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Technologists Poster Session 3

Tuesday October 13, 2009 08:00h - 09:30h
Room: Hall 117

TP074 **A software for automatic calculation of glomerular filtration rate with ⁵¹Cr-EDTA**
09:09h -
09:12h

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Introduction: glomerular filtration rate (GFR) studies with ⁵¹Cr-EDTA are performed in large number in hospitals throughout the world. There are three important methods to determinate GFR: the method of Ham and Piepsz (Ham HR, Piepsz A. "Estimation of glomerular filtration rate in infants and children using a single plasma sample method". J Nucl Med 1991; 32: 1294.), the method of Mistry (Mistry R. Manual of Nuclear Medicine Procedures, Cap 2 Chapman and Hall Ltd, 1988.) and the bicompartmental model proposed by Sapirstein (Truniger B, Donath A, Kappeler M. "Simplified clearance techniques". Helv. Med. Acta, 34: 116-119, 1968). The calculation of GFR using any of these methods is not very complex, but tedious and time-consuming. **Objective:** The goal of this project is to develop a computing facility to automatically calculate GFR. **Materials and methods:** Briefly, the equations used in the calculations are Method of Ham and Piepsz: $GFR = 2.602 \times V_{120} - 0.273 V_{120} = Dose / A_{120} A_{120} = A_{(t)} \times e^{(0.008)(t-120)}$ Method of Mistry: $GFR = Dose \times 0.693 \times 0.87 \times 1000 / (A_0 \times 1000 \times T_{1/2})$ Bicompartmental model of Sapirstein: $GFR = I \lambda a \lambda b / (A \lambda a + B \lambda b) = I \ln 2 / (A T_{1/2a} + B T_{1/2b})$ $A_t = A e^{-\lambda a t}$ (fast exponential) and $B_t = B e^{-\lambda b t}$ (slow exponential) $I = doses \text{ in cpm} \lambda = \ln 2 / T_{1/2}$ For developing a software incorporating these calculations we have used Visual Basic 6.0 and Visual Studio Installer. **Results:** We have developed three forms for automatic calculation of GFR by means of three methods: the method of Ham and Piepsz, the method of Mistry and the bicompartmental model proposed by Sapirstein. Each form relies on a database to store, manage and retrieve the data of GFR studies. Moreover these forms offer the possibility of printing a detailed report of each GFR study. These forms are included in a software called Nucleolab, which is freely available at <http://serfa.radiofarmacia.org/?m=27> **Conclusion:** The software we have developed has an easy-to-use interface, that makes the calculation complexity of GFR studies completely hidden for the user, saving you the time that you previously spent on these laborious calculations and reducing the risk of error.

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