

# Factors associated with medical knowledge acquisition during internal medicine residency

McDonald FS, Zeger SL, Kolars JC

**Background:** Knowledge acquisition is a goal of residency and is measurable by in-training exams. Little is known about factors associated with medical knowledge acquisition.

**Objective:** To examine associations of learning habits on medical knowledge acquisition.

**Design, Participants:** Cohort study of all 195 residents who took the Internal Medicine In-Training Examination (IM-ITE) 421 times over 4 years while enrolled in the Internal Medicine Residency, Mayo Clinic, Rochester, MN.

**Measurements:** Score (percent questions correct) on the IM-ITE adjusted for variables known or hypothesized to be associated with score using a random effects model.

**Results:** When adjusting for demographic, training, and prior achievement variables, yearly advancement within residency was associated with an IM-ITE score increase of 5.1% per year (95%CI 4.1%, 6.2%;  $p < .001$ ). In the year before examination, comparable increases in IM-ITE score were associated with attendance at two curricular conferences per week, score increase of 3.9% (95%CI 2.1%, 5.7%;  $p < .001$ ), or self-directed reading of an electronic knowledge resource 20 minutes each day, score increase of 4.5% (95%CI 1.2%, 7.8%;  $p = .008$ ). Other factors significantly associated with IM-ITE performance included: age at start of residency, score decrease per year of increasing age, -0.2% (95%CI -0.36%, -0.042%;  $p = .01$ ), and graduation from a US medical school, score decrease compared to international medical school graduation, -3.4% (95%CI -6.5%, -0.36%;  $p = .03$ ).

**Conclusions:** Conference attendance and self-directed reading of an electronic knowledge resource had statistically and educationally significant independent associations with knowledge acquisition that were comparable to the benefit of a year in residency training.