

AN INCREASE IN A NUMBER OF JAPANESE MAINTENANCE HEMODIALYSIS PATIENTS IS APPROXIMATING TO A PLATEAU

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PURPOSE: Verification of usefulness of a dynamic mathematical analysis of a number of maintenance hemodialysis patients in Japan.

METHOD: A multiitem approximation formula created for a HD pt number (Y) - year(X) relation is: $Y = -0.0127 X^5 + 1.1069X^4 - 34.673 X^3 + 643.47 X^2 - 1884.6 X + 1293.6$ (R= 0.9996). A first and a second derivative formula are :

$$Y' = -0.0635X^4 + 4.4276X^3 - 104.019X^2 + 1286.94X - 1884.6,$$

$$Y'' = -0.254X^3 + 13.2828X^2 - 208.038X + 1286.94.$$

RESULTS: A number of HD pts is approximating to a plateau. In 1992, a second derivative value, an acceleration degree in a change in a patient number, started declining. In 1999, a first derivative value, a speed in a change in a patient number, started declining while a second derivative value turned negative. Extrapolation indicates that a first derivative value will become negative, and a decrease in a patient number will start, in 2009. Mathematical modelling is very useful.