Electronic oral health records: ethical issues

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Abstract Electronic oral health records could be defined as electronic records of oral health information that have been entered by an oral healthcare provider. In Dental practice, they are increasingly being used and they seem to have certain benefits over paper records. Nevertheless, their use raises economic, organizational and, above all, ethical issues. The paper intends to discuss benefits, risks and further ethical concerns associated to their implementation.

Introduction

An electronic health record (EHR) is a medical record – i.e. a systematic documentation of a patient’s medical history and care – in digital format. In 2003, the Patient Safety Report, published by the Institute of Medicine of the National Academies, describes it as encompassing [1]:

“1. a longitudinal collection of electronic health information for and about persons;
2. (immediate) electronic access to person- and population-level information by authorized users;
3. provision of knowledge and decision-support systems (that enhance the quality, safety, and efficiency of patient care);
4. support for efficient processes for health care delivery”.

Words used in this field include electronic health record (EHR), electronic medical record (EMR), computer-based patient record (CPR), electronic patient record (EPR), etc [2]. These terms can be used interchangeably or generically but some specific differences could be identified. For example, many people define an EMR as just the physician interface and EHR including both a physician and patient interface [3, 4]. In this paper, they are used as synonyms.

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EHRs are increasingly being used in medical practice and their efficiency seems to be significant. Nevertheless, their use raises considerable ethical issues.

**Electronic oral health records**

In Dental practice, EHRs are increasingly being used and they are generally called electronic oral health records; they are included in the so-called “Dental Informatics” [5-7].

According to Heid et al. [5], an electronic oral health record could be defined as “an electronic record of oral health information that has been entered by an oral healthcare provider”.

In Dentistry, several electronic administrative information systems are usually adopted to store schedule appointments, patient accounts, conduct billing operations or other notations. Nevertheless, these information systems do not yet provide for an electronic oral health record that should be “standardized and consistent with data that is recorded in other electronic systems related to healthcare” [5].

During the last two decades, efforts have generally been done to define and document the structure and content of EHRs, in particular from the American Health Information Management Association, which represents the health record management professionals.

With reference to Dental practice, electronic oral health record standards are at present under study.

For Heid et al., a standardized electronic oral health record should allow the following functions:

- transmission of the patient’s complete oral health record, or selected parts, to a dental or medical specialist for patient care consultation;
- electronic transfer of a patient’s complete oral health record to a new dentist when the patient moves or changes oral healthcare providers;
- transmit and receive patient radiographic and photographic images in order to facilitate consultations, third party pre-authorization, and adjudication functions;
- receive medical test reports from medical laboratories;
- improve the safety and accuracy of patient care by sharing critical medical and dental information between medical and dental practitioners treating the same patient;
- inclusion in national taxonomies as well as in diagnostic and treatment coding systems;
- inclusion in standardized care documentation systems to facilitate interdisciplinary communication, long-term care outcomes assessment, and clinical research” [5].
Benefits and risks

EHRs have undoubtedly certain benefits over paper records. They allow to access health data at any time and anywhere. They require less storage space, and they can be stored indefinitely. They help research activities; expedite data retrieval and billings; reduce the number of lost records; allow for a complete set of backup records at low or no cost; speed data transfer, regardless of geographic collocation; are a proven long-term cost reducer [8-12].

Moreover, they produce legible records and this could reduce many of the problems of wrong prescriptions, wrong dose and wrong procedure [8]. At the same time, EHRs connected to pharmacies and drug data banks could reduce adverse drug events, for example, not permitting prescriptions and orders for drugs for which a certain patient has a known adverse reaction [8].

In short, EHRs have been shown to reduce medical errors, to facilitate quality assurance and to improve patient compliance [10].

With particular regard to electronic oral health records, they allow dentists to electronically document patient care and allow claims transactions to be more quickly and reliably processed. Moreover, they allow practitioners to organize and analyze clinical information associated with the practice (for example, pharmacotherapeutic interventions, diagnostic procedures, dental material selection and inventory control). Finally, being able to interface with records of other healthcare organizations, they have the ability to have new functions added without major programming revisions [5].

Nevertheless, EHRs also present some problems. Major critics cite economic issues (for example, high initial costs, large training investments), organizational issues (for example, complexity, waits for the use of systems) including ethical issues.

Ethical concerns

A basic element of the professional obligations of health care providers is that they have a special obligation to respect the confidentiality of what they learn about their patients. In other words, “every fact revealed to the health professional by a patient is, in principle, subject to the requirement of confidentiality, so that nothing may be revealed to anyone else without the patient’s permission” [13-17].

The ethical reason for protecting privacy is fundamentally that it represents “a mean to self-determination”, since “control over personal information about oneself is viewed as a central component of the ability to shape one’s life according to one’s own vision of it” [13].

In addition to legally mandate reporting (for example, evidence of child abuse), there are some derogations to the health professional’s obligation to confidential-
ity that are generally accepted and expected [13]. Following are the third parties to which relevant facts revealed by a patient are communicated:

1. other health professionals who are involved in the patient’s care (for example, other physicians or health care personnel) in order to provide effective care;
2. persons not directly involved in the patient’s care (for example, hospital managers);
3. health professional students involved in the patient’s care for educational reasons.

The cumulative effect of these three exceptions is that many people learn facts about patients that were originally confidential.

Moreover, the setting in which health care is nowadays provided have grown in an increasingly complex and interconnected manner. A recent estimate holds that in the course of a three-to-five-day hospital, for example, an average of 150 persons will have legitimate access to a patient’s medical record [13].

So, the protection of the confidentiality of personal information has become more and more problematic in contemporary medicine.

The EHRs implementation has certainly enlarged this difficulty, bringing new opportunities for both deliberate and inadvertent violations of patients’ privacy [10, 13, 18-31]. This enlargement can be explained by the following considerations:

1. EHRs allow a greater access to health data. As a consequence, breaches of confidentiality with EHRs could be more considerable than breaches with paper medical records.

In fact, a single electronic breach could affect more patients than a breach of confidentiality with paper records, as only one paper record at a time can be accessed. Moreover, more data on each patient can be quickly retrieved in digital format. Finally, EHRs can be accessed from many computers, producing more potential sites for violations of patients’ privacy.

2. Because the use of EHRs by health care professionals and their staffs is new, many are not yet familiar with the precautions they need to protect patients’ privacy.

3. EHRs in some healthcare organisations allow for outcomes research to be carried out, for example to assess drugs as used in widespread clinical practice rather than in smaller controlled clinical trials. Although this does not imply physical risk to patients, it could, instead, imply psychosocial risk: in fact, as Lo B has noted, “patients may also feel that their freedom or autonomy is violated if they become subject of research studies without their knowledge or consent” [10].

4. EHRs data can be easily used for aims other than direct clinical care. For example, it is the case in which they are used to identify patients in order to realize advertising and promotions from for-profit companies selling healthcare products.

In some ways, the protection of the confidentiality of personal information can be more important in Dental practice, if you think that dentists are often the first health care professionals to see the earliest manifestations of some pathologies.
An example is the HIV infection/AIDS: the earliest manifestations of which can occur in the oral cavity and whose advent has sharply heightened patients’ sensitivity to secure confidentiality about their personal data.

As a consequence, the use of electronic oral health records should be particularly careful and all the adequate precautions need to be taken in order to protect health information.

In fact, some episodes of electronic breaches have already occurred: for example, in Florida, the names of 6,000 persons with HIV infection were mistakenly attached to an email sent to 800 employees in the county health department [10].

**General principles of Informatics Ethics and precautions**

Ethical reasons for protecting privacy of patient’s have therefore become more urgent in the face of electronic record keeping.

In order to facilitate this protection, over the past few years, various professional associations and consortia in the informatics field have developed guidelines or codes.

Perhaps the most noteworthy of these is *The IMIA Code of Ethics for Health Information Professionals* [32], published by the International Medical Informatics Association [33]. It is composed of two parts:

1. **A.** an introduction, including a brief list of general principles of informatics ethics, widely accepted, derived from a set of fundamental ethical principles (i.e., principle of autonomy, equality and justice, beneficence/non-maleficence, impossibility and integrity). They are:

   1. **Principle of Information-Privacy and Disposition.** All persons have a fundamental right to privacy, and hence to control over the collection, storage, access, use, communication, manipulation and disposition of data about themselves.
   2. **Principle of Openness.** The collection, storage, access, use, communication, manipulation and disposition of personal data must be disclosed in an appropriate and timely fashion to the subject of those data.
   3. **Principle of Security.** Data that have been legitimately collected about a person should be protected by all reasonable and appropriate measures against loss, degradation, unauthorized destruction, access, use, manipulation, modification or communication.
   4. **Principle of Access.** The subject of an electronic record has the right of access to that record and the right to correct the record with respect to its accuracy, completeness and relevance.
   5. **Principle of Legitimate Infringement.** The fundamental right of control over the collection, storage, access, use, manipulation, communication and disposition of personal data is conditioned only by the legitimate, appropriate and relevant data-needs of a free, responsible and democratic society, and by the equal and competing rights of other persons.
6. Principle of the Least Intrusive Alternative. Any infringement of the privacy rights of the individual person, and of the individual’s right to control over person-relative data as mandated under Principle 1., may only occur in the least intrusive fashion and with a minimum of interference with the rights of the affected person.

7. Principle of Accountability. Any infringement of the privacy rights of the individual person, and of the right to control over person-relative data, must be justified to the affected person in good time and in an appropriate fashion” [28].

B. a detailed set of ethical rules of behaviour – developed by applying the general principles of informatics ethics – that offers more particular guidance.

This set of principles and ethical rules of behaviour can be extended even to electronic oral health records. Further and more detailed precautions ethically required of dentists who employ electronic record-keeping technologies could be the following [13]:

1. A dentist’s staff need to be as committed to respecting patient’s confidentiality as the dentist, and the latter need to educate and supervise to make sure that behavior conforms to this commitment.

2. Access to data should be available only on a need-to-use basis.

3. Dentists and their staff need to be well educated in the utilization of adequate electronic safeguards, as for example password, firewalls, and so on, to protect electronic oral health records.

4. Dentists and their staff need to be well educated to assuring the integrity of electronic oral health records. In particular, the dentist’s in-house software and/or arrangements with service providers must include the ability to verify the integrity of data and to trace changes made to a record after it is initially created.

5. Dentists and their staff who use off-site physical storage have the additional ethical requirement to be well educated about the use of appropriate safeguards at the other site.

6. As electronic oral health records are more vulnerable (because of crash, viruses, etc) than paper records, dentists and their staff have the ethical requirement to make special (economic) efforts to assure access to patients’ electronic records.

7. Dentists have a privacy obligation to their patients to make sure that information about them is not being used for purposes other than those intended when they provided it. Even the use of information about a patient with all identifying characteristics of the patient removed is still information about that patient and may not be used without the patient’s consent.

Conclusion

The implementation of electronic records within Dental practice – whose standardization is at present under study – has undoubtedly certain benefits over the use of paper records: it allows dentists to electronically document patient care; it allows practitioners to organize and analyze clinical information associated with
the practice; and it has the ability to have new functions added without major pro-
gramming revisions.

Nevertheless, it also raise some economic, organizational and above all ethical
issues.

In particular, in Dentistry, the protection of the confidentiality of personal in-
formation is, in some ways, more considerable, if you think that dentists are often
the first health care professionals to see the earliest manifestations of some pa-
thologies.

So, all the adequate precautions need to be taken in order to protect health in-
formation. In this regard, the observance of *The IMIA Code of Ethics for Health
Information Professionals* and of some precautions could be useful.

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