# A SOFTWARE FOR AUTOMATIC CALCULATION OF RADIOACTIVE DECAY AND DISPENSATION OF RADIOPHARMACEUTICALS

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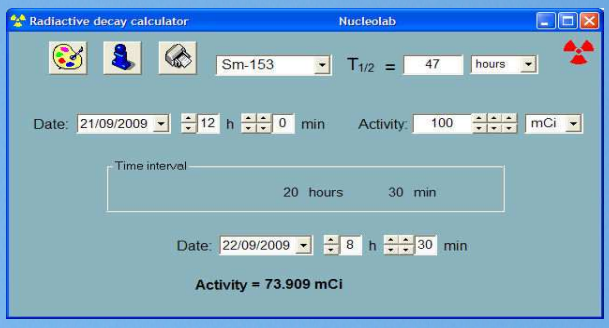
**Introduction:** The radioactive concentration of radiopharmaceuticals decreases according to radioactive decay law, so for a certain activity the volume needed increases in time. In the day-to day practice of nuclear medicine services and radiopharmacies it is necessary to calculate radiactive decay, activity and volume of radiopharmaceuticals. These calculations are not very complex but annoying and time-consuming.

**Objective:** The aim of this project is to develop a software for calculation of radioactive decay, activity and volume of radiopharmaceuticals at every time.

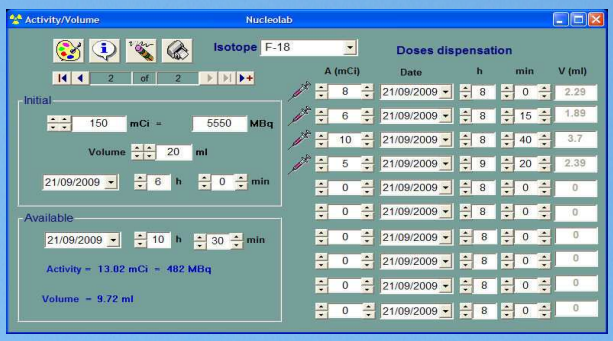
**Materials and methods:** For developing a software incorporating this calculations we have used Visual Basic 6.0 and Visual Studio Installer.

**Results:** We have developed a form called Radioactive Decay Calculator, which computes radioactive decay for a databank containing 43 radioisotopes. With a combo box the user can select an isotope from the list, but if the desired isotope is not on the list, the user can enter the isotope half-life and its time unit in the text boxes at the top of the form. Useful for calculating today´s activity for any radioactive isotope. You may also back decay sources to find out the original activity (or for any date), knowing the current activity.

The following examples illustrate the use of this software.




We also have developed a form for calculating dose-volume of radiopharmaceuticals, according the isotope, time, initial activity and initial volume. This form also calculates the remaining activity and volume at any time and relies on a database to store, manage and retrieve the data. Calendar pickers are included for date entry convenience.




These forms are included in a software called Nucleolab, which is available at:

http://www.radiofarmacia.org/nucleolab-english

**Conclusion:** This two forms have an easy-to-use interfaces that make the calculation complexity of radioactive decay, and other parameters about dispensation of radiopharmaceuticals, completely hidden for the users, saving you the time that you previously spent on these laborious calculations and reducing the risk of error.