



# Kidney Care for Primary Care: Trying to Keep it Simple

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Family Physician Forum, Vancouver, BC

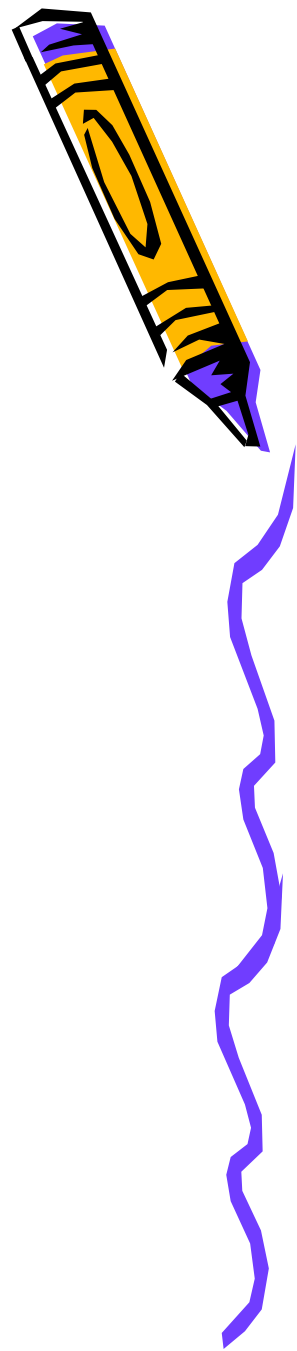
# Disclosures

- None



# Objectives

- Review the role of Primary Care
- Review Classification of CKD
- Risk Factors
- Early Detection
- Who to Refer
- Take Home Points



# Why is Primary Care Important in CKD Management?



# CKD : What the primary care provider needs to know

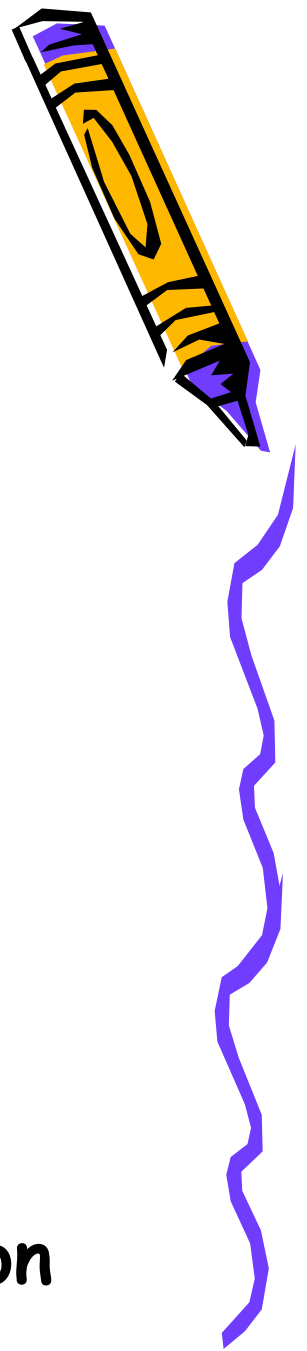


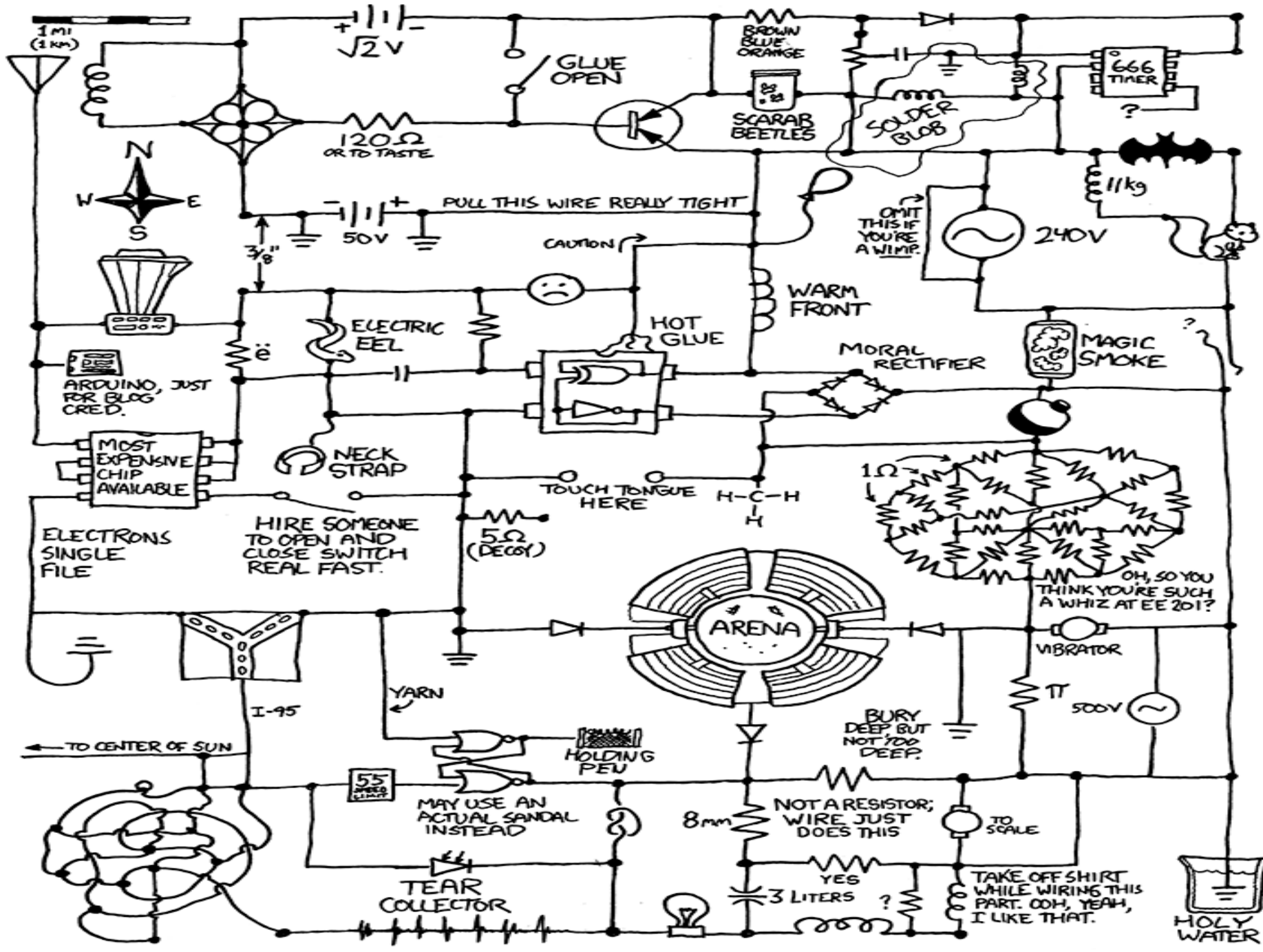
- Chronic Kidney Disease is common
- CKD does not usually progress to end stage disease in most patients
- CKD is associated with CVD, diabetes and other chronic conditions
- Dialysis is a terminal illness!



# The problem

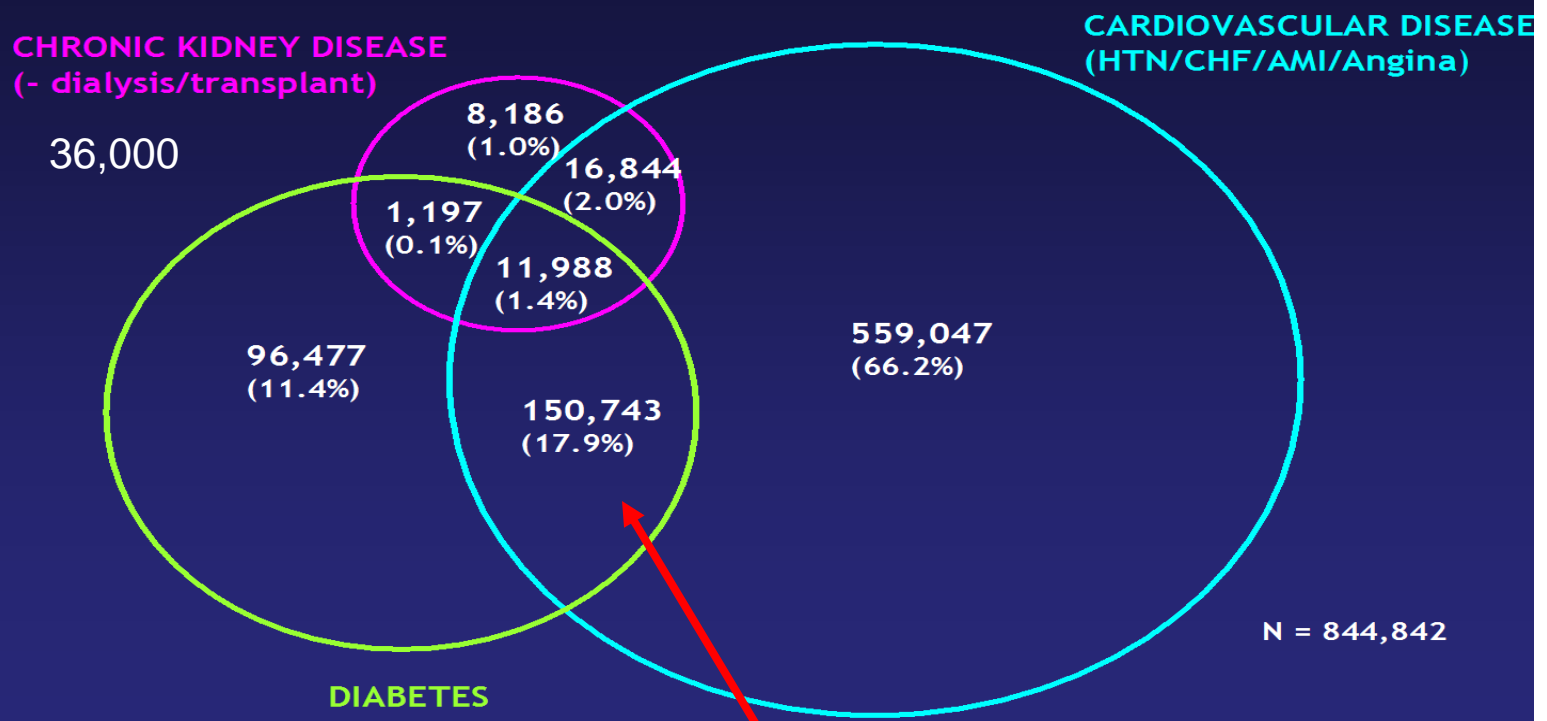
- **Chronic Kidney Disease**
  - Perceived as complex and difficult
  - Associated with other clinical conditions
    - Cardiac disease
    - Diabetes
    - Depression
  - Rarity of dialysis and transplant patients in general practice
  - Changing paradigm and identification of early CKD





# Scope of the Challenge in BC: Large group of patients: 884,000

## CKD, CVD and DM Patients, BC, 2005.

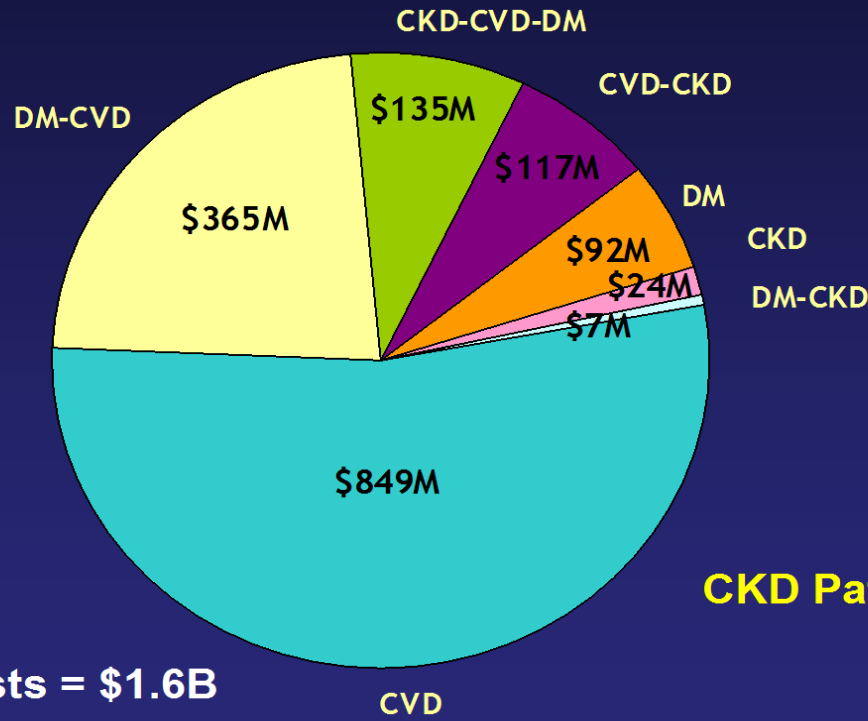


189,000 at highest risk



# Disproportional costs for hospitalization

## Proportion of Hospital Costs by Group, 2005.



Total costs = \$1.6B

**CKD Patients = 5% patients  
= 18% of costs**

# Classification

The National Kidney Foundation Kidney  
Disease Outcomes Quality Initiative  
(NKF KDOQI™)

Kidney Disease: Improving Global Outcomes  
(KDIGO)



# Definition of Chronic Kidney Disease

## 2002/ 2008 KDOQI , KDIGO

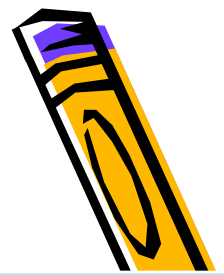


- Sustained reduction in kidney function or evidence of kidney damage (>3 mo)
- Staging system based on eGFR with some modifications based on presence of albuminuria

Description	GFR (mL per min per 1.73 m <sup>2</sup> )
- At risk	≥60 (with risk factors for chronic kidney disease)
1 Kidney damage with normal or increased GFR	≥90
2 Kidney damage with mildly diminished GFR	60-89
3* Moderately reduced GFR	30-59
4 Severely decreased GFR	15-29
5 End-stage renal disease (kidney failure)	<15



# What's New?

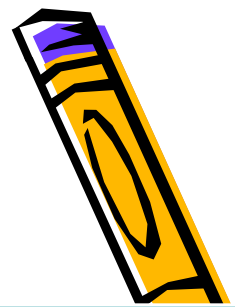


## DEFINITION OF CKD

KDOQI 2002	KDIGO 2012
CKD is defined as either : <ul style="list-style-type: none"><li>•Kidney damage; or</li><li>•GFR &lt;60 mL/min/1.73 m<sup>2</sup> for ≥3 months</li></ul>	<ul style="list-style-type: none"><li>• Definition remains intact</li></ul>
CKD is classified mainly by GFR category	<ul style="list-style-type: none"><li>• CKD is classified by:<ul style="list-style-type: none"><li>- Cause</li><li>- GFR category</li><li>- Albuminuria</li></ul></li><li>• Referred to as CGA Staging</li></ul>
CKD is divided into 5 stages	<ul style="list-style-type: none"><li>• “Stage 3” is subdivided into 3a &amp; 3b</li><li>• Terminology change from “stages” to “classifications”</li></ul>



# What's New?



## ALBUMINURIA

### KDOQI 2002

Not incorporated into the staging system

Previous terminology:

- Normoalbuminuria
- Microalbuminuria
- Macroalbuminuria

### KDIGO 2012

- Added with 3 categories of severity:
  - Normal to mildly increased
  - Moderately increased
  - Severely increased

- New terminology:
  - Normal to mildly increased
  - Moderately increased
  - Severely increased
- The term “microalbuminuria” is no longer used and is discouraged



# Assign albuminuria\* categories



## CGA Staging

Category	AER	ACR (Approximate equivalent)		Terms
		(mg/d)	(mg/mmol)	
A1	<30	<3	<30	Normal to mildly increased
A2	30-300	3-30	30-300	Moderately increased*
A3	>300	>30	>300	Severely increased**

Abbreviations: AER, albumin excretion rate; ACR, albumin-creatinine ratio;

\*Relative to young adult level.

\*\*Including nephrotic syndrome (albumin excretion usually >22000 mg/24 hours [ACR >2220 mg/g; >220 mg/mmol])

\* Note that where albuminuria measurement is not available, urine reagent strip results can be substituted



# What's New?



## EVALUATION & MANAGEMENT

### KDOQI 2002

Risk relationship between GFR and albuminuria is not defined

- Frequency of monitoring and referral:
  - Based on eGFR

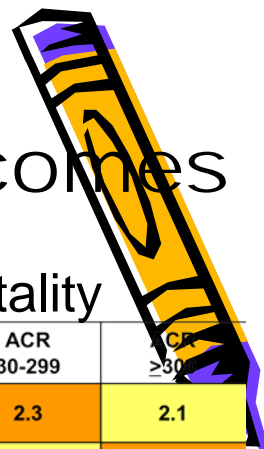
### KDIGO 2012

Risk relationship between GFR and albuminuria is defined

- Frequency of monitoring and referral:
  - Based on eGFR and albuminuria categories



# CKD Consortia Data: Impact of GFR & Albuminuria on outcomes



## All Cause Mortality

	ACR <10	ACR 10-29	ACR 30-299	ACR ≥300
eGFR > 105	1.1	1.5	2.2	5.0
eGFR 90-105	Ref	1.4	1.5	3.1
eGFR 75-90	1.0	1.3	1.7	2.3
eGFR 60-75	1.0	1.4	1.8	2.7
eGFR 45-60	1.3	1.7	2.2	3.6
eGFR 30-45	1.9	2.3	3.3	4.9
eGFR 15-30	5.3	3.6	4.7	6.6

## Cardiovascular Mortality

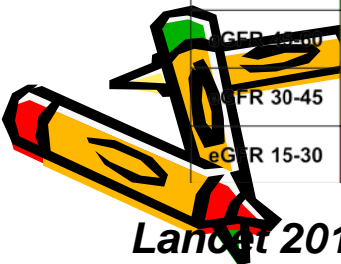
	ACR <10	ACR 10-29	ACR 30-299	ACR ≥300
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eGFR 75-90	1.0	1.3	1.6	3.7
eGFR 60-75	1.1	1.4	2.0	4.1
eGFR 45-60	1.5	2.2	2.8	4.3
eGFR 30-45	2.2	2.7	3.4	5.2
eGFR 15-30	14	7.9	4.8	8.1

## End Stage Renal Disease

	ACR <10	ACR 10-29	ACR 30-299	ACR ≥300
eGFR > 105	Ref	Ref	7.8	18
eGFR 90-105	Ref	Ref	11	20
eGFR 75-90	Ref	Ref	3.8	48
eGFR 60-75	Ref	Ref	7.4	67
eGFR 45-60	5.2	22	40	147
eGFR 30-45	56	74	294	763
eGFR 15-30	433	1044	1056	2286

## Acute Kidney Injury

	ACR <10	ACR 10-29	ACR 30-299	ACR ≥300
eGFR > 105	Ref	Ref	2.7	8.4
eGFR 90-105	Ref	Ref	2.4	5.8
eGFR 75-90	Ref	Ref	2.5	4.1
eGFR 60-75	Ref	Ref	3.3	6.4
eGFR 45-60	2.2	4.9	6.4	5.9
eGFR 30-45	7.3	10	12	20
eGFR 15-30	17	17	21	29





# Who is at risk & should be tested for CKD?

- Patients with diabetes mellitus
- Patients with hypertension
- Patients with heart failure
- Patients with atherosclerotic coronary, cerebrovascular or peripheral vascular disease
- Patients with a family history of ESRD
- Specific ethnic groups
  - First nations peoples
  - Asians and South Asians
  - Pacific Islanders/ African- Americans



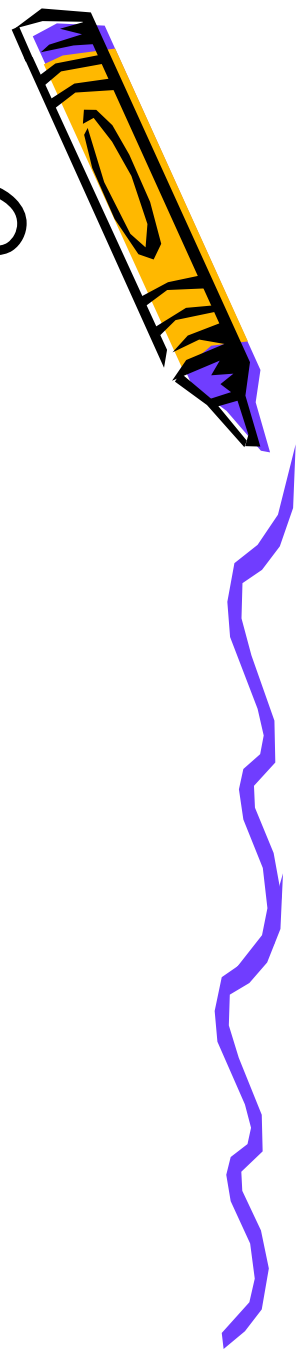
# Early Detection: The Premise



- Early identification of CKD will improve outcomes by identifying high risk groups, and permitting targeted therapy to be implemented so that adverse events are reduced..
  - Progression to ESRD
  - CVD events



# What we know: Delay of Progression of CKD

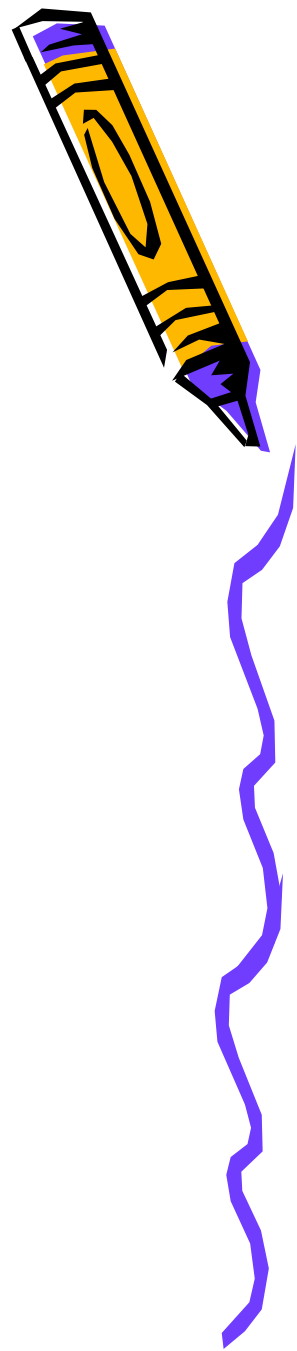


- Reduction of BP
- Reduction of Proteinuria
- Use of ACEI
- Protein and phosphate restriction
- ? Vitamin D
- ? Erythropoietin therapy/ Anemia



Independent care

# Possible Events and Outcomes of Patients CKD

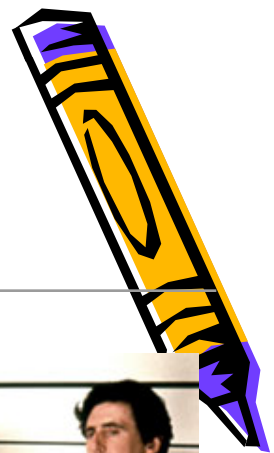


- Kidney Related
  - No change in GFR over time
  - Increased risk of Acute Kidney Injury
    - transient or sustained
  - Progression to dialysis/ transplantation
- Non kidney related
  - Increased risk of CVD
    - Heart Failure, dysrhythmias, sudden death
  - Increase risk of infection
  - Increased risk of all cause mortality



# Who is most likely to have progressive CKD...

- Clinical predictors of accelerated progression to ESRD
  - Proteinuria ( uACR >60)
  - Hypertension
  - Diabetes
  - Race (African-American, Asian, South Asian, First nations)
  - Gender (men>women)



# BC Study

## Variability and Risk Factors for Kidney Disease Progression and Death Following Attainment of Stage 4 CKD in a Referred Cohort

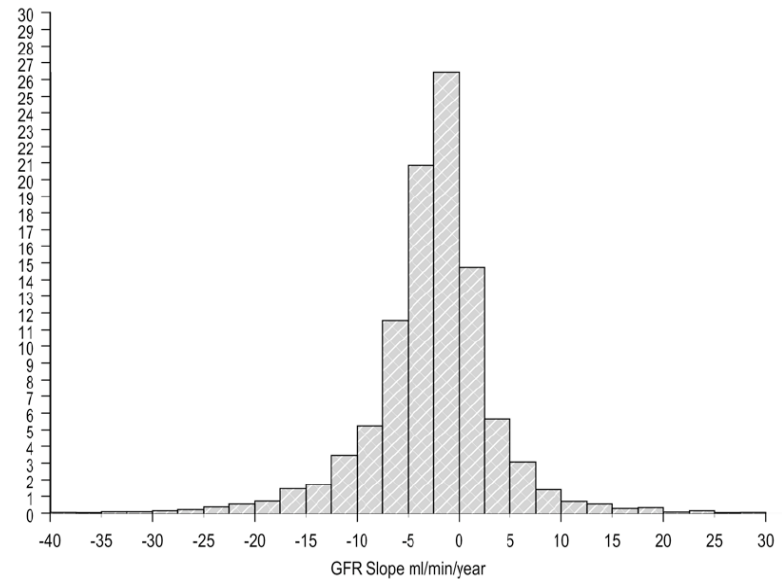
*Adeera Levin, MD, FRCPC, Ognjenka Djurdjev, MSc, Monica Beaulieu, MD, FRCPC, and Lee Er, MSc*

- Observational cohort study
- Patients registered in provincial database, start observational period at  $GFR < 30\text{mL}/\text{min}/1.73\text{m}^2$ , known to nephrologists
- $N = 4300+$  individual patients with follow up  $> 2$  years



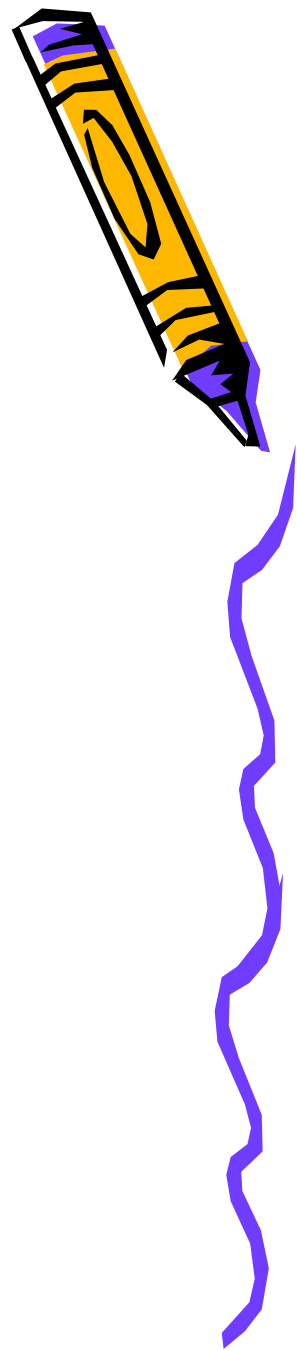
# Variable rates of progression noted

- mean rate of change in eGFR -2.65 mL/min/1.73m<sup>2</sup>/y
- 28% had no progression
- 46% had moderate progression (1-5 mL/min/y)
- 26% had rapid progression (>5mL/min/y)



# What tests?

- Blood
- Urine
- Imaging



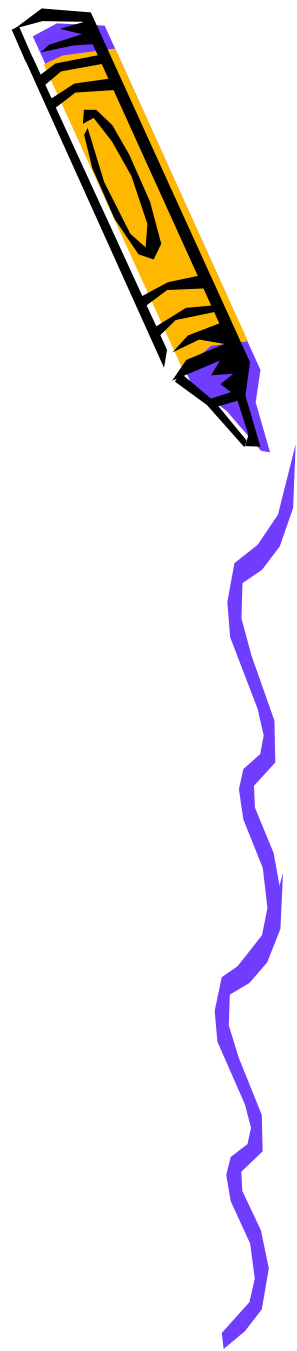


# Current eGFR equation provisos

- eGFR calculations may be less reliable in:
  - individuals with near normal GFR ( $>60$  ml/min/ $1.73\text{m}^2$ )
  - individuals with markedly abnormal body composition
    - extreme obesity
    - cachexia
    - paralysis
    - amputations
- Controversies exist as to the applicability of these formulae to
  - Different ethnic groups
    - Currently formulae exist for Japanese, Chinese, and Taiwanese populations
  - the very elderly



# Interpretation of uACR measurements

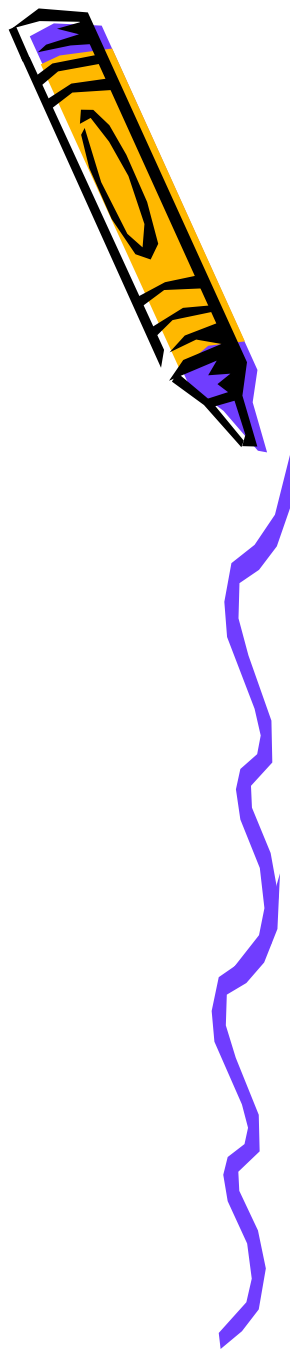


- Fluctuations common
- Repeat 2/3 samples positive
- uACR  $>3$  but consistently less than 40 is not a cause for referral alone
- Benign (transient) causes of elevated uACR
  - Concentrated urine
  - Blood in urine (menstrual period)
  - Exercise
  - Febrile illness



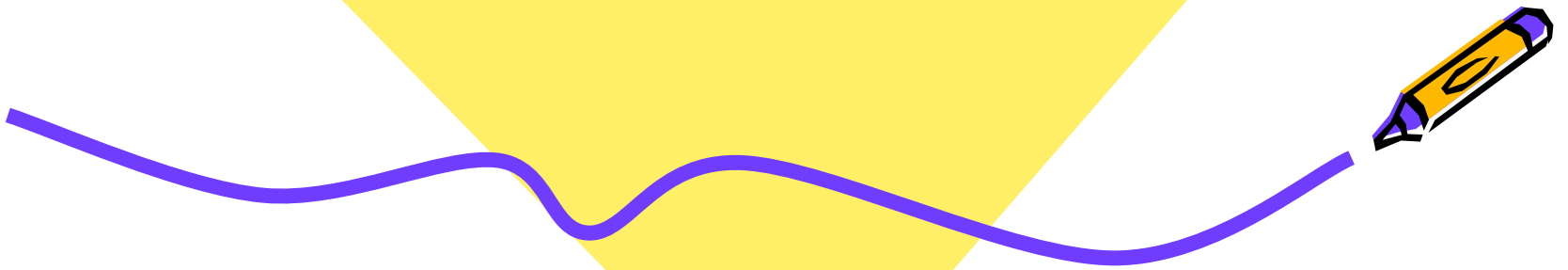
# Other Tests?

- ?ANCA
- ?C3, C4
- ?Hep B, Hep C, HIV
- ?ANA
- ?cryoglobulins





Who & When to Refer?



# Referral is recommended for

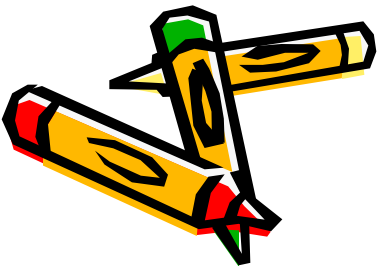
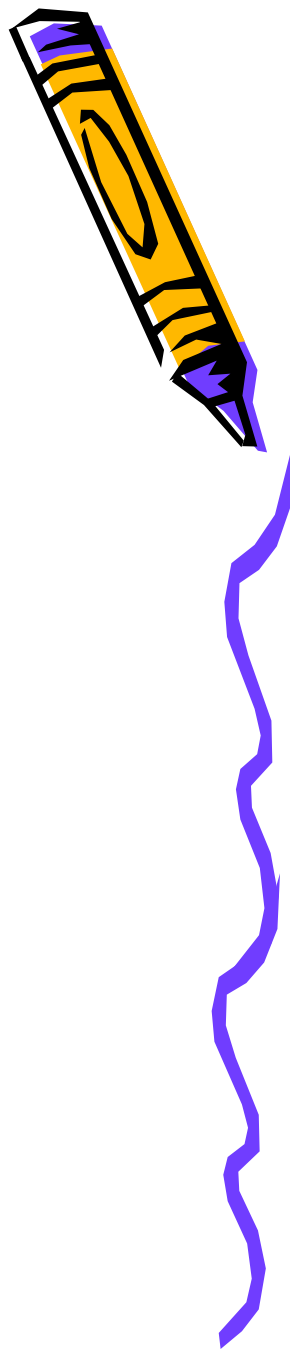
- Acute kidney failure/ abrupt sustained change
- eGFR < 30 ml/min/1.73m<sup>2</sup>. (CKD stage 4 and 5) ; contextualized within age and other parameters
- Progressive decline of eGFR not readily explained or requiring qualification
- Increasing urine protein values or active urine sediment
  - Red cell casts, RBC >20 sustained and not readily explained
- Inability to achieve treatment targets or Reassurance; explanation

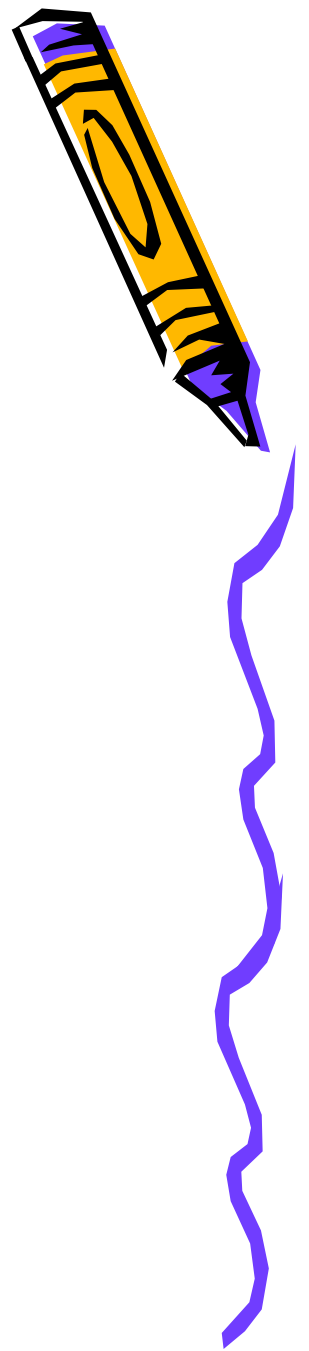


# Timely Referral

- Sooner than later
- Late referral has been associated with a 37% greater mortality than early referral

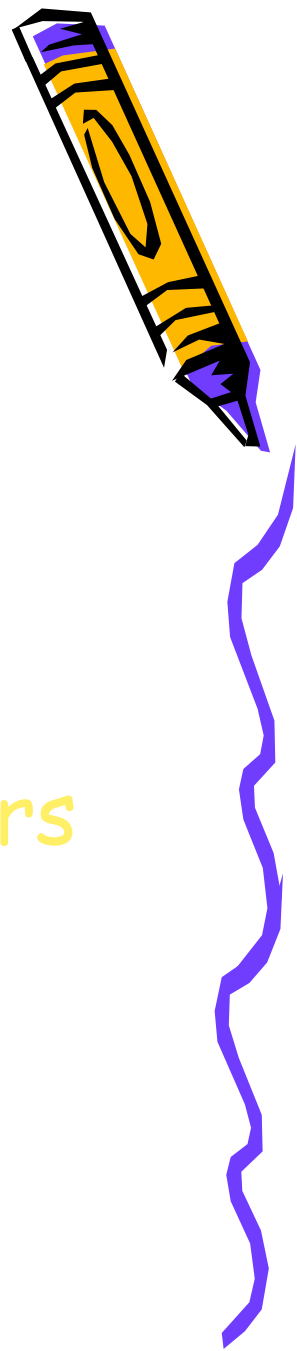
Archives of Internal Medicine  
162 (17) 2002





- 92 yrs old
- GFR: 15, ACR: 16
- Type 2 Diabetes, +HTN

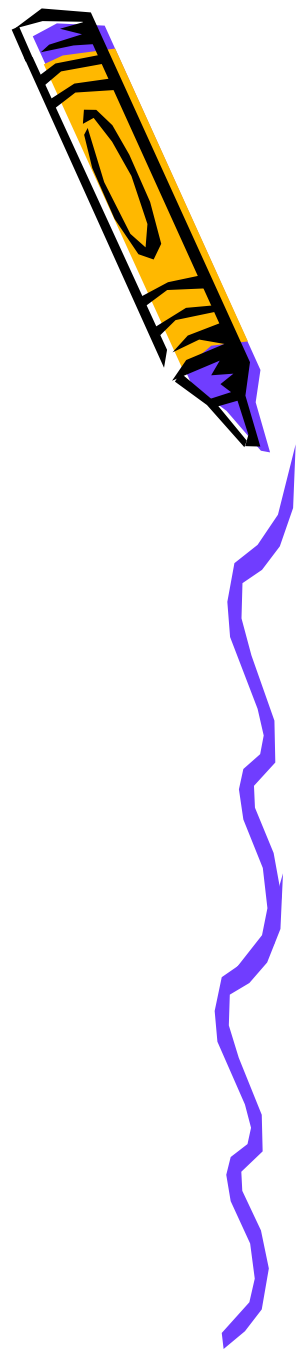




- 70 yrs
- GFR: 38, ACR: 3.0
- Post MI, no diabetes, no HTN
- Stable renal function over last 5 yrs







- 47 yr old male
- GFR: 26
- ACR: 110
- Type 2 Diabetes, HTN
- Strong FHx of ESRD





## Take Home Points

Chronic Kidney Disease is common

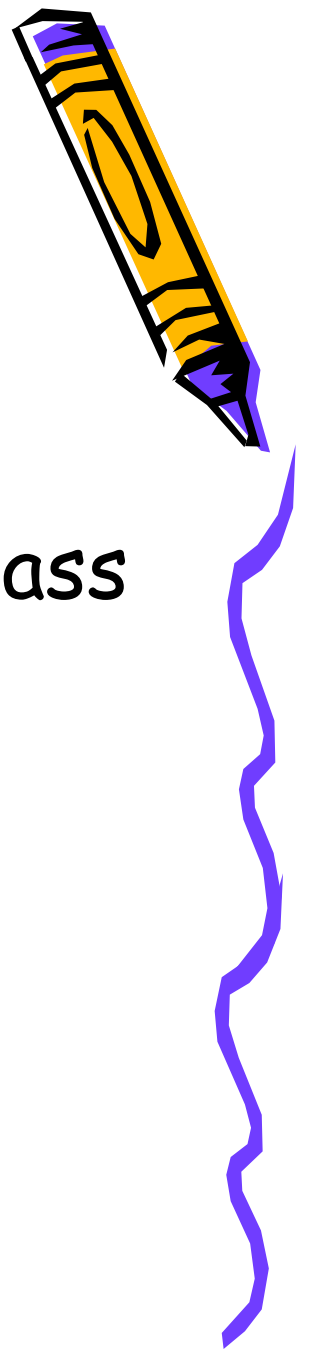
CKD does not usually progress to end stage disease in most patients





- Primary Care is best suited to deal with CKD and all the co-morbid problems
- Refer early when appropriate (RRT/Transplant)
- Document CKD in the Problem List - Automatic Review with labs
- Dialysis is a terminal disease - average life expectancy is < 5yrs if no transplant!





- Avoid Nephrotoxic Drugs!
- Try new tactics to deal with the mass of Chronic Disease!

