1106-VG-1543 **Boniface Otieno Kwach*** (bkwach@kibabiiuniversity.ac.ke), Kibabii University College, P. O. Box 1699, Bungoma, Bungoma, 50200, Kenya, **Naphtali Omolo Ongati** (nomoloongati@gmail.com), JOOUST, P. O. Box 210, Bondo, Kisumu, +254, Kenya, **Michael Oduor Okoya** (oduor_okoya@yahoo.com), JOOUST, P. O. Box 210, Bondo, Kisumu, +254, Kenya, and **Amos E. O Otedo** (otedoamos@yahoo.com), Kisumu East District Hospital, P. O. Box, P.O.Box 4685-40103, Kisumu, +254, Kenya. *Mathematical modeling of Insulin therapy in Patients with Diabetes Mellitus.* Preliminary report.

This paper presents a Mathematical Model of Insulin Therapy in Patients with Diabetes Mellitus which includes external rate at which blood Glucose, Insulin and Epinephrine are being increased in the form, $\dot{Y} = AY + \vec{r}(t)$ and whose solution was analyzed to provide the systems natural frequency, ω_0, which is the basic descriptor of saturation level of the drug. It was established that the resonance period for the final model, that is, $T_0 = 3.76912$ hrs, is in the acceptable therapeutic range and agrees well with the data for the existing Insulin therapy. By employing the model, it is shown that, the peak, which is the time period for Insulin to be most effective in lowering blood sugar, is shorter than $T_0 = 5.3199$ hrs, for the existing model. This model would help the medical practitioners to predict Insulin Therapy in patients with Diabetes Mellitus, in such a way that the concentration of the drug remains in the therapeutic range.

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