Disclosures


Sponsorships: None.

Funding source: None.

Reference


Response to “2-Year Sleep Surgery and Medicine Fellowships for Otolaryngologists”: The Array of Sleep Fellowship Formats

DOI: 10.1177/0194599815574259

No sponsorships or competing interests have been disclosed for this article.

We thank Camacho et al for their interest in our piece and their compelling suggestions. The need to have a centralized website to provide visibility for these programs is paramount. At present, ENT Connect, a networking tool for American Academy of Otolaryngology—Head and Neck Surgery members, houses a list of sleep fellowship programs designed for otolaryngologists on its website. This is the first step in providing access and information to otolaryngology residents interested in careers in sleep medicine and surgery.

We would like to outline 2 other training formats that may also be appealing. The first option is a 1-year hybrid sleep medicine and surgery fellowship. The first author (R.C.D.) is enrolled in such a program at the University of Washington. As a sleep medicine fellow of the Accreditation Council for Graduate Medical Education, the trainee is board eligible at the end of the 1-year fellowship. This format also allots 20% to 30% time to sleep surgery (clinic and operating room), providing the key training components of preoperative patient selection, technical surgical skills, and longitudinal postoperative care. For those trainees interested in launching sleep research careers, another option should be considered: 2-year combined clinical and research sleep fellowship. The first year would consist of hybrid sleep medicine and surgery training as outlined above. The second year would be funded by a National Institutes of Health–supported (T32) research training grant with a focus on sleep research.

There appear to be several viable options for training in sleep medicine and surgery. We feel that the variety of options provides choices for matriculating residents and will help to maximize the potential of our field.

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Disclosures

Competing interests: None.

Sponsorships: None.

Funding source: None.

The Misleading Meta-analysis

DOI: 10.1177/0194599815572804

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

I read with great interest the meta-analysis of early versus late tracheostomy by Liu et al. I believe this article highlights a serious issue with meta-analysis.

Meta-analyses are widely regarded as the highest standard for providing evidence and has indeed contributed many important, cumulative effects of research studies (eg, the relationship between infant sleeping position and sudden infant death syndrome). They aim to provide an objective summary of the outcome of multiple tests of the same intervention or treatment.

However, they also have the power to magnify error to a level of significance and be misleading. As the number of studies included in a meta-analysis increases, the influence of a type II error increases and therefore false rejection of a null hypothesis becomes a serious risk. This risk increases by massing studies of high methodological heterogeneity, with variable aims and data completeness. Thus, the objectivity of the meta-analysis is vulnerable.
Liu et al\textsuperscript{1} report the conclusion that the cumulative result of all 11 studies is that early tracheostomy is associated with a decrease in intensive care unit (ICU) length of stay. The largest, best-designed studies do not concur.\textsuperscript{5,6} The largest effect size, suggesting ICU stay is shortened in association with early tracheostomy, is produced by much smaller studies, which are less robustly designed and considerably underpowered. By including all of these studies, the accurate answer is at risk of being drowned out by background “noise.”

In this situation, Slavin’s principle of “best evidence” must be remembered when considering conclusions drawn from meta-analyses.\textsuperscript{7} Here, surely the best evidence included in the meta-analysis clearly shows no decrease in ICU length of stay?

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Disclosures
Competing interests: None.
Sponsorships: None.
Funding source: Leeds Teaching Hospitals NHS Trust, Royal college of Surgeons of Glasgow, Mason Medical Research Foundation, Leeds University Betty Woolsey Endowment.

References

Re: Early versus Late Tracheostomy: A Systematic Review and Meta-Analysis
DOI: 10.1177/0194599815572805

We would like to thank Dr Sethi for his response and comments to our study “Early versus Late Tracheostomy: A Systematic Review and Meta-Analysis.” We welcome the opportunity to discuss the concerns raised.

First, we would like to address the concern regarding the increased possibility of falsely rejecting the null hypothesis. The probability of committing a type I error is set by the alpha level, which varies from study to study but is conventionally 0.05 or 0.01. Our meta-analysis defined an alpha of 0.05, and a $P$ value less than this was considered to be significant (this was consistent with the alpha values set by the evaluated studies). Without an increase in the alpha level, the risk of committing a type I error should not be any higher than in the original studies. Alternatively, one of the benefits of a meta-analysis is that it increases the power with which a research question can be answered. An effect that was not statistically significant in smaller studies may become statistically significant when multiple studies are combined in a meta-analysis. Whether this statistical significance indicates clinical significance is a separate argument.

The second point is in regard to the heterogeneity among the included studies. We greatly appreciate having Dr Sethi raise this point, as we agree that it is an important issue in the conduction of a meta-analysis. There is no consensus regarding how to best handle study heterogeneity in meta-analyses. We took a conservative approach and combined data only when heterogeneity was moderate or less. An exception was made for intensive care unit (ICU) length of stay, as all the measured effects from the included studies were in the same direction, indicating that the true effect likely lies in that direction. As such, a pooled estimate was presented. While combining data from methodologically heterogeneous studies can yield inaccurate and misleading results, we believe that we took the appropriate steps to minimize this risk.

Third, Dr Sethi referenced 2 recent randomized controlled trials that investigated the effect of early tracheostomy on ICU length of stay.\textsuperscript{1,2} Young et al did not find a statistically significant decrease in ICU length of stay. Terragni et al found a significant increase in ICU-free days in the early tracheostomy group, suggesting that early tracheostomy was actually associated with a decrease in ICU length of stay. The fact that these 2 well-conducted randomized controlled trials came to