**Milestones vs Early Career Outcomes**

**ACGME Summary**

We have competed our initial analysis of the relationship between graduating trainee Milestone ratings and early career outcomes in non-fellowship trained general surgeons.

**Methods**

In summary, we collected administrative claims data from both Carrier fee-for service claims as well as a 100% sample of the Medicare Analysis Provider and Review (MedPAR) files from 2014-2017. These were linked to General surgery trainee Milestones data using the National Plan and Provider Enumeration System (NPPES) database.

Our surgeon cohort was generated from the list of identified NPIs associated with partial colectomy procedures in the Medicare Carrier file ranging from 2014-2017. This list of surgeons was then cross-referenced with a list of NPIs of graduated general surgery residents from ACGME training programs with Milestones ratings at time of graduation. We further restricted our analysis to surgeons that were not fellowship trained in order to eliminate the confounding effect of additional training after final residency Milestone ratings were assigned.

Outcomes included 30d mortality, reoperation and readmission as well as coded post-op complications. We also examined a composite of these, labeled severe complication that was associated with >75 percentile mean LOS.

All inpatient admission/discharge data for each patient were then obtained from MedPAR to find all encounters associated with the relevant 30-day procedural window. We only included cases performed within 24 months of completion of a surgeon’s general surgery residency for analysis in order to better isolate the association between graduating Milestone ratings on the performance of general surgeons from the effects of accumulated experience in clinical practice.

We examined the most proximal Milestone ratings for each trainee to the time of their graduation. For each resident, we examined both a mean overall score of all 16 subcompetencies as well as mean scores of three separate performance clusters of subcompetencies we labeled Operative Performance (PC3, MK2, ICS3), Professionalism (Prof1, Prof 2, Prof3), and Leadership (Prof1, ICS1, ICS2, SBP1). These clusters were of theoretical interest and were derived from previous factor analysis of single institution data as part of other research.

Using generalized mixed models, we analyzed mean Milestone ratings both continuously and as a binary predictor in which each claim was categorized as corresponding to a general surgeon from either the “Proficient (mean score ≥ 8)” or “Not Yet Proficient” (mean score < 8) cohort. For both analyses, we included patient, procedure and hospital-level characteristics as fixed effects, and also accounted for clustering of patients within hospitals and individual surgeons by including both hospital and surgeon as random effects.

**Results**

For each category of Milestone rating (Overall, Op Performance, Professionalism and Leadership) we report a descriptive table of the underlying characteristics in each cohort that we adjust for in our models. We then report an OR with 95% CI and predicted rate of complication for each outcome, treating Milestone ratings as both a continuous (left) as well as a binary predictor (right) for each outcome. A sample regression table for the outcome “any complication” follows showing all fixed and random effects included in our models as well as their predicted effect on the outcome.

The attached analyses shows that there is a non-significant association between mean graduation Milestone ratings and early career outcomes in partial colectomy when examined continuously as well as using a binary predictor of proficiency having achieved a mean score of at least 8 corresponding to overall competence in measured performance domains.

When examining each subdomain of performance ratings we found a similar pattern. The strongest association we found in our analysis was related to Professionalism finding a significant result when examining the outcome “any complication”.

Based on our analysis we concluded that there is little association of Milestone ratings at graduation and patient outcomes after colectomy for early career general surgeons.