- 2/3 Bone
 - o NB not as Hydroxyapatite
- 1/3 Intracellular
- 1/100 Extracellular
 - o 65% ionized (active form)
 - o 20% bound to negatively charged proteins primarily albumin (inactive form)
 - o 15% complexed with anions like citrate, PO4, SO4, other proteins, etc (inactive form)
 - o NB like K+ serum Mg poorly reflects total body Mg
 - O NB unlike calcium labs measure all forms of magnesium
 - NB you don't have to check ionized Mg it is not that important
- NB no hormone regulation rather the [Mg] itself regulates its absorption, secretion, etc in bone, GI, and kidney

In = GI (300mg/d is normal intake but only 100mg/d is absorbed (throughout SI) w/ 200mg/d excreted) • Decreased Intake ○ Alcoholism (MOST COMMON) • Decreased Absorption ○ Diarrhea, etc Stored = Bone (refer to HypoCa) Out = Kidney (300mg/d is filtered and 200mg/d is reabsorbed (15% PCT, 70% Thick LOH, 15% DCT) and thus 100mg/d excreted) • Decreased Reabsorption ○ @ PCT: drugs the block reabsorption like Aminoglycosides, Amphotericin, Cisplatin, Cyclosporin, etc ○ @ LOH: Loop Diuretics / Bartter's Syndrome ○ @ DCT: HyperCa (Ca competes for Mg for reabsorption) Other • Low Insulin States • Late Burns • High Thyroid • Pancreatitis • HypoCa symptoms (low Mg inhibits PTH release and sensitivity) • 8 (CNS depression) → 10 (Decreased DTRs) → 15 (CV/Pulm Pancreatics w/ High Thy bradvered to the Am Thy the Am Thy bradvered to the Am Thy the Am Thy bradvered to the Am Thy the		
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Out = Kidney (300mg/d is filtered and 200mg/d is reabsorbed (15% PCT, 70% Thick LOH, 15% DCT) and thus 100mg/d excreted) • Decreased Reabsorption • @ PCT: drugs the block reabsorption like Aminoglycosides, Amphotericin, Cisplatin, Cyclosporin, etc • @ LOH: Loop Diuretics / Bartter's Syndrome • Decreased Reabsorption Other • Low Insulin States • Late Burns • High Thyroid • Pancreatitis • HypoCa symptoms (low Mg inhibits PTH release and sensitivity) Bone (refer to HyperCa) * Cidney • Decreased Filtration • RF • Increased Reabsorption Other • Increased Reabsorption • Other • Increased Reabsorption • Increased Reabsorption • Increased Reabsorption • Thiazide Diuretics / Gittleman's Syndrome • Iatrogenic (MOST COMMON) esp women who are being treated for preeclampsia w/ MgSO4 • High Insulin States • Low Thyroid • Adrenal Insufficiency • Li (actually slightly high Mg makes people feel a little better) • Bancreatitis • HypoCa symptoms (low Mg inhibits PTH release and sensitivity) • 8 (CNS depression) → 10 (Decreased DTRs) → 15 (CV/Pulm	200mg/d excreted)	Increased Intake
 Decreased Absorption Diarrhea, etc Stored = Bone (refer to HypoCa) Decreased Filtration RF Out = Kidney (300mg/d is filtered and 200mg/d is reabsorbed (15% PCT, 70% Thick LOH, 15% DCT) and thus 100mg/d excreted) Decreased Reabsorption @ PCT: drugs the block reabsorption like Aminoglycosides, Amphotericin, Cisplatin, Cyclosporin, etc @ LOH: Loop Diuretics / Bartter's Syndrome @ DCT: HyperCa (Ca competes for Mg for reabsorption) Other Low Insulin States Late Burns High Thyroid Pancreatitis Other (MOST COMMON) esp women who are being treated for preeclampsia w/ MgSO4 High Insulin States Early Burns Low Thyroid Adrenal Insufficiency Li (actually slightly high Mg makes people feel a little better) # (CNS depression) → 10 (Decreased DTRs) → 15 (CV/Pulm 	Decreased Intake	 Mg containing laxatives / antacids
Stored = Bone (refer to HypoCa) Out = Kidney (300mg/d is filtered and 200mg/d is reabsorbed (15% PCT, 70% Thick LOH, 15% DCT) and thus 100mg/d excreted) Decreased Reabsorption Decreased Reabsorption Percreased Reabsorption Percreased Reabsorption (ike Aminoglycosides, Amphotericin, Cisplatin, Cyclosporin, etc. Percreased Reabso	 Alcoholism (MOST COMMON) 	
Stored = Bone (refer to HypoCa) Out = Kidney (300mg/d is filtered and 200mg/d is reabsorbed (15% PCT, 70% Thick LOH, 15% DCT) and thus 100mg/d excreted) • Decreased Reabsorption • Decreased Reabsorption • @ PCT: drugs the block reabsorption like Aminoglycosides, Amphotericin, Cisplatin, Cyclosporin, etc • @ LOH: Loop Diuretics / Bartter's Syndrome • @ DCT: HyperCa (Ca competes for Mg for reabsorption) Other • Low Insulin States • Late Burns • High Thyroid • Pancreatitis • HypoCa symptoms (low Mg inhibits PTH release and sensitivity) • S (CNS depression) → 10 (Decreased DTRs) → 15 (CV/Pulm)	Decreased Absorption	Bone (refer to HyperCa)
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Amphotericin, Cisplatin, Cyclosporin, etc		
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Depression w/ HypoTN, bradycardia, etc) \ 17 (Comp. Prolonges	1	
	 HypoK symptoms (low Mg inhibits renal K reabsorption) 	Depression w/ HypoTN, bradycardia, etc) $ ightarrow$ 17 (Coma, Prolonged
PR, QRS, QT) \rightarrow 20 (Cardiac Arrest)		
NB hyperMg acts like a CCB		
 Mild (1-1.5): eat nuts/raisins and Magnesium Gluconate 500mg PO TID Mild (2-3): withhold exogenous Mg the kidney can usually clear it loop diuretics, fluids 		 Mild (2-3): withhold exogenous Mg the kidney can usually clear it, loop diuretics, fluids
Mod (<1): Magnesium Oxide 400mg PO TID (240mg elemental Mg) many Severe (>3): HD, 10% CaGluconate (refer to Severe HypoCa Tx),	Mod (<1): Magnesium Oxide 400mg PO TID (240mg elemental Mg) many	 Severe (>3): HD, 10% CaGluconate (refer to Severe HypoCa Tx),
others but this is best absorbed CV/Pulm Support	others but this is best absorbed	CV/Pulm Support
Severe (<1 w/ Sx): Magnesium Sulfate 1-4g IV over 2-8hrs (750mg-3g)	Severe (<1 w/ Sx): Magnesium Sulfate 1-4g IV over 2-8hrs (750mg-3g)	
elemental Mg, 1g increases serum Mg by only 0.1!) NB conventionally is		
taught that Mg should be given over 1-4hrs but when you give that	taught that Mg should be given over 1-4hrs but when you give that	
much that quick it just spills over in kidney therefore slow down	much that quick it just spills over in kidney therefore slow down	
infusion, 290mg IM 1-3x/wk is another option for chronic hypoMg	infusion, 290mg IM 1-3x/wk is another option for chronic hypoMg	
very common in surgical patients	very common in surgical patients	
hypoMg makes hypoK and hypoCa more difficult to treat therefore	 hypoMg makes hypoK and hypoCa more difficult to treat therefore 	
always treat Mg b/f anything else	always treat Mg b/f anything else	