The Audit of Comprehensiveness of Dental Records at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand

Tipruthai Prayoonwong[1]*, Thanaphat Chirattanasak[2], Duangruethai Boonyo[2], Narathip Yuthim[2], Natthapon Kerdphol[2]

1. Department of Preventive Dentistry, Faculty of Dentistry, Naresuan University, Phitsanulok, Thailand.
2. Faculty of Dentistry, Naresuan University, Phitsanulok, Thailand.

Abstract

The purpose of this study was to investigate the comprehensiveness of dental records at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand from 2009 to 2015. Data were collected from 2,315 dental records in paper format using comprehensiveness of dental recording evaluation form. Data were analyzed by quantitative analysis of percentage, mean, and standard deviation.

The results showed that patient information was at excellent level (95.64 percent). Personal history recorded by students was at good level (81.22 percent) but the same recording performed by instructors was at inadequate level (42.87 percent). Inform consent was at inadequate level (44.62 percent). Clinical examination (full chart) recorded by students was at good level (81.19 percent) but the same recording performed by instructors was at moderate level (75.18 percent). Clinical examination (brief chart) recorded by students and instructors were at moderate and inadequate level, respectively (73.00 and 61.15 percent, respectively). Treatment recorded by students and instructors were at inadequate level (42.80 and 25.85 percent, respectively). Overall, the comprehensiveness of dental records was at inadequate level (62.35 percent).

Results from this study should be used as a guideline to improve the comprehensiveness of dental records at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand.

Clinical article (J Int Dent Med Res 2019; 12(2): 584-590)

Keywords: Audit, Comprehensiveness, Dental records.

Received date: 27 July 2018 **Accept date:** 25 November 2018

Introduction

Quality and safety of health care services are the expectations of all societies in every country. However, adverse events, unpleasant incidents, mistakes, and other risks can occur. Thus, mechanisms which promote and stimulate the development of the quality of hospitals and health care services are needed. Such mechanisms and systems should be effective and adaptable to the circumstances and context of the hospital.

Hospital Accreditation (HA) is an accreditation process to stimulate the development of the internal systems of the hospital. It is a self-assessment and external peer assessment process used by health care organizations. Having to reach accreditation standards, hospitals are required to continuously improve.[1]

Medical record audit is one of the key mechanisms for improving hospital quality. Quality medical recording can be used as medical evidence. It is used as a communication tool for health care teams to plan and care for patients continuously. It is also used to review the process and to maintain results to ensure that the quality of care meets accepted standards.[2] Therefore, medical/dental record audits are considered to be part of a quality control system.

HA has defined the activity of reviewing the completion of medical records as one of the main activities of hospital quality development.[1] In addition, the Thai Dental Council has improved the Thai Dental Safety Goals and Guidelines 2015 which ensures maximum safety for both service providers and recipients. This has led to a quality dental clinic. Safe record is one of the

Corresponding author:
Tipruthai Prayoonwong
Department of Preventive Dentistry,
Faculty of Dentistry, Naresuan University,
Phitsanulok, Thailand
E-mail: tipruthai@hotmail.com

main goals in this dental safety practice.[3] Quality assurance of dental records will help to reflect the quality of patient services through the perspective of the investigator. The objective is to control the quality of patient services in accordance with professional standards or standards of quality provided by dental clinics.

Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand has been improving the quality of the hospital through the HA's quality assurance system since 2007 and was given initial assessment in October 2015. The self-assessment of dental record audit was conducted in each clinic at the dental hospital by using the dental recording evaluation form in October 2007. However, the dental recording evaluation form and data obtained from the dental record audit activities had never undergone a systematic review and analysis of data based on systematic research. Moreover, the assessors had problems with the interpretation of the evaluation form; did not use the same standard in rating; or relate it with a real situation in some topics of the evaluation form. Thus, it is possible that the data from the dental record audit activities is incomplete or inaccurate.

Therefore, the purpose of this study was to investigate the comprehensiveness of dental records at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand from 2009 to 2015. Results from this study should be used as a guideline to improve the comprehensiveness of dental records at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand in the way that staffs should have more concern to improve the quality of his/her records in dental record form in accordance with the professional standard.

Materials and methods

A retrospective, descriptive study was carried out between 2009 and 2015. The study analyzed the dental records in paper format, using a comprehensive dental recording evaluation form at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand. This study was approved by Naresuan University Institutional Review Board (IRB No. 471/59), Thailand.

The study population was 31,206 dental records in paper format from January 2009 to December 2015 at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand. The study sample size was calculated using the formula for a descriptive study with a finite population, which was 2,315 dental records in paper format. Then, proportional stratified random sampling was carried out with systematic random sampling, divided by each year.

A comprehensive dental recording evaluation form was devised by the researchers, based on a synthesis of the studies and guidelines.[2-8] Topics in the evaluation form were divided into five sections as follows; Section 1: patient information; Section 2: personal history; Section 3: informed consent; Section 4: clinical examination; and Section 5: treatment records.

Three types of checklists were as follows: 0 (No information); 1 (Incomplete information); and 2 (Complete information). Evaluation criteria of each topic for complete information (code 2) was clearly determined following the medical records audit guidelines of Thai National Health Security Office 2014 [2] with Safety Records of Thai Dental Safety Goals and Guidelines 2015.[3]

Content validity of the evaluation form was tested by three content experts with Index of Item-Objective Congruence (IOC) between 0.70 – 1.00. Inter-calibration kappa values from four researchers were 0.71 – 1.00 and intra-calibration kappa values were 0.89 – 1.00. Data were analyzed by quantitative analysis of percentage, mean, and standard deviation using the Microsoft Excel 2010. Complete information (code 2) was analyzed for percentage in each topic, and the scoring interpretation was as follows:

Percentage of complete information	Scoring interpretation
90.1 - 100.0	Excellent level
80.1 - 90.0	Good level
70.1 - 80.0	Moderate level
Less than 70.0	Inadequate level

Results

Data were collected from 2,315 dental records in paper format (7.4 percent of total dental records in paper format from January 2009 to December 2015 at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand).

Section 1 Patient information

There are 14 topics in this section. This section was recorded by dental record staffs. Assessment results of section 1 shows that the comprehensiveness of dental records in all topics were at good to excellent level (Table 1).

Topics	Assessment result (N = 2,315 dental records) (Percentage)		
	Complete information	Incomplete information	No information
1. Dental Number (DN)	99.9	0.1	0.0
2. Name	95.1	4.9	0.0
3. Age	99.9	0.0	0.1
4. Sex	99.9	0.0	0.1
5. Birth date	98.5	1.3	0.2
6. Identification number (ID number)	93.0	0.1	6.9
7. Occupation	98.2	0.0	1.8
8. Payment	92.5	0.0	7.5
9. Contact address of patient	95.1	4.7	0.2
10. Telephone number of patient	98.5	0.2	1.3
11. Person to contact in emergency	89.6	9.8	0.6
12. Contact address of person to contact in emergency	84.7	12.0	3.3
13. Relationship of person to contact in emergency	96.7	0.0	3.3
14. Telephone number of person to contact in emergency	97.4	0.2	2.4

Table 1. Assessment result of section 1 patient information.

Section 2 Personal contact

There are 5 topics in this section. There are 438 dental records (18.9 percent) recorded by students (undergraduate and graduate students) and 1,877 (81.1 percent) recorded by instructors. Table 2 demonstrates assessment results of section 2.

The results recorded by students show that the chief complaint concerned the lack of comprehensiveness of dental records, and this was shown to be inadequate. Incomplete information in topic 1 was lack of information to identify symptoms, area, and duration. The comprehensiveness of dental records in topic 2 present illness, topic 3 medical history, topic 4 dental history, and topic 5 personal history were at good to excellent level. But subtopic 2.5 how often and subtopic 2.6 oral health checkup were at inadequate level. The results recorded by instructors show that the comprehensiveness of dental records in all topics were at inadequate level.

Section 3 Informed consent

There were 4 topics in this section. This section was recorded by dental record staffs. Table 3 illustrates the assessment results of section 3. The results show that for most topics of the comprehensiveness of dental records were at inadequate level, except for topic 4, which specifies the date of consent was at good level. Incomplete information in topic 1 patient signature and topic 4 staff signature were 44.5 percent and 76.7, respectively because of signature without printed name and surname.

Topics	Assessment result (N = 2,315 dental records) (Percentage)					
	Students (438 dental records)			Instructors (1,877 dental records)		
	Complete information	Incomplete information	No information	Complete information	Incomplete information	No information
1. Chief Complaint	62.1	36.5	1.4	30.9	34.2	34.9
2. Present Illness						
2.1. What	96.4		3.6	55.4		44.6
2.2. Where	88.2		11.8	49.7		50.3
2.3. When	93.1		6.9	47.6		52.4
2.4. How	88.9		11.1	49.9		50.1
2.5. How often	52.3		47.7	22.4		77.6
2.6. Oral health checkup	68.9	9.4	21.7	16.4	6.3	77.3
3. Medical History	81.5	17.4	1.1	46.1	18.1	35.8
4. Dental History	95.0	4.1	0.9	60.8	2.8	36.4
5. Personal History	85.8	15.5	1.1	49.5	8.6	41.8

Table 2. Assessment result of section 2 personal history.

Section 4 Clinical examination

Two thousand three hundred and fifteen dental records in paper format, section 4 was recorded 1,924 dental records (81.8 percent) and no recorded 391 dental records (18.2 percent). No recorded in this section was identified as the

incomprehensiveness of dental records in section 4. 1,924 dental records in section 4, it was divided into two formats consisting of full chart 491 dental records (25.5 percent) and brief chart 1,433 dental records (74.5 percent). This section was recorded by students and instructors.

Topics	Assessment result (N = 2,315 dental records) (Percentage)		
	Complete information	Incomplete information	No information
1. Patient signature	51.2	44.5	4.3
2. Patient's witness signature			
2.1. Having patient's witness	24.4	26.6	49.0
2.2. Having no patient's witness	44.1		55.9
3. Staff signature	19.1	76.7	4.2
4. Specify date of consent	84.3	0.0	15.7

Table 3. Assessment result of section 3 inform consent.

Full chart

There were 8 topics in this section. There were 438 dental records (89.2 percent) recorded by students and 53 dental records (10.8 percent) recorded by instructors. Table 4 presents assessment results of section 4 clinical examinations (full chart). The results recorded by students show that most topics of the comprehensiveness of dental records were at good to excellent level except for topic 7 treatment plan, subtopic 8.2 name-surname of student, and subtopic 8.4 name-surname of instructor, which were at inadequate level. No information in subtopic 8.2 and 8.4 were 51.0 percent and 99.1, respectively because of signature without printed name and surname. The results recorded by instructors showed that most topics of the comprehensiveness of dental records were at good to excellent level. However, topic 1 name-surname of patient and dental number (DN), topic 7 treatment plan, and subtopic 8.4. name-surname of instructor were at inadequate level.

Topics	Assessment result (N = 491 dental records) (Percentage)					
	Students (438 dental records)			Instructors (53 dental records)		
	Complete information	Incomplete information	No information	Complete information	Incomplete information	No information
1. Name-surname of patient and DN	83.6	4.3	12.1	56.6	0.0	43.3
2. General appliance	98.4	0.0	1.6	89.1	0.0	10.9
3. Masticatory muscles and TMJ	98.4	0.9	0.7	90.9	1.8	7.3
4. Oral examination	82.0	16.4	1.6	79.2	11.3	9.4
5. Clinical finding	100.0	0.0	0.0	98.2	0.0	1.8
6. Diagnosis	99.1	0.9	0.0	96.4	1.8	1.8
7. Treatment plan	66.5	33.4	0.1	47.1	52.4	0.5
8. Student examiner and instructor						
8.1. Student signature	100.0		0.0			
8.2. Name-Surname of student	49.0		51.0			
8.3. Instructor signature	98.0		2.0	98.1		1.9
8.4. Name-Surname of instructor	0.9		99.1	1.9		98.1
8.5. Date	98.4	0.2	1.4	94.3	0.0	5.7

Table 4. Assessment result of section 4 clinical examination (full chart).

Brief chart

There were 5 topics in this section. There were 671 dental records (46.8 percent) recorded by students and 762 dental records (53.2 percent) recorded by instructors. Table 5 presents assessment results of section 4 clinical examination (brief chart). The results recorded by students show that most topics of the comprehensiveness of dental records were at good to excellent level, except that subtopic 5.2 name-surname of student, and subtopic 5.4 name-surname of instructor were at inadequate level because of signature without printed name and surname. The results recorded by instructors show that most topics of the comprehensiveness of dental records were at inadequate level.

Section 5 Treatment records

Two thousand three hundred and fifteen dental records in paper format, section 5 was contained 1,853 dental records (80.0 percent) and no recorded 462 (20.0 percent), because patients needed no treatment or services after history taking and clinical oral examination. There were 9 topics in this section. There were 972 dental records (52.5 percent) recorded by students and 881 dental records (47.5 percent) recorded by instructors. Table 6 presents assessment results of section 5. The results

recorded by students show that the comprehensiveness of dental records in topic 1 name-surname of patient and DN, topic 2 date, and topic 9 procedure note were at excellent level. The other topics were at inadequate level, and no information was provided for 31.5 to 100.0 percent. The results recorded by instructors show that the comprehensiveness of dental records in almost all topics were at inadequate level - except only topic 2 date, which was at excellent level.

Topics	Assessment result (N = 1,433 dental records) (Percentage)					
	Students (671 dental records)			Instructors (762 dental records)		
	Complete information	Incomplete information	No information	Complete information	Incomplete information	No information
1. Name-surname of patient and DN	93.2	0.9	5.8	59.2	1.9	38.9
2. Clinical finding	97.9	0.0	2.1	78.3	2.4	19.3
3. Other investigations	93.3	1.4	5.3	60.9	6.4	32.7
4. Diagnosis	97.3	0.3	2.4	68.8	1.1	30.0
5. Student examiner and instructor						
5.1. Student signature	100.0		0.0			
5.2. Name-Surname of student	2.2		97.8			
5.3. Instructor signature	99.5		0.5	97.2		2.8
5.4. Name-Surname of instructor	0.6		99.4	2.5		97.5

Table 5. Assessment result of section 4 clinical examination (brief chart).

Topics	Assessment result (N = 1,853 dental records) (Percentage)					
	Students (972 dental records)			Instructors (881 dental records)		
	Complete information	Incomplete information	No information	Complete information	Incomplete information	No information
1. Name-surname of patient and DN	92.9	0.8	6.3	47.2	1.4	51.4
2. Date	98.5	0.2	1.3	97.3	0.1	2.6
3. Chief complaint	13.8	0.5	85.7	21.9	8.3	69.8
4. Present illness	7.4	0.5	92.1	2.8	1.5	95.7
5. Blood Pressure, Heart Rate, Infection Control on the day of treatment						
5.1 Blood pressure	68.3	0.0	31.7	17.4	0.0	82.6
5.2 Heart rate	68.5	0.0	31.5	17.0	0.0	83.0
5.3 Infection control screening	4.5	0.0	95.5	5.2	0.0	94.5
5.4 Medical history	1.1	0.1	98.8	0.5	0.0	99.5
5.5 Drug allergy	0.0	0.0	100.0	0.0	0.0	100.0
6. Clinical finding	22.8	0.7	76.5	35.0	1.8	63.2
7. Diagnosis	42.7	0.0	57.3	29.4	0.7	69.9
8. Treatment plan	37.8	0.4	61.8	23.8	0.9	75.3
9. Procedure note	98.1	1.8	0.1	38.5	61.4	0.1

Table 6. Assessment result of section 5 treatment records.

Discussion

Section 1 Patient information

The dental records' comprehensiveness in all topics were at good to excellent level, because computer systems were used to assist in recording this information, starting in 2010. The implementation of an electronic patient records (EPR) system in many sectors of health care organizations has led to positive relationships with both quality of care and improved pedagogy.[9-11] The use of EPR is considered to improve clinical quality and patient safety[12] through improved records control; easier document storage and accessibility; better provision of information for clinic management; and excellent data provision for the evaluation of overall patient care.[9] However, it needs to be carefully considered about capital adequacy and other constraints for example high costs, time constraints necessary for process workflow change, overall project complexity, and security and privacy issues when introducing an EPR system into the whole system of the institute.[9, 10]

Section 2 Personal history, Section 4 Clinical examination, and Section 5 Treatment record

The summary of the comprehensiveness of dental records recorded by instructors was at inadequate level in all topics. The barrier to maintaining adequate dental records by instructors may be conformed to 'usual practice' rather than 'best practice'.[12] Because of time constraints work on each patient, taking the time

to treat the patient rather than recording the information in the dental record often found in the real practice. Thus, the minimum requirements outlined in the guidelines for record keeping is extensive and would require considerable time after each patient to complete all the necessary information, before the next patient is seen.

Section 3 Inform consent Section 3 Informed consent

The summary of the comprehensiveness of dental records in section 3 was at inadequate level because of signature without printed name and surname. To solve this problem, it is recommended that the dental record staffs should ask the patients to write their name and surname next to their signature. Moreover, this dental hospital requires two signatures (co-signatures) for most entries: the student provider and the attending licensed instructor. Both signatures are necessary to meet state legal requirements as well as accreditation guidelines. For instructors and students, it could set code for them and determine them to writing their code or using rubber stamp of their name and surname along with signature in every dental recording.

In addition, any procedure that is "invasive or irreversible" requires informed consent [13] as well as informed refusal of treatment, which may occur when the patient or parent refuses the proposed or alternative forms of treatment.[14] Both informed consent and informed refusal of treatment should be documented and signed by the patient or parent for retention in the dental records. Separate forms, or separate areas outlining each procedure on the same form, would be necessary to accurately advise the patient regarding each procedure.[15]

Dentists are also required to provide information to patient or parent about the dental health problems the dentist observes; the nature of any proposed treatment; the potential benefits and risks associated with that treatment; any alternatives to the treatment proposed; the potential risks and benefits of alternative treatments, including no treatment; and obtain a dated signature by patients or parents.[2]

Creating a good attitude of the comprehensiveness of dental records and regularly reviewing dental records are important issues for improving hospital quality. The purpose of those issues is to verify the accuracy of the data recorded in the dental records and to review the whole process for any defects in order to improve the quality of services. Thus, dental records must do the best in all patients. It is not for evaluation purposes only, but is also carried out to ensure maximum safety for both service providers and patients.[2]

Moreover, providing dental records following clinical audit training is a useful tool for assessing one's performance in clinical practice such as dental recording and can promote positive changes in clinical practice. The teaching of clinical audit as a quality improvement method can prepare students for safe practice in the workplace and ensure that quality of care meets the accepted standards when they graduate.[7, 16]

Conclusions

Table 7 provides a summary of the comprehensiveness of dental records in all sections. Overall, the comprehensiveness of dental records at Dental Hospital, Faculty of Dentistry, Naresuan University, Thailand from 2009 to 2015 was at inadequate level (62.35 percent).

Topics	Comprehensiveness of dental records (Percentage)	
	Mean (SD)	Interpretation
Section 1 Patient information	95.64 (4.43)	Excellent level
Section 2 Personal history		
– Students	81.22 (15.07)	Good level
– Instructors	42.87 (14.58)	Inadequate level
Section 3 Inform consent	44.62 (25.88)	Inadequate level
Section 4 Clinical examination (full chart)		
– Students	81.19 (30.01)	Good level
– Instructors	75.18 (31.33)	Moderate level
Section 4 Clinical examination (brief chart)		
– Students	73.00 (44.27)	Moderate level
– Instructors	61.15 (31.92)	Inadequate level
Section 5 Treatment record		
– Students	42.80 (38.23)	Inadequate level
– Instructors	25.85 (28.23)	Inadequate level
Total	**62.35 (26.40)**	**Inadequate level**

Table 7. Summary of the comprehensiveness of dental records.

Declaration of Interest

The author no conflict of interest and the article was supported by research grants from Naresuan University.

References

1. The Institute of Hospital Quality Improvement and Accreditation. Hospital and health care standard: sixtieth anniversary cerebrations of his majesty's accession to the throne edition. Bangkok: D-One Book; 2015:1-190.
2. National Health Security Office. Medical record audit guideline. Bangkok: Sri Mueang Printing; 2014:1-28.
3. The Thai Dental Council. Dental safety goals and guidelines 2015. Available at. "http://www.dentalcouncil.or.th/th/dental_safety_goal.php". Accessed June 1, 2018.
4. Crawford JR, Beresford TP, Lafferty KL. The CRABEL score - a method for auditing medical records. Ann R Coll Surg Engl. 2001;83:65-8.
5. Pessian F, Beckett HA. Record keeping by undergraduate dental students: a clinical audit. Br Dent J. 2004;197(11):703-5.
6. Dosumu EB, Dosumu OO, Lawal FB. Quality of records keeping by undergraduate dental students in Ibadan, Nigeria. Ann Ib Postgrad Med. 2012;10(1):13-7.
7. Chong JA, Chew JKY, Ravindranath S, Pau A. Clinical audit teaching in record-keeping for dental undergraduates at International Medical University, Kuala Lumpur, Malaysia. J Dent Educ. 2014;78(2):206-12.
8. American Academy of Pediatric Dentistry. Guideline on record-keeping. Pediatr Dent. 2012;37(6):307-14.
9. Atkinson JC, Zeller GG, Shah C. Electronic patient records for dental school clinics: more than paperless systems. J Dent Educ. 2002;66(5):634-42.
10. Langabeer JR, 2nd, Walji MF, Taylor D, Valenza JA. Economic outcomes of a dental electronic patient record. J Dent Educ. 2008;72(10):1189-200.
11. Tierney WM, Overhage JM, McDonald CJ. Demonstrating the effects of an IAIMS on health care quality and cost. J Am Med Inform Assoc 1997;4(2 Suppl):S41-6.
12. Brown LF. Inadequate record keeping by dental practitioners. Aust Dent J. 2015;60(4):497-502.
13. Kakar H, Gambhir R, Singh S, Kaur A, Nanda T. Informed consent: corner stone in ethical medical and dental practice. J Family Med Prim Care. 2014;3(1):68-71.
14. American Academy of Pediatric Dentistry. Guideline on informed consent. Pediatr Dent. 2015;37(6):315-7.
15. American Dental Association Division of Legal Affairs. Dental Records. Chicago, Ill: American Dental Association; 2007:16.
16. Cowpe J, Plasschaert A, Harzer W, Vinkka-Puhakka H, Walmsley AD. Profile and competences for the graduating European dentist - update 2009. Eur J Dent Educ. 2010;14(4):193-202.