"The July Effect: Impact of the Academic Year-End Changeover on Patient Outcomes"
John Q Young, MD MPP, ET. Al., Ann Intern Med 2001: 155: 309-315
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Joan Weinryb, MD

Definition of terms:
July Effect is composed of drop in clinical experience of the physicians in the clinical system and a decrease of physicians familiar with the clinical system.

Type of study: Systematic review of studies identified by electronic literature search, describing the effects of trainee changeover on patient outcomes.
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Identified studies that examined the turn-over of physicians in training related to the beginning of the year, used a control group or time period in comparison, reported the effect of the changeover on mortality, morbidity, medical error, or efficiency of care. Studies were reviewed in full. 2 authors independently abstracted data using standardized form, to review outcomes, study setting, design, statistical methods, characterizing methodology, size, and outcomes.
Data abstracted: number of sites and the patients studied, location and type of care system, study period and duration, specialty studied, patient and hospital eligibility criteria, data source, type of control, size of changeover and control groups, statistical tests and control for confounders (demographic characteristics, case mix, time trends), definition of patient care team, resident involvement in patient care, oversight structure, primary and secondary outcomes, and results.

Study outcomes organized into 4 categories: mortality, morbidity (e.g., perioperative complications, rate of errors in lab ordering), and efficiency (e.g., length of stay, costs, operating room time).

Bias assessment: Assessed degree study guarded against major potential biases involved in observational research.
Whether investigators: guarded against possibilities of differences in patient mix between comparison periods through adjustment for patient factors, used statistical methods to account for within-year variations in outcomes or between-year trends, incorporated a concurrent control group (e.g., non-teaching hospital).

Categorization of study quality:
1- Poor quality: did not adjust for possible confounding
2- Fair quality: adjusted only for demographic variables and case-mix
3- Good quality: adjusted for patient factors and time trends
4- Very good: used concurrent control in addition to adjusting for demographic characteristics, case mix and time trends.
39 studies, all inpatient settings: 27(69%) reported mortality, 19(49%) reported efficiency (length of stay, duration of procedure, hospital charges), 23(59%) reported morbidity, 6(15%) reported medical errors. All English, mostly, U.S.A.

**Results:** Studies with higher quality designs and larger sample sizes more often showed increased mortality and decreased efficiency. Studies of morbidity and medical error were of lower quality (did not use validated surveillance systems) and had inconsistent results.

**Conclusion:**
Review indicates “July Effect” exists
Study heterogeneity and methodological limitations preclude determination of degree of risk posed, effect on morbidity and on medical error.

**Limitations:** Supervision structure varied considerably between programs.
Study heterogeneity limited ability to determine which features of a residency program or changeover system are most problematic.
Most of the studies did not control for time trends, level of supervision.
Most did not use methodology appropriate for hierarchical data analysis.

**Authors’ Conclusions:**
Authors suggest developing changeover systems informed by human factor principles:
avoiding cognitive overload and fatigue, reduce initial workload (lower admission caps/panels) Use of physician extenders. Strategies for reducing system disruption (staggered schedule starts).
Since trainees at a given level have different competency, graded responsibility linked to competency assessment could occur.
Requires collaboration between residency programs, health system engineers, medical center leaders.

**Dr Benjamin Rush, at the Constitutional Convention:**
"The Constitution of this Republic should make special provision for medical freedom. To restrict the art of healing to one class will constitute the Bastille of medical science. All such laws are un-American and despotic . . . Unless we put medical freedom into the constitution the time will come when medicine will organize into an undercover dictatorship and force people who wish doctors and treatment of their own choice to submit to only what the dictating outfit offers"

**“Learning in Practice: Competency based medical training: a review”**
Wai-Ching Leung

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