

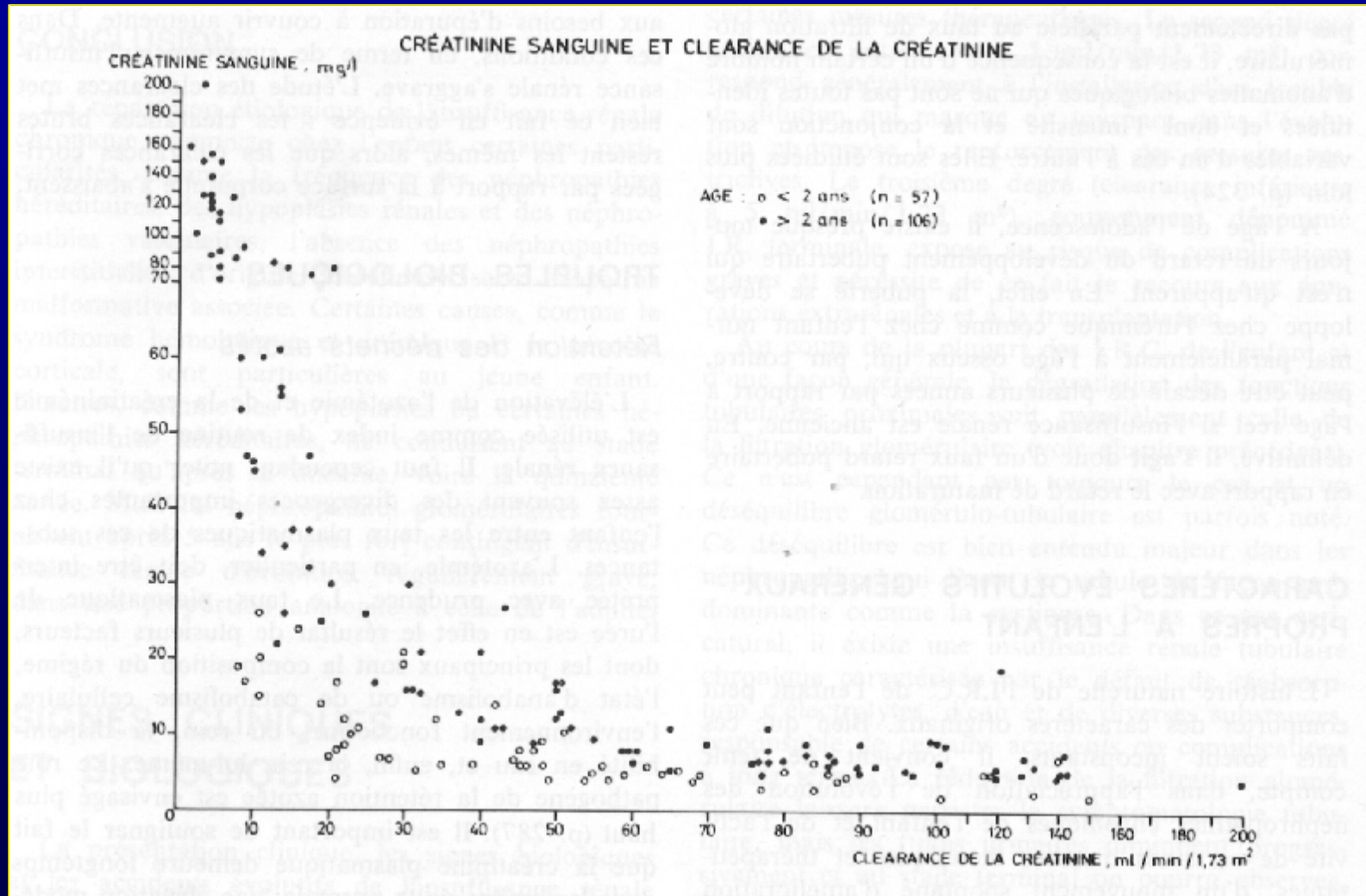
Guidelines for Paediatric Imaging

BSNM, 25 September 2004



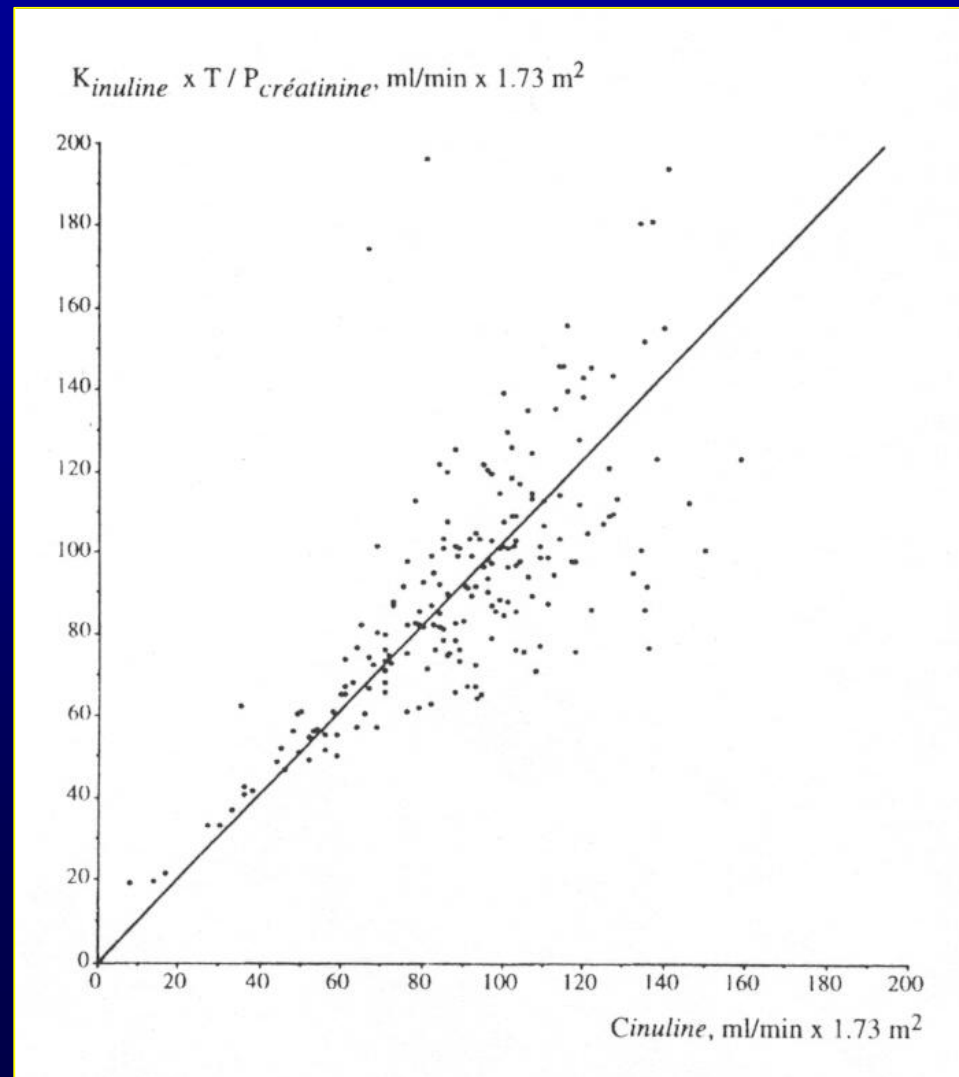
Plasma clearance in children

Plasma creatinine as an estimate of clearance



Estimated GFR from Schwartz algorithm

Hanggi et al, Arch Pédiatr, 1999



Radioisotopes and plasma samples

Which tracers ?

Glomerular filtration

first choice

- Tc-99m DTPA
- Cr 51- EDTA

Tubular secretion

second choice

- I131 or I 123 Hippurate
- Tc-99m MAG3
- Tc-99m EC

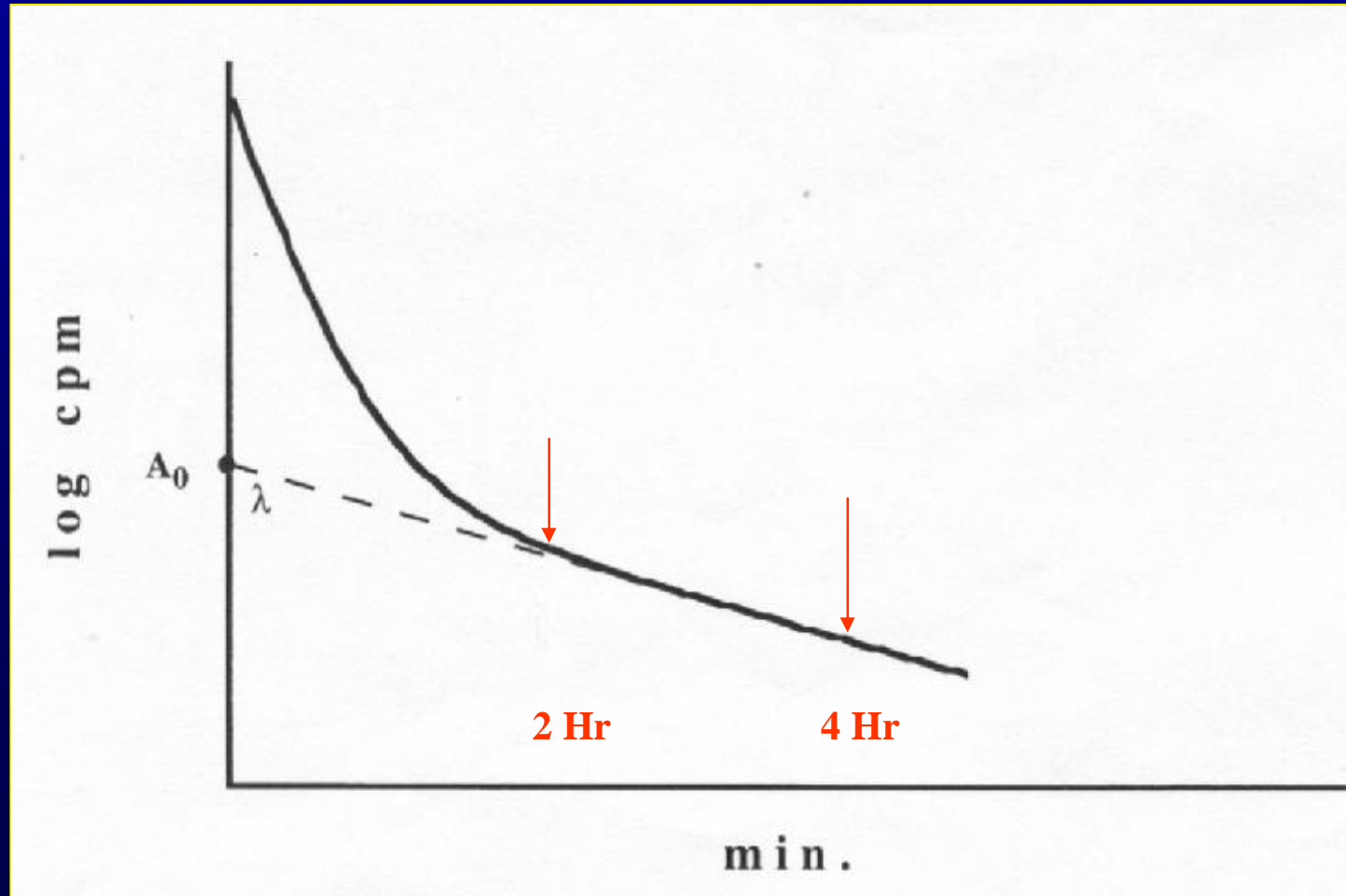
Which radionuclide method ?

Single shot injection and simplified methods

- 2 blood samples
- 1 blood sample

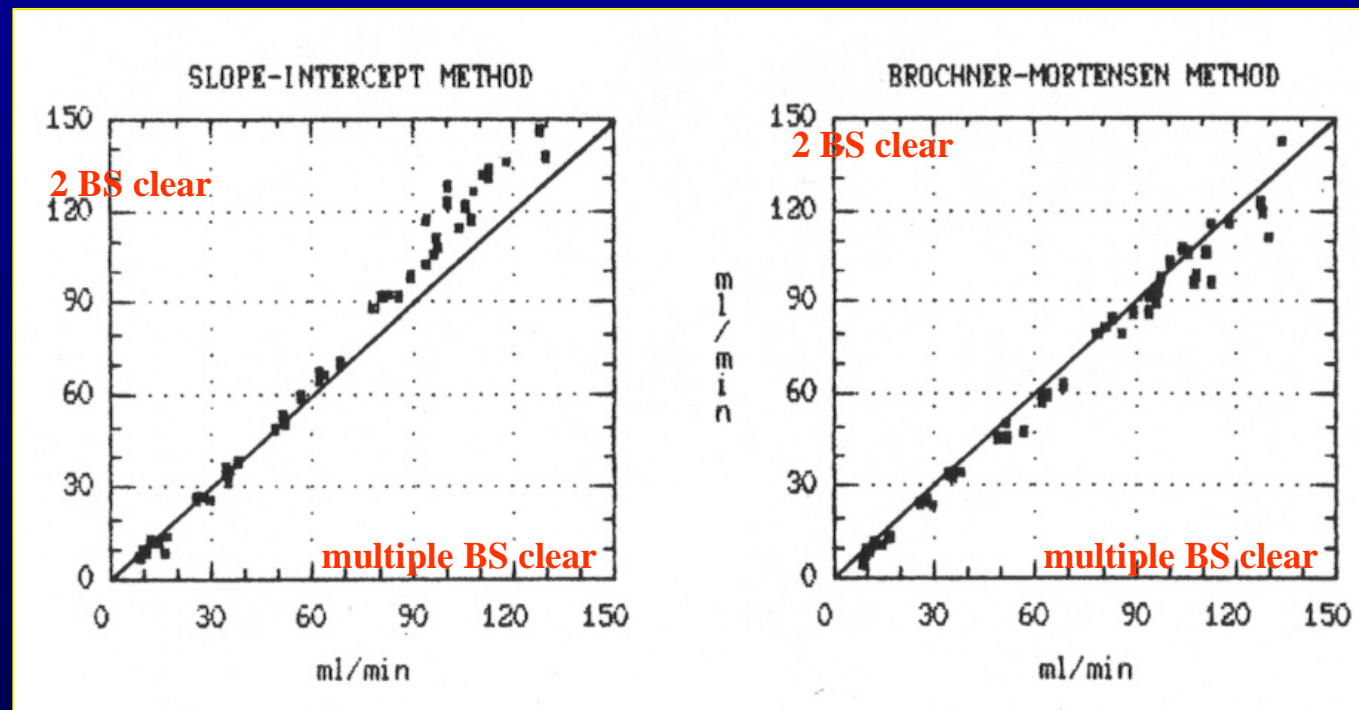
Simplified model : 2 blood samples

Clearance =
Distribution volume (DV) x slope
 $DV = \text{Dose} / A_0$



GFR : Validation of slope-intercept method

Piciotto et al, Eur J Nucl Med ;1992



1 BS methods

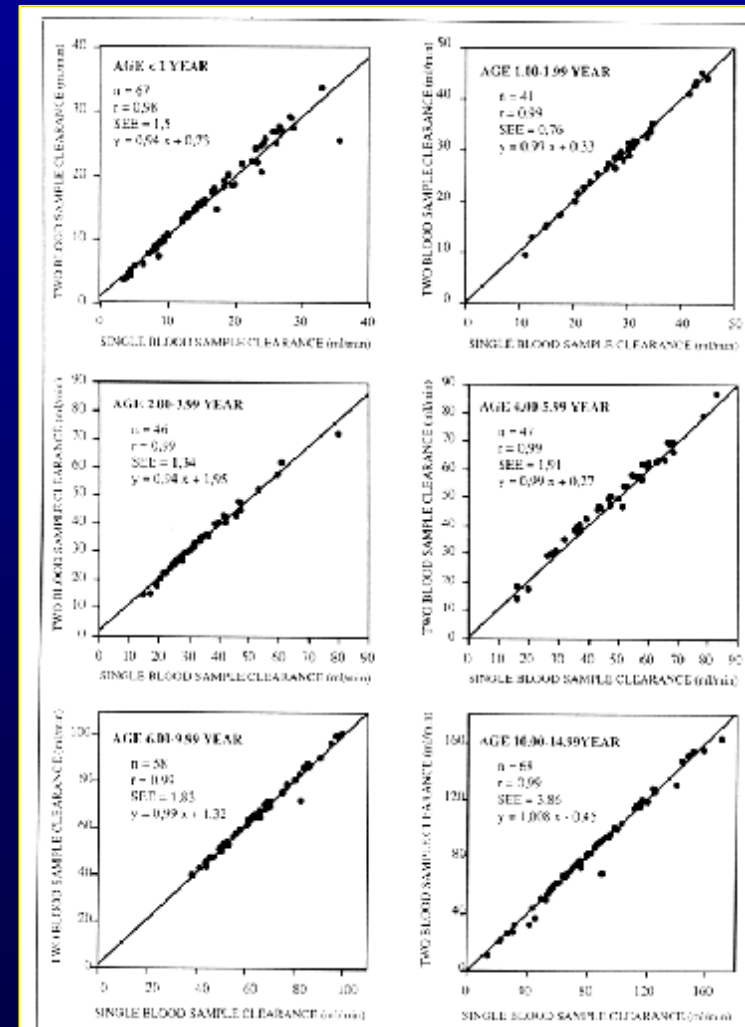
Empirical methods

Dose / Plasma concentration at time t

GFR : 1 BS method in children

Ham and Piepsz, J Nucl Med, 1991

- Plasma sampling : 2 hours
- Linear equation
- Only if $GFR > 30 \text{ ml/min/1.73 m}^2$



Indications

- **Follow up of chronic renal disease :**
diabetes, hemolytic uremic syndrom, glomerulopathies,...
- **Monitoring of nephrotoxic drugs**
cyclosporin, cisplatinum ...
- **Estimation of single kidney GFR :**
bilateral hydronephrosis or reflux, single or small kidney,...
- **Early diagnosis of renal impairment**

Practical considerations

Measurement of

- administered dose
- empty syringe
- standard of dose
- blood samples and dilution of standard

Strictly intravenous injection

Exact report of sampling time

Not particularly complex technique,

but needs care and ... experienced technologist

ALL DETAILS IN GUIDELINES