

Title: THIOPENTAL SLEEP DOSAGES IN GERIATRIC PATIENTS  
Authors: S. MURAVCHICK, M.D., PH.D., J. MANDEL, M.D.  
Affiliation: DEPARTMENT OF ANESTHESIA, UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, PHILADELPHIA, PENNSYLVANIA 19104

**Introduction:** Although loss of nervous system reserve function and reduced anesthetic requirement are factors generally accepted as relevant to the proper conduct of anesthesia for geriatric patients, no quantitative guidelines exist for thiopental sleep dosages in the aged patient<sup>1</sup>. Our study questioned whether there are significant differences in the dose of thiopental required to achieve loss of consciousness for routine anesthetic induction in geriatric as compared to young adult surgical patients.

**Methods:** 31 geriatric patients (65 yrs or older) and 17 control patients (20-40 yrs) were studied with the approval of the local Committee for Investigations on Human Beings. Prior to coming to the operating room, each received pre-medication with morphine 5-10 mg IM and atropine 0.2-0.4 mg IM. Each patient received a randomly selected dose of thiopental (TPL) of 1.6 to 2.8 mg/kg diluted to a final volume of 10 ml and injected over 10 seconds into a rapid IV infusion. Time to loss of response to verbal command, time to loss of lid reflex and vital signs were measured. After determination of response, induction proceeded with additional TPL at the discretion of the anesthetist. No acutely ill patients or patients PS4 or greater were studied.

**Results:** The 24 geriatric patients studied who received 1.8 to 2.5 mg/kg (figure) all failed to respond to the command "open your eyes" within 90 seconds. Mean time for loss of consciousness (LOC) defined in this manner was 28 ± 6 seconds. One patient in this group failed to lose lid reflex after LOC. The incidence of LOC was 71% in the geriatric patients given 1.6 mg/kg.

No control patients receiving 1.8 or 2.0 mg/kg showed LOC (figure). A 100% incidence of LOC required 2.8 mg/kg. At all doses tested the fraction of geriatric patients showing LOC by either verbal or reflex criteria was greater than the corresponding fraction of control patients. Neither group showed statistically significant alterations of blood pressure or heart rate after injection of TPL.

**Discussion:** To provide clear separation of patient groups with respect to both chronological and physiological age, we defined a control group whose oldest patient would be 25 years younger than the youngest patient in the geriatric group. Using a simple "yes" or "no" LOC response to a single arbitrarily-selected bolus of TPL<sup>2</sup>, we have attempted to minimize uncontrollable factors such as cerebral perfusion, circulation time, and plasma protein binding which would alter response to TPL infusions continued to the point of LOC. Although our study does not yet include enough patients to establish precise dose response parameters, our data do indicate a clear separation between the response of the geriatric and control groups and suggest that the ED<sub>50</sub> for TPL in premedicated geriatric patients will be significantly less than the corresponding value for premedicated young adults.

**References:**

1. Stella L., et al.: The relative potencies of thiopental, ketamine, propranolol, alphaxalone and diazepam. *Brit. J. Anaesth.* 51:119, 1979.
2. Côté C.J., et al.: The dose response of intravenous thiopental for the induction of general anesthesia in unpremedicated children. *Anesthesiology* 55: 703, 1981.

**Figure:**

