

Prologue

Evidence-Based Surgery—Inevitable?



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Guest Editors

Knowledge is the enemy of disease. This phrase appears on 30,000 pencils distributed by the National Electronic Library for Health, knowledge resource of the British National Health Service. This idea is at the very center of evidence-based surgery (EBS) and evidence-based surgical practice (EBSP). The knowledge to solve most clinical problems exists. The application of what we know already will have a bigger impact on health and disease than any drug or technology likely to be introduced in the next decade. Where we fail is often in not applying what is known. This may be as simple as a small clinical problem or as complex as the efficient and effective organization of a patient's journey through a surgical service. In most clinical situations, we know what should be done and also the best way in which to deliver the required clinical care. Yet we do not always succeed. Indeed, the Institute of Medicine has cataloged a large series of errors and failures in our health care systems and has suggested that between 44,000 and 98,000 deaths are the result of medical error. This indicates that knowledge was available but not applied.

Health care systems around the world are being heavily criticized for costing too much and not applying available resources effectively. A significant component of cost savings would be realized if best practices defined in medical, surgical, or hospital literature were universally adopted. Why is day case inguinal hernia repair or laparoscopic cholecystectomy not applied universally? The medical, surgical, anesthetic, nursing, and pain (symptom) control requirements are well known. The systems that permit delivery of these operations on a daily basis are well described. Every part of the patient

journey is understood. Yet it has not happened as universally in the western world as one would expect. In the United States, insurance companies drive the agenda. In globally funded health care systems, failure to implement daily case work is not lack of knowledge but is a managerial, system, and professional failure. Knowledge management is integrating knowledge and its application.

The application of what we know can prevent or minimize ubiquitous systemic problems in health care:

- Medical error
- Uneven health care quality
- Inefficient use of resources
- Poor patient experience
- Overenthusiastic adoption of interventions of low or unproven value
- Failure to get new evidence into practice
- Variations in policy and practice

While each of the above requires a different bit of knowledge; each has a base of intellectual capital to enhance or resolve the difficulty. Knowing what we do know allows us to define what is really important: what we don't know. It is then possible to either find the information or perform the studies that will resolve the issues. The principles of patient safety and quality of patient-centered outcomes will be significantly enhanced by application of what we know to resolve the above list of health care deficiencies.

What is knowledge? There is no single universally accepted meaning, but a useful definition is that *data* are transformed into *information*, which is stored until someone wants to use it and *knowledge* is information in action.

In the context of EBS and EBSP, there are three types of knowledge:

- evidence (knowledge from research);
- statistics (knowledge from measurement of outcomes); and
- judgement (knowledge from experience).

This last is the sum of analysis of complications, morbidity, mortality, adverse events, and can be paraphrased as “good judgement comes from experience, and experience comes from bad judgement.”

On August 22, 2005, a Google search using *evidence based surgery* provided 942,081 results, while a search using *evidence-based surgery* provided 343,950 results. Ask Jeeves provided 1,356,000 and 324,200 results, respectively, highlighting significantly the importance of defining our terms and our questions.

Further refinement to *evidence-based surgical practice* provided 183,534 (Google) and 105,500 (Ask Jeeves) results. On PubMed, *EBS* had 8666 articles, *E-BS* 2985, and *E-BSP* 950. The definition of terms is not only key to searching for information and evidence but also essential to its communication and implementation.

Objective

Our objective is to take the fishtail below and flesh out the skeleton highlighting where EBS and knowledge management can contribute to the delivery of high-value EBSP (Fig. 1).

Defining our terms

A rose is a rose is a rose.

—Gertrude Stein

What’s in a name? That which we call a rose
By any other word would smell as sweet.

—William Shakespeare, *Romeo and Juliet*

“When I use a word”, Humpty Dumpty said, in rather a scornful tone,
“it means just what I choose it to mean—neither more nor less.”

—Lewis Carroll, *Through the Looking-Glass*

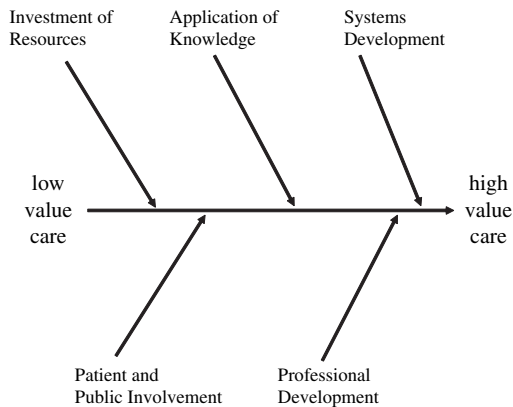


Fig. 1. Fishtail used to determine where EBS can contribute to high-value EBSP.

Visualize, if you will, Newcastle General Hospital, the hub of hospital care in the northeast for many years—solid, Victorian, dependable. The hospital’s honest, uncompromising and practical atmosphere might strike you as an unlikely setting for the twentieth century’s most influential philosopher, but Ludwig Wittgenstein was employed as a laboratory technician there during the Second World War. He showed such great promise as a laboratory investigator that attempts were made to persuade him to take up a scientific career. However, he chose to return to philosophy, linguistic philosophy in particular:

- proposing, in his tantalizing prose, that arguments and differences of opinion resulted from a failure to recognize that the two sides were using the same word with different meanings.

Defining words by words

The definition of a word is the summary of its meaning by a lexicographer such as Dr. Johnson, sometime Fellow of Pembroke College, Oxford, and compiler of the first great English dictionary. It was another Fellow of an Oxford College, Dr. James Murray, first Editor of the *Oxford English Dictionary*, who decided that a dictionary should contain not only definitions but also the meanings of the words by providing examples of the word in use, arranged chronologically so that the evolution of the meaning of the word could be understood. The meaning of a word is often different from its definition and can best be understood by observing its use. Murray's policy was at first fiercely resisted by some of the delegates of the Oxford University Press because of the effect this policy had on the magnitude, and therefore cost, of the exercise. Both were correct; the delegates because the task was immensely long (by the time of Murray's death 39 years after the commencement the dictionary had reached no further than the letter T), and Murray, because the enduring success of the *Oxford English Dictionary* has changed forever the way we think and find out about meanings.

Defining words by their usage

The principles of James Murray and the philosophy of Ludwig Wittgenstein are very similar. Wittgenstein's philosophy is difficult to read, and the two great works, the *Tractatus Logico Philosophicus* and *Philosophical Investigations*, consist of lean, numbered propositions, arranged hierarchically in the former and as a single sequence in the latter, but the absence of long paragraphs does not make them easy to understand. Easier access is provided by the numerous books about the twentieth century's most influential philosophers—for example, Antony Kenny's book *Wittgenstein*.

There is no meaning of a word that is always and indubitably the right meaning. There are only uses that are clear and uses that are not clear, uses that are new and uses that are not new. The need to observe how a word is used to understand its meaning is one of the principles of Wittgenstein's philosophy that underpins this book, and rather than expecting the reader to buy Last's *Dictionary of Epidemiology*, excellent though that is, we have endeavored to make it clear how we are using particular terms.

Two other of Wittgenstein's principles are also relevant to decision-makers:

- New words such as “Internet,” or new uses of words such as “World Wide Web” can clarify, confuse and be useful, but as the term becomes more widely used by more people, its use becomes increasingly diverse, and there may come a point at which the term causes more confusion than clarity and should no longer be used. Consider, for example,

how often you have heard the term “evidence” used when it was obvious that it was being used with a different meaning from the way in which you would use it.

- Many arguments—Wittgenstein believed all arguments—result from a failure to appreciate that the people involved have failed to agree on the meaning of the terms being used. Consider, for example, how often you have heard arguments about the proposition that “evidence-based medicine destroys clinical freedom” without time being taken to reach agreement on the terms “evidence-based medicine,” “destroys,” and “clinical freedom.”

Decision-making can be improved and arguments prevented, therefore, by prefacing the debate with statements such as: “When we use the word “evidence,” we mean “knowledge derived from research”; when we use knowledge derived from our own experience, we shall make that clear.”

Word euthanasia

Sometimes it is necessary to take steps to discontinue the use of a term that is consistently and frequently the cause of confusion and as such prevents understanding and progress. This is less frequently necessary in management than in clinical practice because management decision-making involves many terms that are created and enter widespread use until they themselves become displaced by later fashions. *Benchmarking* and *modernizing* are examples of such terms, and the same fate may, heaven forbid, befall *evidence-based decision-making*, but if it does cause more confusion than clarity then it should be dropped from decision-making discourse. Even in clinical practice, however, terms can cause confusion and may need to be deleted from debate.

In his highly praised biography, Ray Monk describes how Wittgenstein, when a technician in a research laboratory in Guy’s Hospital in 1941, formed a Medical Research Council team whose leader had observed that “there is in practice a wide variation in the application of the diagnosis of ‘shock’ without an agreed meaning of the term” that was harmful to patients and “renders it impossible to assess the efficacy of the various methods of treatment adopted.” He argued that “there is good ground, therefore” for the view that it is better to avoid the diagnosis of “shock” and to replace it with an accurate and complete record of a patient’s state and progress, together with the treatment given. We have been similarly unsuccessful with “sepsis.” Only Humpty Dumpty really knows!

Wittgenstein was himself influenced by a physicist, Hertz, who proposed dropping the use of the term “force” from the vigorous debates of the time, accepting that if this were done “the questions as to the nature of force will not have been answered but our minds, no longer vexed, will cease to ask illegitimate questions.” Wittgenstein, in paying homage to this approach, said that “in my way of doing philosophy, its whole aim is to give an

expression such a form that certain disquietudes disappear.” He also proposed that if Dr. Grant was required to include the word *shock* in his annual report, as some authorities wished, the word should be printed “upside down to emphasize its unsuitability.”

There is no evidence that Wittgenstein studied the work of Murray, but he would surely have approved of his painstaking collection of examples of the word in use that are set out, clearly allowing Murray to take bundles of examples of the meanings in use, held together by a pin, so that he could “write and polish and fuss with and burnish, for each one of the words and senses and meanings, what he divined to be their definitions.”

Defining words by numbers

Vienna at the end of the Hapsburg empire was in the final stages of its glory, already turning a little rotten on the bough. Although rottenness implies decay, decay is necessary for the creation of new life forms. Wittgenstein was a product of Vienna—or, to be more precise, of the intellectual and wealthy Jewish community living in Vienna; so, too, was Malinowski. Malinowski argued contrary to Wittgenstein that knowledge was created, not by the lonely intellectual sitting at his desk, as Wittgenstein did throughout the English winters, but by groups of people taking and using language to create new knowledge.

The Vienna School of Philosophy flourished as Wittgenstein left the city and became very influential, particularly in Britain, where it gave rise to what is known as *logical positivism*, the leading figure and most eloquent reporter of which was A.J. Ayer. In *Language, Truth and Logic*, Ayer took an approach to the definition of a term that did not rely on words at all. He proposed that instead of trying to understand the meaning of a proposition by analyzing the meaning of the individual terms that compose it, another approach should be taken.

“The criteria which we use to test the genuineness of apparent statements of fact is the criterion of verifiability. We say that a sentence is factually significant to any given person, if, and only if, he knows how to verify the propositions which it purports to express—that is, if he knows what observations would lead him, under certain conditions, to accept the proposition as being true, or reject it as being false. And with regard to questions the procedure is the same. We enquire in every case what observations would lead us to answer the question, one way or the other; and, if none can be discovered, we must conclude that the sentence under consideration does not, as far as we are concerned, express a genuine question, however strongly its grammatical appearance may suggest that it does.”

The logical positivists believe that no term should be examined in isolation—a study of the term “efficiency” would be pointless—but investigated in the context of propositions, such as “this hospital is more efficient than that hospital.” To define the meaning of this proposition, a logical positivist

would not have recourse to a dictionary but instead seek to agree on the data that would need to be collected to confirm or refute it. Thus, for this particular proposition, the debate immediately becomes: “How would you measure efficiency?” Options include:

- cost per case;
- throughput per bed;
- percentage of costs spent on administration.

Meaning, reality, and language

The traditional view of language is that it describes reality. This is undoubtedly true for physical objects such as “a table” or “a chair,” unless one belongs to the more skeptical school of philosophy, which holds that everything ceases to exist when one closes one’s eyes. For social constructs, however, language does not simply describe reality; it creates it.

The clearest description of the relationship between language and reality comes from anthropologists, notably Benjamin Lee Whorf, who worked as a loss adjuster for The Hartford Fire Insurance Company and studied the language of the Hopi Indians. He created the theory of linguistic relativity, which proposes that language creates social realities such as “the future” or “the quality of evidence”—or, indeed, “evidence-based health care.” Through the use and evolution of language comes social change and social reality. The work of the anthropologists such as Wharf and Edward Sapir, whose Wharf Sapir hypothesis of linguistic relativity is the best articulation of this concept, for example, in the statement that “the fact of the matter is that the ‘real world’ is to a large extent unconsciously built up on the language habits of the group” has been developed by sociologists. The most accessible sociologic text is *The Social Construction of Reality* by Berger and Luckman.

Words have meanings, but the meanings create and change reality as well as express it.

Indefinite definitions

Throughout this issue of the *Surgical Clinics of North America*, we have tried to give a clear definition of a term without implying that our definition is *the* definition; *caveat lector*, let the reader beware.

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Further readings

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