

APPENDIX D **CONCEPTUAL FRAMEWORKS IN THE STUDY OF DUTY HOUR CHANGES IN GRADUATE MEDICAL EDUCATION: AN INTEGRATIVE REVIEW**

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Executive Summary

Resident physicians bear an enormous burden of responsibility for the nature and quality of patient care in the hospitals in which they are employed, and residency training has traditionally been a period of demanding and rigorous service. In 2003, the Accreditation Council for Graduate Medical Education instituted duty hour regulations in which residents of all specialties were limited to 80 hours per week.¹ In 2008, the Institute of Medicine issued a report, “Resident Duty Hours: Enhancing Sleep, Supervision, and Safety.”² Despite noting a lack of empirical evidence, the report recommended additional changes to duty hour regulations, including protected sleep periods and additional time off.

In choosing which outcomes of duty hours to describe and how to study them, researchers and others advance arguments that use conceptual frameworks, which represent simplified representations of the complex relationships between duty hours and outcomes to patients, residents, faculty, institutions, and other health professionals. These frameworks may be based on theories (evidence based, explanatory, and predictive), best practices (evidence-based observations), or models (presumptive relationships).³

The goal of this study was to identify and specify the conceptual frameworks used in the development, implementation, and study of duty hour regulations in the Institute of

Medicine report and publications since the report.

Articles were searched across multiple bibliographic databases in July 2009, with additional articles through September 2009 located through automated alerts. Websites and conference proceedings for organizations involved in graduate medical education in the primary care specialties were also searched. Articles were reviewed to identify outcomes of duty hour changes, and to describe and critique conceptual frameworks used explicitly or implicitly to argue for the relationship between duty hour changes and outcomes.

Frameworks identified were reviewed by the 7-member project team to confirm their structure, and disagreements were resolved by discussion and consensus.

We reviewed 203 publications in full and identified 83 outcomes of duty hour changes that have been studied or discussed. Twenty-three conceptual frameworks were identified and described. The frameworks vary both in their theoretic basis and the amount of empirical evidence supporting the hypothesized relationships. Many of the frameworks are in opposition, some even making directly opposite predictions about the impact of a change in duty hours on such important outcomes as patient welfare and resident quality of life. On the whole, much of the discussion, both in the IOM report and by organizations responding to it, is characterized by strongly held positions and limited evidence.

Several gaps in the literature were identified as a result of the critique of conceptual frameworks. The concept of “duty hours” itself is contested, and long-standing questions about

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the balance of education and service for house staff have yet to be explicitly resolved. Too little attention has been paid to the nature and intensity of the activities that occupy those hours. Reflection on the European experience with 48-hour limits has rarely been given serious attention by US authors despite considerable European work on the scientific study of fatigue and risk associated with particular shift configurations, schedules, and rotations at the ward or service level.

Most of the literature to date focuses on isolated outcomes of changes in duty hours. Few conceptual frameworks have explicitly posited tests of mediators or moderators. Another, and related, critical gap in the literature is the dearth of studies that investigate the net tradeoffs between such key outcomes as patient safety, resident safety, resident education, resource costs (to society and programs), and quality of

life for resident and attending physicians; even less study has been directed to the *value* society places on such tradeoffs.

Conceptual frameworks underlie arguments made about the impact of duty hour changes and frame assumptions about research hypotheses and necessary research designs to provide evidence about the impact of changes. We encourage researchers and advocates to make their conceptual frameworks explicit and to detail their bases, workings, and implications.

References

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