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 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 conditions.
tions and on quality assessments of restora-
tions. However for practitioners responsible for
day-to-day clinical decision making this
information is often difficult to access, proc-
ess 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 demon-
strate agreement with their peers.

Inconsistency in decision making has been
investigated but not in a very practical manner.4
The investigators have concentrated on high-
lighting 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 cen-
tred, utility-based decision making and treat-
ment planning which take account of people’s
risk attitudes.

Information processing model
Computer-based advisory systems would ap-
pear to offer a solution. A first attempt to de-
velop a computer-based advisory system has
been reported by Bader and Shugers.3 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 stimu-
late researchers to further explore these factors,
in which return will provide the necessary in-
formation 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 decreas-
ning budget for health care research, an inter-
national 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 assessment5 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 exist-
ing restorations?

In an environment in which patients have in-
creasing expectations of dental care and are be-
coming litigious when not satisfied, it is
incumbent on us as members of the dental pro-
fession 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 appoint-
ment?’ 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 Nether-
lands and Manchester have recognised the im-
portance of developing practical solutions to
problems in clinical decision making. They
have started to develop a computer-based advi-
sory 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 philoso-
phy of risk management in contemporary den-
tal practice, could have a useful influence on
diagnostic, decision making and treatment
planning skills.

A J M Plasschaert, E H A M Verdonchot,
N H F Wilson, A S Blinkborn

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