IN this editorial, the third in a series of four on excellence in anesthesiology, I will give a brief introduction to the concept of tacit knowledge and discuss how qualitative studies can clarify its role in anesthesiology. The series was introduced by Andrew Smith, F.R.C.A. (Consultant Anesthesiologist and Honorary Professor, Department of Anesthesia, Royal Lancaster Infirmary, Lancaster, United Kingdom), highlighting the risk we take of losing sight of our professional work as a whole when we pay attention mainly to measurable competencies, and referring to his work examining how knowledge is acquired and used in anesthesiology. In the second editorial, Ronnie Glavin, F.R.C.A. (Consultant Anesthetist, Anesthetic Department, Victoria Infirmary, Glasgow, United Kingdom), discussed anesthesiologists' nontechnical skills, which emerged as a result of a study based also on qualitative methodology. Both Smith and Glavin touch on skills and methods in research, and finally report on a study of how anesthesiologists think about their work, as an example of how qualitative studies can give us better tools for facilitating trainees' development of tacit knowledge.

In the reductionist view of teaching, the best way of understanding a complicated phenomenon is to reduce it to its component parts and add to this a set of rules, explaining how the parts relate to each other. This way of thinking, which has long been predominant in medical education, is linked to the logical positivist tradition, where the underlying assumption is that we can have knowledge only about that which can be formulated in written text and which can be proven by formal methods. Consequently, the focus has been on factual knowledge: principles, theories, and facts presented in textbooks and formal lectures. However, the complex work of anesthesiologists has this other dimension of knowledge and skills, which can be acquired only through training, experience, and reflection. It is an aspect of knowledge that has been named the tacit dimension by Michael Polanyi, scientist and philosopher of science, in his book of the same name. By tacit knowledge, we here mean knowledge that cannot be described by using propositional statements (statements that can be defined as true or false).

If tacit knowledge is thought of at all, it is sometimes thought of as an inferior form of knowledge, but, according to Polanyi, it instead represents a higher level of knowledge, integrated and ready to be used. The step from explicit to integrated knowledge is necessary for the development of clinical proficiency. Integrated knowledge means that the knowledge includes a tacit dimension; it can be seen as the whole at one glance and can be used subconsciously without being deliberately focused on. The way knowledge is usually presented in textbooks—structured, in logical order, sometimes as algorithms—is of little value in giving the knowledge a tacit dimension. Reaching this dimension is instead a question of the knowledge changing from being open and explicit to a state where the knowledge can stay in the background but, as an integrated part of the professional, can nevertheless guide our management of a clinical phenomenon or situation.

The tacit dimension of knowledge cannot be straightforwardly described, but we can observe the result of it. Expert anesthesiologists' ability to act correctly and at times uncannily fast in difficult and uncertain situations is but one example. It is based on the anesthesiologists having internalized formal knowledge after reflection on clinical situations. In acute situations, when time is short, they can use analogous situations from their experience to guide their action. Reflection, therefore, is an essential element of training in anesthesiology. However, some anesthesia trainees see their training predominantly as a matter of learning rules and guidelines. These trainees need to understand that work is just as much about managing a large repertoire of clinical situations. They must let go of the feeling of security that they get from explicit knowledge. Rules are helpful in the anesthesiologist's work, but rule following without tacit knowl-
edge does not work. Trainees who base their action solely on rules will need rules for how to use the rules and may find themselves in a blind alley, despite their best efforts. Teachers then can facilitate trainees’ learning process by using clinical examples as ways of presenting nonexplicit forms of knowledge.

To explore the nature of tacit knowledge in anesthesiology and how to get it means focusing research on how anesthesiologists think and what they experience. Such questions are different from those that anesthesiologists deal with in the more common biomedical research in anesthesiology, where research is about objects that can be measured and quantified, a kind of research where the influence of the subject is at best completely annihilated. Human experiences, in contrast, cannot be quantified, but we can still conduct research about them, by using qualitative methods where we accept that the researcher is part of the research process. The aim of such research is not to confirm or refute hypotheses by using statistical methods but to increase our understanding of complex human or social phenomena by discovering patterns of human thinking and acting. Anesthesiologists at work is one example of humans in action. Indeed, action or performance is what counts as important in anesthesiology practice. However, human performance is based on understanding. Therefore, if we are to understand what is behind variations in how anesthesiologists act, we should look for patterns of variation in how they think. This was the rationale behind the study presented in the paragraph to follow.

In this study, performed by our group in Uppsala on Swedish anesthesiologists’ conceptions of work, we discovered a pattern of four ways of understanding it: taking responsibility for the patient’s vital functions, minimizing the patient’s suffering and making the patient feel safe, giving service to the whole hospital to facilitate the work of other doctors and nurses, and organizing and leading the operating theater and team. These understandings mirror four different aspects of work that the anesthesiologist may focus on as required by the clinical situation at hand: the patient as a physiologic object, the patient as a person, the hospital system, and the operating team. We transformed these conceptions of work into four metaphors—professional artist, good Samaritan, servant, and coordinator—describing four ways of relating to work. We suggest that this “work map” could be used as an educational tool by providing a structure to reflection sessions after trainees’ experiences of difficult work situations. Reflection on such situations is a powerful stimulus to the development of the tacit dimension of professional competence. However, work situations experienced by trainees can be quite messy, because problems are not clear-cut and there are usually technical, personal, and interpersonal aspects to consider, among others. Therefore, when reflecting on them, trainee and teacher must agree on which aspect to focus on. By using the work map with the aforementioned metaphors, the teacher can help the trainee discern the different aspects to choose between. In this way, trainee and teacher may decide more quickly which aspect of a certain clinical situation has the greatest learning potential.

Now, how can research help us to move forward in anesthesia training? One important step could be to explore in depth why it is so difficult for some trainees to go from novices to competent practitioners. In a project of ours just started, we have chosen anesthesia induction as a model for learning the work, because it is an often repeated procedure that necessitates both practical skills and theoretical knowledge. Further, assessment of the smoothness of induction can be used to test the effect of educational interventions. Our tentative hypothesis is that the idea of protocols and guidelines as the only base for learning anesthesia, despite explicit rules being a useful aid in anesthesia practice, may constitute an obstacle to reaching more advanced levels of expertise by jeopardizing the development of tacit knowledge.

To conclude, trainees who work “by the book” may be at risk of not acquiring the tacit knowledge that they will need when in the future they confront complex and challenging situations. This can be a difficult step to take because it involves leaving the security of an ordered world where fact and reason reign supreme, cause and effect are predictably related, and the unexpected does not happen. To take this step successfully and without undue stress, trainees need easy access to the support of more experienced colleagues. If the next generation of trainees is to develop excellence, we need to remind ourselves of the importance of the tacit elements of our professional knowledge, and then show them the way.

References

6. Thornton T: Tacit knowledge as the unifying factor in evidence based medicine and clinical judgement. Philosophy Ethics Humanities Med 2006; 1:12
10. Sæther A: Metaphor and anaesthesia. ANESTHESIOLOGY 1995; 85:1351–45

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