

# Evaluation of Electronic Dental Medical Records at Sultan Agung Islamic Dental Hospital: Compliance with Indonesian Laws and Regulations

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# Evaluation of Electronic Dental Medical Records at Sultan Agung Islamic Dental Hospital: Compliance with Indonesian Laws and Regulations

## ABSTRACT

**Background:** Dental electronic medical records have already been used in many dental care services in Indonesia. Yet, the actual definitions and constitution that regulate this dental electronic medical record are still in debate. Therefore, this study aims to analyze the use of dental electronic medical records in Sultan Agung Dental Hospital Semarang based on the constitution in Indonesia. **Method:** Our study used a cross-sectional analysis with an observational description of the component and security of the dental electronic medical record in Sultan Agung Islamic Dental Hospital Semarang. **Results:** Dental electronic medical record in Sultan Agung Islamic Dental Hospital didn't complete the odontogram teeth component. The software used in the dental electronic medical record didn't have a tool to write specific symbols and color signs on the odontogram teeth component. **Conclusion:** The complete format and the security of dental electronic medical records in Sultan Agung Islamic Dental Hospital Semarang have not aligned with the Indonesian constitution and regulations.

## INTRODUCTION

The medical record is a very crucial part of the health system. A medical record can affect the quality of the health service, which is a legal format of the health service system. A good health service, whether general medicine or dental medicine, is given to patients depending on a medical record. The quality of medical records can affect dental health services. Based on Indonesian constitutions regulation of ministry of health number 269/Menkes/PER/III/2008 about medical records, stated in chapter 1 verse 1, "Medical record is a document that consists of note and file about patient identity, examination, therapy, intervention, and any other health services that have been given to the patient<sup>1-3</sup>.

Dental medicine medical records are filled with important information about clinical conditions of the patient mouth and teeth that are needed for the subsequent examination and therapy. In the Indonesian constitution for medical practices, number 29 the year 2004, chapter 46 verse 1 explained that doctors and dentists should make medical records in the right way, precise, and complete thus, the therapeutic aspect and legal format of the law fulfilled<sup>4,5</sup>.

As the technological aspect of our lives is developed, manual medical records have been shifting to the electronic medical record. This system is applied in dental medicine as

well. Odontogram, a specific examination for the dental patient, also turns to the electronic medical record. A Dental hospital management also uses developing Information Technology to apply a new comprehensive system called information system hospital management. This development is making a new paradigm in how to manage health information by health providers in hospitals and also law practitioners related to health<sup>6-8</sup>.

<sup>8</sup> The constitution has already managed the medical record. It is listed on the constitution number 29, the year 2004 about medical practices, number 44, the year 2009 about the hospital, and a letter from the health ministry about the medical record. However, experts are still debating the actual definition of electronic medical records. Suppose we see it from the description of the electronic system aspect and electronic information aspect. In that case, we can conclude electronic <sup>4</sup> medical record is an electronic document that consists of a patient's examination history<sup>9-11</sup>.

In real-world practice, the electronic medical record needs an input process and secure access to ensure personal information security. Moreover, the electronic medical record must include the doctor, dentist, or other health worker's identity with a personal signature when conducting the patient health service. The authenticity of the patient document must be clear to prevent disputes in the future. The legal aspect of the document and the regulation for the document to be used must be clear and undisputed<sup>12-14</sup>. For these reasons, we need to analyze the electronic dental medical record implementation in Sultan Agung Dental Hospital following the Indonesian constitution.

## <sup>1</sup> METHOD

This <sup>1</sup> research is descriptive-observational with a cross-sectional design. The observation of this study is to evaluate the completeness of the format and system security of the electronic dental medical record. The observation is based on the checklist and guidebook from the health ministry of Indonesia. In addition, we also analyze information and electronic transaction based on the constitution <sup>2</sup> Ministry of Health regulation number 269/MENKES/PER/III/2008 and national constitution number 11 the year 2008. The ethics commission has approved this study from the <sup>6</sup> Faculty of Dentistry Gadjah Mada University with document number 00722/KKEP/FGK-UGM/EC/2021.

## RESULTS

<sup>1</sup> The dental electronic medical record in Sultan Agung Dental Hospital Semarang has not been fully implemented because most of its content is written manually. Our study showed

that dental electronic medical records in Sultan Agung Dental university already have a checklist based on the ministry of health regulation number 269/MENKES/PER/III/2008 about medical records and guide book for the medical record. Electronic dental medical records must have the same component as manually written ones. Although electronic dental medical records should have details such as patient identity, medical data, odontogram, table for health services, and appendix<sup>11,12</sup>.

**Table 1.** Patient identity format

No	Medical record component	Checklist for completeness		Description
		yes	no	
1.	Patient identity	Name	√	Exist
		Place and date birth	√	Exist
		Citizen number	√	Exist
		Age	√	Exist
		Gender	√	Exist
		Race	√	Exist
		Job	√	Exist
		Home address	√	Exist
		Telephone home	√	Exist
		Office address	√	Exist
Telephone office	√	Exist		

**Table 2.** Medical data that require attention

No	Medical record component	Checklist for completeness		Description
		yes	no	
2.	Medical data that require attention	Blood type	√	Exist
		Blood pressure	√	Exist
		Heart disease	√	Exist
		Diabetes	√	Exist

Haemophilia	√	Exist
Hepatitis	√	Exist
Gastring	√	Exist
Other	√	Exist
disease		
Drug allergy	√	Exist
Food allergy	√	Exist

**Table 3.** Odontogram dan intraoral examination

No	Medical record component	Checklist for completeness		Description
		yes	no	
3.	Odontogram	Odontogram maps	√	Not functioning
		Odontogram writting		√ Not functioning
Server of application to write odontogram			√ Not functioning	
Intraoral examination	Occlusion	√		Exist
	Torus palatinus	√		Exist
	Torus mandibula	√		Exist
	Palatum	√		Exist
	Diastema	√		Exist
	Teeth anomaly	√		Exist
	Others	√		Exist

No	Medical record component	Checklist for completeness		Description
		yes	no	
4.	Treatments	Date	√	Exist
		Teeth that being taken care	√	Exist

Complain and diagnose	√	Exist
ICD 10 code	√	Exist
Type of care	√	Exist
Dentist signature	√	Exist
Additional description	√	Exist

**Table 4.** Dental care examination

**Table 5.** Appendix

No.	Medical record component	Checklist for completeness		Description
		yes	no	
5.	Appendix	Informed consent	√	Not exist
		Informed refusal	√	Not exist
		Radiograph	√	Exist
		Cost	√	Exist

**Table 6.** Security aspect of electronic medical record

No.	Medical record component	Checklist for completeness	
		yes	no
6	Privacy	Health worker account is secure and save (data is encrypted)	√
		Is there user id and password for health worker	√
.	Integrity	Information in medical record cannot be changed without permission of previous dentist or health worker who wrote the medical record.	√
		Is there an electronic signature for the dentist to write electronic dental medical record.	√
.	Authentic	Authenticity of information in medical record can be held accountable (the information of medical record is coming from the result of patient examination by the dentist or other health worker).	√
		Is there an electronic signature in every dentist writing in medical record? Using user id and password for the dentist or health worker to access it.	√
.	Availability	Is there availability of information if needed.	√
		Is the electronic dental medical record content meet the completeness criteria?	√
.	Access Control	User id and password is secure?	√

	How is the access management of the electronic medical record? Does it require identification and a password?	√
Non Rapadiatum	The history of medical record writing is showed	√
	Every change that was made in the medical record should also being recorded in the history and can be known which part is deleted or added.	√

## DISCUSSION

The format of the dental electronic medical record in Sultan Agung Dental hospital can be seen in tables 1 to 5. In all aspects that were required, some components still lacked, such as the odontogram. In the odontogram part, the software made a mistake because the medical record writer could not input a symbol and a color sign. Also, in the appendix part of the medical record software, there is no button to upload documents like informed consent, laboratory examination, or imaging results. These can affect the quality of electronic medical records because not all the information from the patient is written. Based on this observation, Sultan Agung Dental Hospital's electronic medical record does not fulfil the requirement of format completeness. Thus, based on the above description, the hospital did not meet the standard of aspect legality and guide book by the ministry of health Indonesia<sup>15-17</sup>.

The software to record electronic medical records has to meet a certain standard and the Indonesian constitution. Some of the regulation and constitution is: "Guide book for writing dental medical record" by Ministry of Health Indonesia (2014). To increase the legality of dental medical records and communication to each health provider in Indonesia, the ministry of health Indonesia made this guidebook. Writing an excellent medical record needs to meet specific standards. The guidebook is on how to write and compose dental medical records in a good and precise form, including using symbols in odontogram. Thus, we have the same symbol based on the guidebook from the Ministry of health<sup>2,18,19</sup>.

Constitution number 29 the year 2004 about Medical Practice, performed two chapters to regulate the rule for medical record implementation. First, chapter 46, verse 1, stated that every doctor and dentist in doing their practices must write a medical record. Then chapter 47, verse 3 stated that the requirement about the medical record, as indicated in verses 1 and verse 2, will be regulated by the Ministry. Ministry of Health regulation number 269/MENKES/PER/III/2008 about medical records performed regulation of the implementation from the national constitution chapter 47 verse 3 number 29 the year 2004



about medical practices. In this regulation, chapter 2, verse 2<sup>1</sup> stated that medical records must be written entirely and clearly, manually or digitally. Therefore, it is clear that this regulation said that medical records could manually or digitally be written. Thus, the content completion is based on the same principle as the manual medical record, as explained in Ministry of Health regulation number 269/MENKES/PER/III/2008, chapter 1 verse 1 stated that medical records are a document consisting of patient identity, the result of the examination, therapy, intervention, and other health services that already been given to the patients<sup>2,20,21</sup>.

National Constitution number 11 the year 2008 performed information and electronic transaction. Besides being patient therapy, medical records can also function as evidence if a medical dispute happens. In this case, the electronic medical record also can act as evidence because it has legality, as explained in this constitution. Chapter 1 verse 4 stated that electronic document is every electronic information that is made, forwarded, sent, received, or kept in an analogue, digital, electromagnetic, optical or as such that can be seen, showed, and/or listened through computer or electronic system. These include but are not limited to writing, sound, picture, maps, design, photo or such, letter, sign, number, code access, symbols or perforation that have meaning or can be translated by someone that can understand it<sup>22-24</sup>.

The electronic device in all forms that this constitution has explained can be used as legal evidence as long as someone can understand or someone who is an expert in this field. Moreover, the electronic medical record in the form of a sound recorder or other electronic information can be a shred of evidence in front of law because has a meaning or can be understood. The electronic medical record can be seen as an aspect of a component and data security as explained by constitution number 11<sup>11</sup> the year 2008 about information and electronic transaction. The data must be protected and can not be shared without patient agreement. Sabarguna (2008) stated that the security of the electronic system in health consists of 6 aspects: privacy, integrity, authentic, availability, access control, and non-rapadiatum<sup>10,25,26</sup>.

Things that need to pay attention to in privacy is the security of a system. Not all people can gain access to and open the data. For example, a medical record consists of a patient's health history, which is a secret document that must be protected and kept secret [10]. Sultan Agung Dental Hospital already has a piece of good security information. Thus, only dentists doing the examination are allowed to change the electronic dental medical record using a personal account system. The weakness is Sultan Agung Dental Hospital did not include an electronic signature. The electronic signature is vital as the electronic identity of the dentist who is doing the examination and therapy to the patient. An electronic signature can also be



considered as the part that makes the document authentic. In addition, an electronic signature can also show the agreement for the therapeutic intervention of the patient<sup>1,10</sup>.

Authentication is a method to ensure that the electronic dental medical record comes from the dentist doing the examination. Authentication in Sultan Agung Dental Hospital uses a user id and password system. Each dentist uses the user id and password to sign in to the system. Although an electronic signature is not used, based on the explanation in some constitutions, it can be replaced by a user id and password system<sup>10</sup>. Availability is the availability of information to be seen when needed. Sultan Agung Dental Hospital availability aspect is not optimum because no symbols and signs are used in odontogram<sup>10</sup>.

Access control aspect of electronic dental medical record in Sultan Agung Dental hospital already facilitated by user id and password system. Access control is used to ensure the right to access for medical record by staff of medical record for example the front office that received the registration from patient in the hospital. Front office staff only can open the identity part of the medical record through the access control system. Odontogram and care table can only be access by the dentist<sup>10,12</sup>.

Non-rapadiatum aspect ensures that the dentist cannot deny that they are the ones writing the medical record. This aspect can show a mistake in the electronic medical record. Every change made in Sultan Agung dental hospital's electronic dental medical record is written in history so we can see who is making a mistake in the electronic medical record. Nugraheni et al. (2018) stated that some hospitals are not concerned with this aspect, so when some change has been made to the record will not be written in history, and we can not see who was the one who made a change<sup>10</sup>.

## CONCLUSION

The dental electronic medical record format of Sultan Agung Dental is insufficient based on the analysis of the regulation of the Indonesian Ministry of Health. In addition, the odontogram components, appendices documents of the dental electronic medical record, and the security aspect require urgent consideration for improvement.





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