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Supplemental Table 1 – Search strategy used in the literature review for MEDLINE (Pubmed, 1966 to 1 October 2016)

1	Vitamin D.tw.	23	Hemodialysis.tw.
2	Vitamin D2.tw.	24	Haemodialysis.tw.
3	Vitamin D3.tw.	25	CAPD.tw.
4	Cholecalciferol.tw.	26	CCPD.tw.
5	Colecalciferol.tw.	27	APD.tw.
6	Ergocalciferol.tw.	28	Hemofiltration.tw.
7	or/1-6	29	Haemofiltration.tw.
8	Paediatric.tw.	30	Hemodiafiltration.tw.
9	Pediatric.tw.	31	Haemodiafiltration.tw.
10	Child*.tw.	32	CKD.tw.
11	Infant.tw.	33	CKF.tw.
12	Neonatal.tw.	34	CRD.tw.
13	Adolescent.tw.	35	CRF.tw.
14	or/8-13	36	ESKD.tw.
15	Kidney disease.tw.	37	ESKF.tw.
16	Kidney failure.tw.	38	ESRD.tw.
17	Renal disease.tw.	39	ESRF.tw.
18	Renal failure.tw.	40	or/15-39
19	Renal insufficiency.tw.	41	7 (limited to systematic review)
20	Renal replacement therapy.tw.	42	7 and 14 (limited to systematic review and clinical trial)
21	Dialysis.tw.	43	7 and 14 and 40
22	Pre dialysis.tw.	44	7 and 40 (limited to systematic review and clinical trial) 7 and 40 (limited to systematic review and clinical trials)

Supplemental Table 2A – Quality of evidence and strength of the recommendation

Quality of evidence	High	A	Strength of recommendation	Level 1	Corresponds to “strong” in GRADE
	Moderate	B			
	Low	C		Level 2	Corresponds to “weak or discretionary” in GRADE
	Very low	D			

Supplemental Table 2B – Clinical practice implications of the level of recommendations

Level 1 recommendation can be examined to determine their suitability for use in developing a clinical performance measure. On the other hand, a level 2 grade inherently indicates uncertainty, and future research may provide higher quality evidence or more precise estimates or yield opposing findings.

Level of Strength	Implications		
	Patients	Clinicians	Policy
1 ("We recommend")	Most patients would want the recommended course of action; only a small proportion would not	Most patients should receive the recommended course of action	The recommendation can be evaluated as a candidate for developing a policy of performance measure
2 ("We suggest")	The majority of patients would want the recommended course of action; but many would not	Different choices will be appropriate for different patients	There is a need for substantial debate and involvement of stakeholders

Supplemental Table 3 - Randomised controlled trials of native vitamin D therapy in children with chronic kidney disease – level of evidence:

Author, year	Sequence generation	Allocation concealment	Blinding of participants	Blinding of personnel	Blinding of outcome assessors	Incomplete outcome data	Selective outcome reporting	Other sources of bias	Funding source
Shroff; 2012 ⁸	Yes	Yes	Yes	Yes	Yes	No	No	No	Research charity

Supplemental Table 4 – Randomised controlled trials of vitamin D₂ vs vitamin D₃ supplementation in children without chronic kidney disease – level of evidence

Author, year	Sequence generation	Allocation concealment	Blinding of participants	Blinding of personnel	Blinding of outcome assessors	Incomplete outcome data	Selective outcome reporting	Other sources of bias	Funding source
Gallo; 2013 ⁸²	Unclear	Unclear	Unclear	Unclear	Unclear	No	No	73% on vitamin D supplement at baseline	Unclear
Thacher; 2010 ⁸⁴	Yes	Yes	Unclear	Unclear	Unclear	No	No	Historic cohort of rachitic children treated with D ₂ used as comparator	Government
Gordon; 2008 ⁸³	Yes	No	No	No	No	No	No	Weekly D ₂ dose is not a direct comparison on a IU per IU basis	Government Research charity

Supplemental Table 5 – Summary of recommendations for native vitamin D therapy in children with chronic kidney disease 2-5D

	CATEGORY	RECOMMENDATION	GRADE
1	<i>Assessing vitamin D status</i>	We recommend measuring serum 25(OH)D concentration for assessing the vitamin D status of children with CKD 2-5D.	not graded
2	<i>Monitoring vitamin D levels</i>	We suggest the following schedule for measuring serum 25(OH)D levels in children with CKD stage 2-5D: - 6 – 12 monthly depending on CKD stage in children not on vitamin D treatment - if normal levels, measure 6 -12 monthly (based on previous 25OHD level and stage of CKD). If vit D supplementation required – check levels after 3 months. If: <ul style="list-style-type: none"> • normal levels, continue vit D supplements as above and measure levels 6-monthly • low levels, consider one repeat course of 'intensive replacement treatment' as described below and repeat levels in 3-months 	2D
3	<i>Defining target levels of vitamin D</i>	We suggest that serum 25(OH)D levels are maintained above 75nMol/L (>30ng/ml) in children with CKD stages 2 – 5D. We classify vitamin D status as follows: - Sufficiency > 75 nMol/L (>30 ng/ml) - Insufficiency 50 – 75 nMol/L (20 – 30 ng/ml) - Deficiency 12 - 50 nMol/L (5- 20 ng/ml) - Severe deficiency <12 nMol/L (<5 ng/ml)	2C
4	<i>Target population</i>	We suggest using native vitamin D supplements for the treatment of vitamin D deficiency in children with CKD stages 2-5D who have serum 25(OH)D concentrations below 75nMol/L. In children with CKD stages 2-3 native vitamin D supplements may be used for the prevention or treatment of secondary hyperparathyroidism.	2B
5	<i>Type of vitamin D supplementation</i>	We suggest using either vitamin D ₂ (ergocalciferol) or vitamin D ₃ (cholecalciferol) treatment in children with CKD 2 – 5D to increase serum 25(OH)D levels to the target range.	2D
6	<i>Treatment schedule for native vitamin. D supplementation</i>	We suggest using a treatment regimen, guided by age and vitamin D concentration, for the prevention and treatment of vitamin D deficiency in children with CKD 2-5D. Mega-dose vitamin D therapy is not recommended.	2C

		<table border="1"> <thead> <tr> <th colspan="4">Intensive replacement phase</th> </tr> <tr> <th>Age</th> <th>25(OH)D serum (nMol/L)***</th> <th>Vitamin D supplementation dose (daily)</th> <th>Monitoring</th> </tr> </thead> <tbody> <tr> <td><1 year</td> <td></td> <td>600 IU / day *</td> <td rowspan="3">- Serum Ca and urinary Ca levels 1-3 monthly based on CKD stage - 25(OH)D levels after 3 months</td> </tr> <tr> <td rowspan="2">>1 year**</td> <td>< 12</td> <td>8000 IU / day</td> </tr> <tr> <td>12 - 50</td> <td>4000 IU / day</td> </tr> <tr> <td></td> <td>50 – 75</td> <td>2000 IU / day</td> </tr> <tr> <th colspan="4">Maintenance phase</th> </tr> <tr> <td><1 year</td> <td rowspan="2">>75****</td> <td>400 IU / day</td> <td rowspan="2">- 25(OH)D levels 6-12 monthly</td> </tr> <tr> <td>>1 year*</td> <td>1000 - 2000 IU /day based on CKD stage</td> </tr> </tbody> </table> <p>* In infants under 1 year a fixed dose is recommended irrespective of the level of 25(OH)D</p> <p>** Consider adjusting dose by body size (weight or body surface area)</p> <p>*** To convert nMol/L to ng/ml divide by 2.5</p> <p>**** If levels remain <75nmol/L, then give doses as per the 'Intensive replacement' schedule for a further course of intensive replacement and recheck levels</p>	Intensive replacement phase				Age	25(OH)D serum (nMol/L)***	Vitamin D supplementation dose (daily)	Monitoring	<1 year		600 IU / day *	- Serum Ca and urinary Ca levels 1-3 monthly based on CKD stage - 25(OH)D levels after 3 months	>1 year**	< 12	8000 IU / day	12 - 50	4000 IU / day		50 – 75	2000 IU / day	Maintenance phase				<1 year	>75****	400 IU / day	- 25(OH)D levels 6-12 monthly	>1 year*	1000 - 2000 IU /day based on CKD stage	
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7	Vitamin D toxicity	We suggest that vitamin D supplementation is stopped at serum 25(OH)D concentrations above 120nMol/L (48ng/ml). Symptomatic toxicity from Vitamin D is defined as serum 25(OH)D above 250nMol/L with hypercalcaemia, hypercalciuria and suppressed PTH.	2D																														