International Pediatric Renal Nutrition Taskforce – Updating KDOQI

Christina L. Nelms, MS RD LMNT
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Objectives

- Describe the formation and purpose of the Paediatric Renal Nutrition Taskforce (PRNT)
- Review the evidence review process to form the Clinical Practice Recommendations
- Outline updates from the Clinical Practice Recommendations

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The Pediatric Renal Nutrition Taskforce (PRNT) is an international team of pediatric renal dietitians and pediatric nephrologists, who develop clinical practice recommendations (CPRs) for the nutritional management of various aspects of renal disease management in children.

From: The dietary management of calcium and phosphate in children with CKD stages 2-5 and on dialysis – clinical practice recommendation from the Pediatric Renal Nutrition Taskforce, submitted to *Pediatr Nephrol*.

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KDOQI Clinical Practice Guideline for Nutrition in Children with CKD Work Group Membership

Work Group Co-Chairs

Bradley A. Warady, MD
Children's Mercy Hospitals and Clinics
Kansas City, MO

Donna Secker, PhD, RD
The Hospital for Sick Children
Toronto, Canada

Work Group

Bethany Foster, MD
Montreal Children's Hospital
Montreal, Canada

Sarah E. Ledermann, MB
Great Ormond Street Hospital for Children
London, UK

Stuart L. Goldstein, MD
Baylor College of Medicine
Houston, TX

Franz S. Schaefer, MD
Heidelberg University Hospital
Heidelberg, Germany

Frederick Kaskel, MD, PhD
Children's Hospital at Montefiore
Bronx, NY

Nancy S. Spinozzi, RD, LDN
Children's Hospital
Boston, MA

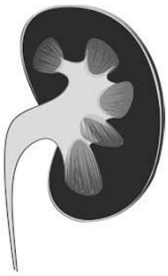
Methods Consultants

Tufts Center for Kidney Disease Guideline Development and Implementation at Tufts Medical Center, Boston, MA

Katrin Uhlig, MD, MS, *Program Director, Nephrology*
Ethan Balk, MD, MPH, *Program Director, Evidence Based Medicine*

National Kidney Foundation KDOQI KIDNEY DISEASE OUTCOMES QUALITY INITIATIVE

KDOQI



PRNT

PAEDIATRIC RENAL NUTRITION TASK FORCE

Taskforce coordinators:

- Rukshana Shroff, Great Ormond Street Hospital for Children, London, UK, Rukshana.Shroff@gosh.nhs.uk
- Vanessa Shaw, University of Plymouth and UCL Great Ormond Street Institute of Child Health, University College London, UK,

Other taskforce members:

- An Desloovere, Pediatric Nephrology, University Hospital Ghent, Belgium, an.desloovere@uzgent.be
- Bernd Hoppe, University of Bonn, Bonn, Germany, Bernd.Hoppe@ukbonn.de
- Brad Warady, M.D. Children's Mercy Kansas City, Kansas City, Missouri, USA, bwarady@cmh.edu
- Christina Nelms, Paediatric Renal Nutrition Consultant and Educator, USA, clnelms@gmail.com
- Fabio Paglialonga, Pediatric Nephrology, Dialysis and Transplant Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Polic
- Jetta Tuokkola, New Children's Hospital / Helsinki University Hospital, Finland, jetta.tuokkola@hus.fi
- Johan Vande Walle, Uzgent University Hospital Ghent, UZ Ghent, Belgium, Johan.vandewalle@uzgent.be
- JWM Renken-Terhaerdt, Wilhelmina Children's hospital, University Medical Center Utrecht, Utrecht, The Netherlands, j.renken
- Larry Greenbaum, Emory University and Children's Healthcare of Atlanta, USA, Lgreen6@emory.edu
- Leila Qizalbash, Great Northern Children's Hospital, Newcastle upon Tyne Hospitals, Newcastle, UK, Leila.qizalbash@nuth.nhs
- Michiel J.S. Oosterveld, Emma Children's Hospital, Amsterdam University Medical Center, Amsterdam, The Netherlands, m.oo
- Nonnie Polderman, British Columbia Children's Hospital, Vancouver, Canada, npolderman@cw.bc.ca

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Members of the PRNT

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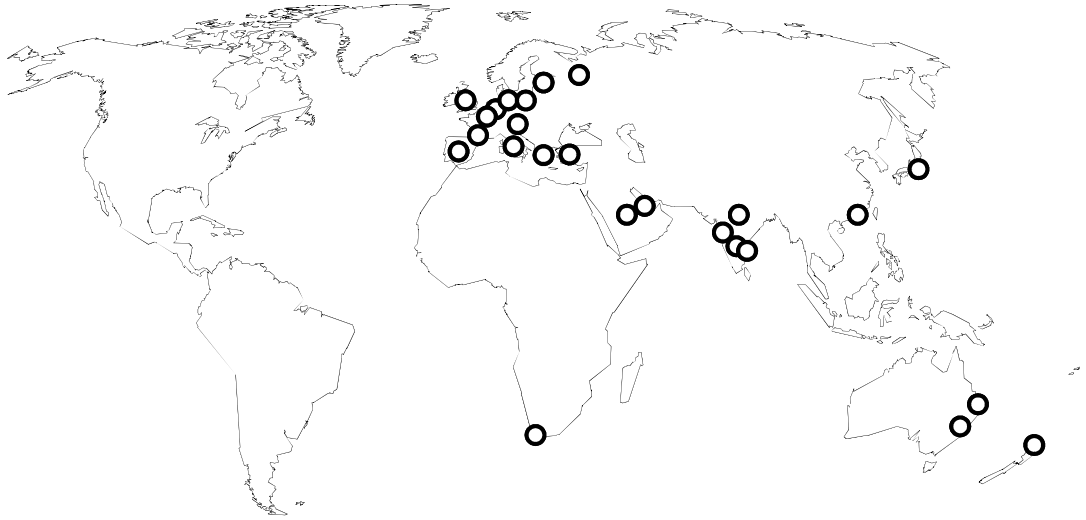
Participants in the First Delphi Survey



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Goals of Recommendations

- KDOQI considered a durable foundation, but there is need to capture advances from newer research
- Update one topic at a time and periodically review
- Provide practical, useful guidance to clinicians
- Distribute to under-served areas of the world, and ultimately impact patient and families
- Consider international perspective

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Formation of Taskforce

- Originally devised as European taskforce
  - Core working group – board members
  - 5 physicians and 5 dietitians chosen from multiple applicants
- North Americans (4) added after the first meeting and additional funding secured
- External advisory group included invited clinicians to help form guidelines on topics of expertise
- Inclusion of multi-national reviewers to strengthen international approach

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European Society for Paediatric Nephrology

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The Paediatric Renal Nutrition Taskforce

PAEDIATRIC RENAL NUTRITION TASK FORCE

The Paediatric Renal Nutrition Taskforce comprises Paediatric Renal Dietitians and Paediatric Nephrologists from 8 countries across Europe and North America wh dedicated to improving the nutritional care of children with kidney disease.

The taskforce is endorsed by ESPN and IPNA.

Our vision: To ensure best practice in the nutritional management of children with kidney diseases

Our mission:

- To formulate clinical practice recommendations to enable best practice
- To provide education and training resources for Healthcare Professionals caring for children with kidney diseases
- To devise resources which offer practical support to children with kidney disease and their families
- To promote research to expand the evidence base for nutritional intervention in CKD

Our values: Our work will be guided by our commitment to open and transparent discussion amongst our members who strive to produce quality recommendations, based on the evidence base where possible. We will work inclusively with external experts and stakeholders and respect their opinion in developing and disseminating best practice for the benefit of children with renal diseases.

Why was the Paediatric Renal Nutrition Taskforce created?

The taskforce was set up in December 2017, prompted by the challenges and inconsistencies in the nutritional management of children with kidney disease globally. Many renal centres do not have trained dietitians and the importance of nutrition in patient care is not always addressed in medical education.

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Evidence Review Process

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PICO Questions

- ***Population*** – Children from birth to 18 years of age with kidney diseases
- ***Intervention***
- ***Comparator***
- ***Outcomes***
- Group derived search terms in major medical databases

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Grading and Follow Up

- Use of the AAP grading system
  - High (A), moderate (B), low (C), very low (D), X – unable to perform studies
- Delphi method
  - International leading experts sent e-questionnaire for level of agreement
    - Strongly agree to strongly disagree
    - 70% consensus required
- Research recommendations included

Supplemental Table 2. American Academy of Pediatrics grading matrix

Aggregate Evidence Quality	Benefit or Harm Predominates	Benefit and Harm Balanced
Level A Intervention: Well-designed and conducted trials, meta-analyses on applicable populations Diagnosis: Independent gold standard studies of applicable populations	Strong Recommendation	Weak Recommendation (based on balance of benefit and harm)
Level B Trials or diagnostic studies with minor limitations; consistent findings from multiple observational studies	Moderate Recommendation	
Level C Single or few observational studies or multiple studies with inconsistent findings or major limitations.		
Level D Expert opinion, case reports, reasoning from first principles	Weak Recommendation (based on low quality evidence)	No recommendation may be made
Level X Exceptional situations where validating studies cannot be performed and benefit or harm clearly predominates	Strong Recommendation / Moderate Recommendation	

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A new term needed – Suggested Dietary Intake (SDI)

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A number of different terms have been used in international recommendations to describe nutrient adequacy; these include Population Reference Intake (PRI), Recommended Dietary Allowance (RDA), Adequate Intake (AI) and others. Since these recommendations for dietary adequacy have different definitions and have used different methods in their derivation, some of the resulting recommendations differ widely… We have taken a pragmatic approach and quoted the range of the published values for our recommendations. We refer to this new reference using a novel term, Suggested Dietary Intake

From: The dietary management of calcium and phosphate in children with CKD stages 2-5 and on dialysis – clinical practice recommendation from the Pediatric Renal Nutrition Taskforce, submitted to *Pediatr Nephrol*.

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Updates from the Recommendations

PAEDIATRIC RENAL NUTRITION TASK FORCE

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The dietary management of calcium and phosphate in children with CKD stages 2-5 and on dialysis

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The dietary management of calcium and phosphate in children with CKD stages 2-5 and on dialysis – clinical practice recommendation from the Pediatric Renal Nutrition Taskforce

Louise McAlister[1*], Pearl Pugh[2*], Laurence Greenbaum[3], Dieter Haffner[4], Lesley Rees[1], Caroline Anderson[5], An Desloovere[6], Christina Nelms[7], Michiel Oosterveld[8], Fabio Paglialonga[9], Nonnie Polderman[10], Leila Qizalbash[11], Jose Renken-Terhaerdt[12], Jetta Tuokkola[13], Bradley Warady[14], Johan Vande Walle[6], Vanessa Shaw[1,15], Rukshana Shroff[1]

*These authors contributed equally

1 Great Ormond Street Hospital for Children NHS Foundation Trust, and University College London Institute of Child Health, London, UK
2 Nottingham Children's Hospital, Nottingham University Hospitals NHS Trust, Nottingham, UK
3 Emory University and Children's Healthcare of Atlanta, USA
4 Children's Hospital, Hannover Medical School, Germany
5 Southampton Children's Hospital, University Hospital Southampton NHS Foundation Trust, Southampton, UK
6 University Hospital Ghent, Belgium
7 PedsFeeds LLC, University of Nebraska, USA
8 Emma Children's Hospital, Amsterdam University Medical Center, The Netherlands
9 Fondazione IRCCS Ca'Granda Ospedale Maggiore Policlinico, Milan, Italy
10 British Columbia Children's Hospital, Vancover, Canada
11 Great Northern Children's Hospital, Newcastle Upon Tyne, UK
12 Wilhelmina Children's Hospital, University Medical Center Utrecht, The Netherlands
13 New Children's Hospital, Helsinki University Hospital, Finland
14 Children's Mercy Kansas City, USA
15 University of Plymouth and Great Ormond Street Hospital for Children NHS Foundation Trust, and University College London Institute of Child Health, London, UK

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PICO Questions

- ***Population:*** Children from birth to 18 years of age with CKD2-5D.
- ***Intervention:*** Nutritional requirements for Ca and P in children at different stages of CKD
- ***Comparator:*** Nutritional requirements for Ca and P in age-matched healthy controls 5
- ***Outcomes:*** Growth, bone disease, fracture risk, Ca balance, bone mineralization on imaging or biopsies, development of hypo- or hypercalcemia, hypo- or hyper-phosphatemia or hyperparathyroidism, and development of vascular calcification.

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Under review

Recommendation Statements

- **1. What are the main dietary sources of Ca and P for an infant, child and adolescent?**
  - **1.1 The main dietary sources of Ca for children are milk, milk products, breast milk and manufactured infant formulas. Statutory or voluntary fortification of foods with Ca can increase the contribution from other foods. (ungraded)**
  - **1.2 The main natural dietary sources of P for children are milk (including milk products, breast milk and manufactured infant formulas), cereal (grains) and cereal products, and meat and meat products. Inorganic P added to some processed foods is readily absorbed and can significantly increase P intake. (ungraded)**

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Under review

Recommendation Statements

- 2. How are Ca and P intake assessed in healthy children and children with CKD2-5D?
- We suggest that in healthy children and those with CKD2-5D a diet history of a typical 24 hour period be used to rapidly identify the main dietary sources of Ca and P, including P additives in processed foods. An estimate of the total Ca and P intake should consider contributions from diet, nutritional supplements, dialysate and medications, including P binders. (grade C, weak recommendation)

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Under review

Recommendation Statements

- 3. What are the Ca and P requirements in an infant, child and adolescent?
  - 3.1 Requirements in healthy children We describe the Ca and P requirements for healthy children as background and justification for estimating the requirements for children with CKD2-5D; specific recommendations for healthy children are outside the scope of this document.
  - 3.2 Requirements in children with CKD2-5D
    - 3.2.1 We suggest that the diet of children with CKD2-5D should be regularly assessed for total Ca and P content. The contribution of P additives to total P intake cannot be quantified, but dietary sources of P additives should be identified where possible. Frequency of assessment is based on the child's age, CKD stage and trends in serum Ca, P and PTH. (ungraded)

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Under review

Recommendation Statements

- 3.2.2 We suggest that the total Ca intake from diet and medications, including P binders, should be within the SDI, and be no more than twice the SDI, unless in exceptional circumstances. (grade C, weak recommendation) 12
- 3.2.3 In special circumstances, such as for infants with CKD or those with mineral depleted bone, a higher Ca intake may be considered with careful monitoring. (grade C, weak recommendation)
- 3.2.4 We suggest that the dietary P intake of children with CKD should be within the SDI for age, without compromising adequate nutrition. (grade C, weak recommendation)

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Under review

Recommendation Statements

- 4. Managing the Ca and P requirements in children with CKD2-5D
  - 4.1 We suggest that intake of Ca and P is adjusted to maintain serum Ca and P levels within the age appropriate normal range, without compromising nutrition. Changes in management should be based on trends of serial results rather than a single result, with integration of serum Ca, P, PTH, alkaline phosphatase and 25-vitamin D levels. (grade C, weak recommendation)
  - 4.2 We suggest that children with CKD who have hyperphosphatemia or hyperparathyroidism may require further dietary restriction of P, potentially to the lower limit of the SDI, without compromising adequate nutrition. Advice to limit the P contribution from phosphate additives should be given. Use of P binders for further control of serum P and PTH levels is often required, in addition to dietary restriction. Be aware of the high phosphate content of phosphate additives. (grade C, weak recommendation)

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Under review

Recommendation Statements

- 4.3 We suggest that children with persistent hypocalcaemia or a high PTH may require a Ca intake above 200% of the SDI for calcium for short periods and under close medical supervision. Calcium can be provided through Ca supplementation, together with vitamin D (usually both native and active forms), as well as other sources of Ca such as a high Ca dialysate. (grade C, weak recommendation)
- 4.4 We suggest that children with persistent hypophosphatemia should have their dietary P intake increased. P supplements may be necessary in some patients, particularly those on intensified dialysis or with renal wasting of P. (grade C, weak recommendation)

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Under review

Recommendation Statements

- 5. Management of the CKD patient with hypercalcemia
  - 5.1 Acute, severe hypercalcemia can be life-threatening and requires rapid medical intervention. (grade X, strong)
  - 5.2 In a child with persistent mild to moderate hypercalcemia, we suggest a stepwise approach with reducing or stopping Ca supplements, Ca-based P-binders, and native and active vitamin D and using lower calcium dialysate. Transient reduction of dietary Ca, without compromising adequate nutrition, may be necessary. Regular reassessment is required, especially when Ca intake is reduced below the SDI. (grade C, weak recommendation)

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Energy and protein requirements for children with CKD stages 2-5 and on dialysis

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PICO Questions

- ***Population:*** Children from birth to 18 years of age with CKD2-5D
- ***Intervention:*** Nutritional requirements for energy and protein in children at different stages of CKD
- ***Comparator:*** Nutritional requirements for energy and protein in age-matched healthy children
- ***Outcomes***: Energy and protein requirements to support normal growth and development in children with CKD2-5D

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Likely highlights from the new recommendations

Foundation from Healthy Children

Using all national databases as a range termed the **SDI** – healthy populations have similar needs to CKD

Factors Influencing Children with CKD

Adjust energy intake toward higher end for underweight children, adjust as needed for overweight; protein should be within SDI, lower for high urea levels, higher for dialysis losses

Nutritional Prescription

Preference is for breastmilk, then whey-based formula, concentrate kcal as needed to meet nutrition goals with gradual increases; solid food as per healthy children balancing with individual diet restrictions, promoting variety and oral stimulation; prompt intervention and supplementation if centiles declining

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Assessment of the nutritional status in children with kidney diseases

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PICO Questions

- ***Population:*** Children from birth to 18 years of age with kidney diseases
- ***Intervention:*** Assessment of nutritional requirements
- ***Comparator:*** Assessment in healthy age- and gender-matched pediatric populations or no comparator
- ***Outcomes*** – Valid assessment of underweight, overweight, obesity, malnutrition and related calorie and protein needs, adequacy of nutritional intake

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Likely highlights from the new recommendations

Anthropometrics

Use standard measures (ht, wt, BMI, HC), age-based guidance; use WHO or region-specific growth charts; trends important; z-scores complementary; frequency guidelines; z-scores complementary; mid-parental height; prematurity guidelines; secondary measure guidelines

Dietary Intake

Frequency of dietary evaluation based on severity of illness/other factors; evaluate appetite; 3 day+ food record first choice, then dietary recalls

Biochemical

nPCR for adolescents on HD, caution with albumin; other labs potentially part of the total picture

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Upcoming Recommendation Documents

- Delivery of the nutritional prescription
- Potassium management
- Obesity and metabolic syndrome
- Kidney transplant

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Thanks!

Any questions?

PAEDIATRIC RENAL NUTRITION TASK FORCE

You can find me at:

- clnelms@gmail.com or nelmscl@unk.edu

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