1056-39-2059   **Tamara Eugenia Awerbuch-Friedlander*** (`tamara@hsph.harvard.edu`), 665 Huntington Ave, Boston, MA 02115, and **Richard Levins** (`Humaneco@hsph.harvard.edu`), 665 Huntington ave, Boston, MA 02445. *The Aging Heart and the Loss of Complexity- a Difference Equation Model.* Preliminary report.

There are indications that the heart-beat rate of humans looses variability as it ages. An initial examination of the time series data, obtained from ECG studies, shows that if we plot the RR interval (the time intervals between beats) as a function of beat number, the young healthy heart exhibits more variability than the old one. The dynamics observed in the rhythm of a young healthy heart is considered "chaotic" and typically reflects physiologic vitality. The transition from chaos to periodic oscillation as in the aging heart, indicates a compromise of cardiac function. Models based on difference equations to explain ECG data of young and old individuals are being constructed. The equations will display changes in dynamical patterns based on parameter values. First we characterize the system looking at the relationship of each beat to previous beats. This is done through statistical analysis in order to produce a phase space map to be used to explore the possibility of a mechanism that can be described by a non-linear difference equation or by a set of non-linear difference equations. Our preliminary results show a loss of non-linearity as the heart ages, indicating some loss of physiological control. (Received September 23, 2009)