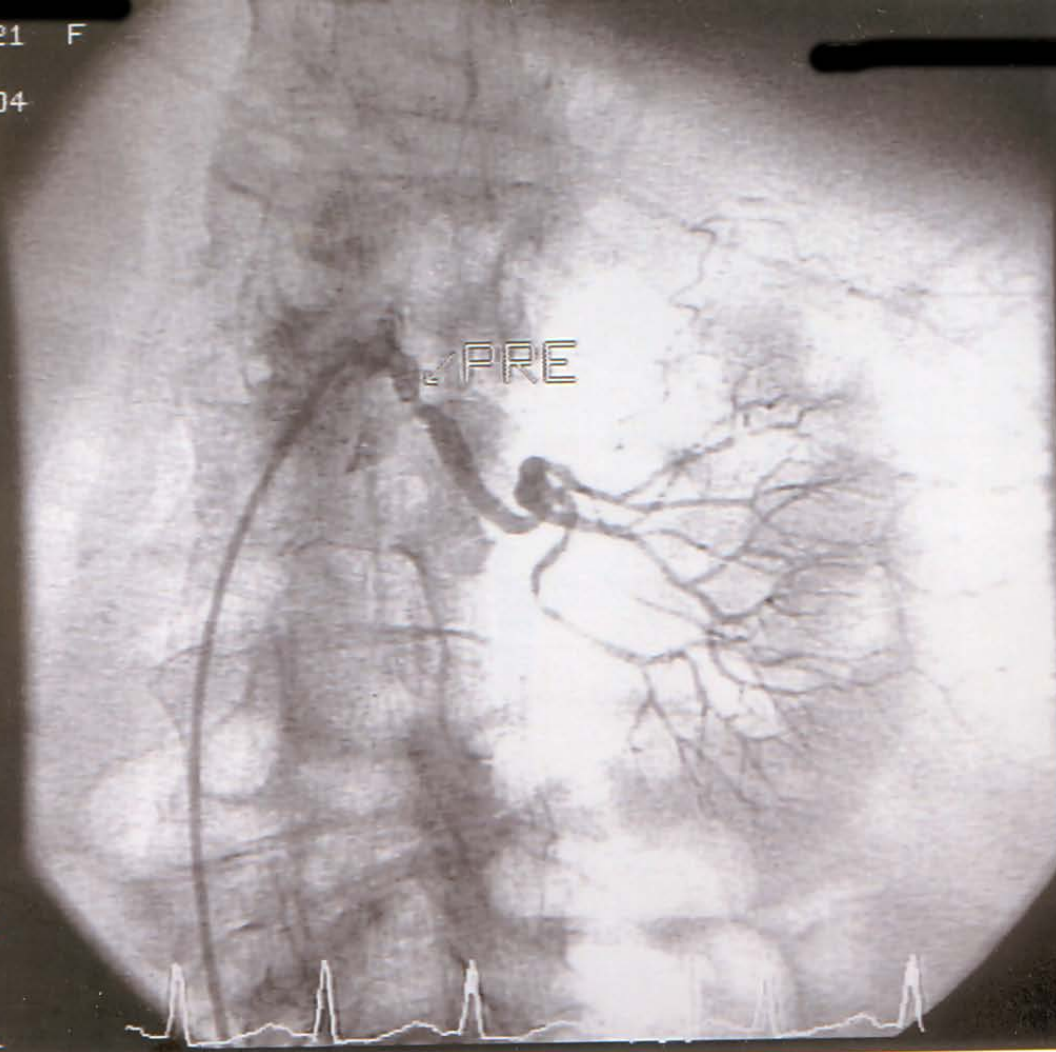
**Anatomic Diagnosis not functional diagnosis**

# Renovascular Disease

**Angiography, with or without digital subtraction, is the “gold standard” for diagnosis for renovascular disease**

**Drive by angio**

05-05-1921 F  
04-1421  
09-23-2004



LAO  
3  
CAUD  
0

T-image:  
1.90  
T-run:  
14:44:01

RUN  
3  
38  
IMAGE  
29



05-05-1921 F  
04-1421  
09-23-2004



POST

LAO  
22

CAUD  
0

T-image:  
1.77

T-run:  
15:03:49

RUN  
10  
58  
IMAGE  
27



# Hypertension CKD Case

18 months later, recurrent pulmonary edema and worsening GFR lead to a duplex of L renal artery - > 70% in stent stenosis

Again we were asked should we fix it?

Again we said yes because of progressive CKD and pulmonary edema

PCI performed with good technical result and bouts of CHF abated

# Hypertension CKD Case

18 months later, GFR now 20 ml/min and duplex shows > 70% stenosis

Again PCI performed and he developed acute flank pain, hypotension and anuria

Once stabilized, he is now on hemodialysis





# Hypertension CKD Case

Imaging promotes intervention

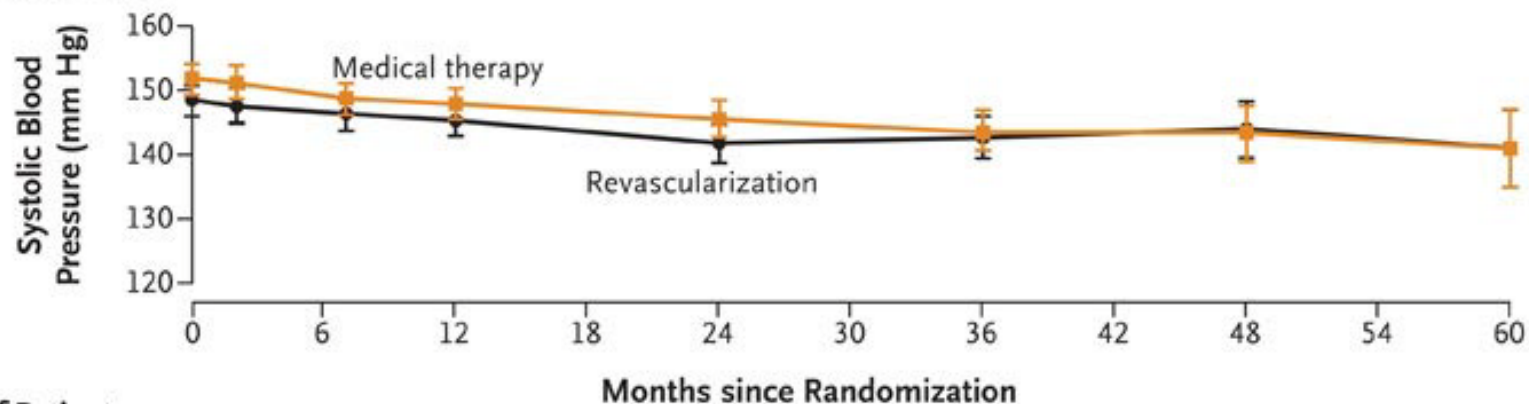
It's hard to do nothing

Does PCI of renal arteries lead to better BP control, prevent pulmonary edema, and preserve renal function?

People who don't think too good  
should not think too much

Ted Williams

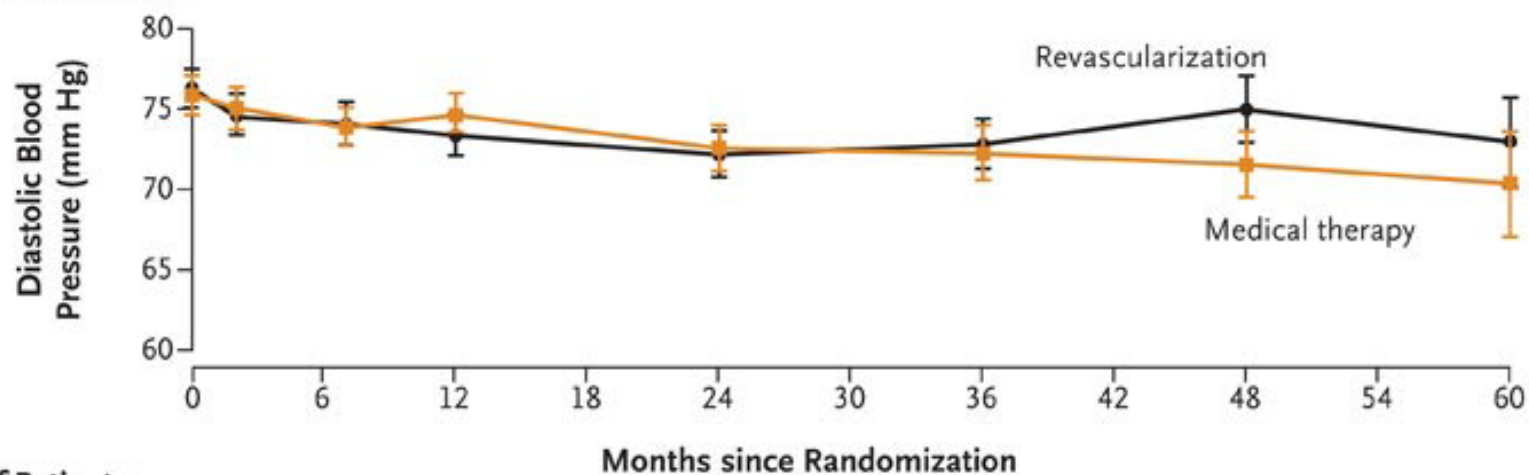
### A Systolic Blood Pressure



#### Number of Patients

Revascularization	385	346	332	321	257	197	125	71
Medical therapy	388	361	350	336	264	178	124	62

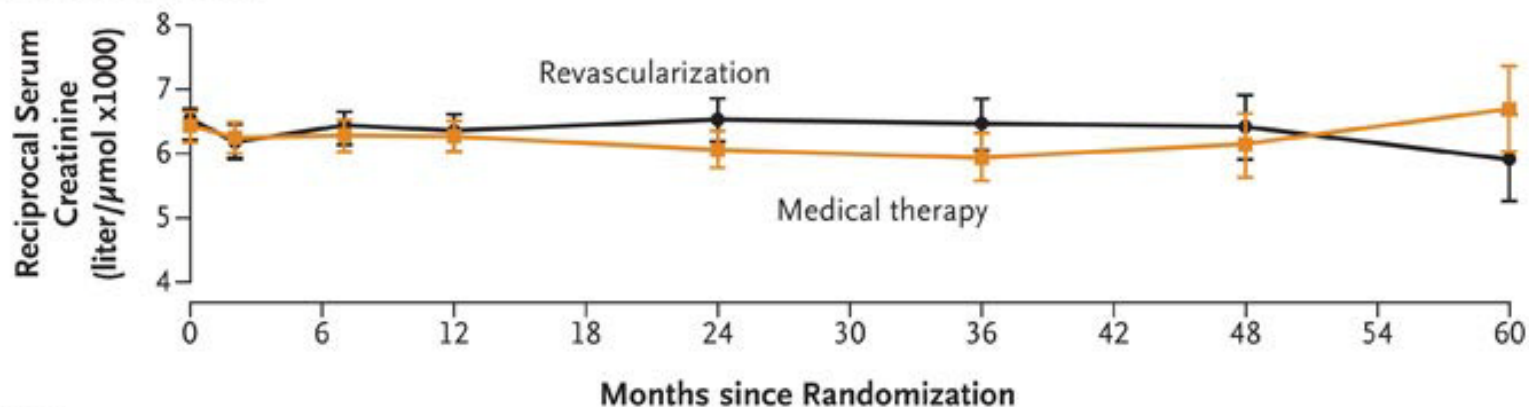
### B Diastolic Blood Pressure



#### Number of Patients

Revascularization	384	344	330	320	256	197	125	70
Medical therapy	388	361	349	335	262	178	123	63

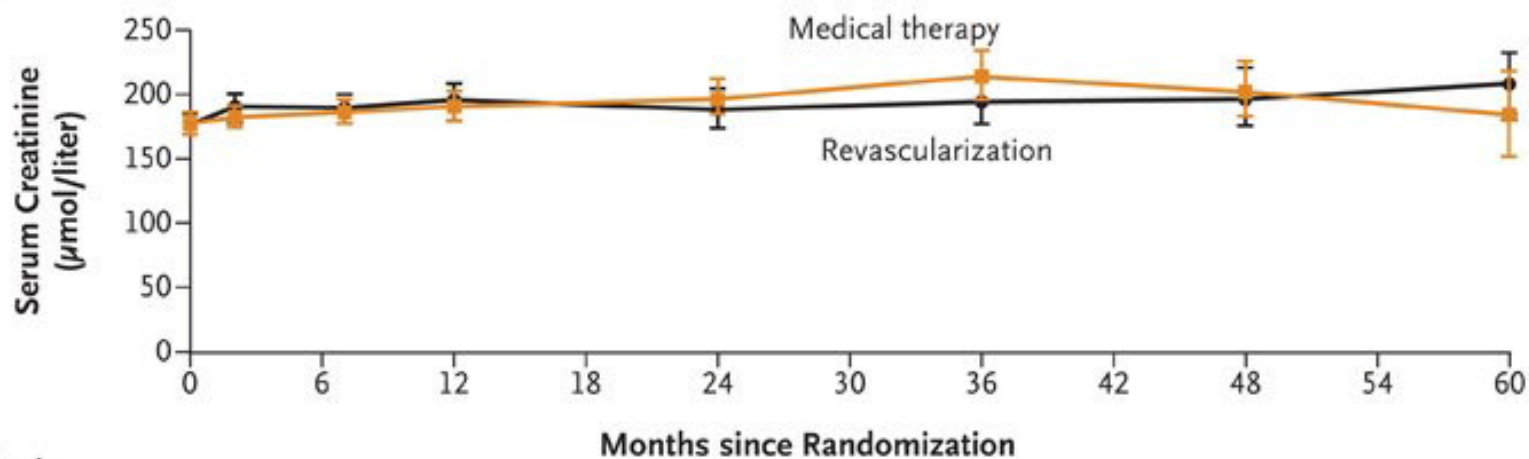
### A Reciprocal of Serum Creatinine



#### No. of Patients

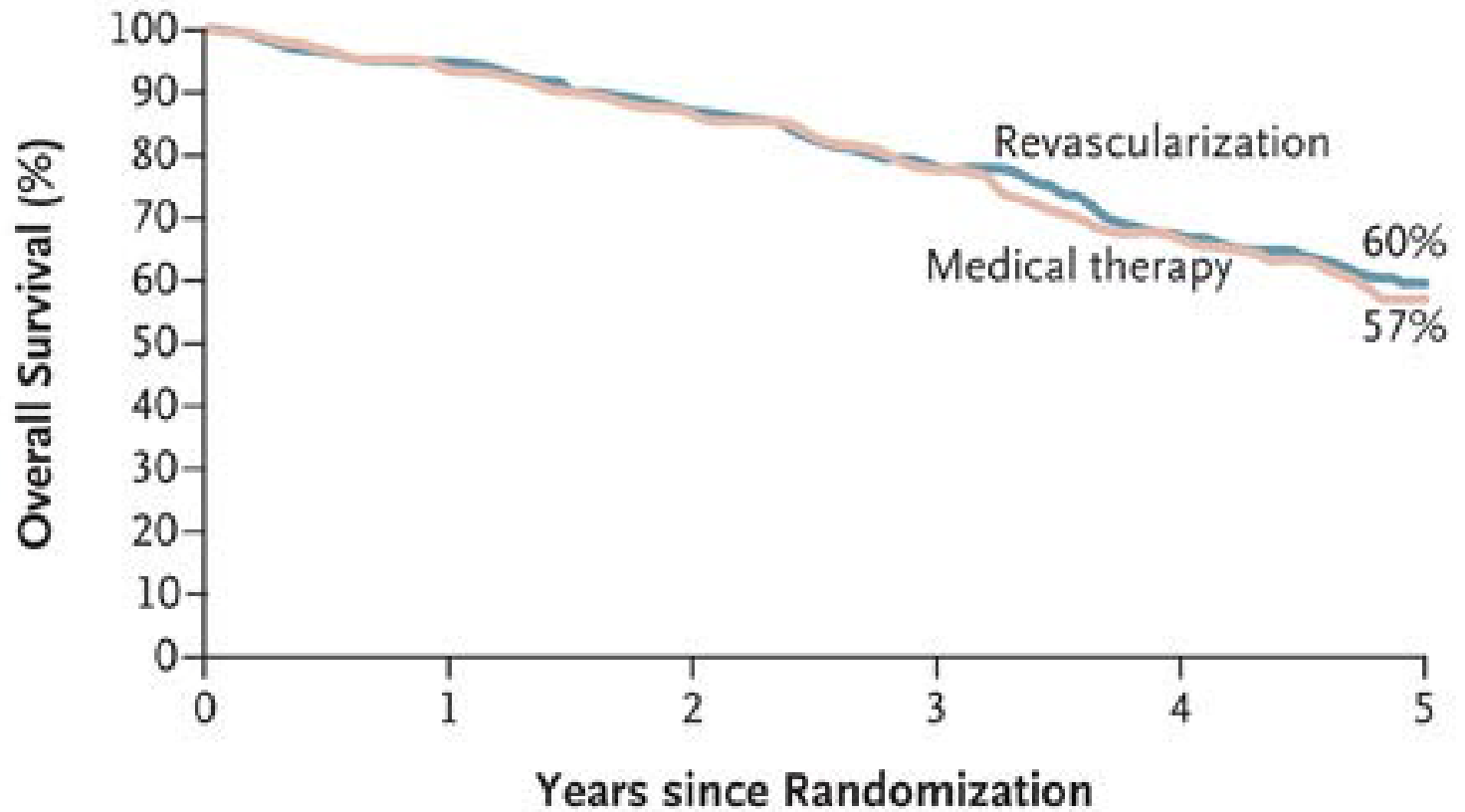
Revascularization	403	349	336	329	263	191	127	72
Medical therapy	403	363	347	343	272	183	119	61

### B Serum Creatinine



#### No. of Patients

Revascularization	403	349	336	329	263	191	127	72
Medical therapy	403	363	347	343	272	183	119	61



**No. at Risk**

Revascularization	403	337	257	178	109	46
Medical therapy	403	332	248	165	96	40

# Renovascular HTN

## Outcomes

Patency Rate at 12 months > 80%

Progression of CKD – medical = intervention

HTN Control – intervention = medication

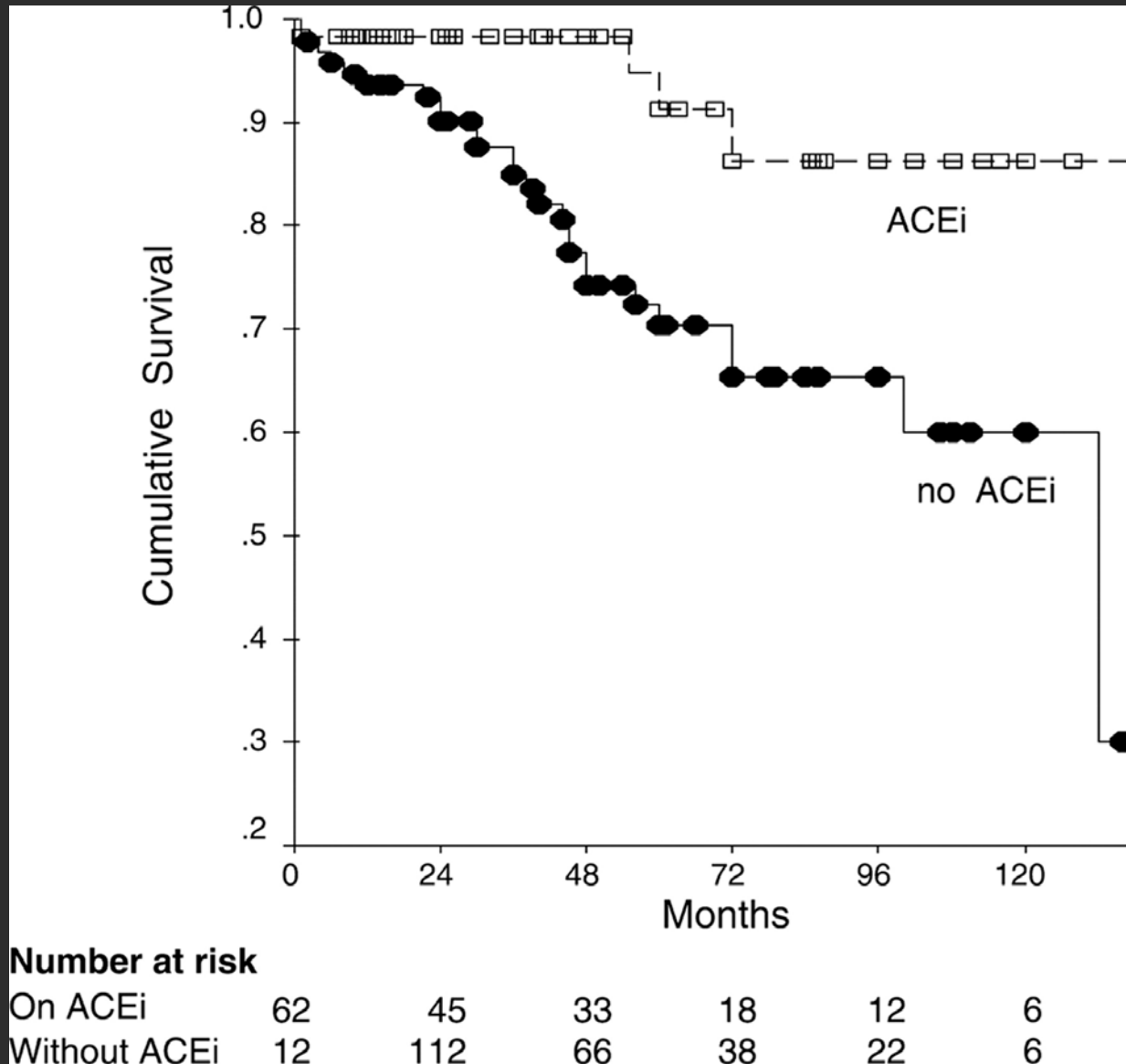
Controversy – patient selection is key and we don't have enough data to make recommendations

**Recurrent flash pulmonary edema, refractory HTN and medication intolerance**

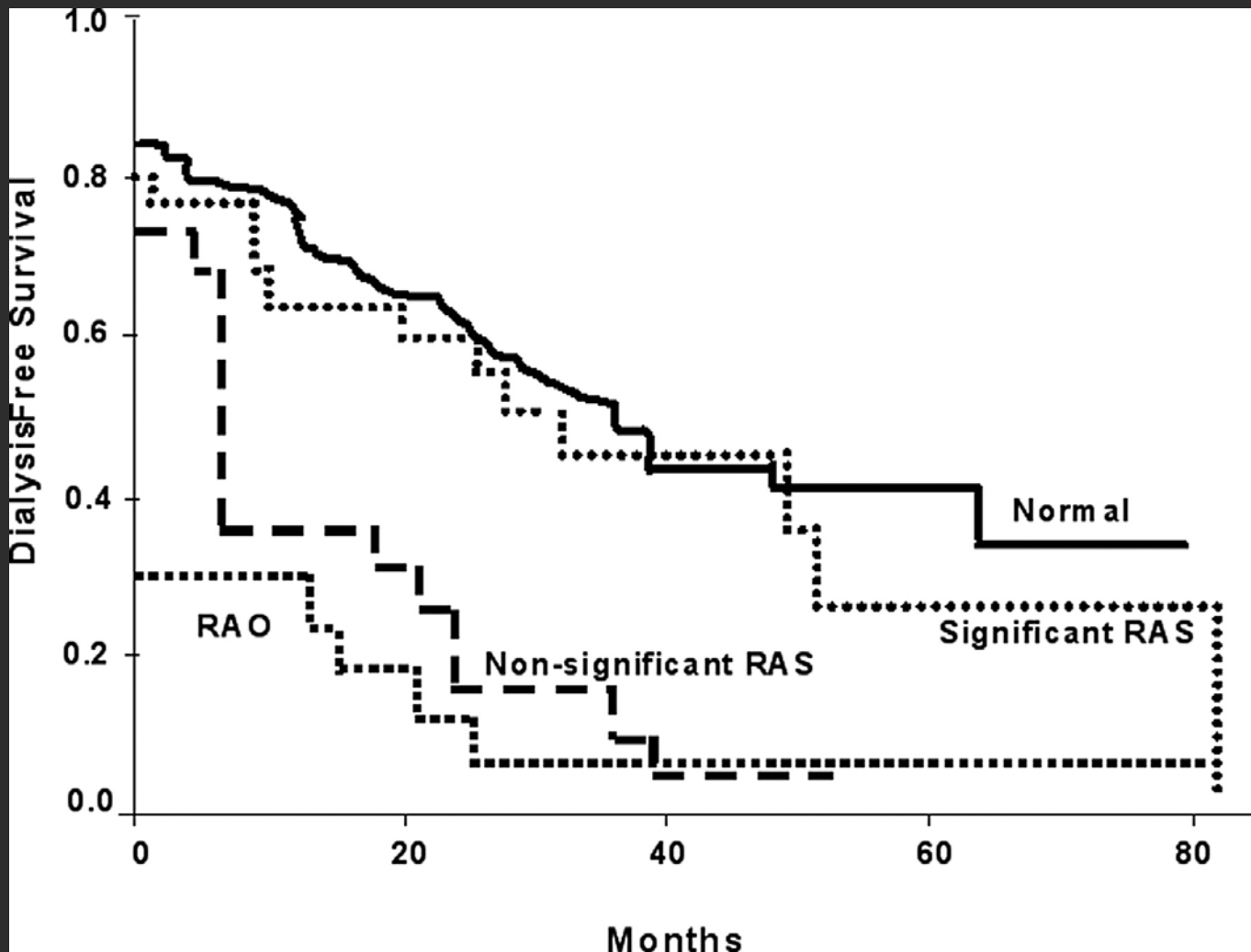
CORAL Trial Recruit until 2011 (7660 1996 to 35000 2005)

Cardiology vs. Nephrology      Rule of one third

Prospective observational cohort study comparing RAS patients treated (n=62) or not treated (n=133) with ACEs inhibitors (mean follow-up: 4.5 years)



# Time to renal replacement therapy or death according to contralateral renovascular anatomy.





Welcome to the web site for the  
Cardiovascular Outcomes in Renal  
Atherosclerotic Lesions (CORAL)

# Coral Trial

NIH sponsored trial looking at PCI vs medical treatment for patients with renovascular disease

CKD, HTN and RAS

End points

primary – CV or renal death, CVA, MI, RRT, CHF, creatinine doubling

secondary – subgroups, cost, GFR decline

# Coral Trial

Medical TX =

1. BP < 140/ (<130/ if DM)
2. Use of ARB or ACEI
3. Lipid – LDL < 100 (?<70)
4. HbA1c < 7%
5. Antiplatelet agent

# Coral Trial - Results

BP goal met with medical treatment:

No DM or CKD – 93%

DM or CKD – 80%

2 year followup

# RAS – Principles of Treatment

Don't poke the skunk  
(for now)