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Kopsala, Jaana Tellervo

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QUALITY ASSURANCE AND DENTAL PATIENT RECORDS

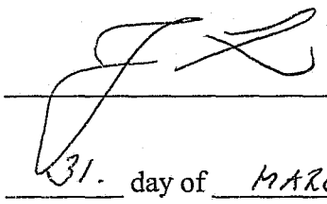
Jaana Tellervo Kopsala

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Dentistry in the branch of Community Dentistry.

Johannesburg, 2000

DECLARATION

I, Jaana Tellervo Kopsala declare that this research report is my own work. It is being submitted for the degree of Master of Dentistry in the branch of Community Dentistry in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.



31. day of MARCH, 2000

DEDICATION

In memory of my father

Olavi Aatos Kopsala

1933 – 1996

ABSTRACT

A well designed, adequately documented and properly maintained patient record is an important tool for quality assurance. The aim of this cross-sectional, descriptive study is to specify and quantify the adequacy of dental patient record keeping and its usefulness for quality assurance purposes. Two study sites were chosen: Alexandra Public Dental Clinic in the township of Alexandra, Johannesburg, and the Department of Restorative Dentistry, University of the Witwatersrand, Johannesburg. The study population included all patients who attended either clinic in 1998 and 1999. One hundred names qualified for inclusion from the 400 names randomly drawn from the records of the Department of Restorative Dentistry and another 100 from the random selection of 120 names from the Alexandra Clinic. A validated check-list encompassed eight key areas as follows: patient identification, medical, and dental history, clinical examination, radiographs, diagnosis, treatment plan and progress notes. This was used to measure the adequacy of dental patient record keeping.

The patient records of both groups had incomplete and inconsistent documentation. Information such as the identity of patients, diagnosis, treatment plan and procedure, materials used, and radiographic information were often missing. Non-existent record cards and often incomplete and inconsistent information gathering reflected a lack of attention to, and standardisation of, dental record keeping in these two study sites.

Adequate patient records lead to complete and accurate documentation of the dental care process. At both study sites, the patient record form needed to be revised in order to meet standard requirements.

In general, documentation at both clinics was poor. None of the patient records fulfilled all the variables included in the study. At the Alexandra Clinic patient records were deficient in documentation in all sectors. The Department of Restorative Dentistry provided patient records that adequately demonstrated the dental care process, but were

lacking in accuracy and completeness. Lack of standardisation and non-uniformity of information was evident at both of the clinics.

Adequate patient records that are completed correctly provide the basis for assessment of the dental care process. The problem orientated approach to dental care is best assured by using dental patient records which divide the dental care process into four particular categories: the assessment, the diagnosis, the treatment plan and the provision of treatment. At the Alexandra Clinic, the inadequate patient records apparently contributed to inferior documentation of the dental care process. Documentation style also reflected the given treatment regime, which was mainly pain relief procedures. The dental patient record at the Alexandra Clinic did not follow the problem orientated approach, leaving most of the burden on adequate documentation for the oral health care professional to demonstrate the dental care process. Lack of understanding of the purpose of complete and accurate documentation was evident at the Department of Restorative Dentistry.

Owing to inadequate patient record design at the Alexandra Clinic, and due to inadequate documentation in both of the clinics, it was impossible to use dental patient records for quality assurance purposes. Whether these deficiencies affect the quality of care can only be speculated.

The patient record is a very important prerequisite for quality assurance in dental care. The government and the professional organisations such as the Health Professions Council of South Africa and the South African Dental Association should be largely responsible for the creation, implementation and monitoring of the policies for quality assurance. These institutions jointly should promulgate rules about adequate patient record keeping. There is a further need for better training in formulary for dental students and postgraduates. There is also a necessity for more intensive monitoring and evaluation in the field.

ACKNOWLEDGEMENTS

I would like to thank all those who assisted me in my work. Particularly, I wish to express my gratitude to the following:

- my supervisor, Professor Michael Rudolph;
- Dr Terri-Lynn Cohen, Dr Patrick Ruck and Professor Sid Setzer, for their co-operation and assistance;
- Miss Helen Lewis, for her invaluable suggestions; and
- the staff at the Alexandra Dental Clinic in the Central Wits Region, and the Department of Restorative Dentistry of the University of the Witwatersrand, Johannesburg for their kind co-operation.

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1.0 INTRODUCTION

1.1 Quality assurance

Health care services have several different objectives. They need to be effective, efficient, accessible and adequate. Quality is only one objective amongst the others. Quality of care can be defined in different ways according to its different elements. The concept of quality is multi-dimensional. To achieve sound results in quality assurance the concept of 'good quality health care' has to be first defined (Crosby, 1979; Donabedian, 1988). Different role-players might have different expectations and demands for what they consider good quality health care.

A medico-technical definition was until recently, most commonly used which emphasised current medical knowledge and technological achievements when providing health care services to patients. This approach presented the providers' points of view, but the latest approach is emerging which gives emphasis to the needs, expectations and perceptions of patients (Donabedian, 1988; Demby, Rosenthal & Angello, 1990; Vuori, 1995; Oskowitz, Schneider & Hlatshwayo, 1997). High quality health care services include consideration of costs, as this aspect is now considered to be part of quality. Unnecessarily expensive care, even if it is of high medico-technical quality, is considered to be poor quality treatment. Increased quality of service might decrease or even be considered unacceptable when the cost of quality increases or escalates greatly. Good quality health care is not a question of maximisation but rather optimisation (Crosby, 1979; Vuori, 1995).

Quality can be improved in many different ways. Quality assurance refers to the ways in which the quality of health care services is measured and improved. Historically, quality assurance has evolved through three stages. The first focused on quality control, the second was quality assessment, and the third and final stage was quality assurance (Vuori, 1995).

Quality assurance is an ongoing process (Widström, 1995; Vuori, 1995), which includes the following phases: mapping of problems, prioritisation of problems, analysis of problems,

mapping of corrective measures, correction of problems and re-evaluation. Quality assurance is not the specific responsibility of any one functionary; it is a joint venture and the ethical and professional duty of every health professional (Vuori, 1995).

The main objective of quality assurance is to increase the quality of care. It can be used for other purposes as well; for quality research purposes and for the provision of health care services. It can also help in planning and evaluation of health care services, and for consumer protection. If it is being used for something other than to enhance the quality of care, then all stakeholders should be aware of the purpose.

The use of quality assurance has changed from primarily investigating current mistakes to an overall improvement of quality. Instead of being involved only to deal with individual negative elements, the aim is to shift the overall distribution curve of quality of health care services in a positive direction. The emphasis in corrective measures has changed from individual mistakes to improvement in the whole system so as to provide good quality health care. Quality assurance follows a 'zero defect' approach, in an attempt towards a successful outcome the first time (Crosby, 1979).

Quality assurance involves a combination of measurements and implemented improvements according to the measurement results. Different aspects of the health care can be measured, including structures, and processes or outcomes. This can occur either internally or externally. In spite of these different approaches the main principle is based on a comparison of measurement results with a good quality model (Vuori, 1995).

As mentioned, quality assurance is divided into structure, process and outcome analysis. Structure analysis compares inputs according to predetermined standards, on the pretext that sound inputs produce positive outcomes. The most common forms of structure analysis are used in the registration of personnel with an acceptable institution, or the accreditation of an institution.

Process analysis is based on the assumption that, if correct, updated protocols are used in care, the likelihood of a positive outcome increases. The most common method is that of a medical audit, which is conducted through the use of patient records. Outcome analysis is focused on the end result of the care. Positive outcomes are more difficult to measure than negative ones, which is why the most common ways of measuring it are indirect, such as mortality and complications.

There are differing opinions about the usefulness of different analysis methods. Currently, structure analysis is seen as the least reliable, and outcome analysis is considered best suited to quality assurance purposes (Vuori, 1995). Outcome analysis shows best which areas need attention. To find ways to improve quality it is often necessary to conduct process analysis, and sometimes structure analysis, because a poor outcome is often the result of structural or procedural deficiencies (Vuori, 1995). Process analysis is as reliable or unreliable as its most important information resource, the patient record. An incomplete or incorrect patient record is a sign of poor quality care. In principle, outcome is the surest measurement of health care services but the difficulty of measuring and comparing expected results with achieved results limits its practical usefulness.

All the quality assurance methods are necessary. Outcome analysis identifies the areas that are in need of improvements and structure and process analysis help to ascertain which methods will achieve them (Jerge & Orlowski, 1985).

According to the principle of quality assurance, the first task is to recognise problems involved with the quality of care and after that to develop a "good quality" model for the most important problem (Vuori, 1995, p. 74). The good quality model meets those criteria which are considered to be important to achieve successful results. Each criterion must accord with a predetermined standard which differentiates good from poor (Bailit, 1985; Vuori, 1995).

A good quality model is necessary to measure quality of care (Bailit, 1985; Varsio & Vehkalahti, 1996). It includes structural, procedural and outcome elements which influence the end result of the care. Each of these elements should have set criteria which define the

standards. The criteria are based on what the health service system should have in terms of resources to provide services. The criteria may be either implicit or explicit, problem based or general, ideal criteria or experience based criteria. Currently, the most commonly applied criteria are explicit, problem, and experience based criteria. However, standards are subjective. Standards may be set according to existing research results, information from literature, best operating practices or own best existing results. Standards have to be set high enough to promote the enhancement of quality, but at the same time they have to be realistic and achievable. When choosing and setting criteria and standards, every role-player should be involved in order to achieve the optimal end result (Bailit, 1985; Vuori, 1995; Widström, 1995).

Quality assurance is useful and meaningful only when it is focused on the quality issues, which were jointly agreed, accepted and prioritised. Mapping problems and prioritising them are important aspects of quality assurance (Vuori, 1995).

Many problems appear to be quality related but in reality they are either economic, administrative or scientific problems (Vuori, 1995). Not all problems are equally important. Limited resources have to be directed to solve the most important problems. In prioritising problems the most important criteria might be, for example, medical or social input (Donabedian, 1982).

Problems can be solved only if the reasons for them are known and understood. For this, proper problem analysis is needed. Analysis needs to be carried out to ascertain who is affected by the problem, and when and where the problem occurs. The aim of analysis is an accurate description of the problem (Vuori, 1995).

The optimal use of results from quality assurance has to be planned. In order to implement improvements an appropriate blueprint is needed. This needs to delineate responsibilities and timelines, as well as to regulate process monitoring and evaluation. After the implementation of a quality assurance programme, there needs to be a re-evaluation of the problem to check that expected targets are achieved (Bailit & Gotowka, 1983; Vuori, 1995; Widström, 1995). In

most cases the results following implementation of measures to rectify quality problems are enough to produce improvements.

Correct, reliable and logically arranged information resources make it possible to detect problems easily, which could suggest quality deficiencies. For routine quality assurance quick, easily conducted and cost efficient collection of information are needed preferably from one source. Collection of information should not increase the workload of health care personnel. The most effective method is to capture the required data and information in the course of routine work (Vuori, 1995).

Some commonly used sources of data and information for quality assurance purposes are clinical statistics and patient records. Clinical statistics are suitable for problem mapping, to find out reasons for the problems and to seek improvements. Patient records are an ideal source of information as they can be used to reconstruct the course of treatment (Vuori, 1995). However, this in reality is often not the case as patient records are often lost, or insufficient. Inadequate patient records lower the quality of care and may be indicative of more serious problems (Jerge et al., 1985).

1.1.1 Quality assurance and dental patient records

According to Maryniuk (1989) quality assurance has two goals in dentistry. It should lead to continuous improvement in the work of all dental practitioners, and the removal of those who prove to be incompetent. Through correct assessment, including the identification of strengths and weaknesses, the quality of dental care should be assured (Marcus, 1990). According to Hokwerda (1991) a quality assurance policy and the implementation of a quality assurance programme in dentistry should improve oral health and increase patient satisfaction.

Various methodologies have been used to evaluate the quality of dental services, and direct and indirect review methods have been used in dental quality assurance programmes. The disadvantages of direct review, such as clinical assessment are its time-consuming and often costly nature, its requirement of clinical facilities, and the limited number of patients who can be examined. Direct review is based more on subjective assessment. Indirect reviews, such as

patient records and profile reviews are less costly, allow more cases to be examined, and do not need clinical facilities or the involvement of professionals. Indirect review is based more on objective assessment. A focus on the technical quality of dental work is not sufficient; it is also necessary to evaluate the technical aspects of the care through clinical examination (Bailit, 1985; Marvin, 1985; Grönroos & Masalin, 1990; Vuori, 1995; Masalin, 1995).

Dental quality encompasses the aspects of structure, process and outcome (Bailit, 1985). The process of care includes four different areas: patient history and assessment, diagnosis, treatment planning and actual treatment. All these aspects have an impact on the outcome of dental care. To evaluate the process of care, patient records are crucial as a way of reconstructing past history and treatment. Patient records allow an evaluation of the care process, the quality of care and the adequacy of specific treatment methods (Jerge et al., 1985; Oberbreckling, 1993; Chasteen, Cameron & Phillips, 1996). Patient records reveal whether an adequate and complete patient history was collected that was sufficient to justify diagnosis, whether a treatment plan was properly drawn up considering the existing information and diagnosis, whether the treatment plan was prioritised and correctly sequenced, and whether the overall care was appropriate and adequate.

Regarding the question whether there is a relationship between the quality of dental care and adequacy of patient records, it is reasonable to assume that precise record keeping does not verify a high quality of dental care, but that high quality dental care is more likely to produce adequate patient records. A correlation between the provision of sound medical care and precise record keeping has been established by several studies (Jerge et al., 1985).

A properly structured and maintained patient record is relevant to patient safety and is an essential instrument for continuity and high quality care. Currently in South Africa, dentists are responsible for keeping accurate and up to date patient records (Department of Health, 1998). A patient record is a legal document. It is the basis for judgement in matters of responsibility and malpractice (Machen, 1990; Rene & Owall, 1991; Dunne & Brown, 1991; Oberbreckling, 1993; Chasteen et al., 1996; Heydt, 1996). Responsibility for the provision of high quality care, and proof of this, rests on the provider of the services. To demonstrate this

there has to be complete and accurate documentation. Even that is not sufficient if the patient record form is not adequate. If record forms are inadequate, record revision should be conducted in order to meet the legal requirements. Only adequate records can provide the basis of an assessment regarding the dental care process, quality and outcome (Jerge et al., 1985).

Problem orientated dental care can be best demonstrated by using dental records, which illustrate patient care as a rational and analysable process (Jerge et al., 1985; Valenza, 1994). The dental care process can be categorised into four discrete compartments: patient history and assessment, diagnosis, a treatment plan, and the provision of treatment. All these contribute towards the outcome. Adequate patient records should encompass the following aspects; space for a database, problem list, treatment plan, progress notes and, finally, outcome. The information provided should be complete and accurate. Logically, every stage contributes to the next one, towards the final favourable outcome. Adequate dental records are easy to use and interpret. They provide a place for every aspect of the care process, and can be easily updated (Jerge et al., 1985; Oberbreckling, 1993).

- Dental patient record audit

The patient record audit can be used in quality assurance programmes to assess the adequacy of patient care or deficiencies in the quality of care (Jerge et al., 1985; Chasteen et al., 1996). The findings should lead to the implementation of relevant improvements, feedback and re-evaluation. The dental record audit can be broad or narrow in focus, depending on the purpose of the audit (Jerge et al., 1985). In the beginning of quality assurance programmes the focus is normally broad so as to ascertain the major areas in need of improvement. The record audit can focus on the entire dental care process or on specific elements of the care. There are two different kinds of patient record audits: broad-based (including procedural or analytic), or focused audits. These enable assessment of overall compliance with procedural standards and with the general level of quality of care. In a procedural audit, emphasis is on adequate patient care as regards the processing of documentation. It assesses whether the criteria and standards were met, and whether possible deficiencies adversely affected the quality of care. To do this, the practice should have explicit criteria and standards, and these are best provided in detailed

protocols. Analytic audits focus on the quality of care, which needs adequate patient charts and adequate documentation (Chasteen et al., 1996). Procedural audits can be conducted by non-professionals because of the explicit criteria and standards provided, but the analytic audit always has an element of subjectivity, so a professional auditor is needed. Focused audits focus narrowly on a specific aspect of dental care, for example medication that is prescribed for acute periodontitis (Varsio et al., 1996; Varsio & Vehkalahti, 1997).

1.2 Context of health care in South Africa

1.2.1 The primary health care approach and district health system

A challenge currently facing the South African health system is the implementation of a comprehensive programme to ensure the availability of high quality primary health care to all citizens. By co-signing with 176 other countries, the Alma Ata Declaration in 1978, the South African government committed itself to the development of a District Health System (DHS) which was based on the Primary Health Care approach (WHO, 1978). South Africa was also committed to Health for All by Year 2000 launched by the 32nd World Assembly in 1979. The overall objective of the health-for-all strategy was the attainment by all the people in the world, by the year 2000, of a level of health that will enable them to lead socially and economically productive lives. A set of national policies, strategies and plans of action was formulated towards the attainment of this goal. To facilitate international comparisons, a set of global indicators was developed for monitoring progress (WHO, 1981). At the local and national levels some of the member states developed their own additional set of indicators.

By adopting the Reconstruction and Development Programme (RDP) in 1994, the Government of National Unity located health sector reform firmly within a development framework (African National Congress, 1994). One aim of the newly elected, democratic government in 1994, was to transform health services from being fragmented, inequitable, curative, and racist orientated, into more unified, equitable, health promotive and preventive. The purpose of the health districts was to provide equity, to eliminate fragmentation and duplication, to encourage community participation and intersectoral collaboration, and to provide high quality care effectively and in an efficient manner. The health districts were

intended to become a self-contained segment of the national health system. The White Paper for the Transformation of the Health System in South Africa, published on the 16th April 1997, notes that the mission of the government is: "To provide leadership and guidance to the National Health System in its effort to promote and monitor the health of all people in South Africa, and to provide caring and effective services through a primary health care approach" (Department of Health, 1997, p. 5).

1.2.2 Health care legislation and policy

The South African Health Act (Department of Health, 1977) stipulates under the section dealing with local authorities: "A medical officer of health ... shall at all times keep himself properly informed on the health of the inhabitants of the district for which he has been appointed and on health conditions in such district" (Department of Health, 1977, p. 685). He or she should also furnish regular and special reports on any matter relating to the health of the inhabitants of the district in question. Regulations concerning the private sector stipulate that where any surgical or other medical activities are performed the records of such activities are to be recorded and retained (Department of Health, 1977).

The National Health Bill (Department of Health, 1998) includes a chapter dealing with the rights and duties of users and health care providers. Health care providers have an obligation to provide appropriate high quality care. Under the subheading, 'obligations to keep a record', it is noted that, "The person or body in charge of a public or private establishment must maintain a permanent health record in the prescribed form of every user of health services at that establishment" (Department of Health, 1998, p. 7). The main difference between the existing Act and the proposed bill is that records should be kept individually and not be establishment based. They should be stored at the establishment where the service has been rendered.

The White Paper for the Transformation of the Health System in South Africa (Department of Health, 1997) emphasises that every effort should be made to ensure improvement in the quality of services at all levels. Another of its main objectives is to improve health sector

planning and the monitoring of health status and services by developing a national health information system (Department of Health, 1997).

1.2.3 Professional organisations

Every dentist who wants to practice in South Africa must register with the Health Professions Council of South Africa (HPCSA), which is the registering body of health professionals. One of the responsibilities of this body is to make sure that all its members follow the laws, rules and regulations pertaining to the dental profession in particular, and regarding oral health in general. Its officers have disciplinary powers with regard to charges of misconduct against its members. Its officers are also responsible for the members' ethical behaviour, and for that purpose it contains ethical rules that are specifically applicable to dentists. None of the existing ethical rules deals specifically with the quality of care and with patient records.

The South African Dental Association (SADA) represents the majority of dentists throughout South Africa. Some of its aims and objectives are to promote ethical practice, and to distribute information via its journal (Heydt, 1996), which contains scientific articles, articles of general interest to dentists, and important official information to the dental profession. It also represents the interests of the profession on matters affecting dentists.

1.2.4 National Health Information System

A national policy for the National Health Information System of South Africa (NHISSA) was developed in April 1995 under the guidance of the Minister of Health. The policy was developed by the NHISSA committee in collaboration with national and provincial representatives from the Department of Health, and the principal consultant from the World Health Organisation. The overall aim of NHISSA is the collection of accurate and complete data on a wide range of aspects of the health system. This data will provide information to be used in improving health care delivery in South Africa. One of the main objectives of NHISSA is better management of health systems, specifically in the areas of daily patient management, administration and finance. Information on patients' health status should be collected and progress towards equity monitored. The NHISSA Committee is also an overall co-ordinating entity, with the goal of providing leadership. This is based on current policy,

building on what already exists. Emphasis is also placed on the feedback and use of data at all levels, especially at the point of its collection (Department of Health, 1995).

One of the NHISSA subcommittees is the Standards Subcommittee. This committee helped to produce a coherent set of Health Informatics Standards on behalf of the NHISSA, for the public sector (Outinen, Holma, Haverinen & Nordblad, 1998). Two broad areas were identified for this: those that constituted goals and those which constituted rules, such as diagnostic and procedure codes. A minimum data set was to be established at national level in accordance with the international indicators. The ICD-10 coding system, which has been adopted by the NHISSA Committee, will be used (Mandil, 1995). The District Health Systems Co· ·aittee designed a code for the uniform numbering of health districts and a personal identification (ID) number was accepted as the unique identifier (NHISSA Committee, 1998).

For the NHISSA to fulfil its objectives it would need to be co-ordinated at all levels. At the provincial level, committees were established to facilitate the implementation of a streamlined health information system, based on national guidelines. The provinces would be responsible for facilitating the development of a district health information system. All key stakeholders should be involved in planning, including non-governmental organisations, the private sector, and academic and research institutions. These should produce a mutually compatible health information system (Mandil, 1995).

The district information system needs to be refined for information to support rational decision making at district level. In most parts of the country routine, standardised, unified data collection at primary health care level was still fragmented at the time of this study. Most provinces and districts could not determine or monitor effective and efficient administration and finance management, nor many of the basic indicators of health status (Herbst & Vundule, 1997).

Some of the current problems with the existing health information system were that no system covered all levels of care, that the systems were fragmented and incompatible, provided

insufficient information, were not well co-ordinated and needed to be restructured and restandardised; that they were used mainly for administrative purposes, were not user-friendly, needed most of the data to be manually collected, and could not be analysed and interpreted at local level (Department of Health, 1995).

1.3 Summary

While attempts to improve the quality of care have a long history, quality assurance that consists of a systematic identification of quality related problems and their subsequent solutions, is relatively new. There has been a growing interest in this in many countries for the past two decades. Patients have become more sophisticated consumers, and demand greater accountability from all health care professionals. Furthermore, in South Africa health care reform and escalating expenses require that providers, patients and third parties should pay more attention to quality. Previously, improving the quality of care did not constitute a priority. Some quality control programmes were in place but were mainly unco-ordinated. They focused on maintaining existing quality rather than on quality improvements. Quality assurance is part of an attitude towards continuous service improvements (Vuori, 1995).

A well designed, adequately documented and properly maintained dental patient record is an important tool for quality assurance. It provides information for administrative, financial and human resource purposes at every level of care. It helps to assess the oral health status of individuals and communities (Tolpin, 1985). It is a useful tool for planning and evaluation purposes at individual, community and national levels. It documents the needs and demands of patient and consumers, and it provides information for the assessment and monitoring of work towards the achievement of goals and objectives (Vehkalahti & Helminen, 1994; Chasteen et al., 1996).

It was therefore considered important to conduct a procedural dental record audit to improve the evaluation of clinical treatment processes and outcomes, and to manage risks and allow effective and efficient planning, implementation and monitoring of primary health.

1.4 Overall aims of study

1.4.1 Rationale for the study

There is paucity of reports regarding dental patient record keeping in the public sector in South Africa. It was felt that a study of such dental patient records could contribute to quality assurance in this area. The patient record is the fundamental source of information on the patient's condition and progress. What happens to patients is a crucial element of clinical activities, and these affect different levels of care.

1.4.2 Aim

The aim of this study is to provide information about the adequacy of dental patient records, for use in planning, implementing, monitoring and evaluating dental care and the dental care service system.

1.4.3 Objectives

The objectives of the study were:

- to investigate the adequacy of dental records,
- to investigate the adequacy of dental record documentation,
- to discuss the usefulness of dental records for the assessment of the dental care process, and
- to discuss the usefulness of dental records for quality assurance purposes.

2.0 MATERIALS AND METHODS

2.1 Study sample

2.1.1 The study sites

Two study sites were chosen. One was the Alexandra Public Dental Clinic in the Central Wits Region. It had the highest number of dentists operating in clinics in the Central Wits Region. It is a comprehensive oral health care clinic in Alexandra. Alexandra is a township located in the Johannesburg metropolitan area of South Africa. The clinic is situated next to the non-governmental community health centre. At the time of the study, Alexandra's oral health care clinic employed the services of two full-time dentists and one half-day dentist, four dental assistants, one sessional dental assistant and a general assistant. The clinic provided services during working hours in the week and on Saturday mornings. Services were by appointment and on a 'first-come-first-served' basis. In general, patients came without an appointment seeking acute care, resulting mainly in extractions. In 1998 the total number of patient visits was 18 522 and the average number of patients treated per month at the clinic was 1 544.

Oral disease is extremely common in the region; almost 90% of Gauteng adults suffered from dental decay, while 70% of six-year-olds in Alexandra showed at least one dental cavity (Department of Health, 1994). Dental decay, a sugar-dependent infectious disease is largely preventable through regular brushing with fluoridated toothpaste. However, the high levels of poverty and unemployment in much of the region (Statistics South Africa, 1998) meant that many families cannot afford to buy the toothpaste and toothbrushes required to maintain oral health.

The other clinic chosen was the Department of Restorative Dentistry, School of Oral Health Sciences at the University of the Witwatersrand. Two of the main functions of a dental school are to train students to become clinically skilled dentists and develop professional attitudes amongst students. Dental students need to deal with the varied aspects of patient management which will help them to develop professional attitude (Chasteen et al., 1996).

The dental school provided treatment to a heterogeneous group of patients with a wide spectrum of oral health care needs. Patients had to be prepared to comply with administrative and treatment schedules that characterise teaching hospitals. According to Schmaman (1989) many patients associated the dental school with the provision of high standard treatment at low cost.

2.1.2 Study design

This cross-sectional descriptive study aimed to specify and quantify the adequacy of dental patient record keeping and discuss its usefulness for quality assurance purposes.

2.1.3 Study population and sampling

In the Alexandra Clinic, the study population comprised all the patients who had attended the clinic during the year 1998. Because of the lack of a 1998 patient register in the Department of Restorative Dentistry, the study population at this site comprised all patients who attended the clinic from the beginning of January to the end of May 1999. A random sample at both sites was selected in the following manner. The patient names listed in the clinical registers during the specified period were numbered. One hundred names qualified for inclusion from the 400 names randomly drawn from the records of the Department of Restorative Dentistry and another 100 from the random selection of 120 names from the Alexandra Clinic. In cases where a selected record was not found, or the patient was under the age of 15 years, or if the record had already been included in the study, another name was drawn. The sample size was 200 in total from both of the clinics. The patient record form from the Alexandra Clinic is reproduced as Appendix A and from the Department of Restorative Dentistry as Appendix B.

2.1.4 Permission for the study

Permission to access the patient records was authorised by the heads of the establishments, the Chief Dentist of the Central Wits Region and by the Head of the Department of Restorative Dentistry (Department of Health, 1998).

The research protocol was given ethical clearance by the Committee for Research on Human Subjects of the University of the Witwatersrand (Appendix C).

- Exclusion criteria

All patients under the age of 15 years were excluded from the study.

2.2 Measurement tool

The measurement tool used was a check-list (see Appendix D) which encompassed eight different sections. Each of the sections included variables which were either present (marked YES), absent (marked NO) or not applicable (marked N/A). Space for comments was available after each section.

The check-list was composed and modified from existing dental quality assurance programmes, the validity of which had been demonstrated (Demby, Rosenthal & Angello, 1990). Reliability of the study was secured by using one auditor who double checked 10% for each 100 of the records used in the study. Agreement was tested using the kappa statistic (Altman, 1991). For Alexandra Clinic λ=0,92 and for the Department of Restorative Dentistry λ=1,00 which can be interpreted as very good agreement (Altman, 1991).

2.2.1 Pilot study

The check-list was piloted using 10 patient records from a public oral health care clinic which was not part of the study. Corrections to the check-list were made before the final study was conducted.

2.3 Limitations of the research

The study comprised a broad-based audit, which identified only a general framework of possible existing deficiencies in the patient record keeping. The samples were only generalisable to the study populations, but issues arising from the results could be applied more widely.

2.4 Statistical analysis

Data was coded, entered and analysed using SSPS statistical software (version 6,1) on an IBM compatible microcomputer. All categorical data were analysed using simple proportions and frequencies. Differences were determined using Chi-square statistics (X^2) or Fisher's exact test where expected cell frequencies were less than five. Content analysis of the comments was also conducted, using the inductive rather than deductive approach.

3.0 RESULTS

For ease of reference and to correlate the material presented, the results from both of the clinics were presented in tabular form followed by comments after each section.

3.1 Patient identification / registration data

3.1.1 Name

Recording of patients' names in patient records is shown in Table 1.

Table 1. Patients' names

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	100	100,0	74	74,0	174	87,0
NO	0	0,0	26	26,0	26	13,0
Total	100	100,0	100	100,0	200	100,0

X^2=29.89 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic all the patient names were recorded adequately. They consisted of at least one first name and the full surname.

In the Department of Restorative Dentistry 26% of the patient records showed incomplete names, such as only one initial or initials and surname were recorded. One other problem was the legibility of the names.

3.1.2 ID / birth date

Recording of ID or birth date of the patient in the patient records is shown in Table 2. Alternatively, if recorded, the age of the patient, or the year of the birth was accepted.

Table 2. ID / birth date

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	98	98,0	88	88,0	186	93,0
NO	2	2,0	12	12,0	14	7,0
Total	100	100,0	100	100,0	200	100,0

X^2=7.68 df=1 p=0.005047 (Fisher's exact test)

In the Alexandra Clinic the age of patients were recorded in 98,0% of the patient files. It was missing in two cases.

In the Department of Restorative Dentistry for most of the patients the year of birth was recorded. There was inconsistency in recording the birth date, several different styles were used. For example: 24 June 1930, 24/06/30 or 30/06/24. In a few cases, ID numbers were used.

3.1.3 Sex

The sex of the patients was recorded as shown in Table 3.

Table 3. Sex of patient

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	97	97,0	96	96,0	193	96,5
NO	3	3,0	4	4,0	7	3,5
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=0.500000

At the Alexandra Clinic either male or female status was recorded in all but three of the records.

In the Department of Restorative Dentistry sex was not stated, but implied in most cases by the use of Prof/Dr/Mr/Mrs/Miss. In four of the records this was missing. In some cases the patient's sex could be assumed from his/her name or from other existing information in the patient record.

3.1.4 Address

The addresses of the patients were recorded as shown in Table 4.

Table 4. Patients' addresses

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	100	100,0	98	98,0	198	99,0
NO	0	0,0	2	2,0	2	1,0
Total	100	100,0	100	100,0	200	100,0

X^2=0.51 df=1 p=0.248744 (Fisher's exact test)

All the addresses were recorded in both of the clinics except two in the Department of Restorative Dentistry. The completeness of addresses was not checked.

3.1.5 Telephone number

The existence of a telephone number and whether it was recorded is shown in Table 5. YES indicates that a telephone number was recorded, NO indicates that there was no record of the existence of a telephone number, or it was not recorded. N/A indicates the non-existence of a telephone number.

Table 5. Telephone number

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	1	1,0	90	90,0	91	45,5
NO	98	98,0	7	7,0	105	52,5
N/A*	1	1,0	3	3,0	4	2,0
Total	100	100,0	100	100,0	200	100,0

X^2=165.91 df=1 p=0.000000 (Fisher's exact test)

*Data in the row 'Not Applicable' was not included in the analysis.

At the Alexandra Clinic patient records showed that telephone numbers were missing in 98% of cases. This might reflect the socio-economic status of its catchment area population. Non-availability might have contributed to the figures.

At the Department of Restorative Dentistry only 7% of telephone numbers were not recorded either because of non-existence or non-recording of telephone numbers.

3.1.6 Occupation

Recording of patients' occupations is shown in Table 6.

Table 6. Occupation

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	1	1,0	78	78,0	79	39,5
NO	99	99,0	22	22,0	121	60,5
Total	100	100,0	100	100,0	200	100,0

X^2=124.05 df=1 p=0.000000 (Fisher's exact test)

Only in one case was the occupation of the patient recorded at the Alexandra Clinic, even though there was a specific space identified for it in the standard dental record form. Lack of recording could be explained partly by the unemployment figures in the Alexandra township area.

At the Department of Restorative Dentistry 78% of the patient records did state the patient's occupation.

3.1.7 Name and number of person to contact in an emergency

Distribution figures about contact information are shown in Table 7.

Table 7. Name and contact number of emergency contact person

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	35	35,5	35	17,5
NO	100	100,0	65	65,0	165	82,5
Total	100	100,0	100	100,0	200	100,0

X^2=42.42 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic on the standard patient record form there was no space reserved for a contact person or his/her contact details. No record forms contained this information.

In the case of the Department of Restorative Dentistry there was a section on the form where the next of kin, their address and telephone number should be recorded. It was completed in 35 cases. On most of the record forms, it was not recorded in the correct place, but was found on a separate personal detail sheet which patients complete at their first clinic visit. This misplacement of information occurred also with ID/Birth date, sex, address, phone number and occupation information.

3.2 Medical history

3.2.1 Evaluation of patient's general health and appearance

Table 8 shows the existence of the evaluation of patients' general health and appearance.

Table 8. The patient's general health and appearance

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	94	94,0	94	47,0
NO	100	100,0	6	6,0	106	53,0
Total	100	100,0	100	100,0	200	100,0

X^2=177.36 df=1 p=0.000000 (Fisher's exact test)

No specific space for this purpose was reserved on the patient record forms at the Alexandra Clinic. It appeared that the area marked "Present illness" was used for the patients' medical history.

In most of the patient records at the Department of Restorative Dentistry patients' general health and appearance was included in the sections of the front page headed "Notes", or "Medic-Alert", or in the history section where it was written as either "Medical history" or "Is this patient fit for treatment?". In six cases there was no record of such information.

3.2.2 Whether patient is under care of physician or if patient is taking medication

Table 9 shows whether there was any indication of a physician's care or if the patient was taking any medication.

Table 9. Information on whether patient is under a physician's care or taking Medication

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	92	92,0	92	46,0
NO	100	100,0	8	8,0	108	54,0
Total	100	100,0	100	100,0	200	100,0

X^2=170.37 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic none of the patient records had evidence of a physician's care or if the patient was taking any medication.

At the Department of Restorative Dentistry the patient records of this information appeared in the spaces marked for "Medical history" and "Ask specifically about". The trade name of medication used was considered sufficient for the purpose of this study. In 8% of cases this important information was not recorded.

3.2.3 Allergies or drug sensitivities

Recording of any allergies or drug sensitivities is noted in Table 10.

Table 10. Disclosure of allergies or drug sensitivities

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	93	93,0	93	46,5
NO	100	100,0	7	7,0	107	53,5
Total	100	100,0	100	100,0	200	100,0

X^2=173.83 df=1 p=0.000000 (Fisher's exact test)

None of the patient records at the Alexandra Clinic included any mention of allergies or drug sensitivities.

In seven cases at the Department of Restorative Dentistry a record of this was made. Relevant information regarding the seven cases was found from the sections "Medical history", "Ask specifically about", "Medic-Alert", or on the front page under "Notes". Drug sensitivities were especially highlighted.

3.2.4 Contraindications

The existence of disclosure of any contraindication or problems with any medication or anaesthetic is shown in Table 11.

Table 11. Contraindication or problems with any medication or anaesthetics

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	93	93,0	93	46,5
NO	100	100,0	7	7,0	107	53,5
Total	100	100,0	100	100,0	200	100,0

X^2=173.83 df=1 p=0.000000 (Fisher's exact test)

None of the patient records at the Alexandra Clinic included any mention of contraindication or problems with any medication or anaesthetics.

In seven cases at the Department of Restorative Dentistry a record of this was made. Relevant information regarding the seven cases was found from the sections "Medical history", "Ask specifically about", "Medic-Alert", or on the front page under "Notes".

3.2.5 History of systemic disease

Existence of information about systemic diseases is presented in Table 12.

Table 12. History of systemic disease

	Alexandra Clin		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	95	95,0	93	93,0	188	94,0
NO	5	5,0	7	7,0	12	6,0
Total	100	100,0	100	100,0	200	100,0

X^2=0.35 df=1 p=0.383672 (Fisher's exact test)

Space existed to record "Present illness" on the patient record form at the Alexandra Clinic. This was completed in 95% of cases by writing either PIN (Present Illness None) or in a very few cases the illness suffered.

The same information was found in 93% of cases under the sections "Medical history" or "Ask specifically about" in the patient records of the Department of Restorative Dentistry.

3.2.6 Existence of prostheses (excluding oral prostheses)

The existence of pacemaker, valvular replacements, prosthetics joints, etc. is shown in Table 13.

Table 13. The prosthetic status of patients (excluding oral prostheses)

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	93	93,0	93	46,5
NO	100	100,0	7	7,0	107	53,5
Total	100	100,0	100	100,0	200	100,0

X^2=173.83 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic there was no recording of prostheses in the patient records.

Information about prostheses of any kind, except oral ones, existed in the section "Ask specifically about" as "Prostheses". Mainly, this information was found next to this or in "Medical history".

3.2.7 Status of pregnancy in women

Information about the recording of women's pregnancy status is presented in Table 14.

Table 14. The status of pregnancy in women

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	1	1,0	45	45,0	46	23,0
NO	54	54,0	6	6,0	60	30,0
N/A*	45	45,0	49	49,0	94	47,0
Total	100	100,0	100	100,0	200	100,0

X^2=80.45 df=1 p=0.000000 (Fisher's exact test)

*Data in the row "Not Applicable" was not included in the analysis.

Only in one case was pregnancy status recorded in the Alexandra Clinic. This does not exclude any other possible pregnant women.

The status of "Pregnancy" was specifically asked in the dental records at the Department of Restorative Dentistry and this was stated in 45 cases. It was not recorded in only six cases. In the case of a missing sex identity, this was assumed from the name of the patient or from other existing information in the patient record.

3.2.8 Evidence of updated medical history

The existence of the above information is presented in Table 15.

Table 15. Updated medical history

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	2	2,0	6	6,0	8	4,0
NO	7	7,0	5	5,0	12	6,0
N/A*	91	91,0	89	89,0	180	90,0
Total	100	100,0	100	100,0	200	100,0

X^2=1.02 df=1 p=0.156918 (Fisher's exact test)

*Data in the row "Not Applicable" was not included in the analysis.

Updated medical history was missing in seven cases at the Alexandra Clinic and in five cases at the Department of Restorative Dentistry.

In the Department of Restorative Dentistry, 90% of cases did not require any update of the medical history because either the patient visited only once, or the treatment process was finalised within one year from commencement. In cases where treatment extended beyond a year or there were separate treatment cycles over the years, an update of medical history was considered relevant.

The lack of medical history and/or other required information on the patient record forms at the Department of Restorative Dentistry was not necessarily evidence that the health professional had not discussed the patient's case with him/her. Unmarked sections under "Medical history" and "Ask specifically about" did not clarify the existence or non-existence of those issues.

Even though one patient at the Department of Restorative Dentistry had mentioned having a pacemaker, valvular replacement and anticoagulant treatment which were recorded correctly on page 2, this information was never transferred to the front page, either to "Notes" or "Medic-Alert" to inform future treatment providers.

3.3 Dental history

3.3.1 Main complaint

Existence of main complaint: the reason for seeking dental care, is shown in Table 16.

Table 16. Main complaint

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	100	100,0	99	99,0	199	99,5
NO	0	0,0	1	1,0	1	0,5
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=0.500000

At the Alexandra Clinic the records showed the complaint to be "Toothache" in every case. All the patients whose records were investigated showed that they came for pain relief treatment, and mainly had extractions.

At both of the study sites the dental record forms had a space reserved for "Main complaint" or "Complaint". These were all completed except in one case at the Department of Restorative Dentistry.

3.3.2 Complications connected with past dental treatment

Existence of above information is shown in Table 17.

Table 17. Complications connected with past dental treatment

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	48	48,0	48	24,0
NO	100	100,0	52	52,0	152	76,0
Total	100	100,0	100	100,0	200	100,0

X^2=63.16 df=1 p=0.000000 (Fisher's exact test)

If any documentation of previous dental treatment was recorded this was considered by the researcher to be sufficient information, since in such cases any previous complications were discussed as well, and recorded if necessary.

At the Alexandra Clinic no recordings of complications connected with past dental treatment were recorded.

Only in 48% of the patient records at the Department of Restorative Dentistry was such information documented, and this was mainly written in the space for "History of main complaint and dental history". This section tended to concentrate on the history of the main complaint.

3.3.3 Oral hygiene practices

Existence of above information is presented in Table 18.

Table 18. Patients' oral hygiene practices

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	1	1,0	1	0,5
NO	100	100,0	99	99,0	199	99,5
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=0.500000

At the Alexandra Clinic no recordings of patients' oral hygiene practices was founded.

Only in one patient record at the Department of Restorative Dentistry was the patient's oral hygiene practices recorded. These practices were noted as "brushing twice a day and flossing once a day". This information was written in the "Clinical examination" section in "Subjective impression of mouth".

3.3.4 Dietary practices

Existence of above information is presented in Table 19.

Table 19. Dietary practices

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	0	0,0	0	0,0
NO	100	100,0	100	100,0	200	100,0
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=N/A

Fisher's exact test could not be computed due to the row total amounting to 0 for the "YES" row.

No patient records at the two sites had specific space reserved for dietary practices. These practices were not recorded on any of the patient records in any section at either clinic.

3.3.5 Habits detrimental to oral health

Existence of habits such as: bruxism, clenching, finger sucking, pencil biting, smoking, snuff, and extensive use of alcohol is presented in Table 20.

Table 20. Habits detrimental to oral health

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	93	93,0	93	46,5
NO	100	100,0	7	7,0	107	53,5
Total	100	100,0	100	100,0	200	100,0

X^2=173.83 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic no recordings of habits detrimental to oral health were found from the patient records.

At the Department of Restorative Dentistry the "Ask specifically about" section included mention of the use of tobacco and alcohol by the patient. This was completed by the majority of dental students. In one patient record, clenching and bruxism were mentioned in the "Clinical examination" section. In seven cases there were no indications that these issues had been discussed.

3.4 Clinical examination

3.4.1 Tooth chart

Existence of a tooth chart showing current restorations and any caries present at the time of initial examination; missing teeth; and any existing prostheses and their age and condition is shown in Table 21.

Table 21. Patients' tooth chart

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	1	1,0	99	99,0	100	50,0
NO	99	99,0	1	1,0	100	50,0
Total	100	100,0	100	100,0	200	100,0

X^2=192.08 df=1 p=0.000000 (Fisher's exact test)

The standard patient record form at the Alexandra Clinic does not include a tooth chart. Only over 15 years old school children's record form includes it. One case was found of a school pupil who visited for a regular annual dental check up. All the other adult patient records included only pain relief treatment. In those cases only the treatment processes were recorded.

In the Department of Restorative Dentistry only one patient record lacked a recorded tooth chart, and in this particular case the patient had discontinued the treatment. Lack of recording standardisation on the tooth chart was noticeable. Prostheses were not marked on the tooth chart, but they could be found in the "History" or "Clinical examination" section. The condition of the prostheses was noted only if they were in need of repair, and in none of the cases was the age mentioned. Condition, and age of prostheses were disregarded.

3.4.2 Periodontal status

Existence of an evaluation of the periodontal status is shown in Table 22.

Table 22. The existence of an evaluation of the periodontal status

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	49	49,0	49	24,5
NO	100	100,0	51	51,0	151	75,5
Total	100	100,0	100	100,0	200	100,0

X^2=64.90 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic the record forms had no specific space reserved for recording periodontal status.

At the Department of Restorative dentistry the record forms had two different spaces where periodontal status could be recorded. Records in either one of these were accepted for purposes of analysis. There did not seem to be any obvious reason as to whether or not to record periodontal status. In some of the cases, where multiple fillings existed and/or were needed, periodontal status was not recorded.

3.4.3 Occlusal status

Existence of some notes regarding occlusal status is shown in Table 23.

Table 23. Occlusal status

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	2	2,0	2	1,0
NO	100	100,0	98	98,0	198	99,0
Total	100	100,0	100	100,0	200	100,0

X^2=0.51 df=1 p=0.248774 (Fisher's exact test)

At the Alexandra Clinic no recordings of occlusal status of the patients' was found.

Only in two cases at the Department of Restorative Dentistry was the occlusal status of patients recorded. The record form did include a specific "Occlusal analysis" chart for completion.

3.4.4 Pathologic conditions

Existence of findings of normal, pathologic or abnormal conditions is shown in Table 24. There should be a statement that the area examined is within normal limits. Positive findings should be noted and explained.

Table 24. Patients' pathologic conditions

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	1	1,0	96	96,0	97	48,5
NO	99	99,0	4	4,0	103	51,5
Total	100	100,0	100	100,0	200	100,0

X^2=180.66 df=1 p=0.000000 (Fisher's exact test)

Only one patient record was provided with notes about oral mucosal condition at the Alexander Clinic. In the standard patient form there is no specific space reserved for this information.

At the Department of Restorative Dentistry the patient form had a section on "Clinical examination" which covers the above issues. This was completed in 96% of the cases, and in 4% of cases no record had been made. In 96 cases not all parts of the "Clinical examination" were filled in. However, even incomplete information was considered sufficient for purposes of analysis.

3.5 Radiographs

3.5.1 Radiographs

Existence of all taken radiographs which were found is shown in Table 25.

Table 25. Radiographs

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	8	8,0	8	4,0
NO	0	0,0	86	86,0	86	43,0
N/A*	100	100,0	6	6,0	106	53,0
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=N/A

Fisher's exact test could not be computed due to the column total amounting to 0 for the Alexandra Clinic.

*Data in the row 'Not Applicable' was not included in the analysis.

N/A shows that according to patient records no radiographs had been taken. Thus N/A also applies to the following three section questions. This was the case in 106 patient records. None of the patient records at the Alexandra Clinic had radiographs.

Recordings that radiographs had been taken were spread throughout different parts of the patient record. Recordings could be found in "Progress notes", the "Radiographs" section and/or on a separate referral sheet to Department of Radiology. Only in 8% of patient records at the Department of Restorative Dentistry could all the recorded radiographs be found. In 86% of the cases the problems were as follows: not all recorded radiographs could be found; while recording radiographs was only mentioned as "radiographs taken", "periap. rtgs taken"; "BW:s x 2"; and "Full mouth rtgs". More radiographs was found than were recorded on the patient records, and the areas taken in periapical radiographs were not recorded.

3.5.2 Orderliness of radiographs

Existence of good order in radiographs found is shown in Table 26.

Table 26. Orderliness of radiographs

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	34	34,0	34	17,0
NO	0	0,0	60	60,0	60	30,0
N/A*	100	100,0	6	6,0	106	53,0
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=N/A

Fisher's exact test could not be computed due to the column total amounting to 0 for the Alexandra Clinic.

*Data in the row 'Not Applicable' was not included in the analysis.

At the Alexandra Clinic no radiographs were taken.

At the Department of Restorative Dentistry while assessing the orderliness of radiographs only those radiographs that could be found were considered because in some of the cases they may have included all the taken radiographs. However, it was not possible to establish this from the recordings. Only in 34% of the cases were the radiographs in good order. These were arranged and set up on transparencies. In some cases the numbers of transparencies with only a few radiographs on them was extensive. In all the other cases radiographs could be found loose or taped to some part of the patient record.

3.5.3 Identity of patient on radiographs

Evidence of identity of the patient on all radiographs is shown in Table 27.

Table 27. Identity of the patient on radiographs

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	30	30,0	30	15,0
NO	0	0,0	64	64,0	64	32,0
N/A*	100	100,0	6	6,0	106	53,0
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=N/A

Fisher's exact test could not be computed due to the column total amounting to 0 for the Alexandra Clinic.

*Data in the row 'Not Applicable' was not included in the analysis.

At the Alexandra Clinic no radiographs were taken.

In 30 cases out of 94 at the Department of Restorative Dentistry the patient's identity was evident from the radiographs. In the rest of the 64 cases it was totally lacking, marked only on some radiographs; or only part of the name was used, or the patient record number was missing.

3.5.4 Date on radiographs

Evidence of date on all radiographs is shown in Table 28.

Table 28. Dating of radiographs

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	16	16,0	16	8,0
NO	0	0,0	78	78,0	78	39,0
N/A*	100	100,0	6	6,0	106	53,0
Total	100	100,0	100	100,0	200	100,0

Fisher's exact test p=N/A

Fisher's exact test could not be computed due to the column total amounting to 0 for the Alexandra Clinic.

*Data in the row 'Not Applicable' was not included in the analysis.

At the Alexandra Clinic no radiographs were taken.

Sixteen patient records included radiographs that stated the date on all films in patient records at the Department of Restorative Dentistry. A transparency which included several radiographs and with the date mentioned only once gave the impression that all the films were taken at the same time. This was considered sufficient for purposes of analysis.

3.6 Diagnosis

Evidence of a diagnosis section where problems have been listed is shown in Table 29.

Table 29. Diagnosis section

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	3	3,0	95	95,0	98	49,0
NO	97	97,0	5	5,0	102	51,0
Total	100	100,0	100	100,0	200	100,0

X^2=169.35 df=1 p=0.000000 (Fisher's exact test)

Diagnosis was not recorded in Alexandra Clinic in 97% of the cases. Only in 3% of the cases was diagnosis mentioned, and that was most likely because of its rarity.

In the Department of Restorative Dentistry the patient record had a special page reserved for "Case analysis and treatment plan". This included three different parts, "Segment or teeth", "Problem", and "Treatment Plan". In 95% of the patient records, diagnosis was recorded in this section. Recordings of diagnosis did not appear to have a standardised format; for example 26 caries, 26 mesial caries or 26 c^2. Severity of the lesion was not recorded. In 5% of cases without a record of diagnosis no further treatment was provided.

3.7 Treatment plan

Evidence of a treatment plan that is legible and easily located within the dental record is shown in Table 30. The plan should be logical, sequential and may list referrals to specialists when appropriate.

Table 30. Legibility of treatment plan

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	6	6,0	98	98,0	104	52,0
NO	94	94,0	2	2,0	96	48,0
Total	100	100,0	100	100,0	200	100,0

X^2=169.55 df=1 p=0.000000 (Fisher's exact test)

A treatment plan was drawn up on 6% of the patient records at the Alexandra Clinic. In those cases specific instructions were recorded for the follow-up visit/s.

In 98% of the patient records in the Department of Restorative Dentistry, a treatment plan was included. In three of the cases it was done without a recorded diagnosis. The language used to record the treatment plan was not uniform. For example, tooth 26 with mesial caries, the treatment plan was recorded in several different ways including amalgam restoration, mesial amalgam, mesial + occlusal amalgam [illegible] a[12].

3.8 Progress notes

3.8.1 Date of treatment

Evidence of above information in patient records is shown in Table 31.

Table 31. Date of treatment

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	100	100,0	84	84,0	184	92,0
NO	0	0,0	16	16,0	16	8,0
Total	100	100,0	100	100,0	200	100,0

X^2=17.39 df=1 p=0.000008 (Fisher's exact test)

At the Alexandra Clinic each separate visit showed the date of the treatment on the patient records.

In the Department of Restorative Dentistry, 16% of the patient records showed some missing treatment dates.

3.8.2 Provider of treatment

Evidence of the identity of the provider who rendered the treatment (title and name) in patient records is shown in Table 32.

Table 32. Provider of treatment

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	62	62,0	62	31,0
NO	100	100,0	38	38,0	138	69,0
Total	100	100,0	100	100,0	200	100,0

X^2=89.86 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic every recorded patient visit was signed using the initials of the provider. This was not found sufficient for purposes of analysis.

At the Department of Restorative Dentistry, each patient visit was noted in the progress notes. This showed the provider's initial or initials, and surname which was regarded as relevant. In 38% of the patient records some visits did not record the name of provider. It seemed that the same provider did not bother to repeat his/her name at every visit, but in some of the cases this was not apparent. In both of the cases, titles were not used because all the providers of the treatment were either dentists or dental students. For that reason it was considered satisfactory for purposes of analysis.

3.8.3 Permanent writing

Existence of permanent writing in patient records is shown in Table 33.

Table 33. Permanence of recording

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	100	100,0	51	51,0	151	75,5
NO	0	0,0	49	49,0	49	24,5
Total	100	100,0	100	100,0	200	100,0

X^2=64.90 df=1 p=0.000000 (Fisher's exact test)

At the Alexandra Clinic only permanent writing was used in recordings.

In 49% of patient records in the Department of Restorative Dentistry permanent writing was not used throughout the whole document. Use of pencil appeared in most of the cases in recording of tooth chart and periodontal status. In a few patient records, some progress notes, diagnosis and treatment plan was written in pencil.

3.8.4 Corrections

Evidence of proper corrections is shown in Table 34. When a correction has been necessary a single line has been drawn though the entry.

Table 34. Corrections

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	2	2,0	23	23,0	25	12,5
NO	0	0,0	25	25,0	25	12,5
N/A*	98	98,0	52	52,0	150	75,0
Total	100	100,0	100	100,0	200	100,0

X^2=0.52 df=1 p=0.244898 (Fisher's exact test)

*Data in the row 'Not Applicable' was not included in the analysis.

At the Alexandra Clinic all the corrections were done satisfactorily.

In 23% of the patient records at the Department of Restorative Dentistry the wrong format for corrections was found. Previous text was either covered with white paint or rewritten on top with pen making the underlying text illegible.

3.8.5 Type of treatment

Evidence of type of treatment; tooth number, if appropriate, in patient records is shown in Table 35.

Table 35. Type of treatment

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	99	99,0	90	90,0	189	94,5
NO	1	1,0	10	10,0	11	5,5
Total	100	100,0	100	100,0	200	100,0

X^2=7.79 df=1 p=0.004829 (Fisher's exact test)

In one patient record at the Alexandra Clinic no treatment or information was mentioned in the progress notes, probably because the patient left the premises before receiving treatment.

In 10% of the patient records at the Department of Restorative Dentistry treatment notes were incomplete. In most of the cases, incomplete treatment notes appeared when root therapy was prescribed. For example, d26 root treatment was started, the size of the file and the length of intrusion was recorded, but no follow-up procedures were recorded, such as whether the tooth was left open, and if so why, and whether any medication was used or whether a temporary filling was placed. Similar incomplete treatment recordings might have been seen to be more common with more thorough study of each treatment recorded.

Missing records of local anaesthetic were not included for analysis at this point, but are dealt with separately in the section entitled "Full documentation on the use of anaesthetics and analgesics".

3.8.6 Materials

Evidence of used materials in treatment (trade name) is shown in Table 36.

Table 36. Materials used for treatment

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	3	3,0	12	12,0	15	7,5
NO	6	6,0	81	81,0	87	43,5
N/A*	91	91,0	7	7,0	98	49,0
Total	100	100,0	100	100,0	200	100,0

X^2=1.34 df=1 p=0.125498 (Fisher's exact test)

*Data in the row 'Not Applicable' was not included in the analysis.

In the case of N/A the patient records notes indicated procedures which did not need any kind of materials, for example, scaling, polishing, extractions, oral examination, drawing up treatment plan or taking radiographs.

At the Alexandra Clinic 91% of the treatments did not need any materials. Only in three cases was use of materials recorded.

At the Department of Restorative Dentistry in 81% of patient records, the trade name of the used material was not mentioned, for example: 11 mesial composite restoration. Trade names of amalgams, composites, glass ionomers, temporary fillings, cements and local medications were left unrecorded in most cases. In a few cases the trade name of composite and even the shade of the colour was recorded.

3.8.7 Medication

Evidence of medication dispensed or prescribed (trade name, concentration, dosage) is shown in Table 37.

Table 37. Medication dispensed or prescribed

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	12	12,0	0	0,0	12	6,0
NO	0	0,0	9	9,0	9	4,5
N/A*	88	88,0	91	91,0	179	89,5
Total	100	100,0	100	100,0	200	100,0

X^2=17.12 df=1 p=0,0000034 (Fisher's exact test)

*Data in the row 'Not Applicable' was not included in the analysis.

In all the cases when medication was dispensed or prescribed at the Alexandra Clinic it was recorded properly.

In 9% of the patient records at the Department of Restorative Dentistry medication was either dispensed or prescribed, but the details were unclear and incomplete in all of those cases. Trade names were stated, but the concentration and/or dosage were not recorded. Lack of standardisation was noticeable at both of the clinics.

3.8.8 Anaesthetics and analgesics

Evidence of full documentation on the use of anaesthetics and analgesics (trade name, concentration, dosage, vasodilator) in patient records is shown in Table 38.

Table 38. Anaesthetics and analgesics

	Alexandra Clinic		Restorative Dentistry		Total	
	No	%	No	%	No	%
YES	0	0,0	51	51,0	51	25,5
NO	88	88,0	16	16,0	104	52,0
N/A*	12	12,0	33	33,0	45	22,5
Total	100	100,0	100	100,0	200	100,0

X^2=99.83 df=1 p=0.000000 (Fisher's exact test)

*Data in the row 'Not Applicable' was not included in the analysis.

In 88% of the patient records at the Alexandra Clinic there was no recording of local anaesthetics, even though extr. `ns in each case was the most common treatment given during those visits. On 12 occasions treatment included some procedures other than extractions, which could also have involved local anesthetics that were not recorded.

In 16% of patient records at the Department of Restorative Dentistry, use of local anaesthetics was recorded with the trade name and dosage. It was assumed that the use of the trade name in these cases also revealed the concentration. Documentation was lacking of the existence or concentration of vasodilator, especially in the case of Xylotox local anaesthetics. Two different types of Xylotox were available on the South African market at the time, one with a vasodilator and one without. This difference should have been recorded, but in those 16 cases only Xylotox was recorded as being administered.

4.0 DISCUSSION

4.1 General comments on dental record keeping

Four hundred names were randomly selected from the register at the Department of Restorative Dentistry and 120 names from the Alexandra Clinic to complete the sample size of 100 record cards for each clinic. In the Alexandra Clinic the reason for the extra 20 names was the replacement of excluded child patients under the age of 15 and non-existing or duplicated records. In the Department of Restorative Dentistry the daily attendance register was inadequately kept; vast numbers of attendancies were not recorded, recorded patients were documented incompletely, for example with only part of the whole name stated, and patient record numbers were missing or incorrectly stated in the register. There was also duplication of patient record numbers. The possibility that the patient record had already been included in the study could have affected the number of selected records. A considerable number of adequately recorded patient records from the daily register could not be found. Possible reasons for this were that records were incorrectly filed, patient record number duplication occurred, patient records were taken by dental students, or records were filed under administrative work.

In the assessment of the adequacy of patient record keeping in both of the clinics, little attention was given to the completeness of information. Some information might have been missing from the records, but due to the limitation of the process of assessment it was difficult or even impossible to validate the information which was recorded. Some information might have been discussed with the patient but not recorded. The non-existence of any kind of recording on the forms was considered inadequate, for the purposes of this analysis.

In many cases information was not recorded in the specific space which was reserved for it, although could be found in other parts of the patient record. Loose, separate sheets including referrals and contact information sheets also lacked information. For example, a loose information sheet recording root treatment did not include space for the patient's name. If this

became separated from the patient's record file it would be almost impossible to return it to the right patient record. The same problem applied to many radiographs.

Lack of standardisation of recording, diagnosis, treatment plans, treatment procedures, and dispensed and prescribed medication was evidently a problem at both of the clinics.

The patient record is the fundamental source of information about what the patient experiences, and this is a crucial element of the clinical activities. Clinical activities affect different levels of care. The aim of this study was to provide information about the adequacy of dental patients' records in order to facilitate their use in planning, implementing, monitoring and evaluating dental care (Jerge et al., 1985; Tolpin, 1985) and improve the dental care service system (Vehkalahti et al., 1994).

4.2 The adequacy of dental records

The problem orientated dental patient record should be data based and encompass five sections as follows: (a) demographic data, medical and dental history and clinical examination; (b) problem/diagnosis list; (c) treatment plan; (d) progress notes; and (e) outcome of the treatment (Jerge et al, 1985; Oberbreckling, 1993). The current study investigated only the four former aspects of the dental patient records. The dental record form of the Department of Restorative Dentistry was adequate in that it fulfilled all these requirements. At the Alexandra Clinic the patient record form did not include specific areas for the clinical examination, diagnosis and treatment plan. Two of these could be recorded as progress notes. However, even the demographic data, and the medical and dental history sections were not comprehensive.

Adequate patient records lead to complete and accurate documentation of the dental care process (Jerge et al., 1985). At both study sites, the patient record form needs to be revised in order to meet standard requirements, both by adding sections that do not exist, and by removing obsolete sections.

4.3 The adequacy of dental record documentation

In general, documentation at both clinics was poor. None of the patient records fulfilled all the variables included in the study. Rasmusson, René, Dahlbom & Borrman (1994) in Sweden found that nearly 40% of the aspects investigated in dental patient records did not follow the National Board of Health and Welfare's given instructions regarding documentation. In this study done in Sweden the dental patient records constituted poor antemortem material for forensic odontology (Solheim, Lorentsen, Sudnes, Bang & Bremnes, 1992; Rasmusson et al., 1994). In forensic odontology, the dental patient records, especially regarding clinical examination, radiographs and progress notes provide antemortem information which is compared with the postmortem information about the deceased during identification. None of the patient records in this study provided accurate and complete information in these three different sectors.

One of the most significant pieces of information in the patient record is the identity of the patient, that is, the name and birth date. This was incomplete in two of the cases in the Alexandra Clinic and in 26 of the cases in the Department of Restorative Dentistry. These results contradict the finding of 99,6% compliance to patient identity in other countries such as Sweden (Rasmusson, 1994).

At the Alexandra Clinic the lack of complete and accurate patient history, both medical and dental, could often be explained by the fact that only pain relief procedures had been carried out. Despite the nature of the treatment, good anamnestic findings are essential. In the patient's history section, if there are no findings, the dentist should note that there were no anamnestic findings, to indicate that the topic has been dealt with. Complete documentation of the patient history was not found in any of the patient records.

Documentation regarding diagnoses at the Alexandra Clinic barely existed. The clinical status chart, together with the record notes, often establish diagnosis. In the present study the dental patient records that were investigated did not include a clinical status chart, and in only three cases was the diagnosis separately documented in the record notes. In contrast, Vehkalahti,

Rytömaa & Helminen (1992) in Finland found that in 98% of cases the clinical status of teeth and periodontium had been adequately documented.

Appropriate handling and documentation of radiographs was poor. Only two patient records complied with this requirement where the radiographs had been taken. These results differed greatly to those found by Rasmusson et al. (1994) but were comparable with the findings of René (1988).

Documentation of a treatment plan was evident for only six patients at Alexandra Clinic. This was presumably because most of the patients needed only pain relief procedures, and the treatment was completed in one visit. However, treatment plans are of great importance for evaluation purposes.

At the Alexandra Clinic, the records investigated were consistently written in pen, whereas only half of the cases in the Department of Restorative Dentistry followed this practice. Non-permanent writing was used primarily for status documentation (Rasmusson et al., 1994).

At the Department of Restorative Dentistry, corrections were made appropriately in 48% of records. In comparison, in the study done in Sweden, only 14% of the corrections were made properly according to Rasmusson et al. (1994).

Documentation of local anaesthetics and medication used or prescribed was poor in the Department of Restorative Dentistry. Documentation regarding the local anaesthetics administered was totally lacking from the dental patient records at the Alexandra Clinic even though extractions were performed. This information is of particular importance in the event of an allergy or anaphylactic shock.

At the Alexandra Clinic patient records were deficient in documentation in all sectors: patient identification data, patient history, status, diagnosis, treatment plan and progress notes. The Department of Restorative Dentistry provided patient records that adequately demonstrated the dental care process, but were lacking in accuracy and completeness. This lack of accuracy

and completeness has been sufficiently discussed by Chasteen et al. (1996). The poorest component was the assessment section, especially the documentation of radiographs. In addition, the identification data, dental history, periodontal and occlusal status, and progress notes need improvement.

Lack of standardisation and non-uniformity of information was evident at both of the clinics. This was evident in the recording of oral health status, diagnosis, treatment plans and progress notes. This lack of standardisation and non-uniformity was highlighted when a Boeing 747-224B Combi of the South African Airways, the Helderberg, crashed into the sea near Mauritius on 28 November 1987. Dental records proved to be inadequate for identification (Ligthelm, 1994). The variety of record keeping styles and abbreviations used in different countries posed a major problem during the identification process.

The completeness and accuracy of record notes is difficult to analyse because the procedures were not actually observed. This leads to difficulty in establishing the exactness of some information, and to subjective judgements.

4.4 Usefulness of dental records to assess the dental care process

Adequate patient records that are completed correctly provide the basis for assessment of the dental care process. The problem orientated approach to dental care is best assured by using dental patient records which divide the dental care process into four particular categories: the assessment, the diagnosis, the treatment plan and the provision of treatment (Bailit, 1985; Jerge et al., 1985).

At the Alexandra Clinic, the inadequate patient records apparently contributed to inferior documentation of the dental care process. Documentation style also reflected the given treatment regime, which was mainly pain relief procedures. The dental patient record at the Alexandra Clinic did not follow the problem orientated approach, leaving most of the burden on adequate documentation for the oral health care professional to demonstrate the dental care process. Documentation of the assessment, diagnosis and treatment plan were sub-optimal;

even the provision of treatment was often incomplete. Due to previously identified problems, the assessment of the dental care process was unmanageable.

Lack of understanding of the purpose of complete and accurate documentation was evident at the Department of Restorative Dentistry. The need to demonstrate what had taken place during a patient's previous dental visit was important. The dental patient record at the Department of Restorative Dentistry provided an opportunity for adequate recording of the dental care processes, which could then be used to assess the quality and outcome of the treatment. The dental record form fulfilled the litigation and risk management requirements, and could also be used for post mortem purposes.

In some of the more complex cases, such as temporomandibular disorder therapy, the need to document the dental care process is extremely important because of the subjectivity of the problem. In this type of treatment, proper record keeping is crucial (Owen, 1991).

4.5 Usefulness of dental records for quality assurance purposes

For quality assurance purposes an analytic audit should be conducted. The prerequisites for this are adequate patient records and adequate documentation (Jerge et al., 1985; Vehkalahti et al., 1992; Chasteen et al., 1996). Owing to inadequate patient record design at the Alexandra Clinic, and due to inadequate documentation in both of the clinics, it was impossible to use dental patient records for quality assurance purposes. Whether these deficiencies affect the quality of care can only be speculated.

5.0 CONCLUSION AND RECOMMENDATIONS

A lack of well-designed dental patient records was obvious, especially at the Alexandra Clinic. Important data such as status, diagnosis and treatment plan were often missing from the records at the Alexandra Clinic.

Areas in need of improvement in the Department of Restorative Dentistry included registration data, dental history, periodontal and occlusal status, radiographs and progress notes. In most of the cases the dental care process could be established from the patient records at the Department of Restorative Dentistry. In both clinics, patient records were, in many cases, unsatisfactory for quality assurance purposes as well as for forensic dentistry. Also, in most of the cases litigation and risk management requirements were not met.

The patient record is a very important prerequisite for quality assurance in dental care (Bailit et al., 1983; Rasmusson et al., 1994). In quality assurance, a well-designed patient record is part of the structure, and properly maintained patient records are part of the dental care process. To find ways to improve quality it is necessary to conduct process analysis and sometimes also to carry out structure analysis, because a poor outcome is often the result of structural and/or procedural deficiencies (Jerge et al., 1985). Structure and process analyses help to identify the methods to achieve the areas in need of improvement. Process analysis is as reliable or unreliable as its most important information resource: the dental patient record. When choosing and setting criteria and standards for dental patient records every role-player should be involved to achieve the best possible end result (Bailit, 1985; Vuori, 1995). Reliable and logically arranged information resources make it easy to detect signs of possible quality deficiencies. For routine quality assurance, quick, easily conducted and cost efficient collection of information is needed, preferably from one source. Collection of needed information should not increase the workload of health care personnel. The best solution would be to obtain the required data and information as a by-product of routine work (Jerge et al., 1985). Continuous information flow to the oral health care professionals about the significance of complete and accurate documentation is crucial owing to possible negative consequences of having poor patient records in individual cases (Rasmusson, et al., 1994).

The government and the professional organisations such as the Health Professions Council of South Africa (HPCSA) and the South African Dental Association (SADA) should be largely responsible for the creation, implementation and monitoring of the policies for quality assurance (Department of Health, 1997; Poorterman, 1997). These institutions jointly should promulgate rules about adequate patient record keeping. There is a further need for better training in formulary for dental students and postgraduates. There is also a necessity for more intensive monitoring and evaluation in the field (Rasmusson et al., 1994; Chasteen et al., 1996). The National Department of Health is committed to attaching a high priority to the improvement of quality of health care. This has led to the establishment of norms and standards in the health sector as a means of improving health services and ultimately the health status of the population.

In conclusion, while introducing reforms in data and information collection it should be remembered that before introducing changes, wide consultation with all the relevant stakeholders is necessary. This consultation between the reform makers and dental professionals is needed to ensure a smooth transition from one system to another. Changes in data and information collection should take into account all the role-players' needs. Time should be allowed for adaptation to the first changes before introducing new ones, in order to avoid the problems associated with rapid change in administrative systems. Dental professionals should not be expected to take on an unreasonable level of additional tasks as a result of the changes. Training is vital if compliance with adequate dental patient record keeping is expected. It should be ensured that all necessary resources are available before introducing changes in dental patient records. It is also important to pilot any changes in systems that affect patient records before introducing them more widely.

The government and the professional organisations such as the Health Professions Council of South Africa (HPCSA) and the South African Dental Association (SADA) should be largely responsible for the creation, implementation and monitoring of the policies for quality assurance (Department of Health, 1997; Poorterman, 1997). These institutions jointly should promulgate rules about adequate patient record keeping. There is a further need for better training in formulary for dental students and postgraduates. There is also a necessity for more intensive monitoring and evaluation in the field (Rasmusson et al., 1994; Chasteen et al., 1996). The National Department of Health is committed to attaching a high priority to the improvement of quality of health care. This has led to the establishment of norms and standards in the health sector as a means of improving health services and ultimately the health status of the population.

In conclusion, while introducing reforms in data and information collection it should be remembered that before introducing changes, wide consultation with all the relevant stakeholders is necessary. This consultation between the reform makers and dental professionals is needed to ensure a smooth transition from one system to another. Changes in data and information collection should take into account all the role-players' needs. Time should be allowed for adaptation to the first changes before introducing new ones, in order to avoid the problems associated with rapid change in administrative systems. Dental professionals should not be expected to take on an unreasonable level of additional tasks as a result of the changes. Training is vital if compliance with adequate dental patient record keeping is expected. It should be ensured that all necessary resources are available before introducing changes in dental patient records. It is also important to pilot any changes in systems that affect patient records before introducing them more widely.

G.P.-S. 81502727

81/502727
TPH 25

BUITEPASIËNT- EN/OF ONGEVALLE AFDELING
OUT-PATIENT AND/OR CASUALTY DEPARTMENT

Hospitaal
Hospital .....

Naam voluit
Name in full .....
Huisadres
Residential address .....
.....

Huwelikstaat
Marital state ..... Geslag
Sex ..... Ras
Race .....

Beroep
Occupation ..... Ouderdom
Age .....

Naam en adres van werkgewer/Persoon verantwoordelik vir betaling van Rek.:
Name and address of employer/Person responsible for payment of Account:
.....
.....

Naam van siekefonds
Name of sick fund..... S/F. No.
S/F. No.

Pasiëntno. Patient No.			
	Datum Date	vm. a.m.	nm. p.m.
Opgeneem Admitted			

Indeling
Classification.....

Dr. .....

SLEGS VIR AFSKEURSTROKIES
(Kwitansies en rekening)
FOR COUNTERFOILS ONLY
(Receipt and account)

Datum/Date	Datum/Date	Datum/Date

* Jaarlikse gesinsinkomste uit alle bronne/Annual family income from all sources:

Broodwinner/Breadwinner ..... R.....

Vrou/Wife..... R.....

Ander afhanklikes/Other dependants..... R.....

Totaal/Total..... R.....

* Getal persone in gesin (broodwinner insluitend)
Number of persons in household (including breadwinner).....

Meld ouderdomme van afhanklikes
State ages of dependants .....

Rede vir afhanklikheid
Reason for dependence .....

(* Minderjariges van 16 jaar en ouer wat selfonderhoudend is, moet uitgesluit word.)
(* Minor children of 16 years and older who are self-supporting are to be excluded.)

Datum van ongeluk/besering
Date of accident/injury..... Tyd
Time..... .....

Ingestuur
Sent in by ..... Geteken
Signed.....

Opnemingsbeampte
Admitting Officer.....

Die aard van die pasiënt se siekte mag vir rekeningdoeleindes vrygestel word.
The nature of the patient's illness may be disclosed for accounting purposes.

Getuie
Witness..... Geteken
Signed.....

Datum/Date.....

Klagte
Complaint

Huidige siekte
Present illness

ONDERSOEK/BEHANDELING/VORDERING
EXAMINATION/TREATMENT/PROGRESS

Datum/Date	

Vervolg agterop/Continued overleaf

81/502727
TPH 25

ONDERSOEK/BEHANDELING/VORDERING (Vervolg)
EXAMINATION/TREATMENT/PROGRESS (Continued)

Dateer elke inskrywing/Date each entry

Datum Date	

NAME Prof Dr Mr Mrs Miss ..... Hospital number .....
Initials ..... Group .....

STUDENT'S NAME	19.....	19.....	.....
	19.....	19.....	.....

SURNAME

DEPARTMENT OF HEALTH SERVICES

ORAL AND DENTAL TEACHING HOSPITAL

UNIVERSITY OF THE WITWATERSRAND

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
DEPARTMENT OF CONSERVATIVE DENTISTRY

PATIENT'S _____
ADDRESS _____
_____
_____ Code _____
Id. No. _____
Year of birth _____ Tel: [H] _____
Occupation _____
Employer _____
Address _____
Telephone _____

REFERRED BY Dr/Dept _____
Address _____
_____
_____
_____ Code _____
_____
Telepone _____ Extn _____
Next of Kin _____
Address _____
Telephone _____

Notes

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MEDIC-ALERT

☐ **YES** ☐ **NO**
See medical history

TAL No

HISTORY

2

MAIN COMPLAINT .....

HISTORY OF MAIN COMPLAINT and DENTAL HISTORY .....

MEDICAL HISTORY .....

ASK SPECIFICALLY ABOUT

- ☐ Cardio-vascular
- ☐ Respiratory disorders
- ☐ Bleeding disorders
- ☐ Anticoagulatns
- ☐ Diabetes mellitus
- ☐ Allergies
- ☐ Hepatitis/jaundice
- ☐ Rheumatic fever
- ☐ HIV
- ☐ Heredotary/familial
- ☐ Cortisone treatment
- ☐ Pregnancy
- ☐ Oral contraceptives
- ☐ Anti-epileptics
- ☐ ANY other medcines
- ☐ Prostheses
- ☐ Alcohol .....
- ☐ Tobacco .....

GIVE RELEVANT DETAILS OF ANY ITEMS CHECKED

IS THIS PATIENT FIT FOR TREATMENT?

☐ Yes ☐ No ☐ With support (see Medic-Alert)

Supportive treatment required or MEDIC-ALERT information

CLINICAL EXAMINATION

External abnormalities, lesion, skin disorders, etc. .....

Palpable lymphnodes .....

Oral mucosa, oropharynx .....

Temporomandibular joint ☐ NAD ☐ See TMJ file

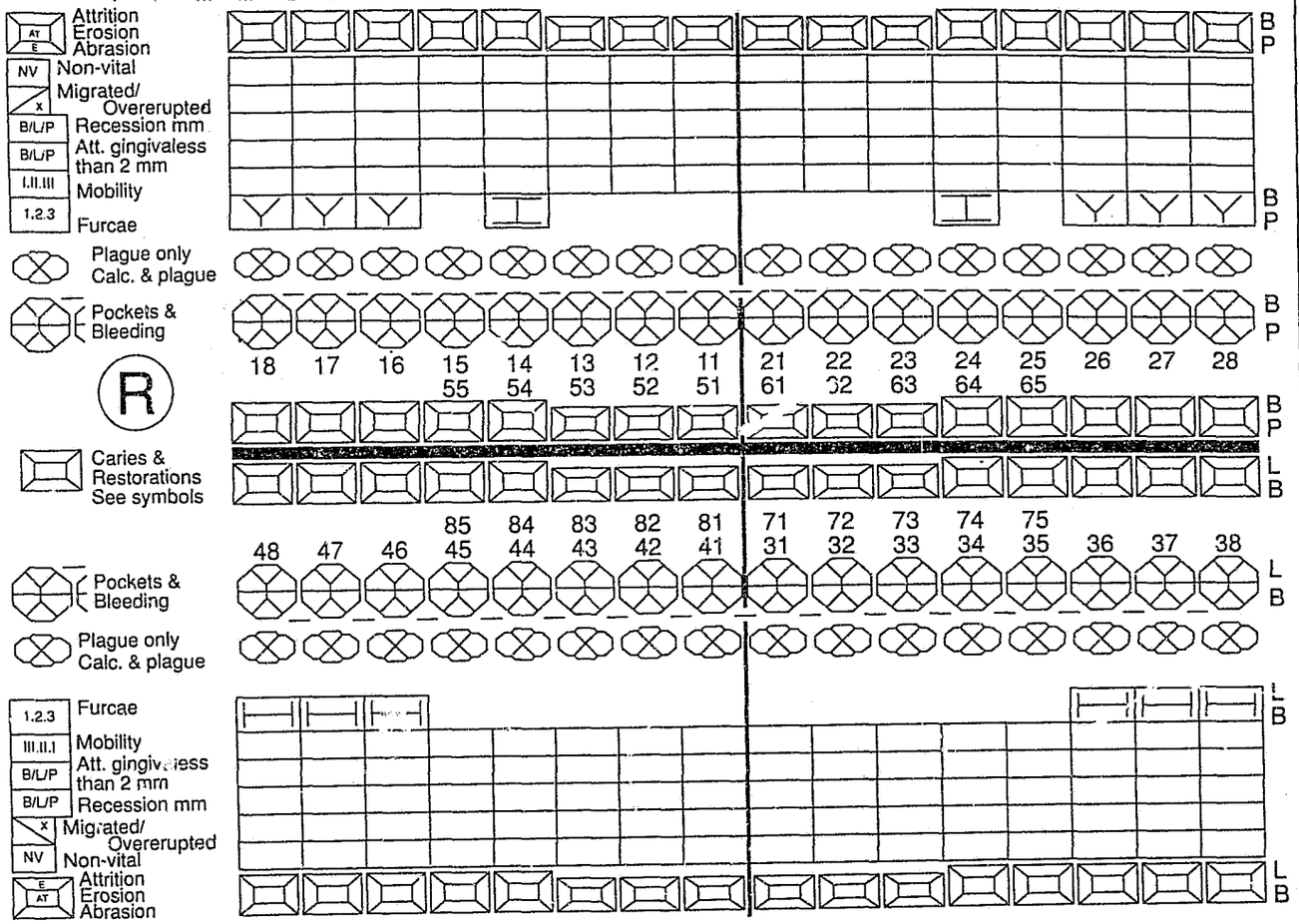
Subjective impression of mouth Describe clearly.

STUDENT	TOOTH OR REGION	**TREATMENT** Please make a **detailed** record of all treatment Patient No _ _ _ _ _ _ _ _ _ _ _ _ _ _	DATE	TREATMENT CODE	TREATMENT IDENTIFIER	GRADING	STAFF SIG & CODE

NOTE: When entire treatment plan is finished this sheet must be ruled off and certified by the signature of the supervisor and dated

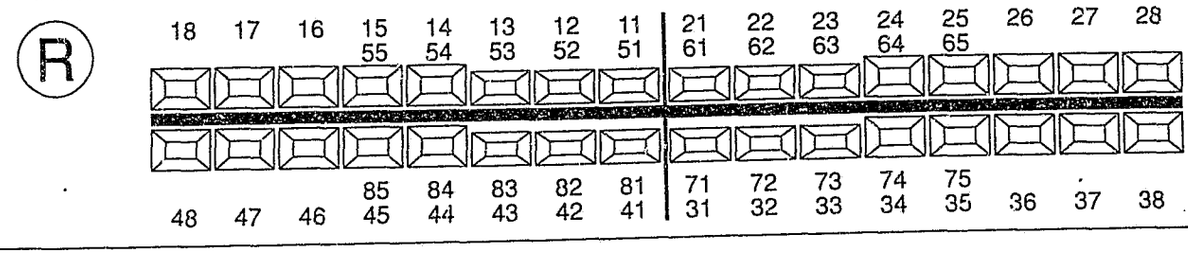
☐ PRE-EXAMINATION SCALING NECESSARY - Staff sig..... Missing S Unerupted

DATE OF THIS CHARTING: Y—Y—M—M—D—D

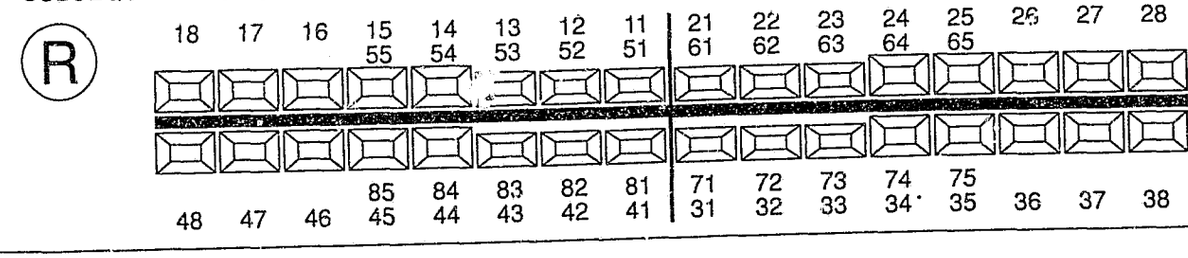


RESTORATIVE TREATMENT REQUIRED

FIRST VISIT



SUBSEQUENT VISITS



RADIORGRAPHS

☐ Periapicals Date ..... Date .....
Date ..... Date .....
☐ Pan Date ..... Date .....

OTHER TESTS & RECORDS

	DATE ORDERED
☐ Clinical photographs	
☐ Study models	
☐ Microbiology	
☐ Other	

CPITN: Transcribe here results if done

COMMUNITY PERIODONTAL INDEX OF TREATMENT NEEDS

SEXTANTS ☐☐☐ ☐☐☐

INDEX ☐

Recorded by .....

Staff signature ..... Date .....

CODE 0 Healthy periodontium
CODE 1 Bleeding of gingiva on probing
CODE 2 Calculus/defective restoration margin
CODE 3 Pathological pocket 4mm or 5mm
CODE 4 Pathological pocket 6mm or deeper
CODE 5 Elective e.g. crown lengthening

SUMMARY OF RESULTS OF TESTS etc.

Caries susceptibility clinical assessment

1. D.... M.... F.... S.... DMFS.....
2. At least one open cavity yes or no
3. Old plaque .....% new plaque .....%
4. More than 10% plaque yes or no
5. White spots under plaque yes or no
6. Patient caries prone yes or no

Refer for saliva tests and diet analysis

OCCLUSAL ANALYSIS

JOIN FOR CONTACTS
CIRCLE FOR FREMITUS

I.C. 8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8

R.C. 8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8

☐ RC = IC
☐ RC → IC slip
☐ Forward ☐ Slight ☐ Pronounced
☐ Left ☐ Slight ☐ Pronounced
☐ Right ☐ Pronounced

Left lateral 8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8

Right lateral 8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8

Protrusive 8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8

Crossbite 8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8
8 7 6 4 3 2 1 | 1 2 3 4 5 6 7 8

☐ Observe
☐ Adjust-reductive ☐ Adjust-additive temp.
☐ Adjust-restorative ☐ Appliance

NOTES

CASE ANALYSIS AND TREATMENT PLAN

SEGMENT or TEETH	PROBLEM	TREATMENT PLAN				
			Appt No.	Code	Credit Value	Done: Date

APPROVED: Staff signature: ..... Name capitals ..... Date: .....

Revised: Staff signature: ..... Name capitals ..... Date: .....

CASE PRESENTATION AND DISCUSSION WITH THE PATIENT

TREATMENT PLAN ACCEPTED BY PATIENT

DATE: ..... PATIENT'S SIGNATURE .....

ORAL AND DENTAL TEACHING HOSPITAL OF THE WITWATERSRAND

1 JAN SMUTS AVENUE
2001 JOHANNESBURG

TELEPHONE 407-8643
PRACTICE NUMBER 9005440

DEPARTMENT OF CONSERVATIVE DENTISTRY

NAME: ..... INITIALS .....
ADDRESS: .....
.....
..... CODE .....

MEDICAL AID ..... MEDICAL AID NUMBER .....

TO PROFESSIONAL SERVICES

DATE	CODE	DESCRIPTION	DEBIT		CREDIT		BALANCE OWING	

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

COMMITTEE FOR RESEARCH ON HUMAN SUBJECTS (MEDICAL)
Ref: R14/49 Kopsala

CLEARANCE CERTIFICATE **PROTOCOL NUMBER** M990412

PROJECT Quality Assurance & Dental Patients Records

INVESTIGATORS Dr J Kopsala

DEPARTMENT Dept of Community Dentistry, Dept of Community Health

DATE CONSIDERED 990430

DECISION OF THE COMMITTEE *

Approved unconditionally

DATE 990503 **CHAIRMAN** .....(Professor P E Cleaton-Jones)

* Guidelines for written "informed consent" attached where applicable.

c c Supervisor: Prof M Rudolph
Dept of Dept of Community Dentistry, Dept of Community Health

Works2\lain0015\HumEth97.wdb\M 990412

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10001, 10th Floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

DATE 6 May 1999 SIGNATURE .....

PROTOCOL NO.: M 990412

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Quality Assurance and the Dental Record Assessment

Procedural Audit

Name of the clinic						
Running number						
Patient's number from register						
Patient's record number						
Patient's age at the first visit						
Date of audit						
Original / duplicate						

1. Patient identification / Registration data

	YES	NO	N/A
Name			
ID / Birth date			
Sex			
Address			
Phone no.			
Occupation			
Name and number of person to contact in an emergency.			

Comments:

_____

_____

_____

2. Medical history

	YES	NO	N/A
An evaluation of the patient's general health and appearance.			
An indication as to whether the patient is under a physician's care or if the patient is taking any medication (name, concentration, dosage).			
Disclosure of any allergies or drug sensitivities.			
Disclosure of any contraindications or problems with any medications or anesthetics.			
History of systemic disease.			
Existence of pacemaker, valvular replacements, prosthetics joints, etc.			
Status of pregnancy in women.			
Evidence of updating medical history.			

Comments:

_____

_____

_____

3. Dental history

	YES	NO	N/A
Chief complaint: the reason for seeking dental care.			
Complications connected with past dental treatment.			
Oral hygiene practices.			
Dietary practices.			

Habits such as: bruxism, clenching, finger sucking, pencil biting, smoking, snuff, extensive use of alcohol.			

Comments:

_____

_____

_____

4. Clinical examination

	YES	NO	N/A
A tooth chart showing current restorations and any caries present at the time of initial examination; missing teeth; and any existing prosthesis, their age and condition.			
The existence of an evaluation of the periodontal status.			
Some notes regarding occlusal status.			
Findings of normal, pathologic or abnormal conditions should be noted. Look for a statement that the area examined is within normal limits. Positive findings should be noted and explained.			

Comments:

_____

_____

_____

5. Radiographs

	YES	NO	N/A
All taken radiographs can be found.			
They are in good order.			
There is evidence of identity of the patient on all films.			

There is evidence of date on all films.			

Comments:

_____

_____

_____

6. Diagnosis

	YES	NO	N/A
A diagnostic section where problems are been listed.			

Comments:

_____

_____

_____

7. Treatment plan

	YES	NO	N/A
The treatment plan is legible and easily located within the dental record. The plan is logical, sequential and may list referrals to specialists when appropriate.			

Comments:

_____

_____

_____

8. Progress notes

	YES	NO	N/A
Date of treatment.			
Provider who rendered the treatment (title and name).			
Permanent writing.			
Proper corrections: when a correction is necessary a single line should be drawn through the entry.			
Type of treatment; tooth number, if appropriate.			
Materials used in treatment (tradename).			
Full documentation of any medication dispensed or prescribed (tradename, concentration, dosage).			
Full documentation on the use of anesthetics and analgesics (tradename, concentration, dosage, vasodilator).			

Comments:

_____

_____

_____

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Author Kopsala J T
Name of thesis Quality Assurance And Dental Patient Records Kopsala J T 1999

PUBLISHER:
University of the Witwatersrand, Johannesburg
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