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# Evidence-Based Body Contouring Surgery and VTE Prevention

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Eric Swanson

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 Springer

Eric Swanson, MD  
Swanson Center  
Leawood, KS, USA

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*Evidence-Based Body Contouring Surgery and VTE Prevention and its sister publication, Evidence-Based Cosmetic Breast Surgery, are dedicated to my wife, Cindy, who remains my most ardent supporter and most discerning critic. There have been many times when this work seemed too large and too diverse to complete. Cindy has patiently endured my long absences in the office assembling research data. These books are the culmination of that work.*

*A big thanks goes to my patients, who have placed their confidence in me. Given the importance of appearance, there is hardly a more sincere gesture of trust, and it is a responsibility that I do not take lightly. Most of what I know has been learned from my patients, not textbooks. My patients have cooperated with dozens of clinical investigations, including outcome studies, laboratory studies, imaging with MRI and ultrasound, and repeated photographic sessions. There is no better education (and opportunity for surgeon humility) than interviewing patients and asking for their feedback. Experienced plastic surgeons understand that we do not teach our patients; our patients teach us.*

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## Preface

This is the first publication to include the words “body contouring surgery” and “evidence-based” in the same title. Plastic surgery textbooks are often titled some variation of “The Art of Plastic Surgery.” This volume, like its sister publication, *Evidence-Based Cosmetic Breast Surgery*, focuses on science, relying on data rather than expert opinion. The source material has been published in the major peer-reviewed plastic surgery journals. Many of the conclusions challenge the status quo. The importance of evidence-based medicine is the theme of not only Chap. 1 but all of the chapters.

Body contouring surgery is generally understood to mean surgery of the trunk and extremities, not the face, neck, or breasts. Accordingly, breast surgery, head and neck procedures, and labiaplasty are not included in this volume.

Like *Evidence-Based Cosmetic Breast Surgery*, this single-author volume is open to criticism that it represents the experience and prejudices of one surgeon. My purpose in writing is not to recite the mainstream view but to challenge it. Existing textbooks are composed of many chapters written by well-known contributors describing their “how I do it” methods. This old habit makes for thick textbooks. A recently published textbook on body contouring surgery exceeded 600 pages. What is the reader to make of all this often conflicting information? It seemed to me that almost everything plastic surgeons “know” about body contouring surgery is based on clinical impressions (Table 1). The old adage has merit—what we measure we improve, and vice versa.

My interest in the scientific evaluation of body contouring surgery began in 2002. I realized that many basic questions about liposuction, and body contouring in general, remained unanswered, despite the fact that liposuction was the most common plastic surgical operation and had been in general use for 20 years. Although the effect seemed obvious, there was a lack of any studies quantifying the effect of liposuction on the fat layer. Magnetic resonance imaging in volunteer liposuction patients provided the answers (Chap. 2).

Many investigators subscribe to the popular view that fat redistributes after surgery. In 2011, an article appeared in *The New York Times*, reviewing an article published in *Obesity*, stating that fat came back, not to the original locations, but rather to untreated areas of the upper body, making women look like linebackers. The researchers were not deterred by the lack of any known physical mechanism that could account for such a phenomenon. Photometric studies exposed the myth of fat redistribution (Chap. 2).

**Table 1** Things we “know” that are wrong

1	Individual risk stratification
2	Chemoprophylaxis
3	Danger of combined procedures
4	Operating time as an independent risk factor
5	Skin tightening with radiofrequency
6	Skin tightening with VASER
7	Laser treatment of cellulite
8	Laser liposuction
9	Cryolipolysis
10	Fat redistribution theory
11	Breast enlargement after liposuction
12	Safety of silicone buttock implants
13	Trivial blood loss after liposuction
14	Electrodissection as opposed to scalpel dissection
15	Scarpa fascia preservation
16	Limited-dissection abdominoplasty
17	Microfocused ultrasound for skin tightening
18	Prone patient positioning
19	General endotracheal anesthesia with paralysis
20	Rectus plication and DVT risk
21	Garments and DVT risk
22	Efficacy of sequential compression devices
23	Bupivacaine toxicity when used in wetting solution
24	Nerve blocks for abdominoplasty
25	Rectus abdominis intrafascial injections
26	Liposomal bupivacaine
27	Pain pumps
28	Gluteal autoaugmentation
29	Intramuscular fat injection of buttocks
30	Subrectus abdominis implants
31	Implantable mesh
32	Floating the umbilicus
33	Inverted-T abdominoplasty scar
34	Injections to dissolve fat
35	Reliability of meta-analyses
36	Practicality of randomized studies in surgery
37	Quilting sutures
38	Tumescent versus superwet technique
39	Routine screening for coagulopathies
40	Body-Q

Outcome studies were missing. Without this information, how could one answer the most basic patient questions, such as, How painful is liposuction or a tummy tuck? Or, when can I return to work? How likely is it that my expectations will be met? Patients are happy to provide the answers (Chaps. 3 and 6). Patient questions can be answered with data. Surgeons' opinions are notoriously optimistic.

When I undertook my studies, some state medical boards were imposing limits on liposuction aspirate volumes despite a general belief that blood loss was miniscule, based on the small amount of blood in the suction canister. Estimated blood loss calculations determined from postoperative hematocrits proved this misconception woefully inaccurate (Chap. 5). Third space blood loss (into the tissues) was much greater than expected and just as important hemodynamically as if the blood had been lost externally.

Popular belief holds that bupivacaine, a more potent and longer-lasting local anesthetic than lidocaine, is dangerous. Yet, there were no studies evaluating plasma bupivacaine levels after plastic surgery. The findings, contained in Chap. 5, revealed a surprisingly wide margin of safety. This is good news for surgeons who wish to provide long-lasting pain relief without ineffective and possibly dangerous pain pumps or nerve blocks. Liposomal bupivacaine is expensive and unnecessary. The body's fat cells act as a bupivacaine slow-release mechanism or "physiological pain pump."

What were the metabolic effects of liposuction? When I undertook this particular study, I believed that the blood tests would confirm the null hypothesis. After all, how could subcutaneous fat removal have any systemic metabolic effect? Not only did I find that it did, but the change appeared to be a healthy one, with a dramatic drop in triglyceride levels in patients with at-risk levels to start with. Another unexpected (and favorable) finding was that the white blood cell count significantly decreased after liposuction. This finding was made completely by serendipity. White blood cells were being counted along with red cells by the automated blood cell counters. These positive effects remain largely unappreciated by plastic surgeons and the public (Chap. 4).

As in cosmetic breast surgery, the literature is full of articles giving the surgeon's practice preferences to reduce complications. For abdominoplasty, these include a limited dissection to preserve blood vessels supplying the abdominal skin flap and preservation of the Scarpa fascia. The notion of limiting the dissection hardly seemed to require a formal study. The findings of a controlled study using laser perfusion to compare a limited and full dissection defied first principles (Chap. 6). Limiting the dissection to a tunnel does not significantly improve flap perfusion after all. Scientifically, this finding should not be surprising; it simply confirms the angiosome theory. There is no substitute for data.

There is no substitute for data.

Quilting sutures are increasingly used to limit the dead space and reduce the risk of seromas after abdominoplasty. A logical alternative, and one supported by clinical studies comparing electrical and scalpel dissection, is to limit the tissue injury by avoiding electrodissection (Chap. 6).

Nonsurgical alternatives to liposuction are a recurring theme. Many plastic surgeons believe that nonsurgical treatments will eventually replace surgery.

Proper scientific evaluation must take precedence over business considerations alone (Chap. 11). Otherwise, patients and surgeons risk disillusionment.

Venous thromboembolism (VTE) is a very serious topic, deserving of its own chapters (Chaps. 12 and 13). Individual risk stratification and routine chemoprophylaxis are a case study in patient management dictated not by factual evidence but by the perceived need to conform to guidelines. In debating this topic last year with Dr. Guyatt, the lead author of the 2012 guidelines of the American College of Chest Physicians, I was reminded of the story of the emperor who wore no clothes. Unfortunately, the term “evidence-based medicine,” coined by Dr. Guyatt himself, has become a cliché, like “validated.” Readers do well to decide for themselves the quality of the evidence and validity of a study and question the authors’ claims.

Individual risk stratification and chemoprophylaxis have largely gotten a free pass in the literature because these concepts represent the conventional wisdom, but a growing body of evidence shows, repeatedly, the failings of this approach: the lack of a scientific foundation for Caprini scores, the undisclosed financial conflicts, the misrepresentation of meta-data, the unjustified statistical adjustments, etc. The closer one looks, the worse it gets for those who believe in our ability to predict affected individuals and safely prevent VTEs by preemptively anticoagulating patients. But there is a silver lining: an opportunity to discard a nonscientific approach, learn more about the natural history of this problem, correct some bad (anesthesia) habits, embrace new technology (ultrasound), and make surgery safer for our patients. Ultrasound surveillance represents a new disruptive technology that has applications in the plastic surgery office that go well beyond early detection of deep venous thromboses (Chap. 13).

There is a silver lining: an opportunity to discard a nonscientific approach, learn about this problem, correct some bad (anesthesia) habits, embrace new technology (ultrasound), and make surgery safer for our patients.

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## About the Author



Dr. Eric Swanson completed medical school and a residency in plastic and reconstructive surgery at the University of Toronto before starting private practice in Kansas City in 1989. Dr. Swanson is an outspoken advocate for evidence-based medicine. Dr. Swanson's self-funded clinical research has produced over 120 publications in the top peer-reviewed plastic surgery journals, including numerous articles and letters that challenge the conventional wisdom and offer science-based alternatives. In 2017, Dr. Swanson published the book *Evidence-Based Cosmetic Breast Surgery*.

Dr. Swanson is a frequent lecturer and panelist at national and international meetings and regularly provides instructional courses in cosmetic breast surgery and body contouring surgery. Dr. Swanson is a member of the American Society of Plastic Surgeons, the American Society for Aesthetic Plastic Surgery, and the American Association of Plastic Surgeons.