

CONE BEAM COMPUTED TOMOGRAPHY REPORT SATISFACTION AMONG DENTAL REFERRERS

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ABSTRACT

Background and Objectives: This study was to evaluate referring dentists' satisfaction with Cone Beam Computed Tomography (CBCT) reports prepared at the Department of Oral and Maxillofacial Radiology (OMFR) at the University of Connecticut Health Center (UCHC).

Material and methods: This study was an anonymous survey of 150 UCHC dental faculty and residents and was approved by our IRB. The survey consisted of 23 questions asking respondents whether they had ordered CBCT studies, and if so, their impressions of the quality and usefulness of the reports and images sent back from OMFR, and their level of trust in the radiologist expertise. Questionnaires were distributed twice through participants' school mailboxes with a one-week interval.

Results: The majority of CBCT scans referrals (62%) were for implant treatment planning. Overall, 66.7 % of respondents were satisfied with CBCT reports. 73% indicated that the reports do not need modification, but a majority indicated that standardization of reports would be helpful.

Conclusion: The use of CBCT scans are useful for the dentist. Most of the participants who had used that equipment proved that it should be allowed in that facility as it will improve their service delivery to the patients.

KEYWORDS: Maxillofacial Radiology, OMFR, CBCT scan, referral, survey, Report

INTRODUCTION

CBCT scanner is considered as one of the modern technologies that have been used to transform the dental practice in the United States. It is important to note that the CBCT scan was approved by the FDA in 2001. The first CBCT scan was known as the Newton machine. Since the introduction of the

machine, it has helped to send an accurate imaging system to a dentist specialist for easy interpretation.¹ However, it is noted that only the OMF Radiologist can be able to interpret that information before he/she send it back to the referring dentist in a more simplified form. As such, commentators argue that such a process is tiresome and it led to wastage of time.² For OMF Radiologists to interpret such

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results, the person must have many years of clinical practice including soft-wear training, anatomical landmarks knowledge, and frequent exposure to different forms of imaging. Based on that, it showcases the challenges that medical practitioners have to enhance before helping their patients. In the case of suspected pathology, it is the responsibility of the OMF surgeons and periodontists to conduct the implant treatment.³ The TMJ teams are supposed to evaluate other CBCT referrals to determine their impacts on the teeth and administer orthodontic treatment.

Based on the medical reports, it is still unclear if the use of a CBCT scan is appreciated by the dentists based on the fact that they require another specialist to interpret the results for them. Also, it is argued that the dentist has not presented the other types of information that they feel should be included in the CBCT scan.⁴ This is majorly based on the idea that they are not certain about how the machine operates. It is however anticipated that in the future, the CBCT scan will be designed in such a way that even the dentist can interpret the results. Another alternative is to enhance more training to this dentist for them to learn how the machine operates. However, as per now, they will continue to depend on the reports from OMF Radiologists.

It is noted that the hypothesis for the study is to determine the usefulness of CBCT reports to the referring dentist. Reports also show that Oral radiologists' reports might require modifications. Some people argue that such modification can interfere with the validity of the results presented.⁵ However, such cases of biasness have not yet been proved by the designed institutions. This study aims to evaluate the level of satisfaction by the referring dentists and to determine the future criteria that can be used to administer CBCT reports.

AIM OF THE STUDY

The objective of the study is to evaluate the

satisfaction of the dental practitioners for the CBCT reports. This would investigate the quality and service which is conducted through the Radiology department.

MATERIALS AND METHODS

The study aims to use surveys as one of the methods of data collection. The survey will be conducted at the UCONN dental faculty. The case group was 150 members of the dental faculty School of Dental Medicine. Some of these people are full-time employees while others are considered to be part-time. It is noted that most of these personnel are likely to order Cone Beam CT for their patients. Ethical approval was obtained by UCHC IRB.

The questionnaire had 23 questions that relate to how the case group understands the quality and the usefulness of the use of CBCT, see (Table 1). Most of them have certainly used that report. The questionnaire also aims at getting information from them that relates to how they find the reported usefulness after it has been translated by OMFR radiologist. Correspondingly, it aims at gauging the level of trust that such people had to the use of the equipment. The questionnaire was accompanied by a memo that includes the purpose of the study, a statement that showcased that the participants were volunteers and that the information presented was private and confidential. The respondents were asked to return the survey after one week after they had completed it. The questionnaires were supposed to be placed in a separate envelope for easy verifications and sent to the author, who is the Oral radiologist conducting that research. Similarly, the questionnaires were encoded with the name of the respondent for easy verification. The questionnaires were distributed twice to the participants through the use of their school emails in a one-week interval. statistical analyses in this study was conducted using STATA Version 13.0 (StataCorp, College Station, Texas, USA).

TABLE (1) The questionnaire for CBCT referral indications, characteristics, and satisfaction of CBCT reports.

THE UNIVERSITY OF CONNECTICUT SCHOOL OF DENTAL MEDICINE

Division of Oral and Maxillofacial Radiology

Cone Beam CT Report Satisfaction Questionnaire	Subject ID: _____			
E____V_____	DATE: _____ / _____ / _____			
	SESSION: _____			
	(0)=intake	(3)=9-mo	(6)=18-mo	(9)=2 mo
	(1)=post tx	(4)=12mo	(7)=21-mo	
	LOCATION _____	1=onsite;	2=offsite;	3=phone

Introduction

Dentists may request a Cone Beam CT (CBCT) series for any number of reasons. The oral radiologists who perform these studies want to make sure that they are providing the referring dentist all the information he or she needs to know to best make

use of the CBCT.

Below are some questions that will help us determine if the reports and images we prepare for dentists are useful, or if we need to make changes in what we report to referring doctors.

1.	What is your dental area or specialty?	a. Dental Student b. General Dentistry c. Prosthodontics d. Periodontics e. Oral Surgery f. Endodontics g. Orthodontics h. Oral Radiology i. Oral Diagnosis, Pathology j. Other _____
2.	Are you familiar with Cone Beam CT technology?	Yes _____ No _____
3.	Have you ever used the Cone Beam CT, or ever made a referral for a Cone Beam study?	Yes _____ No _____
	<i>If you have never requested a Cone Beam CT, you may stop now. Thank you for your help.</i> <i>If you have requested CBCT, please answer the remaining questions</i>	

4.	If you have requested a Cone Beam CT, what condition or situation prompted the request?	a. Root Canal Treatment b. Extraction(s) c. Implant Treatment Planning or Follow-up d. Pathology Interpretation e. Orthognathic Surgery Treatment Planning or Follow-up f. Other _____ g. Never requested a Cone Beam CT	
CBCT Questions (cont).			
5.	Do you read the report that is sent by the radiologist?	Yes _____	No _____
6.	Do you receive images with the report?	Yes _____	No _____
7.	How often, if ever, do you contact the oral radiologist about a report?	a. Never b. Rarely c. Sometimes d. Often e. Every time I receive a report	
8.	Do you ever disagree with the radiologist's assessment?	a. Never b. Rarely c. Sometimes d. Often e. Every time I receive a report	
9.	If you do disagree with the radiologist's assessment, what do you do?	a. Rely on my own judgment and proceed from there b. Request another consultation from the same radiologist c. Request another consultation from a different radiologist d. Get an opinion from a colleague e. Not applicable, I never disagree with the radiologist's assessment	
10.	How satisfied are you with CBCT reports and images that you receive?	a. Very unsatisfied b. Somewhat unsatisfied c. Somewhat satisfied d. Very satisfied	
11.	Please place a check mark beside each type of information you expect to see in a CBCT report (<i>check all that apply</i>)	a. _____ Patient Information b. _____ Scan Type c. _____ Indication or Reason for Scan d. _____ Images e. _____ Measurements f. _____ Description of findings g. _____ Differential diagnosis h. _____ Summary	

12.	Are the images sent to you sufficiently detailed, or do you sometimes manipulate them yourself?	a. ____ Images are fine as they are sent to me b. ____ Sometimes I need to manipulate the images to improve interpretability
13.	From your point of view, What is the most important piece of information in the reports?	a. Description b. Measurements c. Differential diagnosis d. Report is not important
14.	How would you like the report to be?	a. Simple and Summarized b. Detailed and descriptive c. Detailed and descriptive followed by a Summary section or bullets

RESULTS

According to the data collected, 53 questionnaires were collected which represented 35% of all dental specialists. The findings indicated that out of the 29 participants, 54% indicated that have already used that CBCT scan. Most of the referrals which accounted for 62%, were using it for implant treatment planning (Chart 1). The reports showed that overall, 67% of the respondent indicated satisfaction with the CBCT report (Chart 2). 73% of the respondent reported that the CBCT report did not require any type of modification, but the other indicated that the report would be better

if it were made to be standardized (Chart 3). The entire respondent concluded that the image should be included in those reports for easy interpretation. 44% noted that it was important to also include certain reports of the measurements that were used. The finding also showed that a small number of the respondent did not read the report and had no idea of any information that was presented (Chart 4). However, based on the fact that the majority of the people were excited about the use of that scan, it should be implemented into the system. It will likely better the performance of the dentist as well as the patients who will get satisfactory services.

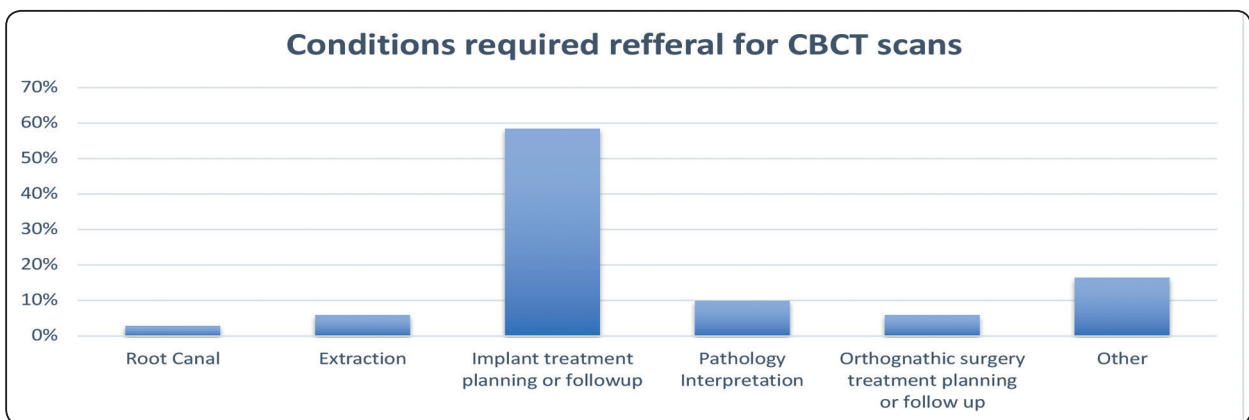


Chart. (1) Frequency of conditions require referral for CBCT scans in the survey.



Chart. (2) The distribution of level of satisfaction among report referrals.

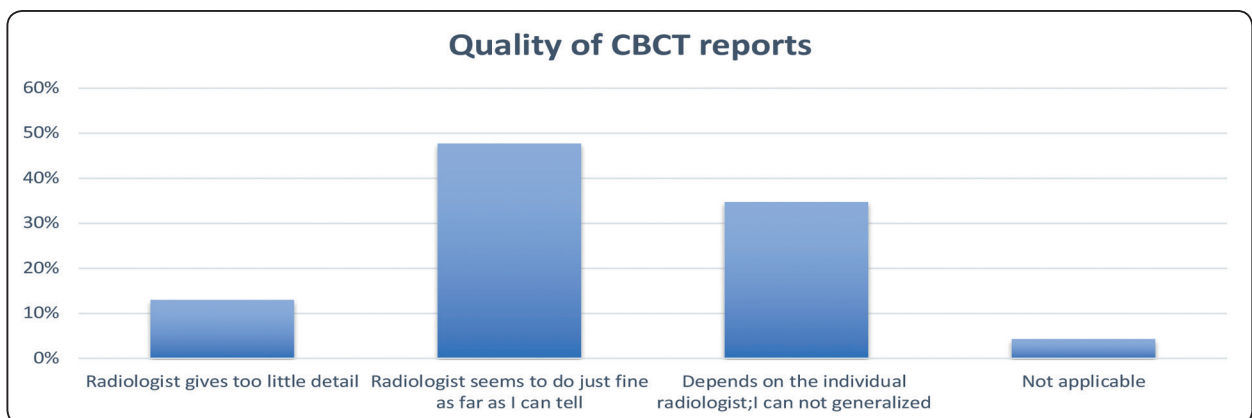


Chart. (3) The perception of the referrals for the quality of CBCT reports.

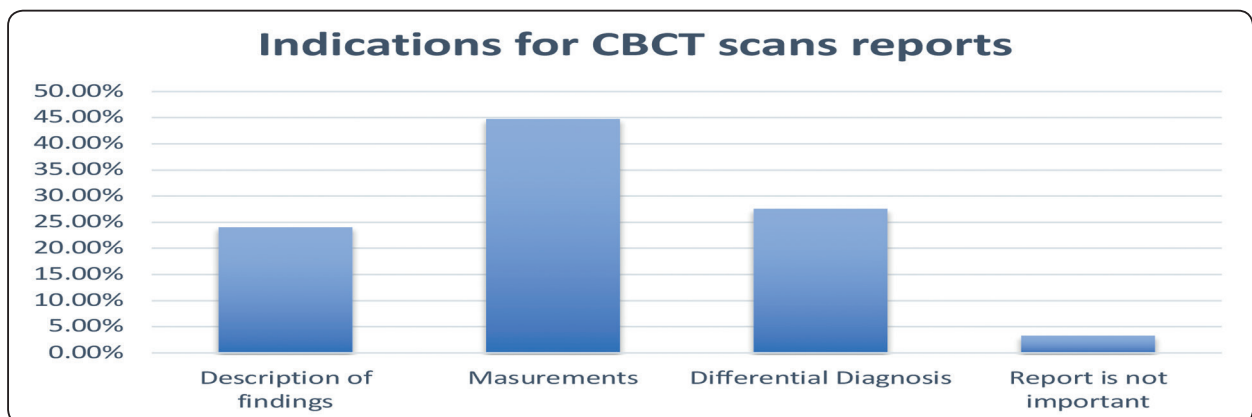


Chart. (4) The common indications for CBCT reports.

DISCUSSION

Based on the result obtained, it was certain that the majority of the referrals found the use of a CBCT scan useful for the dentist. Most of the participants who had used that equipment proved that it should be allowed in that facility as it will improve their service delivery to the patients.⁶ The main concern focuses on the interpretation of the scan as it required another individual to read and translate the information and report it back to the referral dentist. As such, they argue that it would be better for the scan to be modified in such a way that the dentist can interpret the results on their own.⁷ A certain number of people believed that modification of the report was not important. Notably, the majority of the respondent noted that such modification is useful in the sense that it will allow the entire referral dentist to use the scan easily. Implant treatment planning was considered to be the most effective use of the CBCT scan. Based on the information presented, it was certain that it will help the dentist to understand better how those implement treatment would be conducted.⁸ The use of imaging was also noted to be another important aspect that should be included in those reports. The imaging allowed easy interpretation of the results and also could be sent to another person for verifications in case of anything. It is recommended that the use of imaging should be made easy for interpretation even if the CBCT report requires years of experience.

CONCLUSION

The great majority of respondents found CBCT reports useful. A small number of participants did not read reports and 1/3 of respondents never requested CBCT. CBCT was requested primarily for implant treatment planning. Standardization of reports would be a useful modification.

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CONFLICT OF INTEREST

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REFERENCES

1. Birnbaum NS, Aaronson HB. Dental impressions using 3D digital scanners: virtual becomes reality. *Compend contin educ dent* 2018;29:494-496.
2. Oppenheimer BD. An alternative for denture wearers; 2012. Available at: <https://www.dentalproductsreport.com/dental/article/alternative-denture-wearers>. Accessed
3. Cesur MG, Yilmaz A, Ozer T. Knowledge and attitudes towards digital radiography and CBCT among orthodontists. *Biomed Res* 2016;27:959-964.
4. Lee CI, Haims AH, Monico EP, Brink JA, Forman HP. Diagnostic CT scans: assessment of patient, physician, and radiologist awareness of radiation dose and possible risks. *Radiology* 2014;231:393-398.
5. Hidalgo-Rivas JA, Theodorakou C, Carmichael F, Murray B, Payne M, Horner K. Use of cone beam CT in children and young people in three United Kingdom dental hospitals. *Int J Paediatr Dent* 2014;24:336-348.
6. Dunbar AC, Bearn D, McIntyre G. The influence of using digital diagnostic information on orthodontic treatment planning—a pilot study. *J Healthcare Eng* 2014;5:411-428.
7. Yilmaz Z, Ucer C, Scher E, Suzuki J, Renton T. A survey of the opinion and experience of UK dentists: Part 1 The incidence and cause of iatrogenic trigeminal nerve injuries related to dental implant surgery. *Implant Dent* 2016;25:638-645.
8. Patchett CL, Crawford PJM, Cameron AC, Stephens CD. The management of supernumerary teeth in childhood—a retrospective study of practice in Bristol Dental Hospital, England and Westmead Dental Hospital, Sydney, Australia. *Int J Paediatr Dent* 2017;11:259-265.