How Does Metabolic Acidosis Impair Muscle and Bone Health?

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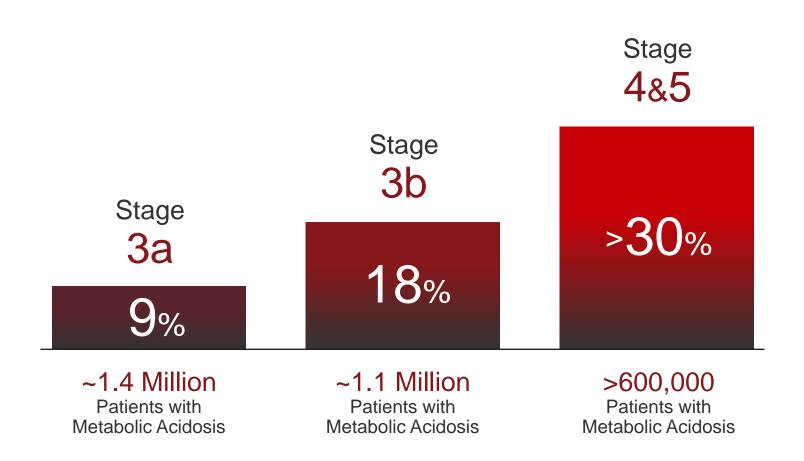
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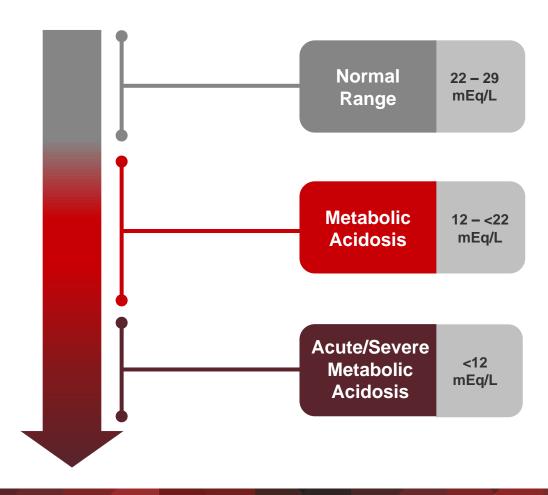
Disclosure: Dr. Bushinsky is a consultant to Tricida, Inc.

Three Million Patients with Stage 3 to 5 CKD Affected by Metabolic Acidosis



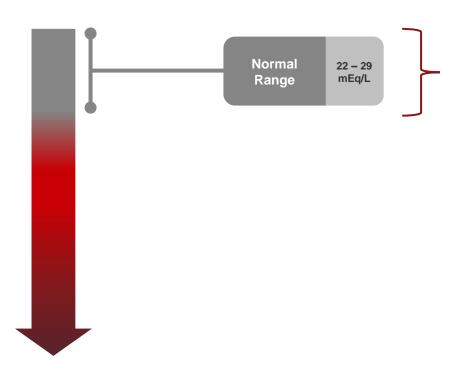
Metabolic Acidosis as Defined by Guidelines

Serum Bicarbonate Levels Fall Below 22 mEq/L



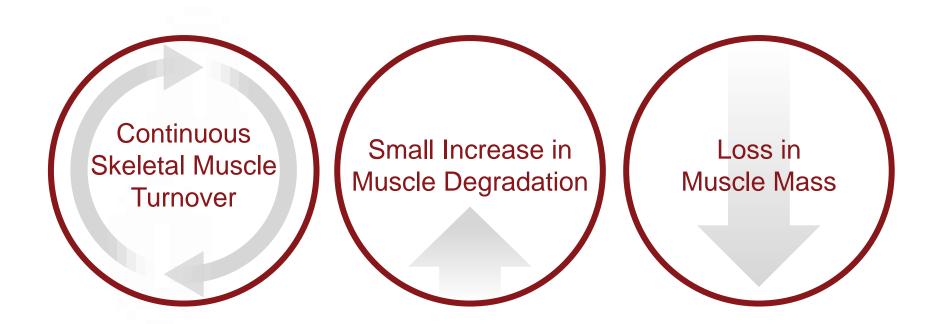
Body Adapts Prior to Decrease from Normal Serum Bicarbonate Range

Serum Bicarbonate Levels

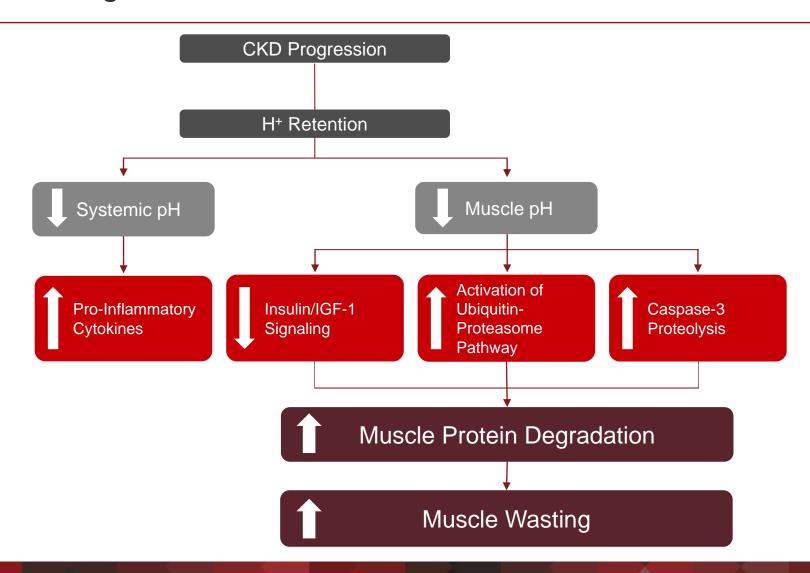


Body Adapts Prior to Decrease from Normal Serum Bicarbonate Range

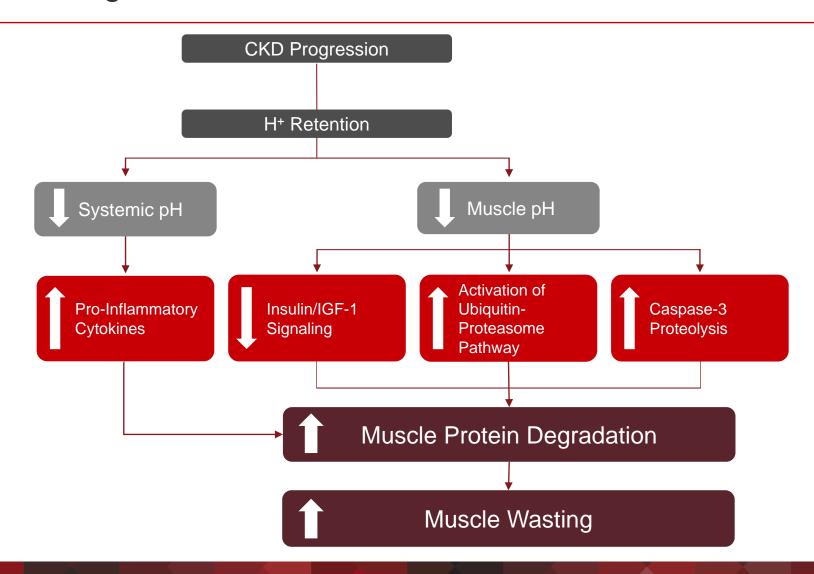
Small Increases in Muscle Degradation Will Cause a Loss of Muscle Mass



Putative Mechanisms that Contribute to Muscle Wasting in Patients with CKD and Metabolic Acidosis



Putative Mechanisms that Contribute to Muscle Wasting in Patients with CKD and Metabolic Acidosis



Studies Show Association Between Metabolic Acidosis and Impaired Physical Function

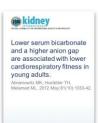






Studies Show Association Between Metabolic Acidosis and Impaired Physical Function









JASN Oral Sodium Bicarbonate for the Treatment of Metabolic Acidosis in Peritoneal Dialysis Patients: A Randomized Placebo-Control Trial.

CJASN Effects of Oral Sodium Bicarbonate in Patients with CKD. Abramowitz MK, Melamed ML, Bauer C, Raff AC, Hostetter TH, 2013 May;8:714-20. JASN.... Ricarbonate Supplementation Slows Progression of CKD and Improves Nutritional Status.

OSTEOPOROSIS INTERNATIONAL Impact of supplementation with bicarbonate on lower-extremity muscle performance in older men and women. Dawson-Hughes B, Castaneda-Sceppa C, Harris SS, Palermo NJ, Cloutler G, Ceglia L, Dallal GE, 2010 July;21(7):1171-79.

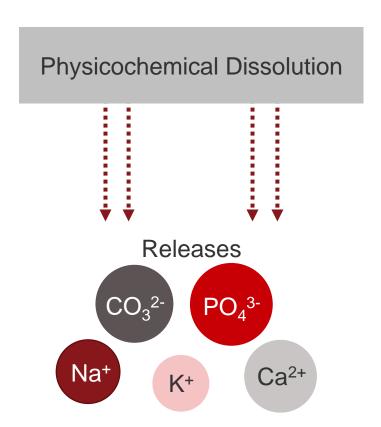
ndt MEPHROLOGY
BANKS BAN Correction of metabolic acidosis improves muscle mass and renal function in chronic kidney disease stages 3 and 4: a randomized controlled Dubey AK, Sahoo J, Vairappan B, Haridasan S, Parameswaran S, Priyamvada PS, 2018 Jul 24.

Pediatric Nephrology Acidosis: progression of chronic kidney disease and quality of life. de Brito-Ashurst I, O'Lone E, Kaushik T, McCafferty K, Yaqoob M, 2015 Aug;30:873-79.

Acid Buffering by Bone with Increased Acid Retention

Short-Term Acute Response

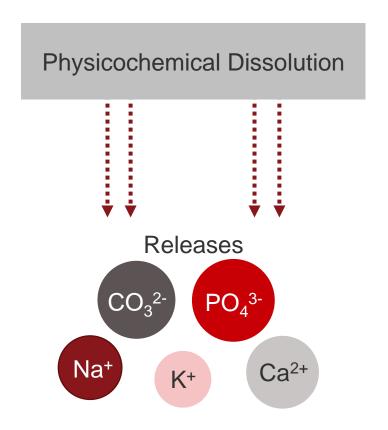
Long-Term Chronic Response

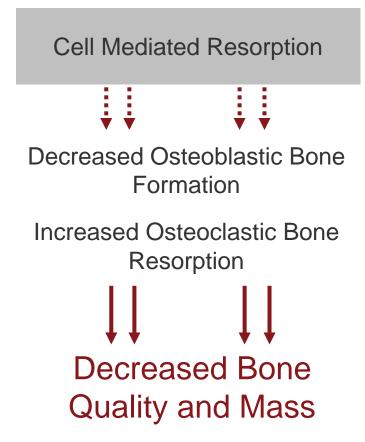


Acid Buffering by Bone with Increased Acid Retention

Short-Term Acute Response

Long-Term Chronic Response





CKD Practice Guidelines Suggest Treatment if Serum Bicarbonate Levels are Below 22 mEq/L







The End