

3.12 IMPROVING PROVIDER PERFORMANCE

3.12.1 Continuing Education

The need for practising dentists to participate in continuing education has long been accepted by the profession. Indeed, such activity is often seen as the solution to improving provider performance. This may well be true if the needs of the dentist in this regard are centred on deficiencies in information, but, if low performance levels are related more to attitudinal factors, the continuing education programmes may not achieve the necessary purpose.

Hozid (1969) pointed out the inhibitory effect on achievement of increased knowledge and skills of the "refresher course" attitude in continuing education and questioned the wisdom of relying on the individual practitioner to update himself. He recommended a systematic and integrated approach to the situation from professional associations, schools and government bodies. Nevertheless, many still believe in the beneficial effects of mandatory continuing education. In a survey in 1977 of a random selection of 2200 dentists from seven western and midwestern States in the U.S.A., it was found that the majority (72.7%) believed in some form of mandatory continuing education (Bauer & Bush 1978). Almost 60% indicated that they would attend more courses if tuition was free and, generally, dentists preferred courses of only one to two days duration. Over 85% of respondents believed that the topic was more important than the reputation of the instructor.

This attitude towards the importance of mandatory continuing education became a focal point of the dental profession's attention in the U.S.A. following regulations proposed by the Department of Welfare in New York State shortly after the enactment of changes to the Social Security Act in 1965. These regulations would have requirements for attendance at continuing education for all dentists seeking reimbursement under the Medicaid programme. Subsequently, the American Dental Association, through its Council on Dental Education, encouraged local societies to require reasonable standards of continuing education for maintenance of membership, if they chose to do so. In its guidelines for continuing education courses, the American Dental Association Council on Dental Education includes the requirement that curricula should be based on assessed health care needs of the community (Anonymous 1974). In 1969, Minnesota became the first State to require continuing education for re-licensure and by 1975, five other States had done likewise with a further 28 States having the matter under consideration. At this stage, eight societies required annual continuing education for membership and 30 had voluntary systems (Graham & De Marais 1975). By October 1986 this initial enthusiasm appears to have abated and only 14 States required continuing education credits for re-licensure (American Dental Association 1987b). On the other hand, by 1983, 35 States had passed legislation requiring mandatory attendance at continuing medical education courses for medical re-licensure and 22 medical specialty boards listed similar requirements (Featherstone, Lo Gerfo & Barnes 1983).

The use of mandatory continuing education as a means of maintaining or improving professional standards has not been without its critics. Brown and Uhl (1970) postulated that mandatory attendance at "cure-all" programmes of continuing medical education for undefined ills would be a disaster and would frustrate the adventurous efforts of an increasing number of educators to create innovative approaches to education for the practicing physician. They asserted that the main deficiency in their current education programmes was the lack of identification of physician and patient needs and the tailoring of educational activities to meet these needs rather than merely transferring information which implies that the only patient care deficiency is a lack of physician knowledge. They felt that there was also a need for evaluation of the programmes.

Butts (1975) opposes the concept of mandatory continuing education as a condition for continued licensure to practice dentistry or even as a requirement of membership in state dental associations, maintaining that it is in direct conflict with the classical concept of professionalism. He maintains that it should be assumed that a dentist will want to continue his education. He does however accept that some occasional review of the dentist's performance would have some merit. He also makes the point that even if one accepted the value of continuing education for the purpose of improving technical knowledge, then that knowledge must be measured by some form of assessment to demonstrate whether the educational objectives have been met.

Chambers and colleagues have considered the possible benefits of

continuing education to patients and question the concept of mandatory course attendance requirements (Chambers 1976; Chambers & Hamilton 1975; Chambers, Hamilton, McCormick & Swendeman 1976). In surveys conducted by this group among Californian dentists, it was found that there was no measurable behaviour change among practitioners in over half the courses most recently attended. What was found more surprising was that technique courses which might be considered to be more likely to produce change were no more likely to do so than those dealing with more esoteric topics. Further evidence was quoted of the discrepancy between instructors and attendees concerning the motives for attendance. Tutors considered the commitment to making a change in their practice the major intention yet only one in twenty attendees listed this as their primary objective and it was generally the least likely motive for attendance. More than any other reason, practitioners attended courses simply because of their general interest in the topic.

In 1974, a research project (Hamilton, McCormick & Swendeman, 1975) sought to determine the degree of behavioural change measured by assessors who visited the practices of dentists who had recently attended a course on four-handed dentistry techniques. Results showed success in effecting changes in technique, posture, equipment positioning, rapport, patient scheduling and surgery design. In relation to this same study, Chambers (1976) also found that those dentists most likely to change could be identified more easily by their pre-course motives rather than their later attitudes to the course. The data suggested that a determined motive to change as a reason for course attendance was a more useful predictor of

subsequent behaviour modification than the opinions expressed later as to the value of the course. He found that the dentists ratings of their own changes were completely random when compared with the quite reliable behavioural measures of the trained assessors. This might tend to indicate that dentists were untrained in identifying quality and poor judges of learning achievement. One finding was the surprising extent to which dentists modify what was presented in the course to suit their own practice situations. It was rare to find any of the suggestions made during the course implemented without change. Based on these results, Chambers considers that the case for mandatory continuing education as a means of changing dentists behaviour and effecting improvements in patient care is an invalid one. He also questions the validity of pre- and post-course questionnaires as a measurement of course worth and lists several problems with such evaluations.

1. The systems model of educational technology seems singularly inappropriate to self-selected, self-motivated continuous learning.
2. The psychometric problems of parallel test forms, criterion referencing and interpretation of change scores demand special expertise not usually found in continuing education programmes.
3. Dentists and course programmers' perceptions of the purpose and content of a course may differ substantially, which brings the validity of evaluations into question.

4. If fewer than 20% of instructors or attendees is concerned about developing factual knowledge, pre- and post-course evaluations which are almost entirely didactic amount to little more than assessments of unintentional learning.
5. The administrative burden and financial costs of keeping meaningful data on course evaluations in addition to records of course attendance would be beyond present resources.
6. Course evaluations are irrelevant to assessment of the quality of patient care in view of evidence that change in behaviour is not a primary motive for attendance and quality of care should be measured directly.

In general, Chambers considers that rather than increasing the attendance levels of dentists of continuing education courses, efforts should be made to improve the quality of the courses.

The next question to be resolved is that relating to the influence of continuing education on the quality of care. Since 1970, the Stanford University School of Medicine has established an extramural programme of continuing education based on a federation of hospitals in Northern California. Data collected indicate that such a programme can act as a beneficial influence on medical practice although it was acknowledged that some of the effects noted might represent only the accentuation of pre-existing trends (Rubenstein 1973).

In another study to test the effect of a course of instruction on the practising physician's ability to identify unknown cardiac sounds, it was found that:

1. initial gains in auscultatory skills were not generally sustained over an extended period;
2. initial gains and immediate post-course achievement are related to previous knowledge, experience, training and educational interest;
3. the effectiveness of instruction measured objectively does not correlate with the participants' opinions of the programme;
4. the instruction had little influence on the quality of records of cardiovascular examination;
5. when specific criteria are used, record review is a good guide to performance; and
6. participants' cooperation in continuing education is enhanced when anonymity is preserved and performance feedback is provided.

Results indicate need for periodic reinforcement of instruction (McGuire, Hurley, Babbott & Butterworth 1964).

The question of the relevance of involvement in continuing education to improvements in the quality of care has also been studied by Lewis

and Hassanein (1970). In an analysis undertaken in the State of Kansas during the period 1956-65, there was found to be no association between continuing education and improvement in the quality of care. This supported an earlier study undertaken in North Carolina (Peterson, Andrews & Spain 1956) in which there was found to be no evidence of an association between quality of care and participation of medical practitioners in continuing education. They suggest that those attending continuing education courses are, in fact, representative of the more competent group of practitioners.

In an attempt to evaluate in behavioural terms the effect of a post-graduate course which emphasised the use of Papaniciolaou (pap) smears in the early detection of cancer of the cervix, a study was conducted by the University of Kentucky (Kane & Bailey 1971). The evaluation was based on comparisons of doctors' activities before and after the course through the use of a percentage rate derived as follows:-

Number of pap smears performed each month

Number of patient visits per month of females over 20 years of age

Results showed an increase of 34.6% in this ratio overall following the educational activity although for two of the eight doctors studied there was no significant increase in this activity. However, both of these two had been performing these tests at higher levels than their colleagues before the course. In order to delineate the results of the course against increases in this activity due to other factors, national surveys were examined which showed an

increase in Kentucky during the period 1961-1966 of 33.6%. In other words, one may conclude that the changes in behaviour found subsequent to the study could be attributed to that likely from secular trends alone.

Featherstone, Lo Gerfo and Barnes (1983) point out that there is little evidence that continuing medical education programmes are effective in improving the quality of care. The study reported by Featherstone and his colleagues was based on the use of prophylactic cephalosporin in hysterectomy patients and was undertaken to determine whether a continuing medical education programme based on a specific deficiency in performance was effective in improving that deficiency. Cephalosporin prophylaxis has been shown to be effective in reducing postoperative infections following hysterectomy but the use of these antibiotics in such cases was considered to be sub-optimal. In the study hospital, improvements in its prophylactic use were seen after the educational intervention, supporting the thesis that continuing education can have beneficial effects on clinical performances. The format used in this study - needs assessment, feedback to participants, hospital grand rounds, and reassessment of practice patterns - is simple, widely applicable and effective. However, even after educational intervention, half of the hysterectomy patients still received cephalosporin in an inappropriate fashion because two physicians did not change their practice patterns, and two others, while showing marked overall improvement, continued inappropriate use for patients in some cases.

A Canadian study set out to examine the relationship between

continuing education and its effect on quality of care. General practitioners were randomly allocated to relevant continuing education packages and the quality of care assessed both before and after the educational involvement (Sibley, Sackett, Neufield, Gerrard, Rudnick & Fraser 1982). Objective tests confirmed that although the clinicians who received continuing education had increased their professional knowledge, there was little effect on the overall quality of care. It was found that when the topics were of relatively great interest, both study and control groups showed equal improvement in care but when the topics were of little interest, the study group showed improvement in quality of care. The researchers concluded that, in view of the magnitude of resources expended, it might be prudent to reconsider the trend towards mandatory continuing education in medicine.

Another illustration of the effect of continuing education on quality of care is exemplified in a study conducted in Rockford Memorial Hospital in Illinois (Williamson, Alexander & Miller 1967). The study measured physician responses to abnormal and unexpected results of routine admission tests eg. urinalysis, fasting, blood glucose and haemoglobin. The results of the survey of physician responses to the abnormal and undetected test results showed "minimum adequate" responses to only 11% and "any" response to only 35%. A workshop conference was organised, was very well attended and the survey data was presented. Participants agreed, almost unanimously, that there was a serious problem requiring immediate corrective action. Subjective evaluation of this conference indicated that it had been considered to be stimulating and informative, and was seen as a

successful educational exercise. Follow up surveys, disappointingly, showed little improvement after the conference in reaction to the unexpected and abnormal test results. During the next six months, reinforcement to the previous educational exercise was provided by way of a newsletter reminding staff of the problem. A subsequent survey again showed little improvement with only 13% "minimum adequate" and 47% "any" responses. Thus more provision of information had exercised little influence in changing clinical behaviour and so it was decided to provide a repetitive stimulus by obscuring abnormal results with fluorescent tape, to be removed only by the doctor. This tape was used for a ten week period following which a survey showed "minimum adequate" and "any" responses to have risen to the level of 78% and 25% respectively. Six months later, quality improvement had been maintained, with "minimum adequate" and "any" responses shown as 60% and 28% respectively. Williamson and his colleagues concluded from this study that:

1. continuing education and patient care research go together;
2. deficiencies in patient care usually involve multiple determinants, the more important of which must be identified if improvement is to be achieved;
3. measurement of what physicians actually do is more important than what they say they do;
4. in some circumstances, non verbal educational stimuli might be more effective than information and logic with behaviour; and

5. a continuing cyclic effort seems essential since educational efforts are short lived.

Consequently, Williamson has since tended to shift the emphasis towards continuing education courses which are based on problem solving (Williamson, Aronovitch, Simonson, Ramirez & Kelly 1975).

The effectiveness of continuing education in dentistry in improving the quality of care has also been questioned (Weinstein, Milgrom, Ratener, Read & Morrison 1977; Milgrom, Chapko, Milgrom & Weinstein 1985). Milgrom and his colleagues have identified the self-supporting nature of continuing dental education in most dental schools which depends on attracting audiences and discourages experimentation and innovation. These authors also criticise the lack of valid course evaluation, with most curricula being assessed in terms of participant satisfaction. Research carried out indicates that in rating effectiveness from most to least, dental practitioners, overall, list methods of continuing education in the following order: university courses, study clubs, talking shop, dental society courses, professional journals and books, trade journals and dental supply house representatives. Moreover it was found that the dentists who favoured the first three of these categories as most useful to them had a slight but significant edge over their colleagues in actual quality of care (Milgrom, Weinstein & Ratener 1980). They found also that the quantity of continuing education courses taken were unrelated to performance of the dentists. The results of this questionnaire on continuing dental education suggest that Washington

dentists preferred the more active forms of educational involvement. Though the blanket assumption that continuing education will lead to improvements in the quality of care was not supported in this study, there is some evidence to relate some types of continuing dental education courses with quality measures.

Kress (1979) reviewed trends in continuing education in the U.S.A. at the time and made the point that course topics seemed to be chosen to suit the interest of the profession rather than deficiencies in health care. There is an inherent danger that concentration of continuing education resources on those topics in demand by the practitioner might well lead away from the potential to provide courses in areas of need. The role of continuing education in quality assurance was investigated as part of the National Quality Assurance Program (American Fund for Dental Health 1983a). It was decided to involve volunteer practicing dentists in the planning process together with the dental faculty and the continuing education co-ordinator. Laminate veneering was chosen as the subject for this pilot course and it was conducted for 90 practitioners over three separate courses. The course consisted of lectures, laboratory work and clinical treatment, the latter being evaluated against explicit criteria. Results showed that the course did alter behaviour in that evaluation of clinical performance showed better results for the course participants than for a control group of practitioners who did not attend the course.

One of the most devastating denials of the effectiveness of customary evaluations of continuing education programmes took place with the

presentation of a paper at the 11th Annual Conference on Research in Medical Education in November 1972. It described a study in which the authors arranged for a professional actor to present both charismatically and unsubstantively a topic about which he knew absolutely nothing. He received coaching in his presentation which was given to three groups of professionals who might be seen to have had some interest or involvement in the general subject. The authors hypothesised that given a sufficiently impressive lecture paradigm, even experienced educators participating in a new learning experience can be fooled into believing that they have learnt something even when exposed to meaningless nonsense by the lecturer. The hypothesis was supported when a significantly favourable response was obtained in general from the various audience groups. The authors postulate that participant satisfaction with continuing education is an invalid measure, possibly only indicating an illusion of learning. The use of professional actors, trained to convey valid material, is also suggested as an innovative possibility in education (Naftalin, Ware & Donnelly, 1973).

3.12.2 Feedback

A study of radiographic practice in 72 randomly selected dental practices in the U.S.A. in 1972 was followed up by an educational programme in an effort to improve the quality of care by reducing unnecessary exposures and improving the quality of radiographs (Gibbs, Crabtree & Johnson 1977). Feedback reports were provided to participating dentists and were followed up by visits to each facility in an attempt to educate and motivate the dentist to effect

recommended changes. A subsequent survey of the same practices confirmed the effectiveness of this approach in achieving reductions in patient exposure to levels approaching the practice minimum for routine clinical use and, at the same time, maintaining or improving the diagnostic quality of the radiographs.

The value of feedback on performance was also shown in a study conducted in Washington State dental practices in 1976 and 1977 by the Department of Community Dentistry, University of Washington (Milgrom, Weinstein, Ratener & Morrison 1978b; Milgrom, Weinstein & Ratener 1980). It was found that quality assessment of 105 volunteer dentists followed by counselling by either letter or personal visit increased the quality of care provided when compared with control groups who received no feedback, both methods of feedback proving to be equally effective.

The effect of feedback on clinical performance was also shown in a project to improve physician performance in colorectal cancer screening which was evaluated as part of an ambulatory quality assurance programme. Having set standards of care, three types of intervention strategy were employed and evaluated as methods of altering behaviour and improving performance. Educational meetings and retrospective feedback of group compliance with care standards were found to be ineffective. However, monthly feedback of individual performance compared with that of peers was found to be effective in improving standards of performance (Winickoff, Coltin, Morgan, Buxbaum & Barnett 1984).

In the quality assurance programme carried out in two neighbourhood health centres in New York City, and developed at the Sunset Park Lutheran Medical Center, it was found that the audit process had a beneficial effect on quality of care (Demby & Rosenthal 1978). The programme, described in detail elsewhere in this treatise, was based on both record audit and the direct clinical examination of selected patients. In the initial audit the most common problems were: lack of logical treatment planning sequence, incomplete charting of caries, inadequate radiographs, lack of adequate diagnosis and treatment of orthodontic and periodontic conditions. However, follow-up audits showed improvements in the quality of care and although the same deficiencies were evident, the frequency of these problems had decreased.

Strauss, Lindahl and Barksdale in 1982 reported the results of a quality assurance study carried out in private practices in North Carolina. Although many dentists initially expressed some anxieties about participation in the exercise which involved both record audit and clinical assessment of patients, most dentists reported making improvements in their clinical performance as a result of feed-back provided to them and they were generally in favour of the project on its completion.

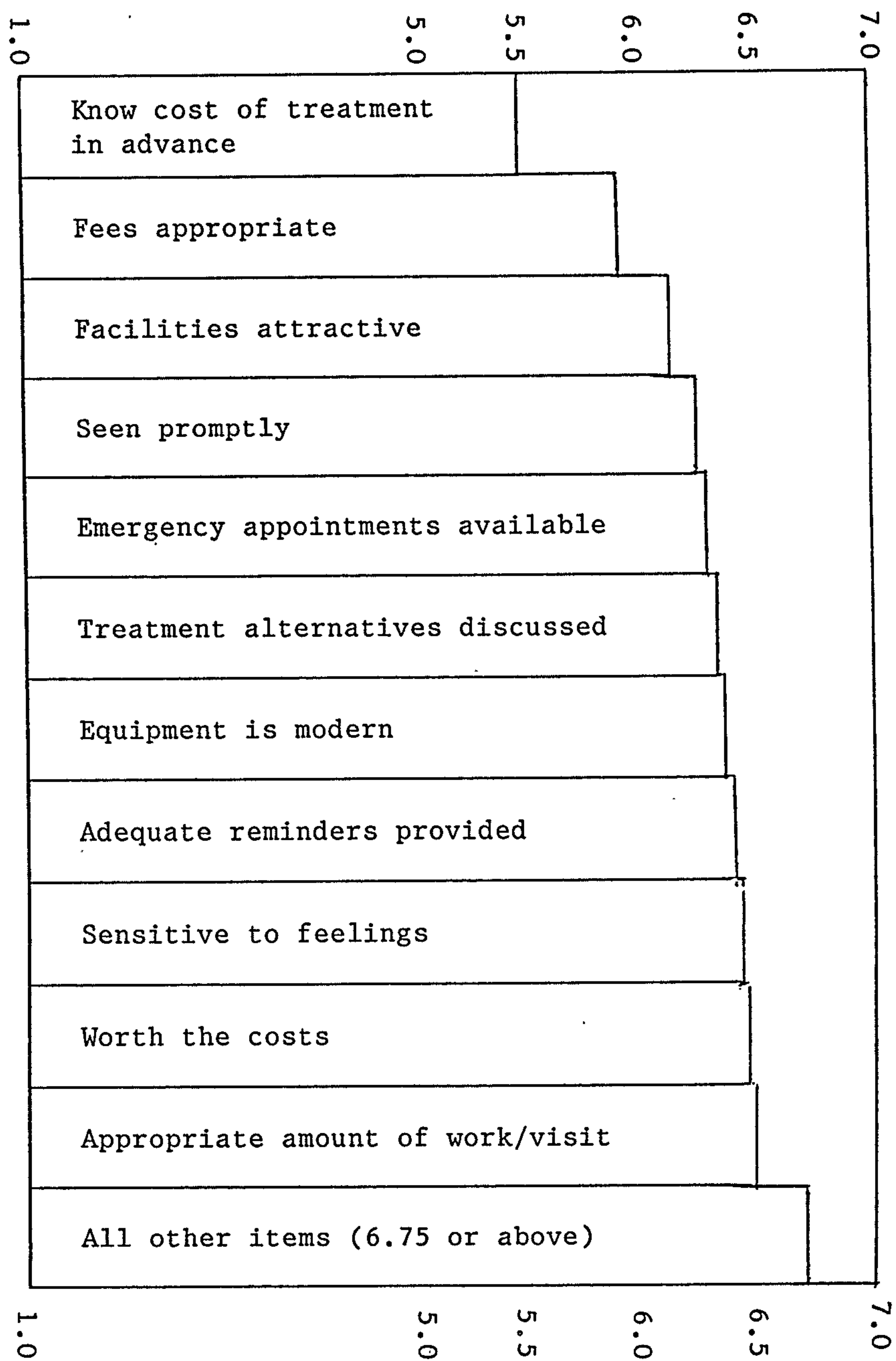
The most recently reported study which explored the effect of feedback of patient satisfaction to the dentist on the quality of care was conducted as one of the thirteen studies in the National Quality Assurance Program of the American Fund for Dental Health. The final report was completed in February 1984 and the study was

published by Kress and Silversin in 1985.

The project was conducted in two parts. Phase 1 concerned itself with obtaining information from patients as to their perceptions of their treatment and, in Phase 2, this feedback was provided to participating dentists and the effect of feedback on their behaviour and attitudes was measured. With the assistance and endorsement of the Massachusetts Dental Society, letters were sent to 1500 dental practices in the Boston area. 308 replied signifying their willingness to participate and, from this number, 100 were selected for the feedback experiment. 25 patients were chosen from each of another four practices for the first phase of this experiment. Patients participating were paid \$25US to attend a two to three hour interview at which their concerns and opinions were elicited using a structured nominal group process to identify those which were most important to them. These items then formed the basis for patient satisfaction surveys in the study. At the beginning of each quarter during a twelve month period, 100 patient satisfaction forms were supplied to each of the 100 participating practices. Patients completed forms outside the dental practice after they were distributed to the first 100 adult patients who presented in each practice during each quarter. It was found that patients generally had a very high level of satisfaction with their practitioner which is illustrated by the scores relevant to a 7 point scale in Figure 6. Twelve of the twenty-six items produced scored lower than 6.75, the item producing the most critical reaction being related to not knowing in advance the cost of treatment.

Figure 6 Patient satisfaction - Boston dental practices
- mean satisfaction scores

Source: Kress & Silversin (1985)



In the feedback phase, table 21 shows the number of dentists reporting changes based on feedback and table 22 summarises the number of changes in various categories reported by both control and experimental groups during the study.

Finally, in table 23, we see the impact of feedback intervention as viewed by the participating dentist.

The results of this study by Kress and Silversin show that although patients are not qualified to assess certain technical elements of the dentist's performance, they do present a range of significant views. Furthermore, based on the large number of dentists who indicated a willingness to participate in this study and their consequent attitudes to the feedback experiment, it seems likely that institution of a system of feedback of patient satisfaction to the clinician might well enhance the prospects of the dentist's participation in a quality assurance programme. As an additional attraction for the participant, it seems equally clear that the feedback experiment was a useful marketing exercise with some 24% of dentists reporting an increased number of patients as a result.

Table 21 Number of dentists reporting changes based on feedback.

Source: Kress & Silversin (1985)

No. of changes	Experimental			Control final
	Mid	Final*	Total	
1 or more	82%	65%	90%	100%
2 or more	67%	37%	76%	67%
3 or more	44%	27%	67%	40%
4 or more	34%	8%	49%	20%
5 or more	19%	0%	38%	13%

*These proportions are based on new changes made during second half of year.

Table 22 Changes reported by experimental and control dentists.

Source: Kress & Silversin (1985)

	No. reported		
	Experimental (N=79)	Prefeedback control (N=20)	Postfeedback control (N=15)
Changes in physical environment	139 (1.76)	22 (1.1)	7 (.47)
Communication/ sensitivity to human needs	77 (.97)	3 (.15)	11 (7.3)
Raise fees	19 (.24)	9 (.45)	1 (.07)
Tell fees in advance	54 (.68)	2 (.10)	4 (.27)
Improve promptness/ use patient reminders	31 (.39)	1 (.05)	3 (.20)
Staff education	21 (.26)	0 (0.0)	2 (.13)
Personal appearance of dentist	14 (.18)	0 (0.0)	1 (.07)
Other changes	84 (1.06)	26 (1.3)	7 (.47)
Total	439 (5.56)	63 (3.15)	36 (2.4)

Table 23 Benefits of patient feedback reported by
 experimental group dentists.

Source: Kress & Silversin (1985)

Improved patient satisfaction	52.0%
Improved staff satisfaction	57.3%
Improved personal satisfaction	74.7%
Increased no. of new patients	24.0%
Increased treatment plan acceptance	26.7%

3.12.3 The effect of quality of care reviews on performance

There would appear to be some evidence that the implementation of a quality assurance programme in itself tends to promote better care. The clinician appears to be motivated and stimulated by such programmes to improve clinical performance. Demby and Rosenthal (1978) have indeed reported such an effect resulting from the implementation of the Sunset Park Dental Quality Assurance Program in New York.

In 1973, in Canada, Devitt reported on the results of a peer review exercise on breast surgery. It was found that performance on three parameters that were studied was improved after the educational effort; but performance on only one of these parameters was shown to have a greater degree of improvement than that which was already occurring before the patient care audit. The results of the educational exercise were also confusing as two surgeons with large clinical outputs did not show any improvement at all. Because the efficacy of continuing medical education was not well demonstrated by this study, a further investigation was commenced using a study of cholecystectomy patients (Devitt & Ironside 1975). This study reaffirmed the evidence that performance improvement shown after patient care audit may, in fact, be only that which was already occurring independent of quality review activities and that no additional improvement has taken place after the educational exercise. It is important, then, that improvements in care brought about by the professions' inherent search for excellence through learning and experience is not incorrectly attributed to the audit

process. These two research projects are thus unsuccessful in demonstrating that patient care audit is effective in improving medical performances.

Baxter (1983) found that, as a result of peer appraisal of output performance in the Leicestershire Community Service, there was a distinct change in work output and treatment patterns. Routine restorations and extractions showed a downward trend while crown and bridgework, orthodontia, radiography, endodontia and the total number of visits per dentist increased.

Marcus, who has developed a methodology for practice audits and a computer-reporting system, believes that dentists have changed their behaviour in response to a quality assurance system. He found that they were paying greater attention to medical histories, making more explicit treatment plans and reviewing their approach to prescribing radiographs in response to recommendations made in quality assurance reviews as part of the Blue Cross of Southern California dental group practice programme (Coady, 1982).

4. ATTITUDES TO QUALITY ASSURANCE

4.1 ATTITUDES OF GOVERNMENTS

The attitudes taken by governments have played a dominant role in the establishment of quality of care programmes. Health professions have often either responded directly to government intervention or acted in anticipation of and in order to prevent same.

In the U.S.A., the first indication of the role of government in quality assurance came with the establishment of the Joint Commission on Accreditation of Hospitals in 1951 (Punch 1980). Later, the U.S. government used the Californian Medical Foundation's quality assurance scheme for its PSRO legislation brought forward in 1972 (Bailit 1980a). In 1965, Medicare legislation was enacted which encouraged the development of utilisation reviews. The further involvement of the U.S. government in dental quality assurance matters has been obviated by the high profile taken by the American Dental Association. The U.S. government has allowed this responsibility to be assumed by the professional associations which is seen by many professionals to be the better alternative (Morrissey 1977; Markus 1981). In 1986, the United States Congress introduced the Health Care Quality Improvement Act which included provisions for the encouragement of professional review activities and, furthermore, in the same year published the document "The Health Policy Agenda for the American People". In the latter, guidelines for ongoing programmes of quality assurance in health care are spelt out.

Governments are concerned generally more with aspects of cost-containment than acting as agencies for the monitoring of the actual quality of care (Dans, Weiner & Otter 1985). There is no doubt, however, that this interest extends into other aspects of the health programmes including the implementation of broader aspects of quality assurance. It has been noted previously that one of the prime stimuli for initiation of ordered review of health care quality in Australia came from a threat by the then Federal Minister for Health to the medical profession (Australia 1976). His exhortation for the profession to contain costs and institute systems of review in order to obviate direct government involvement was a hint which was very well heeded. More recently, the N.S.W. government has as a matter of policy required all hospitals and area health services to establish and maintain quality assurance programmes (New South Wales 1987).

4.2 ATTITUDES OF HEALTH FUNDING ORGANISATIONS

The influence of third party organisations which fund health care has been described earlier in this treatise as a major factor in the growth and development of quality assurance. Dental Service Corporations, non-profit dental insurance carriers organised in the 1950s by several state dental societies, introduced one of the first types of quality assurance programmes for dentistry (Bailit 1980a). In this system, about 20% of all claims are subjected to pre-treatment review and usually require information sufficient for determination of the disease or injury present, the nature and extent of treatment and services, and the cost of each service intended. Pre-treatment radiographs are often required and, occasionally, screening of patients is carried out by an examining dentist.

The attitudes of health insurance bodies to the broader aspects of dental care review were aptly illustrated by Hankin at the 24th Health Insurance Council National Dental Health Conference in March 1973 (American Dental Association 1973a). He complained that local peer review bodies restricted their deliberations to fee questions, ignoring utilisation and quality issues. Aetna Life and Casualty is reported (American Dental Association 1973b) as having a similar attitude, favoring the establishment by the dental profession of effective peer review mechanisms to consider matters relating to quality and appropriateness of treatment. Marcus (1985) has noted an increasing awareness of quality by the consumer and those who represent the consumer and forecasts that this will lead to

increasing demands from third party funding bodies for quality assurance programmes.

Not all third party organisations restrict their attention to the cost-containment elements of review activities. The Winston-Salem Dental Care Plan which covers employees of RJ Reynolds Industries in North Carolina has a comprehensive quality assurance program comprising record audits, laboratory quality control, patient satisfaction, provider credentialling, sterilization and environment, and continuing education (Snyder 1983).

Hooper (1985), in reviewing the expressed attitudes towards quality assurance of both third party funding organisations and the profession itself, notes that the former take a much broader view of the subject. They see quality of care as embracing patient satisfaction, cost-containment, appropriateness of services and technical quality whereas Hooper feels that much of the profession sees quality assessment merely as relating to the delivery of care of the highest clinical quality in its idealistic sense. He blames this narrow approach on the conditioning as an undergraduate with its focus on quality of technique.

4.3 ATTITUDES OF PROFESSIONAL ASSOCIATIONS

In tracing the history of quality assurance in an earlier section of this treatise it has been seen that promotion of medical assurance activities by professional bodies commenced really with the American College of Surgeons in 1916 and, much later, with encouragement of the American Public Health Association in 1944. The establishment of the Joint commission on Accreditation of Hospitals in 1957 transferred this responsibility for monitoring of quality of care from the professional bodies. The American Medical Association is very active in quality assurance matters and has issued recently, through its Council on Medical Service, a number of guidelines for review of care (American Medical Association 1986a) and its Board of Trustees has endorsed these guidelines (American Medical Association 1986b).

The American Hospital Association in 1983 also issued policies for quality assurance in health care institutions and published guidelines for management of the review process in hospitals (American Hospital Association 1986a,b & c).

In Australia, the involvement of the Australian Medical Association was in the vanguard of quality assurance activities with its involvement in the establishment of the Australian Council on Hospital Standards in 1973 and the formation of AMA/ACHS Peer Review Resource Centre several years later. In the U.K., the Royal College of General Practitioners and the Royal College of Physicians have been involved in reviews of care during the past 20 years (Maxwell,

1984).

The positive attitudes of the American Dental Association towards quality assurance were exemplified as early as 1946 when it began the accreditation of hospital dental programmes. In California in 1955, the California Dental Association became involved in the creation of a quality assurance system through the California Dental Service and, in 1967, the Council on Dental Care Programs of the American Dental Association urged State Associations to establish peer review committees (Anonymous 1974). In 1975, the American Dental Association resolved "that it is the prerogative and duty of the dental profession to conduct all necessary review of dental practice through organised dentistry's establish mechanism, including peer review" (American Dental Association 1983b). In 1977, the Association's Council on Hospital and Institutional Dental Services adopted standards which included a requirement for clinical review (American Dental Association 1977).

One strategy adopted to encourage interest in quality assurance within the profession was the establishment by the National Committee on Dental Quality Assurance of offering fellowship support for small postgraduate research projects in dental quality assurance. Additional funding for this initiative was provided by the W.K. Kellogg Foundation with fellowships being available from 1978 (O'Shea, Mercer & White 1984).

The establishment of its Office of Quality Assurance in 1982 served as a further sign that the American Dental Association was committed

to the development of quality assurance. In 1983, the American Dental Association Special Committee on the Future of Dentistry made a number of recommendations relating to quality assurance activities including:

1. development of incentives to encourage individual dentists and local dental societies to participate in quality assurance activities;
2. collection of data for various quality assurance activities to facilitate evaluation in terms of cost-benefit;
3. further exploration of the relationship between continuing education and quality assurance and investigation of the role of self-assessment;
4. development of quality assurance methodologies that reliably relate profile analysis to direct measures of care;
5. development of quality assurance activities to accurately assess the treatment-planning capabilities of practising dentists;
6. assessment of the role of quality as a marketing tool;
7. development of quality assurance methodologies that are effective in changing practitioner behaviour through feedback mechanisms;
8. the evolution of dental society peer review committees into true

quality assurance committees; and

9. encouragement of exploration of comprehensive quality assurance activities (other than those related to cost-containment) by third party insurers.

In contrast to the attitude of the American Dental Association to quality assurance, dental associations elsewhere have taken a much lower profile on the matter. The Federal Council of the Australian Dental Association adopted a Policy Statement on Peer Review in November 1978 but restricted its deliberations to the consideration of isolated instances of alleged deficient practice in accordance with its definition of peer review. This Policy Statement did not address the matter of quality assurance in its broad aspect and is not atypical of the approach taken outside the U.S.A.

4.4 ATTITUDES OF THE CARE PROVIDER

Many factors might affect the profession's support of a particular evaluation system. It has been suggested that the dental profession must have a significant role in development of the system, the method must be objective, the cost reasonable and the basic dentist-patient relationship kept intact (Bailit, Koslowsky, Grasso, Holman, Levine, Valluzzo & Atwood 1974).

It has been suggested that practitioner reluctance to participate in quality assurance activities may be merely a continuation of behaviour patterns exhibited as a dental undergraduate. Waldman and Schlissel (1977) refer to a project at the State University of New York which reinforced this hypothesis following a study which attempted to relate students' perceptions of classmate performance and faculty evaluations of student performance to the various criteria used in the admissions process. The level of co-operation of the student body in this study was very low indeed and considerable anxieties towards peer review were expressed. The authors suggest that it is possible that the combination of factors such as the type of person who is attracted to dental school, the educational environment and the protective, co-operative response to perceived threats may act as a barrier to the implementation of peer review systems either in the student or graduate context.

One of the earliest moves to integrate study of quality assurance into the dental undergraduate curriculum was undertaken at the School of Dentistry, Meharry Medical College, Tennessee, in 1974. The

programme was designed to enable senior dental students to better assess both their own work and that of their colleagues (Martin 1977). The programme has been successful. Other schools to introduce quality assurance programmes for undergraduates include Loma Linda and the University of Minnesota - the latter being undertaken as part of the National Quality Assurance Program. Furthermore, UCSF has in the last few years instituted a quality assurance programme based on record audits and utilisation reviews (University of California San Francisco 1986). At U.C.L.A., Schoen (1987) has described the introduction of a quality assurance module in the final year graduate curriculum. It consists of a review exercise carried out in volunteer private practices and the compilation of an assessment report. Regrettably, this element is not popularly received by the study body who consider it time-consuming and less relevant than other aspects of the curriculum.

Demby and Rosenthal (1978) have shown the reaction of dentists to quality assurance programs in a neighbourhood health centre. The audit consisted of both a record review and clinical assessments of a sample of patients. Almost universally, the dentists reacted favourably to the results irrespective of the outcomes, even though most had initially been unfavourable to the programme when the idea was first presented to them. Dentists who received unfavourable reports treated them as learning experiences and before a second audit, dentists showed very little resistance and were anxious to see whether their work had shown improvement.

An interesting analysis of the characteristics of dentists

volunteering to participate in a quality assurance research project was undertaken by a team from the University of Washington (Milgrom, Ratener, Weinstein, Read & Morrison 1978a). This study found that there were differences in personal characteristics and situational determinants (eg. subject interest, expectation of a favourable evaluation, sociability, achievement, motivation), between the volunteer group and practitioners at large.

In a survey of dentists in New York State in 1979, 93.5% of respondents were in favour of some form of peer review, with 45.5% in favour of restriction of reviews to matters of quality of care only. Dentists who work in partnerships or group practices were found to be more favourable to some form of peer review and younger dentists tended to produce more favourable responses (Orlansky & Pappas 1980).

In a quality assurance study conducted in North Carolina private practices, many dentists admitted some anxiety about participation in the project but they were generally reassured by the actual experience which involved both record and peer review. Most participants reported having made improvements in their practices, as a result of feedback following the review (Strauss, Lindahl & Barksdale 1982).

The question of whether quality assurance programmes should be mandatory or voluntary among dentists has been considered in the U.S.A. Expert opinions are divided on this issue and dentists are seen to be a little wary about government involvement in such issues (Coady 1982).

The attitude of the dental profession in Australia to quality assurance has not been explored, although, given the lack of development of such programmes outside the U.S.A., it would not be surprising to find that practitioners would see quality of care reviews as threatening. Relatively recently, it was reported that most Australian medical practitioners considered quality assurance to be time-consuming, unnecessary and unproductive (Brand 1981).

4.5 ATTITUDES OF THE QUALITY ASSURANCE REVIEWER

An offshoot of the benefits resulting from quality assurance exercises might well be the effect the programme has on the reviewers themselves. The improvement on provider performance resulting from the programme itself without any feedback or corrective action has been shown (Demby & Rosenthal 1978; Coady 1982; Baxter 1983) and was discussed in an earlier section. Additionally, it has been shown that dentists who have acted as assessors in quality assurance programmes have themselves reported benefits in terms of the contribution such exercises make to their own dental education in allowing them to observe at first hand the various techniques and approaches used by other practitioners (Harbo & Heaney 1985). It is important, however, that before attributing improvements in health care to the implementation of a quality assurance programme it is necessary to isolate those changes which would have occurred over this time anyway. In a study of changes in medical care in Northern California, conducted by Stanford University, Rubenstein (1973) has reported that many of the changes initially attributed to action under the programme were simply changes reflecting natural trends.

The attitudes generally of dentists conducting quality assurance reviews have been most positive, despite some early apprehension before participation. A number of studies have been published which illustrate such attitudes (Strauss, Lindahl & Barksdale 1982; Harbo & Heaney 1985; Morris, Bentley & Bomba 1985).

4.6 ATTITUDES OF PATIENTS

Patients obviously have a concern with the quality of care, and, with the growth of consumerism, are taking a much greater interest in the clinical performance of the health care provider. Emily Friedman, in an address given at a quality assurance conference in San Diego in February 1987, reported a recent survey where approximately half of the patients responding identified quality of care as the most important factor in their choice of medical practitioner. In a study focusing on patients' attitudes to their dentist, over 50% overall cited competence as the reason for their satisfaction, with more likelihood of this being listed as the main reason by patients in the higher socio-economic groups (Jenny, Frazier, Bagramian & Proshek 1973). Patients, generally, have a good opinion of the health care professional and in a survey in Melbourne, a high level of confidence was shown by patients in their dentist (Biro & Hewson, 1976).

One might well assume, then, that this abiding interest of patients in quality of care might be translated to support for quality assurance programmes. Harbo and Heaney (1985) found that patients were supportive of their dentists' participation in such activities. On the other hand, Coady (1982) has reported that patients are wary of government involvement in such programmes other than restriction to funding and support.

Some have stated that adoption of a peer review mechanism will have advantages other than improvement in the quality of care. In particular, it has been postulated that such reviews will improve the

image of the dentist and the profession as a whole (Barish & Collins 1974).

Demby (1985) reports that in the U.S.A. where advertising is permitted, eight out of nine practices indicate that their internal advertising contains some reference to the quality of care provided. The goal in internal marketing is to achieve satisfaction among patients in order to retain them within the practice and stimulate referrals. Demby even suggests that one particular marketing strategy might be the development of a quality assurance methodology which ranks the provider in accordance with his or her clinical competence.

In a study conducted in dental practices in North Carolina it was reported that 97.5% of patients interviewed thought that the quality of dental care should be evaluated, although 31.9% felt that evaluation of their dental record by other than their own dentist would constitute an invasion of privacy. 85.7% responded favourably to coming for an evaluation appointment and 50.3% were even willing to pay an increase in fees for the exercise (Strauss, Claris, Lindahl & Parker 1980).

In further reports (Strauss, Lindahl & Barksdale 1983; American Fund for Dental Health 1983a) concerning patients' attitudes to participation in a quality assurance programme in North Carolina private practices, the researchers found that patients were generally pleased with the quality of dental care they were receiving. With respect to their attitudes to quality assurance, it was reported

that:

1. 76% of respondents to a questionnaire believed that the quality of dentists' care should be checked by others;
2. 45% believed that this checking would either definitely or probably improve their own dentist's quality of work and 75% believed that it would definitely or probably improve the quality of American dentistry;.
3. 44% believed their dental records to be private and that they should not be reviewed by government or insurance agencies;
4. only 18.5% were unfavourable to returning for clinical examinations as part of a quality of care review;
5. only 39.5% were definitely not in favour of returning for this clinical examination even if it would entail some increase in fees;
6. factors seen as most important by patients in estimating quality of care were lack of pain, technical quality of work and the respect expressed by the dentist for the patient; and
7. patients who participated in the survey were much more favourable towards quality assurance activities than non-participants.

When advised of instances of unsatisfactory treatment detected during

the assessment exercise, patients generally responded positively - attributing clinical deficiencies to "human error". Only 0.5% of patients interviewed before examination felt negative enough to consider going to another dentist to have unsatisfactory work corrected. Thus quality assurance tends to reassure patients and increase patient confidence.

Tolpin (1985) has classified the attitudes of the consumers of dental health care into two categories - the first, comprising those members of the population who are currently in receipt of dental care and the second, those who are outside the dental health care system. The first group is satisfied overall with the care they are receiving and tend to hold their dentist and the profession in general in high esteem. This group is interested in quality of care but recognises their limitations in judging it without professional assistance. Nevertheless, they continue to seek more involvement in decision making and choices available to them. Dentists, in general, have responded well to the demands of this group. The second group of consumers is in more of an adversary relationship to the profession, mistrusts it and seeks to utilise non-professional providers of dental care.

Jago (1974) predicted the probability of growing involvement of the general population in quality assurance activities and analysed the possibilities for consumer influence on the quality of care. He concluded that the consumer might influence the quality of care but not determine it. In this day and age there is increasing pressure for consumer representation on committees of review and one must

recognise that, although excepted by the strict definition of peer review, the profession will have to face up to this situation eventually and some peer review committees in the U.S.A. have such representation already. Friedman (1981) takes a rather simplistic and cynical attitude to this "problem" and states that it is good public relations to have such representation and little disadvantage since the person's presence will have little bearing on the outcome of any review due to their lack of expertise in the practice of dentistry.

4.7 THE DENTIST-PATIENT RELATIONSHIP AND THE REVIEW OF QUALITY OF CARE

The dentist-patient relationship seems to enjoy a unique reverence pertaining to its integrity and is usually regarded as sacrosanct. Not all writers share this view, however.

Schoen (1985) has given as one reason for lack of involvement of third party bodies in direct criticism of quality what he terms to be "the result of a steady stream of propaganda upholding the sanctity and infallibility of the dentist-patient relationship".

Donabedian (1968) considers that the quality of the provider-patient relationship is an important factor in achieving optimum utilisation of health care and Kerr (1985) suggests that the dentist-patient relationship has a direct effect on the quality of care and discusses the various ways in which this relationship can influence this quality.

One important element in the dentist-patient relationship is the regard each party has for the other and the different ways in which each views dental health. The differences in perceptions of dental health care between the providing dentists and groups of patients known to need dental treatment were established in a survey conducted in a large U.S. midwestern city (Frazier, Jenny, Bagramian, Robinson & Proshek 1977). Provider-dentists were found to have the attitude that low socio-economic consumers did not value dental services when compared with other types of consumer goods and services, and that

they do not believe that dental care is important. This was not, in fact, the perception of low income mothers in the same city and they stated that they considered dental care important. There were general disincongruities between the expectations of and orientations towards the provision of dental care between provider and consumer groups. It is suggested by these authors that the psychological barrier to a patient of receiving care in an inhospitable setting is a barrier to them gaining treatment.

The apparent discrepancy in perceptions and expectations between patients and dentists is often the cause of breakdown in communication between them and loss of confidence of the patient in their dentist leading to frustration, resentment and unfortunately, sometimes, litigation. Differences in dentist and patient expectations regarding the success of full dentures is a common problem. Chamberlain, Razzoog and Robinson (1984) compared the perceptions of patient and prosthodontist regarding existing full dentures and sought to develop a mechanism to enhance dialogue between clinician and patient prior to commencement of treatment. Criteria for reflecting the quality of complete dentures, developed by the University of Michigan School of Dentistry, were used as a basis for prosthodontist evaluation and patient perceptions were obtained using criteria relating to commonly occurring complaints. The following results were obtained from this study.

1. There was nearly 100% agreement for aesthetics criteria of tooth shade, lip support and amount of teeth displayed.

2. While only 2% of patients were satisfied with the general appearance of the denture when the prosthodontist was not, 14% of patients expressed dissatisfaction with the general appearance of their dentures when the prosthodontist considered the total aesthetic result to be acceptable.
3. With regard to comfort, over 90% agreement was demonstrated between the patient and the dentist for outline form of the lower denture and nearly 100% agreement for the upper denture.
4. Although almost 60% of the patients agreed with the prosthodontist regarding vertical dimension (comfort), 32% of the patients were satisfied with the interocclusal distance when the prosthodontist regarded it as overclosed and 4% of patients were satisfied with their dentures when the clinician considered there to be inadequate interocclusal distance.
5. Almost 80% of the time, the patient and prosthodontist disagreed about the adequacy of denture retention, although 80% agreement was obtained concerning denture stability. Approximately 66% of the disagreement occurred when the patient evaluated the dentures as non-retentive when the clinician did not.
6. The greatest disagreement concerned the function of the dentures.
7. Although nearly half the patients agreed with the prosthodontist that occlusion was inadequate, 44% were satisfied with occlusion which the prosthodontist considered deficient. Furthermore, 6% of

the patients were dissatisfied with the occlusion when the prosthodontists found it acceptable.

In another study conducted in Washington State, 97 general dental practitioners and 1,287 patients were surveyed in order to explore the relationship between patient perceptions of dental care, their oral health status, dentist perceptions of their patients and the quality of care (Weinstein, Milgrom, Ratener & Morrison 1979; Weinstein, Milgrom, Ratener, Read & Morrison 1978). The following results were obtained.

1. Patient dental values were related to oral health status.
2. Dentist perceptions indicated that about 20% of patients were perceived as presenting non-clinical problems of some sort.
3. Patient and dentist perceptions were statistically associated. On the other hand, dentists showed a limited ability to be aware of the dental values of their many patients.
4. Patient perceptions were related to the overall quality of restorative care.

In all, this study found that patient dental values are related to both oral health and the quality of restorative care. As both patient and dentist perceptions were found to be remarkably similar, it is hypothesised that some transfer of these attitudes and values may have been communicated directly and indirectly to the dentist.

5 COSTS

5.1 THE COST EFFECTIVENESS OF QUALITY ASSURANCE PROGRAMMES

It is generally assumed that the implementation of quality assurance systems will lead to increased quality of care, and it is further assumed that this will lead in turn to better dental health. Whether these assumptions are justified or not, it must be noted that improving quality is only one approach to improving oral health. The critical problem is really to decide whether the increase in oral health standards which can be obtained as a result of a quality assurance programme is more cost-effective than alternative methods of improving oral health eg. fluoridation or dental health education programmes.

Some believe that quality assurance programmes have the potential to reduce costs of delivery of dental care by leading to changes in methods of delivery of treatment and improved utilisation of dental manpower (Barish & Collins 1974). Yet others have noted that a genuinely effective quality assurance system must add to the overall costs of care (Hine & Bishop 1979).

Bailit (1980b) has expressed similar concerns about the costs of quality assurance. He says that there is often some confusion between cost-containment and quality assurance in the belief that increased quality will lower costs, when, in fact, this may not be so. Savings from reductions in over-treatment are limited and there may be examples of under-treatment detected in such reviews. He believes

that better quality dental care is probably going to cost more.

In making recommendations for a quality assurance programme, Di Angelis (1984) concedes that it is likely that such a programme will be expensive. He believes that the balance of evidence tends to suggest that quality assurance will increase the cost of care. Yet, Zambito (1980) refers to two studies which indicate that implementation of quality assurance and cost control are not mutually exclusive.

In a paper presented at the Symposium on Quality Assurance and Cost Containment of Oral Health at Ann Arbor, Michigan, on October 18, 1985, Donabedian outlined the interplay between costs and quality of care. He pointed out that society dictates the level of care expected as a minimum and is, per se, agreeable to its cost providing it is appropriate to that particular level of oral health.

Norden (1986) has reported that the implementation of quality assurance programmes can add to hospital costs by virtue of the additional data collection involved. He says also that while endeavouring to improve the quality of care it is quite likely that costs will increase due to the employment of more or better qualified staff and the purchase of more or better quality equipment. On the other hand, he concedes that modifications to existing treatment modalities as a result of clinical review might serve to reduce unnecessary services and thus cut costs.

A study investigated the technical quality of restorations in a

population of employees at the University of Connecticut Health Centre (Grasso, Nalbandian, Sanford & Bailit 1979). The thesis put forward as a result of this study was that some deficiencies in the process of care showing a low rate of incidence are the result of the normal conditions of practice and should not be a cause of concern. The point is made that attempts to improve such deficiencies by imposition of quality review systems would lead to increased costs, depletion of finite health care resources and thus a lowering of the health of the particular population. These researchers conclude that quality review is best employed in monitoring the services of the small percentage of dentists whose care is "very inadequate".

5.2 THE USE OF COMPUTERS

Previous discussion in this treatise has shown how the utilisation of clerical personnel in the audit process and the elimination of unnecessary time involving professional staff can help in keeping audit costs down. The age of computerisation has allowed us to save additional recurrent costs in quality assurance. A lot, of course, will depend on the review methods used. Miller and Berry (1980) discuss the use of computers in studying the quality of care and list some of the situations when computers may or may not be suitable. In general, they consider that a computer is helpful when a large amount of data must be handled, when complicated computational analysis is needed, or when many simple but repetitive computations must be performed. When one or more of these requirements is not met they assert it is usually better to carry out the exercise manually.

An excellent example of the utilisation of computers in clinical review was reported by Mather (1982). To minimise clerical work for medical officers at the Royal Childrens Hospital, Melbourne, involved in clinical review, an organised computerised stored data handling system was developed in 1979. Modification was carried out to the first page of the patients' record include a review which could be ticked. Members of surgical staff were encouraged to indicate for review those cases where diagnosis or treatment which contributed to substandard care, thus enabling selection of cases for review meetings.

As previously described, one way of reducing costs in quality

assurance is to focus review on those instances which are detected by some form of screening process. Computers are particularly suitable in managing the large volumes of data collected from claims against health funds and analysis of utilisation rates or service patterns may lead to refinement of the review process. The Medical Management Analysis System described by Craddick in 1979 is an excellent example of this approach and was detailed in chapter 3 of this treatise along with the work of Bailit and Clive in utilising computers in a study conducted as part of the National Quality Assurance Program of the American Fund for Dental Health. The adaptation of PACE to dentistry, undertaken by Cohen in the same national programme is yet another example where computer analysis of treatment patterns can provide screening of large amounts of data to enable more productive and cost-effective reviews of the quality of care.

5.3 THE EFFECT OF FUNDING SYSTEMS ON QUALITY OF CARE

5.3.1 Hospital funding

The quality of care in hospitals related to the methods of funding has been the subject of debate for a long time. Grimaldi and Micheletti (1984) trace the developments in methods by which hospitals have been financed under the Medicare programme following U.S. Social Security Act Amendments in 1983. Under the old law, the Medicare programme provided funding on the basis of reasonable costs for inpatient services, thus giving hospitals the opportunity if they so desired to augment admissions, extend lengths of stay and use any number of ancillary services. Under later amendments, hospitals are funded a fixed, pre-established amount according to the patient's assignment to a diagnosis-related group (DRG). The concept of diagnosis-related groups was first used by researchers at Yale University in the early 1970s. This method encourages hospitals to shorten stays and avoid unnecessary ancillary services but does not remove the incentive to increase admissions. Quality assurance activities in hospitals must then assume an increased importance as it is conceivable that reduced lengths of stay with curtailment of ancillary services might affect quality of care.

The lack of clinical similarity between patients is a major criticism of the classification system using diagnosis-related groups. In one study, the researchers identified severity of illness as one of the variables which can disturb the homogeneity of the groups within this classification and, furthermore, contended that the use of a severity

of illness classification might allow for modification of the DRG system to result in more medically meaningful groupings (Kreitzer, Loebner & Roveti 1984). As a result of criticism of the DRG classification for such issues as lack of clinical input, absence of homogeneity in categories, and lack of consideration of disease severity, the Yale researchers developed a set of 467 DRG's based on anatomical sites and not solely disease process (Serluco & Johnson 1983).

In 1979 and 1980, a technique for defining case mix groupings, known as "generic algorithms" was developed to quantify patient care (Bertram, Schumacher, Horn, Clopton, Lord & Chan 1982). Generic algorithms were developed to approximate the impact that a patient's procedures and secondary diagnoses could have on the costs of his or her hospitalisation. For example, if two patients both had a principal diagnosis of liver cirrhosis, what cost differences could be expected if one had a secondary diagnosis of upper respiratory infection and another had congestive cardiac failure? These are two types of generic algorithms, one which classifies patients in accordance with their diagnosis and the other which classifies them according to surgical procedures performed. The former take into account severity of illness and chronicity of disease while the latter are based on the concept of invasiveness of the surgical procedures. This refinement to the simple DRG approach has advantages in distinguishing patient groups and forming a basis for evaluation of care.

The Australian hospital system is presently undergoing pressures for

the introduction of DRGs as a funding basis, and with such change must come careful monitoring of its effect on quality of care.

5.3.2 Cost-sharing

Access to care is an element which must be considered in any assessment of quality. Indeed, as detailed in an earlier section, Maxwell (1984) includes this aspect in his outline of the dimensions of quality of care.

Studies of a random sample of families from six different areas of the U.S.A. assigned to one of five dental insurance plans in the period 1964-1982 showed clear effects of cost-sharing on the outcome dimension of quality (Bailit, Brook, Kamberg, Goldberg, Spolsky, Camp, Cantrell, Hanley, Black & Newhouse 1984). For both caries and periodontal disease, subjects not contributing to cost had less disease at the end of the study with those contributing most to the costs having the poorest oral health. Nevertheless, even with free care, there was still substantial untreated disease. On the other hand, cost-sharing had no apparent influence on participants' perception of pain or worry related to teeth or gums. For the process dimension of quality, cost-sharing had a significant effect on the timeliness of seeking treatment with those enrolled in the free plans having almost three times the percentage of teeth restored within twelve months of enrolment when compared with those in the highest contributing plans.

Evidence from this study indicated substantial undertreatment. Even

in the free plan, only 30% of decayed teeth were restored within twelve months of enrolment and only 10% of patients with P.I. scores greater than 1.2 received prophylaxes and scalings. Thus, there are other factors involved than purely cost. On the other hand, the impact of cost-sharing on over-treatment was minimal. Neither did cost-sharing influence the percentage of enrollees receiving dentures, having more anterior teeth replaced, or having missing mandibular teeth replaced when five or more were missing. In the case of missing maxillary teeth, significant free versus pay plan differences only existed when five or more teeth were missing. The method of tooth replacement ie. fixed or removable prostheses was also found not to be influenced by cost-sharing. Indeed, relatively few subjects receiving free care opted for fixed replacements. The data on the appropriate use of full mouth and bitewing radiographs parallel those seen for other services and reduced cost-sharing did not increase unnecessary care. For both dentate and edentulous subjects, cost sharing had a significant impact on the continuity of care. But again, even with free care, only half of the sample visited the dentist each year of the study.

In another study (Brook, Ware, Rogers, Keller, Davies, Donald, Goldberg, Lohr, Masthay & Newhouse 1983) free care had no effect on the major health habits that were associated with cardiovascular disease and some types of cancer but people with specific conditions that physicians are able to diagnose and treat did benefit from free care. However, reductions in mortality, in and of themselves, were not considered enough to justify free care to all adults. Rather it was suggested that it might be better to direct efforts towards

screening programmes for such diseases as hypertension.

Three hundred and forty-six dentists, randomly selected from the membership of the Washington State Dental Association, volunteered to participate in a controlled experiment in treatment planning for elderly patients (Conrad, Milgrom & Kiyak 1984). Each volunteer dentist formulated two treatment plans - one being idealistic for optimum dental health ignoring the financial status of the hypothetical patient and the other taking into account the benefits of the particular dental insurance plan and the economic status of the patients. Results suggest that increasingly comprehensive insurance coverage does not lead necessarily to uniform increases in dental expenditure for all types of service. Rather, change in the mix of services with substitution of one type of service for another appears to be the dominant effect, with the singular exception of increases in fixed prosthodontics. It is deduced from this study that careful design of improved dental insurance plans for the elderly could widen the range of dental services provided without necessarily increasing total treatment cost.

In dentistry, one must also examine the effect of funding mechanisms on the quality of care. A controlled trial of alternative health insurance policies including a comprehensive dental quality of care assessment was conducted commencing in late 1973. Although final results are not yet published, data will be available to illustrate the effect on dental health outcomes of various financing arrangements and it will have significant implications for dentistry in the U.S.A. (Newhouse, Spolsky, Feldman, Messing, Black, Goldberg,

Brook & Bailit 1983; Newhouse, Manning, Morris, Orr, Duan,
Keeler, Leibowitz, Marquis, Marquis, Phelps & Brook 1981).

6 LEGAL CONSIDERATIONS

Investigation of the quality of care might arise from a patient complaint, a funding authority or a Government or professional body concerned with the professional performance of the provider of health care. In 1970, Bellin and Kavalier estimated that the incidence of poor quality dental care plus alleged fraud would be in the order of five to ten per cent of patients treated under U.S. Medicaid arrangements.

Gilbert (1984) pointed out that courts in the U.S.A. are increasingly requiring hospitals to monitor, at least retrospectively, the competence of their medical staff and the quality of care delivered by them. He notes the legal responsibility of the hospital with respect to assuming this competence. Gilbert noted that the delegation of this responsibility to quality of care committees brings with it the possibility that performance information gathered by these bodies is neither co-ordinated nor shared so as to enable the hospital to assess staff competence conscientiously. He reviewed a number of recent court decisions which identify the legal responsibilities of the employing hospital.

Organised quality assurance activities bring with them two very real legal problems:

1. the status of the reviewer in terms of protection from legal liability; and

2. the confidentiality and access to information collected during the assessment of care.

Firstly, let us consider the position of the reviewer. Included in an analysis of problems experienced by the Ohio Dental Association's Council on Dental Care Program in conducting peer review, Lauer (1973) lists the need for protection of reviewers against legal liability. As a result of this concern, Ohio legislation was amended to absolve members of peer review committees acting without malice in the course of their duties from the possibility of legal action. The matter of protection for dentist members of peer review committees against litigation was also raised as a matter of concern by Di Angelis and Spiedel (1985). The United States government responded to these legal issues when the Congress brought down the "Health Care Quality Improvement Act of 1986". This legislation gave specific protection to professional review bodies and their participants against litigation arising from their legitimate review activities. This matter was addressed in a submission by the Australian Medical Association to the Law Reform Commission of Australia in 1983 (Anonymous 1984b). It points out that participants in peer review committees may be protected against action based on defamation by resort to the defences of truth, fair report, triviality or qualified privilege. Various cases in U.S. law are quoted where the latter defence has been granted. It is further suggested in this submission that, although untested in court to date, the defamation laws concerning qualified privilege in Australia would seem to grant adequate protection.

The second aspect of concern referred to is the matter of access to records of clinical review or, indeed, whether the patient's treatment record is confidential and not accessible to other than the provider of care. Colin Thomson, Senior Lecturer, Faculty of Law, Australian National University, has described some of the legal issues relating to review of quality of care. In particular, he explores the legal standing and obligation of hospitals instituting programmes of clinical review, the need to pursue privacy of patient records and the limits regarding use of information obtained. Concerns about possible litigation resulting from access to written records of clinical review meetings are becoming evident and in 1986, this resulted in a decision by medical staff at Westmead Hospital to abandon the practice of keeping detailed minutes of such meetings. These minutes are now restricted to an outline only of the subject matter and are deliberately designed to prevent such material being used as evidence in litigation.

The Australian Medical Association has mounted a case for protection of the confidentiality of the proceedings of reviews of the quality of care (Anonymous 1984b). To support its arguments it refers to U.S. laws of immunity relating to quality reviews which generally provide a considerable amount of protection particularly with regard to the confidentiality of minutes and committee reports.

The AMA submission also addresses the concerns of the medical profession that the growth of quality assurance activities might increase the incidence of litigation. It points out that open discussion can only take place if the participants and their

deliberations are protected. It is acknowledged, however, that some take a differing view. Brian Bromberger, Senior Lecturer in Law, University of N.S.W., quoted in the same report, for instance, believes that active and public peer review will in fact reduce the likelihood of litigation.

In August 1987, the N.S.W. Department of Health issued a discussion paper on the subject of privilege and quality assurance which, while noting the concerns of a number of institutions and professional associations, concluded that the N.S.W. defamation laws concerning qualified privilege might give adequate protection to participants in quality assurance activities.

7 IMPLEMENTATION

Scarf, Weaver, Duckett and Schmied (1979) have espoused a number of basic principles for a quality assurance programme, derived from a review of the U.S. literature and the Australian experience. They have made the following recommendations.

1. Programmes of quality assurance should be formally required by the hospital board and the appropriate statutory authority.
2. Evaluation of the medical aspects of care should be carried out on a routine rather than an ad hoc basis.
3. A quality assurance programme should evaluate both clinical and administrative practices.
4. Quality assurance programmes should be based on pre-determined standards.
5. The subject for a quality assurance programme should relate to the process, structure or outcome of medical care or some combination of these.
6. A quality assurance programme must lead to appropriate action being instituted.

It may well be that existing health programmes already contain the required elements for monitoring the standard of care and instituting

corrective action. Soricelli (1968) elaborates a number of principles of administrative control which would promote quality in existing programmes and which might then provide a basis for evaluation and re-direction of ongoing programmes. He discusses such items as continuing education, record form design and statistics collection as applied in the Department of Health, Philadelphia, to illustrate these points.

As part of the National Quality Assurance Project established by the American Dental Association, a model for quality assurance programmes was developed, identifying 12 major elements (Stern, Morrissey & Mauldin 1979b).

1. Planning
2. Administration
3. Topic and provider selection
4. Case selection
5. Criteria and standards
6. Data sources
7. Data collection
8. Analysis and peer review
9. Feedback, action and appeals
10. Follow-up
11. Evaluation of the review system
12. Impact of review.

A concerns-based approach to the implementation of quality assurance systems has been described (Anderson & Forquer 1982; Forquer & Anderson 1982). Briefly, the approach is based on the premise that, when faced with innovations or new situations, eg. the implementation

of a quality assurance system, individuals exhibit a predictable sequence of concerns. These concerns progress from a self-focus to a task focus to an impact focus (Table 24). A second dimension of the concerns-based theory involves tracking an innovations level of use through a successive series of stages. In this theory, when the level of use precedes the providers' stages of concern, successful implementation of an innovation may not occur.

Di Angelis (1984) makes a number of recommendations for the approaches to be taken in quality assurance.

1. Incorporation of teaching of quality assurance concepts and techniques in dental schools.
2. Increasing research into the process and outcome of care as a function of faculty involvement in clinical programmes.
3. Use of record audits.
4. Application of oral health indices.
5. Establishment of quality assurance committees.
6. Use of patient satisfaction data.
7. Training in self-assessment.
8. Encouragement of continuing care or patient recall.

Table 24 Stages of provider concerns

Source: Forquer & Anderson (1982) p15

Self Concerns

QA requires too much time and too much paperwork.

Clinician time is taken up by clerical functions.

System encourages staff to play paper games to keep records in order.

Time limits for treatment imply that you didn't do your job well.

Little time for clinical supervision because you can't emphasise paperwork and clinical skills at the same time.

People who do good paperwork get rewarded, even though they may be poor clinicians.

QA is another system of paperwork designed by someone to justify an otherwise unneeded position.

Task Concerns

The forms already in use might be reviewed to determine whether revisions were necessary, to eliminate any duplication, or to reduce the number of forms already in use.

The role functioning scale has been difficult to use with children and adolescents.

Don't understand QA appeal procedure.

Consider extending assessment period beyond 30 days.

Role performance scales not adequate for alcohol/drug clients.

Drug profile should be used selectively and not as frequently as every six months.

Impact Concerns

I feel QA has added the accountability that we have needed for a long time. I would like to see a closer link between hospitals and centers in the actual use of QA.

Training should be uniform, consistent, and frequent, and should be set up by state-level QA officials.

There should be some energy channeled into clinical research ... concerning the effectiveness of treatment ...

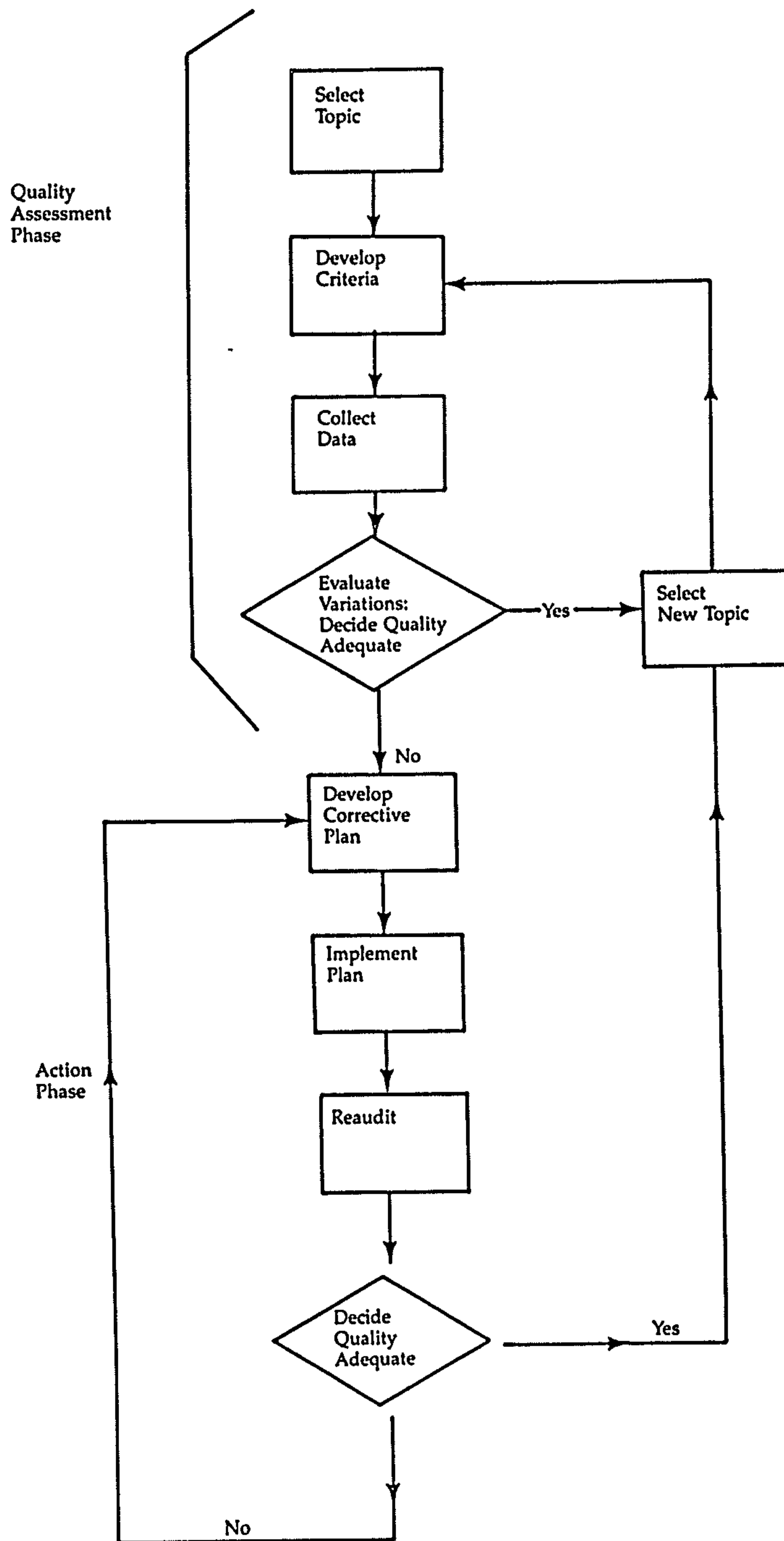
Need to reestablish our goals. The product is not getting the results envisioned.

Provide training for clinical care and provide research time.

Having considered the principles involved in the implementation of a quality assurance system, it is necessary to formulate a plan of action which will not only assess the quality of care but provide for appropriate measures to be taken to achieve required improvement. The American Dental Association, Office of Quality Assurance (1983) in its publication, "Guidelines for the development of a quality assurance audit system for hospital dental programs", has laid down the basic elements of an audit system (Figure 7). The essential feature of this system is the need not only to assess the quality of care but to initiate corrective action and then to re-audit to check progress.

Figure 7 Basic elements of an audit system

Source: American Dental Association (1983) p7



8 DENTAL QUALITY ASSURANCE PROGRAMMES

In order to provide an overview of the current state of progress in dental quality assurance, it is intended in this section to review five significant evaluation projects which have had and are considered most likely to have in the future a positive influence on the development of ongoing review of dental care. The first of these has stood the test of time over a decade and continues to form the basis of dental care audits. The other four are of recent origin, one of which is not yet publicly released in its entirety.

The excellent approach taken by the American Dental Association, Office of Quality Assurance (1983d) in its publication, "Guidelines for the development of a quality assurance audit system for hospital dental programs" is also worthy of special note as an example of a quality assurance system. In section 3.8 of this treatise, its use of criteria lists and criteria maps have been described, and it certainly provides a useful basis for the implementation of dental quality of care audits.

8.1 CALIFORNIA DENTAL ASSOCIATION

In any analysis of the development of dental quality assurance in the United States of America, the influence of the California Dental Association plays a prominent part. It signified its readiness to accept this responsibility when its House of Delegates approved a resolution in 1973 ".... to establish a task force to define the standards of quality of dental care and the necessary measures or procedures which shall be utilized by any agencies who participate in a dental quality-control program....." Subsequently this task force developed quality assessment guidelines which were published in 1977 (California Dental Association 1977).

The publication of these guidelines, titled "Quality Evaluation for Dental Care" and subtitled "Guidelines for the Assessment of Clinical Quality and Professional Performance" became the backbone for evaluation of dental care in California. The rating system, based on that originally introduced by Ryge and Snyder (1973) for restorations but adapted for other services has been utilised in a number of subsequent studies and consists for each dental service category or care component of two main categories - "Satisfactory" or "Not Acceptable". Two subratings are used within each of these two main categories, as shown in Table 25.

Table 25 Rating system - Guidelines for the Assessment of
 clinical quality and professional performance
 - California Dental Association

Source: California Dental Association (1977) p3

S
A
T
I
S
F
A
C
T
O
R
Y

(R) ROMEO - indicates clinical quality and/or
 professional performance rated in
 range of excellence.

(S) SIERRA - indicates clinical quality and/or
 professional performance rated in
 range of acceptability.

N
O
T

A
C
C
E
P
T
A
B
L
E

(T) TANGO - indicates clinical quality and/or
 professional performance which SHOULD
 be repeated, replaced, repaired or
 corrected for preventive reasons and
 is likely to cause future damage to
 the patient's general or dental health,
 or to individual components of the
 patient's masticatory system.

(V) VICTOR - indicates clinical quality and/or
 professional performance that MUST be
 repeated, replaced and/or immediately
 treated because damage is now occurring
 or because serious inadequacies exist.

The California Dental Association Guidelines also set out rules for examination and rating (by two dentists) and instructions for recorders. The Quality Evaluation recording form specified is shown in Table 26. The publication contains general guidelines, details of the rating system and provides evaluation criteria for the following aspects of dental care.

1. History and clinical examination.
2. Radiographs.
3. Diagnosis.
4. Treatment plan.
5. Management of pain, anxiety and emergencies.
6. Preventive dentistry.
7. Endodontics.
8. Periodontics.
9. Oral and maxillofacial surgery.
10. Operative dentistry.
11. Crowns and fixed partial prosthodontics.
12. Removable partial prosthodontics.
13. Complete denture prosthodontics.
14. Pedodontics.
15. Orthodontics.

As an example, the rating system and evaluation criteria for "History and Clinical Examination" are reproduced in Table 27. A similar approach is taken for the other 14 elements reviewed.

Table 26 Quality evaluation recording form

- Guidelines for the assessment of clinical quality and professional performance
- California Dental Association

Source: California Dental Association (1977) p7

QUALITY EVALUATION RECORDING FORM

NAME		PATIENT #			DATE		
		SEX	M	F	AGE	RECORDER #	
Treatment Aspect	Removable Partial or Complete Prosthodontics	Crown and Bridge	Operative	Exam- iner #	Satisfactory/Not Acceptable	Abbreviations for S,T,V, calgs.	Placement Code
History and Clinical Examination	Max Mand	Single Crown Bridge Tooth (Teeth) #	Tooth # Surface Material	R	S	T	V
				R	S	T	V
				Final	R	S	T
Radiographs	Max Mand	Single Crown Bridge Tooth (Teeth) #	Tooth # Surface Material	R	S	T	V
				R	S	T	V
				Final	R	S	T
Diagnosis	Max Mand	Single Crown Bridge Tooth (Teeth) #	Tooth # Surface Material	R	S	T	V
				R	S	T	V
				Final	R	S	T
Treatment Plan	Max Mand	Single Crown Bridge Tooth (Teeth) #	Tooth # Surface Material	R	S	T	V
				R	S	T	V
				Final	R	S	T
Management of Pain, Anxiety and Emergencies	Max Mand	Single Crown Bridge Tooth (Teeth) #	Tooth # Surface Material	R	S	T	V
				R	S	T	V
				Final	R	S	T
Preventive Measures	Max Mand	Single Crown Bridge Tooth (Teeth) #	Tooth # Surface Material	R	S	T	V
				R	S	T	V
				Final	R	S	T

Table 27 Rating system and evaluation criteria

- Guidelines for the assessment of clinical quality and professional performance
- California Dental Association

Source: California Dental Association (1977) p10-11

Quality Evaluation Rating System			Quality Evaluation Criteria and Abbreviations		
	Rating	Operational Explanation	Code	History	Code Clinical Examination
S A T I S F A C T O R Y	Range of Excellence R Romeo Code: R Call: Romeo	The history and examination provide all necessary information for the development of a rational diagnosis and treatment plan.		A thorough history has been taken initially, including previous radiographs, and updated regularly (dates indicated).	A thorough clinical examination has been conducted and recorded.
	Range of Acceptability S Sierra Code: S Call: Sierra	The history and examination provide sufficient information for diagnosis and treatment plan but one or more features of the history and/or examination deviate from the ideal.	SUD SCM SRC	A fairly complete dental/medical history has been taken initially, but evidence is missing that it has been updated periodically. A fairly complete dental/medical history has been taken initially, but one or more items have not been completed or recorded.	(Refer to General Guidelines.) A fairly thorough clinical examination has been conducted and items that are necessary for diagnosis and treatment planning are included. Conditions that clearly deviate from normal health and appearance are recorded, but the clinical examination record is incomplete.
N O T A C C E P T A B L E	Not Acceptable T Tango Validity Questionable Code: T Call: Tango	The history and examination, as recorded, do not provide the information necessary for the development of a rational diagnosis and treatment plan but the deficiencies do not appear to be harmful or dangerous for the dental or general health of the patient.	TGL TSS TAL TSN TMD TTR TBL	Dental/medical history has been taken but is inadequate. Information is missing in regard to general health, or systemic diseases, or allergies and sensitivity, or present medication and treatment, or bleeding problems.	TRC There is no direct record of the clinical examination, but the treatment plan indicates that potentially harmful or dangerous conditions were detected.
	Not Acceptable V Victor Information Inadequate Code: V Call: Victor	The history and examination are inadequate for establishment of whether potentially harmful or dangerous conditions are present.	VRC	No record exists to show that a dental/medical history was taken initially or during subsequent treatments.	Harmful or dangerous conditions were not detected in the clinical examination. There is evidence of large carious lesions, periodontal pockets and bone loss, periapical pathology, undetected fractures and traumas, and/or pathological conditions.

The most significant thing about the California Dental Association method is that it has not suffered with time and it remains the standard by which other programmes are measured. The emphasis on explicit criteria is a feature and the guidelines allow for this audit to be conducted for all elements of general dental practice.

This method of evaluation includes both a record audit and clinical assessment of patients in the practice being surveyed. The operation is normally carried out by two independent dentist evaluators and is thus a fairly expensive exercise. It is possible, however, for the guidelines and the developed criteria to be used for a simpler type of audit with less cost involved eg. self-assessment or peer review within a group practice.

It must be noted, however, that the California Dental Association publication is not a comprehensive quality assurance programme, per se. It consists of excellent sets of criteria and guidelines for assessment of care but requires to be associated with appropriate corrective action to be considered for a quality assurance programme. Its original purpose, of course, was merely to provide an instrument for quality assessment - the development of comprehensive dental quality assurance programmes not having commenced when these guidelines were first published.

8.2 SUNSET PARK PROGRAMME

This evaluation method arose from a review project reported by Demby and Rosenthal (1978) which was conducted in two neighbourhood dental health clinics in New York - the Lutheran Medical Center, Brooklyn of which Dr. Demby is Chief of Dental Services and the East Harlem Council for Human Services, Neighbourhood Health Center at which Dr. Rosenthal is Dental Director. In April 1978, the American Dental Association decided to evaluate this quality assurance system. The programme was fully documented, examined thoroughly via a site visit and reviewed by some 30 experts in quality assurance who rated it against a model of 100 characteristics of the ideal quality assurance programme. It was then selected as one of three methods recommended to the Department of Health, Education and Welfare, for field testing as a potential evaluation instrument for private practice. In 1979, it received funding from the W.K. Kellogg Foundation through the National Dental Quality Assurance Program of the American Fund for Dental Health.

Demby, Rosenthal, Angello and Calhoun (1985) have described the need for development of a quality assurance system containing the following characteristics.

1. It should be able to assess multiple parameters of care eg. oral health status, records, radiographs, clinical quality, treatment planning and patient satisfaction.
2. It should be largely outcome-related.

3. It should rely on utilisation of both implicit and explicit approaches to review.
4. It should be designed for use specifically in private dental practices by private practitioners.
5. It should both assess and assure the quality of care.

The above requirements were satisfied by the production of the Sunset Park Reviewer Manual by Demby and colleagues. The Manual contains instructions for calibration of examiners and outlines all audit procedures including logistics of office visits and sequence of audit. Details of explicit criteria used in the audit are set out and supported where appropriate by clinical photographs. A bibliography and abstracts related to the criteria utilised is included in the Reviewer Manual.

The following elements are covered in the audit process.

1. Oral health status
2. Record assessment
3. Radiographic assessment
4. Clinical assessment of technical proficiency
5. Assessment of treatment
 - a. Completeness of diagnosis
 - b. Integration of non-dental considerations
 - c. Appropriateness of treatment
 - d. Logical sequence of treatment

e. Patient's perception of treatment.

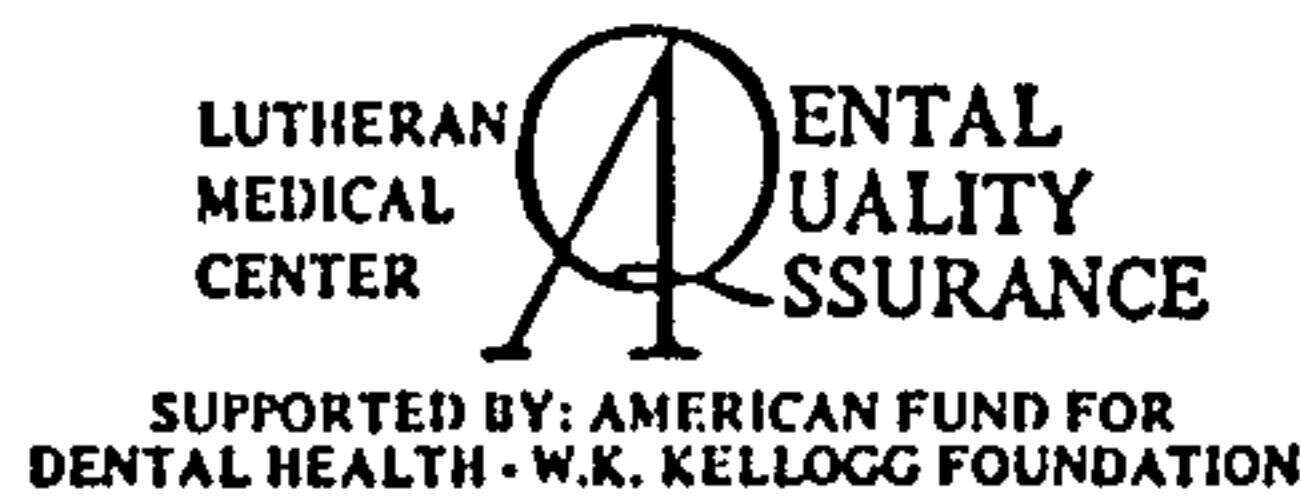
Examples of audit forms used for assessment are shown in Figures 8, 9, 10 and 11 (Lutheran Medical Center 1980).

The Sunset Park programme represents an assessment method which in its clinical assessment uses a two-rating scale as distinct from the four-rating scale developed by Ryge and Snyder (1973) and evident in other quality assessment projects.

The method was developed, as outlined previously, for use in the community clinic situation but there is no need for it to be confined to this environment. Indeed, the originators of this scheme foresaw it as being a useful model for quality assessment of private dental practice. It tends to be a little too simple, in some respects, perhaps and lacks, for instance, the incorporation of more valid patient satisfaction analysis. It is, nevertheless, an excellent multi-faceted dental quality assurance instrument and has the advantage over many other systems which fail to incorporate direct assessment, record review, patient satisfaction and outcome analysis.

Figure 8 Oral Health Status Assessment Form
- Sunset Park Study

Source: Lutheran Medical Center (1980)

**FORM A CLINICAL ASSESSMENT**

2-7 DATE

--	--

--	--

--	--

 DATE DAY YEAR

PATIENT NAME _____

8-11 REVIEWER _____ PATIENT NUMBER

--	--	--

12 REVIEWER NUMBER

I ORAL HEALTH STATUS INDICATORS

Instructions - This section applies to persons who are dentulous. If the person is completely edentulous, check the box NOT APPLICABLE below and go to next section.

13 ☐ Not Applicable

If the person is dentulous, continue below.

A. Count the number of teeth and place in box.

14-18	Total number of teeth		
-------	-----------------------	--	--

B. ORAL HYGIENE - PERIODONTAL INDICATORS

Evaluate the sample teeth and surfaces indicated below for each of the three indicators for persons 13 years and older.

Evaluate the Oral Hygiene and Gingival Indicators only for persons 12 years and under.

If a tooth is missing, **DO NOT** evaluate another tooth. Leave the boxes for that blank.

SCALE		SURFACE CODE
ORAL HYGIENE INDEX	0=no continuous plaque 1=continuous plaque	D=distal
POCKET DEPTH	Depth measured to the nearest millimeter	M=mesial
GINGIVAL INDEX	0=no bleeding within 30 seconds 1=bleeding within 30 seconds	F=facial L=lingual

[illegible]

C. CARIES INDEX

Place a Check (✓) in the box below the tooth that has new or recurrent caries and/or fractured teeth not restored where there is dentinal involvement.

[illegible][illegible]

Figure 9 Record Review Form
- Sunset Park Study

Source: Lutheran Medical Center (1980)

LUTHERAN MEDICAL CENTER

DENTAL QUALITY ASSURANCE
 SUPPORTED BY: AMERICAN FUND FOR
 DENTAL HEALTH - W.K. KELLOGG FOUNDATION

FORM B CLINICAL ASSESSMENT

DATE

DATE DAY YEAR

PATIENT NAME _____

REVIEWER _____ PATIENT NUMBER

REVIEWER NUMBER

II RECORD REVIEW

Instructions - Review the chart for the following criteria. Check (✓) the appropriate answer for each of the criteria below.

A. RADIOGRAPHIC ASSESSMENT

Review all radiographs taken during the last 5 years. If there is no full mouth survey taken during this time, use the most recent set in evaluating the first criteria.

1. Sufficient films in last full mouth survey. (1) ☐ YES (2) ☐ NO

2. Quality - check problem areas

☐ Insufficient contrast ☐ Distortion (elongation, foreshortening) ☐ Cone cut ☐ Other _____ SPECIFY _____	☐ Overlapping images ☐ Apex and surrounding bone not shown ☐ Poor developing
---	---

Overall estimation of quality of x-rays taken within last 5 years

ACCEPTABLE NOT ACCEPTABLE

3. Evidence of a date on all films taken within last 5 years

4. No more than 2 full mouth surveys within last 5 years

(1) ☐	(2) ☐
(1) ☐	(2) ☐
(1) ☐	(2) ☐

B. DENTAL RECORD ASSESSMENT

Check all criteria if present or absent. If present, check if acceptable or not acceptable using definitions in review manual.

	PRESENT	ABSENT	ACCEPTABLE	NOT ACCEPTABLE
5. Medical History	(1) ☐	(2) ☐	(1) ☐	(2) ☐
6. Extra Oral/Intra Oral Examination	(1) ☐	(2) ☐	(1) ☐	(2) ☐
7. Dental Charting	(1) ☐	(2) ☐	(1) ☐	(2) ☐
8. Treatment Plan	(1) ☐	(2) ☐	(1) ☐	(2) ☐
9. Progress Notes	(1) ☐	(2) ☐	(1) ☐	(2) ☐

10. Periodontal Charting

If there are no pockets of 5 millimeters or more, check NOT APPLICABLE. If the patient exhibits a pocket of 5 millimeters or more on one tooth or more in the Health Status Section, complete as in preceding section.

NOT APPLICABLE	PRESENT	ABSENT	ACCEPTABLE	NOT ACCEPTABLE
(1) ☐	(2) ☐	(3) ☐	(1) ☐	(2) ☐

COMMENTS:

Figure 10 Clinical Assessment Form
- Sunset Park Study

Source: Lutheran Medical Center (1980)

PATIENT NAME _____

PATIENT NUMBER -

DATE _____

III CLINICAL ASSESSMENT

Instructions - Review each of the criteria. Check (✓) acceptable if the criteria conform to the definitions provided in the review manual. For the first three categories (Operative, Crown & Fixed Prosthodontics, Endodontics), rate the criteria not acceptable if at least one tooth is judged not acceptable. Specify teeth and appliance judged not acceptable. More than 4 teeth found not acceptable should be noted in comment section.

	NOT APPLICABLE	ACCEPTABLE	NOT ACCEPTABLE	SPECIFY TEETH					
OPERATIVE									
1. Marginal Integrity	36 (1) ☐	(2) ☐	(3) ☐	37-44 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
2. Contour of Gingival Margins	46 (1) ☐	(2) ☐	(3) ☐	47-54 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
3. Contact Areas	56 (1) ☐	(2) ☐	(3) ☐	57-64 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
4. Occlusion	66 (1) ☐	(2) ☐	(3) ☐	67-74 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
5. Surface	76 (1) ☐	(2) ☐	(3) ☐	77-84 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
CROWN AND FIXED PROSTHODONTICS									
6. Marginal Integrity	86 (1) ☐	(2) ☐	(3) ☐	87-94 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
7. Gingival Contour	96 (1) ☐	(2) ☐	(3) ☐	97-104 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
8. Embrasures	106 (1) ☐	(2) ☐	(3) ☐	107-114 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
9. Gingival Contour of Pontic	116 (1) ☐	(2) ☐	(3) ☐	117-124 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
10. Occlusion	126 (1) ☐	(2) ☐	(3) ☐	127-134 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
ENDODONTICS									
11. Apical Fill (Obturation)	136 (1) ☐	(2) ☐	(3) ☐	137-144 <table><tr><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐					
REMOVABLE PROSTHODONTICS									
PARTIAL DENTURES									
12. Stability	146 (1) ☐	(2) ☐	(3) ☐	147 ☐ PL 148 ☐ PL					
13. Retention	149 (1) ☐	(2) ☐	(3) ☐	150 ☐ PL 151 ☐ PL					
14. Occlusion	152 (1) ☐	(2) ☐	(3) ☐	153 ☐ PL 154 ☐ PL					
15. Extension/Tissue Adaptation	155 (1) ☐	(2) ☐	(3) ☐	156 ☐ PL 157 ☐ PL					
16. Design & Framework	158 (1) ☐	(2) ☐	(3) ☐	159 ☐ PL 160 ☐ PL					
17. Esthetics	161 (1) ☐	(2) ☐	(3) ☐	162 ☐ PL 163 ☐ PL					
COMPLETE DENTURES									
18. Stability	164 (1) ☐	(2) ☐	(3) ☐	165 ☐ PL 166 ☐ PL					
19. Retention	167 (1) ☐	(2) ☐	(3) ☐	168 ☐ PL 169 ☐ PL					
20. Occlusion	170 (1) ☐	(2) ☐	(3) ☐	171 ☐ PL 172 ☐ PL					
21. Extension	173 (1) ☐	(2) ☐	(3) ☐	174 ☐ PL 175 ☐ PL					
22. Vertical Dimension	176 (1) ☐	(2) ☐	(3) ☐	177 ☐ PL 178 ☐ PL					
23. Tissue Adaptation	179 (1) ☐	(2) ☐	(3) ☐	180 ☐ PL 181 ☐ PL					
24. Esthetics	182 (1) ☐	(2) ☐	(3) ☐	183 ☐ PL 184 ☐ PL					
185 SUMMARY - Indicate in general the overall quality of the clinical work.	(1) ☐ Excellent (2) ☐ Good (3) ☐ Fair (4) ☐ Poor								
COMMENTS: _____									

Figure 11 Treatment Assessment Form
- Sunset Park Study

Source: Lutheran Medical Center (1980)

PATIENT NUMBER

IV ASSESSMENT OF TREATMENT

PATIENT NAME _____

DATE _____

Instructions - Review the patient and chart for the first four criteria. Use judgement for the overall assessment of each of these five criteria using the specific areas listed under each criteria as a guide.

1. COMPLETENESS OF DIAGNOSIS

Check problems overlooked or not noted in treatment

186-188

☐ Caries

189-191

☐ Missing Teeth

192-194

☐ Periapical Pathology

195

ASSESSMENT OF DIAGNOSIS

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

186-188

☐ Gingivitis

189-191

☐ TMJ/Facial Pain

192-194

☐ Malocclusion

195

ASSESSMENT OF DIAGNOSIS

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

186-188

☐ Periodontitis

189-191

☐ Oro/Facial Pathology

192-194

☐ Problems of Space Maintenance in children

COMMENTS: _____

2. INTEGRATION OF NON-DENTAL CONSIDERATIONS

Review chart and interview patient about non-dental problems. Check areas not appropriately considered in treatment.

196-197

☐ Medical

198-199

☐ Drug Related

200

ASSESSMENT OF NON-DENTAL CONSIDERATIONS

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

196-197

☐ Emotional

198-199

☐ Lifestyle

COMMENTS: _____

3. APPROPRIATENESS OF TREATMENT

a. Check services considered inappropriate

201-203

☐ Restorative

204-206

☐ Removable Prosthodontics

207-209

☐ Oral Surgery

210

☐ Other _____
SPECIFY

211

ASSESSMENT OF APPROPRIATENESS OF TREATMENT

201-203

☐ Periodontics

204-206

☐ Fixed Prosthodontics

207-209

☐ Orthodontics/Space Maintenance

210

☐ Endodontics

211

ASSESSMENT OF APPROPRIATENESS OF TREATMENT

201-203

☐ Pulp Protection

204-206

☐ Medication Prescribed

211

ASSESSMENT OF APPROPRIATENESS OF TREATMENT

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

b. Review preventive care in chart

212

ASSESSMENT OF APPROPRIATENESS OF PREVENTIVE CARE

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

COMMENTS: _____

4. LOGICAL SEQUENCE OF TREATMENT

Review progress notes and treatment plan in chart. Check areas that are not judged to be in proper sequence.

213-215

☐ Pain Control

216-218

☐ Preventive Services

219-221

☐ Space Maintenance

222

☐ Other _____
SPECIFY

223

ASSESSMENT OF LOGICAL SEQUENCE OF TREATMENT

213-215

☐ Caries Control

216-218

☐ Malocclusion

219-221

☐ Surgical Treatment

222

☐ Pulpal Therapy

223

ASSESSMENT OF LOGICAL SEQUENCE OF TREATMENT

213-215

☐ Periodontal Disease Control

216-218

☐ Restoration of Missing Teeth

223

ASSESSMENT OF LOGICAL SEQUENCE OF TREATMENT

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

COMMENTS: _____

5. PATIENT'S PERCEPTION OF TREATMENT

Question patient on satisfaction in each of the following areas.

Check Problems

224-227

☐ Comfort

228

ASSESSMENT OF PATIENT'S PERCEPTION OF TREATMENT

224-227

☐ Esthetics

228

ASSESSMENT OF PATIENT'S PERCEPTION OF TREATMENT

224-227

☐ Function

228

ASSESSMENT OF PATIENT'S PERCEPTION OF TREATMENT

224-227

☐ Satisfaction With Dentist

228

ASSESSMENT OF PATIENT'S PERCEPTION OF TREATMENT

228

ASSESSMENT OF PATIENT'S PERCEPTION OF TREATMENT

ACCEPTABLE

(1) ☐

NOT ACCEPTABLE

(2) ☐

COMMENTS: _____

SUMMARY

Indicate in general the overall quality of treatment

229

Excellent (1) ☐

229

Good (2) ☐

229

Fair (3) ☐

229

Poor (4) ☐

COMMENTS: _____

SUMMARY OF CASE MANAGEMENT

Indicate the overall quality of the total management of patient care. Review the chart, Clinical, and treatment components before making a final assessment.

230

Excellent (1) ☐

230

Good (2) ☐

230

Fair (3) ☐

230

Poor (4) ☐

8.3 ORAL HEALTH STATUS

One of the most significant recent developments in dental quality assurance was the development of an oral health status index by Marcus, Gershen and Koch as part of the National Dental Quality Assurance Program (American Fund for Dental Health 1983a). While these researchers concentrated entirely on the development of this index and did not seek to examine, in this study, other elements of a quality assurance programme, their work provides a new dimension for future evaluation instruments.

One of the problems in utilising existing epidemiological indicators eg. DMF, CPITN for measurement of overall dental health outcome is that these indicators are specialised and are unrelated to each other. The aim of these researchers, then, was to develop an integrated oral health status measurement system which could serve as the basis for assessment of the quality of care. This index could be used statistically to evaluate population groups either in cross-section to compare one group with another or longitudinally to assess the level of oral health outcome in a given population over a period of time. The developed index would be of the same type as say the Consumer Price Index - made up of a number of variable factors.

The researchers assumed that different dentists would have differing opinions as to what might constitute deficiencies in care but would generally agree on what might represent good dental health. A paired preference technique was used to develop the variable factors which would indicate deficiencies in health outcome. Following a pilot

programme at the University of California, Los Angeles, 315 pairs of simulated cases were presented to each of 12 dentists. Each case comprised study models, radiographs, photographs and demographic details about each "patient". Each dentist selected which of each pair was considered to be in better dental health and noted his reasons eg. missing teeth, periodontal health etc. for making this choice.

Statistical analysis of the factors deemed significant by the examining dentists enabled the researchers to decide upon a number of basic variables which would have sufficient predictive power to form the basis for oral health status indexes for both adults and children. Five parameters were identified for the adult index and four for the index for children. Two versions of the adult index were developed, one for indirect assessment using radiographs and the other for use with direct clinical examination. The children's index was designed for direct examination due to its orthodontic content.

For adults, the variables decided upon were as follows:-

- (1) Severe periodontal disease
- (2) Moderate periodontal disease
- (3) Caries
- (4) Missing teeth
- (5) Replacements

The first three variables represent active disease, the fourth is the end-point for this disease process in most cases and the fifth enables the treatment process to be monitored. The perfect mouth was

rated with a score of 100 and an index coefficient was added or subtracted for each instance of one of the variables as can be seen in Table 28.

For children, the four variables used were:-

- (1) Decayed teeth
- (2) Missing teeth
- (3) Occlusion
- (4) Tooth position

The coefficients for the children's index are shown in Table 29.

Table 28 Oral health status index coefficients - adults

Source: American Fund for Dental Health (1983a)

<u>INDIRECT INDEX</u>		<u>DIRECT INDEX</u>	
<u>VARIABLE</u>	<u>COEFFICIENT</u>	<u>VARIABLE</u>	<u>COEFFICIENT</u>
*Severe bone loss	-3.35	*Bone loss 6+mm	-3.02
*Moderate bone loss	-1.37	*Bone loss 4-6mm	-0.73
Missing/free ends	-3.13	Missing/free ends	-3.13
Decayed/fractured	-2.17	Decayed/fractured	-1.79
Replaced	+0.69	Replaced	+0.61

*Bone loss at the mesial aspect of the tooth.

The differences in the two indexes relate to the differences in detection of variables using either method and, although highly correlated, yield slightly different results.

Table 29 Oral health status index coefficients - children

Source: American Fund for Dental Health (1983a)

<u>VARIABLE</u>	<u>COEFFICIENT</u>	
	<u>1° ANT</u>	<u>1° POST & PERM</u>
Missing teeth	-2.27	-4.55
Decayed teeth	-1.12	-2.24
Occlusion	-4.38	-4.38
Position	-1.73	-1.73

As can be seen from Table 29, the children's index recognises the consequences of deficiencies related to primary posterior or permanent teeth compared with the same deficiencies for primary anterior teeth and these differences are reflected in the coefficients applied.

Marcus and his colleagues have developed a very detailed user's guide to assist the evaluator. Examples of the assessment forms used for both direct and indirect assessment of adults and direct assessment of children are shown in Figures 12, 13 and 14. In the indirect assessment process, the grids are used to measure periodontal bone loss from radiographs and are exemplified in Figure 15.

In assessing the quality of dental care, these indices of oral health enable the reviewer to compare outcomes quantitatively and thus establish the efficacy of treatment rendered. The indices are simple, relevant and easy to use whether the assessment is carried out by direct assessment or, in the case of adults, by examination of records and radiographs.

Figure 12 Indirect oral health status index
- Adult examination form

Source: American Fund for Dental Health (1983a)

PATIENT I.D.: 001-999
BIRTH DATE: 1/27/30

DATE: 1/28/80
ABTRACTOR: GYS
RADIOGRAPHS
DATE: 1/11/80

		Tooth #	Teeth	Bone Loss	
				1/3-1/2	>1/2
UPPER ARCH	POSTERIOR	1	(M) R D N C		
		2	(M) R D N C		
		3	(M) R D N C		
		4	M R D (N) C		
		5	M R D N (C)		
	ANTERIOR	6	M R (D) N C		
		7	M R (D) N C	✓	
		8	M R (D) N C	✓	
		9	M R D (N) C		
		10	M R D (N) C		
		11	M R D (N) C		
	POSTERIOR	12	M R D N (C)		
		13	M R D (N) C		
		14	(M) R D N C		
		15	(M) R D N C		
		16	M R D (N) C	✓	
LOWER ARCH	POSTERIOR	17	M R (D) N C		
		18	(M) R D (N) C		
		19	(M) (R) D N C		
		20	M R (D) N C		
		21	M R (C) N C		
	ANTERIOR	22	M R D (N) C	✓	
		23	M R D (N) C		✓
		24	M R D (N) C		✓
		25	M R D (N) C		✓
		26	M R D (N) C		✓
		27	M R D (N) C	✓	
	POSTERIOR	28	M R D (N) C		
		29	M R D (N) C		
		30	(M) R (D) N C		
		31	(M) R D (N) C		
		32	(M) R D N C		

Adequate
Yes No
Full Mouth ✓
Bitewings ✓
Panoramic X-rays ✓

LEGEND:
M = missing
R = replaced
D = decayed
N = normal
C = space closure
FE = free end

TALLY

	#	Coeff	Subtotal
MAXIMUM			100.00
Missing	5	-3.13	-15.65
Free Ends	1	-3.13	-3.13
Replaced	1	+0.69	0.69
Decayed	7	-2.17	-15.19
1/3-1/2	5	-1.37	-6.85
1/2	4	-3.35	-13.40
INDEX			46.47

Figure 13 Direct oral health status index
- Adult examination form

Source: American Fund for Dental Health (1983a)

PATIENT I.D.: 550-999
BIRTH DATE: 2/4/40

DATE: 1/22/80
EXAMINER: GVS

		Tooth #	Teeth	Bone Loss	
				4-6mm	6+mm
UPPER ARCH	POSTERIOR	1	M R D (N) C		
		2	M R D (N) C		
		3	(M) (R) D N C		
		4	M R D (N) C		
		5	M R D N (C)		
	ANTERIOR	6	M R D (N) C		
		7	M R D (N) C		
		8	M R D (N) C		
		9	M R (D) N C		
		10	M R D (N) C		
		11	M R D (N) C		✓
	POSTERIOR	12	M R D N (C)		
		13	M R (D) N C		✓
		14	(M) (R) D N C		
		15	(M) (R) D N C		
		16	(M) R D N C		
LOWER ARCH	POSTERIOR	17	M R D (N) C		
		18	(M) (R) D N C		
		19	(M) (R) D N C		
		20	M R (D) N C	✓	
		21	M R D (N) C		
	ANTERIOR	22	M R D (N) C		
		23	M R D (N) C		
		24	M R D (N) C		
		25	M R D (N) C		
		26	M R D (N) C		
		27	M R D (N) C		
	POSTERIOR	28	M R D (N) C		✓
		29	M R (D) N C	✓	
		30	(M) R D (N) C	✓	
		31	(M) R D (N) C	✓	
		32	(M) R D N C		

LEGEND:
M = missing
R = replaced
D = decayed
N = normal
C = space closure
FE = free end

TALLY

	#	Coeff	Subtotal
MAXIMUM			100.00
Missing	5	-3.13	-15.65
Free Ends	1	-3.13	-3.13
Replaced	5	+0.61	3.05
Decayed	4	-1.79	-7.16
4-6 mm	4	-0.73	-2.92
6+ mm	3	-3.02	-9.06
INDEX			65.13

Figure 14 Children's oral health status index
- Examination form

Source: American Fund for Dental Health (1983a)

PATIENT I.D. 443 DATE: 2/1/80
BIRTH DATE: 8/5/72 EXAMINER I.D. 6YS

OCCLUSION:
CROSSBITE = 1° ANT. ☒ 1° POST. ☐ 2° ANT. ☐ 2° POST. ☐ NONE ☐
OVERBITE = EXCESS (>4mm) ☐ OPEN (<-1) ☐ NA ☐ NORMAL (-1 to 4mm) ☒ TOTAL
OVERJET = EXCESS (>4mm) ☒ ABSENT (<1mm) ☐ NA ☐ NORMAL (1-4mm) ☐ OCCLUSAL CHECKS 2
PROFILE = CONCAVE ☐ STRAIGHT/CONVEX ☒
LIPS = INCOMPETENT ☐ NORMAL ☒

ABNORMAL POSITION:
SPACE LOSS UPPER ANT. ☐ UPPER POST. ☒ LOWER ANT. ☐ LOWER POST. ☐ NA ☐
CROWDING 1° = UPPER ANT. ☐ UPPER POST. ☐ LOWER ANT. ☐ LOWER POST. ☒ NA ☐
CROWDING 2° = UPPER ANT. ☐ UPPER POST. ☐ LOWER ANT. ☐ LOWER POST. ☐ NA ☐

LEGEND:
M = Missing
D = Decayed
S = Sound
AP = Abnormal Position
(rotated, displaced,
tipped, ankylosed,
ectopic)

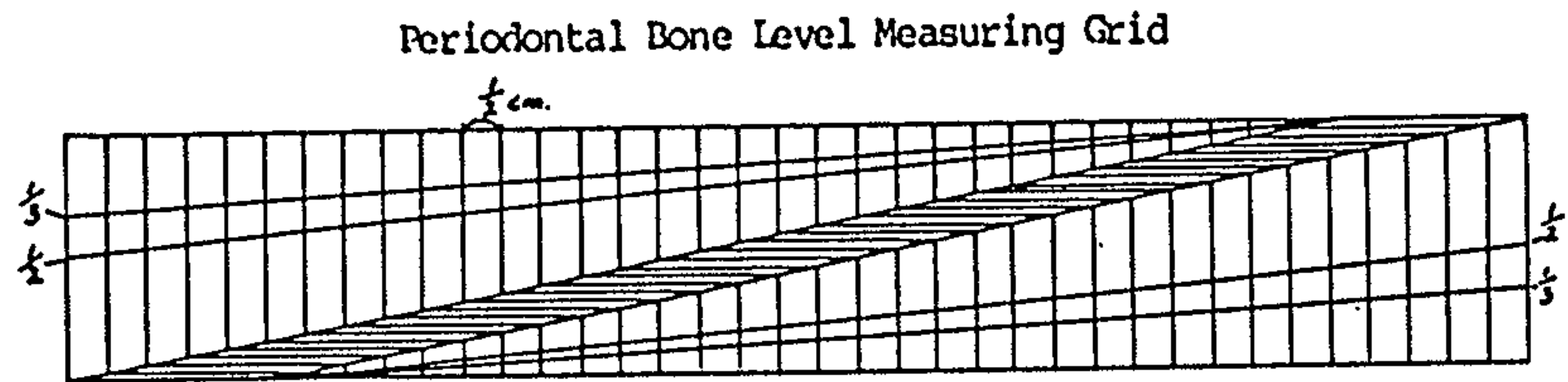
		PRIMARY			PERMANENT		
		AP	Teeth	Tooth #	Tooth #	Teeth	AP
UPPER ARCH	POST				2	☒ M ☐ D ☐ S	
					3	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	A	4	☐ M ☐ D ☐ S	
			☒ M ☐ D ☐ S	B	5	☒ M ☐ D ☐ S	
	ANT		M ☐ D ☐ S	C	6	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	D	7	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	E	8	☐ M ☐ D ☐ S	☒
			M ☐ D ☐ S	F	9	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	G	10	☐ M ☐ D ☐ S	☒
			M ☐ D ☐ S	H	11	☐ M ☐ D ☐ S	
	POST		☒ M ☐ D ☐ S	I	12	☒ M ☐ D ☐ S	
			M ☐ D ☐ S	J	13	☐ M ☐ D ☐ S	
					14	☐ M ☐ D ☐ S	
					15	☒ M ☐ D ☐ S	
LOWER ARCH	POST				18	☒ M ☐ D ☐ S	
					19	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	K	20	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	L	21	☐ M ☐ D ☐ S	
	ANT		M ☐ D ☐ S	M	22	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	N	23	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	O	24	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	P	25	☐ M ☐ D ☐ S	☒
			M ☐ D ☐ S	Q	26	☐ M ☐ D ☐ S	
			☒ M ☐ D ☐ S	R	27	☒ M ☐ D ☐ S	
	POST		M ☐ D ☐ S	S	28	☐ M ☐ D ☐ S	
			M ☐ D ☐ S	T	29	☐ M ☐ D ☐ S	
					30	☐ M ☐ D ☐ S	
					31	☒ M ☐ D ☐ S	

TALLY

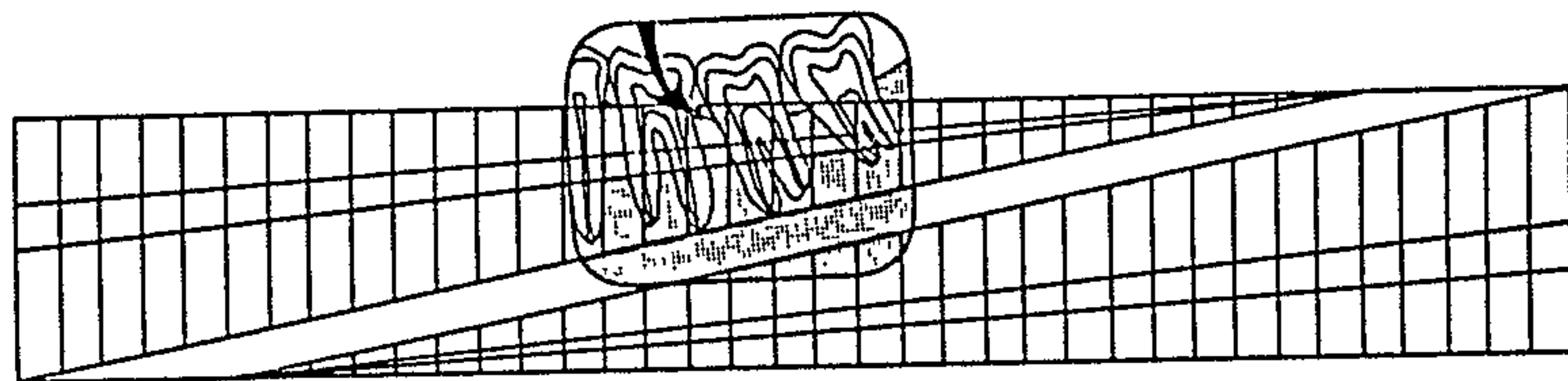
	#	Coeff	Subtotal
MAXIMUM			100.00
M 1° Ant	1	-2.27	-2.27
M 1° Post 2° All	2	-4.55	-9.10
D 1° Ant	0	-1.22	—
D 1° Post 2° All	6	-2.24	-13.44
Occlusion	2	-4.38	-8.76
Abnormal Position	5	-1.73	-8.65
INDEX			57.78

Figure 15 Oral health status index
- Periodontal bone grids

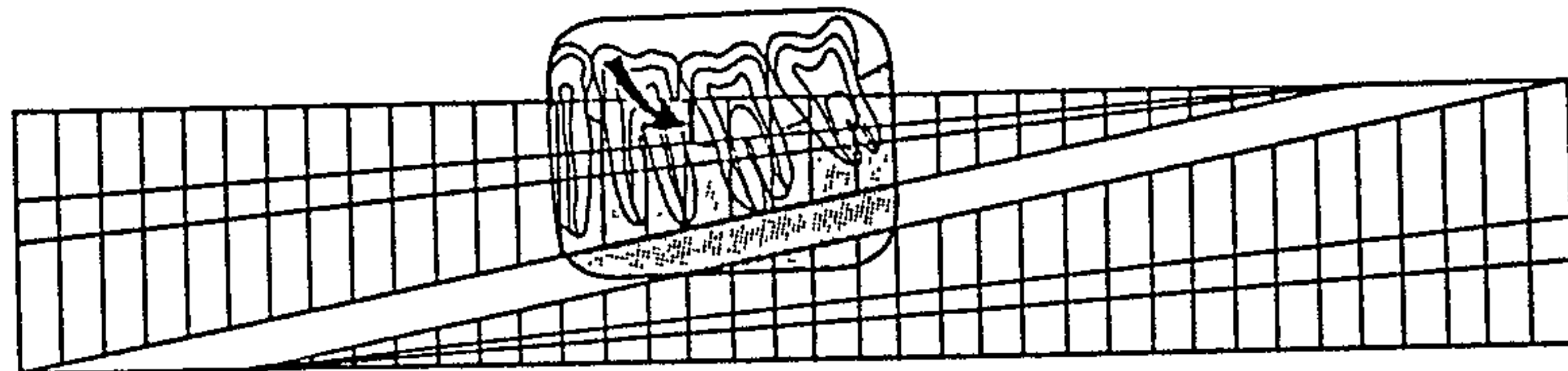
Source: American Fund for Dental Health (1983a)



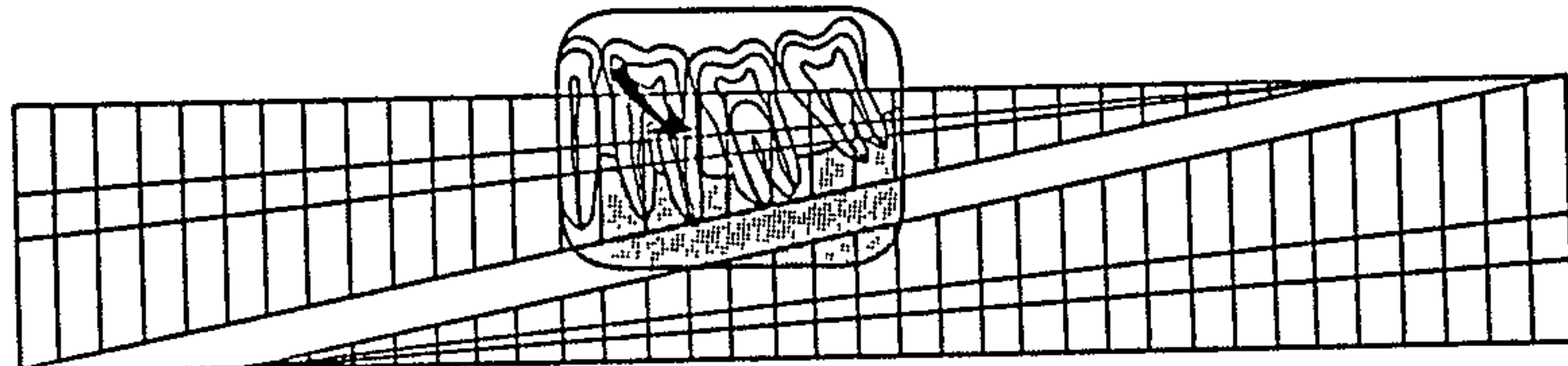
Periodontal Bone Loss Less Than 1/3 of Root



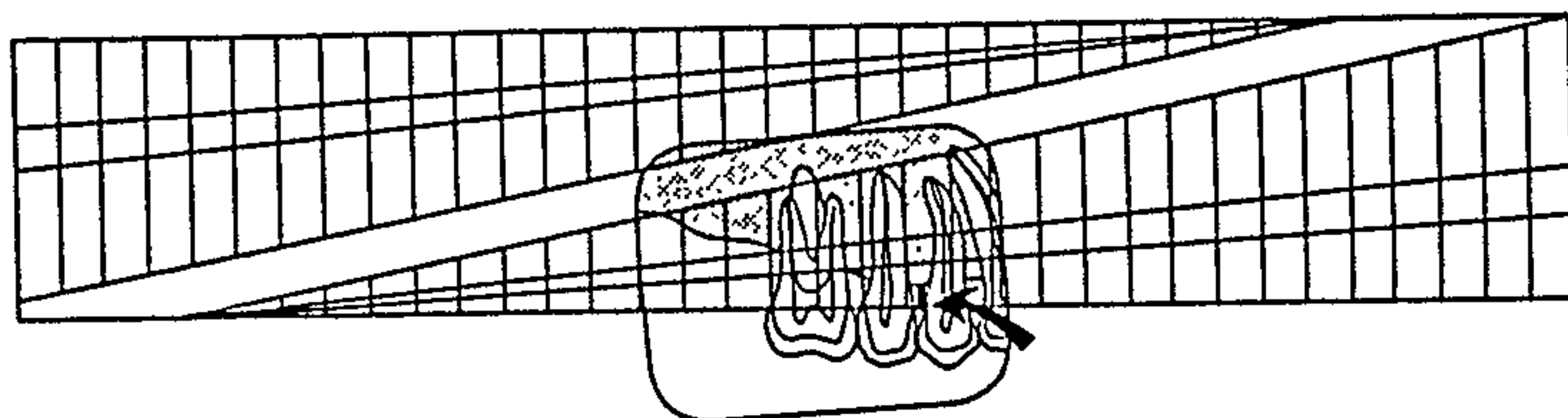
Periodontal Bone Loss Between 1/3 and 1/2 of Root



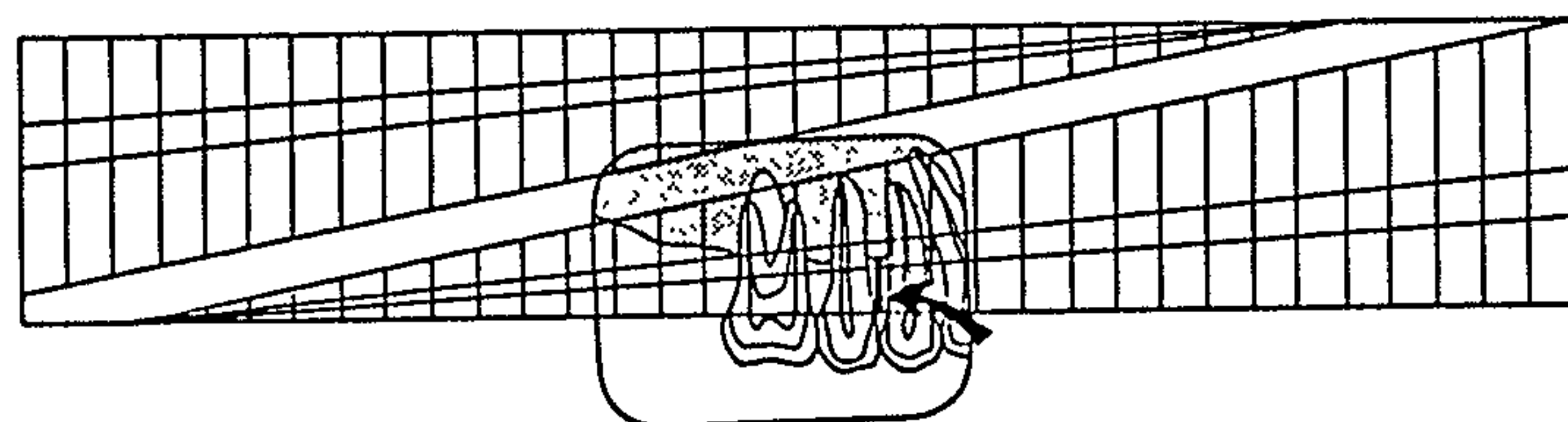
Periodontal Bone Loss Greater Than 1/2 of Root



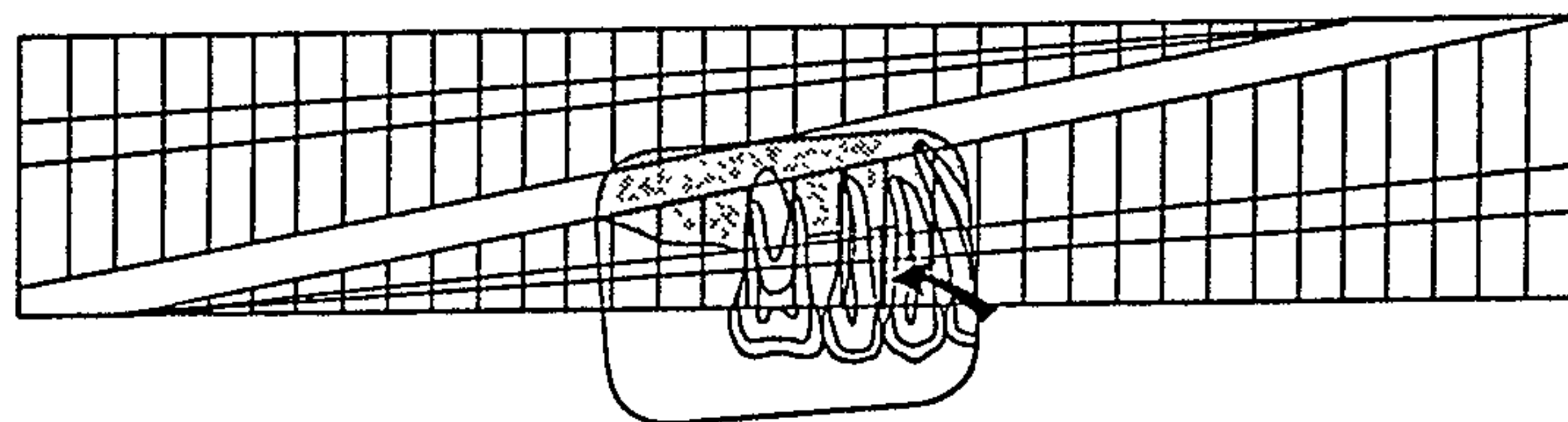
Periodontal Bone Loss Less Than 1/3 of Root



Periodontal Bone Loss Between 1/3 and 1/2 of Root



Periodontal Bone Loss Greater Than 1/2 of Root



8.4 DEMCAD PROJECT

In February 1982, the W.K. Kellogg Foundation funded a project jointly sponsored by the School of Dental Medicine, University of Pennsylvania and the School of Public Health of Columbia University. The exercise was known as DEMCAD - Development of Evaluation Methods and Computer Applications in Dentistry - but was in fact comprised of two independent quality assurance research projects. The first, dealing with the development of an evaluation model for general dental practice was the responsibility of the University of Pennsylvania with Dr. A.L. Morris as Project Director. Columbia University, through Dr. H.L. Bailit undertook that part of the research project centred on the development of micro-computer based patient management data system for evaluation of patient care. Both projects were coordinated through the University of Pennsylvania (Morris, Kephart, Bailit & Vito 1982; Klyop 1985).

8.4.1 Development of Evaluation Methods (Morris and Bailit 1986).

This method was designed for a one-day practice evaluation visit by a selected expert panel. A reviewer manual was produced covering 19 components relating to structure, process and outcome. Ten leading general practitioners (nominated by the dental profession) were recruited from widespread areas of the U.S.A. and trained as evaluators in order to test the validity of the method.

The American Dental Association selected one State from each of the fourteen Trustee districts for participation in the exercise. The

aim was to recruit 21-22 volunteer practices for each State to make up 300 practices for the survey. Of these, the mix was designed to include 50 rural, 50 urban group practices and 200 urban non-group practices. Dentists were selected at random from the American Dental Association Directory and letters sent inviting participation. The response rate was around 15 per cent.

The sample obtained was not perfectly representative of the U.S. dental profession as the rural group were somewhat younger than the urban group. There were only five female dentists in the sample and an unusual number of group practices participating (68%) employed more than four dentists. The assessors carried out an average of three practice visits per week during 1984 and 1985. The average time for each visit was 6.2 hours.

The reaction of the 300 participants was very positive indeed and only 22 signified any doubt when asked whether they would consider accepting a follow-up visit. The actual evaluation scores obtained followed a near normal distribution but it must be remembered that the survey was carried out using volunteer participants. One might question, then, whether these participants were considered to be (at least in their own eyes) representative of the "better" practitioners. There were no significant differences in evaluation scores between urban, rural, group and non-group practitioners although it was found that those from the Western regions of the country rated higher. The average cost per practice visit was US\$311 and covered travel, accommodation and meals.

A number of conclusions were reached as a result of this study.

1. An assessment instrument can be developed which would permit a valid evaluation of private dental practice in a single day visit.
2. The assessment instrument is able to discriminate between practices with varying characteristics.
3. The assessment instrument is suitable for application to rural, urban, group and non-group practices throughout all areas of the U.S.A.
4. Dentists can be trained to use this instrument to give valid results ie. a disciplined approach which produces comparable results for the evaluation of comparable practices.
- 5.* Private dental practitioners are willing to participate in a voluntary quality assessment scheme.
6. Those being assessed and those conducting the assessments react positively to participation in such a programme.

*(This conclusion does not appear to be substantiated given the response rate (15%) to invitations to participate!)

Morris (1987) has advised that a further evaluation of this instrument was carried out in Florida early in 1987 over three days.

Minor changes, such as the specification of wearing masks and gloves, were indicated and a revised version of the instrument forwarded to the American Dental Association on 9th March 1987. The original planning panel - eight dentists - and the ten evaluators met and, using a Delphi process, reviewed and reset priorities of importance.

Further Kellogg funding has been obtained by Morris to examine the effect of feedback from the exercise on quality of care. All participants have been given a report of their own ratings together with a general indication of the level of ratings of other participants. By mid 1987, the first 30 participants of the original 300 have been re-assessed and early indications are that improvements have taken place purely as a result of the assessment process. The "DEM" instrument, being the most recent and certainly the most tested, quality assessment method could quite possibly become the American Dental Association recommendation for use nationally. It is oriented to private practice and has been thoroughly evaluated, even to the extent of costings for each category of visit based on geographical distance, accommodation standards etc. It covers all aspects of dental practice and perhaps the only barrier to be overcome is some residual sensitivity to releasing the results of the original survey. At time of writing this treatise, the instrument has not been made public and remains the property of the American Dental Association. The Association's Board of Trustees endorsed the broad concept of the system at its August 1987 Session and also adopted several resolutions for its further development. One of the proposals concerns conduct of a pilot, voluntary programme for one State association before offering it to the profession at large.

Another proposal under consideration by the Board relates to the approval for release of DEM materials to outside bodies (Sigmon 1987).

8.4.2 Computer Applications in Dentistry (Morris and Bailit 1986).

This part of the DEMCAD Project signified the first major research project into dental computer systems. It was centred around a microcomputer-based dental patient information system, titled DENTAL CLINICIAN (DC).

The objectives of the project were:

1. to develop a microcomputer-based data system for patient clinical information for general dental practitioners which could take the place of the dental record;
2. to prepare prototype expert systems to assist dentists in making clinical and fiscal management decisions;
3. to link this DC system with the fiscal management system distributed by the American Dental Association (ADOSI - American Dental Office Systems Inc.);
4. to test the systems in the practices of five general dental practitioners; and
5. to compare the information generated by the computer systems with

the data from the one-day practice evaluation visits in order to assess their value as measures of the quality of care.

The system was designed for a small microcomputer with data being able to be added or retrieved using either keyboard, a light pen or voice. It was able to handle an unlimited number of patients either in the active file or the daily schedule. The following screens were available:

1. Patient demographics.
2. Dental history.
3. Medical history.
4. Physical examination.
5. Odontogram.
6. Periodontal chart.
7. Occlusion.
8. Temporomandibular joint.
9. An optional screen - to be designed by the user.
10. An alert screen - for important information eg. medical history.
11. Patient menu - scheduled patients.
12. System menu - allows entry of systems eg. expert systems, DC, ADOSI.
13. Treatment planning screen - all positive findings from the previous screens are listed for treatment planning purposes.

In addition, there were report screens which are able to summarise all restorative and periodontal findings per tooth.

Prototype expert systems were also developed to assist in the

diagnosis or treatment of specific conditions by following a path of clinical logic. Some applications of these systems exemplified were for such conditions as hepatitis, odontogenic pain, white lesions and the fiscal management of practices. User manuals for DENTAL CLINICIAN and the expert systems were developed.

At this stage, linkage of DC and ADOSI has not been achieved but the DC program is currently being tested in the following institutions:

University of Michigan, School of Dentistry

University of Detroit, School of Dentistry

University of Pennsylvania, School of Dentistry

Columbia University, School of Dentistry

Dental Department, St. Francis Hospital, Hartford CT

This programme is still incomplete and requires testing in private general dental practices. It will also be necessary to ascertain its level of acceptance by the dental profession. Unfortunately, with the departure of the principal investigator from the University of Columbia to a non-dental position in private enterprise, there is some doubt surrounding its further development.

8.5 MICHIGAN PEER REVIEW MECHANISM

The Michigan Dental Association responded to the rapid growth of dental prepayment plans in the late 1960s and early 1970s and began directing its efforts at developing criteria for the assessment of clinical quality which could be used in the field by trained personnel. Criteria were developed for each of the eight clinical phases of the practice of dentistry, as well as criteria for diagnosis and treatment planning. The rating system used, developed by Ryge and Snyder (1973), was identical to that employed by the California Dental Association in its published guidelines.

In September 1980, a final report, titled "Ongoing Assessment of the Quality of Dental Care - Demonstration of a Statewide Peer Review Mechanism", was submitted as part of the National Quality Assurance Program. The sponsors of this project were the Michigan Dental Association and the University of Michigan, School of Dentistry. It successfully demonstrated the practicality of a review mechanism capable of routinely and systematically assessing the quality of restorative dental care provided to third party insurance subscribers. Post-treatment reviews were carried out by a trained panel of 42 dentists on clients of three participating insurance carriers, two quasi-public service corporations and the Michigan Medicaid program. From a stratified sample of clients, 8580 were invited to attend a clinical review session. Of these, 863, ie. a little more than 10%, presented for review.

As a result of this study, the following conclusions were reached.

1. Patient convenience was a major factor in determining patient attendance for review.
2. Based on statistical data gathered during this project, it would appear that a response rate of ten to fifteen percent could be anticipated by an organisation conducting a similar review. A higher response rate could result if more attendance could be paid to client convenience when scheduling appointments.
3. Based on the sampling schemes used in this study, it can be anticipated that the same five percent of services rendered might receive an unacceptable rating in any similar exercise conducted by another organisation for routine restorative services.
4. It was projected that a review mechanism of this type might be self-sustaining if all phases of dentistry rather than just restorative services were to be reviewed.
5. Scheduling of two reviewers tended to result in assessments of the quality of dental services that were more "critical" than those provided by only one reviewer.
6. Reviewers trained at the University of Michigan School of Dentistry differed from those trained at meetings of component societies of the Michigan Dental Association. The former tended to be less critical of the quality of restorative services than the latter group.

The significance of the Michigan Peer Review Mechanism is that it exemplifies the approach taken by a state dental association and will undoubtedly stimulate other associations to follow suit. The assistance and participation of health insurance bodies, the University and private practitioners, as in this project, are necessary for the establishment of similar programmes in other States.

9 DISCUSSION

The dearth of dental quality assurance activities in Australia is in stark contrast to the situation in the U.S.A. While the environment which led to the American situation differs from that in this country, there are sufficient indications that growth in dental quality assurance activities here are inevitable.

It seems most unlikely that the obsession in public sector dentistry with traditional productivity statistics and the absence of any evidence of the assessment of quality in these areas can continue much longer. The assumption made that the employment of qualified staff subject to conventional management organisation, concentrating for the most part on quantities of treatment categories delivered, will produce good patient care is considered to be indefensible. Similarly, the restriction of the involvement of the Australian Dental Association and governments through their statutory bodies - the registration boards - to deliberations concerning malpractice and litigation without extension of their interest to matters of the ongoing assessment of quality is considered to be an anachronism of limited future.

The promotion of reviews of the quality of health care has long been accepted in medicine. It is now over ten years since the Australian Federal Government directed the medical profession to put its house in order in this regard and, although this stimulus was no doubt inspired by the involvement of that government in health funding, the establishment of the philosophy of obligatory health care review will

no doubt flow on to dentistry. One way in which this flow-on is occurring already is arising in the public sector. The accreditation of hospitals involves assessment of mechanisms of clinical review. Many hospitals now include significant dental elements and the accreditation of Westmead Hospital in 1982 encouraged the development of systems of dental care review in its Dental Clinical School. It is expected that accreditation of dental hospitals will occur in the very near future.

The climate of third party funding, seen in the U.S.A., is different from the situation here as contracts are drawn up between funding bodies and employer groups rather than with individuals as is the case here. The American situation promotes interest and activity in dental quality assurance if only as a result of attempts in cost-containment, inspired by the large premiums paid by these employer groups. Nevertheless, a significant amount of funding for dental care is now obtained through health insurance arrangements in Australia and there is no reason to believe that these organisations will not take more interest in the results of this expenditure.

Perhaps the most important factor in encouragement of dental quality assurance is likely to be the growth in consumerism with its vigilance over all elements of returns on expenditure, including those provided by the professions. It is not inconceivable that consumer agitation might add a further impetus to government pressure for dental quality assurance schemes.

If dental quality assurance, then, is both desirable and inevitable

the question of what areas to be reviewed must be addressed. Bailit in 1980 made the perfectly valid comment that there is a tendency for assessors to measure what is easiest. There is no doubt that the past concentration on elements of structure is a reflection of this tendency. Structural dimensions of care are important but go nowhere near giving assurance that treatment rendered will be of good quality.

Investigation of the process of care was the first attempt to move away from this adherence to structure. Process auditing is now an established procedure in hospitals and the examples in the American experience give plenty of scope for this approach in dentistry. Of course, one of the important questions which arises is the relationship between observed deficiencies in process and the effect of these on health outcomes. There are a number of factors other than the quality of the treatment process which play a part in the eventual health status of the patient, some of which are completely beyond the control of the clinician. Bailit (1980) has illustrated a number of difficulties in this regard and makes the point that one problem is establishing the point in time at which outcome is to be measured. Consequently, there are occasions when process audit becomes the method of choice - as demonstrated by Kaplan and Greenfield (1978).

It has been recognised for some time that the ideal focus for health care review should be targeted to the assessment of outcome and measures taken to correct deficiencies in this aspect. Williamson recognised this some twenty years ago and has since endorsed the

approaches which are centred around outcome and the concentration on clinical problem solving. In dentistry, there are a number of long-established measures of dental health outcome such as DMF and a number of different indices of oral hygiene and periodontal status. These indices have been developed to satisfy specific epidemiological requirements and need not necessarily be the most appropriate for use in dental quality assurance. It is for this reason that a number of specialised dental health outcome measures have been developed. One advantage of such specialised measures over the traditional ones is that they combine various elements of dental health which are inter-related in the one index.

Freed, Marcus and Forsyth in 1979 showed how outcome might be related to patterns of care, analysing patient attendance into four categories - episodic, initial, maintenance and non-use. The assumption behind this approach is that ideal progression for a patient is to the maintenance phase and measurement of programmes including private practices might be undertaken to test conformity with this ideal.

At Harvard School of Dental Medicine, Antczak and Weinstein (1987) have developed a measure for dental health outcome based on assessment of what they term QATYs or quality adjusted tooth years. Aspects such as sensitivity and aesthetics are considered together with the relative values of anterior and posterior teeth and prognosis for retention to form an index.

Perhaps the most suitable approach to date has been the work

undertaken by Marcus, Gershen, Koch and Snyder in California as one of the thirteen studies forming the National Dental Quality Assurance Program in the U.S.A. The development in this research of validated oral health status indices for both adults and children could well form the basis of future dental care audits.

The importance of criteria and standards in the assessment of the quality of health care has been discussed. While criteria can be either explicit or implicit, the former allow objective analysis to be undertaken and there is evidence to show the validity of such judgements if objective criteria are applied. There are many examples of the establishment of sets of criteria for undergraduate assessment and similar approaches have been taken in dental quality assurance. Having established lists of criteria, the matter of standards ie. conformity with a level of satisfaction with those criteria must be considered. Abramowitz and Mecklenberg (1972) have pointed out the need to make these standards reasonable and to set them at the minimum acceptable level to avoid discouraging attempts to meet them if set too high. Most evaluation instruments in the latter field borrow heavily from the four point rating system laid down by Ryde and Snyder in 1973, although some such as the Sunset Park programme utilise a simpler analysis.

There has been a tendency in the U.S.A. to utilise direct assessment of patient care by the reviewer. The evaluation of undergraduate training is almost entirely dependent on this method and it may have some merit in certain institutional settings where management structure and patient access allow. However, it can be an awkward

and costly exercise - particularly in private practice - and would be seen as threatening by the clinician reviewed unless handled very carefully. Clinical examination in peer review should be confined ideally to those situations wherein it is practical and cost-effective.

There are, of course, other approaches which can be taken such as self assessment and record review. The former has considerable merit as it is cheap and non-threatening and a number of papers published by Milgrom, Weinstein and colleagues from the University of Seattle would tend to support the thesis that it can be as effective as peer review. The basic elements of self assessment are inherent in any profession and could well be organised into meaningful quality assurance programmes such as the one reported by Perkins in the United Kingdom in 1976.

Record review, which would include radiographs, study models and all other types of patient information, have been long established both in medicine and dentistry. They are cheap to conduct but their worth rather depends on the type of record available for audit and the standard of the record keeping. There are a number of studies which have been carried out, some of which question the relationship between the contents of the record and clinical performance. However, there is enough evidence and examples to encourage the use of record audits as an effective quality assurance tool.

Williamson, as early as 1968, has analysed the results of past reviews of health care quality and has been critical of the lack of

good results in achieving better outcomes. He believes quite strongly that a lot of the blame must be attached to selection of topics which did not deserve the priority given to them. He has demonstrated the use of a nominal group technique, after Delbecq and van de Ven (1971), to form priorities for clinical review topics and has based their selection on what he terms ABNA - achievable benefit not achieved. At Westmead Hospital this approach has been utilised to good effect in both medical and dental applications.

The methodology of quality assurance used in medicine has been shown to be equally applicable to dentistry. Lembcke (1956) pioneered the scientific audit of health care and his criteria audit has been a common tool in quality assessment ever since. The use of criteria mapping with its advantages of flexibility in the analysis of the decision-making aspects of diagnosis and treatment is particularly suitable in dentistry and excellent examples have been produced, under the authorship of Bailit and Gotowka, in the American Dental Association's publication "Guidelines for the Development of a Quality Assurance Audit System for Hospital Dental Programs". We have seen that utilisation reviews can be used as a predictor of clinical performance and there are many circumstances in which the data needed is readily available. The formal review of cases is an inherent part of hospital protocols and can lend itself also to the dental situation. Concentration on retrospective reviews is the norm although there is a need to develop guidelines which can be used prospectively in the assurance of sound health care.

Patient satisfaction surveys should not be ignored. They need to be

valid and reliable and there has been some criticism of the reports of some surveys in this regard. Reliable tested methods have been reported, however, and their application can complement other quality assurance programmes, although the relationship between such exercises and the actual quality of care has been questioned by some. It is considered that they are not just a useful public relations and marketing exercise but patient satisfaction surveys can act as a problem-seeking, problem-solving focus in the review of dental care.

One needs to go further than just assess the quality of care. Unless corrective action is taken with regard to observed deficiencies, such exercises do not meet the definition of quality assurance. The American Dental Association has produced an excellent model which illustrates this requirement and it has been detailed in this treatise.

While the quality assessment exercise itself has been seen in some circumstances to bring about desirable change, one must consider the part played by the traditional measure of continuing education. There has been much evidence shown to question the effect of continuing education programmes. They fulfil a function of supplying information but, in many cases, the problem is not one of ignorance but one of attitude or behaviour. Unless the programmes are able to effect change in these aspects they have severe limitations as a quality assurance measure. Naftalin (1973) has shown up some of the problems in education programmes where evaluation by participants rests heavily on the presentation rather than the substance or, indeed, the topic chosen. There is a tendency for continuing

education to be regarded as if it was a marketing exercise with concentration on those topics of most interest to likely participants. There is a need to base such programmes on areas of need and to concentrate on problem-solving aspects rather than merely the provision of what might be regarded as professional entertainment. In the U.S.A., moves to require mandatory continuing education participation as a quality assurance measure appear to have foundered, particularly in dentistry. In 1969, Minnesota became the first State to require attendance at a stated level for dental relicensure and by 1975 five other States had followed suit with a further 28 having the matter under consideration. Yet by October 1986, the original enthusiasm seems to have abated - only 14 States listing such requirements, less than half those adopting this approach for medical relicensure.

The motivation of those participating in continuing education deserves to be questioned. There is no guarantee that those who need the information will be represented in the audience, particularly if topics are chosen on the basis of their appeal. Such an approach only tends to encourage "preaching to the converted" as can often be seen with lectures arranged by specialist societies.

Chambers and colleagues have carried out some interesting studies into the subject and have shown that resulting improvements in behavioural change are far from evident, even when courses are more "technical" and less "esoteric". They found also that tutors seriously misjudged the motives of those attending, mistakenly assuming that the participants were interested in making changes to

their professional practice. In fact, most attended because of their "interest" in the subject and the seeking of information to allow changes in practice was very lowly rated as a reason for attendance. In 1974, Hamilton and others found that pre-course motives were important in effecting change. In other words, those who attended to seek the required information to change were more likely to do so subsequently. Chambers and colleagues (1976) reported the same conclusions.

One method of effecting attitudinal or behavioural change has been shown to be the provision of some form of feed-back to the participants in a quality assurance programme. A number of studies have been described which have shown how effective this mechanism is in altering dental practice behaviour, commencing with one in 1972 reported by Gibbs et al (1977) and supported in work done by Milgrom, Weinstein and colleagues in 1976 and 1977 in Washington State. Feed-back was an integral part of the system used in the Sunset Park Study to good effect and in North Carolina, Strauss et al (1982) have reported similar beneficial effects of feed-back as did Kress and Silversin who explored the same subject in the National Quality Assurance studies.

The introduction of dental quality assurance was feared by some to bring with it problems of acceptance by both dentists and their patients, not to mention the alleged potential for disturbing the dentist-patient relationship. There is no doubt, however, from research carried out in the U.S.A. that these fears are unfounded. Generally it has been found that dentists participating in quality

assurance programmes have accepted the exercise well and with very few exceptions have indicated their willingness to participate in further projects. Patients also have reacted positively to dental quality assurance and have accepted any deficiencies assessed without losing respect for their dentist. These programmes have shown no indication of any adverse effect on the dentist-patient relationship.

There have been variable reports about the effect of quality assurance on costs. Although there are some indications that some programmes may effect cost savings, most experts seem to think that there would be increased costs associated with such activities. Of course, in the U.S.A. the tendency for direct assessment of patients does undoubtedly add to expense. If one assumes then that there may be additional costs involved with quality assurance over and above any resulting cost reductions, it might be well that these increases are an acceptable sequel to improvement in care.

One of the best ways to avoid unnecessary expenditure is to select only those practitioners for review whose treatment patterns indicate more likelihood of deficiencies. The use of such screening mechanisms have been endorsed for some time commencing with Baillet and Raskin in 1978. Two of the thirteen National Quality Assurance studies were devoted to establishing suitable screening mechanisms by identifying particular practice patterns which might be associated with deficiencies in care.

The management of large amounts of data associated with quality assurance studies lends itself to the employment of computers. They

are particularly useful in utilisation reviews and enable the operation of the screening mechanisms described in the previous paragraph. Bailit and colleagues at the University of Connecticut have recently been granted funding under the DEMCAD project to study such computer applications.

Review of care by peers brings with it the question of legal protection of the assessing dentists against action under defamation laws. There is also the problem of litigants being able to subpoena minutes of quality assurance meetings where frankness and honesty are necessary for constructive discussion. The U.S. Government has addressed these problems with recent legislation in this regard and, although not resolved with absolute certainty, it seems that the N.S.W. government is moving in the same direction. Such protection is mandatory if quality assurance programmes are not to be inhibited.

Towards the end of this treatise, five recent quality assurance systems were discussed and, earlier, an outline had been given of the approach taken by the American Dental Association in its published guidelines for hospital dental programmes. The latter instrument as did the systems of the California and Michigan Dental Associations utilised explicit criteria lists for the audit of care. They concentrate basically on process audit and while the American Dental Association guidelines were directed to record audit, those methods outlined by the two state associations were concentrated primarily around the direct review of patients. The Oral Health Status indices developed by Marcus and his colleagues have introduced a specialist measure of dental health outcome which might be suitable for

incorporation in future dental quality assurance evaluations. The Sunset Park programme did include an analysis of dental health status utilising standard epidemiological indices, in addition to direct clinical assessment, record and radiograph review and a simple assessment of the patient's perception of treatment. In some ways, this programme led the way in approaching quality assurance from a number of angles but it is probably fair comment that it errs on the side of being a little too simplified in some aspects. It is, nevertheless, an excellent evaluation instrument for general dental practice, either in the public or private sectors. The state-of-the-art in dental quality assurance is probably represented by the first part of the DEMCAD project. It covers all dimensions of care - structure, process and outcome and promises to be the most complete of all systems so far developed. Unfortunately, although the project is now complete, it has not yet been released for outside scrutiny by the American Dental Association.

10 RECOMMENDATIONS

Consequent upon this review of the development of quality assurance in health care and, in particular, the dental applications, it is possible to postulate the following recommendations.

1. There is an overdue need to introduce quality assurance programmes in Australia.
2. These programmes should not be confined to the hospital environment as there are many applications available which are suitable for private practice.
3. It is important that moves in this direction come, in the first instance, from the profession itself. If it remains unwilling to address these matters, government intervention will be inevitable.
4. The evaluation of dental care should include matters of structure, process and outcome.
5. When selecting topics for review, particular emphasis should be placed on a problem-solving approach.
6. The development of explicit criteria and setting of appropriate standards must be a requisite of all quality assessment instruments.

7. The direct assessment of patient care by peers should be confined to those instances where it is economical to do so.
8. Self assessment programmes should be encouraged, particularly in private practice where the implementation of the formal review process is more difficult.
9. Record audits, including the analysis of radiographs and study models should be an essential part of the audit exercise.
10. The standard methods of quality of care audit used in medicine, ie. criteria audit, utilisation review and formal case review, may be applied to dentistry.
11. Valid patient satisfaction surveys are to be encouraged as part of the quality assurance project.
12. Where applicable, the review process should be focused to likely areas of deficiency by screening of available data, in order to save time and reduce costs.
13. Quality assessment requires corrective action to be initiated to complete the exercise.
14. The deficiencies of the traditional approach to continuing education as a means of improving health care should be recognised and there is a need for programmes of education to be concentrated on problem-solving rather than mere professional

entertainment.

15. The institution of feedback to those being reviewed is to be encouraged as a proven method of promoting required attitudinal and behavioural change.
16. The introduction of dental quality assurance should not be delayed by unjustifiable fears that it will interfere with the dentist-patient relationship.
17. Increased costs associated with implementation of quality assurance programmes must be minimised by attention to methodology - in particular by avoidance of costly peer review, the use of computers when appropriate and the promotion of the focused audit.
18. Governments must legislate to provide for protection of participants in peer review against the laws of defamation and to ensure that the confidentiality of records of quality assurance meetings enables them to remain outside the normal processes of litigation.
19. All dental institutions should have demonstrable quality assurance programmes.
20. The Australian Dental Association would be well served to follow the example set by the American Dental Association in fostering the development of dental quality assurance so that it can be

prepared to undertake the responsibility for monitoring the quality of dental treatment in private practice as an alternative to this being conducted by government or semi-government organisations.

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APPENDIX 1 Glossary of dental quality assurance terminology

Source: American Dental Association (1983).
Office of Quality Assurance Guidelines for the
Development of a Quality Assurance Audit System
for Hospital Dental Programs. p30-33.

ABSTRACT	A data collection form used to record selected information on a patient. This information is often recorded in a coded form. The usual source of information is the patient's dental record.
ACCEPTABILITY	Overall assessment of the dental care available to a person or group includes accessibility, cost, quality, results, convenience and attitudes of both dentists and patients.
ACCOUNTABILITY	An obligation to periodically disclose appropriate information in adequate detail and consistent form to all contractually involved parties.
ACCREDITATION	Formal recognition by an agency or organisation which evaluates and recognises a program of study or an institution as meeting certain predetermined standards; may be either permanent or for a specific period of time. (Also see CERTIFICATION.)
ADEQUATE	Reasonable, sufficient and satisfactory; minimally acceptable according to pre-set standards.
ADMISSION CERTIFICATION	A form of utilization review in which assessment is made of the necessity - based on health status and treatment needs - of a patient admission to a hospital or other inpatient institution; health status considerations include both physical and psychological conditions.
APPROPRIATE	Determination that the service being provided is suited for the condition that is present; suitable for a particular person, group, community, condition, occasion and/or place; proper.
ASSESS	See QUALITY ASSESSMENT.
ASSURANCE	See QUALITY ASSURANCE.
AUDIT	The qualitative or quantitative review of dental services, rendered or proposed, which may take the form of comparison of patient records and claim form information; a patient questionnaire, or patient examination before, during or after treatment.

CERTIFICATION	The process by which a governmental or nongovernmental agency or association evaluates and recognizes a person who meets predetermined standards; sometimes used with reference to material or services. "Certification" is usually applied to individuals and "accreditation" to institutions. Current examples of certification programs in dentistry include those for dental specialists, dental assistants, and dental laboratory technicians. (Also see ACCREDITATION.)
CREDENTIALING	1. The recognition of professional or technical competence. (See ACCREDITATION, CERTIFICATION.) 2. Establishment of level and scope of clinical privileges on a hospital's staff. 3. Licence awarded in lieu of examination.
CRITERIA	Predetermined rules or guidelines for dental care - developed by dentists relying on professional expertise, prior experience and the professional literature - with which aspects of actual instances or dental care may be compared. Explicit Criteria are pretermained, specific and measurable; Implicit Criteria are implied or understood but not directly expressed.
EFFECTIVENESS	The degree to which action(s) achieve the intended health result under normal or unusual circumstances.
EVALUATION	An examination of and judgement about the quality of services or programmes based on predetermined criteria/standards; also sometimes used with respect to individual services.
FOCUSED REVIEW	Review that concentrates on a perceived problem area that may be a specific diagnosis, procedure, practitioner(s), patient(s) or other limited scope topic; done in lieu of a more comprehensive review or as a preliminary to it.
MEDICAL CARE EVALUATION (MCE STUDY)	See PATIENT CARE EVALUATION STUDY.
MORBIDITY	State of being diseased; can be used as an outcome measure such as number of decayed, missing and filled teeth.
MORTALITY	Death rate.

NORMS	Numerical or statistical measure of usual observed performances when related to health care provided to a given number of patients over time; often used in the building of profiles; can be the average or the median or some other cut-off point in a series.
OBJECTIVE	Measurable or based on something which was measured. (Also see SUBJECTIVE.)
OUTCOME MEASURE	1. A measure of the quality of dental care in which the standard of judgement is the attainment of a specified end result; can be short term, intermediate or long-term. 2. Description of the health status of a person or group resulting from interaction or lack of interaction with dental professionals.
PATIENT CARE EVALUATION STUDY	A process, usually performed retrospectively, in which an in-depth assessment of the quality and/or nature of the utilisation of an aspect of health care services is conducted, often by means of record audit or of observation; corrective action is taken where indicated and a subsequent analysis is made of the effect of the corrective action.
PATIENT SATISFACTION	As an outcome measure of quality, refers to the perception of the patient(s) of one or more aspects of a dental care system.
PEER REVIEW	Formal assessment by dental professionals of the quality of dental services performed.
PEER REVIEW SYSTEM	A professional sponsored and operated system for the rendering of professional judgement on disagreements between or among dentists, patients or fiscal intermediaries regarding quality of care and related matters.
POST TREATMENT EVALUATION	Any type of assessment conducted after a course of treatment has been completed on a patient(s), such as profile analysis or record audit.
POST TREATMENT EXAMINATION	A clinical examination of a patient conducted for assessment purposes after a course of treatment has been completed.
PROCESS	The activities of health professionals in the management of patients; a dimension of quality of care which measures what the dentist or dental care system does in the management of the patient's dental health, refers to the procedures and therapy performed and commonly includes patient history, diagnosis and treatment planning, and patient-dentist interaction.

PROFESSIONAL JUDGEMENT	Decisions or evaluations by a dentist on professional matters based on his/her knowledge and experience.
PROFILE	Aggregated data in a format which displays patterns of dental services provided over a defined period of time; generally concerned with utilization rates but can include attention to other aspects of dental care profiles can be created for a practitioner(s) or patient(s) as well as a program(s).
PROFILE ANALYSIS	Evaluation of profiles to identify patterns of dental care services for purposes of programme administration and/or quality review.
PROSPECTIVE REVIEW	A screening mechanism for conducting the review process prior to the receipt of dental care to assure necessity and appropriateness.
QUALITY OF CARE	A concept embracing the full range of activities that pertain to the interrelationships of persons with a dental care system. It focuses on the major components of providing and receiving dental care such as the personal interactions of the practitioner and patient, the art and science of diagnosis, treatment planning and treatment, and, finally, the technically measurable aspects by the care provided. It is directed towards making care effective by maintaining optimum oral health of the person or improving less than optimum oral health. It is concerned with the whole person and the full context within which the dental care actions take place. It needs full participation by both the patient and all dental health personnel assisting that patient. It is related to - and potentially limited by - the resources which society and individuals choose to allocate to dental care . (Also see QUALITY ASSURANCE SYSTEM.)
QUALITY ASSESSMENT	The measurement of quality; generally includes selecting an aspect of dental care or the dental care system to be evaluated, establishing criteria and standards for quality dental care, and comparing what has actually been done with the criteria and standards.
QUALITY ASSURANCE	All those activities intended to improve the oral health of persons. (Also see QUALITY OF CARE and QUALITY ASSURANCE SYSTEM.)
QUALITY ASSURANCE SYSTEM	A formally organised sequence of activities in dentistry which combines assessment of the existing situation, judgement about necessary changes, development of plans to effect such changes, implementation of these plans, and re-assessment to

determine that the desired changes have taken place.

**QUALITY
REVIEW
COMMITTEE**

A committee established by a professional organisation or institution to assess and/or assure quality. Unlike peer review committees, it can function on its own initiative on a broad range of topics.

RELIABILITY

1. In research, the reproducibility of an experimental result; the extent to which an experiment, test or measuring procedure yields the same result during independent, repeated trials.
2. The ability of two or more observers to examine the same data and arrive at a similar judgement within pre-defined bounds concerning quality of care.

**RETROSPECTIVE
REVIEW**

Assessment of quality of care after care has been rendered. (Also see POST-TREATMENT EVALUATION.)

**RISK
MANAGEMENT**

A programme designed to identify, contain, reduce or eliminate the potential for harm to patients, visitors, and employees and the potential financial loss to the facility if a compensable event occurs; usually concerned with the delivery system and/or site rather than practitioner performance.

SCREENING

The initial process of separating from a group those that do not conform to predetermined quality guidelines and thus require additional investigation.

STANDARDS

Professionally developed expressions of the rate of acceptable variation in quality of care; generally with respect to specific services.

STRUCTURE

Dimension of quality that explores the setting within which care is provided; includes facility, equipment, administration, and credentials of personnel.

SUBJECTIVE

Non-measurable; based on something which was not measured. (Also see OBJECTIVE.)

TRACERS

A topic(s) selected for appraisal in programmes which seek to assess the quality of dental care chosen because it is believed that the quality of care given for the topic(s) is representative of the quality of care given generally; the topic(s) chosen can be from such areas as diagnosis, treatment, disease entities, or administrative procedures.

UTILISATION
REVIEW
(UR)

Analysis of the necessity, appropriateness and efficiency of medical and dental services, procedures, facilities and practitioners; in a hospital, this includes review of the appropriateness of admissions, services ordered and provided, length of stay, and discharge practices, on both a concurrent and retrospective basis.

VALIDITY

The degree to which data or results of a study are correct or true. (Also see RELIABILITY.)

Appendix 2 American Fund for Dental Health
National Dental Quality Assurance Program
of Studies in Dental Quality Assurance

1. COMPUTER APPLICATIONS FOR DENTAL QUALITY ASSURANCE

Organisation: California Foundation for Dental Health

Investigators: Daniel F. Gordon DDS
 Ronald G DeVincenzi DDS
 Gunnar Ryge DDS
 Linda Stein

2. RETROSPECTIVE COST/EFFECTIVENESS ANALYSIS OF DENTAL TREATMENT PATTERNS

Organisation: University of Connecticut

Principal Investigator: Howard L. Bailit DMD PhD

Project Director: Joanathon Clive

3. ADAPTATION OF PACE FOR DENTISTRY

Organisation: American Dental Association Health Foundation

Principal Investigator: Joan F. Cohen

4. A COMPARISON OF TWO QUALITY REVIEW SYSTEMS, PATIENT PERCEPTIONS OF QUALITY AND PROVIDER ATTITUDES TOWARDS QUALITY

Organisation: University of North Carolina

Investigators: Roy L. Lindahl BS DDS MS
 Ronald P. Strauss BA DMD MA PhD
 Denis P. Gillings BSc PhD
 Mary B. Barksdale BA
 Susan M. Stone BA

5. A STUDY OF THE EFFECT OF PATIENT FEEDBACK ON SATISFACTION WITH DENTAL CARE

Organisation: Harvard School of Dental Medicine

Investigators: Gerard Kress PhD
 Jacob Silversin DMD DrPH

6. THESIS AND DISSERTATION SUPPORT FOR RESEARCH AND QUALITY ASSURANCE IN DENTISTRY.

Organisation: University of Buffalo Foundation, Inc.

Principal Investigator: Robert M. O'Shea PhD

7. COMPREHENSIVE UNDERGRADUATE QUALITY ASSURANCE PROGRAM

Organisation: University of Minnesota

Investigators: Lawrence Meskin DDS PhD
Michael J. Loupe PhD
Anthony J. Di Angelis DMD MPH
Muriel J. Bebeau PhD

8. THE ROLE OF CONTINUING EDUCATION IN QUALITY ASSURANCE

Organisation: University of Oklahoma

Principal Investigator: Frances S. Watkins EdD

9. IMPLEMENTATION AND TEST OF SUNSET PARK QUALITY ASSURANCE SYSTEM

Organisation: Lutheran Medical Center, New York.

Co-Principal Investigator: Neal A. Demby DMD MPH
Investigators: Murray Rosenthal DDS

10. DEVELOPMENT OF ORAL HEALTH STATUS MEASURES FOR QUALITY ASSURANCE

Organisation: UCLA School of Dentistry

Investigators: Marvin Marcus DDS
Jay A. Gershen DDS
A.L. Koch DDS

11. ONGOING ASSESSMENT OF THE QUALITY OF DENTAL CARE
- DEMONSTRATION OF A STATEWIDE PEER REVIEW MECHANISM

Organisation: Michigan Dental Association

Project Director: Matthew E. Boylan Jr.

Consultant: John G. Nolen DDS

12. ADAPTATION OF MEDICAL QUALITY ASSURANCE METHODS TO OUTPATIENT DENTAL CARE.

Organisation: University of Connecticut

Principal Investigator: Howard L. Bailit DMD PhD

13. DEMONSTRATION AND EVALUATION OF A DENTAL QUALITY ASSURANCE MODEL IN A PREDOMINANTLY RURAL STATE - MONTANA

Organisation: University of Washington, School of Dentistry.

Project Personnel: Peter Milgrom DDS
Philip Weinstein PhD
Lawrence Owens DMD
Peter Ratener MS

Appendix 3 Quality assurance and cost containment
of oral health care

Source: Topics presented at the Symposium held at the
 School of Dentistry, University of Michigan,
 Ann Arbor, Michigan,
 October 18-19, 1985.

TOPICS AND PRESENTERS

THE ROLE OF THE FEDERAL GOVERNMENT

Carolyn K. Davis PhD

THE ROLE OF LABOR

David C. Beier

THE ROLE OF INDUSTRY

Beach B. Hall MBA

THE ROLE OF THE INSURANCE CARRIERS

John F. Field DDS

QUALITY ASSURANCE OF ORAL HEALTH

Avedis Donabedian MD

THE ROLE OF TESTING AGENCIES IN ASSURING QUALITY OF ORAL HEALTH CARE

William K. Collins DDS

QUALITY ASSURANCE: HOW IT IS ADDRESSED BY THE CANADIAN DENTIST PRACTICING IN THE PROVINCE OF QUEBEC

Charles E. Gosselin DDS

THE ROLE OF THE COURTS IN QUALITY ASSURANCE AND THE EFFECT OF MALPRACTICE LITIGATION ON COST OF ORAL HEALTH CARE

Burton R. Pollack DDS, JD

EDUCATORS ROLE IN QUALITY ASSURANCE AND COST CONTAINMENT

Howard L. Bailit PhD

REVIEW OF RESEARCH/QUALITY ASSURANCE

John Klyop MS

THE PROFESSION'S RESPONSIBILITY TO QUALITY ASSURANCE AND COST CONTAINMENT

John L. Bomba DDS

