

## Mathematical simulation to optimize the platelet concentrate stocks in the CVTTH

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**BACKGROUND.** The management of stocks of platelet concentrate (PC) is complicated because it has a short shelf-life and demand for it is variable. The persons responsible generally decide how much PC to produce based on personal experience. This study seeks to provide a tool for helping to decide more rationally and objectively how many units of PC to produce on each day of the week.

**STUDY DESIGN AND METHODS.** Using past data on PC produced, expired and transfused in the Basque Country in 2012, a mathematical model is constructed based on the normality of time series of transfusions on the same day of the week throughout the year. That model is implemented on an easy-to-use Excel spreadsheet and is validated by comparing the proposed output with actual data from 2013.

**RESULTS.** A comparison between the data from the simulation and actual data for 2013 reveals an 87.7% drop in PC outdates, a 14.3% drop in the number of PCs produced and a decrease of 1 day in the age of the units of PC transfused.

**CONCLUSION.** The practical application of the tool designed helps to decide how many units of PC to produce each day and results in a substantial reduction in the number of units produced and discarded as outdated, thus saving money. It also results in a decrease of almost a full day in the average age of the units of PC transfused.

**Keywords:** Blood transfusion, platelet concentrate, optimisation of stocks.