

## PDF hosted at the Radboud Repository of the Radboud University Nijmegen

The following full text is a publisher's version.

For additional information about this publication click this link.

<http://hdl.handle.net/2066/22406>

Please be advised that this information was generated on 2019-02-18 and may be subject to change.

## Decision making in restorative dentistry: intuition or knowledge based?

Dentists around the world make numerous and important clinical decisions on a daily basis about a patient's dental future: Should a tooth be extracted or retained? Is a restoration really required? Which material is most appropriate? Is the replacement of a restoration necessary? Is any restorative treatment appropriate prior to preventive care?

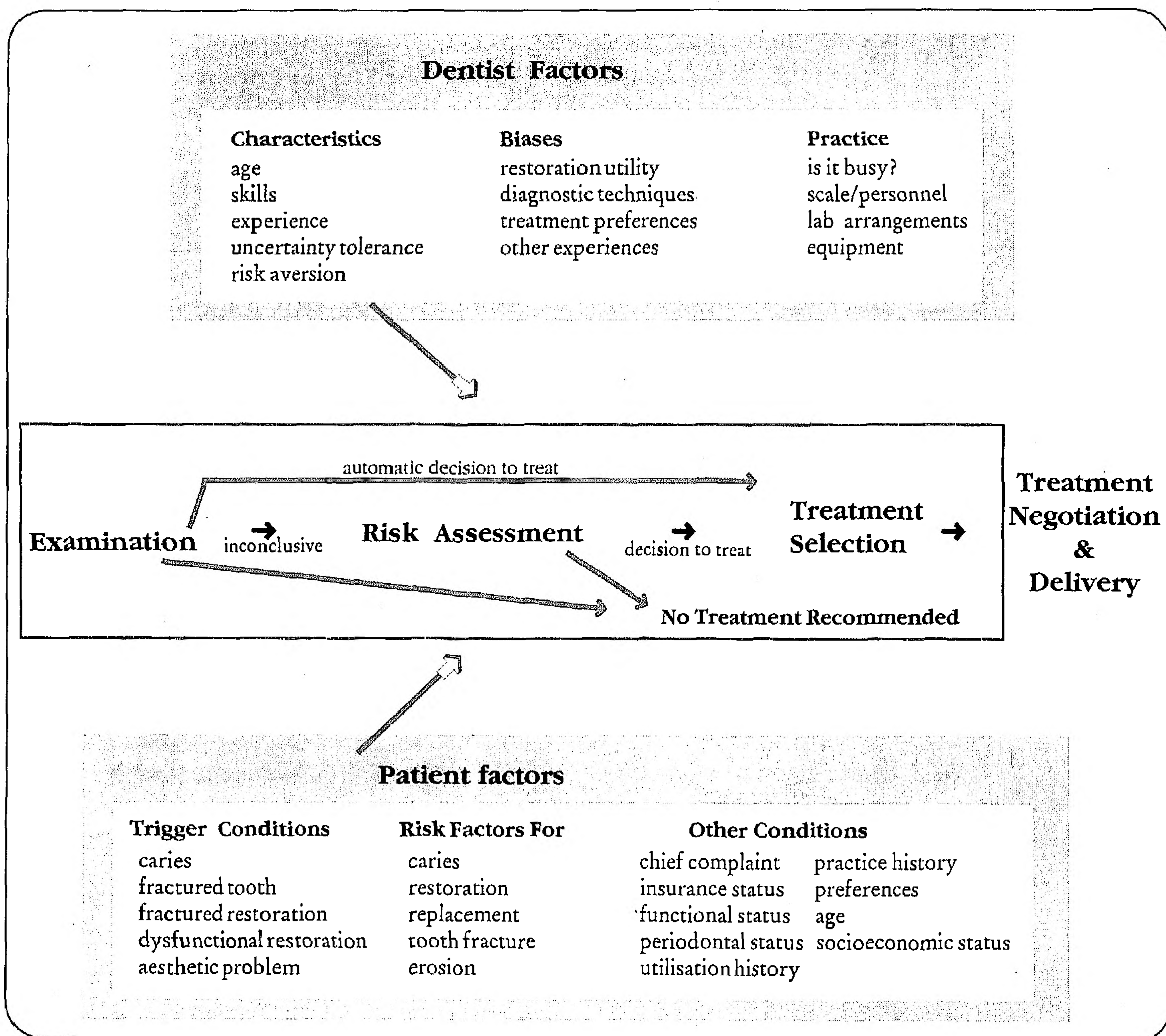
Most decisions are made in an implicit, intuitive way and there is evidence that dental professionals do not share a common decision making process.

Several studies,<sup>1-5</sup> have demonstrated little agreement amongst dentists concerning clinical decision making in restorative dentistry. On reflection such findings could well be expected as clinical decisions are the accumulated result of

undergraduate education, postgraduate training, information gleaned from professional journals and acquired clinical experience.

Wide differences in decision making amongst dentists affect the cost effectiveness and cost benefit of dental care; with consequences ranging from the effects on individual patients to impacts at national and, in some cases, international levels. Changes in clinical decision making may have a significant influence on the oral health of numerous patients and in turn, a major impact on the extent of 'health gain' achieved through spending health care budgets.

Many research findings have been published on the prevalence of caries and periodontal disease, the durability of dental restorative materials under *in vitro* and *in vivo* condi-



A J M Plasschaert is professor in restorative dentistry and E H A M Verdonchot is senior lecturer in dental radiology at the Dental College, University of Nymegen in the Netherlands. N H F Wilson is professor in conservative dentistry and A S Blinkhorn is Professor in child dental health at the Turner Dental School, University of Manchester.

Fig.1 Model of dentists' restorative decision making process (reprinted with kind permission from *J Dent Educ* 1993; 57: 417).



tions and on quality assessments of restorations. However for practitioners responsible for day-to-day clinical decision making this information is often difficult to access, process and apply. Indeed, given the rapid and increasing flow of information pertinent to decision making, particularly in restorative dentistry and periodontology, it is unrealistic to expect practitioners to practise state-of-the-art decision making, let alone demonstrate agreement with their peers.

Inconsistency in decision making has been investigated but not in a very practical manner.<sup>6</sup> The investigators have concentrated on highlighting the problem from a scientific point of view but have given little thought to providing dentists with practicable and effective 'tools' which would yield more towards patient centred, utility-based decision making and treatment planning which take account of people's risk attitudes.

### Information processing model

Computer-based advisory systems would appear to offer a solution. A first attempt to develop a computer-based advisory system has been reported by Bader and Shugers.<sup>3</sup> In their model of dentists' restorative decision making process (see fig. 1) they have related relevant variables in a logical structure. It illustrates that many more factors are involved than just the biomedical problems. Some of these factors may be under-researched at present.

Developing a coherent, knowledge-based decision support system will clarify what these factors are, and will direct attention to these white spots in our knowledge. That will stimulate researchers to further explore these factors, which in return will provide the necessary information to improve the system.

Further development of this information processing model could become of great value to dental practitioners, teachers and students, and possibly policy makers with responsibility for oral health care. However, even with the necessary funding, it will take several years of concerted action to develop such an advisory system.

Given the complexity of the refined model, the limited 'know-how' in building such system, and in view of the ever decreasing budget for health care research, an international approach to the problems involved rather than a national solution would seem logical. This would help to establish and then subsequently maintain the system. It is furthermore suggested that attention should be given to the role of risk assessment<sup>7</sup> in the decision making process. For example, to what extent does risk assessment, rather than

subjective assessment of marginal adaptation, influence decisions to replace or adjust existing restorations?

In an environment in which patients have increasing expectations of dental care and are becoming litigious when not satisfied, it is incumbent on us as members of the dental profession to recognise the growing importance of practical risk management in many aspects of everyday life.

### Adopting risk management

This is clearly in contrast to current decision making which seldom concentrates on 'will problems develop before the next appointment?' or, in more extreme situations, 'could I be sued if I don't act?'. The two approaches need to meet so that decisions are based on balanced judgements of the need to intervene.

The Universities of Nijmegen, The Netherlands and Manchester have recognised the importance of developing practical solutions to problems in clinical decision making. They have started to develop a computer-based advisory system, drawing on the expertise and new knowledge in many diverse fields.

Success in these endeavours, together with the realisation of the need to adopt the philosophy of risk management in contemporary dental practice, could have a useful influence on diagnostic, decision making and treatment planning skills.

A J M Plasschaert, E H A M Verdonschot,  
N H F Wilson, A S Blinkhorn

### References

- 1 Drake C W, Maryniuk G A, Bentley C. Reasons for restoration replacement: differences in practice patterns. *Quintessence Intern* 1990; 21: 125-130.
- 2 Nuckles D B, Sneed W D, Bayme J B, Collins D E, Hook C R, Welsh E L. Faculty differences in replacement decisions for amalgam restorations. *Quintessence Intern* 1991; 22: 533-540.
- 3 Bader J D, Shugars D A. Need for change in standards of caries diagnosis - epidemiology and health services research perspective. *J Dent Education* 1993; 57: 415-421.
- 4 Nuttall N M, Fyffe H E, Pitts N B. Caries management strategies used by a group of Scottish dentists. *Brit Dent J* 1994; 176: 373-378.
- 5 Kay E J, Nuttall N M. Relationship between dentists' treatment attitudes and restorative decisions made on the basis of simulated bitewing radiographs. *Community Dent Oral Epidemiol* 1994; 22: 71-74.
- 6 El-Mowafy O M, Lewis D W. Restorative decision making by Ontario dentists. *J Can Dent Assoc* 1994; 60: 305-310, 313-316.
- 7 Chan DCN. Current methods and criteria for caries diagnosis in North America. *J Dent Education* 1993; 57: 422-427.