# Alternative Decision-Making Considerations in Prosthodontics

Evidence-based medicine (EBM) is now accepted worldwide, and prosthodontics has been influenced by this relatively new clinical discipline. This is reflected by a significant increase in the publication of epidemiologic studies, meta-analyses, and more robustly reported clinical research. Nonetheless, conclusions in these publications frequently report a lack of scientific evidence and caution that more clinical trials are needed. We used PubMed to identify and study 60 review papers and meta-analyses published between 2006 and 2010 and found a similar conclusion in 48 of them. This apparent incongruence between published conclusions and the realities regarding a best-evidence approach to clinical decision making suggests a need for alternative considerations. The objective of this commentary is to suggest other ways in which clinical prosthodontic decision-making processes may occur.

Most forms of prosthodontic treatment involve numerous variables that pose serious challenges for clinical research designs that seek to verify the various recruited hypotheses to base decisions on. The inherent complexity of our profession is made up of interconnected parts that combine into a whole that exhibits one or more properties, including behaviors, that are not readily differentiated from the properties of the individual parts. This is not unlike a genomic analysis project that simply cannot completely clarify essential life phenomena. In addition, the rigorous use of certain aspects of EBM also imply that decision making should be based exclusively on statistical information or the expected value of its utility. This is not in accordance with a shared decision-making approach wherein both the professional and patient communicate using personal interpretation of evidence, with patients also encouraged to deliberate the possible attributes and consequences of various options. This approach may facilitate informed treatment planning as well as ensure a patient's ethical and legal autonomy where this is desired. However, clinicians and patients may have difficulty understanding probability-based decision making and will not necessarily like it.[1] In fact, such decision making has recently been criticized with regard to applicability limits.[2]

It is often said that clinical rules of thumb are not science. However, if such rules included the right determinants, they could be synthesized so as to evolve into a useful and even invaluable scientific approach. The net result would be to clarify the cognitive algorithms of clinicians who determine the most appropriate clinical procedures based on collective clinical experiences.[3] We would therefore like to endorse strategies that include such key determinants to facilitate clinicians' and researchers' decision-making aptitudes.

First, it is important to represent the preference of the majority of skilled clinicians in a scientific manner by employing convenient aspects of the Delphi technique[4] and clinical epidemiology. Second, it must not be forgotten that clinical data are frequently distinguished by two characteristics: the considerations of multiple dimensions and fewer case histories. Data analyses need to be considered, including a decision to not extract statistical features but to select the significant clinical ones. Third, recognition that the accumulation of various stimuli and changes are time-dependent and may precipitate an adverse clinical event is necessary. Minor problems that precede such a risk should be addressed as early as possible. It is essential that all seemingly trivial signs are recognized and rectified if morbidity changes are to be avoided. Finally, it would also be desirable to articulate a hypothesis (or answer to the clinical question) through clinical practice and then seek to validate it using traditional experimental protocols. A useful example of this approach was developed by Miyachi[5] as a result of experiences gleaned from a retrospective analysis of 1,643 scrupulously documented case histories (Fig 1). We suggest that this sort of organized information is unlikely to be readily acquired from routine clinical research projects given the sample size and sophisticated cognitive skills that permitted its organization and analysis. It remains important to articulate a suitable hypothesis in relation to diverse clinical situations and/or disease groups that demand both clinical experiences together with a profound awareness of the complexity of the clinical research question.

Consequently, the basic question must be posed: What are the most important requirements for decision making? In a clinical situation, we should make clinical decisions not by using ambiguous criteria but by using heuristic reasoning,[6] eg, the process of trial and error rather than following set rules. Yet we also have to acknowledge that such an approach can generate flawed judgment. Conversely, the establishment of the hierarchic level of evidence, with the randomized controlled trial as the best option

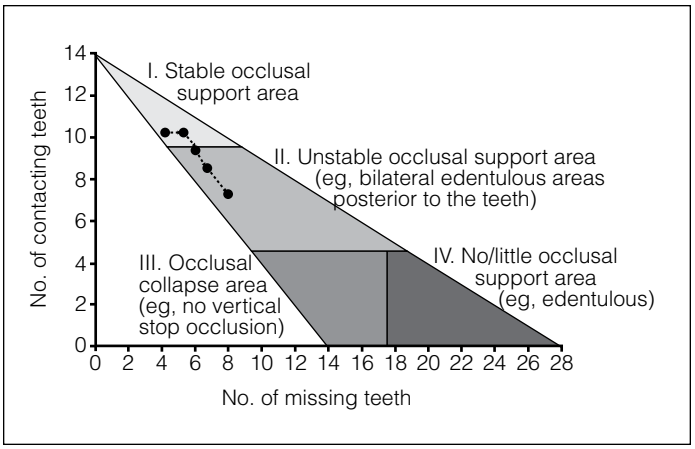


**Fig 1** The possible relationship between the number of occlusal contacting teeth and missing teeth is plotted inside the "occlusal triangle" and is located in one of four areas. The plot trajectory (●····●) helps depict chronologic changes of the occlusal relationship. The "occlusal triangle" is quite helpful as a diagnositc tool in occlusal conditions and clinical outcomes and is one example of the impact of deductive and inductive inference resulting from clinical experience.

followed by the prospective cohort study, can be interpreted as dismissive of other efforts that prioritize clinical skill and alternative research methods. A concept such as the "GRADE system" makes it possible to consider the evidence in terms of quantity, quality, consistency, applicability, generalizability, and clinical impact.[7] The approach is not unlike skillful clinicians' decision-making processes.

Good communication between patients and professionals is the foundation for sound and prudent clinical decision making. This would validate specific rules of thumb via a reconciliation of clinical guidelines with best-available evidence. A proposed formula comprising such rules of thumb, the formulation of research questions, clinical investigations, and ongoing evaluations is required even if specific and long-term research protocols offer additional reassurance when needed. It is now opportune for clinical specialists to reconsider decision making based exclusively on EBM. It is clear that the reconciliation of our knowledge base in all three aspects of our prosthodontic remit—education, research, and service—demands a more eclectic and open approach.

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