Chronic Kidney Disease in Children

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CKiD Principal Investigator ECC

CKiD Investigators

CKiD Coordinators

CKiD Study Goals

- Recruit and Retain CKiD participants
- Define risk factors for CKD progression
- Define effects of CKD progression on:
  - Cardiovascular Disease risk factors
  - Neurocognitive development/function
  - Growth failure

Study Design

- **Observational Cohort Study**

  - 5 year study initially, 10 year renewal

  (Oct 2003 – Jul 2008, Aug 2008 – Jul 2013, Aug 2013 – Jul 2018)

  - Cohort 1 enrollment: Apr 2005 - Aug 2009

  - Cohort 2 enrollment: Feb 2011 – March 2014

  - Cohort 3 to be enrolled: Aug 2016 – July 2018

- **Cohort 1: 586 Children age 1 to 16 with mild to moderate kidney dysfunction: 30-90 ml/min|1.73m^2**
- **Cohort 2: 305 Children age 1 to 16 with mildly impaired kidney function: 45-90 ml/min|1.73m^2**
- **Cohort 3: 190 Children age 0.5 to 16 with Non-Glomerular disease for less than 5 years**

CKiD Baseline Characteristics (Median or %) of Children by CKD Diagnosis, N= 891

Characteristic	Glomerular N=275	Non-Glomerular N=616
Male	53%	66%
African-American	31%	19%
Hispanic Ethnicity	16%	14%
Age, years	14	10
Age at CKD onset, years	8.5	0.0
Years since CKD onset	3.5	9.3
SCr (Enzymatic), mg/dL	1.1	1.1
Cystatin C (Siemens Healthcare), mg/L	1.2	1.5
Urine protein:creatinine (uP/C)	0.7	0.3
iGFRc, ml/min/1.73m^2	59.4	46.2
Systolic BP ≥ Expected 95th %ile – 5	+8%	+8%
Diastolic BP ≥ Expected 95th %ile – 5	+5%	+8%
Self- Reported Hypertension	56%	43%
Left Ventricular Hypertrophy	15%	11%
IQ	96	98
Child Overall QOL	79	77
Premature (Gestational Age< 36 weeks)	9%	13%
Low Birth Weight (< 2500 grams)	15%	20%
Height Percentile – 50	-9	-23
BMI Percentile – 50	+32	+12

Distribution of Chronic Kidney Disease Diagnoses, N= 891

Glomerular CKD Diagnosis	% (n) n=275	Non-Glomerular CKD Diagnosis	% (n) n=616
Focal Segmental Glomerulosclerosis	29% (79)	*Obstructive Uropathy*	*24% (149)*
Hemolytic Uremic Syndrome	19% (52)	*Aplastic/Hypoplastic/Dysplastic Kidneys*	*24% (146)*
Systemic Immunological Disease (including SLE)	14% (38)	*Reflux Nephropathy*	*19% (118)*
Chronic Glomerulonephritis	8% (23)	*Other*[a]	*12% (71)*
Familial Nephritis (Alport's)	7% (19)	Autosomal Recessive Polycystic Kidney Disease	4% (23)
IgA Nephropathy (Berger's)	6% (17)	Renal Infarct	3% (21)
Membranoproliferative Glomerulonephritis Type I	4% (12)	Pyelonephritis/Interstitial Nephritis	2% (13)
Henoch Schonlein Nephritis	3% (9)	*Syndrome of Agenesis of Abdominal Musculature*	*2% (13)*
Other	3% (7)	*Congenital Urologic Disease*	*2% (11)*
Idiopathic Cresentic Glomerulonephritis	3% (7)	Medullary Cystic Disease/Juvenile Nephronophthisis	2% (11)
Congenital Nephrotic Syndrome	1% (4)	Cystinosis	2% (11)
Membranous Nephropathy	1% (4)	Wilms' Tumor	1% (7)
Membranoproliferative Glomerulonephritis Type II	1% (3)	Methylmalonic Acidemia[b]	1% (6)
Sickle Cell Nephropathy	<1% (1)	Perinatal Asphyxia	1% (5)
		Autosomal Dominant Polycystic Kidney Disease	1% (4)
		Branchio-oto-Renal	1% (3)
		Vactrel or Vacter Syndrome	*<1% (2)*
		Oxalosis	*<1%* (2)

Data Source: December 2014 & CKDDX December 2014 *Italics indicate urologic diagnosis*

[a] In Cohort 1, 28 of the 62 KIDs with non-glomerular "other" primary diagnosis were classified as urologic diagnosis

[b] Methylmalonic Acidemia was added as a new primary diagnosis category in May 2013

Data Collection

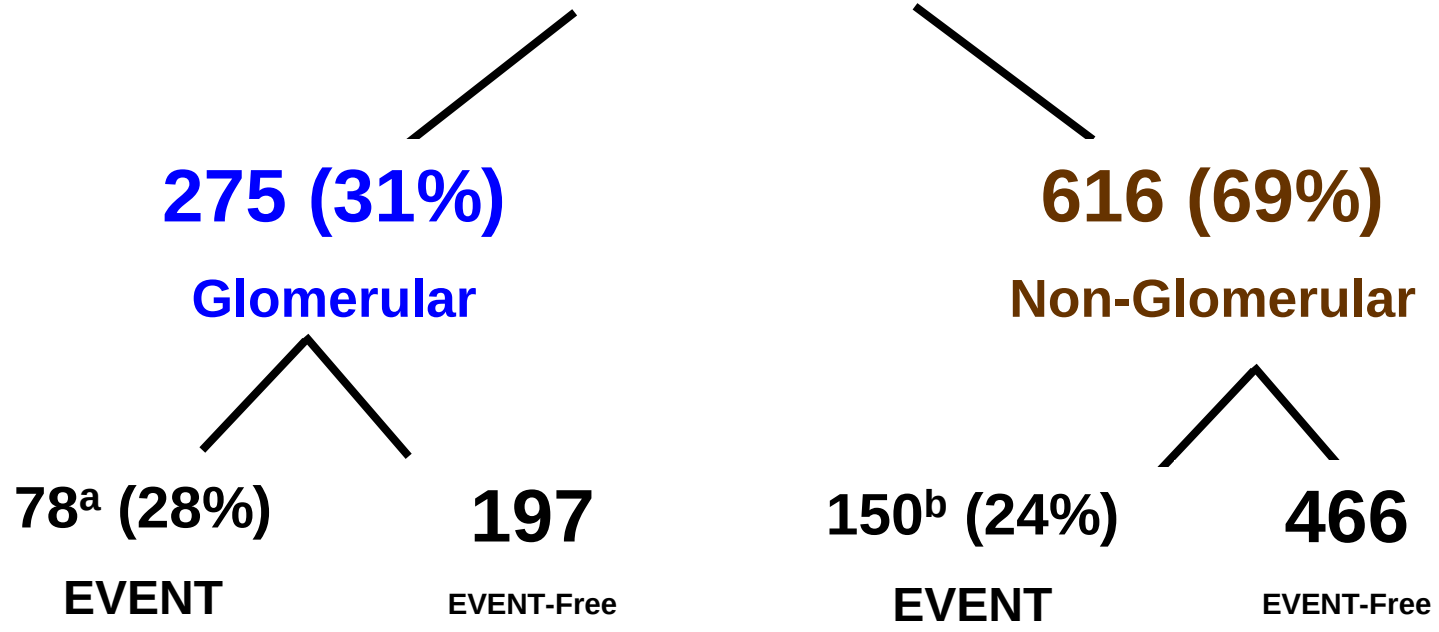
		Pre-Study	V1A	V1B	Even Follow-up	Odd Follow-up
	Consent	♦				
Basic	Questionnaires/Forms	♦	♦	♦	♦	♦
	Physical Examination		●	●	●	●
	Blood & Urine Samples		X	X	X	X
Kidney	Iohexol-based GFR		X		X	
	Estimated GFR	X	X		X	X
CVD	ABPM & Lipid Profile				■	
	Echocardiogram				■	
Neuro	Pediatric Quality of Life			▲	▲	▲
	Cognitive Development			▲		▲
	Behavioral Assessment [b]			▲		▲ [a]
Growth	Tanner Staging		●		●	●
	iPTH & hsCRP			●		●
Stored	*Biological Samples*			*X*	*X*	*X*
	Genetic Sample			*X*		

[a] Behavioral Assessment discontinued beginning at V9

CKiD Cohort as of December 2015

891= 586+305

V1a Visits with at least one measurement of GFR



[a] 78 = 17 Transplants + 59 Dialysis + 2 Death

[b] 150 = 72 Transplants + 76 Dialysis + 2 Death

KIDMAC Index

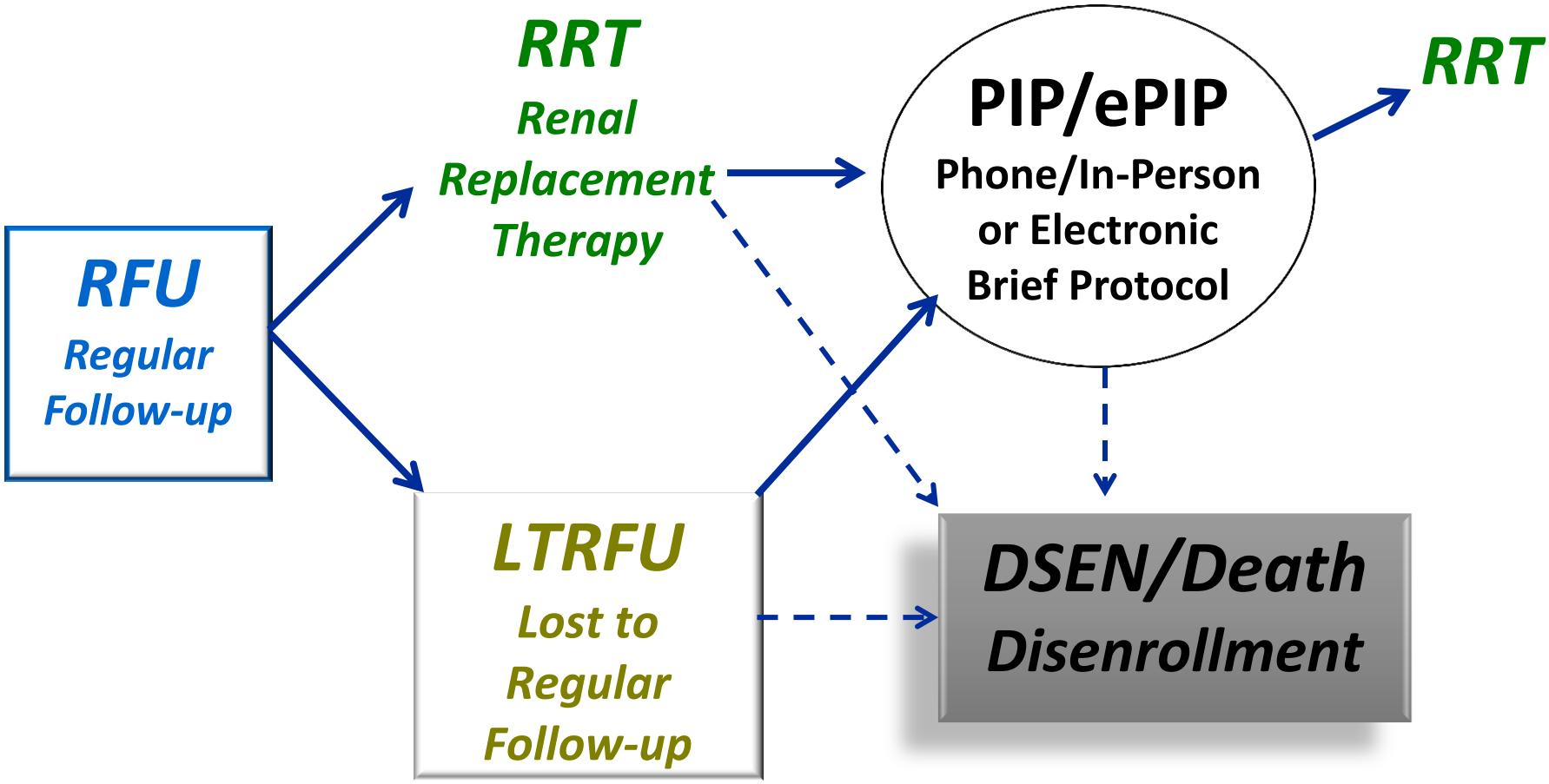
- N= 891= 275 Glomerular + 616 Non-glomerular
  - # African-American= 199
  - # of KIDs with ≥5 visits= 586[a]
- # of person-years= 4491[b]
- # of person-visits= 4247[c]
- # of SCr= 4219[d]
- # of iohexol studies= 2640
- # of Dialysis= 146 (11)
- # of Transplant= 92 (3)
- # of Continued follow-up visits (PIP/ePIP)= 517

- # of sites= 54
  - # of active sites= 45
- # of NP Assessments= 2274
- # of Echos= 1530
- # of ABPMs=1368

[a] Subset of clinical visits, excluding visit 15
[b] Sum of LDATSTDY – BSDATE
[c] # of clinical visits, excluding visit 15
[d] Centrally or locally measured SCr

Based on studies in 02Dec15 gfrsummary
Based on CBL available SCr in 02Dec15 gfrsummary

Participation Status in CKiD



Repository Index

- # of participants with Biological samples archived= 752
  - # of biological samples archived= 90,509
  - # of biological sample shipped= 12,688
  - # of ancillary studies= 10
- # of participants with DNA samples archived= 720
  - # of DNA samples archived= 755
  - # of DNA samples shipped= 1,683
  - # of ancillary studies= 7
- Data collected as of July 31, 2014
  - # of records archived= 110,896
  - # of data files= 61
  - # of ancillary studies= 8

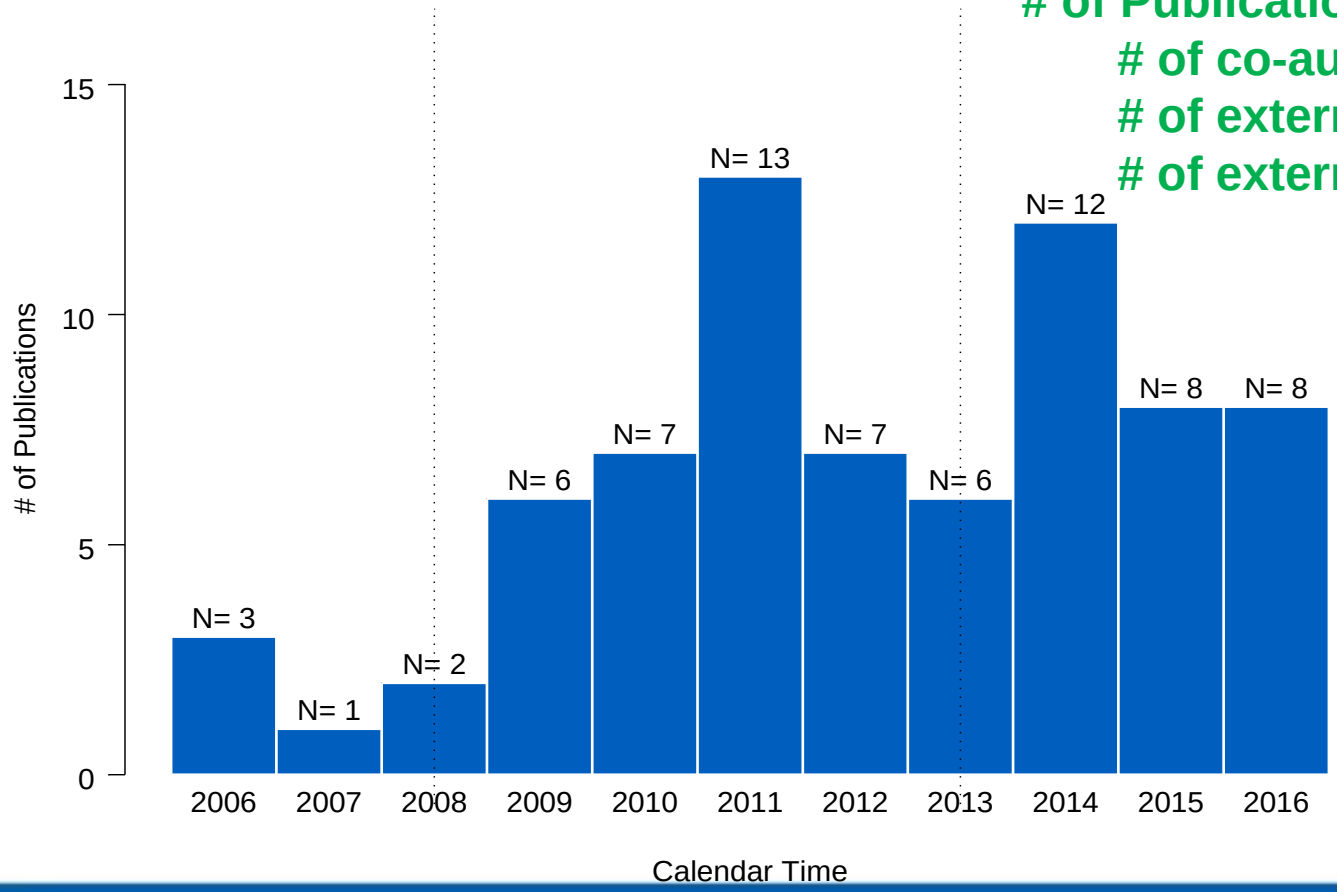
147
CKiD Initiatives

42
Expedited

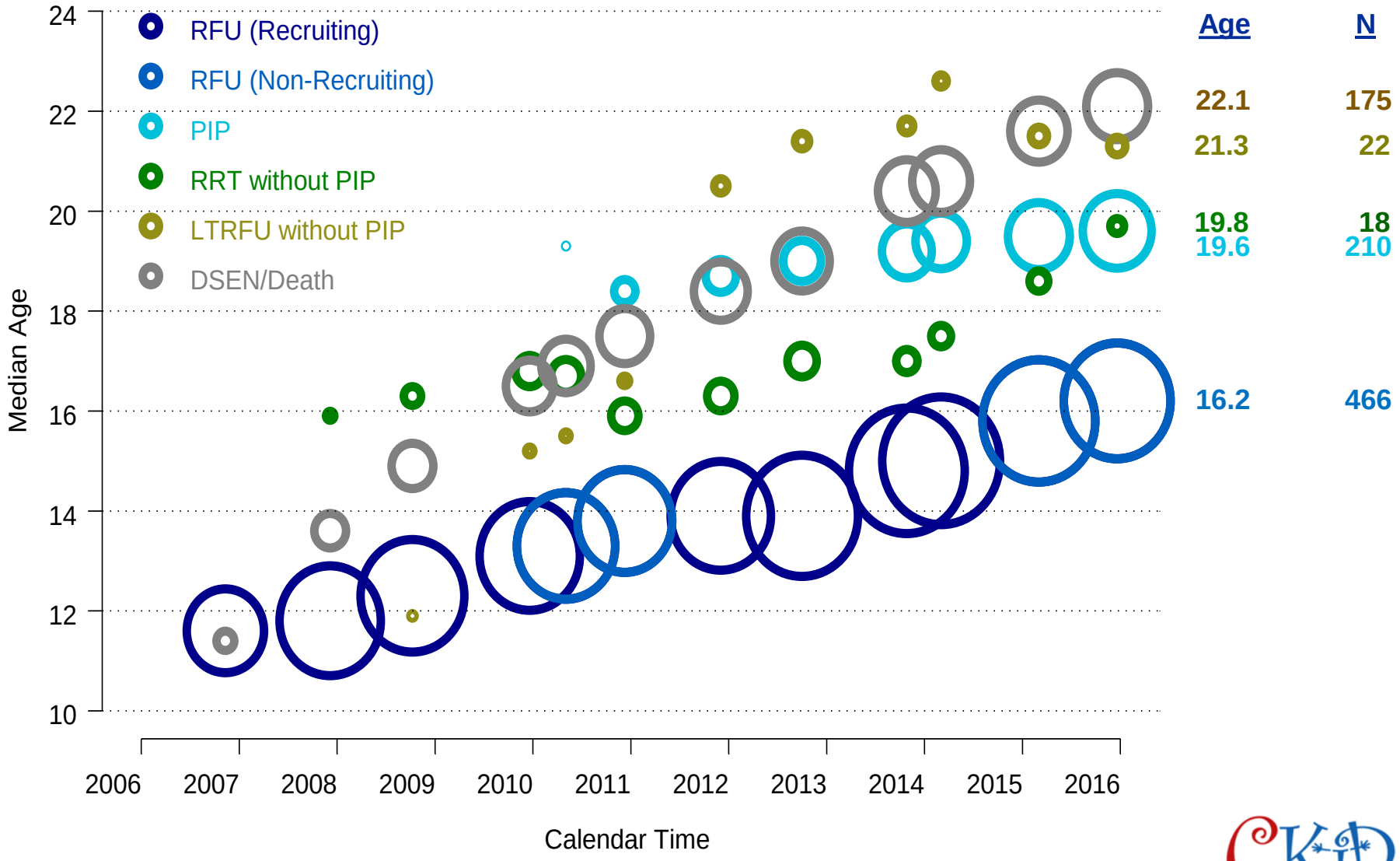
105
Scientific Review

CKiD Publications by Year

# of Publications= 73
# of co-authors= 143
# of external investigators= 65
# of external lead authors= 17



Evolution of Participation Status in CKiD



http://statepi.jhsph.edu/ckid/

CKiD Chronic Kidney Disease in Children

Home | Study Information | Study Administration | Investigator Resources | Coordinator's Corner | Psychologist's Corner | Family Corner | Publications & Dossier

About CKiD

The CKiD Study is a NIH-funded, multicenter, prospective cohort study of children aged 1 to 16 years with mild to moderate impaired kidney function. The primary goals of CKiD are to determine the risk factors for decline in renal function and to define how progressive decline in renal function impacts biomarkers of risk factors for cardiovascular disease; neurocognitive function and behavior; and growth failure and its associated morbidity. Two clinical coordinating centers (CCCs) (at Children's Hospital of Philadelphia and at Children's Mercy Hospital in Kansas City), a central biochemistry laboratory (at the University of Rochester), and a data coordinating center (at Johns Hopkins School of Public Health) formed a cooperative agreement to conduct the CKiD Study.

Study Aims

- To determine risk factors for progression of pediatric chronic kidney disease
- To examine the impact of CKD on neurocognitive development
- To examine the impact of CKD on risk factors for cardiovascular disease
- To examine the impact of CKD on growth

Clinical Coordinating Centers

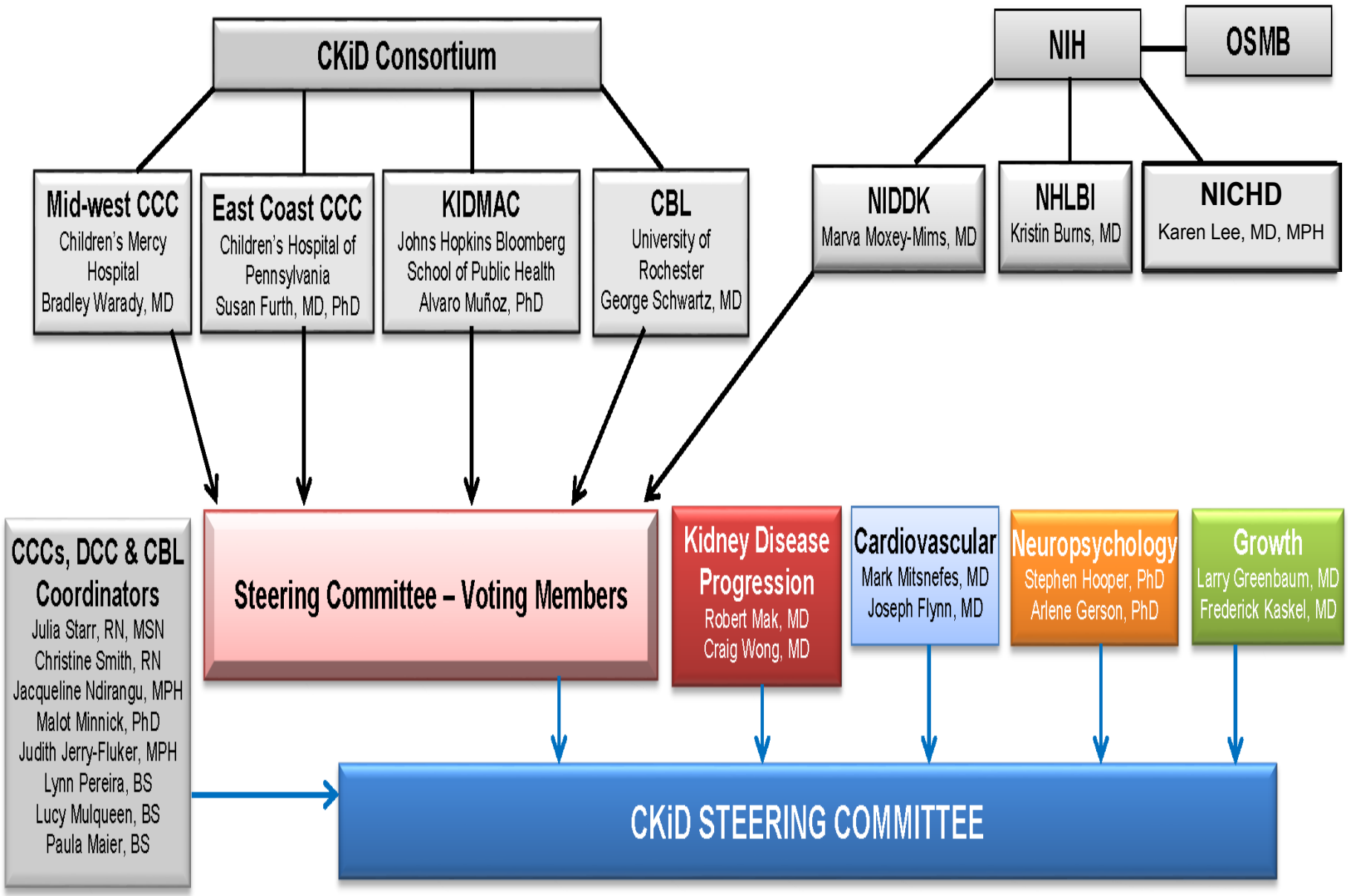
CKiD Study Workshop
June 19-20,2017

Contact Us

CKiD Study Information

Key Forms for Sites

Online BP Certification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