An Overview of Reasons for the Placement and Replacement of Restorations

Vassiliki Deligeorgi, Ivar A Mjör and Nairn HF Wilson

Aim: Surveys on reasons for the placement and replacement of restorations have been conducted in various countries. The purpose of this paper is to bring together and review the data of 10 such surveys with similar methodology.

Method: The studies reviewed are all based on the protocol described by Mjör in 1981.

Results: The surveys reviewed provide data on the reasons for the placement and replacement of a total of 32,777 restorations. Notwithstanding differences between countries, different groups of practitioners and minor variations in methodology, the data included in the selected surveys indicate that everyday clinical practice in Scandinavia, UK and USA during the 1980s and 1990s has involved more replacement than initial restorations, with the ratio of initial to replacement restorations ranging from 1:1.1 to 1:2.4 for amalgam and 1:1.1 to 1:3.8 for composite materials. Primary caries has been consistently found to be the principal reason for the provision of initial restorations of amalgam and composite. The principal reason for the replacement of restorations of amalgam and composite has remained secondary caries as diagnosed clinically. Material failures (marginal degradation, discoloration, bulk fracture and loss of anatomic form) accounted for the replacement of more restorations of composite than amalgam. Recent surveys have reported secondary caries as the principal cause of failure of restorations of glass-ionomer cements and related materials.

Conclusions: The clinical diagnoses of caries may continue to be found to account for the placement and replacement of most intracoronal restorations. Surveys of the type reviewed provide valuable insight into patterns of provision of dental care and highlight research priorities in relation to direct restorations.

Introduction

Over the last 50 years numerous surveys have been conducted in various countries on reasons for the placement and replacement of restorations.1-24 Data from such surveys, despite their acknowledged limitations,25-7 are considered to be of importance in extending existing knowledge and understanding the patterns of provision of primary dental care, including the use of restorative materials.

The philosophy underpinning the provision of dental care changed radically in the last quarter of the 20th century: the ‘replace for prevention’ ideology28 was superseded by the ‘wait and watch approach’.29 In recent years, developments in this field may be considered to stem from a late 1980s international symposium on criteria for the placement and replacement of dental restorations.30

Given the number, extent and timing of studies on the reasons for the placement and replacement of restorations reported over the last two decades, there is considered to be good cause to review and summarise the findings of these surveys. In this way future direction and priorities for this type of research may be identified.

Method

Central to this review are the studies on reasons for the placement and replacement of direct intracoronal restorations conducted over the last 20 years based on the protocol described by Mjör.3 These studies were identified by means of electronic and, where necessary, hand-searching of the literature.

The principal data reported in the articles identified by the search were brought together and summarised in tabular form. Observations on the tabulated data were summarised to provide an overview of the conclusions drawn from the various studies.

Results

The data obtained in the 10 surveys selected to be reviewed related to a total of 32,777 restorations, comprising 14,548 initial placement restorations and 18,229 replacement restorations including 18,557 amalgams,
12,002 composites and 2137 glass ionomers (Table 1). As detailed in Table 1, the initial placement to replacement ratios observed ranged widely from 1:0.2 to 1:3.8. Regarding the reasons for the initial placement of restorations, primary caries predominated throughout (Table 2). Similarly secondary caries has been consistently found to be the principal reason for the replacement of restorations, albeit with certain exceptions as detailed in the relevant publications (Table 3).

From the data presented in Table 3 it may be seen that the reasons recorded for replacing amalgam restorations have not changed significantly in recent times. For composite restorations the only consistent reason for replacement has been secondary caries.

Concerning the conclusions drawn from the various studies, these were distilled as set out in Table 4. No attempt was made to compare these conclusions albeit that the various studies had similar methodology—differences in hypotheses probably accounting for different emphases in the various conclusions.

**Discussion**

The methodology used in each of the investigations reviewed was based on that originally employed by Mjör, but in some studies modified or even redesigned to distinguish the study or address issues of particular interest to the investigators. This, together with the unknown effects of international differences in treatment decisions, let alone the studies having spanned 20 years and the influence of the introduction of many new materials, techniques and philosophies during the 1980s and 1990s, made it inappropriate to pool the data from the various studies.

**Ratio of initial to replacement restorations**

Notwithstanding differences between countries, different groups of practitioners, the time between studies and variations in study methodology, the data reviewed indicate that everyday clinical practice in Scandinavia, the UK and the USA has previously involved and continues to include more replacement than initial restorations, with the ratio of initial to replacement restorations ranging from 1:2.4 to 1:1.1 for amalgam and from 1:3.8 to 1:1 for composites in these parts of the world. In contrast, in Italy, Korea and Greece, everyday clinical practice has been found to involve more initial than replacement restorations with the initial to replacement restoration ratio ranging from 1:0.7 to 1:0.6 for amalgam and 1:0.9 to 1:0.7 for composites which in the most recent studies probably included a small number of restorations of compomers. For glass ionomers and related materials the overall ratio of initial to replacement restorations has been reported to range from 1:0.3 to 1:0.2. Four studies only, however, report on the reasons for the placement and replacement of restorations of glass ionomer materials. Furthermore, in these studies, with one exception, the number of restorations of glass ionomers and related materials was relatively small with insufficient information being available to draw other than limited conclusions. As a consequence, and despite glass-ionomer materials having been widely used as restorative materials for 10-15 years, any comparison to amalgam and composite regarding reasons for replacement is considered inappropriate.

The differences between the findings from the studies in Scandinavia, UK and the USA and those in Italy, Korea and Greece in terms of the ratio of initial to replacement restorations may be the product of a range of factors, a number of which may be interrelated. These factors include the age, gender and
dental awareness of the patients included in the studies, variations between countries in terms of the patterns of dental disease, international differences in diet and caries susceptibility, differences in the nature and arrangements for the provision of dental care and, possibly most importantly, the clinical setting in which the data were collected. It is suggested that further, more detailed investigations would be required if subsequent workers wish to identify which of the many varied influencing factors may be responsible for the international differences observed and any future change in ideology relating to the ‘replace for prevention’ to the ‘wait and watch approach’.

Restorative materials

Overall, the studies reviewed indicate that amalgam has been the most widely used restorative material over the last 20 years. The use of amalgam has, however, decreased in recent years. In the most recent surveys the use of tooth-coloured materials (composites and glass-ionomer cements and related materials) has been found to be similar to that of amalgam despite the ratio of anterior to posterior teeth restored remaining essentially unchanged. The most recent studies conducted in Scandinavia show a continuing decrease in the use of amalgam with a concurrent increase in the use of tooth-coloured restoratives. Limitations on the use of amalgam (despite assurances as to the safety of amalgam alloys) and environmental concerns, changes in patterns of dental disease and increasing patient expectations have, it is suggested, contributed to the observed changes in the relative use of materials. Furthermore, it is anticipated that increasing patient expectations, notably in Scandinavia and the USA, will further reduce the use of amalgam relative to that of tooth-coloured restoratives. Such trends would appear to go against the substantial evidence indicating that for situations in which aesthetics are of secondary importance, amalgam remains the most cost-effective direct restorative material.

Regarding changes in the relative use of different types of tooth-coloured restorative materials, further studies of the type reviewed could helpfully map out trends in the use of such restorative materials around the world. Further surveys in student clinics could concurrently help inform teachers of international trends in the teaching of operative dentistry.

### Table 2: Reasons for the initial placement of restorations

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Clinicians (characteristics)</th>
<th>Materials</th>
<th>Reasons for initial placement (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mjör IA 1981</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>Primary caries: 29</td>
</tr>
<tr>
<td></td>
<td>(private practice)</td>
<td>Composite</td>
<td>21</td>
</tr>
<tr>
<td>Qvist and others</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>48</td>
</tr>
<tr>
<td>1986</td>
<td>(postgraduate courses)</td>
<td>Composite</td>
<td>39</td>
</tr>
<tr>
<td>Qvist and others</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>39</td>
</tr>
<tr>
<td>1990</td>
<td>(postgraduate courses)</td>
<td>Composite</td>
<td>38</td>
</tr>
<tr>
<td>Mjör and Toffenetti</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>59</td>
</tr>
<tr>
<td>1992</td>
<td>Italy</td>
<td>Composite</td>
<td>52</td>
</tr>
<tr>
<td>Mjör and Um 1993</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>62</td>
</tr>
<tr>
<td>South Korea</td>
<td>Composite</td>
<td>59</td>
<td>NA</td>
</tr>
<tr>
<td>Pink and others</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>44</td>
</tr>
<tr>
<td>1994</td>
<td>USA</td>
<td>Composite</td>
<td>49</td>
</tr>
<tr>
<td>Wilson and others</td>
<td>General practitioners</td>
<td>Amalgam</td>
<td>34</td>
</tr>
<tr>
<td>1997</td>
<td>(university affiliated)</td>
<td>Composite</td>
<td>23</td>
</tr>
<tr>
<td>Deligeorgi and others</td>
<td>Students</td>
<td>Amalgam</td>
<td>40</td>
</tr>
<tr>
<td>1998</td>
<td>United Kingdom</td>
<td>Composite</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Glass ionomer</td>
<td>24</td>
<td>60</td>
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<tr>
<td>Deligeorgi and others</td>
<td>Students</td>
<td>Amalgam</td>
<td>61</td>
</tr>
<tr>
<td>1998</td>
<td>Greece</td>
<td>Composite</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Glass ionomer</td>
<td>22</td>
<td>56</td>
</tr>
<tr>
<td>Burke and others</td>
<td>Vocational dental practitioners</td>
<td>Amalgam</td>
<td>55</td>
</tr>
<tr>
<td>1999</td>
<td>and trainers</td>
<td>Composite &amp; modified glass ionomer</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>United Kingdom</td>
<td>Glass ionomer</td>
<td>45</td>
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</tbody>
</table>

NA: not applicable/no data provided.

Reasons for providing restorations

**Initial placements**

Primary caries as diagnosed clinically has consistently been found to be the principal reason for the provision of initial restorations of amalgam and composite. Other reasons for the provision of initial restorations of tooth-coloured restorations, notably composites, have included trauma and, more recently, the restoration of defects such as non-carious cervical lesions. At the same time it would appear that an increasing range of tooth-coloured materials, despite inherent limitations, will be used in the restoration of Class III, IV and V lesions and in an increasing proportion of Class I and selected Class II preparations. In anticipation of such trends, dental schools should continue to review and extend teaching in relation to newer forms of materials and appropriate techniques.

**Replacement restorations**

The principal reason for the replacement of restorations of amalgam and composite has consistently been found to be secondary caries, as diagnosed clinically, ranging from 25% to 67% for amalgam and from 20% to 44% for composite. Despite the many varied differences between the studies reviewed in terms of different circumstances,
and notwithstanding improvements in clinical techniques and dental materials, secondary caries has remained the predominant reason for the replacement of restorations. This observation was apparent in all studies except one: the first survey by Mjör, and then for composite restorations only, in which poor anatomic form was the principal reason for replacement. The question that arises is the sensitivity and specificity of the clinical diagnosis of secondary caries within and between the various studies. From the work of Elderton and Mjör and Toffenetti, it is widely accepted that secondary caries may not have been associated with a large proportion of restorations deemed to have failed as a consequence of secondary caries. In an attempt to obtain more information on caries causing clinicians to decide to replace restorations, Deligeorgi and others sought information on ‘frank caries’ and ‘limited caries’, the former having referred to clinically visible secondary caries and the latter to secondary caries that was suspected to be present or diagnosed after radiographic examination. This approach revealed that of the 54% of the restorations replaced as a result of secondary caries the majority were diagnosed as having frank caries (31%) rather than limited caries (23%). This would imply at least partial implementation of contemporary criteria for the replacement of restorations. Furthermore, recent observations on secondary caries, as discussed, for example, by Mjör and Toffenetti may begin to change attitudes to decision making in the replacement of restorations.

Apart from secondary caries, the bulk fracture of amalgam and composite restorations and the marginal fracture and discoloration of composite restorations have consistently been found to be principal reasons for restoration replacement. Although marginal fracture is recorded as one of the main reasons for the replacement of restorations of amalgam in all the studies reviewed, it may be observed that such failure is less

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year of publication</th>
<th>Clinicians (characteristics)</th>
<th>Country</th>
<th>Materials</th>
<th>SC</th>
<th>BD</th>
<th>MD</th>
<th>BF</th>
<th>MF</th>
<th>PA</th>
<th>TF</th>
<th>LR</th>
<th>ORR</th>
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<tr>
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<td>1981</td>
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<td>Sweden</td>
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<td>58</td>
<td>13</td>
<td>9</td>
<td>12</td>
<td>8</td>
<td>20</td>
<td>13</td>
<td>7</td>
<td>40</td>
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<tr>
<td>Qvist and others</td>
<td>1986</td>
<td>General practitioners (postgraduate courses)</td>
<td>Denmark</td>
<td>Amalgam</td>
<td>33</td>
<td>15</td>
<td>1</td>
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<td>38</td>
<td>27</td>
<td>12</td>
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<td>9</td>
<td>8</td>
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<td>General practitioners (private practice)</td>
<td>Italy</td>
<td>Amalgam</td>
<td>59</td>
<td>13</td>
<td>11</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Mjör and Um</td>
<td>1993</td>
<td>General practitioners (private practice)</td>
<td>South Korea</td>
<td>Amalgam</td>
<td>47</td>
<td>26</td>
<td>11</td>
<td>10</td>
<td>6</td>
<td>6</td>
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<td>Pink and others</td>
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<td>USA</td>
<td>Amalgam</td>
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<td>23</td>
<td>(marginal failure)</td>
<td>16</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Wilson and others</td>
<td>1997</td>
<td>General practitioners (university affiliated)</td>
<td>United Kingdom</td>
<td>Amalgam</td>
<td>43</td>
<td>5</td>
<td>(including poor anatomic form)</td>
<td>19</td>
<td>15</td>
<td>11</td>
<td>7</td>
<td>36</td>
<td>36</td>
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<td>Deligeorgi and others</td>
<td>1998</td>
<td>Students</td>
<td>United Kingdom</td>
<td>Amalgam</td>
<td>67</td>
<td>1</td>
<td>11</td>
<td>4</td>
<td>2</td>
<td>3</td>
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<td>Deligeorgi and others</td>
<td>1998</td>
<td>Students</td>
<td>Greece</td>
<td>Amalgam</td>
<td>25</td>
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<td>2</td>
<td>6</td>
<td>15</td>
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<tr>
<td>Burke and others</td>
<td>1999</td>
<td>Vocational dental practitioners and trainers</td>
<td>United Kingdom</td>
<td>Amalgam</td>
<td>46</td>
<td>12</td>
<td>13</td>
<td>10</td>
<td>18</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Composite &amp; compomer</td>
<td>46</td>
<td>12</td>
<td>13</td>
<td>10</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Glass ionomer &amp; modified glass ionomer</td>
<td>40</td>
<td>7</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
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</tbody>
</table>

| SC | secondary caries; BD, bulk discoloration; MD, marginal discoloration; BF, bulk fracture; MF, marginal fracture PA, poor anatomic form; TF, tooth fracture; LR, lost restoration; ORR, other reason for replacement. |
common than previously. The assumption that there is a relationship between marginal defects and caries led to the use of marginal integrity as one of the principal criteria for judging the quality of a restoration. Thus many restorations have, in all probability, been replaced because of imperfections in marginal adaptation rather than secondary caries. Since the presence of a limited marginal discrepancy alone, whether it is associated with a newly placed or older restoration, should no longer be a criterion for restoration replacement, it is to be hoped that many more restorations with limited marginal defects but several serviceable years remaining will be left undisturbed, refinshed or possibly repaired rather than replaced. To achieve this, it is suggested that ways need to be identified to remunerate dentists for saving, rather than replacing restorations which have suffered limited failure.

Poor anatomic form and marginal discrepancies are reasons for the replacement of composite restorations which are considered to have declined in recent years. However, it is suggested that this trend is not apparent from the findings of the studies summarised in Table 3. A possible explanation for this inconsistency is that overhangs and badly finished composites were classed as having poor anatomic form in a number of studies. Improvements in the properties of composites which result in less degradation and wear have provided materials that show a relatively high incidence of bulk fracture which is not significantly different from that of amalgam restorations.

The information on reasons for the replacement of glass-ionomer cements and related materials has been regarded as insufficient to draw conclusions with regard to everyday clinical practice. However, since similar findings have been reported in different studies, it is worth mentioning that for restorations of glass-ionomers, bulk fracture, marginal fracture and poor anatomic form would appear to be the main reasons for failure in addition to secondary caries (Table 3). The mode of failure of restorations of glass-ionomers should be the subject of further investigation.

**Differences between practitioners**

From the data set out in Tables 1-3, it is apparent that there are many similarities between the different groups of clinicians, including students, in terms of reasons for the placement and replacement of restorations. It is accepted, however, that differences may have

<table>
<thead>
<tr>
<th>Author/study</th>
<th>Principal features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mjör; Qvist and others 1981,1986,1990 Scandinavia</td>
<td>The total number of restorations replaced has declined from about 70% for amalgam and 80% for tooth-coloured restorations in the 1981 survey to around 60% for both amalgam and tooth-coloured restorations in the 1990 survey, indicating a positive trend in the effect of preventive interventions with the incidence and progression of the caries disease. A 10% decrease in the relative use of amalgam was noted between the 1986 and 1990 survey. This probably reflects a trend towards more aesthetic dentistry, a recognition of the improved quality of the tooth-coloured materials, and an awareness of the potential problems with mercury.</td>
</tr>
<tr>
<td>Mjör and Toffenetti 1992 Italy</td>
<td>The treatment pattern was different from that reported previously in Scandinavia regarding the placement of restorations due to primary caries. Such differences in treatment were thought to reflect differences in previous treatment experiences. The 50-60% frequency range of secondary caries was in agreement with previous studies.</td>
</tr>
<tr>
<td>Mjör and Um 1993 South Korea</td>
<td>The treatment pattern in Korea relating to the ratio of initial placement to replacement restorations is quite different to the treatment patterns in Scandinavia, possibly reflecting less regular dental care than in Scandinavia. However, the percentage distribution of the reasons for the replacement of amalgam restorations and to a lesser extent composite restorations is similar to that reported in other countries (Sweden, Denmark, Italy).</td>
</tr>
<tr>
<td>Pink and others 1994 USA</td>
<td>A risk exists that the data will not reflect a ‘true sample’ of practitioners despite the findings being in agreement with those of the previously mentioned studies, regarding secondary caries being the predominant reason for amalgam and composite replacement, and that replacement restorations comprise the majority of routine restorative care.</td>
</tr>
<tr>
<td>Wilson and others 1997 UK</td>
<td>Of failed glass-ionomer restorations 30% were considered to have failed as a result of secondary caries. Despite the study being a limited snapshot in time, this finding corroborates the finding of Mjör (1996).</td>
</tr>
<tr>
<td>Deligeorgi and others 1998 UK/Greece</td>
<td>The differences observed between the student clinics of the Universities of Manchester and Athens were most likely the result of the differences in patient populations rather than differences in teaching.</td>
</tr>
<tr>
<td>Burke and others 1999 UK</td>
<td>In the UK the clinical decision-making of recent graduates in relation to intracoronal restorations is similar to that of established practitioners despite the introduction in the dental schools of new materials, techniques and the trend towards a more preventive approach to patient care.</td>
</tr>
</tbody>
</table>
exist between these groups and that the methods used may not have been sufficiently sensitive to detect such differences. Of particular note was the selection of practitioners in the Korean and Italian study, the difference observed between trainees and trainees by Burke and others and the apparent lack of difference between the general dental practitioners and students included in the study reported by Deligeorgi and others. Despite the students surveyed by Deligeorgi and others having been encouraged to adopt a preservative approach in the management of the patients, in practice their decision-making mimicked that of local practitioners. Such findings are considered to highlight the difficulties in changing clinical decision-making in relation to the placement and replacement of restorations.

The value of the findings

The methodology used in the studies reviewed have, from time to time, been the subject of criticism, notably in relation to the clinical diagnosis of secondary caries. Bader and Shugas stress that there is variation among dentists in their clinical decision-making and suggest that if accurate and reliable data are to be obtained, parameters such as the type of dental practice, patient and individual tooth should be taken into account and standardised. As the studies of the type reviewed do not meet these expectations, workers such as Bader and Shugas believe that they cannot be considered seriously. However, as stated by Mjör and subsequently by Wilson and others, the data collected in the studies in question are substantial but more importantly represent ‘real world’ decisions. Accordingly, they are considered to give an important insight into patterns and trends in clinical practice together with an appreciation of the ways in which clinicians perceive restorations of different materials to have failed. However it is regarded that the studies reviewed were inconsistent in the recording of the age of restorations at the time of replacement. The availability of such additional data would have contributed greatly to the outcome of this collective research endeavour.

It is widely acknowledged that substantial variation exists in relation to dentists’ assessment of caries, decisions to intervene and in the prescription of treatment recommended to the patient. As concluded by Anusavice even dentists who have considerable levels of advanced education do not consistently agree on decisions about preventive and restorative caries treatments. The findings of the study by Söderholm and others, concerning correlation between marginal discrepancies at the amalgam/tooth interface and recurrent caries, showed that all investigators suggested more restoration replacement than was required from a cariogenic point of view, with the less experienced investigators recommending more replacements than more experienced clinicians. These statements and outcomes emphasise the pressing need for changes in decision-making processes in dentistry. This requires changes at all levels of the dental education continuum with special emphasis on diagnosis and treatment planning. At the undergraduate level it has been suggested that more attention should be focused on grading the students’ performance according to the number of correctly diagnosed and treated teeth, rather than to the number of restorations placed.

In addition to the above, a more preventive approach should be encouraged throughout dentistry. The goal of restorative dentists as we enter the 21st century should be to delay and wherever possible prevent the placement of initial restorations. Modern dentistry should institute remineralisation therapy for all non-cavitated lesions and delay operative intervention until remineralisation attempts have failed. Dentists should be able to assess the caries risk level and plan treatment accordingly, notably with regard to irreversible operative intervention. The cost benefits and manpower implications of the implementation of such approaches may be considerable. Research is urgently needed in this area, to include how best to educate patients to accept this approach and to have dentists suitably rewarded for adopting a preservative rather than an interventive approach to their everyday management of patients. This trend towards preventive dentistry, however, cannot be satisfactorily achieved without the aid and cooperation of the patients themselves. Once patients have been educated in preventive measures, success in such an approach is dependent on patients taking responsibility for their oral health maintenance.

A more preventive approach towards dentistry includes consideration of repair and refurbishment instead of the replacement of restorations. Repair should be considered as a favourable alternative to the replacement of failed restorations albeit that secondary caries, as shown by Mjör, does not always occur in a continuous manner. As a consequence efforts are required to direct educational endeavours and
decision-making research towards outcomes with enhanced prospects of having an impact on the advancement of preservative dentistry.

Conclusions

It can be concluded that:

- Surveys of reasons for the placement and replacement of restorations have over the last 20 years produced important 'real life' data indicating the need to further research and teach a more preservative approach to everyday clinical practice in dentistry.
- The surveys reviewed provide insight into international trends in the use of restorative materials, with tooth-coloured materials being used increasingly as the use of amalgam tends to diminish.
- Variations in the ratio of initial to replacement restorations in different parts of the world should be further investigated.

Finally, it is concluded that surveys of the type reviewed, despite acknowledged limitations, are of value in extending existing knowledge and understanding of prevailing educational philosophies and the provision of primary dental care. The review also calls for detailed studies of secondary caries, the most commonly stated reason for replacement of restorations.

References


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