

10
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2016



— KIDNEY —
DISEASE
& CHILDREN

**ACT EARLY
TO PREVENT IT!**

World Kidney Day 2016: Kidney Disease & Children. Act Early to Prevent It!



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World Kidney Day 2016: Kidney Disease & Children. Act Early to Prevent It!

- ▶ Kidney disease affects millions of people worldwide, including many children who may be at risk at an early age.
- ▶ It is **crucial** that we encourage and facilitate education, early detection and a healthy life style in children, to fight the increase of preventable kidney diseases and to treat children with inborn and acquired disorders of the kidneys worldwide.



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Pediatric Kidney Disease – An Update

Edited by the ASPN Clinical Affairs Committee
and G. Hidalgo, MD

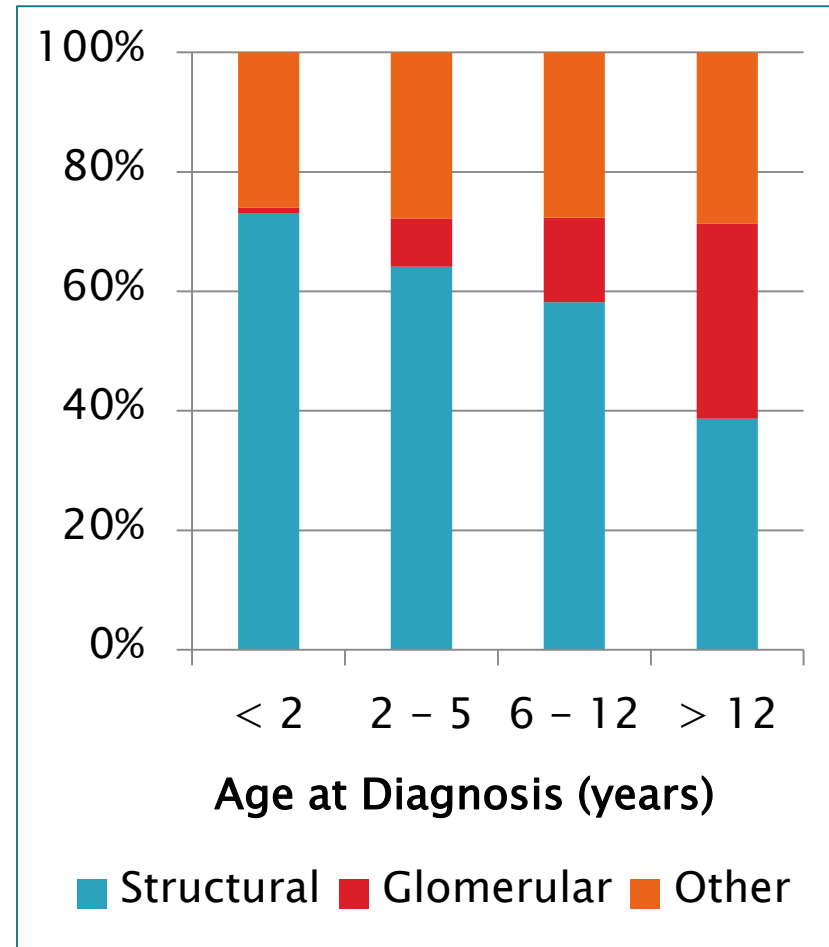


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CKD: Etiologies

- Congenital structural disorders **49%**
 - Mutations in *PAX2* and *HNF1B* genes account for about 10% of hypodysplasia
- Glomerular disorders (NS/GN) 16%
- Genetic kidney disease (PKD) 10%
- Acquired kidney disease 6%
- Other 16%
- Unknown 3%

NAPRTCS 2008 Annual Report



CKD: Definition and Staging

- ▶ Current CKD staging (> 2 y/o):

CKD Stage	GFR	Management
1	≥ 90*	Treat p... n
2	60 – 89*	Monit... on
3	30 – 59 [#]	Assess... Report)
4	15 – 29 [#]	Complica... increase; discuss ESRD
5 (ESRD)	< 15 [#]	Renal replacement therapy

5 year mortality of 11% in children developing ESRD (USRDS 2015 Annual Report)

*Plus abnormality ≥ 3 months in blood, urine, imaging or biopsy

[#]For ≥ 3 months

- ▶ GFR = glomerular filtration rate (mL/min/1.73m²)
 - Estimated by revised (2009) Schwartz formula: $0.413 \times \text{Ht (cm)} \div \text{creatinine}$



CKD: Recent Studies



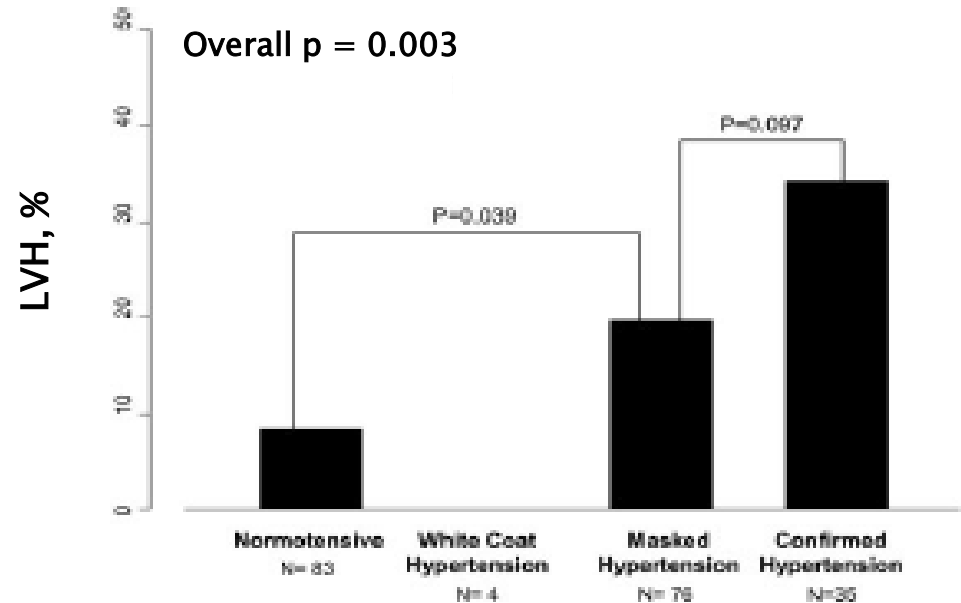
- ▶ Chronic Kidney Disease in Children (CKiD) study
 - NIH-sponsored prospective cohort study
 - Started enrollment in 2005. ECU Peds Neph is a participating center, since 2011.
 - 57 participating centers
 - *891* patients enrolled
 - 63 publications by the end of 2015
 - Top areas of publication:
 - Cardiovascular disease in pediatric CKD
 - GFR measurement
 - CKD progression
 - Neurocognitive function in pediatric CKD



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Important Findings on CKD Complications

- ▶ Masked HTN is common (38%) in pediatric CKD and is associated with LVH
 - BP is often undertreated



Mitsnefes, et al. JASN 2010



Important Findings on CKD Complications



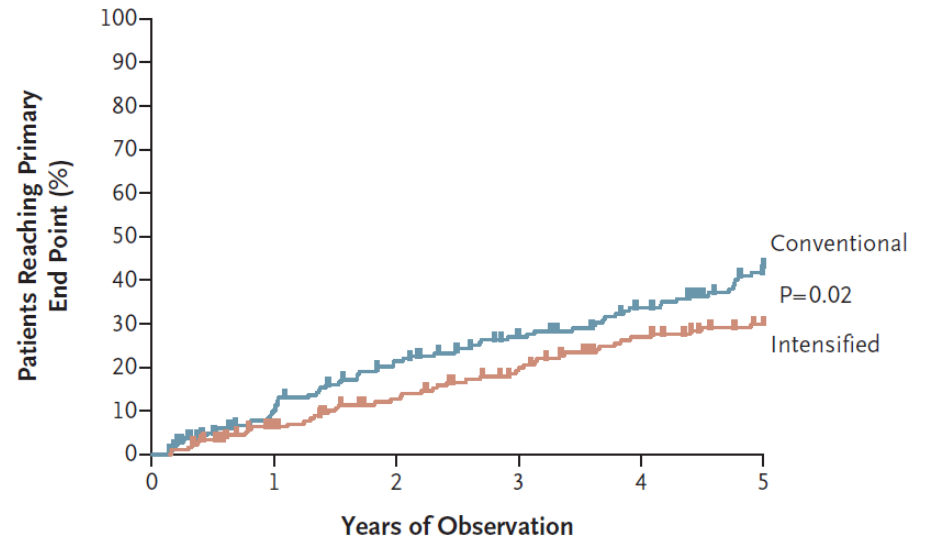
- ▶ Children with CKD are at increased risk for scoring low (< 1 SD) in neurocognitive measures (IQ, academic achievement, attention and executive function)
 - Lower GFR and longer CKD duration associated with lower scores
- ▶ Growth in pediatric CKD remains suboptimal
 - Low birth weight and small for gestational age are independent risk factors
 - Greater use of growth hormone and controlling acidosis may offer highest yield in improvement



CKD Progression and Treatment



- ▶ BP treatment
 - More aggressive goal (<50th/tile, amb MAP) may slow CKD progression
 - ESCAPE trial
 - Large (n = 385) RCT in children with CKD comparing strict (<50th %) vs standard (<90th %) BP goal



Wuhl et al. NEJM 2009

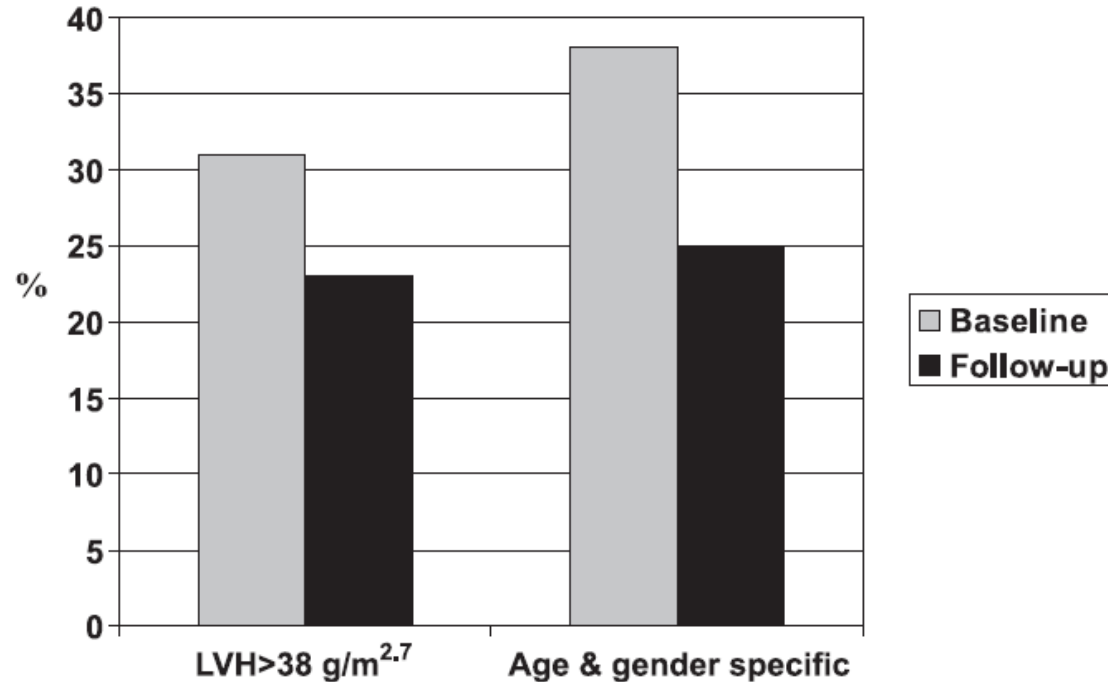


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CKD Progression and Treatment



- BP treatment with ACE inhibitors may decrease prevalence of LVH



Matteucci et al. CJASN 2013



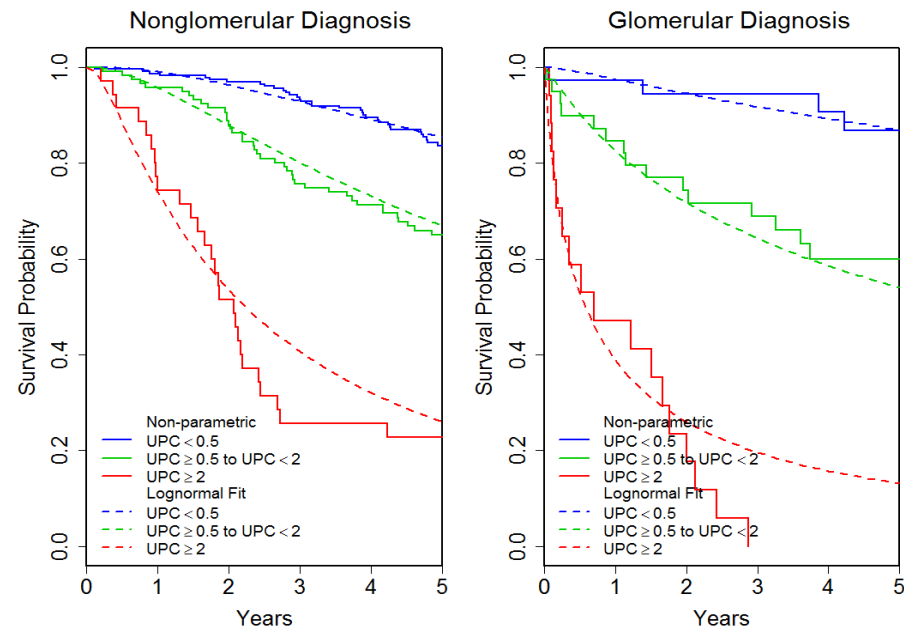
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CKD Progression and Treatment



▶ Proteinuria

- Important risk factor in CKD progression
 - For both glomerular and non-glomerular disease
- Agents to reduce proteinuria
 - ACE inhibitors (ACEI)
 - Angiotensin receptor blockers (ARBs)
 - Avoid combination therapy with ACEI + ARBs
 - Mineralocorticoid antagonists



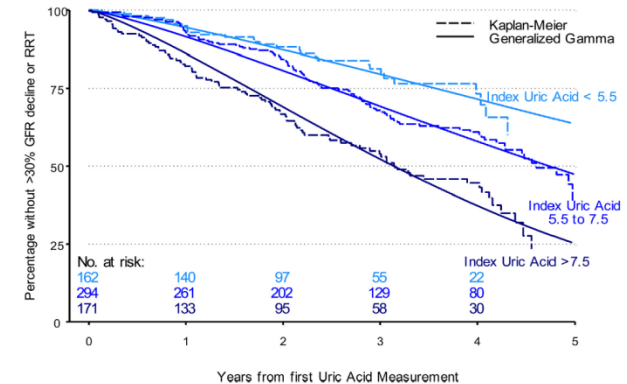
Warady et al. AJKD 2015



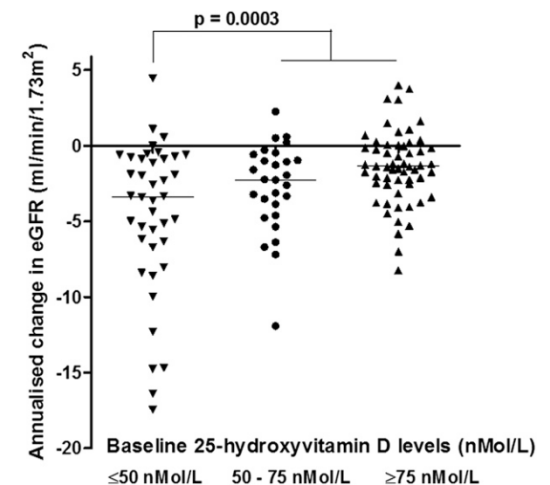
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CKD Progression and Treatment

- ▶ Other risk factors for CKD progression which may lead to new therapeutic targets
 - Metabolic acidosis
 - Hyperuricemia
 - Low vitamin D level
- ▶ Other agents being investigated
 - e.g. pentoxifylline
 - Slowed CKD progression in adults with diabetes and CKD stage 3–4



Rodenbach et al. AJKD 2015



Shroff et al. JASN 2016

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CKD: Summary



- ▶ Congenital structural disorders account for half of CKD in children
- ▶ Hypertension is under-recognized and under-treated in children with CKD
- ▶ CKD adversely affects growth and neuro-cognitive development



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Happy World Kidney Day 2016!



Your pediatric nephrology community continues to work hard to improve clinical care, foster education, and advance the science regarding kidney disease in children! We appreciate your support and all you do for children's health care!



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