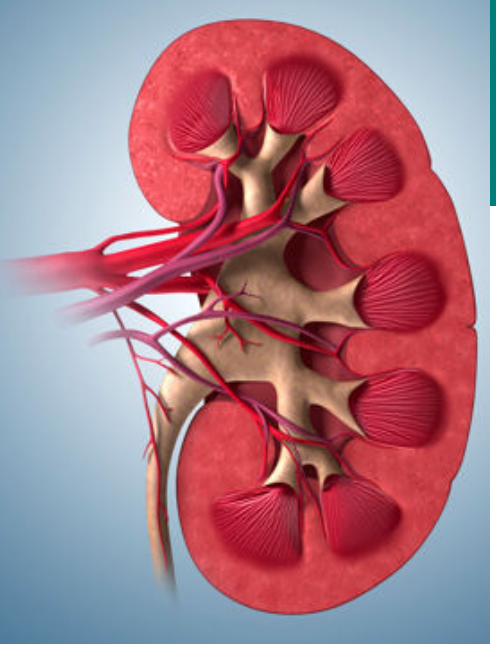


Virga Jesseziekenhuis

van Fosfordom

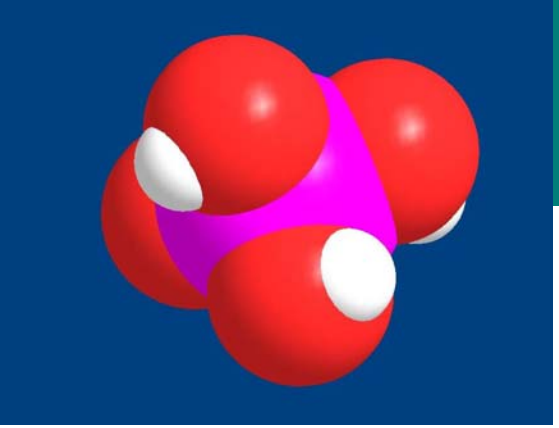
tot

Fosforbom

Bart De Moor

Ontdekking van een ‘phosphoriserende’ stof

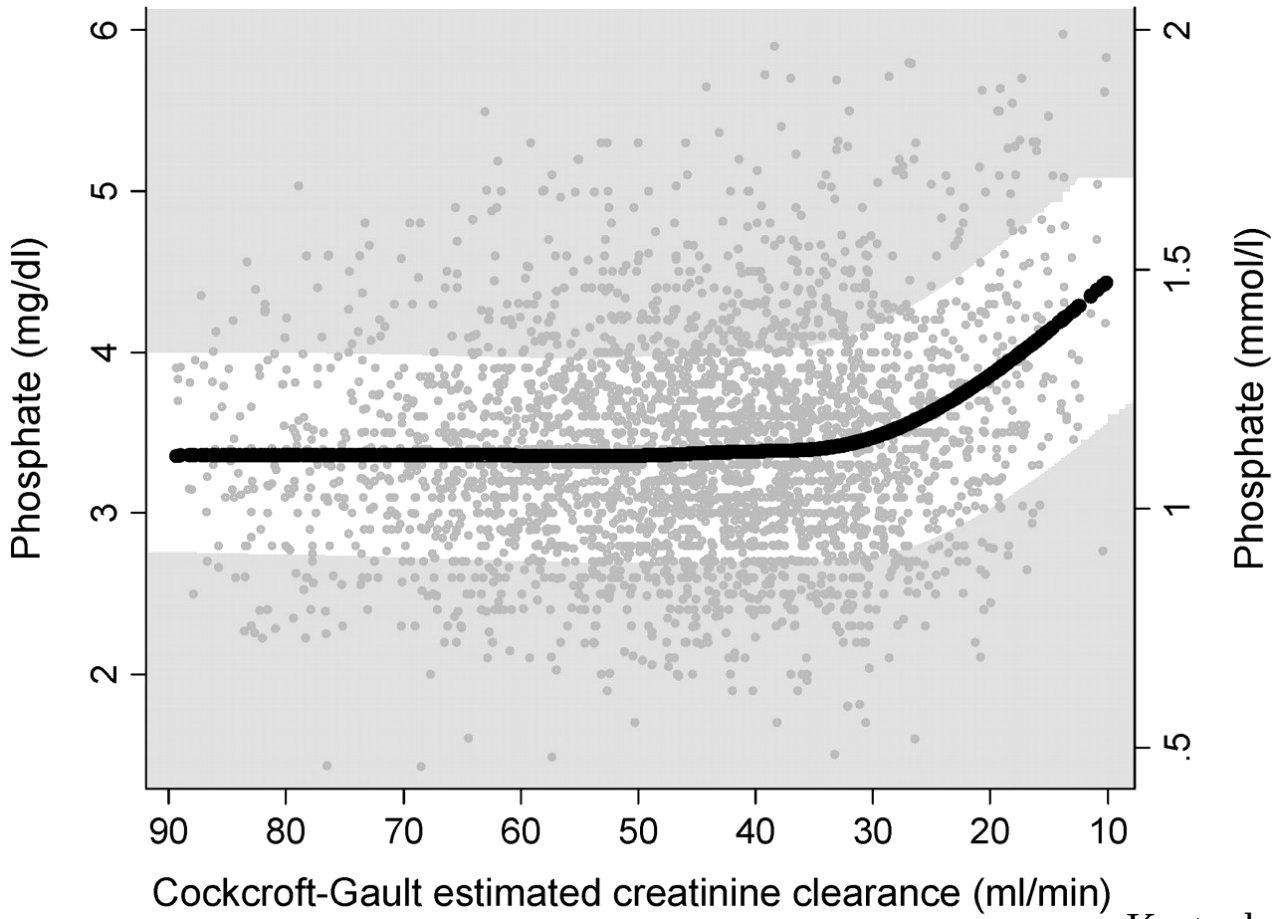
1669, Duitse amateur alchemist Brand



Fosfor: ‘brood’nodig

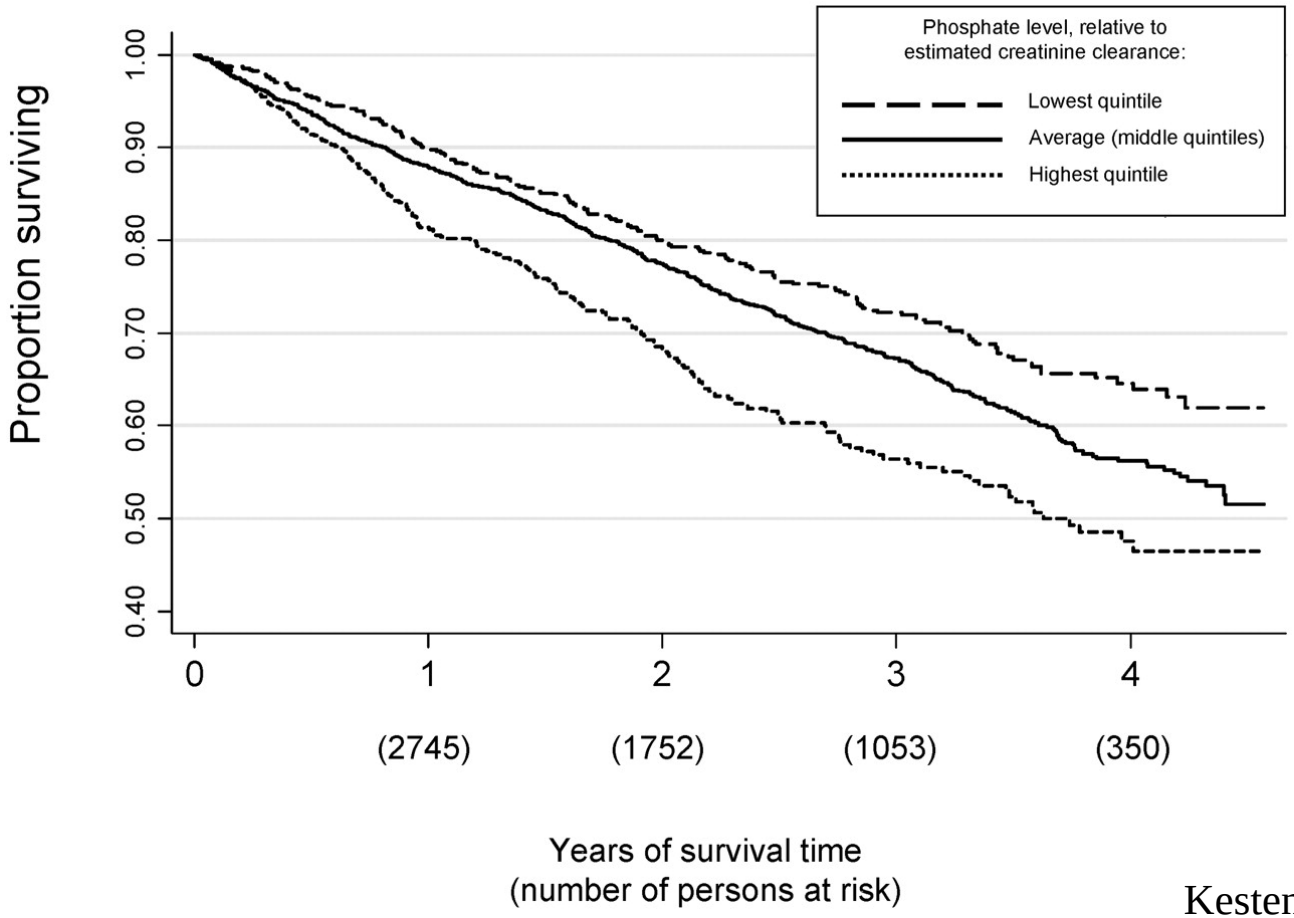
- Nodig voor intracellulaire energie overdracht (ATP), als second messenger (cAMP en cGMP), in DNA/RNA en phospholipiden:
  H_3PO_4
- Nodig voor bot en tanden
  onder vorm van hydroxyapatiet:
  Ca10(PO4)6(OH)2

Fosfor stapelt op bij nierfalen



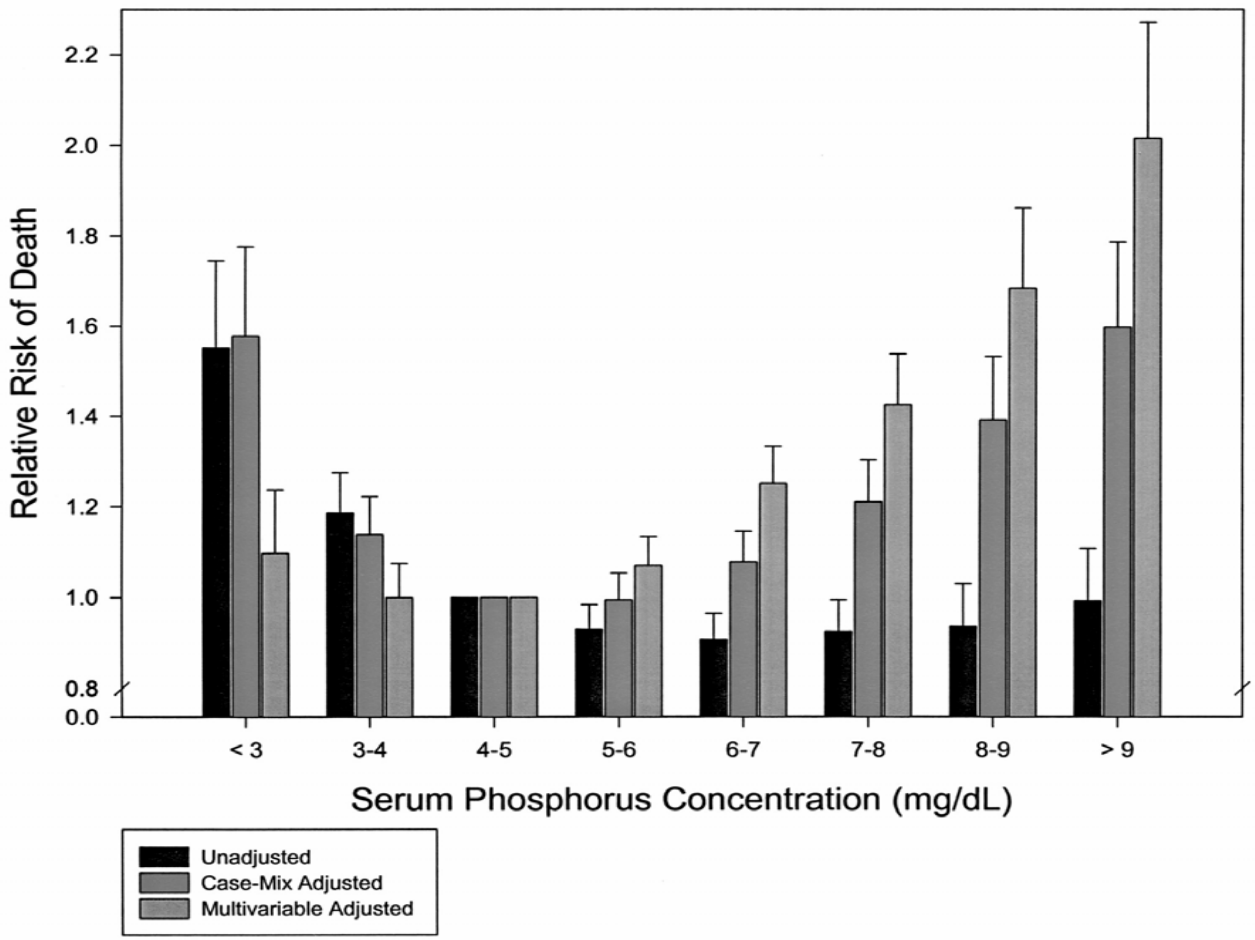
Kestenbaum, JASN, 2005

Fosfatemie correleert met overleving *(CKD 1 → 5)*



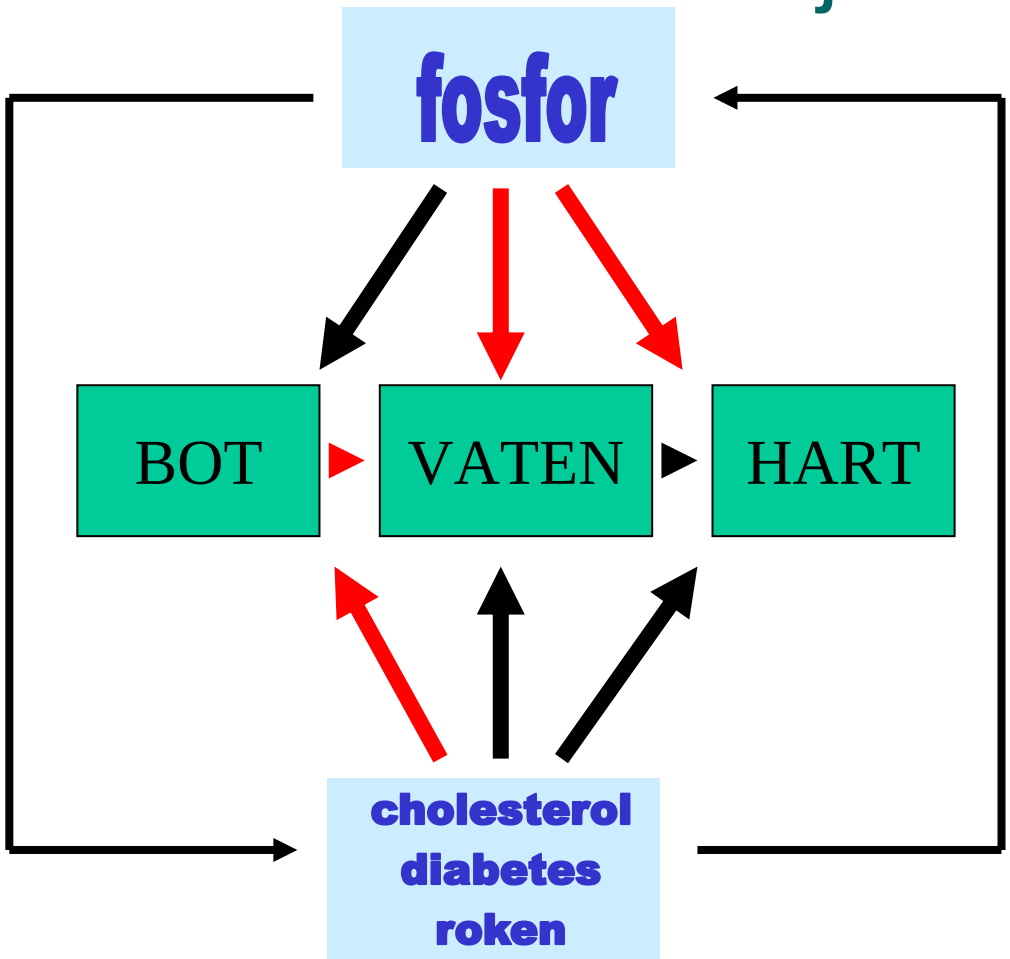
Kestenbaum, JASN, 2005

Fosfatemie correleert met overleving *(HD patiënten)*



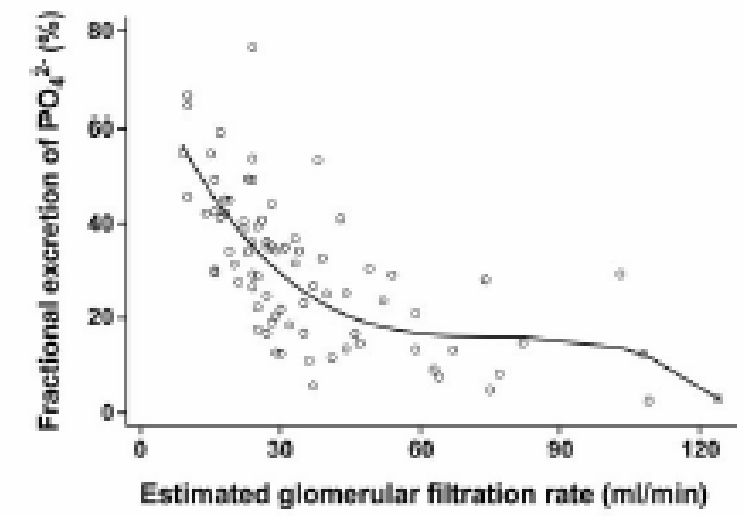
Block, JASN, 2004

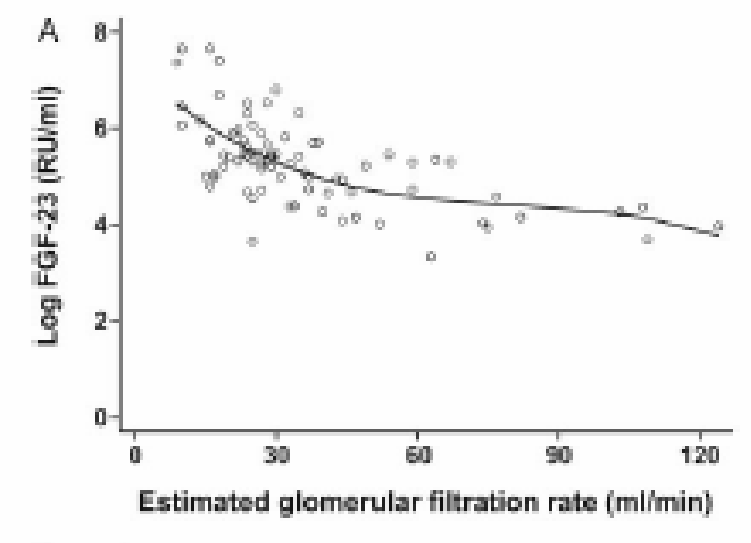
Waarom is fosfor gecorreleerd aan overlijden?



Fosfor en het bot (1)

BOT ▸ VATEN ▸ HART

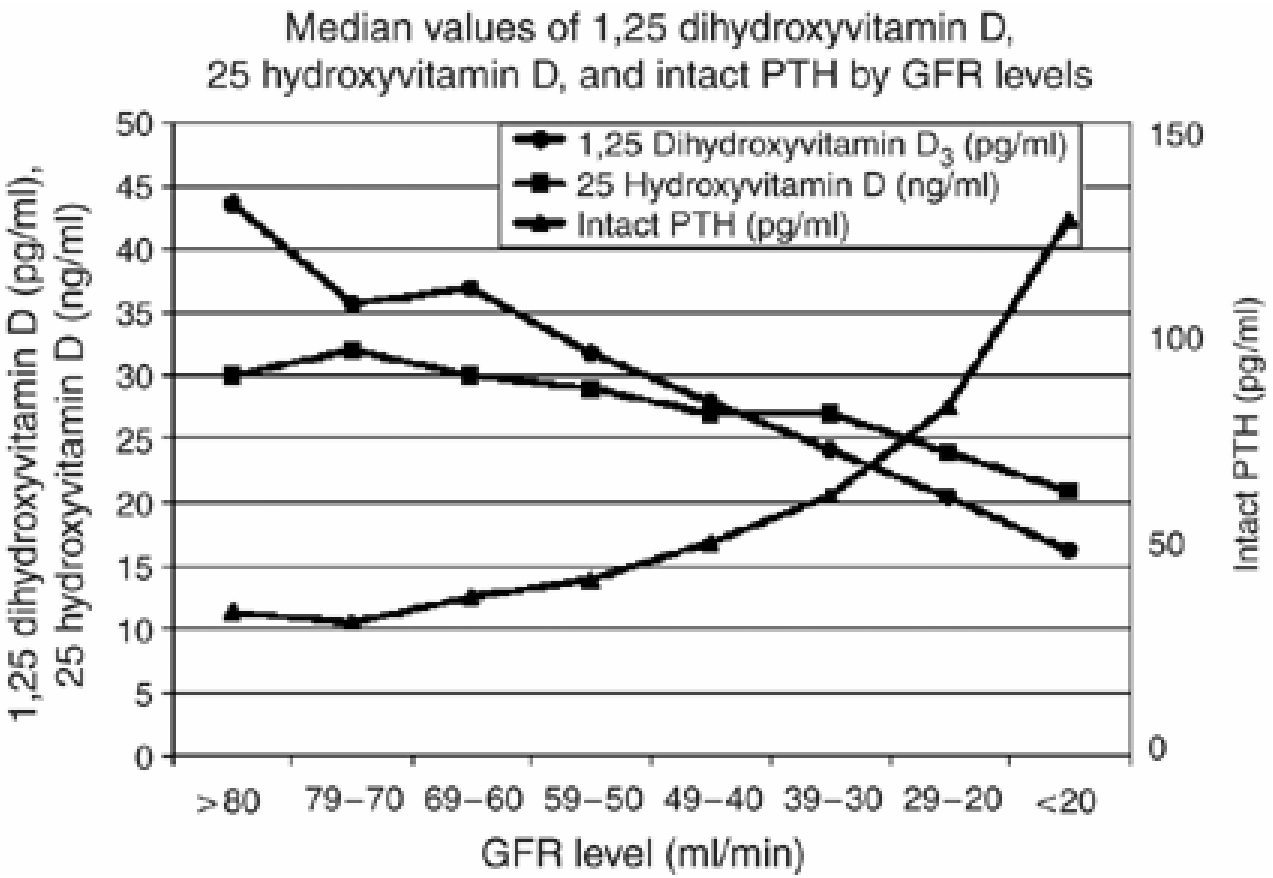




Gutierrez, JASN, 2005

Fosfor en het bot (2)

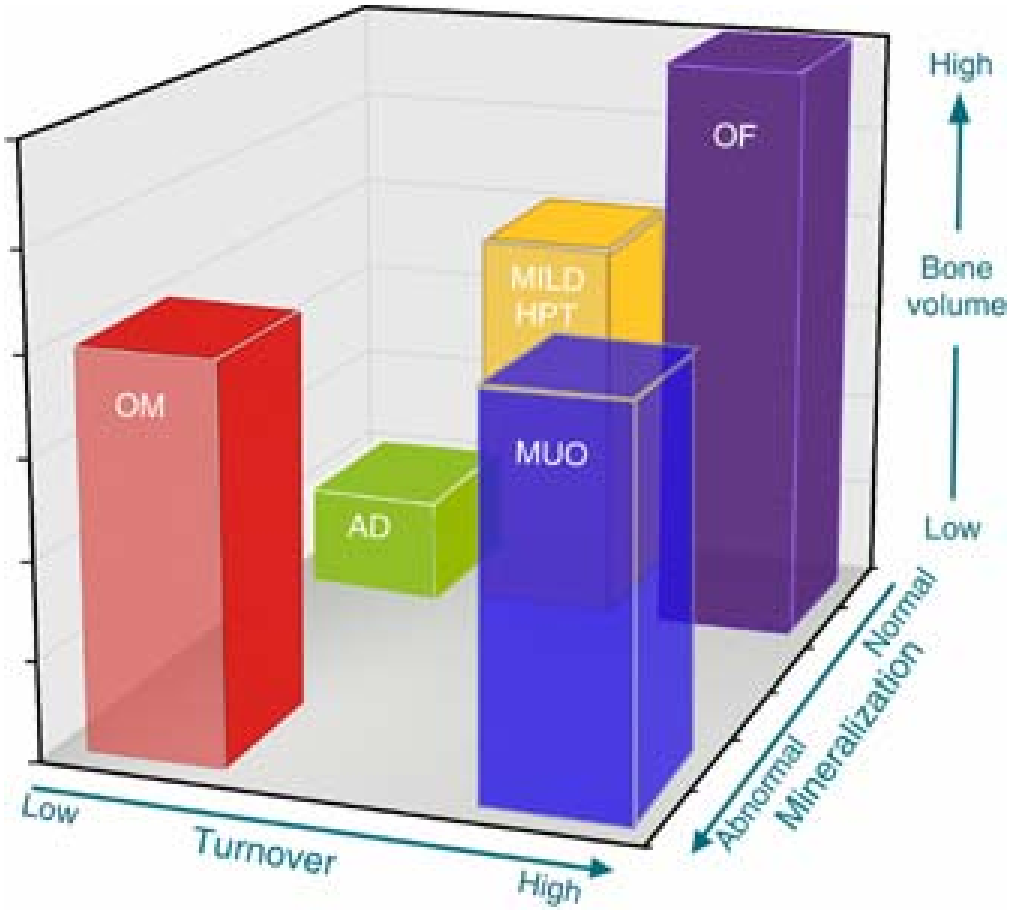
BOT



Levin, KI, 2007

Fosfor en het bot (3)

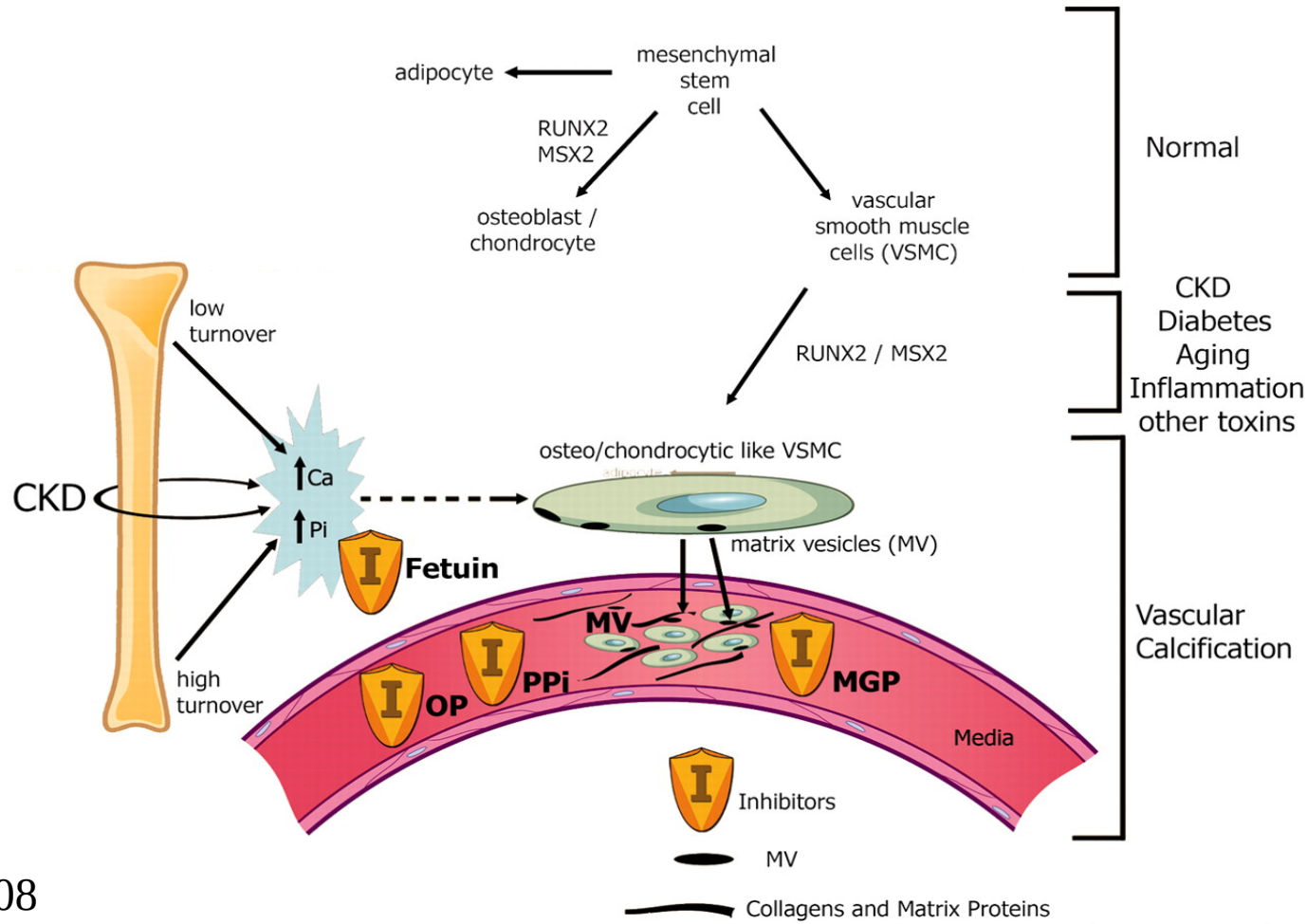
BOT



OM= osteomalacia, AD= adynamic bone disease, MUO= mixed uremic osteodystrophy
Mild HPT= Mild hyperparathyreoidism, OF= osteitis fibrosa

VATEN

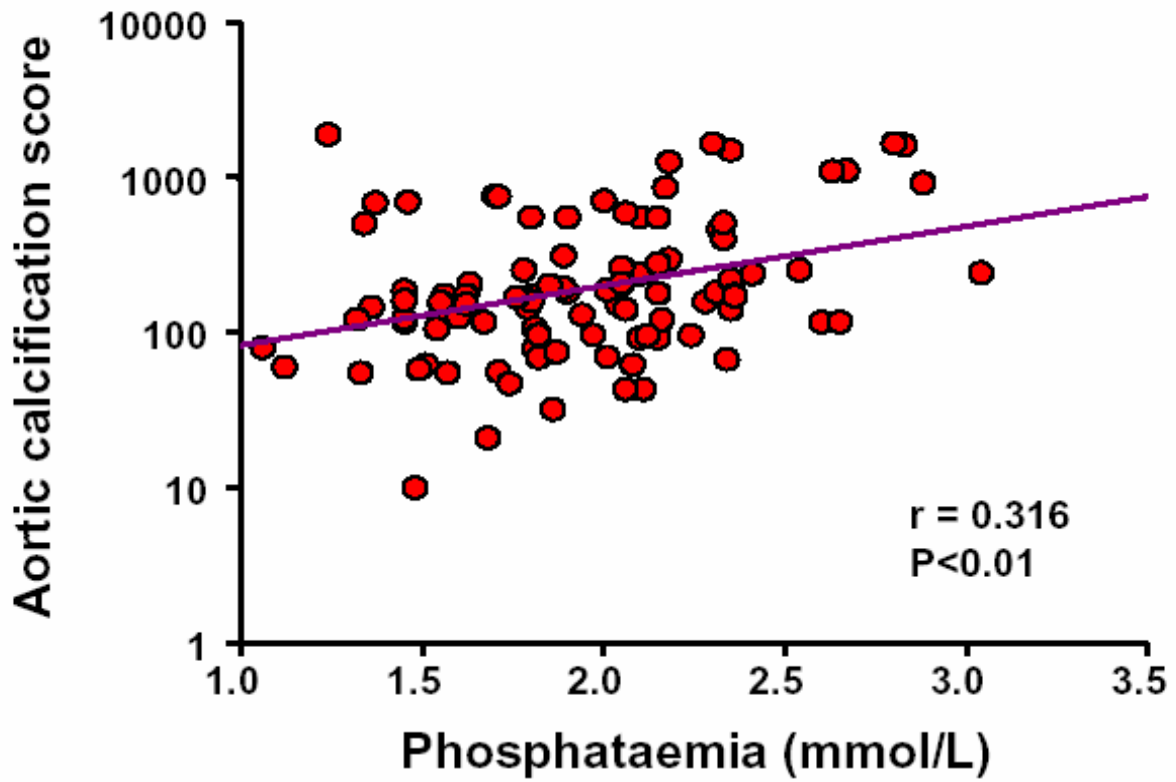
Fosfor en vaatverkalkingen



Moe, JASN, 2008

VATEN

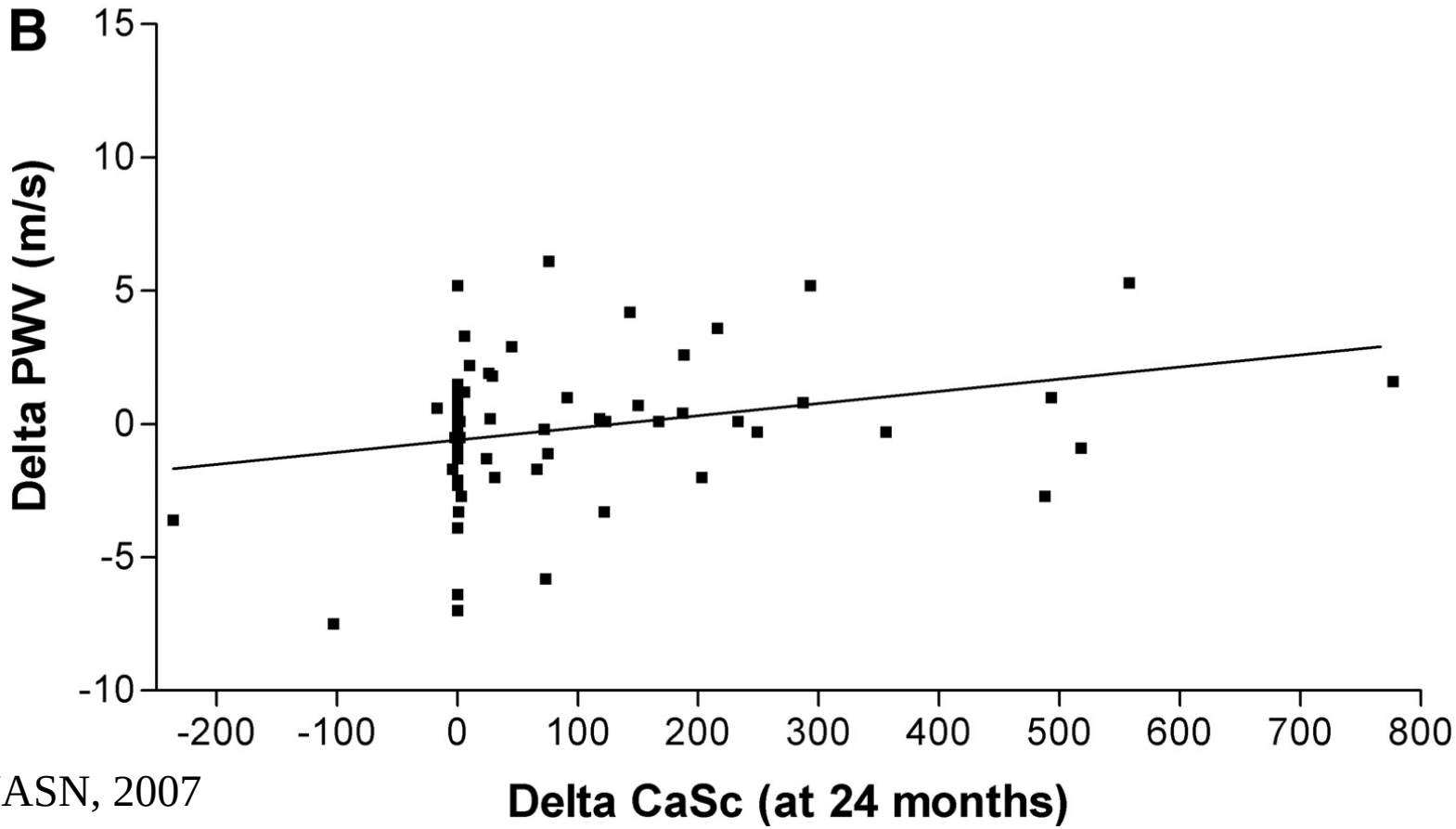
Fosfor en vaatverkalkingen



London, NDT in press

VATEN

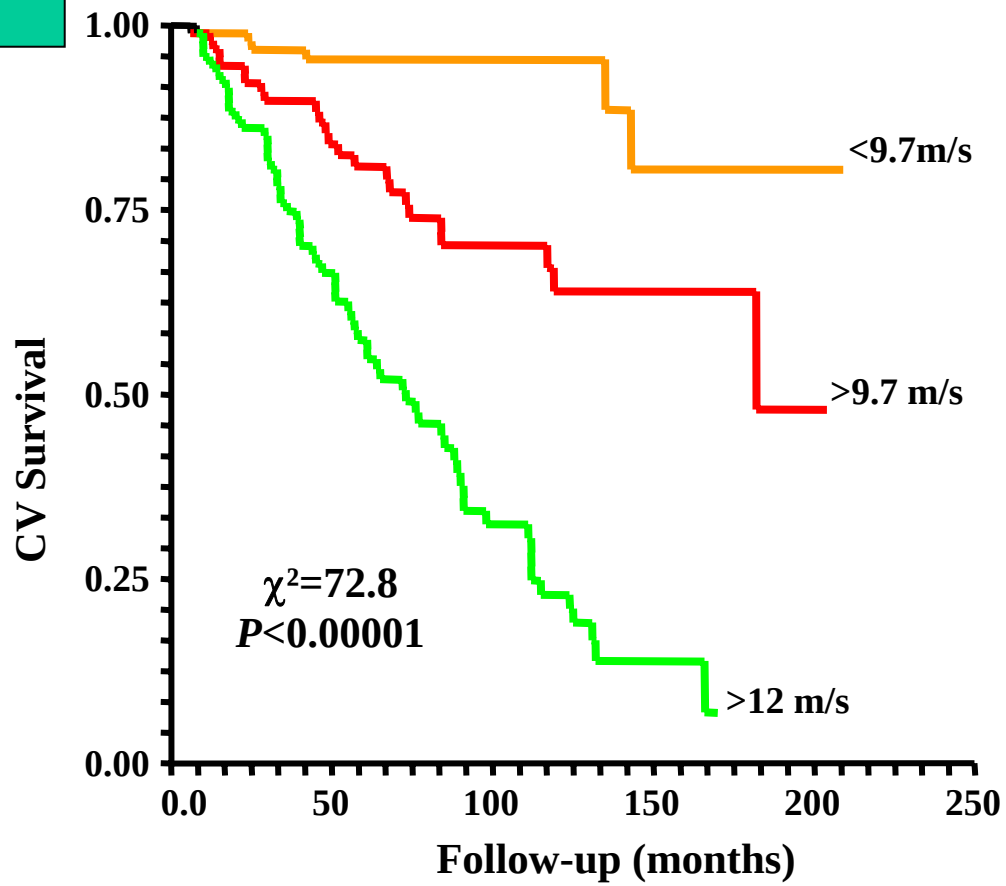
Calcification and arterial stiffness



Sigrist, CJASN, 2007

VATEN

Stiffness and mortality

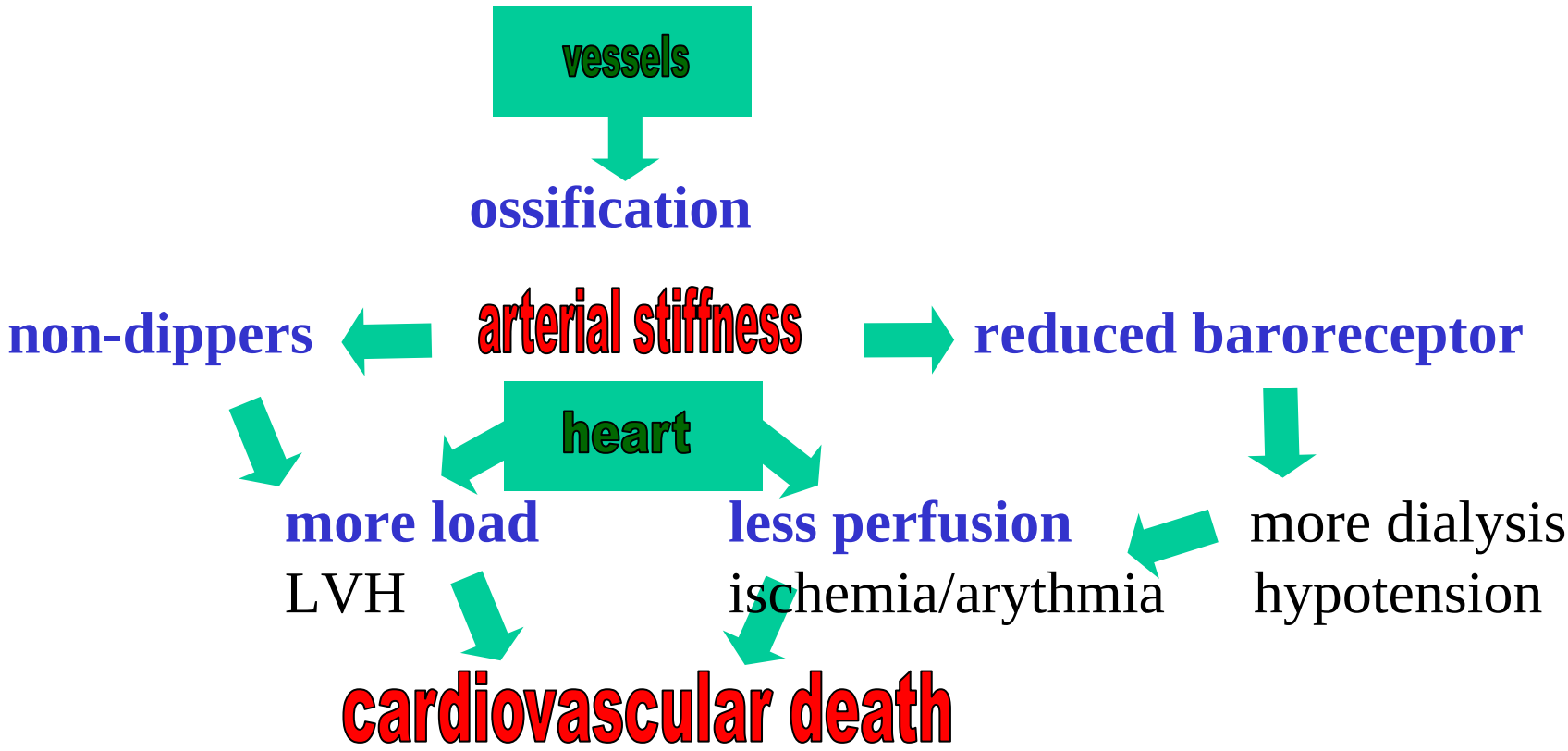


Study of 241 hemodialysis patients for 72±41 months (mean ±SD), divided into three tertiles according to PWV

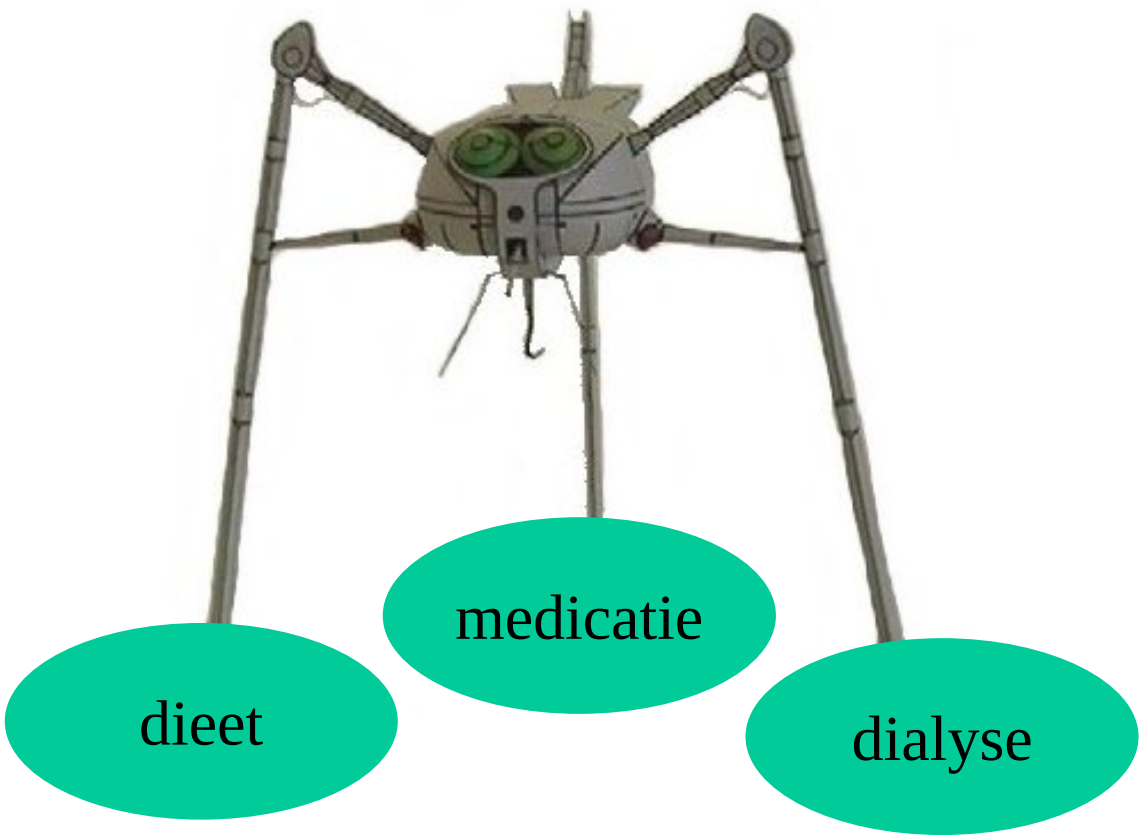
Blacher et al, *Circulation* 1999

HART

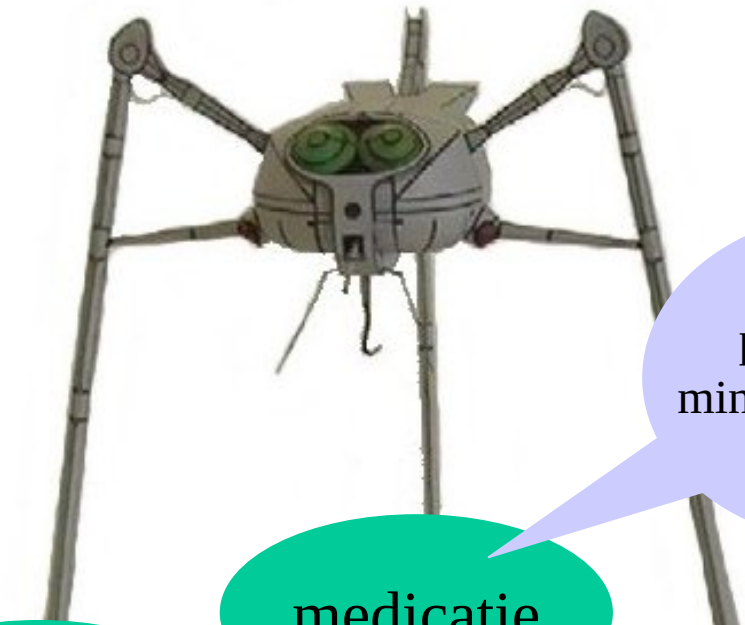
Fosfor en het hart



Controle van de fosfatemie



Controle van de fosfatemie



strenge fosforbeperking geeft eiwittekort

dieet

hoe meer pillen, des te minder ze genomen worden

medicatie

één dialyse verwijdert de fosforinname van één dag

dialyse

Dieet: voornaamste fosforbron zijn eiwitten (proteïnen)

dieet

Virga Jesseziekenhuis

Dieet: verborgen fosfaatzuren

E338: Fosforzuur

E339a:Natriumdiwaterstoffosfaat

E339b: Dinatriumwaterstoffosfaat

E339c: Trinatriumfosfaat

E340a: Kaliumdiwaterstoffosfaat

E340b: Dikaliumwaterstoffosfaat

E340c: Trikaliumfosfaat

E341a: Monocalciumfosfaat

E341b: Calciumwaterstoffosfaat

E341c: Tricalciumdifosfaat

E343: Magnesiumfosfaat

Een blikje cola van 33 cl bevat 44 tot 62 mg,

een blikje cola light tussen 27 en 39 mg fosfaten.

dieet

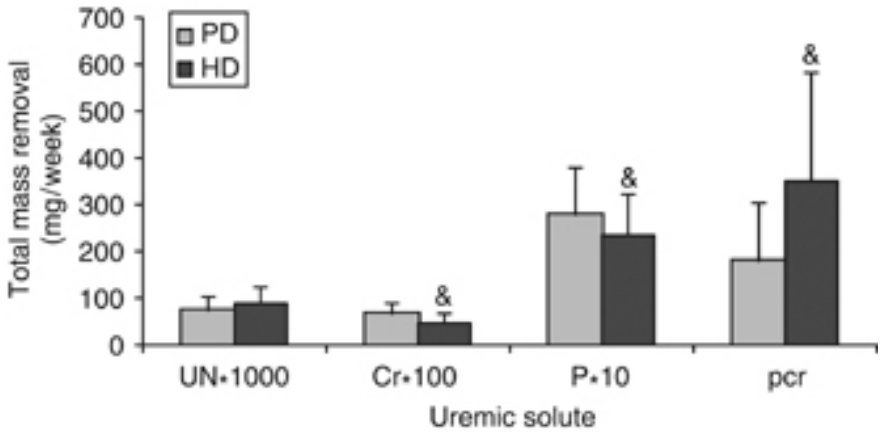
Iatrogene fosfaatintoxicaties

Prepacol = Dulcolax + Na_2PO_4 477 mg en $NaHPO_4$ 2.09 g

Fleet Phosphosoda = Na_2PO_4 7 H_2O 0.9 g en $NaHPO_4$ 1 H_2O 2.4 g

Fleet Enema of Fosfaatlavement

Hemodialyse en Peritoneale Dialyse



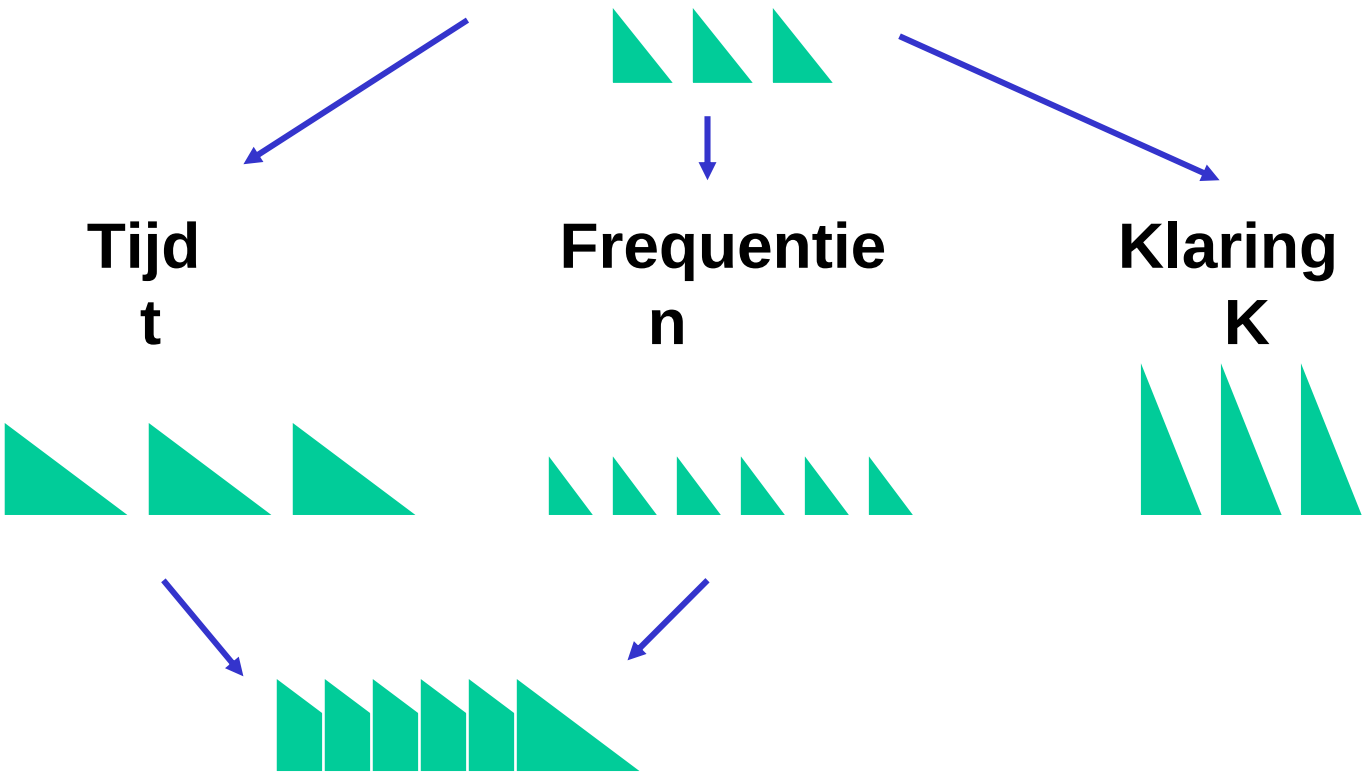
mass removal

Bammens, KI, 2006

Virga Jesseziekenhuis

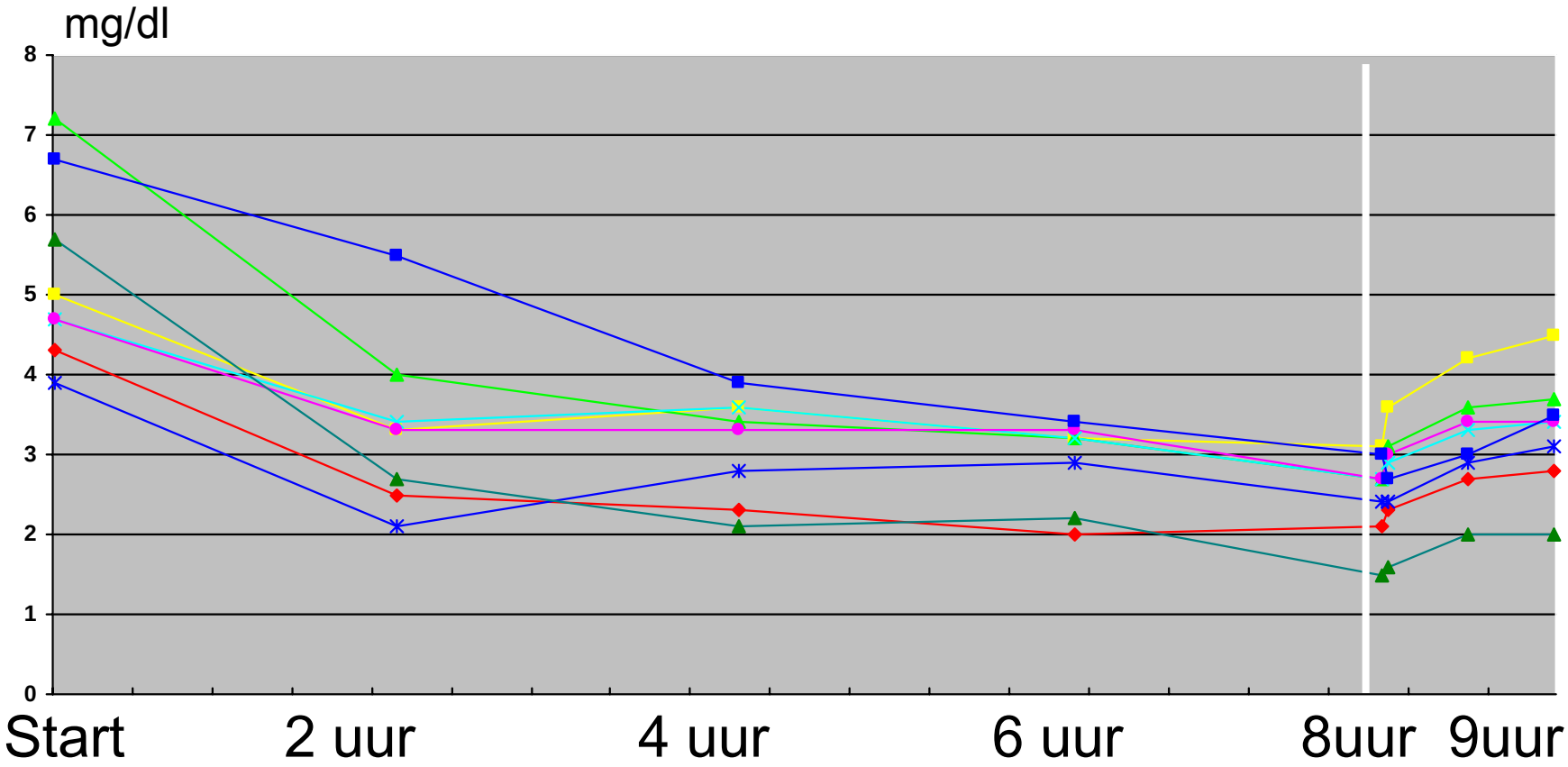
Dialyse strategieën

Conventionele dialyse



dialyse

Langdurige nachtelijke dialyse



n=8 nachtelijke dialysepatiënten (eigen data)

Virga Jesseziekenhuis

Dagelijkse dialyse

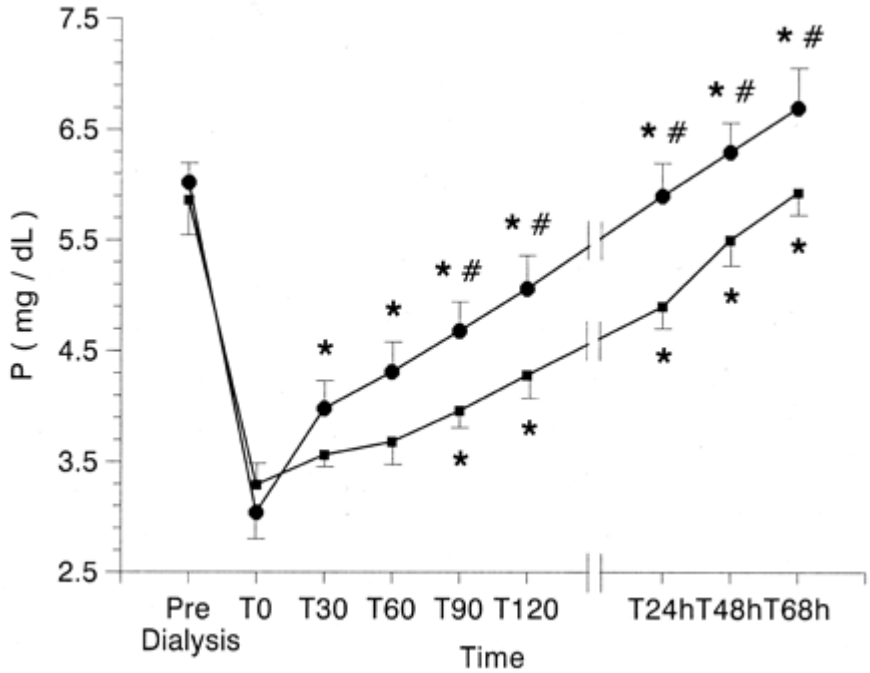
	3 x 4 uur Qb: 370 ml/' Qd: 500 ml/'	3 x 8 uur Qb: 370 ml/' Qd: 500 ml/'	6 x 2 uur Qb: 370 ml/' Qd: 800 ml/'	6 x 8 uur Qb: 250 ml/' Qd: 100 ml/'
stKt/V	2.4	3.26	3.26	4.77
Fosfatemie (mg/dl)	5.76	5.39	4.6	4.2

Leypoldt, Sem Dial, 2005

dialyse

Virga Jesseziekenhuis

Hemodiafiltratie



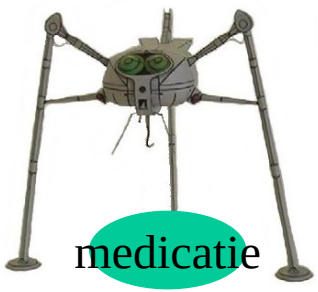
- Hemodiafiltratie
- Hemodialyse

Voor identieke Kt/V:

Hemodiafiltratie
- 1170 +- 90 mg per sessie

Hemodialyse
- 814 +- 79 mg per sessie

Minutolo, J Am Soc Nephrol, 2002



Phosphorus binders through the years

Sevelamer carbonate*
Magnesium-based compounds*
Trivalent iron compounds*
Niacin (inhibitors of intestinal mucosal phosphate transport)*

Aluminum-based binders

1

Calcium acetate

Sevelamer hydrochloride

Calcium carbonate

Lanthanum carbonate

1970's | 1980's | 1990's | 2000's

3

Cinacalcet hydrochloride

Calcitriol PO & IV

Paricalcitol: IV → PO

2

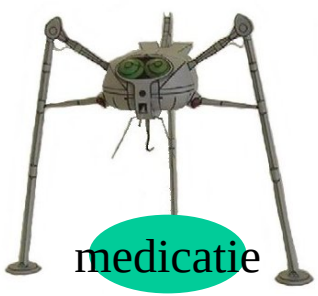
Doxercalciferol: PO → IV

1 alpha-hydroxyvitamin D3**
22-oxacalcitriol**

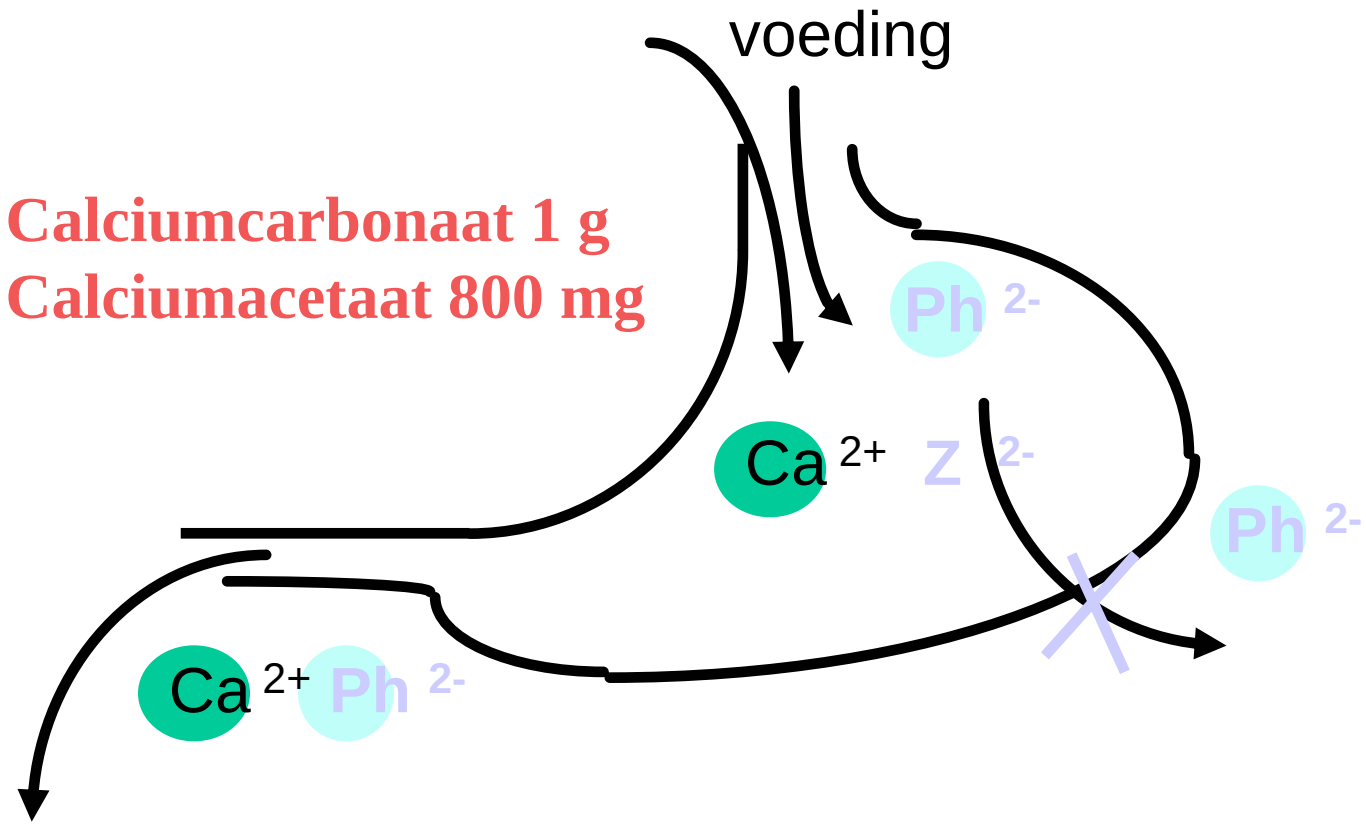
*Not yet FDA approved as phosphate binder

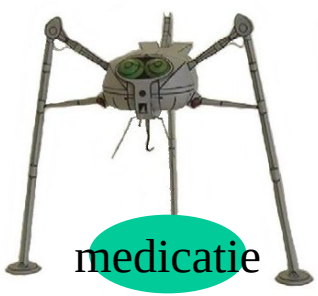
**Not approved in the US

Kovesdi, CJASN, 2008

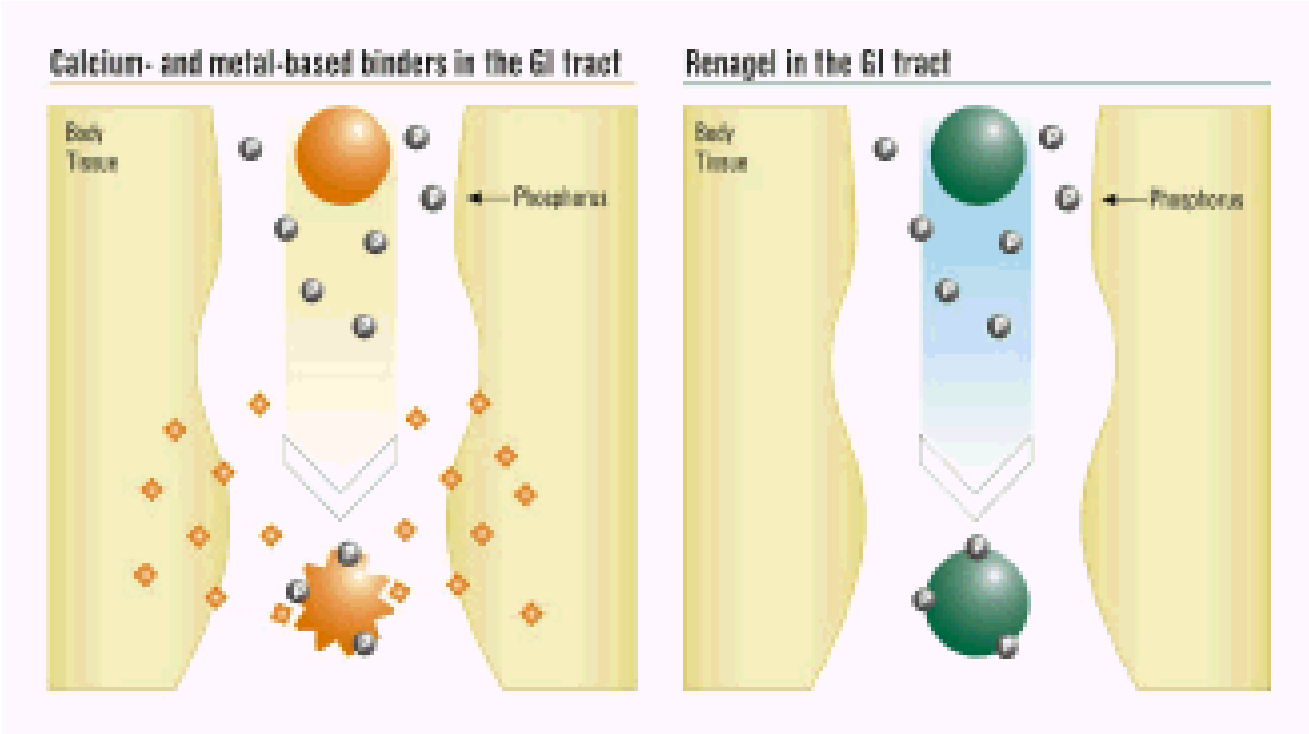


Fosfaatbinders

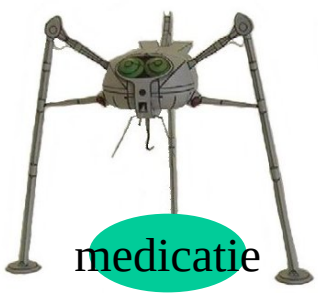




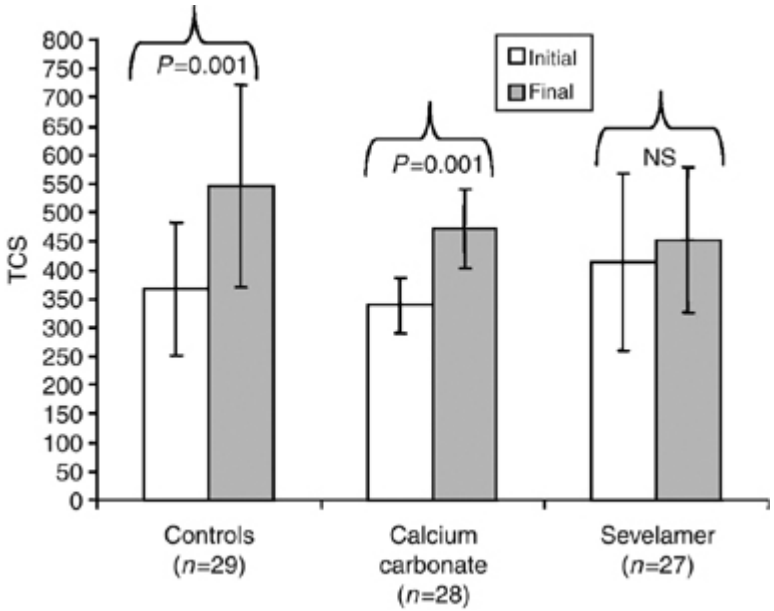
Calciumhoudende versus niet calciumhoudende fosfaatbinders

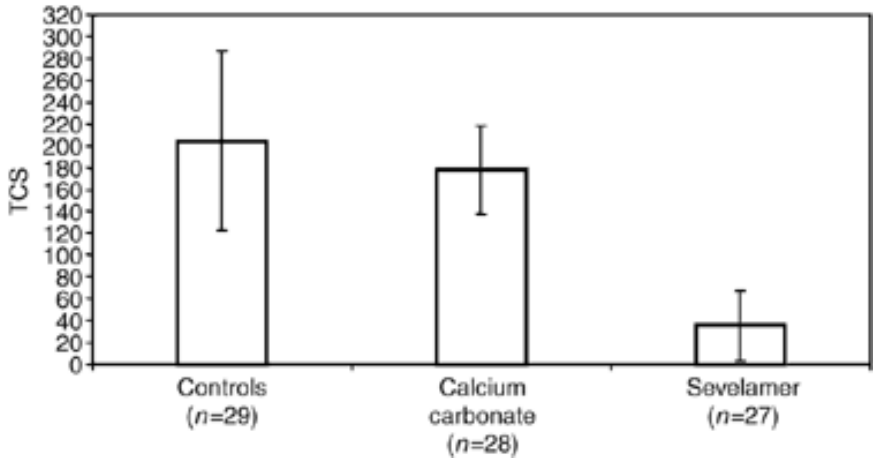


Renagel®

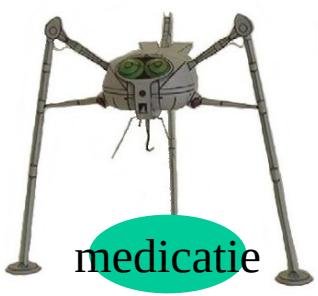


Calcification score, phosphorus binder choice in predialysis patients

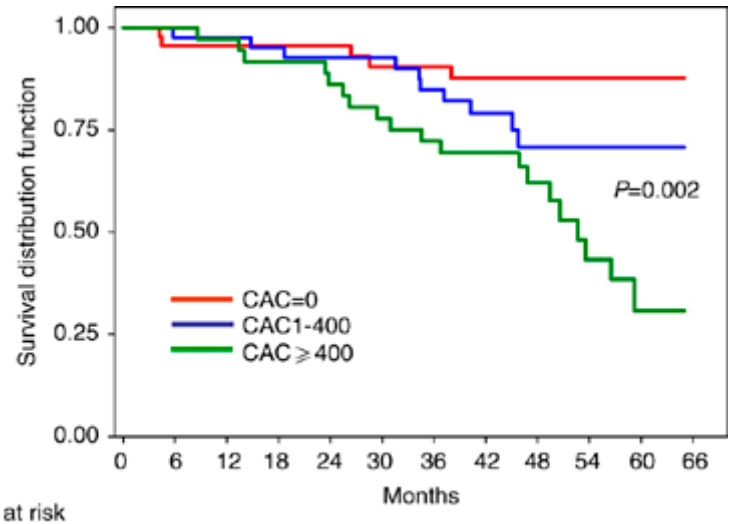




Russo, Kidney Int, 2007

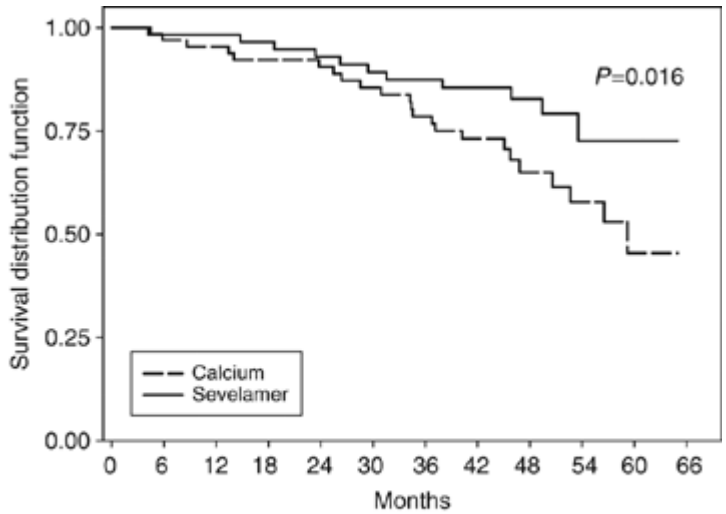


Calcification, Phosphorus binder choice and survival in dialysis patients



No. at risk

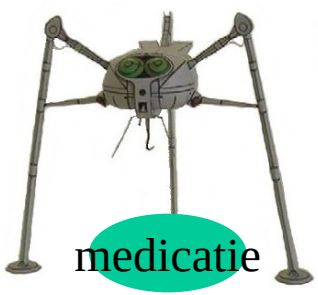
CCS = 0	46	42	42	39	34	18	4
CCS < 400	42	41	40	36	32	14	1
CCS ⩾ 400	39	37	35	31	26	15	4



No. at risk

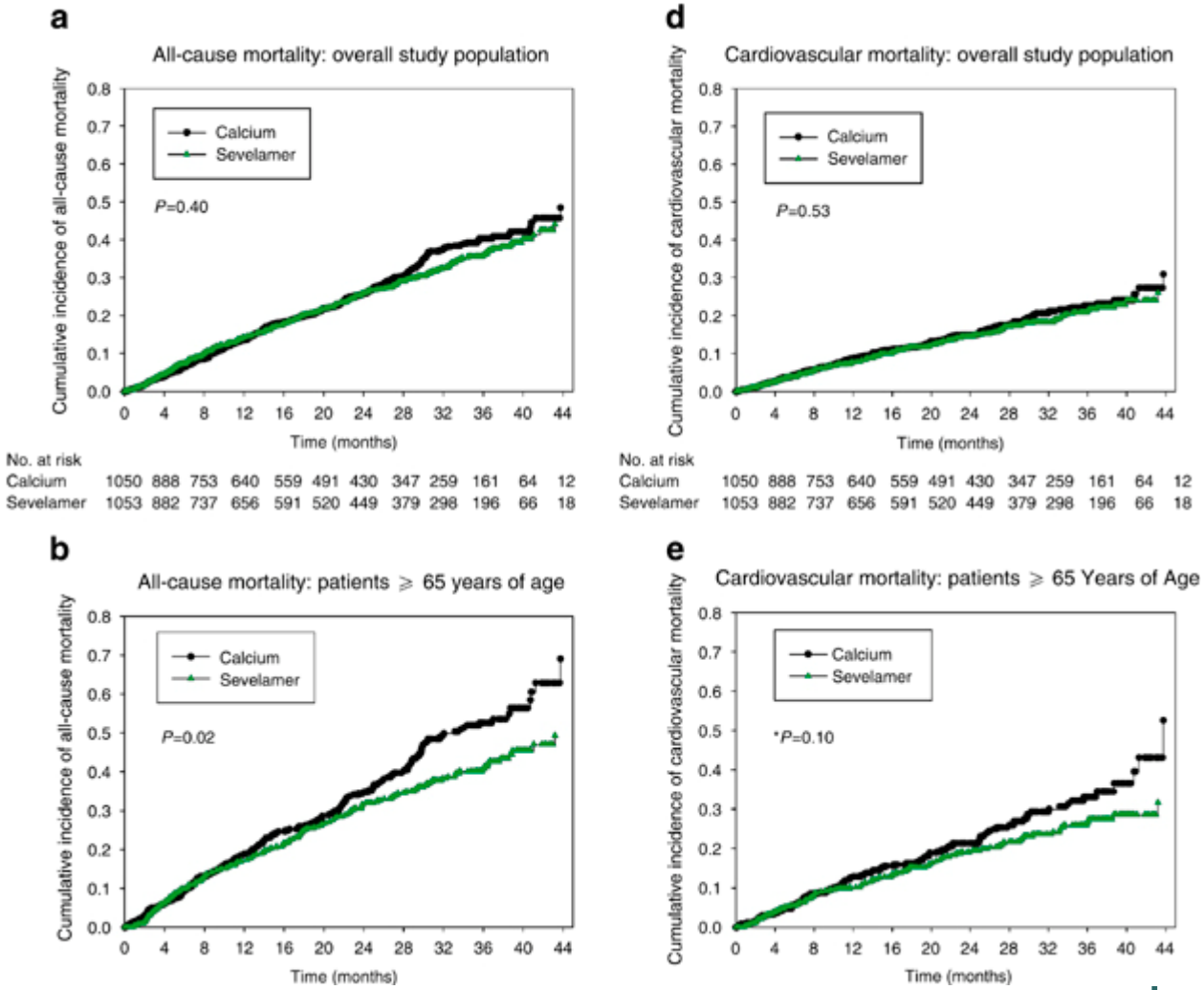
Calcium	67	63	60	55	45	22	5
Sevelamer	60	57	57	51	47	25	4

Block, Kidney Int, 2007



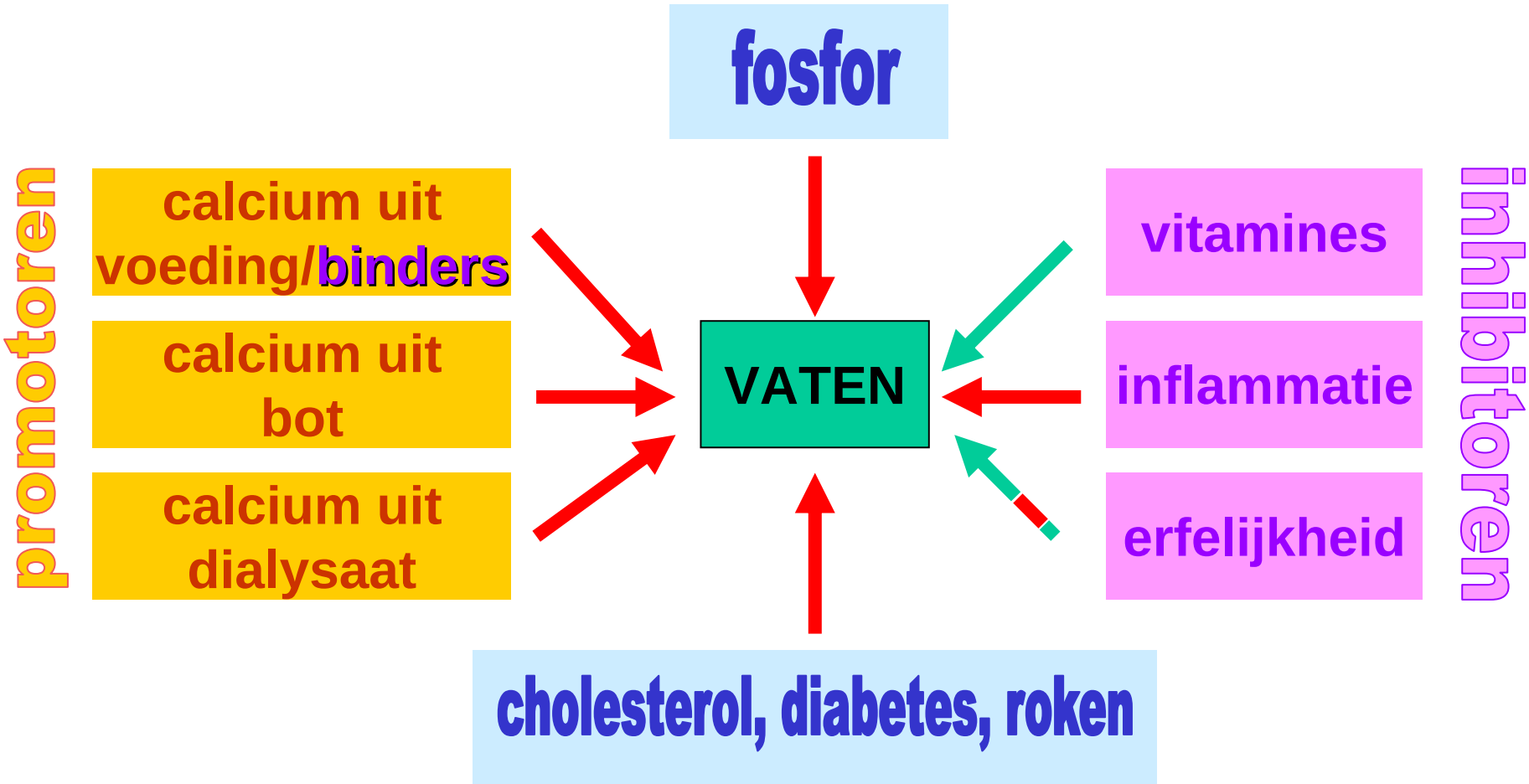
Virga Jesseziekenhuis

DCOR trial

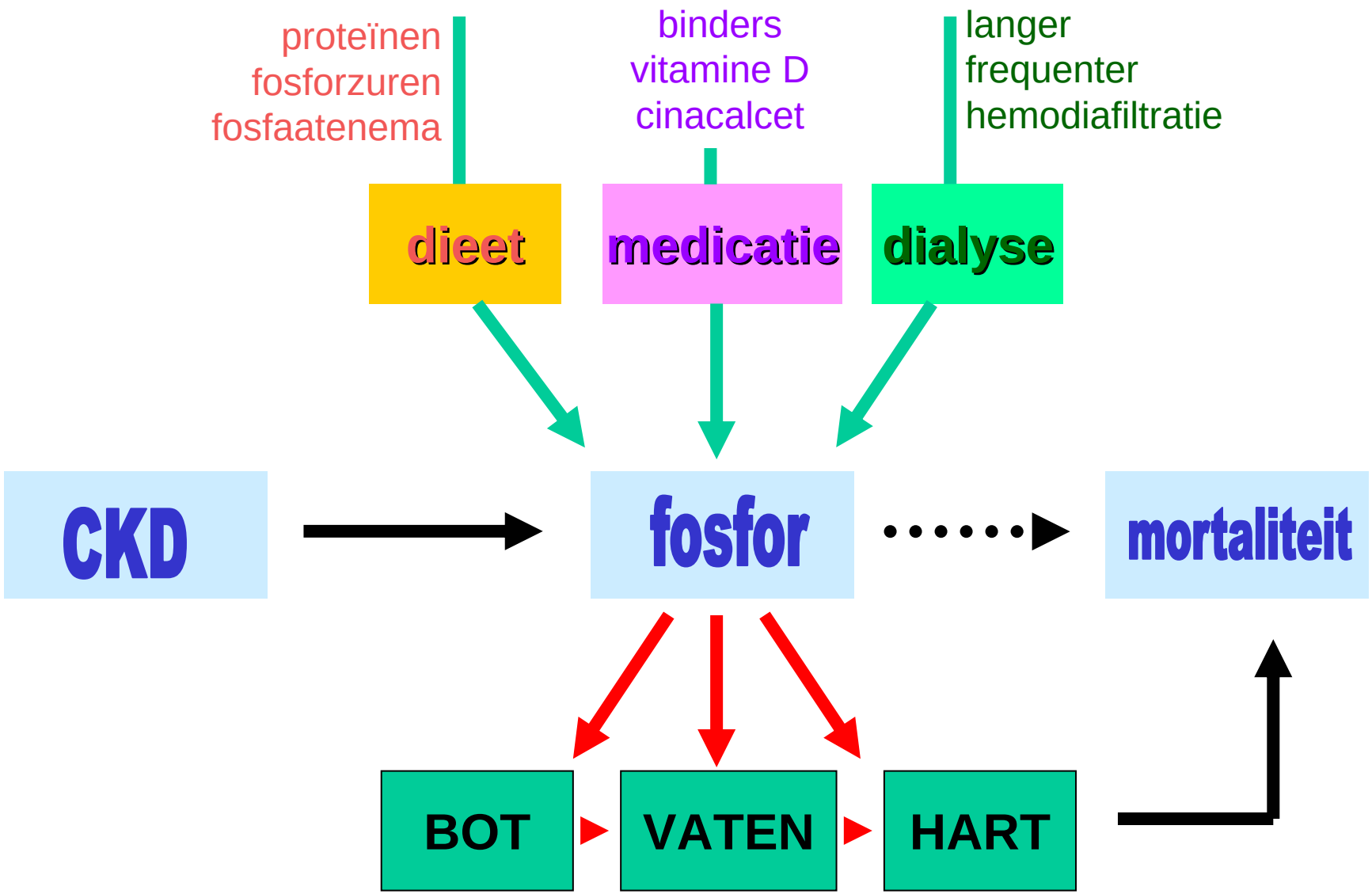


Suki, KI, 2007

Waarom is het zo ingewikkeld?



Conclusie


proteïnen
fosforzuren
fosfaatenema
binders
vitamine D
cinacalcet
langer
frequenter
hemodiafiltratie
dieet
medicatie
dialyse
CKD
fosfor
mortaliteit
BOT
VATEN
HART


Dank U voor de aandacht
1921: ontploffing van een fosforbom