

Four Models for Surgical Resident Education under an 80-hour Limit

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The surgery residency program at the McGaw Medical Center of Northwestern University developed four practical schemes of resident rotations that program directors could adopt to their local environment to meet the 80-hour workweek while at the same time maintaining or hopefully enhancing resident education. The models that emerged from a think tank at Northwestern University Hospital are: the Stretch Model, the Night Float Model, the Apprentice Model and the Mastery or Case-Based Model. Current practice is assumed to be hospital-based teams of residents who work with multiple attending physicians on a service and who take night call on a regular schedule, typically every third night.

In the *Stretch Model*, residents take call every fourth night (or less frequently) and leave early the next morning after call (although up to six hours are allowed for transition of care). This reduces the number of work hours in the week. The stretch model is probably the easiest way to get to an 80-hour week, but it has no real educational advantages other than shortening the work week and presumably giving residents more time to read. The *Night Float Model* consists of a traditional resident team system, except that a percentage of the program's total residents are designated to work a permanent night shift, usually for a month at a time (in most programs, residents will be on night float two to three months per year). Several teams would work the day shift, that includes a one hour overlap with the night team allowing for a robust "sign-out." Teams working during the day would leave in the evening and take no in-house night call. There is again an overlap hour in the evening for "sign-out." The "night float" team would work a night shift six days per week, although larger programs may be able to have a five nights per week schedule.

The *Apprentice Model* involves one resident working exclusively with one or two faculty members over one to three months. Residents work side-by-side with their assigned mentors in the operating room and outpatient office, and take home call when their mentor is on call. Residents are involved only in the care of their mentors' patients. Faculty members would need to be selected carefully based on dedication to education and an appropriate practice profile. This model lends itself particularly well to certain subspecialty areas like colorectal surgery or breast surgery but can be used for general surgery rotations as well. Because apprentices take no regular in house night call, it is usually possible to construct a work week that is less than 80 hours long, even if the resident has to come in at night once or twice a week. In the *Mastery (Case-Based) Model*, patient cases are assigned to residents based on the residents' learning needs irrespective of attending or team assignments. Proficiency, knowledge and skills associated with diseases and operations are measured by personal progress, not by time. Proficiency is verified through formal assessment, and then residents are allowed to move on to other areas, and are not required to scrub on operations they have mastered unless they feel the need to refresh their knowledge. Participating residents would meet each week to receive their final patient/attending assignments for the coming week. Residents are responsible for making arrangements to review the cases with the appropriate attending. Residents round on their own patients in the morning and go to the clinic or operating room depending on their assignments for that week. They do not necessarily take regular night call, but could take call from home. Either in-house or home call can work with the model. Residents would follow all of their assigned/operated patients, irrespective of attending or service. There would be an outpatient clinic block, which would probably have to be attending-based, since it would be difficult for residents to follow-up on their patients in multiple ambulatory offices. Learning expectations are made clear at the start and are mastery-based, but broken down by years for planning purposes.

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