

# Nullius in Verba—Surgical Manifesto for the 21<sup>st</sup> Century

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## INTRODUCTION

Most of the current procedures, endoscopy, robotic surgery, natural orifice surgery, cyber-knife, uterine artery embolization, as well as ultrasound, CT scan, MRI, positron emission tomography, and genetic counseling as we know it today, as well as artificial intelligence were not yet available when I graduated medical school 50 years ago. But still, my colleagues and I were certain we were living in the most modern and advanced era, as did Horatius who coined the term “nullius in verba” in 20 BC, which became the motto of the Royal Society in London founded in 1660.<sup>1</sup> This motto can be explained as: do not take any knowledge as a final one. Whenever the horizon is reached, a new one emerges. Surgical technology will certainly continue to develop and modify, but nevertheless it is expected that the whole surgical culture and knowledge will be present at the point where the surgeon’s scalpel first touches the skin.

Despite continuous surgical achievements that are nonetheless certain to be replaced or modified in years to come, there are basic principles that should stay with us despite these developments.

Surgical procedures were already done in ancient times, but the procedures as we know them emerged during the 19th century when the first successful laparotomy was performed, by Ephraim McDowell in 1809.<sup>2</sup>

Throughout the 19th century, surgeons used longitudinal incisions when performing abdominal operations. Surgery developed significantly after general anesthesia was introduced in 1846.<sup>3</sup> Near the end of the 19th century, the transverse incision was introduced by Pfannenstiel.<sup>4</sup>

Endoscopy appeared in the 20th century, first experimentally<sup>5</sup> and later for clinical use, at the beginning by gynecologists and later by all surgical disciplines. Today there are endoscopic solutions for most surgical procedures.

Robotic surgery was introduced toward the end of the 20th century,<sup>6</sup> and recently, an emerging discipline appeared: the natural orifice surgery.<sup>7</sup>

Like our predecessors, we might be certain that we are living in the most advanced surgical era. Yet, one can imagine that different surgical and nonsurgical methods will replace many of today’s procedures, and some of today’s procedures might be considered in the future as a medical erratum.

Procedures for the same indication vary not just from hospital to hospital but also among surgeons working in the same department. These deviations should be analyzed and compared to define the most optimal procedure, the evidence-based standardized method.<sup>8</sup> Without analyzing and standardizing each surgical step, it will never be possible to compare and evaluate the outcomes.

This is particularly true for today’s growing usage of evaluation by meta-analysis.<sup>9</sup>

The aim of this manifesto is to summarize the basic universal fundamentals, those who are not dependent on today’s or the future technical developments, the principles that should stay with us and our successors.

## THE UNIVERSAL SURGICAL PRINCIPLES

### Doctor-Patient Relationships

Even in today’s era of advanced technology and the Telemedicine, which became available by the developed cyber world, listening intently and talking face to face with the patient will contribute to the trust needed by the patient in his/her surgeon. In-person contact is preferred by the public for surgical consultations. Most patients feel that the important trust and comfort is best accomplished by a personal meeting, and that it is of utmost importance to meet the surgeon prior to the day of surgery.<sup>10</sup>

“Listen to the patients, they tell you the diagnosis.” It is important to sit in front of the referred patient, talk and examine him/her. It seems that future technical developments will not change the basic need for the personal human touch.

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Suggested modes of treatment and possible alternatives should be discussed directly with the patients before presenting them to colleagues and anesthetists.

### **The Surgeon**

The surgeon is expected to have humanistic, mental and manual qualifications along with extensive general medical knowledge. A physician might have excellent knowledge but not the necessary manual dexterity, mental abilities, nor perhaps the physical stamina needed for such a demanding discipline.

Therefore, before accepting a physician for training, these qualifications should be evaluated and continually re-evaluated. It is necessary to provide accurate feedback to the trainee to avoid frustration if, at the end of the training, she or he will not be able to be qualified as an independent surgeon.

As aging surgeons might have a limited ability to accurately self-assess, guidelines are needed to assess their physical and cognitive abilities together with their chronological age by periodic reviews of their surgical outcomes and decision making.<sup>11</sup>

### **The Indication**

Surgery should always be the last option to solve a medical problem, after considering all other options.

As an example, in the 1930s, the rate of Cesarean section, probably one of today's very few operations without an endoscopic alternative, was just about 3%.<sup>12</sup> Nowadays it is extremely higher.<sup>13</sup> Many of these operations are certainly done today without any justified indications, adding risks for the newborn and mother. Measures like a documented second opinion for each nonemergency operation could dramatically reduce the rate of unnecessary Cesarean sections.

No surgery except for an obvious, irrefutable emergency should be done before presenting the case to colleagues and considering their comments.

### **Knowledge of Anatomy**

Human anatomy will certainly remain unchanged and its knowledge and possible variations, such as the location of lymph glands in oncological surgery or vascularization variability of the gallbladder, are necessary and important. Anatomical knowledge should constantly be refreshed.

The anatomy as encountered during abdominal surgery seems different during endoscopy or trans-Douglas surgery.<sup>14</sup> The surgeon should be familiar and feel secure with the knowledge of the topographic anatomy from any angle or surgical approach. The surgeon must have knowledge of where to find the origin of unexpected bleeding and which structures should be guarded while attempting hemostasis.

### **Training**

The days of training while actually operating are over, as is the era of learning by working with a grand master. Surgical simulators for endoscopy or robotic surgery are available and training on simulators, with continuous evaluation, should be the state of the art as long as human beings perform surgery. We can expect that there will be new generations of simulation technologies for endoscopy and robotic surgery. Scoring systems should be used. It has been shown that even experienced surgeons improve by using simulators.<sup>15</sup>

Trainees, junior surgeons, as well as qualified surgeons should use simulators routinely throughout their training and career and be objectively re-evaluated periodically.

### **Surgery**

The "less is more" principle was popularized by Mies van der Rohe, a German-American architect, and is used today also as an invitation to recognize the potential risks of overuse of medical care.<sup>16</sup> Decisions such as suturing one or two layers in bowel surgery, suturing the peritoneum or leaving it open in endoscopy or open surgery, using robotic surgery, endoscopy, or nonsurgical measures for specific indications, must be based on evidence.

Meta-analyses do not have any value if all the analyzed series were not using similar groups of patients and comparable surgical procedures.<sup>17</sup>

Instruments for specific operations should be standardized for the sake of measurement and comparison, so also the suture material and needles used, as the size of the needle defines the amount of suture material left behind, which is a cause of foreign body reaction.<sup>18</sup> Principles of safe use of surgical energy should be known by any endoscopist.

## Safety

By commitments to safety protocols the outcome of 2%–3% patients will improve yearly.<sup>19</sup> In today's mega-sized hospitals, it is not unusual to perform operations with a changing cast of assistants, nurses, and anesthetists. To guarantee safety, strict protocols should be used. These protocols should confirm the identity of the operation room staff, the identity of the patient, and confirmation of the indicated procedure before starting the operation. This also applies to the peri- and postoperative routines, such as confirmation of the identity of the specimen sent for pathological evaluation.<sup>20</sup>

## CONCLUSION

In our unprecedented quickly developing surgical technology, it is important that the following basic principles should be maintained regardless of future surgical advances.

The doctor–patient contact should not be replaced by telemedicine and online cyber connections. These should be used temporarily in unexpected situations, such as the current pandemic; and even if it becomes more routine, it should not be a substitute for in-person evaluation and contact with patients.

Surgeons should be chosen for training by evaluation of their knowledge, and mental and physical abilities. There are several ways to assess surgical skills, such as the Procedure-Based Assessment.<sup>21</sup> These skills should be continuously evaluated throughout training and also thereafter. The surgical outcomes for some procedures are less favorable when performed by older surgeons.<sup>22</sup> Therefore guidelines are needed to assess their physical and cognitive abilities together with their chronological age by periodic reviews of their surgical outcomes and decision making.

Surgical indications should be decided only after considering all other alternative options. Some operations can be done with different approaches, endoscopy, robotics, and others. Each approach in which the surgeon is most comfortable should be standardized, based on evidence, and performed by surgeons who were evaluated after training by simulators. Safety should be guaranteed by strictly applying protocols. The human values should remain in the background of any surgical discipline.

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