# eGFR, Timing of Referral and Multidisciplinary Care

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# Objectives

- Review eGFR and its interpretation
- Timing of referral
- Goal of Early referral
- Goal of Multidisciplinary CKD care

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# eGFR – The meaning

- What is GFR?
  - A true sum total of glomerular filtration
- What is eGFR?
  - An estimate of GFR
  - Uses proteins (Creatinine, cystatin-C) and equations to estimate GFR
  - Uses DTPA and other exogenous markers

# eGFR – How to estimate

- Radioisotope
  - Inulin – Gold standard (not used)
  - DTPA and Iodothalimate
- Creatinine
  - MDRD (Cr, age, gender, race)
    - Valid in GFR<60ml/min
  - CKD-EPI (Cr, age, gender, race)
    - Valid in both < and > 60ml/min

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# eGFR – The problems

- Normalized to body surface area
  - Generally use 1.73m$^2$
- Age
  - GFR declines with age (normal process)
  - Loss of 0.4-1.2 mL/min/year after age of 50

# eGFR – The problems

- Acute Kidney Injury
  - Changes in eGFR estimates do not reflect true GFR
  - Only way to estimate is radinucleotide scan or urine Cr excretion rates
- Very lean or obese individuals
  - Tend to overestimate true GFR

# eGFR – Problems with Cr

- Tubular secretion
  - As GFR declines contribution greater
  - Better to use average of Urea and Cr clearances as an estimate of GFR

# Goal of Early Referral

- Patient Education
- Modality Decisions
- Creation and maturation of vascular access
- Delay progression to ESRD
- Cardiovascular disease management

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# Consequences of Late Referral

- Increased morbidity and mortality
- Anemia
- Hyperparathyroidism
- Cardiovascular Disease
- Increased risk of hospitalization
- Increased health-care costs
- Suboptimal vascular access
- Less informed choice of dialysis modality

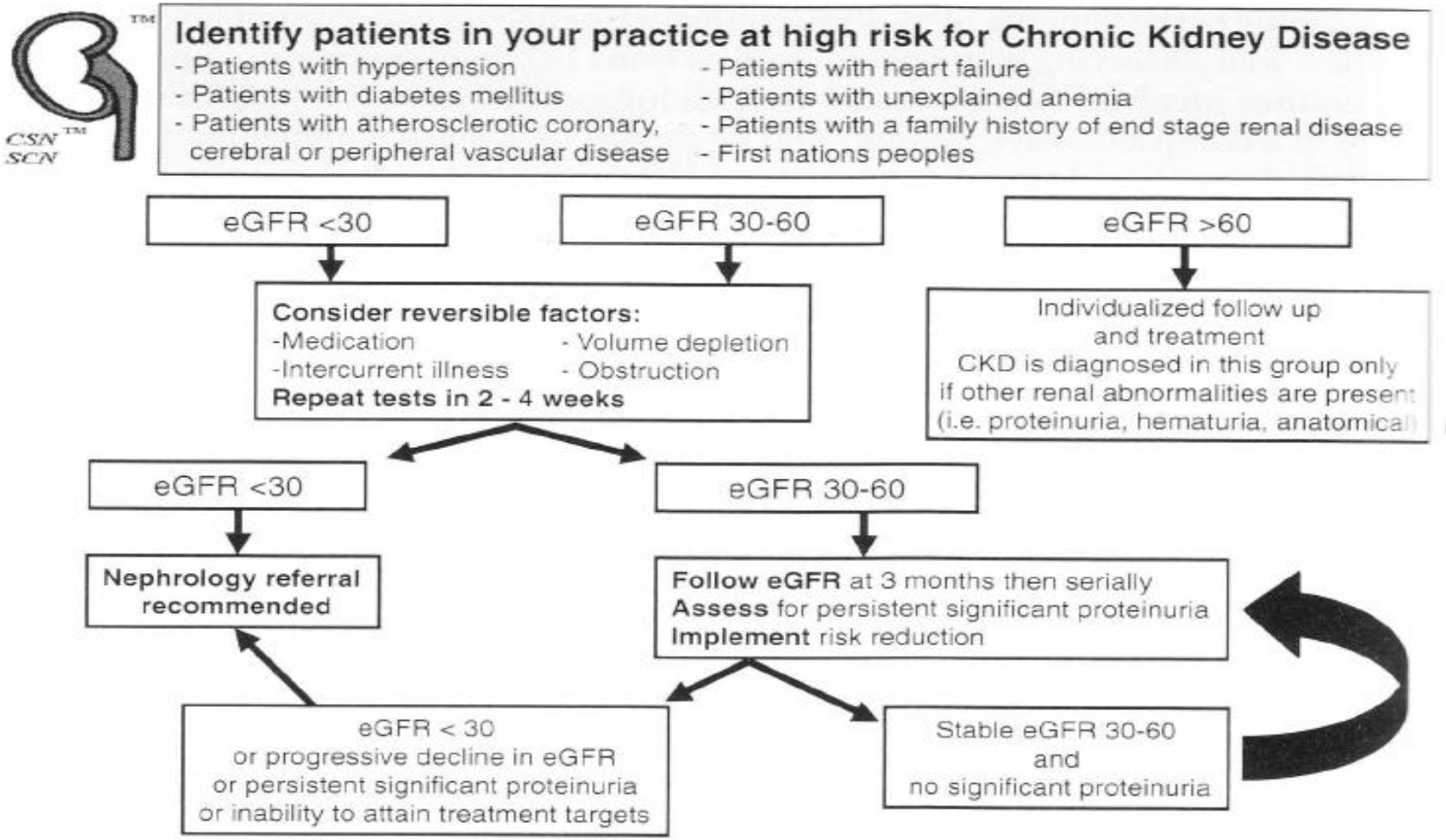
# Benefits of Early Referral

- Improved biochemical abnormalities
- Fewer hospitalized days
- Increased choice of home modalities
- Increased survival
- Delay onset of ESRD
- Less use of permanent access

# Timing of Referral

- Literature suggests:
  - Late is <1 month before ESRD
  - Early is >4 months before ESRD
- Revised definition should be:
  - Refer at least 10 months before ESRD required (preparation time)

# When to Refer




Adapted from: Handbook of Chronic Kidney Disease Management, Daugirdas JT Chapter 39, The unfulfilled promise of pre-diaylsis care in Canada. Lebner A, **Benaroia M**, Mendelssohn D. 2011

# When to Refer

- Identify high risk patients
  - Hypertension
  - DM
  - CAD
  - Anemia
  - PVD

# When to Refer

- Determine eGFR
  - Stratify according to eGFR
    - <30ml/min
    - 30-60ml/min
    - >60ml/min
  - Look for reversibility in those <60ml/min
    - Volume depletion, medicaitons
    - Do follow-up tests in 2-4 weeks

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# When to Refer

- Refer when GFR <30ml/min
  - In those where no reversible causes found
- Refer if persistent proteinuria (with risk reduction strategies) and GFR 30-60ml/min
- Refer >60ml/min if proteinuria, hematuria or other unexplained anomalies
- Rapidly progressive disease irrespective of cause

# Multidisciplinary Renal Clinic

- Patient-centered care
  - Education
- Goal to delay progression of disease
  - Target CVS disease and lifestyle changes
- Prepare patient for renal replacement
- Specialized consultation
  - Physicians, pharmacists, social workers, dieticians, nurse educators, vascular access, transplant

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# Benefits of Multidisciplinary Clinics

- Decreased urgent/crash dialysis starts
  - Optimal starts
- Home dialysis as modality
- Optimal vascular access
- Improved
  - blood pressure control, anemia and mineral metabolism
- Fewer hospitalizations, decreased mortality

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# Questions?

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