

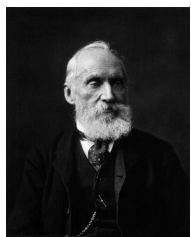
 Pharmaceutical Research Institute

Pharmacokinetics of vitamin D

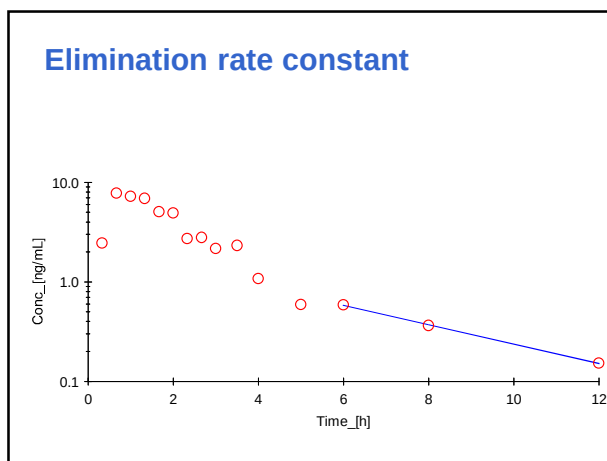
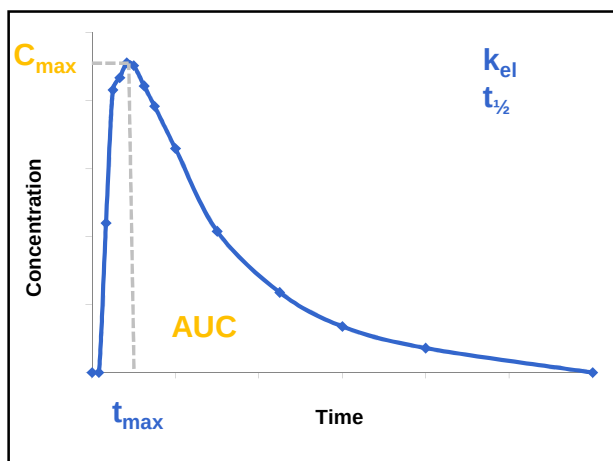
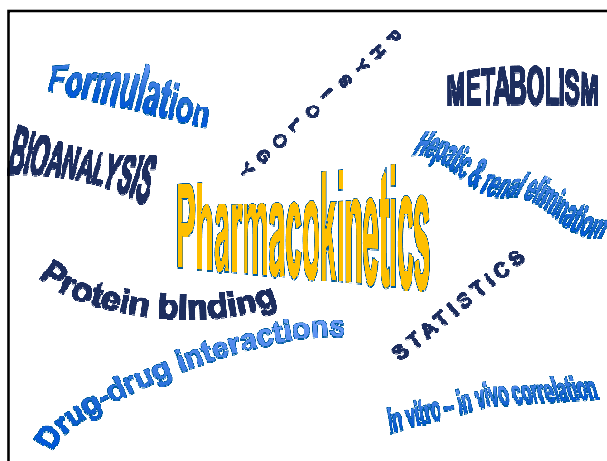
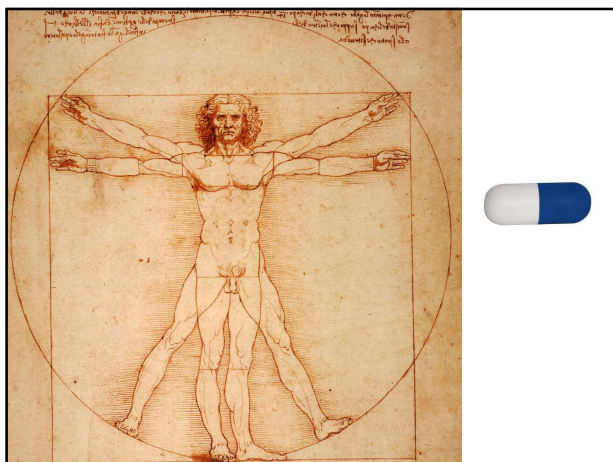
Piotr J. Rudzki

DECIDE, Galway, June 15th, 2016

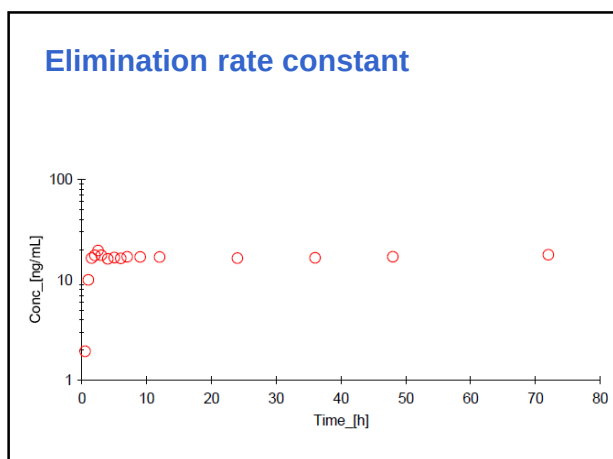
*I often say that
when you can
measure what
you are speaking about,
and express it in numbers,
you know something about it...*



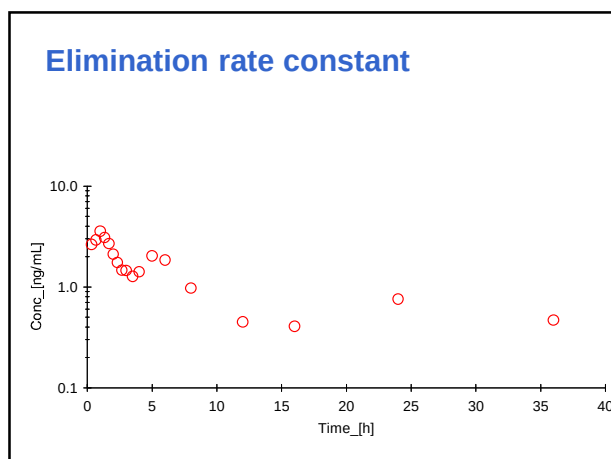
Lord Kelvin (1824 Belfast -1907 Largs)



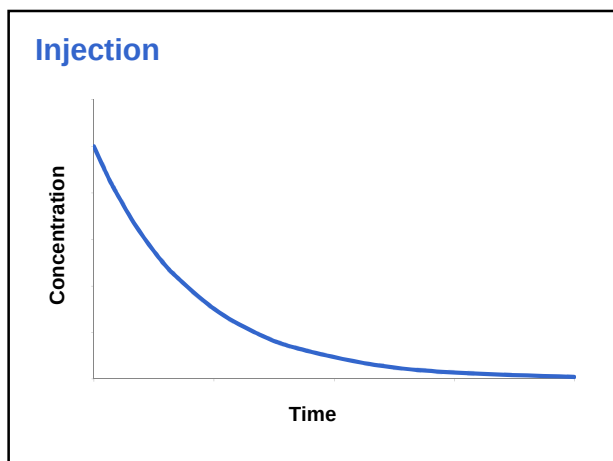
Elimination rate constant



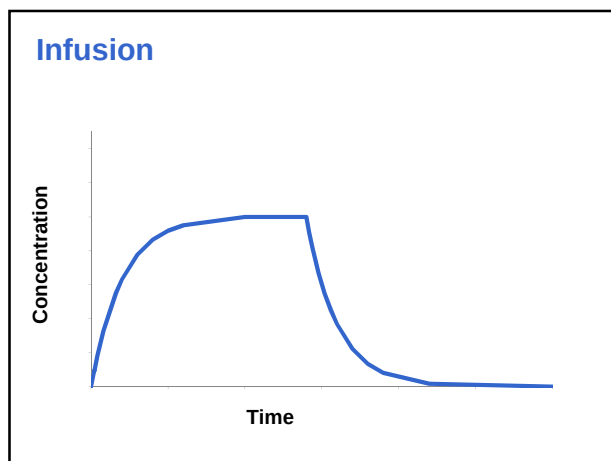
Elimination rate constant



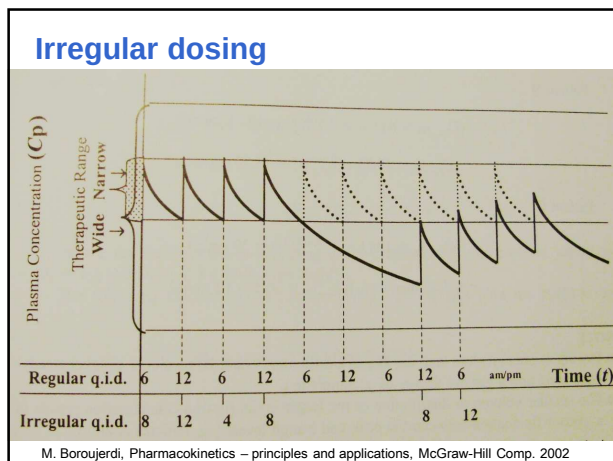
Injection



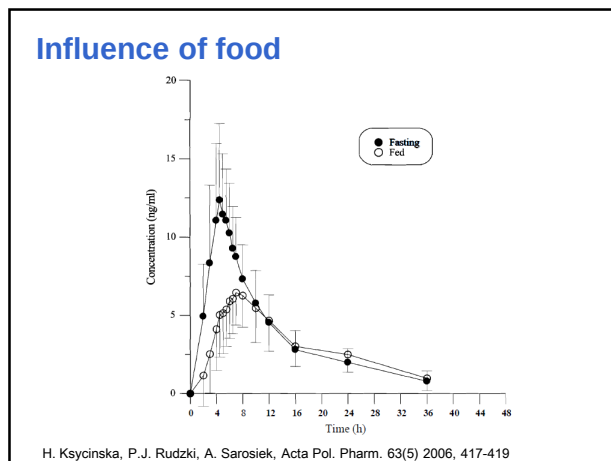
Infusion



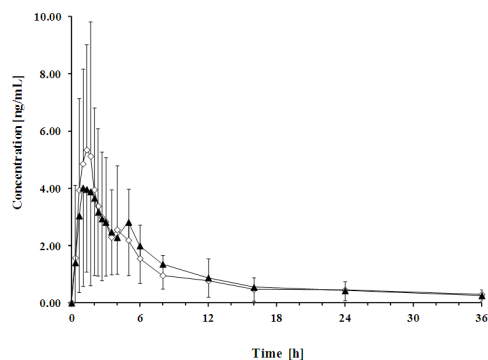
Irregular dosing



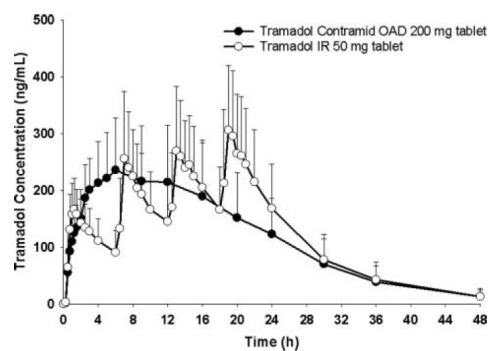
Influence of food



Influence of formulation

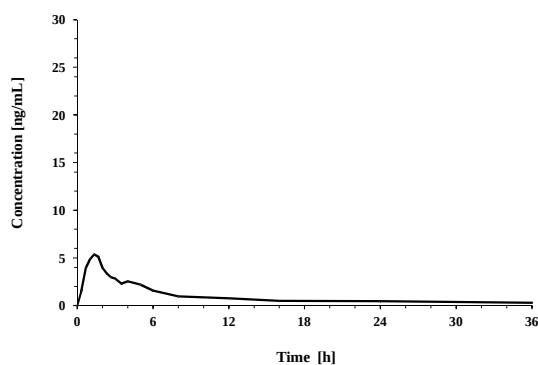


Influence of formulation

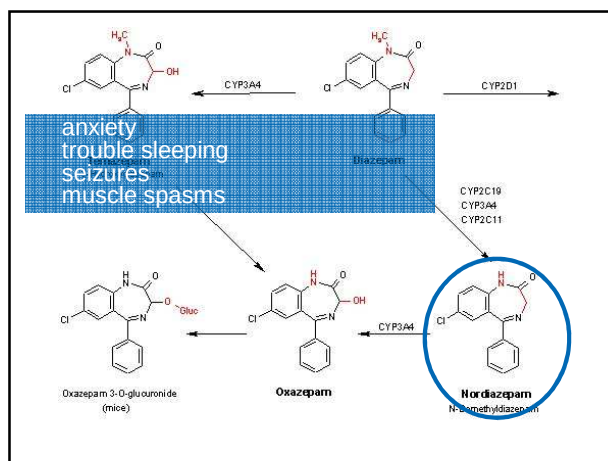
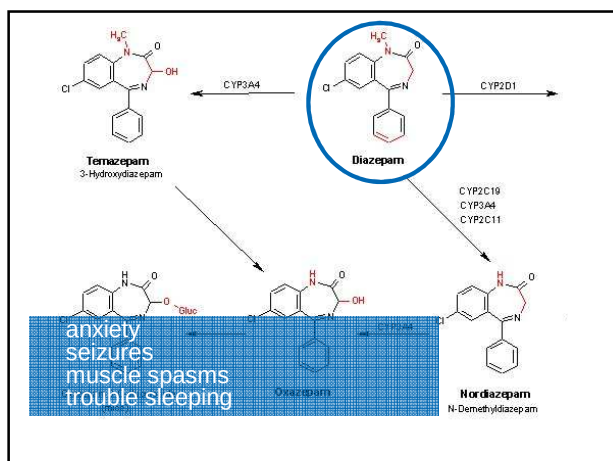
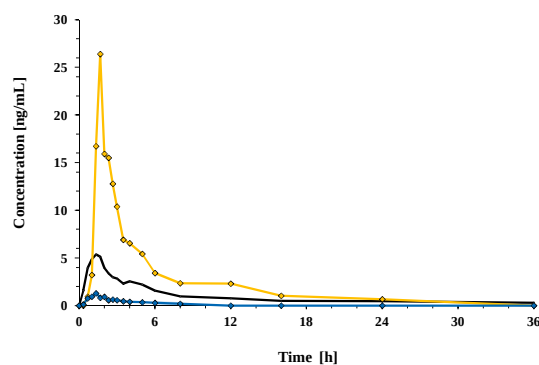


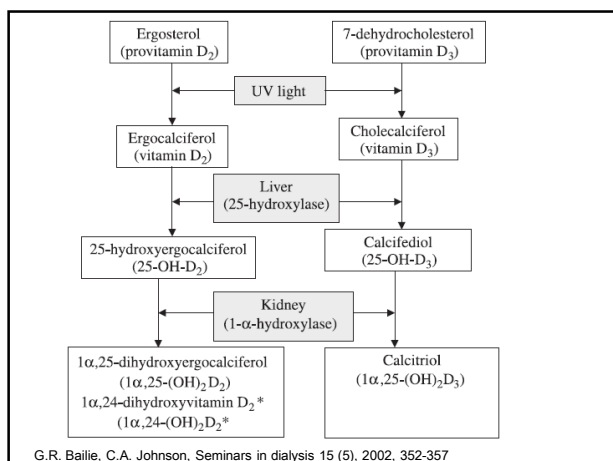
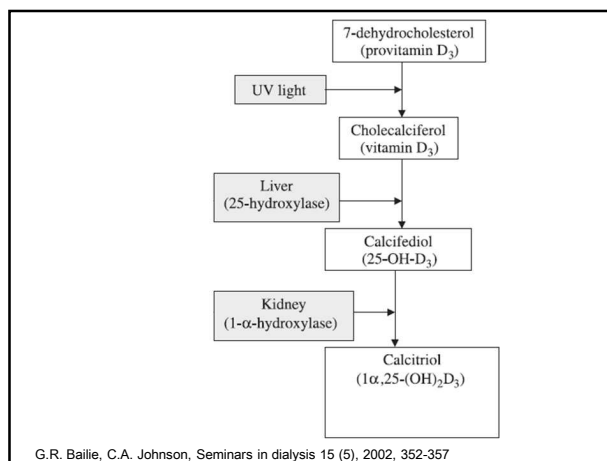
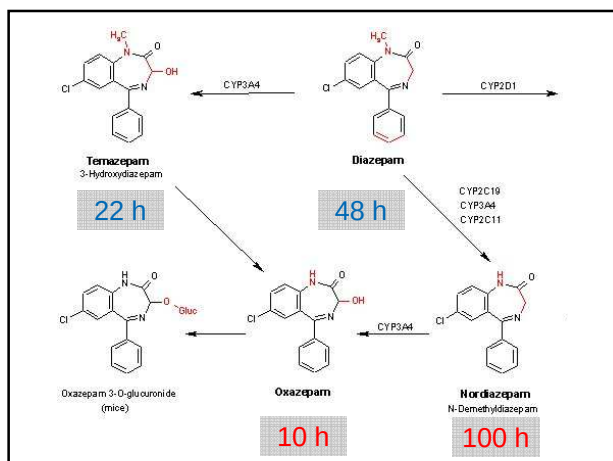
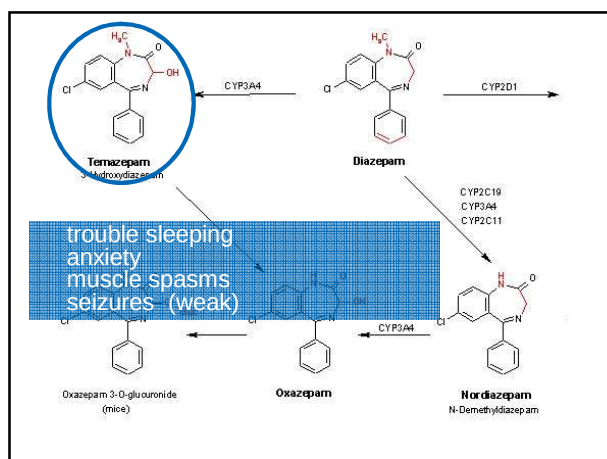
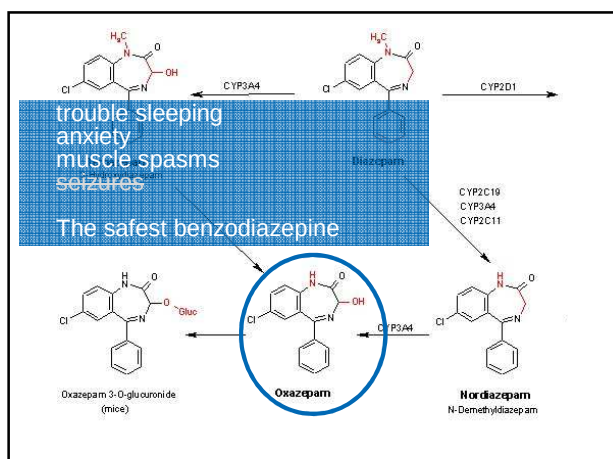
D. Karhu et al., J. Clin. Pharmacol., 2010;50:544-553

Inter-individual variability



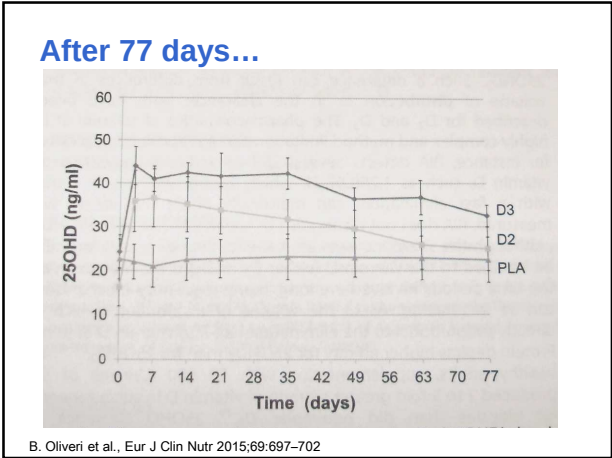
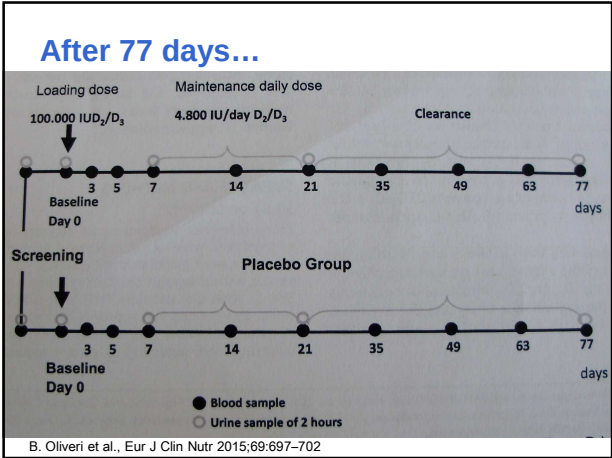
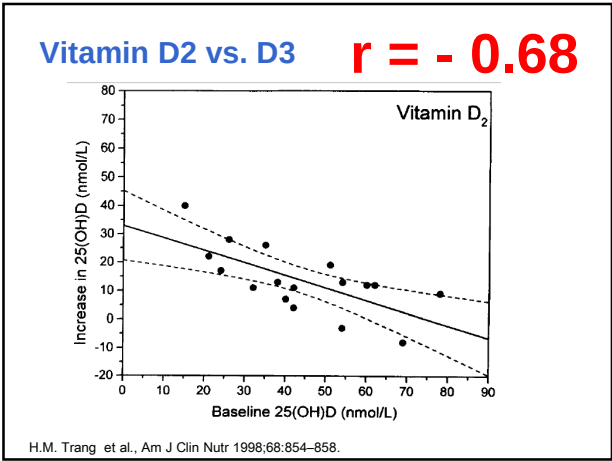
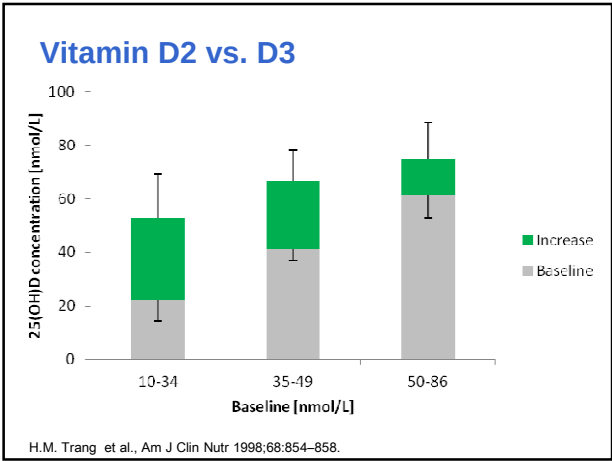
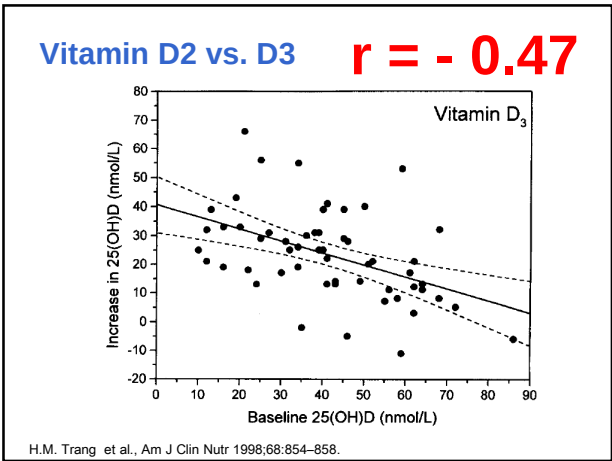
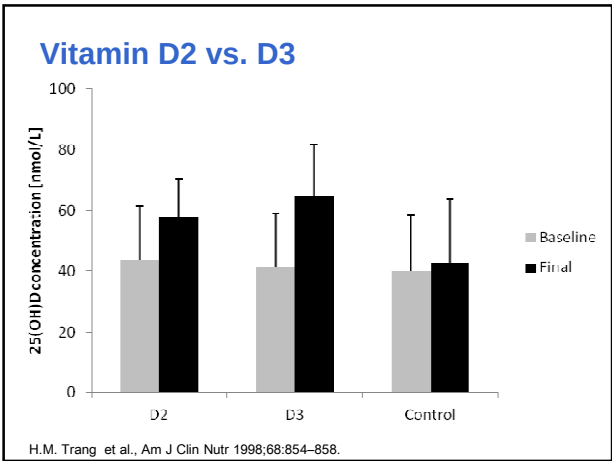
Inter-individual variability



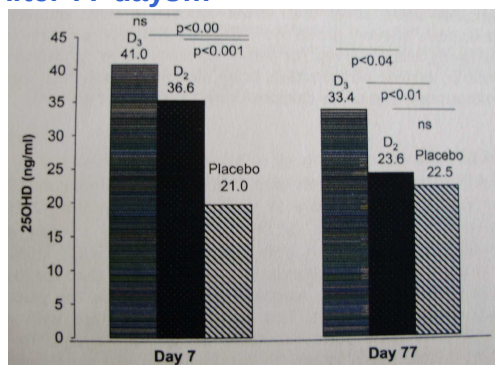


Vitamin D2 vs. D3

4000 UI x 14 days

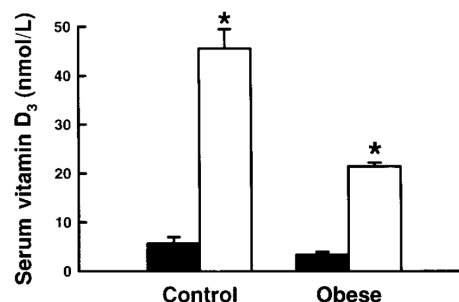


After 77 days...



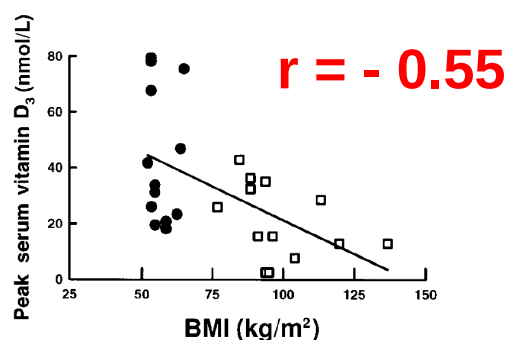
B. Oliveri et al., Eur J Clin Nutr 2015;69:697-702

Vitamin D & obesity (irradiation)



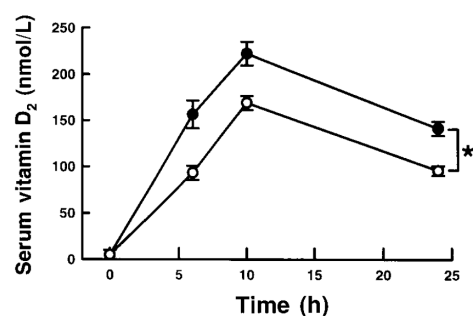
J. Wortsman et al., Am J Clin Nutr 2000;72:690-693

Vitamin D & obesity (irradiation)



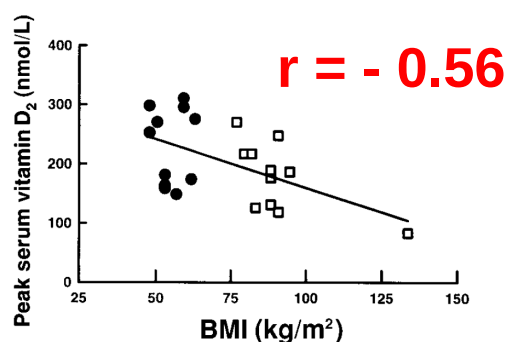
J. Wortsman et al., Am J Clin Nutr 2000;72:690-693

Vitamin D & obesity (1.25 mg oral)



J. Wortsman et al., Am J Clin Nutr 2000;72:690-693

Vitamin D & obesity (1.25 mg oral)



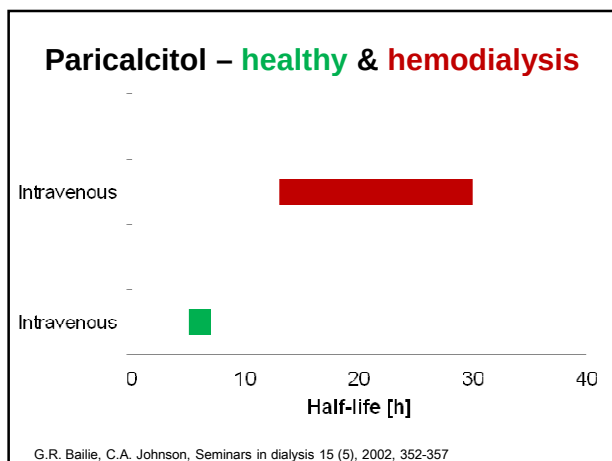
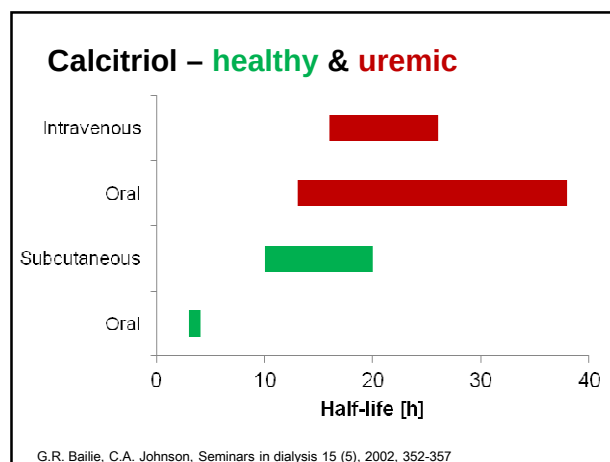
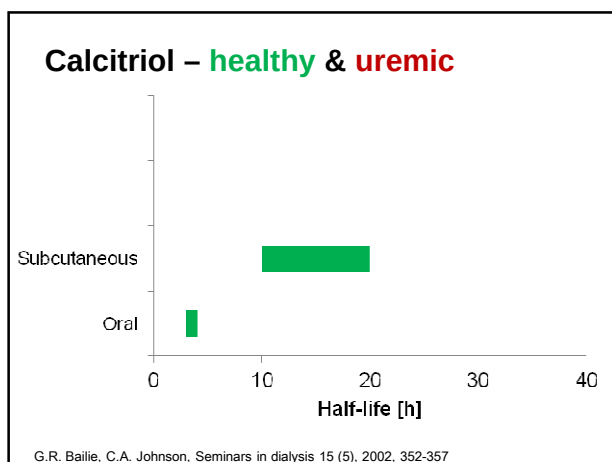
J. Wortsman et al., Am J Clin Nutr 2000;72:690-693

Vitamin D & obesity

**decreased
bioavailability
of D₃**

due to its deposition in body fat ?

J. Wortsman et al., Am J Clin Nutr 2000;72:690-693



Eldecalcitol – launched 2011

Half-life = 53 h

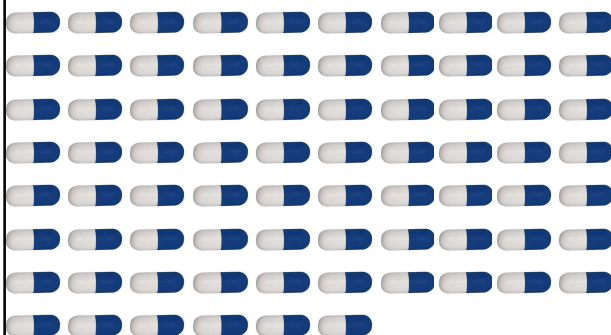
Vitamin-drug interactions		
Vit. D	Drug	Outcome
D3	Cisplatin	No change 25(OH)D3 and 24,25(OH)2D3 50% decreased 1,25(OH)2D3
D3	Prednisoneb	40-60% decreased t1/2 D3 decreased 1,25(OH)2D3
1,25(OH)2D3	Dexamethasone	No impact
25(OH)D3	Rosuvastatin	260% increased 25(OH)D3 16% increased 1,25(OH)2D3
25(OH)D3	Fluvastatin	No impact

S-J Lim, SH Kim, J. Pharm. Invest. 44, 2014, 317-328

38 µg single dose in cancer patients

S-J Lim, SH Kim, J. Pharm. Invest. 44, 2014, 317-328

38 µg single dose in cancer patients



S-J Lim, SH Kim, J. Pharm. Invest. 44, 2014, 317-328

Formulation for children



Formulation for children



Is our **knowledge**
on Vitamin D pharmacokinetics of

**satisfactory
kind ?**

**Patients
need**

further pharmacokinetic studies
on Vitamin D !



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