

# Surgical skills lab and dissection curricula train neurosurgical residents

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A surgical skills laboratory and corresponding dissection curricula were established in the Department of Neurosurgery at the Cleveland Clinic in the 2011-2012 academic year. The authors describe how this came about and what it has meant for neurosurgical resident training and assessment of residents' surgical skills in the following paper: "Establishing a surgical skills laboratory and dissection curriculum for neurosurgical residency training" by James K. C. Liu, MD, and colleagues, published today online, ahead of print in the *Journal of Neurosurgery*.

As background to this paper the authors mention some external pressures on surgical resident education due to changes in modern [health care](#). On the one hand, health care is constantly striving for greater efficiency and accountability. On the other hand, mandated reductions in on-duty hours have curtailed residents' practical surgical experience. The authors state that these pressures have spurred surgical educational programs to respond with innovative ways to supplement and assess residents' surgical capabilities. The Department of Neurosurgery at the Cleveland Clinic chose to establish a surgical skills laboratory and corresponding curricula for junior- and senior-level resident training.

The authors describe their experience in creating the lab and corresponding coursework. Surgical skills labs are not new, but a formal curriculum of structured dissection and provision of all the materials for that purpose are relatively novel and have not been established in all neurosurgical programs. The authors list basics needed to establish such a program, specifically lab space, funding, and equipment. They offer a

review of their experience to show how they were able to set up a fully equipped facility at the Cleveland Clinic while keeping costs down.

Space was allocated within the institution. Most of the equipment used to fill that space was donated by industry. The Department of Neurosurgery provided minimal start-up funds. The authors obtained funding through educational grants from the Cleveland Clinic as well as from industry for equipment that was not donated.

The authors describe in detail the equipment needed to simulate the surgical experience. A number of dissection stations were outfitted to resemble the setup in the operating room. Added to these was a master dissection station where demonstrations can be made. The master station includes a video monitor on which trainees can follow microscopic procedures and a video capture unit to retain videos and still pictures for educational archives. Each station has a variety of tools necessary to perform anatomical dissection: operating microscopes, high-speed drills, and portable electric aspirators, to name a few. The authors mention various ways of procuring new and refurbished equipment and supplies for little or no money. They even suggest the purchase of veterinary surgical equipment because it is often less expensive than items used in human operations.

Of course, you cannot have a surgical skills lab without anatomical specimens. The authors tell us that a minimum of two cadaveric specimens are sufficient for a year- long curriculum, although the availability of more specimens can enhance the surgical educational experience and allow residents the means for extra practice. The authors describe specimen preservation techniques that provide realistic experiences for the residents and prolong the use of each specimen. They also outline how curriculum topics can be arranged so that specimens last throughout the course of study.

Attending neurosurgeons and neurosurgical residents provided feedback on the new lab and curricula by responding to an internal survey. The attending surgeons all agreed that the lab and curricula were excellent additions to resident education, and almost all stated that the surgical skills of their trainees improved after the experience. All respondents also agreed that proficiency of certain skills and techniques in the lab should become a prerequisite to performing them in the operating room. Likewise, nearly all residents found that the lab and curricula improved their experience in understanding anatomical relationships and mastering surgical approaches. Full coverage of the results of this survey is provided in the paper as well.

A recent survey conducted by the Cleveland Clinic found that 94% of responding US neurosurgical programs provide residents with access to cadaver or animal dissection, but only 59% of the programs provide regularly scheduled dissection sessions and additional lab time for individual practice. Ninety-six percent (96%) of respondents stated that an anatomical dissection curriculum should be incorporated into all neurosurgical resident educational programs. The authors would like to see this occur.

When asked about the new program, Dr. Liu responded, "Our experience serves as a proof of concept that a [surgical skills](#) lab and dissection curricula can be achieved at any training program, and we have provided a blueprint to do so. The addition of this resource has resulted in a more comprehensive training environment, one that is likely to become the standard in the future of surgical training."

**More information:** Establishing a surgical skills laboratory and dissection curriculum for neurosurgical residency training. *Journal of Neurosurgery*, published online, ahead of print, May 26, 2015; [DOI: 10.3171/2014.11.JNS14902](https://doi.org/10.3171/2014.11.JNS14902).

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