Why Evidence-Based Medicine Matters to Aesthetic Surgery

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This issue of Aesthetic Surgery Journal marks the one-year anniversary of Dr. Foad Nahai’s editorial heralding an increased focus on evidence-based medicine (EBM) in the pages of the Journal.1 This year, the Journal will increase the visibility of EBM articles by showcasing the Level of Evidence (LOE) pyramid to identify pertinent articles with a ranking of Level 1, 2, or 3. Levels of Evidence are but one of the tools used in EBM to assess the validity of data presented in scientific studies, thereby enabling us to make more informed decisions and take better care of our patients. During the past year, as discussions about EBM have become more frequent, many plastic surgeons have questioned what exactly EBM is, why it is necessary, and how will it affect their practice and their patients.

David Sackett2 has defined EBM as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.” Several key words in this definition guide us toward not only what EBM is but, just as importantly, what EBM is not. First, EBM is conscientious. It is based on a concerted and thoughtful effort to apply information in a different way and, as such, requires as significant a change in our ways of thinking and our culture as a change in our daily processes. Second, EBM is explicit. When applying EBM principles, we purposefully and systematically seek out the most appropriate information, examine it in a critical way, and incorporate this information as we implement a balanced action plan. It is important to note that the information that we seek is the current best information—not the information that we wish we had or will have in the future—and is thus limited by research and clinical reports. “Judicious” hints at what EBM is not: EBM does not create algorithms that we are expected to follow blindly, nor does it define standard of care. Importantly, EBM does not replace the element of art and judgment that is revered within our specialty. Because EBM is applied to individual patients, it actually supports and enhances our art and judgment; we learn to target the information that is most applicable and translate it to the patient sitting before us, taking into account not only his or her desires, concerns, biology, anatomy, and resources but also our own skills and experiences (Figure 1). In essence, EBM is a bridge connecting information (evidence) with patient care. EBM does not limit choice; rather, it increases and optimizes choice.4

In order to guide clinical decision making, EBM brings together two fundamental principles. The first principle is that a hierarchy of evidence exists wherein different levels of evidence convey different types of information. “Higher” LOE studies—specifically, randomized clinical trials (RCT)—are structured to avoid bias and thus provide valid...
Adapted from Swanson et al.7 studies into their clinical decision making.

We are evolving toward a culture of evidence. In the future, the surgical literature. Traditionally, the culture of plastic surgery has been a culture of experts. This is in large part because technical experience and good judgment are critical to success in aesthetic surgery. We thus have a healthy respect for the insights of our senior clinicians who have taught by our mentors. In plastic surgery, we can all remember a time when dermaplaning, topical oxygen, and photodynamic therapy were promising; vitamin E was considered good for scars; Dakin’s solution was good for dirty wounds; and a week of antibiotics after an elective aesthetic surgery was a good idea. Accumulated evidence has refuted these assumptions, and the laser coat rack in the corner of the office stands as a monument to decisions made with a dearth of evidence.

EBM promises to transform aesthetic surgery as such long-held beliefs are overturned. When challenged with the need for EBM in our specialty, many respond with statements such as “EBM isn’t really applicable to aesthetic surgery,” or “You can’t measure the art that I do,” or “You can go too far with EBM.” As stated earlier, we firmly believe that evidence elevates the art of plastic surgery, aesthetic surgery is widely adaptable to EBM, and EBM is essential to our mission of providing better answers for our patients. There is no doubt that we currently possess the capacity to measure more concrete outcomes such as hematoma, seroma, or reoperation rates and to utilize these end points in comparing one technique to another in randomized trials. Although a lack of agreed-upon aesthetic outcomes metrics has certainly limited our ability to develop aesthetic outcomes evidence in the past, developing the science of patient-reported outcomes measurement allows us to quantify these subjective end points.10 Which approach works better for mastopexy? What measurement allows us to quantify these subjective end points?10 Which approach works better for mastopexy? What measurement allows us to quantify these subjective end points?

Table 1. American Society of Plastic Surgeons’ Scales for Rating Levels of Evidence and Grading Recommendations: Evidence Rating Scale for Therapeutic Studies

<table>
<thead>
<tr>
<th>Level</th>
<th>Qualifying Studies</th>
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<tbody>
<tr>
<td>1</td>
<td>High-quality, multicenter or single-centered, randomized controlled trial with adequate power; or systematic review of these studies</td>
</tr>
<tr>
<td>2</td>
<td>Lesser quality, randomized controlled trial; prospective cohort study; or systematic review of these studies</td>
</tr>
<tr>
<td>3</td>
<td>Retrospective comparative study; case-control study; or systematic review of these studies</td>
</tr>
<tr>
<td>4</td>
<td>Case series</td>
</tr>
<tr>
<td>5</td>
<td>Expert opinion; case report or clinical example; or evidence based on physiology, bench research, or first principles</td>
</tr>
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Adapted from Swanson et al.7

Results (Table 1).5,6 Because these higher-level studies involve direct, controlled comparisons between treatment options, they answer questions such as, “Which treatment is better?” Studies with “lower” levels of evidence, such as case reports and case series, communicate clinical experience. This information is indeed valuable, but the data and conclusions are inherently more likely to be influenced by bias. LOE rankings therefore help a reader to identify potential sources of bias and subsequently weigh the conclusions appropriately. Different study designs may indeed serve different purposes. For example, it would be useful to communicate a new technique for minimally-invasive facelift surgery in a case series, but we would ultimately want a prospective cohort study or RCT before we could confidently adopt the technique in our own practice. This hierarchy is, however, not absolute. For example, a poorly performed RCT (LOE 2) may be more likely to mislead us than a large-scale, well-designed prospective cohort study (LOE 3).

The second key concept behind EBM is that evidence alone should never be the sole guide of clinical decisions. EBM does not seek to replace our surgical judgment with research studies; rather, EBM seeks to complement our clinical expertise through efficient, judicious application of the surgical literature. Traditionally, the culture of plastic surgery has been a culture of experts. This is in large part because technical experience and good judgment are critical to success in aesthetic surgery. We thus have a healthy respect for the insights of our senior clinicians who have learned by trial and error in their own practices. This is true today and will remain true in the future. However, we now recognize the limitations of clinical observations, and we are cognizant of the deficiencies in our human ability to make correct inferences. We also recognize the hidden biases in clinical situations that may lead us (and our experts) astray. Rather than a culture of experts, we are evolving toward a culture of evidence. In the future, the “new experts” will be clinicians who not only have great insights from their own experience but also recognize bias and successfully incorporate evidence from high-quality studies into their clinical decision making.

Is EBM “sexy” and exciting like a novel surgical technique or a new noninvasive device? Maybe not, but EBM is considered one of the 15 most important developments in the history of medicine, and it has the capacity to radically change how we care for our patients and how we process surgical decisions.6 Within even the past several weeks, a stunning example of EBM at work has garnered marked media attention. For more than two decades, prostate-specific antigen (PSA) evaluation has been the mainstay of prostate cancer detection and screening. Nearly every mature man reading this editorial has undergone PSA screening, and some have undergone prostatectomy or radiation therapy as a result. However, in a systematic assessment of the evidence—including large, prospective trials—the US Preventative Services Task Force recently concluded that “prostate-specific antigen–based screening results in small or no reduction in prostate cancer-specific mortality and is associated with harms related to subsequent evaluation and treatments, some of which may be unnecessary.”8 Although we await the results of additional trials that might further modify the recommendations, this statement represents a profound shift in preventive care. In 2009, the same organization released controversial recommendations concerning mammographic screening, including a recommendation against both self-breast examination and routine mammography for women younger than age 50.9 As EBM grows across specialties, it can overturn our preconceived notions or what we have been taught by our mentors. In plastic surgery, we can all remember a time when dermaplaning, topical oxygen, and photodynamic therapy were promising; vitamin E was considered good for scars; Dakin’s solution was good for dirty wounds; and a week of antibiotics after an elective aesthetic surgery was a good idea. Accumulated evidence has refuted these assumptions, and the laser coat rack in the corner of the office stands as a monument to decisions made with a dearth of evidence.

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choices with our patients. No doubt there will be casualties—some of our favorite techniques will be proven inferior, the laser we didn’t buy might be better than the one we actually purchased, or the less profitable procedure might be proven best for the patient. Change is hard and is often met with resistance, but abandoning inferior or ineffectual treatments and embracing treatments supported by evidence only improves the art of aesthetic surgery and the care of our patients.

Disclosures

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REFERENCES

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