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Ontology Driven Clinical Decision Support for Early Diagnostic Recommendations

Volume II - Appendix

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A thesis submitted in fulfilment of the requirements

for a PhD in Health Informatics

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1 Appendix 1

1.1 Email sent to optometrists for recruitment during the trial

Impact of decision support on diagnostic accuracy and management of virtual patients by community optometrists

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

Click link below to start trial:

Case 1

What is the purpose of the study?
This study will be looking at the impact of clinical decision support software on clinical decision making by community optometrists. The study is part of a larger study looking at diagnostic and management clinical decision making of community optometrists. Clinical decision support system is a type of computer program that analyses the data that has been entered and provides useful diagnostic and management recommendations based on latest published clinical guidelines. The study will last for 8 months (October 2015 - May 2016) and you can participate in this study at any point during that time period. The total amount of time spent on the study will not exceed 30 minutes.

The study is part of a PhD research program in the School of Mathematics, Computer Science and Engineering (SMCSE) at City University London, in collaboration with Division of Optometry & Visual Sciences at City University London, Moorfields Eye Hospital and UCL Institute of Ophthalmology.

Why have I been invited?
You have been invited to participate in the study because you are currently practising as a qualified optometrist in the community as an independent or as part of a regional or national chain within the United Kingdom. The study will recruit a total of 100 optometrists.

Do I have to take part?
It is up to you to decide whether or not to take part. If you decide to take part you are still free to withdraw at any time and without giving a reason. The study is not associated with any optometry chain or network and the data will be completely confidential.

What will happen if I take part?
Your participation in the study will not exceed 30 minutes in total duration, and you can complete the experiment anytime during the period of the study.

The main part of the study is an online experiment that involves diagnosing and managing a virtual patient, with the help of advice from clinical decision support software. Subsequently you will be asked

to complete a questionnaire detailing your experience of using the software. The study will involve collecting basic information about you (Age & Gender), type of practice and educational qualifications. You will be asked to provide your email address to access the website. You can enter any email address as long as it's yours.

The study is evaluating clinical decision making with and without the help of decision support. The study will be conducted online via a website, and you can complete the study on any computer with high-speed Internet connectivity. Instructional materials will be provided via YouTube videos and will therefore require a stable Internet connection.

Expenses and Payments
You will be given 1 Continuing Education and Training (CET) point as reward for completing the study. If you need the point you will be asked to provide your GOC number and Name as well, in addition to the information above. If you do not require the CET point you do not have to provide your GOC number. Once you have successfully completed the study, your details will be forwarded to GOC who will issue the point.

What do I have to do?
The main component of the study is an experiment that will involve diagnosing and managing a virtual patient case over the Internet on a website. You will be given clinical histories, de-identified diagnostic test results and images of patients. You can choose to ask the virtual patient questions based on what you believe is relevant for that particular situation. You can also choose to perform diagnostic tests and view images that are relevant and performed routinely in practice. The clinical decision support software will provide you with recommendations based on latest clinical guidelines. You can choose to accept/ignore these recommendations based on your clinical judgement. You do not have to justify your clinical decision making in any manner.

You will be asked to complete 1 case that is commonly encountered in the community. After completing the case and the subsequent questionnaire you have completed the study. Training in the form of a tutorial case and instructional videos will be provided on the website.

What are the possible disadvantages and risks of taking part?
We do not foresee any significant risks or side effects to the participant arising from participating in this study.

What are the possible benefits of taking part?
The virtual patient cases that will be provided as part of this experiment are based on actual cases that you're likely to encounter in the community during routine clinical practice. Decision support software had great potential for improving clinical diagnosis and management in medicine. The recommendations provided by the decision support system are based on current clinical guidelines and the participants will benefit from exposure to current clinical management guidelines.

The study will allow us to gain a deeper understanding of the role decision support software can play in improving clinical decision making and guide further investment of time and money in developing full decision support for optometrists and other healthcare professionals involved in primary care.

What will happen when the research study stops?

Once the research study has concluded all the data collected as part of the study will be stored in secure lockers and encrypted hard drives for a duration of 10 years at City University London premises. After 10 years the data will be destroyed using industry specific standards for secure destruction of sensitive data.

Will my taking part in the study be kept confidential?
Only the research team and technical personnel involved in the study will have access to data. Your personal information and trial data will be kept secure and will not be shared with third parties, including your colleagues and employers.

What will happen to results of the research study?
The results of the trial will be published in peer-reviewed journal publications. Detailed analysis of results will be published as part of the PhD thesis. If participants require a copy of the publications or a summary of the findings please contact the researcher at the contact details given below. Participant anonymity will be maintained when publishing results of the study.

What will happen if I don't want to carry on with the study?
If you do not wish to continue with the study you are free to withdraw at any moment without any explanation. However you will only receive the CET point upon completion of the study.

What if there is a problem?
If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through the University complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Impact of decision support on diagnostic accuracy and management of virtual patients by community optometrists

You could also write to the Secretary at:
Anna Ramberg
Secretary to Senate Research Ethics Committee
Research Office, E214
City University London
Northampton Square
London
EC1V 0HB
Email:███████████████████

City University London holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Who has reviewed the study?
This study has been approved by City University London Computer Science Research Ethics Committee (CSREC)

Further information and contact details
Gopikrishnan M. Chandrasekharan
PhD Research Student- SMSCE

Email: ███████████████████████████████

Phone: ████████████

1.2 Ethics form for Chapter 4 optometry study

Ethics Proportionate Review Application: Staff and Research Students

Computer Science Research Ethics Committee (CSREC)

Staff and research students in the Department of Computer Science undertaking research that involves human participation must apply for ethical review and approval before the research can commence. If the research is low-risk, an application can be submitted for a proportionate review using this form. Applicants are advised to read the information in the SMCSE Framework for Delegated Authority for Research Ethics prior to submitting an application.

There are two parts:

Part A: Ethics Checklist. The checklist determines whether the research is low-risk. If it is, Part B of the form should also be completed. If not, the checklist provides guidance as to where approval should be sought, but the checklist itself does not need to be submitted.

Part B: Ethics Proportionate Review Form. This part is the application for ethical approval of low-risk research and should only be completed if the answer to all questions (1 – 18) is NO.

Completed forms should be returned to the Chair of CSREC by email ██████████████████████).

Part A: Ethics Checklist

If your answer to any of the following questions (1 – 3) is YES, you must apply to an appropriate external ethics committee for approval:	*Delete as appropriate*
1. Does your research require approval from the National Research Ethics Service (NRES)? (E.g. because you are recruiting current NHS patients or staff? If you are unsure, please check at http://www.hra.nhs.uk/research-community/before-you-apply/determine-which-review-body-approvals-are-required/)	~~Yes~~/No
2. Will you recruit any participants who fall under the auspices of the Mental Capacity Act? (Such research needs to be approved by an external ethics committee such as NRES or the Social Care Research Ethics Committee http://www.scie.org.uk/research/ethics-committee/)	~~Yes~~/No
3. Will you recruit any participants who are currently under the auspices of the Criminal Justice System, for example, but not limited to, people on remand, prisoners and those on probation? (Such research needs to be authorised by the ethics approval system of the National Offender Management Service.)	~~Yes~~/No

	If your answer to any of the following questions (4 – 11) is YES, you must apply to the Senate Research Ethics Committee for approval (unless you are applying to an external ethics committee):	*Delete as appropriate*
4.	Does your research involve participants who are unable to give informed consent, for example, but not limited to, people who may have a degree of learning disability or mental health problem, that means they are unable to make an informed decision on their own behalf?	~~Yes~~/**No**
5.	Is there a risk that your research might lead to disclosures from participants concerning their involvement in illegal activities?	~~Yes~~/**No**
6.	Is there a risk that obscene and or illegal material may need to be accessed for your research study (including online content and other material)?	~~Yes~~/**No**
7.	Does your research involve participants disclosing information about sensitive subjects?	~~Yes~~/**No**
8.	Does your research involve the researcher travelling to another country outside of the UK, where the Foreign & Commonwealth Office has issued a travel warning? (http://www.fco.gov.uk/en/)	~~Yes~~/**No**
9.	Does your research involve invasive or intrusive procedures? For example, these may include, but are not limited to, electrical stimulation, heat, cold or bruising.	~~Yes~~/**No**
10.	Does your research involve animals?	~~Yes~~/**No**
11.	Does your research involve the administration of drugs, placebos or other substances to study participants?	~~Yes~~/**No**

	If your answer to any of the following questions (12 – 18) is YES, you must submit a full application to the Computer Science Research Ethics Committee (CSREC) for approval (unless you are applying to an external ethics committee or the Senate Research Ethics Committee). Your application may be referred to the Senate Research Ethics Committee.	*Delete as appropriate*
12.	Does your research involve participants who are under the age of 18?	~~Yes~~/**No**
13.	Does your research involve adults who are vulnerable because of their social, psychological or medical circumstances (vulnerable adults)? This includes adults with cognitive and / or learning disabilities, adults with physical disabilities and older people.	~~Yes~~/**No**
14.	Does your research involve participants who are recruited because they are staff or students of City University London? For example, students studying on a	~~Yes~~/**No**

	particular course or module. (If yes, approval is also required from the Head of Department or Programme Director.)	
15.	Does your research involve intentional deception of participants?	~~Yes~~/**No**
16.	Does your research involve participants taking part without their informed consent?	~~Yes~~/**No**
17.	Does your research pose a risk to participants greater than that in normal working life?	~~Yes~~/**No**
18.	Does your research pose a risk to you, the researcher(s), greater than that in normal working life?	~~Yes~~/**No**

You must make a proportionate review application to the CSREC if your research involves human participation and you are not submitting any other ethics application (i.e. your answer to all questions 1 – 18 is "NO").

Part B: Ethics Proportionate Review Form

If you answered NO to all questions 1 – 18, you may use this part of the form to submit an application for a proportionate ethics review of your research. The form must be accompanied by all relevant information sheets, consent forms and interview/questionnaire schedules.

Note that all research participants should be fully informed about: the purpose of the research; the procedures affecting them or affecting any information collected about them, including information about what they will be asked to do, what data will be collected, how the data will be used, to whom it will be disclosed, and how long it will be kept; the fact that they can withdraw at any time without penalty.

Background Information	
Name:	Gopikrishnan Mannamparambil Chandrasekharan --- ██████████████████████████
Supervisor (if student):	Dr Dympna O'Sullivan--███████████████ Dr Andrew MacFarlane--████████████

Your Research Project	
Title:	**Impact of decision support on diagnostic accuracy and management of virtual patients by community optometrists**
Start date:	**01-09-2015**
End date:	**31-01-2016**

Describe your project: overall aim(s) and method (up to 300 words)

The elderly population of UK is expected to increase in the next couple of decades and this is bound to increase the reliance on heavily loaded Hospital Eye Services (HES) for acute and chronic problems. Community optometrists are already working within several structured co-managed schemes to provide enhances services to patients, and help reduce the workload on HES. However, research has shown significant false positive referrals from optometry practices.

Our study evaluates the role played by clinical decision support system (CDSS) in reducing false-positive referrals by introducing the guidelines at crucial points of the decision-making process. The study will also assess the impact a CDSS might be expected to have on both accuracy of diagnosis and appropriateness of referral to the HES.

Methods

This study is a controlled trial in which optometrists are presented with 1 case vignette. Case-vignettes are hypothetical cases that represent various levels of decision making and cover a variety of ophthalmological conditions normally managed in optometry practices. The total duration taken to complete 1 case vignette, including tutorials and trial information will not exceed 30 minutes.

This study is to be undertaken by high street optometrists including optometrists belonging to Boots Opticians Ltd. The optometrists will be recruited via email. 100 optometrists will be recruited for the study. An email containing information about the trial and link to the trial web application will be sent

to staff from Boots who will then forward the email to optometrists within the network. Other optometrists not belonging to the Boots network will be recruited directly via email using the personal network of researchers collaborating in the trial.

Information indicating that the trial is completely voluntary and will be made explicit in the email and attached information sheet. The consent information and information about the data confidentiality will also be included in the email. Clicking on the link will take them to the consent form. The optometrists can only start the trial once they provide consent. Optometrists not interested in participating in the trial can ignore the email or not click on the email link. They are also free to exit the trial web application any time. The data will be confidential and will be stored in a secure database and Boots or any other third party organisation, employers or colleagues of the optometrist will not be provided access to the data.

The research will be undertaken online following a training session that will also be conducted online. Participating optometrists will receive 1 Continuing Education and Training (CET) point for their participation in the trial. The participating optometrists will only need to provide their email address as personal information. They can enter any email address they want as long it's theirs. If they require the CET point they will asked to provide their name and General Optical Council (GOC) number. GOC will then issue the point. This information is publicly available on the GOC website. https://www.optical.org/en/utilities/online-registers.cfm

The optometrists will be presented with a series of questions determining the diagnostic and referral decisions after each case has been presented. The time taken to arrive at the decision will also be recorded. After the experiment is completed, the decisions made by each optometrist for each patient case will be compared to the results of an earlier study. After completing the cases, subjects will be asked to complete a questionnaire about their experience of the system. The age group, gender, year of qualification, post graduate qualifications and type of practice of the optometrists will be recorded alongside the questionnaire.

Attachments (these must be provided if applicable):	*Delete as appropriate*
Participant information sheet(s)	**Yes / ~~No~~ / ~~Not applicable~~**
Consent form(s)	**Yes / ~~No~~ / ~~Not applicable~~**
Questionnaire(s)	**Yes / ~~No~~ / ~~Not applicable~~**
Topic guide(s) for interviews and focus groups	**~~Yes~~ / No / Not applicable**
Permission from external organisations (e.g. for recruitment of participants)	**~~Yes~~ / ~~No~~ / Not applicable**

2 Appendix 2

This section contains all the candidates and arguments of each vignette used in the Chapter 4 Optometry study as part of the intervention group study. The candidates and arguments are used by the Tallis CDSS application to generate diagnostic recommendations to the optometrist.

2.1 OHT Vignette candidates and arguments

The following sections (2.1.1 - 2.1.4) gives the candidates for the OHT vignette.

There are 4 candidates for the OHT vignette diagnosis node

- OHT (2.1.1)
- POAG (2.1.2)
- Normal-Repeat tests (2.1.3)
- Normal-No referral (2.1.4)

2.1.1 OHT candidate

IOP Intraocular pressure in mmHg - IOP is the fluid pressure of the eye. Non-contact tonometry (NCT) is one of the tests for measuring IOP. The other test is Goldmann applanation tonometry (GAT). If the IOP measurements is greater than 21mmHg then it is higher than normal and it indicates OHT, but not Glaucoma.	Support
IOP_NCT_Right_Reading_Average > 21 OR IOP_NCT_Left_Reading_Average > 21	2
IOP_GAT_Left = "24" OR IOP_GAT_Right = "23"	2
Visual Fields Humphrey Visual fields is a method for measuring the patient's entire scope of vision. Humphrey is a type of visual fields test. In OHT there is no pathology, only elevated IOP. Therefore, the visual fields tests will be normal.	
Visual_fields_Right_Humphrey = "Normal" AND Visual_fields_Left_Humphrey = "Normal"	2
Visual_fields_Right_Humphrey = "Abnormal" OR Visual_fields_Left_Humphrey = "Abnormal"	-2
(Visual_fields_Right_Humphrey = "Uncertain" AND Visual_fields_Left_Humphrey = "Uncertain") OR (Visual_fields_Right_Humphrey = "Uncertain" OR Visual_fields_Left_Humphrey = "Uncertain")	-1
Visual Fields Henson Henson is another type of visual fields test. In OHT there is no pathology, only elevated IOP. Therefore, the visual fields tests will be normal.	
Visual_fields_Right_Henson = "Normal" AND Visual_fields_Left_Henson = "Normal"	2

Visual_fields_Right_Henson = "Abnormal" OR Visual_fields_Left_Henson = "Abnormal"	-2
(Visual_fields_Right_Henson = "Uncertain" AND Visual_fields_Left_Henson = "Uncertain") OR (Visual_fields_Right_Henson = "Uncertain" OR Visual_fields_Left_Henson = "Uncertain")	-1
Optic disc status Optic disc is the part of the optic nerve that is clinically visible on examination. The optometrist must look at images of the back of the eye and grade the images (Normal/Uncertain/Abnormal) based on the status of the optic disc. In OHT there is no pathology, only elevates IOP. Therefore, the optic discs will be normal.	
Optic_Disc_Status_Right = "Abnormal" OR Optic_Disc_Status_Left = "Abnormal"	-2
Optic_Disc_Status_Right = "Normal" AND Optic_Disc_Status_Left = "Normal"	2
(Optic_Disc_Status_Right = "Uncertain" AND Optic_Disc_Status_Left = "Uncertain") OR (Optic_Disc_Status_Right = "Uncertain" OR Optic_Disc_Status_Left = "Uncertain")	-1
Van Herick Van Herick is another test for glaucoma that is based on grading of images of the front of the eye. The optometrist must grade the images (0-4) based on the clinical appearance of images. A grade of >2 means that there is no pathology and therefore supports OHT.	
Van_Herick_Right =< 2 OR Van_Herick_Left =< 2	-1
Van_Herick_Right > 2 AND Van_Herick_Left > 2	1

Table 2-1 - OHT candidate with arguments and weights for OHT vignette

2.1.2 POAG candidate

IOP If the IOP measurements is greater than 21mmHg indicates the pressure is higher than Normal.	Support
IOP_NCT_Right_Reading_Average > 21 OR IOP_NCT_Left_Reading_Average > 21	2
IOP_GAT_Right = "23" OR IOP_GAT_Left = "24"	2
Visual Fields Humphrey In POAG there are signs of pathology and therefore the visual fields test will be abnormal	
Visual_fields_Right_Humphrey = "Normal" AND Visual_fields_Left_Humphrey = "Normal"	-1
Visual_fields_Right_Humphrey = "Abnormal" OR Visual_fields_Left_Humphrey = "Abnormal"	2

(Visual_fields_Right_Humphrey = "Uncertain" AND Visual_fields_Left_Humphrey = "Uncertain") OR (Visual_fields_Right_Humphrey = "Uncertain" OR Visual_fields_Left_Humphrey = "Uncertain")	1
Visual Fields Henson In POAG there are signs of pathology and therefore the visual fields test will be abnormal	
Visual_fields_Right_Henson = "Normal" AND Visual_fields_Left_Henson = "Normal"	-1
Visual_fields_Right_Henson = "Abnormal" OR Visual_fields_Left_Henson = "Abnormal"	2
(Visual_fields_Right_Henson = "Uncertain" AND Visual_fields_Left_Henson = "Uncertain") OR (Visual_fields_Right_Henson = "Uncertain" OR Visual_fields_Left_Henson = "Uncertain")	1
Optic disc status In POAG there are signs of pathology and therefore the optic discs will be abnormal	
Optic_Disc_Status_Right = "Abnormal" OR Optic_Disc_Status_Left = "Abnormal"	2
Optic_Disc_Status_Right = "Normal" AND Optic_Disc_Status_Left = "Normal"	-2
(Optic_Disc_Status_Right = "Uncertain" AND Optic_Disc_Status_Left = "Uncertain") OR (Optic_Disc_Status_Right = "Uncertain" OR Optic_Disc_Status_Left = "Uncertain")	1
Van Herick Van Herick =< 2 does not support POAG	
Van_Herick_Right =< 2 OR Van_Herick_Left =< 2	-1
Van_Herick_Right > 2 AND Van_Herick_Left > 2	1

Table 2-2 - POAG candidate with arguments and weights for OHT vignette

2.1.3 Normal-Repeat tests candidate

IOP If the IOP measurements is greater than 21mmHg indicates the pressure is higher than Normal, but not yet a pathology.	**Support**
IOP_NCT_Right_Reading_Average > 21 OR IOP_NCT_Left_Reading_Average > 21	1
IOP_GAT_Left = "24" OR IOP_GAT_Right = "23"	1
Visual Fields Humphrey If the visual fields in both eyes are uncertain then it may support Normal, but the tests need repeating	

Visual_fields_Right_Humphrey = "Normal" AND Visual_fields_Left_Humphrey = "Normal"	-2
Visual_fields_Right_Humphrey = "Abnormal" OR Visual_fields_Left_Humphrey = "Abnormal"	-1
(Visual_fields_Right_Humphrey = "Uncertain" AND Visual_fields_Left_Humphrey = "Uncertain") OR (Visual_fields_Right_Humphrey = "Uncertain" OR Visual_fields_Left_Humphrey = "Uncertain")	2
Visual Fields Henson If the visual fields in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Visual_fields_Right_Henson = "Normal" AND Visual_fields_Left_Henson = "Normal"	-2
Visual_fields_Right_Henson = "Abnormal" OR Visual_fields_Left_Henson = "Abnormal"	-1
(Visual_fields_Right_Henson = "Uncertain" AND Visual_fields_Left_Henson = "Uncertain") OR (Visual_fields_Right_Henson = "Uncertain" OR Visual_fields_Left_Henson = "Uncertain")	2
Optic disc status If the optic disc status in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Optic_Disc_Status_Right = "Abnormal" OR Optic_Disc_Status_Left = "Abnormal"	-2
Optic_Disc_Status_Right = "Normal" AND Optic_Disc_Status_Left = "Normal"	-2
(Optic_Disc_Status_Right = "Uncertain" AND Optic_Disc_Status_Left = "Uncertain") OR (Optic_Disc_Status_Right = "Uncertain" OR Optic_Disc_Status_Left = "Uncertain")	2
Van Herick Van Herick =< 2 indicates the presence of pathology	
Van_Herick_Right =< 2 OR Van_Herick_Left =< 2	-2

Table 2-3 - Normal-Repeat tests candidate with arguments and weights for OHT vignette

2.1.4 Normal-No referral candidate

IOP If the IOP measurements is greater than 21mmHg indicates the pressure is higher than Normal, but not yet a pathology.	**Support**
IOP_NCT_Right_Reading_Average > 21 OR IOP_NCT_Left_Reading_Average > 21	-2

IOP_GAT_Right = "23" OR IOP_GAT_Left = "24"	-2
Visual Fields Humphrey If the visual fields in both eyes are Normal, then it supports Normal-No referral	
Visual_fields_Right_Humphrey = "Normal" AND Visual_fields_Left_Humphrey = "Normal"	2
Visual_fields_Right_Humphrey = "Abnormal" OR Visual_fields_Left_Humphrey = "Abnormal"	-2
(Visual_fields_Right_Humphrey = "Uncertain" AND Visual_fields_Left_Humphrey = "Uncertain") OR (Visual_fields_Right_Humphrey = "Uncertain" OR Visual_fields_Left_Humphrey = "Uncertain")	-1
Visual Fields Henson If the visual fields in both eyes are Normal, then it supports Normal-No referral	
Visual_fields_Right_Henson = "Normal" AND Visual_fields_Left_Henson = "Normal"	2
Visual_fields_Right_Henson = "Abnormal" OR Visual_fields_Left_Henson = "Abnormal"	-2
(Visual_fields_Right_Henson = "Uncertain" AND Visual_fields_Left_Henson = "Uncertain") OR (Visual_fields_Right_Henson = "Uncertain" OR Visual_fields_Left_Henson = "Uncertain")	-1
Optic disc status If the optic disc status in both eyes are normal then it supports Normal-No referral	
Optic_Disc_Status_Right = "Abnormal" OR Optic_Disc_Status_Left = "Abnormal"	-2
Optic_Disc_Status_Right = "Normal" AND Optic_Disc_Status_Left = "Normal"	2
(Optic_Disc_Status_Right = "Uncertain" AND Optic_Disc_Status_Left = "Uncertain") OR (Optic_Disc_Status_Right = "Uncertain" OR Optic_Disc_Status_Left = "Uncertain")	-1
Van Herick Van Herick =< 2 indicates the presence of pathology	
Van_Herick_Right =< 2 OR Van_Herick_Left =< 2	-2

Table 2-4 - Normal-No referral candidate with arguments and weights for OHT vignette

2.2 Normal Vignette candidates and arguments

The following sections (2.2.1-2.2.2) gives the candidates for the Normal vignette.

There are 3 candidates for the Normal vignette diagnosis node

- Normal-Repeat tests (2.2.1)
- Normal-No referral (2.2.2)

2.2.1 Normal-Repeat tests candidate

IOP If the IOP measurements is less than 21mmHg indicates the pressure is Normal, and doesn't require repeat tests	Support
IOP_NCT_Right_Reading_Average_C2 < 21 OR IOP_NCT_Left_Reading_Average_C2 < 21	0
IOP_GAT_Left_C2 = "14" OR IOP_GAT_Right_C2 = "15"	0
Visual Fields Humphrey If the visual fields in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Visual_fields_Right_Humphrey_C2 = "Normal" AND Visual_fields_Left_Humphrey_C2 = "Normal"	-2
Visual_fields_Right_Humphrey_C2 = "Abnormal" OR Visual_fields_Left_Humphrey_C2 = "Abnormal"	-1
(Visual_fields_Right_Humphrey_C2 = "Uncertain" AND Visual_fields_Left_Humphrey_C2 = "Uncertain") OR (Visual_fields_Right_Humphrey_C2 = "Uncertain" OR Visual_fields_Left_Humphrey_C2 = "Uncertain")	2
Visual Fields Henson If the visual fields in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Visual_fields_Right_Henson_C2 = "Normal" AND Visual_fields_Left_Henson_C2 = "Normal"	-2
Visual_fields_Right_Henson_C2 = "Abnormal" OR Visual_fields_Left_Henson_C2 = "Abnormal"	-1
(Visual_fields_Right_Henson_C2 = "Uncertain" AND Visual_fields_Left_Henson_C2 = "Uncertain") OR (Visual_fields_Right_Henson_C2 = "Uncertain" OR Visual_fields_Left_Henson_C2 = "Uncertain")	2
Optic disc status	

If the optic disc status in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Optic_Disc_Status_Right_C2 = "Normal" AND Optic_Disc_Status_Left_C2 = "Normal"	-2
Optic_Disc_Status_Right_C2 = "Abnormal" OR Optic_Disc_Status_Left_C2 = "Abnormal"	-2
(Optic_Disc_Status_Right_C2 = "Uncertain" AND Optic_Disc_Status_Left_C2 = "Uncertain") OR (Optic_Disc_Status_Right_C2 = "Uncertain" OR Optic_Disc_Status_Left_C2 = "Uncertain")	2
Van Herick Van Herick =< 2 indicates the presence of pathology	
Van_Herick_Right_C2 =< 2 OR Van_Herick_Left_C2 =< 2	-2

Table 2-5 - Normal-Repeat tests candidate with arguments and weights for Normal vignette

2.2.2 Normal-No referral candidate

IOP If the IOP measurements is less than 21mmHg indicates the pressure is Normal	**Support**
IOP_NCT_Right_Reading_Average_C2 < 21 OR IOP_NCT_Left_Reading_Average_C2 < 21	1
IOP_GAT_Left_C2 = "14" OR IOP_GAT_Right_C2 = "15"	1
Visual Fields Humphrey If the visual fields in both eyes are Normal, then it supports Normal-No referral	
Visual_fields_Right_Humphrey_C2 = "Normal" AND Visual_fields_Left_Humphrey_C2 = "Normal"	2
Visual_fields_Right_Humphrey_C2 = "Abnormal" OR Visual_fields_Left_Humphrey_C2 = "Abnormal"	-2
(Visual_fields_Right_Humphrey_C2 = "Uncertain" AND Visual_fields_Left_Humphrey_C2 = "Uncertain") OR (Visual_fields_Right_Humphrey_C2 = "Uncertain" OR Visual_fields_Left_Humphrey_C2 = "Uncertain")	-1
Visual Fields Henson If the visual fields in both eyes are Normal, then it supports Normal-No referral	

Visual_fields_Right_Henson_C2 = "Normal" AND Visual_fields_Left_Henson_C2 = "Normal"	2
Visual_fields_Right_Henson_C2 = "Abnormal" OR Visual_fields_Left_Henson_C2 = "Abnormal"	-2
(Visual_fields_Right_Henson_C2 = "Uncertain" AND Visual_fields_Left_Henson_C2 = "Uncertain") OR (Visual_fields_Right_Henson_C2 = "Uncertain" OR Visual_fields_Left_Henson_C2 = "Uncertain")	-1
Optic disc status If the optic disc status in both eyes are normal, then it supports Normal-No referral	
Optic_Disc_Status_Right_C2 = "Normal" AND Optic_Disc_Status_Left_C2 = "Normal"	-2
Optic_Disc_Status_Right_C2 = "Abnormal" OR Optic_Disc_Status_Left_C2 = "Abnormal"	-2
(Optic_Disc_Status_Right_C2 = "Uncertain" AND Optic_Disc_Status_Left_C2 = "Uncertain") OR (Optic_Disc_Status_Right_C2 = "Uncertain" OR Optic_Disc_Status_Left_C2 = "Uncertain")	2
Van Herick Van Herick =< 2 indicates the presence of pathology	
Van_Herick_Right_C2 =< 2 OR Van_Herick_Left_C2 =< 2	-2

Table 2-6 - Normal-No referral candidate with arguments and weights for Normal vignette

2.3 NTG Vignette candidates and arguments

The following sections (2.3.1-2.3.4) gives the candidates for the NTG vignette.

There are 4 candidates for the NTG vignette diagnosis node

- Normal-Repeat tests (2.3.1)
- Normal-No referral (2.3.2)
- NTG (2.3.3)
- POAG (2.3.4)

2.3.1 Normal-Repeat tests candidate

IOP If the IOP measurements is less than 21mmHg indicates the pressure is Normal, and doesn't require repeat tests	Support
IOP_NCT_Right_Reading_Average_C3 < 21 OR IOP_NCT_Left_Reading_Average_C3 < 21	0
IOP_GAT_Left_C3 = "19" OR IOP_GAT_Right_C3 = "19"	0
Visual Fields Humphrey If the visual fields in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Visual_fields_Right_Humphrey_C3 = "Normal" AND Visual_fields_Left_Humphrey_C3 = "Normal"	-2
Visual_fields_Right_Humphrey_C3 = "Abnormal" OR Visual_fields_Left_Humphrey_C3 = "Abnormal"	-1
(Visual_fields_Right_Humphrey_C3 = "Uncertain" AND Visual_fields_Left_Humphrey_C3 = "Uncertain") OR (Visual_fields_Right_Humphrey_C3 = "Uncertain" OR Visual_fields_Left_Humphrey_C3 = "Uncertain")	2
Visual Fields Henson If the visual fields in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Visual_fields_Right_Henson_C3 = "Normal" AND Visual_fields_Left_Henson_C3 = "Normal"	-2
Visual_fields_Right_Henson_C3 = "Abnormal" OR Visual_fields_Left_Henson_C3 = "Abnormal"	-1
(Visual_fields_Right_Henson_C3 = "Uncertain" AND Visual_fields_Left_Henson_C3 = "Uncertain") OR (Visual_fields_Right_Henson_C3 = "Uncertain" OR Visual_fields_Left_Henson_C3 = "Uncertain")	2
Optic disc status If the optic disc status in both eyes are uncertain then it may support Normal, but the tests need repeating to confirm	
Optic_Disc_Status_Right_C3 = "Normal" AND Optic_Disc_Status_Left_C3 = "Normal"	-2
Optic_Disc_Status_Right_C3 = "Abnormal" OR Optic_Disc_Status_Left_C3 = "Abnormal"	-2
(Optic_Disc_Status_Right_C3 = "Uncertain" AND Optic_Disc_Status_Left_C3 = "Uncertain") OR (Optic_Disc_Status_Right_C3 = "Uncertain" OR Optic_Disc_Status_Left_C3 = "Uncertain")	2

Van Herick	
Van Herick =< 2 indicates the presence of pathology	
Van_Herick_Right_C3 =< 2 OR Van_Herick_Left_C3 =< 2	-2

Table 2-7 - Normal-Repeat tests candidate with arguments and weights for NTG vignette

2.3.2 Normal-No referral candidate

IOP	Support
If the IOP measurements is less than 21mmHg indicates the pressure is Normal	
IOP_NCT_Right_Reading_Average_C3 < 21 OR IOP_NCT_Left_Reading_Average_C3 < 21	1
IOP_GAT_Left_C3 = "19" OR IOP_GAT_Right_C3 = "19"	1
Visual Fields Humphrey	
If the visual fields in both eyes are Normal, then it supports Normal-No referral	
Visual_fields_Right_Humphrey_C3 = "Normal" AND Visual_fields_Left_Humphrey_C3 = "Normal"	2
Visual_fields_Right_Humphrey_C3 = "Abnormal" OR Visual_fields_Left_Humphrey_C3 = "Abnormal"	-2
(Visual_fields_Right_Humphrey_C3 = "Uncertain" AND Visual_fields_Left_Humphrey_C3 = "Uncertain") OR (Visual_fields_Right_Humphrey_C3 = "Uncertain" OR Visual_fields_Left_Humphrey_C3 = "Uncertain")	-1
Visual Fields Henson	
If the visual fields in both eyes are Normal, then it supports Normal-No referral	
Visual_fields_Right_Henson_C3 = "Normal" AND Visual_fields_Left_Henson_C3 = "Normal"	2
Visual_fields_Right_Henson_C3 = "Abnormal" OR Visual_fields_Left_Henson_C3 = "Abnormal"	-2
(Visual_fields_Right_Henson_C3 = "Uncertain" AND Visual_fields_Left_Henson_C3 = "Uncertain") OR (Visual_fields_Right_Henson_C3 = "Uncertain" OR Visual_fields_Left_Henson_C3 = "Uncertain")	-1
Optic disc status	

If the optic disc status in both eyes are normal, then it supports Normal-No referral	
Optic_Disc_Status_Right_C3 = "Normal" AND Optic_Disc_Status_Left_C3 = "Normal"	2
Optic_Disc_Status_Right_C3 = "Abnormal" OR Optic_Disc_Status_Left_C3 = "Abnormal"	-2
(Optic_Disc_Status_Right_C3 = "Uncertain" AND Optic_Disc_Status_Left_C3 = "Uncertain") OR (Optic_Disc_Status_Right_C3 = "Uncertain" OR Optic_Disc_Status_Left_C3 = "Uncertain")	-1
Van Herick Van Herick =< 2 indicates the presence of pathology	
Van_Herick_Right_C3 =< 2 OR Van_Herick_Left_C3 =< 2	-2

Table 2-8 - Normal-No referral candidate with arguments and weights for NTG vignette

2.3.3 NTG candidate

IOP If the IOP measurements is less than 21mmHg indicates the pressure is Normal, and may support NTG	**Support**
IOP_NCT_Right_Reading_Average_C3 < 21 OR IOP_NCT_Left_Reading_Average_C3 < 21	2
IOP_GAT_Right_C3 = "19" OR IOP_GAT_Left_C3 = "19"	2
Visual Fields Humphrey If the visual fields in both eyes are abnormal, then it supports NTG	
Visual_fields_Right_Humphrey_C3 = "Normal" AND Visual_fields_Left_Humphrey_C3 = "Normal"	-1
Visual_fields_Right_Humphrey_C3 = "Abnormal" OR Visual_fields_Left_Humphrey_C3 = "Abnormal"	2
(Visual_fields_Right_Humphrey_C3 = "Uncertain" AND Visual_fields_Left_Humphrey_C3 = "Uncertain") OR (Visual_fields_Right_Humphrey_C3 = "Uncertain" OR Visual_fields_Left_Humphrey_C3 = "Uncertain")	1
Visual Fields Henson If the visual fields in both eyes are Normal, then it supports NTG	

Visual_fields_Right_Henson_C3 = "Normal" AND Visual_fields_Left_Henson_C3 = "Normal"	-1
Visual_fields_Right_Henson_C3 = "Abnormal" OR Visual_fields_Left_Henson_C3 = "Abnormal"	2
(Visual_fields_Right_Henson_C3 = "Uncertain" AND Visual_fields_Left_Henson_C3 = "Uncertain") OR (Visual_fields_Right_Henson_C3 = "Uncertain" OR Visual_fields_Left_Henson_C3 = "Uncertain")	1
Optic disc status If the optic disc status in both eyes are abnormal, then it supports NTG	
Optic_Disc_Status_Right_C3 = "Normal" AND Optic_Disc_Status_Left_C3 = "Normal"	-2
Optic_Disc_Status_Right_C3 = "Abnormal" OR Optic_Disc_Status_Left_C3 = "Abnormal"	2
(Optic_Disc_Status_Right_C3 = "Uncertain" AND Optic_Disc_Status_Left_C3 = "Uncertain") OR (Optic_Disc_Status_Right_C3 = "Uncertain" OR Optic_Disc_Status_Left_C3 = "Uncertain")	1
Van Herick Van Herick =< 2 does not support NTG	
Van_Herick_Right_C3 =< 2 OR Van_Herick_Left_C3 =< 2	-1
Van_Herick_Right_C3 > 2 AND Van_Herick_Left_C3 > 2	1

Table 2-9 – NTG candidate with arguments and weights for NTG vignette

2.3.4 POAG candidate

IOP If the IOP measurements is less than 21mmHg indicates the pressure is Normal and does not support POAG	Support
IOP_NCT_Right_Reading_Average_C3 < 21 OR IOP_NCT_Left_Reading_Average_C3 < 21	-2
IOP_GAT_Right_C3 = "19" OR IOP_GAT_Left_C3 = "19"	-2
Visual Fields Humphrey If the visual fields in both eyes are abnormal, then it supports POAG	

Visual_fields_Right_Humphrey_C3 = "Normal" AND Visual_fields_Left_Humphrey_C3 = "Normal"	-1
Visual_fields_Right_Humphrey_C3 = "Abnormal" OR Visual_fields_Left_Humphrey_C3 = "Abnormal"	2
(Visual_fields_Right_Humphrey_C3 = "Uncertain" AND Visual_fields_Left_Humphrey_C3 = "Uncertain") OR (Visual_fields_Right_Humphrey_C3 = "Uncertain" OR Visual_fields_Left_Humphrey_C3 = "Uncertain")	1
Visual Fields Henson If the visual fields in both eyes are abnormal, then it supports POAG	
Visual_fields_Right_Henson_C3 = "Normal" AND Visual_fields_Left_Henson_C3 = "Normal"	-1
Visual_fields_Right_Henson_C3 = "Abnormal" OR Visual_fields_Left_Henson_C3 = "Abnormal"	2
(Visual_fields_Right_Henson_C3 = "Uncertain" AND Visual_fields_Left_Henson_C3 = "Uncertain") OR (Visual_fields_Right_Henson_C3 = "Uncertain" OR Visual_fields_Left_Henson_C3 = "Uncertain")	1
Optic disc status If the optic disc status in both eyes are abnormal, then it supports POAG	
Optic_Disc_Status_Right_C3 = "Normal" AND Optic_Disc_Status_Left_C3 = "Normal"	-2
Optic_Disc_Status_Right_C3 = "Abnormal" OR Optic_Disc_Status_Left_C3 = "Abnormal"	2
(Optic_Disc_Status_Right_C3 = "Uncertain" AND Optic_Disc_Status_Left_C3 = "Uncertain") OR (Optic_Disc_Status_Right_C3 = "Uncertain" OR Optic_Disc_Status_Left_C3 = "Uncertain")	1
Van Herick Van Herick =< 2 does not support POAG	
Van_Herick_Right_C3 =< 2 OR Van_Herick_Left_C3 =< 2	-1
Van_Herick_Right_C3 > 2 AND Van_Herick_Left_C3 > 2	1

Table 2-10 - POAG candidate with arguments and weights for NTG vignette

2.4 Wet AMD Vignette candidates and arguments

The following sections (2.4.1-2.4.3) gives the candidates for the Wet AMD vignette.

There are 3 candidates for the Wet AMD vignette diagnosis node

- Dry AMD (2.4.1)
- Wet AMD (2.4.2)
- Macular Hole (2.4.3)

2.4.1 Dry AMD candidate

Dry AMD is the most common type of macular degeneration. It is more common than its counterpart Wet AMD. It is a condition that affects the retina of the eye leading to degeneration of the cells of the retina.

Onset of blurry vision This argument denotes a recent onset of blurry vision. If the onset of blurry vision is recent, for example "Yesterday" then it does not support the Dry AMD candidate	**Support**
Reason_visit_C4_b = "Yesterday"	0
Visual acuity Reduced visual acuity in atleast one eye supports the Dry AMD candidate	
Refraction_C4 includes "Subjective findings"	1
Lens Absence of significant cataract rules out cataract and the blurry vision of the eye could be caused by Dry AMD.	
Lens_Right_C4 = "Early nuclear sclerotic changes"	1
Macula Image Presence of abnormal Macula which can be seen in the posterior images of the eye is an indication of Dry AMD	
Macula_Right_C4 = "Abnormal" OR Macula_Right_C4_Repeat = "Abnormal"	1
Amsler test Amsler test is a test for AMD. If there is evidence of distortion as reported by the patient, then it does not support Dry AMD.	
Amsler Grid_Right_C4 = "Area of distortion present"	0
Oculomotor balance Normal Orthophoric oculomotor balance also supports Dry AMD	
Distance_OMB_C4 = "Orthophoric" OR Near_OMB_C4 = "Orthophoric" OR Cover_test_Distance_C4 = "Orthophoric" OR Cover_test_Near_C4 = "Orthophoric"	1

Table 2-11 – Dry AMD candidate with arguments and weights for Wet AMD vignette

2.4.2 Wet AMD candidate

Wet AMD is a type of AMD affects only 10-15% of the population with AMD, however is responsible for 90% of the blindness or severe vision loss.

Onset of blurry vision This argument denotes a recent onset of blurry vision. If the onset of blurry vision is recent, for example "Yesterday" then it supports the Wet AMD candidate	Support
Reason_visit_C4_b = "Yesterday"	1
Visual acuity Reduced visual acuity in atleast one eye supports the Wet AMD candidate	
Refraction_C4 includes "Subjective findings"	1
Lens Absence of significant cataract rules out cataract and the blurry vision of the eye could be caused by Wet AMD.	
Lens_Right_C4 = "Early nuclear sclerotic changes"	4
Macula Image Presence of abnormal Macula which can be seen in the posterior images of the eye is an indication of Wet AMD	
Macula_Right_C4 = "Abnormal" OR Macula_Right_C4_Repeat = "Abnormal"	1
Amsler test Amsler test is a test for AMD. If there is evidence of distortion as reported by the patient, then it strongly supports Wet AMD.	
Amsler Grid_Right_C4 = "Area of distortion present"	8
Oculomotor balance Normal Orthophoric oculomotor balance also supports Wet AMD	
Distance_OMB_C4 = "Orthophoric" OR Near_OMB_C4 = "Orthophoric" OR Cover_test_Distance_C4 = "Orthophoric" OR Cover_test_Near_C4 = "Orthophoric"	1

Table 2-12 – Wet AMD candidate with arguments and weights for Wet AMD vignette

2.4.3 Macular Hole candidate

Macular Hole is condition affecting the macula of the eye where there is hole in the macula.

Onset of blurry vision This argument denotes a recent onset of blurry vision. If the onset of blurry vision is recent, for example "Yesterday" then it does not support Macular Hole	Support
Reason_visit_C4_b = "Yesterday"	0
Visual acuity Reduced visual acuity in atleast one eye supports Macular Hole	
Refraction_C4 includes "Subjective findings"	1
Lens Absence of significant cataract rules out cataract and the blurry vision of the eye could be caused by Macular Hole.	

Lens_Right_C4 = "Early nuclear sclerotic changes"	1
Macula Image Presence of abnormal Macula which can be seen in the posterior images of the eye is an indication of Macular Hole	
Macula_Right_C4 = "Abnormal" OR Macula_Right_C4_Repeat = "Abnormal"	1
Amsler test If there is evidence of distortion as reported by the patient, then it supports Macular Hole.	
Amsler Grid_Right_C4 = "Area of distortion present"	1
Oculomotor balance Normal Orthophoric oculomotor balance also supports Macular Hole	
Distance_OMB_C4 = "Orthophoric" OR Near_OMB_C4 = "Orthophoric" OR Cover_test_Distance_C4 = "Orthophoric" OR Cover_test_Near_C4 = "Orthophoric"	1

Table 2-13 – Macular Hole candidate with arguments and weights for Wet AMD vignette

3 Appendix 3

3.1 Links to vignettes used in Chapter 4 study with optometrists

Copy-paste links below into web browser to access vignette application modelled in PROforma using Tallis and hosted on openclinical.net

3.1.1 OHT vignette

http://tallis.openclinical.net/EnactFile.page?protocol=optometry-C1-2015-11-03-OK.pf&template=openclinical-tabbed&bundleFolder=optometry

3.1.2 Normal vignette

http://tallis.openclinical.net/EnactFile.page?protocol=optometry-C2-2015-11-03-OK.pf&template=openclinical-tabbed&bundleFolder=optometry

3.1.3 NTG vignette

http://tallis.openclinical.net/EnactFile.page?protocol=optometry-C3-2015-11-03-OK.pf&template=openclinical-tabbed&bundleFolder=optometry

3.1.4 Wet AMD vignette

http://tallis.openclinical.net/EnactFile.page?protocol=optometry-C4-2015-11-03-OK.pf&template=openclinical-tabbed&bundleFolder=optometry

3.2 Links to vignette files used in Chapter 4 study with optometrists

The Tallis files for all vignettes can be accessed via this Google Drive repository

https://drive.google.com/drive/folders/0B67O3_av5-CVT1kwelIxUlNFQkk?usp=sharing

3.2.1 Instructions to open and inspect vignette Tallis files

- Download all files in the Google drive repository
  - https://drive.google.com/drive/folders/0B67O3_av5-CVT1kwelIxUlNFQkk?usp=sharing
- Go to openclinical.net and download the Tallis composer
  - https://www.openclinical.net/index.php?id=393
- Open the zip file containing files for Tallis composer and unzip the files to local disk
- Click and open composer.bat file
- In the main menu of Tallis composer, click on File > Open and select the .pf file to open the vignette

- o   For OHT vignette - optometry-C1-2015-11-03-OK.pf
- o   For Normal vignette - optometry-C2-2015-11-03-OK.pf
- o   For NTG vignette - optometry-C3-2015-11-03-OK.pf
- o   For Wet AMD vignette - optometry-C4-2015-11-03-OK.pf

4 Appendix 4

4.1.1 OHT

The table below (Table 4-1) shows the correct vs incorrect management recommendations for the OHT diagnosis that were recommended by the expert clinicians.

Management Recommendations	Options	Correct Answer	Wrong Answer
Re-examination intervals			
	3 months	12 months	3 months
	6 months		6 months
	12 months		
	18 months		18 months
	24 months		24 months
Supplementary tests			
	Fields	Fields	
	Goldmann Tonometry	Goldmann Tonometry	
	Dilation	Dilation	
Referral recommendations			
	No Referral Required	No Referral Required	To GP Only
	No Referral, But Report Of Findings Sent To GP	No Referral, But Report Of Findings Sent To GP	To GP Routine To Ophthalmologist (3/12)
	To GP Only		To GP Soon To Ophthalmologist (3/52)
	To GP Routine To Ophthalmologist (3/12)		To GP Urgent To Ophthalmologist (1/52)
	To GP Soon To Ophthalmologist (3/52)		To Ophthalmologist Within 3 Days
	To GP Urgent To Ophthalmologist (1/52)		Same Day A&E
	To Ophthalmologist Within 3 Days		
	Same Day A&E		

Table 4-1: OHT diagnosis correct vs Incorrect answers

4.1.1.1 OHT – Referral

The following table (Table 4-2) shows the correct and incorrect numbers of the OHT – Referral obtained from optometrists with (intervention group) and without (control group) support of CDSS

OHT – Referral	Correct	Incorrect
With CDSS	4 (30.77%)	8 (61.54%)
Without CDSS	48 (48.00%)	52 (52.00%)

Table 4-2: OHT – Referral correct vs incorrect numbers

4.1.1.2 OHT – Re-examination Interval

The following table (Table 4-3) shows the correct and incorrect numbers of the OHT – Re-examination Interval obtained from optometrists with (intervention group) and without (control group) support of CDSS

OHT – Re-examination Interval	Correct	Incorrect
With CDSS	8 (61.54%)	4 (30.77%)
Without CDSS	59 (59.00%)	41 (41.00%)

Table 4-3: OHT – Re-examination Interval correct vs incorrect numbers

4.1.1.3 OHT – Supplementary Tests – Fields

The following table (Table 4-4) shows the correct and incorrect numbers of the OHT – Supplementary Tests – Fields obtained from optometrists with (intervention group) and without (control group) support of CDSS

OHT – Supplementary Tests – Fields	Correct	Incorrect
With CDSS	8 (61.54%)	4 (30.77%)
Without CDSS	30 (30.00%)	70 (70.00%)

Table 4-4: OHT – Supplementary Tests – Fields correct vs incorrect numbers

4.1.1.4 OHT – Supplementary Tests – Goldmann Tonometry

The following table (Table 4-5) shows the correct and incorrect numbers of the OHT – Supplementary Tests – Goldmann Tonometry obtained from optometrists with (intervention group) and without (control group) support of CDSS

OHT – Supplementary Tests – Goldmann Tonometry	Correct	Incorrect
With CDSS	8 (61.54%)	4 (30.77%)
Without CDSS	36 (36.00%)	64 (64.00%)

Table 4-5: OHT – Supplementary Tests – Goldmann Tonometry correct vs incorrect numbers

4.1.1.5 OHT – Supplementary Tests – Dilation

The following table (Table 4-6) shows the correct and incorrect numbers of the OHT – Supplementary Tests – Dilation obtained from optometrists with (intervention group) and without (control group) support of CDSS

OHT – Supplementary Tests – Dilation	Correct	Incorrect
With CDSS	2 (15.38%)	10 (76.92%)
Without CDSS	10 (10.00%)	90 (90.00%)

Table 4-6: OHT – Supplementary Tests – Dilation correct vs incorrect numbers

4.1.2 Normal

The table below (Table 4-7) shows the correct vs incorrect management recommendations for the Normal diagnosis that were recommended by the expert clinicians.

Management Recommendations	Options	Correct Answer	Wrong Answer
Re-examination intervals			
	3 months	12 months	3 months
	6 months	18 months	6 months
	12 months	24 months	
	18 months		
	24 months		
Supplementary tests			
	Fields		Fields
	Goldmann Tonometry		Goldmann Tonometry
	Dilation		Dilation
Referral recommendations			
	No Referral Required	No Referral Required	To GP Only
	No Referral, But Report Of Findings Sent To GP	No Referral, But Report Of Findings Sent To GP	To GP Routine To Ophthalmologist (3/12)
	To GP Only		To GP Soon To Ophthalmologist (3/52)
	To GP Routine To Ophthalmologist (3/12)		To GP Urgent To Ophthalmologist (1/52)
	To GP Soon To Ophthalmologist (3/52)		To Ophthalmologist Within 3 Days
	To GP Urgent To Ophthalmologist (1/52)		Same Day A&E
	To Ophthalmologist Within 3 Days		
	Same Day A&E		

Table 4-7: Normal diagnosis correct vs incorrect answers

4.1.2.1 Normal-Referral

The following table (Table 4-8) shows the correct and incorrect numbers of the Normal-Referral obtained from optometrists with (intervention group) and without (control group) support of CDSS

Normal-Referral	Correct	Incorrect
With CDSS	8 (61.54%)	1 (7.69%)
Without CDSS	93 (93.00%)	9 (9.00%)

Table 4-8: Normal-Referral correct vs incorrect numbers

In the Normal diagnosis it is not required for the optometrist to refer the patient to an ophthalmologist.

4.1.2.2 Normal-Re-examination Interval

The following table (Table 4-9) shows the correct and incorrect numbers of the Normal-Re-examination Interval obtained from optometrists with (intervention group) and without (control group) support of CDSS

Normal-Re-examination Interval	Correct	Incorrect
With CDSS	7 (53.85%)	2 (15.38%)
Without CDSS	90 (90.00%)	12 (12.00%)

Table 4-9: Normal-Re-examination Interval correct vs incorrect numbers

In the Normal diagnosis the patient only needs to be recalled for routine eye examination i.e. every 12 months if needed.

4.1.2.3 Normal-Supplementary Tests – Fields

The following table (Table 4-10) shows the correct and incorrect numbers of the Normal-Supplementary Tests – Fields obtained from optometrists with (intervention group) and without (control group) support of CDSS

Normal-Supplementary Tests – Fields	Correct	Incorrect
With CDSS	4 (30.77%)	5 (38.46%)
Without CDSS	77 (77.00%)	25 (25.00%)

Table 4-10: Normal-Supplementary Tests – Fields correct vs incorrect numbers

4.1.2.4 Normal-Supplementary Tests – Goldmann Tonometry

The following table (Table 4-11) shows the correct and incorrect numbers of the Normal-Supplementary Tests – Goldmann Tonometry obtained from optometrists with (intervention group) and without (control group) support of CDSS

Normal-Supplementary Tests – Goldmann Tonometry	Correct	Incorrect
With CDSS	6 (46.15%)	3 (23.08%)
Without CDSS	95 (95.00%)	7 (7.00%)

Table 4-11: Normal-Supplementary Tests – Goldmann Tonometry correct vs incorrect numbers

4.1.2.5 Normal-Supplementary Tests – Dilation

The following table (Table 4-12) shows the correct and incorrect numbers of the Normal-Supplementary Tests – Dilation obtained from optometrists with (intervention group) and without (control group) support of CDSS

Normal-Supplementary Tests – Dilation	Correct	Incorrect
With CDSS	8 (61.54%)	1 (7.69%)
Without CDSS	98 (98.00%)	4 (4.00%)

Table 4-12: Normal-Supplementary Tests – Dilation correct vs incorrect numbers

4.1.3 Normal Tension Glaucoma (NTG)

The table below (Table 4-13) shows the correct vs incorrect management recommendations for the NTG diagnosis that were recommended by the expert clinicians.

Management Recommendations	Options	Correct Answer	Wrong Answer
Re-examination intervals			
	3 months	3 months	18 months
	6 months	6 months	24 months
	12 months	12 months	
	18 months		
	24 months		
Supplementary tests			
	Fields	Fields	
	Goldmann Tonometry	Goldmann Tonometry	
	Dilation	Dilation	
Referral recommendations			
	No Referral Required	To GP Routine To Ophthalmologist (3/12)	No Referral Required
	No Referral, But Report Of Findings Sent To GP	To GP Soon To Ophthalmologist (3/52)	No Referral, But Report Of Findings Sent To GP
	To GP Only		To GP Only
	To GP Routine To Ophthalmologist (3/12)		To GP Urgent To Ophthalmologist (1/52)
	To GP Soon To Ophthalmologist (3/52)		To Ophthalmologist Within 3 Days
	To GP Urgent To Ophthalmologist (1/52)		Same Day A&E
	To Ophthalmologist Within 3 Days		
	Same Day A&E		

Table 4-13: NTG diagnosis correct vs incorrect answers

4.1.3.1 NTG – Referral

The following table (Table 4-14) shows the correct and incorrect numbers of the NTG – Referral obtained from optometrists with (intervention group) and without (control group) support of CDSS

NTG – Referral	Correct	Incorrect
With CDSS	13 (100.00%)	0 (0.00%)
Without CDSS	77 (77.00%)	24 (24.00%)

Table 4-14: NTG – Referral correct vs incorrect numbers

In the NTG diagnosis vignette the patient has to be referred to an ophthalmologist for additional care.

4.1.3.2 NTG – Re-examination Interval

The following table (Table 4-15) shows the correct and incorrect numbers of the NTG – Re-examination Interval obtained from optometrists with (intervention group) and without (control group) support of CDSS

NTG – Re-examination Interval	Correct	Incorrect
With CDSS	13 (100.00%)	0 (0.00%)
Without CDSS	75 (75.00%)	26 (26.00%)

Table 4-15: NTG – Re-examination Interval correct vs incorrect numbers

The patient has to be recalled every 3-12 months as needed for regular repeat eye examinations.

4.1.3.3 NTG – Supplementary Tests – Fields

The following table (Table 4-16) shows the correct and incorrect numbers of the NTG – Supplementary Tests – Fields obtained from optometrists with (intervention group) and without (control group) support of CDSS

NTG – Supplementary Tests – Fields	Correct	Incorrect
With CDSS	9 (69.23%)	4 (30.77%)
Without CDSS	20 (20.00%)	81 (81.00%)

Table 4-16: NTG – Supplementary Tests – Fields correct vs incorrect numbers

4.1.3.4 NTG – Supplementary Tests – Goldmann Tonometry

The following table (Table 4-17) shows the correct and incorrect numbers of the NTG – Supplementary Tests – Goldmann Tonometry obtained from optometrists with (intervention group) and without (control group) support of CDSS

NTG – Supplementary Tests – Goldmann Tonometry	Correct	Incorrect
With CDSS	9 (69.23%)	4 (30.77%)
Without CDSS	16 (16.00%)	85 (85.00%)

Table 4-17: NTG – Supplementary Tests – Goldmann Tonometry correct vs incorrect numbers

4.1.3.5 NTG – Supplementary Tests – Dilation

The following table (Table 4-18) shows the correct and incorrect numbers of the NTG – Supplementary Tests – Dilation obtained from optometrists with (intervention group) and without (control group) support of CDSS

NTG – Supplementary Tests – Dilation	Correct	Incorrect
With CDSS	4 (30.77%)	9 (69.23%)
Without CDSS	12 (12.00%)	89 (89.00%)

Table 4-18: NTG – Supplementary Tests – Dilation correct vs incorrect numbers

4.1.4 Wet AMD

Management Recommendations	Options	Correct Answer	Wrong Answer
Re-examination intervals			
	3 months	3 months	18 months
	6 months		24 months
	12 months		6 months
	18 months		12 months
	24 months		
Supplementary tests			
	Fields	Fields	
	Goldmann Tonometry	Goldmann Tonometry	
	Dilation	Dilation	
Referral recommendations			
	No Referral Required	To GP Soon To Ophthalmologist (3/52)	No Referral Required
	No Referral, But Report Of Findings Sent To GP	To GP Urgent To Ophthalmologist (1/52)	No Referral, But Report Of Findings Sent To GP
	To GP Only	To Ophthalmologist Within 7 Days	To GP Only
	To GP Routine To Ophthalmologist (3/12)	Same Day A&E	To GP Routine To Ophthalmologist (3/12)
	To GP Soon To Ophthalmologist (3/52)		
	To GP Urgent To Ophthalmologist (1/52)		
	To Ophthalmologist Within 3 Days		
	Same Day A&E		

Table 4-19: Wet AMD diagnosis correct vs incorrect answers

The table above (Table 4-19) shows the correct vs incorrect management recommendations for the Wet AMD diagnosis that were recommended by the expert clinicians.

4.1.4.1 Wet AMD – Referral

The following table (Table 4-20) shows the correct and incorrect numbers of the Wet AMD – Referral obtained from optometrists with (intervention group) and without (control group) support of CDSS

Wet AMD – Referral	Correct	Incorrect
With CDSS	14 (107.69%)	0 (0.00%)
Without CDSS	82 (82.00%)	18 (18.00%)

Table 4-20: Wet AMD – Referral correct vs incorrect numbers

In the Wet AMD diagnosis, the patient's vision can deteriorate rapidly, sometimes in a matter of days. Therefore, the patient has be referred to an ophthalmologist immediately or to the Accident and Emergency (A&E) department of the nearest hospital on the same day itself if possible.

4.1.4.2 Wet AMD – Re-examination Interval

The following table (Table 4-21) shows the correct and incorrect numbers of the Wet AMD – Re-examination Interval obtained from optometrists with (intervention group) and without (control group) support of CDSS

Wet AMD – Re-examination Interval	Correct	Incorrect
With CDSS	14 (107.69%)	0 (0.00%)
Without CDSS	88 (88.00%)	12

Table 4-21: Wet AMD – Re-examination Interval correct vs incorrect numbers

The patient should be recalled every 3 months for re-examination.

4.1.4.3 Wet AMD – Supplementary Tests – Fields

The following table (Table 4-22) shows the correct and incorrect numbers of the Wet AMD – Supplementary Tests – Fields obtained from optometrists with (intervention group) and without (control group) support of CDSS

Wet AMD – Supplementary Tests – Fields	Correct	Incorrect
With CDSS	4 (30.77%)	10 (76.92%)
Without CDSS	5 (5.00%)	95 (95.00%)

Table 4-22: Wet AMD – Supplementary Tests – Fields correct vs incorrect numbers

4.1.4.4 Wet AMD – Supplementary Tests – Goldmann Tonometry

The following table (Table 4-23) shows the correct and incorrect numbers of the Wet AMD – Supplementary Tests – Goldmann Tonometry obtained from optometrists with (intervention group) and without (control group) support of CDSS

Wet AMD – Supplementary Tests – Goldmann Tonometry	Correct	Incorrect
With CDSS	2 (15.38%)	12 (92.31%)
Without CDSS	1 (1.00%)	99 (99.00%)

Table 4-23: Wet AMD – Supplementary Tests – Goldmann Tonometry correct vs incorrect numbers

4.1.4.5 Wet AMD – Supplementary Tests – Dilation

The following table (Table 4-24) shows the correct and incorrect numbers of the Wet AMD – Supplementary Tests – Dilation obtained from optometrists with (intervention group) and without (control group) support of CDSS.

Wet AMD – Supplementary Tests – Dilation	Correct	Incorrect
With CDSS	8 (61.54%)	6 (46.15%
Without CDSS	22 (22.00%)	78 (78.00%)

Table 4-24: Wet AMD – Supplementary Tests – Dilation correct vs incorrect numbers

5 Appendix 5

The DS Model and the Multi-level DS Model can be accessed via the following link.

https://drive.google.com/drive/folders/0B67O3_av5-CVUzZmVzBVYktTUk0?usp=sharing

5.1 Instructions to open and inspect DS Model and Multi-level DS Model

- Download DS Model file from the link above and save to local disk
- Download Protégé Desktop software from the link below
  - http://protege.stanford.edu/products.php
- Install Protégé
- Open Protégé Desktop
- In the main menu, click on File>Open and open the DS Model file named Dental_pain_model-2017-01-31.ttl

6 Appendix 6

6.1 Case Study 1 files

Download the files for Case Study 1 from the following link

https://drive.google.com/drive/folders/0B67O3_av5-CVVnliMkFOS1dWeG8?usp=sharing

6.2 Case Study 1 Python CDSS instructions

- Install Python 3.4
- Download Case Study 1 files from Google drive
  - https://drive.google.com/drive/folders/0B67O3_av5-CVVnliMkFOS1dWeG8?usp=sharing

- Install all python modules in Case_Study_1/requirements.txt
- Click File>Open and select Case_Study_1/DS_Model_frontend.py in Python IDLE.
  - IDLE is Python's Integrated Development and Learning Environment.
  - For more info see: https://docs.python.org/3/library/idle.html
- Click Run>Run Module
- The user will be presented with a window
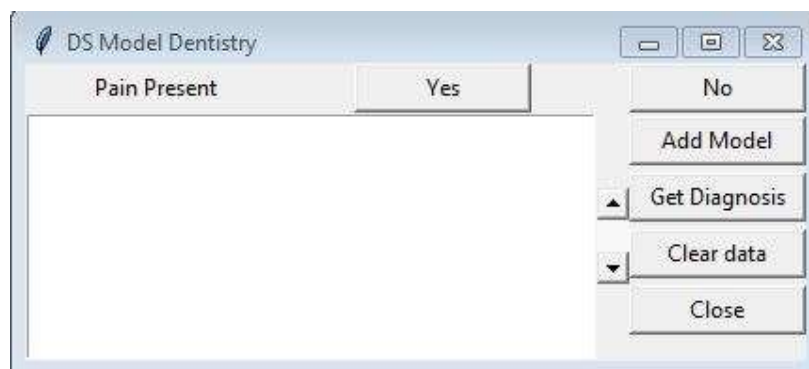
Figure 6-1 - Case Study 1 start screen

- Click on Add Model
- Click on either Yes or the No button on top (Figure 6-1)
- Click on Get Diagnosis button to get a ranked diagnosis list (Figure 6-2)
- Click Clear data to start again
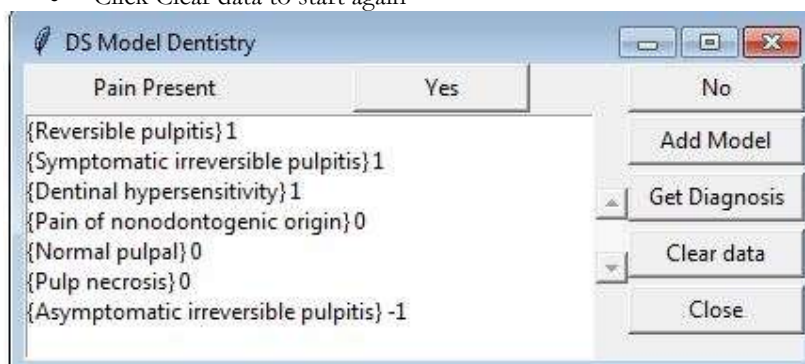
Figure 6-2 - Case Study 1 diagnoses

7 Appendix 7

7.1 Case Study 2 files

The file for this Case Study can be downloaded from the Google Drive Folder link below

https://drive.google.com/open?id=0B67O3_av5-CVc0ZUWl9DSkVHT1E

7.2 Case Study 2 instructions

7.2.1 Fuseki server instructions

- Download Jena Fuseki server
  - https://jena.apache.org/documentation/serving_data/#download-fuseki1
  - Download apache-jena-fuseki-2.5.0.zip
- Unzip the files in the zip folder.
- Click fuseki-server.bat file to run the server.
- Go to http://localhost:3030/manage.html?tab=datasets
- Click on add new dataset.
- Give dataset the name "DSModel".
- Select Persistent and create dataset.
- A dataset called "DSModel" has been created successfully.
- Click on existing datasets and select upload data near DSModel.
- Download DS Model from Google Drive folder
  - https://drive.google.com/open?id=0B67O3_av5-CVc0ZUWl9DSkVHT1E
  - Download Case Study 2 files/Case_Study_2/ Dental_pain_model-2017-01-31-V1.ttl
- Give destination graph the name "Dental_pain_model" and select the Dental_pain_model-2017-01-31-V1.ttl from the Google Drive folder, and click upload now button.
- The DS Model has been successfully uploaded to the named graph called "Dental_pain_model"

7.2.2 MySQL instructions

- Download and Install MySQL server
  - https://dev.mysql.com/downloads/mysql/
- Start MySQL server
  - https://dev.mysql.com/doc/refman/5.7/en/windows-start-command-line.html

- From the MySQL command line, enter the following command to create database called Study2.
  - mysql> CREATE DATABASE CaseStudy2;
- Create a new user called "dbtest" and password "1111222" with the following command
  - mysql> CREATE USER 'dbtest'@'localhost' IDENTIFIED BY '111222';
- Grant all privileges to user with the following commands

- o   mysql> GRANT ALL PRIVILEGES ON * . * TO ' dbtest '@'localhost';
- o   mysql> FLUSH PRIVILEGES;
- Enter USE command;
  - o   mysql> USE CaseStudy2;
- Get table schema "casestudy2.sql" from Google Drive link
  - o   https://drive.google.com/open?id=0B67O3_av5-CVc0ZUWl9DSkVHT1E

  - o   Download Case Study 2 files/ MySQL files/ casestudy2.sql
- Import table schema "casestudy2.sql" into CaseStudy2 database using the following command
  - o   mysql>source {your_directory}/casestudy2.sql
- The pain_present table will be successfully created.

7.2.3 D2RQ instructions

- Download d2rq files from Google Drive folder
  - o   https://drive.google.com/open?id=0B67O3_av5-CVc0ZUWl9DSkVHT1E
  - o   Case Study 2 files/d2rq files /d2rq-0.8.1
- Navigate to the d2rq-0.8.1 folder in command line
- Run the following command in the command line to run the D2R server
  - o   d2r-server DSModel_mapping.ttl
- The D2R server will be running in http://localhost:2020/

7.2.4 Case Study 2 Python CDSS instructions

- Install Python 3.4
- Download Case Study 2 files from Google drive
  - o   https://drive.google.com/open?id=0B67O3_av5-CVc0ZUWl9DSkVHT1E

  - o   Download all files in Case Study 2 files/Case_Study_2
- Install all python modules in Case_Study_2/requirements.txt
- Click File>Open and select Case_Study_2/DS_Model_front_end.py in Python IDLE.
  - o   IDLE is Python's Integrated Development and Learning Environment.
  - o   For more info see: https://docs.python.org/3/library/idle.html
- Click Run>Run Module
- The user will be presented with a window (Figure 7-1)
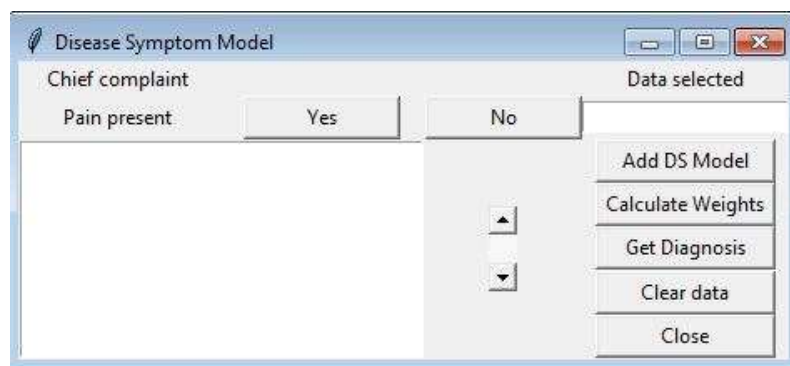
Figure 7-1 - Case Study 2 start screen

- Click on Add DS Model
- Click on either Yes or the No button on top (Figure 7-1)
- Click on Calculate Weights
- Click on Get Diagnosis button to get a ranked diagnosis list (Figure 7-2)
- Click Clear data to start again

Figure 7-2 - Case Study 2 diagnoses

8 Appendix 8

8.1 Case Study 3 and 4 files

The files for Case Study 3 and 4 can be found via the following Google Drive link

https://drive.google.com/open?id=0B67O3_av5-CVb2FoWEVSZllBSHc

8.1.1 Fuseki server instructions (if not installed previously)

- Download Jena Fuseki server
  - https://jena.apache.org/documentation/serving_data/#download-fuseki1
  - Download apache-jena-fuseki-2.5.0.zip
- Unzip the files in the zip folder.
- Click fuseki-server.bat file to run the server.
- Go to http://localhost:3030/manage.html?tab=datasets
- Click on add new dataset.
- Give dataset the name "DSModel".
- Select Persistent and create dataset.
- A dataset called "DSModel" has been created successfully

8.2 Case Study 3 and 4 Java Jena CDSS instructions

- Install Java 7
  - http://www.oracle.com/technetwork/java/javase/downloads/jre7-downloads-1880261.html
- Download Jena files
  - https://jena.apache.org/download/
  - Download apache-jena-3.2.0.zip
- Install Eclipse
  - https://www.eclipse.org/downloads/?
- Open Eclipse
- Download DS Model java project directory from Google Drive
  - https://drive.google.com/open?id=0B67O3_av5-CVb2FoWEVSZllBSHc

  - Case Study 3_4 files/DS Model
- Import Case Study 3 and 4 files into Eclipse
  - Click on File> Import Existing Projects> DS Model
- Install Jena in Eclipse
  - Follow instructions in this tutorial to setup Jena libraries in Eclipse
    https://www.youtube.com/watch?v=YXjYPz6SHjA
- Once Jena libraries has been setup in Eclipse the CDSS application can be run to generate diagnosis recommendations.
- For Case Study 3 diagnosis
  - The dental patient vignette data in the form of RDF can be found in DSModel/src/PatientData/
  - The vignette patient data is in the format DP_GK_2016_100XX.nt
  - The vignette patient data has been generated using the APDG patient data generator.

- o Click Run > Run to run the DSModel.java application in Eclipse and the diagnosis recommendation will be delivered in the console.
- For Case Study 4 diagnosis
  - o The dental patient data exported from OpenEMR in the form of RDF can be found in DSModel/src/PatientData/openemr_dump.ttl
  - o The openemr_dump.ttl was obtained from the OpenEMR database using the D2RQ method.
  - o Click Run > Run to run the DSModel_OpenEMR.java application in Eclipse and the diagnosis recommendation will be delivered in the console.

9 Appendix 9

9.1 Advanced Patient Data Generator (APDG) files

The APDG application and the XML files used for representing the dental patient vignettes and the RDF output can be found in the following Google Drive link

https://drive.google.com/open?id=0B67O3_av5-CVeDhsa3dqdVZHdFE

9.2 APDG instructions

- Open xml file from APDG/data/xml
- Edit the file to change values for data
- Save the file
- Run run-apdg.bat
- The output data will be found in APDG/data/output

10 Appendix 10

10.1 Data collection form sent to dentists for recruitment during the Chapter 6 DS Model evaluation study

The following link gives access to a sample data collection form sent to the dentists for data collection in the Chapter 6 DS Model evaluation study. It also includes the participant instructions and the consent form, before going to the data collection form.

https://docs.google.com/forms/d/1ezdPSfRmgyNumtclUj882R_Mqqhkhe8Ck2qXuNSNIBQ/viewform

10.2 Ethics form for Chapter 6 DS Model evaluation study

Ethics Proportionate Review Application: Staff and Research Students Computer Science Research Ethics Committee (CSREC)

Staff and research students in the Department of Computer Science undertaking research that involves human participation must apply for ethical review and approval before the research can commence. If the research is low-risk, an application can be submitted for a proportionate review using this form. Applicants are advised to read the information in the SMCSE Framework for Delegated Authority for Research Ethics prior to submitting an application.

There are two parts:

Part A: Ethics Checklist. The checklist determines whether the research is low-risk. If it is, Part B of the form should also be completed. If not, the checklist provides guidance as to where approval should be sought, but the checklist itself does not need to be submitted.

Part B: Ethics Proportionate Review Form. This part is the application for ethical approval of low-risk research and should only be completed if the answer to all questions (1 – 18) is NO.

Completed forms should be returned to the Chair of CSREC by email ▮▮▮▮▮▮▮▮▮▮▮▮).

Part A: Ethics Checklist

If your answer to any of the following questions (1 – 3) is YES, you must apply to an appropriate external ethics committee for approval:	*Delete as appropriate*
1. Does your research require approval from the National Research Ethics Service (NRES)? (E.g. because you are recruiting current NHS patients or staff? If you are unsure, please check at http://www.hra.nhs.uk/research-community/before-you-apply/determine-which-review-body-approvals-are-required/)	~~Yes~~/**No**
2. Will you recruit any participants who fall under the auspices of the Mental Capacity Act? (Such research needs to be approved by an external ethics committee such as NRES or the Social Care Research Ethics Committee http://www.scie.org.uk/research/ethics-committee/)	~~Yes~~/**No**

3.	Will you recruit any participants who are currently under the auspices of the Criminal Justice System, for example, but not limited to, people on remand, prisoners and those on probation? (Such research needs to be authorised by the ethics approval system of the National Offender Management Service.)	**Yes/No**

If your answer to any of the following questions (4 – 11) is YES, you must apply to the Senate Research Ethics Committee for approval (unless you are applying to an external ethics committee):	*Delete as appropriate*

4.	Does your research involve participants who are unable to give informed consent, for example, but not limited to, people who may have a degree of learning disability or mental health problem, that means they are unable to make an informed decision on their own behalf?	**Yes/No**
5.	Is there a risk that your research might lead to disclosures from participants concerning their involvement in illegal activities?	**Yes/No**
6.	Is there a risk that obscene and or illegal material may need to be accessed for your research study (including online content and other material)?	**Yes/No**
7.	Does your research involve participants disclosing information about sensitive subjects?	**Yes/No**
8.	Does your research involve the researcher travelling to another country outside of the UK, where the Foreign & Commonwealth Office has issued a travel warning? (http://www.fco.gov.uk/en/)	**Yes/No**
9.	Does your research involve invasive or intrusive procedures? For example, these may include, but are not limited to, electrical stimulation, heat, cold or bruising.	**Yes/No**
10.	Does your research involve animals?	**Yes/No**
11.	Does your research involve the administration of drugs, placebos or other substances to study participants?	**Yes/No**

If your answer to any of the following questions (12 – 18) is YES, you must submit a full application to the Computer Science Research Ethics Committee (CSREC) for approval (unless you are applying to an external ethics committee or the Senate Research Ethics Committee). Your application may be referred to the Senate Research Ethics Committee.	*Delete as appropriate*

12.	Does your research involve participants who are under the age of 18?	**Yes/No**

13.	Does your research involve adults who are vulnerable because of their social, psychological or medical circumstances (vulnerable adults)? This includes adults with cognitive and / or learning disabilities, adults with physical disabilities and older people.	**Yes/No**
14.	Does your research involve participants who are recruited because they are staff or students of City University London? For example, students studying on a particular course or module. (If yes, approval is also required from the Head of Department or Programme Director.)	**Yes/No**
15.	Does your research involve intentional deception of participants?	**Yes/No**
16.	Does your research involve participants taking part without their informed consent?	**Yes/No**
17.	Does your research pose a risk to participants greater than that in normal working life?	**Yes/No**
18.	Does your research pose a risk to you, the researcher(s), greater than that in normal working life?	**Yes/No**

You must make a proportionate review application to the CSREC if your research involves human participation and you are not submitting any other ethics application (i.e. your answer to all questions 1 – 18 is "NO").

Part B: Ethics Proportionate Review Form

If you answered NO to all questions 1 – 18, you may use this part of the form to submit an application for a proportionate ethics review of your research. The form must be accompanied by all relevant information sheets, consent forms and interview/questionnaire schedules.

Note that all research participants should be fully informed about: the purpose of the research; the procedures affecting them or affecting any information collected about them, including information about what they will be asked to do, what data will be collected, how the data will be used, to whom it will be disclosed, and how long it will be kept; the fact that they can withdraw at any time without penalty.

Background Information	
Name:	Gopikrishnan Mannamparambil Chandrasekharan --- ██████████████████████████████
Supervisor (if student):	Dr Dympna O'Sullivan--██████████████████████ Dr Andrew MacFarlane--██████████████████

Your Research Project	
Title:	**Evaluation of diagnostic inference models for clinical decision support using clinical scenarios**
Start date:	**01-10-2015**
End date:	**31-06-2016**

Describe your project: overall aim(s) and method (up to 300 words)

Diagnostic decision support systems are widely used in routine clinical practice to aid in clinical diagnosis and also management of patient. Evidence has shown the performance of several diagnostic decision support systems has tremendous scope for improvement. Diagnostic error is also a significant cause of clinical decision making error and decision support systems have been recommended as one of the several tools at the disposal of clinicians to help reduce diagnostic error. In an effort to improve diagnostic decision support performance we have explored different models of diagnostic inference models. We have identified two models that can be used to model diagnostic knowledge and relations between concepts, and can also be executed with the help of sematic web technologies. The use of semantic web technologies and standards enable reuse of knowledge models and also assists in semantic interoperability. The key difference between the two models is the presence or absence of abstract knowledge relations.

Our study aims to compare and evaluate the diagnostic performance of these models. The diagnostic performance will be evaluated using clinical case scenarios. These clinical case scenarios or "Vignettes" will be validated with the help of a clinical expert. The expert will give his diagnostic opinion of the case and grade the acceptability and level of difficulty. The expert will also provide a ranked differential diagnosis. The expert is a collaborator in the study.

Once validated these scenarios (n=30) will be used to evaluate the diagnostic performance of both models. The scenarios will be created within the dentistry domain. The cases will also be presented to a group of dentists (n=20) who will provide their diagnostic opinion of the case, and also a ranked

differential diagnosis. The performance of these models will be compared to the performance of the clinicians.

Methods

This study is a controlled trial in which dentists are presented with 5 case vignettes. Vignettes are hypothetical cases that represent various levels of decision making and cover a variety of dental conditions normally managed in dental practices. The total duration taken to complete 5 vignettes, including instructions will not exceed 30 minutes.

This study is to be undertaken by practicing dentists who are either independent, part of a regional or national chain, or practicing in an educational intuition within India. The dentists will be recruited via email. 20 dentists will be recruited for the study. An email containing information about the trial and link to the trial web application will be send to dentists directly. A No-Objection letter providing consent for recruiting staff for the trial will be obtained from the regional head of any dental chains, if recruited.

Information indicating that the trial is completely voluntary and will be made explicit in the email and attached information sheet. The consent information and information about the data confidentiality will also be included in the email. Clicking on the link will take them to the consent form. The dentists can only start the trial once they provide consent. Dentists not interested in participating in the trial can ignore the email or not click on the email link. They are free to exit the trial web application any time. The data will be confidential and will be stored in a secure database and any other third party organisation, employers or colleagues of the dentist will not be provided access to the data.

The research will be undertaken online following a training session that will also be conducted online. Participating dentists will receive £10.00 (or equivalent in INR) gift voucher as compensation for participation in the trial.

The dentists will be provided with clinical history, signs, symptoms, diagnostic test results and radiographic reports of cases. The dentists will need to select the right diagnosis from the drop down menu, and also provide a second and third diagnosis for the patient as well. In addition the dentists will be asked to provide management recommendations as well. He/she will also have to grade the difficulty and degree of familiarity of the case. After all 5 cases are completed the dentist will be asked to provide his/her demographic information (Age & Gender), education qualifications and clinical experience information.

The time taken to arrive at the decision will also be recorded. After the experiment is completed, the decisions made by each dentist for each case will be compared to the results of the evaluation using the diagnostic inference models and the expert diagnosis opinion.

Attachments (these must be provided if applicable):	*Delete as appropriate*
Participant information sheet(s)	**Yes** / ~~No~~ / ~~Not applicable~~
Consent form(s)	**Yes** / ~~No~~ / ~~Not applicable~~

Questionnaire(s)	**Yes / ~~No~~ / ~~Not applicable~~**
Topic guide(s) for interviews and focus groups	**~~Yes~~ / ~~No~~ / Not applicable**
Permission from external organisations (e.g. for recruitment of participants)	**~~Yes~~ / ~~No~~ / Not applicable**

11 Appendix 11

This section outlines the different vignettes used in the Chapter 6 DS Model evaluation study. Each vignette contains the diagnosis provided by the Endodontist on the top section, followed by the content provided to the participating dentists. This includes a summary of the patient data, followed by the data in tabular format.

11.1 Vignette 1

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Normal Pulpal Tissues		
Pulpal Diagnosis- Rank 2	NULL		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient has come for routine cleaning of teeth. On examination caries has been found in relation to #36 (Lower Left First Molar) Pulp tests were Normal. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1989	
	Occupation	Bank employee	
Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	
	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	None	

	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"I want to do cleaning of my teeth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
Extra Oral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	

	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
Intra Oral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active moderate dentin caries outer one-third of dentin	
	Location of caries (in relation to)	Tooth Number : #36	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	

	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	No	
	Existing restoration type	N/A	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			

	Tooth tested	Tooth Number :#36	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits
Hot pulp test-(Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#36**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			

Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency limited to the outer one-third of dentin	
	Radiolucency location (in relation to)	**Tooth number: #36**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-1 - Vignette 1

11.2 Vignette 2

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Reversible Pulpitis		
Pulpal Diagnosis- Rank 2	Dentinal Hypersensitivity		

Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient complains of pain in relation to tooth in lower right jaw. Patient had pain for the past week or so. Pain is a sharp and intense pain that lasts for few seconds. Pain is initiated by drinking cold water or when eating ice-cream. Pain subsides when stimulus is removed. Patient has history of diabetes. On examination caries has been found in relation to #46 (Lower Right First Molar) Caries extends to inner dentine of the tooth. Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with moderate pain. Pain subsides on removal of stimulus. Tooth responds to mild electric stimulus. Radiographic examination showed radiolucency in crown of #46 , that extends to inner dentine. No radiographic changes observed periapically.		
Patient Information			
	Gender	Male	
	Birth Year	1975	
	Occupation	Journalist	
Medical History			
	General health status	No relevant history	
	Current medical history	Diabetes Mellitus Type II	
	Current medications	Metformin: 500 mg orally twice a day	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes Mellitus Type II	
	Hypertension	Yes, father has Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Pain in relation to right lower jaw when eating or drinking cold food / drink"		
	Pain Present	Yes	

	Location of pain	In relation to lower right area of jaw	
	Pain initiated by	Cold food and drink	
	Pain relieved by	Removal of stimulus	
	Quality of pain	Sharp and intense pain	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	4 (Moderate Pain)	
	When did you first notice symptoms?	When eating ice-cream	
	History of pain	Pain has been present intermittently for the past week	
	Locate tooth	Yes, patient can locate tooth	
	Onset of pain	Stimulation required for onset	
	Progression of pain	Pain present and pain character has not changed over time	
	Does the pain keep you awake at night?	No	
	Duration of pain	Pain lasts for seconds	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			

	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on lower lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries inner pulpal one-third of dentin	
	Location of caries (in relation to)	**Tooth Number : #46**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #27	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	

Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Moderate	Mild
	Positive cold pulp test response type	Pain subsides on removal of stimulus	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)

	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number :#46**	**Tooth Number :#47 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#46**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency reaching the inner one-third of dentin, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #46**	
	Radiopacities	Absent	

Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-2 - Vignette 2

11.3 Vignette 3

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Symptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient has complains of severe pain in relation to right upper jaw. Patient has had pain intermittently for the past few days. Pain is a dull and throbbing pain that lasts for several minutes and sometimes hours once started. Pain is spontaneous and initiates due to no apparent reason. Pain is more severe when drinking cold water, and not so much when eating or drinking hot food/drink. Pain subsides a little when NSAID medication is consumed, but pain returns shortly after. Patient also has trouble sleeping at night.		

	Pain radiates to right side of the head around the temple region, and patient has difficulty localizing pain. Patient has medical history of hypertension. On examination deep caries has been found in relation to #17 (Upper Right Second Molar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with severe pain. Pain lasts for minutes after stimulus is withdrawn. Tooth responds to hot stimulus with moderate pain that also last for few minutes Tooth responds to mild electric stimulus. Radiographic examination showed radiolucency in crown of #17 , that extends to the pulp. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1972	
	Occupation	Lecturer	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	None	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Severe Pain in relation to upper right jaw since the past couple of days"		
	Pain Present	Yes	
	Location of pain	In relation to upper right area of jaw	
	Pain initiated by	No apparent reason	
	Pain relieved by	NSAID medication	
	Quality of pain	Dull pain	
	Location of radiation of pain	Moderate, into temple region	
	Intensity of Pain (On a scale of 0-10)	8 (Severe Pain)	
	When did you first notice symptoms?	When eating food	
	History of pain	Pain has been present intermittently for the past few days	
	Locate tooth	No, patient cannot locate tooth causing pain	

	Onset of pain	Sudden onset or spontaneous pain	
	Progression of pain	Pain has increased since first noticed symptoms	
	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for minutes, sometimes hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	

	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	Tooth Number : #17	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #27	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	

	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Severe	Mild
	Positive cold pulp test response type	Lingering pain	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Moderate	Mild
	Positive hot pulp test response type	Lingering pain	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits

Bite test (using bite block)			
	Tooth tested	**Tooth Number :#17**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #17**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	

	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-3 - Vignette 3

11.4 Vignette 4

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Asymptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient has come for routine filling of decayed tooth. Patient does not complain of any pain at present. No previous history of pain. Patient has medical history of hypertension. On examination deep caries has been found in relation to #15 (Upper Right Second Premolar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds within normal limits to cold and hot pulp tests. Radiographic examination showed radiolucency in crown of #15 , that extends to the pulp. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1962	
	Occupation	Retired	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	

	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Routine filling of decayed tooth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	

	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Aphthous ulcer present on tongue	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #15**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	

	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #37	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	**Tooth Number :#15**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	Tooth tested	**Tooth Number :#15**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A

Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#15**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#15**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #15**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#15**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	

Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #15**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-4 - Vignette 4

11.5 Vignette 5

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			

Apical Diagnosis- Rank 1	Asymptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Chronic Apical Abscess		
Patient summary	Patient has come for routine cleaning of teeth. Patient does not complain of any pain at present. Patient had pain in relation to upper left jaw several months back. Previous pain was moderate-severe. It lasted for several days, and disappeared following a dose of antibiotics and painkillers. The previous pain initiated when eating or drinking hot food/drink, and decreased when cold was applied to face. Patient has medical history of Hypertension, Diabetes and Gastroesophageal reflux disease On examination deep caries has been found in relation to #25 (Upper Left Second Premolar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth did not respond to cold and hot pulp tests. The tooth did not respond to Electric pulp tests as well. Radiographic examination showed radiolucency in crown of #25 , that extends to the pulp. Slight widening of periodontal ligament space also seen in radiographs.		
Patient Information			
	Gender	Male	
	Birth Year	1967	
	Occupation	Business	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension, Diabetes and Gastroesophageal reflux disease	
	Current medications	Medication for Hypertension, Diabetes and Gastroesophageal reflux disease	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient has come for routine cleaning of teeth"		
	Pain Present	No	
	Location of pain	N/A	

	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	Previous history of pain present	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	

	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on lower lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	Primary active moderate dentin caries outer one-third of dentin
	Location of caries (in relation to)	**Tooth Number : #25**	**Tooth Number : #15**
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #46, #47	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			

	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#25**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#25**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#25**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#25**	**Tooth Number :#26 (Control Tooth for comparison of results)**

	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #25**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#25**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #25**	
	Radiopacities	Absent	

Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #25	

Table 11-5 - Vignette 5

11.6 Vignette 6

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pain of Nonodontogenic Origin		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Pain of Nonodontogenic Origin		
Apical Diagnosis- Rank 2	Normal Apical Tissues		
Patient summary	Patient complaints of pain in relation to upper right back tooth. Patient previously had pain in relation to another upper right back tooth. No evidence of decay or periodontal disease was seen in that tooth, and because of pain RCT was performed on the tooth. There was no relief in pain and the tooth was subsequently extracted. The pain still remains even after extraction of the tooth. The current pain is moderate-severe dull pain, and the patient describes it as a burning sensation. The pain is spontaneous and initiates during chewing/mastication at certain times.		

	Patient has a habit of teeth clenching, nail biting and also chews gum. Patient has no relevant medical history. Palpation of muscles revealed two trigger points, in the right anterior temporalis region and right masseter area, which triggered pain in the right premolar-molar area of the jaws. Slight tenderness was seen in right Temporomandibular joint during palpation of the joint. #16 was extracted previously. On examination caries has been found in relation to #15 (Upper Right Second Premolar). Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responded normally to cold and hot pulp tests. The tooth responded normally to Electric pulp tests as well. Local anesthetic infiltration has shown reduction in pain that was triggered during palpation of muscles. Radiographic examination showed radiolucency in crown of #15 , that extends to the outer 1/3 of dentine. No radiographic changes observed periapically		
Patient Information			
	Gender	Female	
	Birth Year	1990	
	Occupation	Student	
Medical History			
	General health status	No relevant history	
	Current medical history	No relevant history	
	Current medications	No relevant history	
	Allergies	Allergy to Penicillin	
Family History			
	Diabetes	None	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient has pain in relation to upper right back tooth"		
	Pain Present	Yes	
	Location of pain	Upper right back tooth	
	Pain initiated by	Pain triggered by chewing during certain times	
	Pain relieved by	No apparent reason.	
	Quality of pain	Dull aching pain, sometimes described as a burning sensation	
	Location of radiation of pain	Pain in right preauricular, temporalis and ocular regions (Does not cross midline)	
	Intensity of Pain (On a scale of 0-10)	7 (Moderate)	
	When did you first notice symptoms?	Symptoms present for long time	

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	History of pain	Previous history of pain present	
	Locate tooth	Patient unable to locate tooth causing problem	
	Onset of pain	Spontaneous or Sudden onset	
	Progression of pain	Pain character has not changed over time	
	Does the pain keep you awake at night?	No	
	Duration of pain	Minutes	
Dental history			
	History of clenching teeth?	Yes	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	Yes	
	Pain present during palpation of muscles?	Yes, Palpation of muscles revealed two trigger points, in the right anterior temporalis region and right masseter area, which triggered pain in the right premolar-molar area of the jaws.	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Pain present during palpation of right TMJ	

IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on lower lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	**Tooth Number : #16**	
	Caries present?	Present	
	Type of caries present	Primary active moderate dentin caries outer one-third of dentin	
	Location of caries (in relation to)	**Tooth Number : #15**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #46, #47	
	Existing restoration type	Composite restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	

	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	Tooth Number :#15	**Tooth Number :#14 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	Tooth Number :#15	**Tooth Number :#14 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#15	**Tooth Number :#14 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#15	**Tooth Number :#14 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits

Electric pulp test			
	Tooth tested	Tooth Number: #15	Tooth Number :#14 (Control Tooth for comparison of results)
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#15	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	Local anesthetic infiltration into pain trigger points in muscle has shown reduction in pain triggered during palpation of muscles	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency limited to the outer one-third of dentin	
	Radiolucency location (in relation to)	Tooth number: #15	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	

Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-6 - Vignette 6

11.7 Vignette 7

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Symptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Symptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Acute Apical Abscess		
Patient summary	Patient complains of severe pain in relation to right upper area of jaw. Patient has had pain intermittently for the past several days. Pain is a dull and throbbing pain that lasts for several minutes and sometimes hours once started. Pain is spontaneous and initiates due to no apparent reason. Pain is more severe when drinking cold water, and not so much when eating or drinking hot food/drink. Patient also has trouble sleeping at night because of the pain. Pain radiates to right side of the head around the temple region, and patient has difficulty localizing pain. Patient also complains of pain when chewing or mastication. Patient is able to locate tooth causing pain during mastication. Pain subsides a little when NSAID medication is consumed. Patient has medical history of hypertension. On examination deep caries has been found in relation to #17 (Upper Right Second Molar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with severe pain. Pain lasts for minutes after stimulus is withdrawn. Tooth responds to hot stimulus with moderate pain that also last for few minutes Tooth responds to mild electric stimulus. Patient also complains of moderate pain on palpation of tooth, and severe pain on percussion of suspect		

	tooth. Radiographic examination showed radiolucency in crown of #17 , that extends to the pulp. No periapical radiolucency seen in radiograph. Widening of periodontal ligament space seen.		
Patient Information			
	Gender	Male	
	Birth Year	1979	
	Occupation	Businessman	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	None	
	Cancer	Yes, father had cancer	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Severe Pain in relation to upper right jaw for past several days"		
	Pain Present	Yes	
	Location of pain	In relation to upper right area of jaw	
	Pain initiated by	Chewing or No apparent reason	
	Pain relieved by	NSAID medication, occasionally warm drink	
	Quality of pain	Dull throbbing pain	
	Location of radiation of pain	Moderate, into temple region	
	Intensity of Pain (On a scale of 0-10)	8 (Severe Pain)	
	When did you first notice symptoms?	When eating food	
	History of pain	Pain has been present intermittently for the past several days	
	Locate tooth	Patient is able to locate tooth causing pain when chewing	
	Onset of pain	Sudden onset or spontaneous pain	
	Progression of pain	Pain has increased since first noticed symptoms	

	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for minutes, sometimes hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	

	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #17**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #27	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	

Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Apical palpation response	Pain on apical palpation	Within Normal Limits
	Apical palpation response severity	Moderate pain	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Axial percussion response	Pain on percussion	Within Normal Limits
	Axial percussion response severity	Severe pain	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Severe	Mild
	Positive cold pulp test response type	Lingering pain	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Moderate	Mild
	Positive hot pulp test response type	Lingering pain	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number :#17**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#17**	

	Bite test result	Pain when bite test administered on any coronal surface of tooth	
	Positive bite test result response	Pain upon application of pressure	
	Positive bite test result severity	Severe	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #17**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	

	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #17	

Table 11-7 - Vignette 7

11.8 Vignette 8

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Asymptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Chronic Apical Abscess		
Patient summary	Patient has come for routine filling of decayed tooth. Patient does not complain of any pain at present. No previous history of pain. Patient has medical history of hypertension. On examination deep caries has been found in relation to #14 (Upper Right First Premolar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth does not respond to cold and hot pulp tests. The suspect tooth also did not respond to electric pulp tests as well. Radiographic examination showed radiolucency in crown of #14 , that extends to the pulp. Periapical radiolucency observed in radiographs. Widening of periodontal ligament space also seen.		
Patient Information			
	Gender	Male	
	Birth Year	1974	
	Occupation	Salesman	
Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	

	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Routine filling of decayed tooth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	

	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Aphthous ulcer present on tongue	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #14**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	

	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #37	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	**Tooth Number :#14**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	Tooth tested	**Tooth Number :#14**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A

Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#14	Tooth Number :#16 (Control Tooth for comparison of results)
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#14	Tooth Number :#16 (Control Tooth for comparison of results)
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	Tooth Number: #14	Tooth Number :#16 (Control Tooth for comparison of results)
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#14	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	

Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	Tooth number: #14	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	Tooth number: #14	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Present in relation to #14	

Table 11-8 - Vignette 8

11.9 Vignette 9

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Symptomatic Irreversible Pulpitis		

Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Acute Apical Abscess		
Apical Diagnosis- Rank 2	Symptomatic Apical Periodontitis		
Patient summary	Patient complains of severe pain in relation to upper left back area of jaw. Pain has been present for several days now. The pain is severe. The patient describes it as a dull-throbbing pain. Pain is also spontaneous and triggers due to no apparent reason. Pain is not greatly reduced with consumption of NSAID medication. Patient finds relief on application of ice pack to face. The pain in more acute when chewing or biting, and patient is able to locate the tooth causing the pain. Patient has medical history of Hypertension, Diabetes and Gastroesophageal reflux disease. Patient has been mild fever and malaise for the past few days as well. Extraoral examination reveals swelling on the left side of the face. Cervical and submandibular lymph nodes are swollen and tender on palpation. Intraoral examination also reveals fluctuant swelling in relation to the gums near #26, #27 region. On dental examination deep caries has been found in relation to #27 (Upper Left Second Molar). Grade 1 mobility was also observed in relation to #27. Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth did not respond to cold and hot pulp tests. The tooth did not respond to Electric pulp tests as well. Tooth experienced tenderness to palpation and percussion. Radiographic examination showed radiolucency in crown of #27 , that extends to the pulp. Periapical radiolucency seen in relation to #27 Widening of periodontal ligament space also seen in radiographs.		
Patient Information			
	Gender	Male	
	Birth Year	1967	
	Occupation	Business	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension, Diabetes and Gastroesophageal reflux disease	
	Current medications	Medication for Hypertension, Diabetes and Gastroesophageal reflux disease	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	

Patient Complaint			
Chief Complaint			
	"Patient has severe pain in relation to left upper back region of jaw"		
	Pain Present	Yes	
	Location of pain	Patient unable to localize pain however, patient able to locate source of pain when chewing	
	Pain initiated by	No apparent reason or When chewing food	
	Pain relieved by	Slight reduction in pain when consuming NSAID medication. Relief of pain on application of ice pack to left side of face.	
	Quality of pain	Dull Throbbing pain	
	Location of radiation of pain	Pain radiates to left side of face in preauricular region	
	Intensity of Pain (On a scale of 0-10)	8 (Severe pain)	
	When did you first notice symptoms?	When chewing food	
	History of pain	Pain present for the past few days	
	Locate tooth	Yes, patient can locate tooth when pain caused by chewing	
	Onset of pain	Spontaneous	
	Progression of pain	Pain has increased since onset	
	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	Yes	
	Lymph node swelling	Yes	
	Lymph node tenderness	Yes	
Extra Oral swelling exam			
	Extra Oral swelling present	Yes	

	Fluctuance of swelling	Fluctuant swelling	
	Location of Extra Oral swelling	Area of the left posterior cheek	
	Spread of Extra Oral swelling	Diffuse swelling	
	Type of Extra Oral swelling	Unilateral	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on lower lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #27**	
Intra Oral swelling examination			
	Intra Oral swelling present	Yes	
	Fluctuance of Intra Oral swelling	Fluctuant swelling	
	Location of Intra Oral swelling	In relation to the gums near #26, #27 region.	
	Spread of Intra Oral swelling	Diffuse swelling	
	Intra Oral Sinus	No	

Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #34, #17	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Present	
	Mobile tooth	**Tooth Number: #27**	
	Mobility grade	Grade 1 mobility	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#27	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Apical palpation response	Pain on apical palpation	Within Normal Limits
	Apical palpation response severity	Severe	N/A
Percussion test			
Axial percussion	Tooth tested	Tooth Number :#27	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Axial percussion response	Pain on axial percussion	Within Normal Limits
	Axial percussion response severity	Severe	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#27	**Tooth Number :#26 (Control Tooth for comparison of results)**

	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#27**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #27**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#27**	
	Bite test result	Pain when bite test administered on any coronal surface of tooth	
	Positive bite test result response	Pain upon application of pressure	
	Positive bite test result severity	Severe	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	

Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #27**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	**Tooth number: #27**	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #27	

Table 11-9 - Vignette 9

11.10   Vignette 10

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Chronic Apical Abscess		

Apical Diagnosis- Rank 2	Asymptomatic Apical Periodontitis		
Patient summary	Patient has come for routine fillings and cleaning of teeth. Pain does not have any pain at present. Patient has history of pain in relation to lower left back tooth several months back. After a brief period of pain the pain resolved itself. Patient has medical history of Hypertension. Intraoral examination also reveals fluctuant swelling in relation to the gums near #36, #37 region. Intraoral sinus also present near apex of #37, and exudes pus on palpation of swelling. On dental examination deep caries has been found in relation to #37 (Upper Left Second Molar). Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth did not respond to cold and hot pulp tests. The tooth did not respond to Electric pulp tests as well. On percussion the tooth felt different from the neighbouring teeth. No pain was reported on percussion or palpation of the tooth. Radiographic examination showed radiolucency in crown of #37 , that extends to the pulp. Periapical radiolucency seen in relation to #37 Widening of periodontal ligament space also seen in radiographs.		
Patient Information			
	Gender	Female	
	Birth Year	1967	
	Occupation	Business	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient has come for routine fillings and cleaning of teeth."		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	

	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	

	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #37**	
Intra Oral swelling examination			
	Intra Oral swelling present	Yes	
	Fluctuance of Intra Oral swelling	Fluctuant swelling	
	Location of Intra Oral swelling	In relation to gums near #36 and #37	
	Spread of Intra Oral swelling	Localized well defined swelling	
	Intra Oral Sinus	Yes, with pus exudate on palpation	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #11	
	Existing restoration type	Composite restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	

	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	N/A	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Axial percussion response	Tooth feels different on percussion	Within Normal Limits
	Axial percussion response severity	Mild	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild

			Tooth Number :#36 (Control Tooth for comparison of results)
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#37**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #37**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	

Lamina dura **Radiographic Examination**			
	Condition of Lamina dura	Normal	
Periodontal Tissue **Radiographic Examination**			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	**Tooth number: #37**	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #37	

Table 11-10 - Vignette 10

11.11 Vignette 11

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Symptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Acute Apical Abscess		
Patient summary	Patient complains of moderate-severe pain in relation to right lower back tooth. Patient had pain for past week or so. Patient complains of pain when chewing or mastication. Pain not present when chewing food on other side of jaw. Patient is able to locate tooth causing pain during mastication. Pain subsides a little when NSAID medication is consumed. Patient has medical history of hypertension.		

On examination deep caries has been found in relation to #47 (Lower Right Second Molar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth did not respond to cold and hot pulp tests. The tooth did not respond to Electric pulp tests as well. Patient also complains of moderate pain on palpation of tooth, and severe pain on percussion of suspect tooth. Bite tests also showed pain on application of bite pressure. Radiographic examination showed radiolucency in crown of #47 , that extends to the pulp. No periapical radiolucency seen in radiograph. Widening of periodontal ligament space seen.			
Patient Information			
	Gender	Female	
	Birth Year	1984	
	Occupation	Student	
Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	None	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Severe Pain in relation to upper right jaw for past several days"		
	Pain Present	Yes	
	Location of pain	Pain is consistent and circumscribed in relation to lower right tooth	
	Pain initiated by	Chewing or mastication	
	Pain relieved by	NSAID medication	
	Quality of pain	Dull throbbing pain	
	Location of radiation of pain	None	
	Intensity of Pain (On a scale of 0-10)	7 (Moderate)	
	When did you first notice symptoms?	When eating food	
	History of pain	Pain has been present intermittently for the past several days	

	Locate tooth	Patient is able to locate tooth causing pain when chewing	
	Onset of pain	Sudden onset	
	Progression of pain	Pain character has not changed over time	
	Does the pain keep you awake at night?	No	
	Duration of pain	Pain lasts for minutes	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	

	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #47**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #27	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	

	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#47**	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Apical palpation response	Pain on apical palpation	Within Normal Limits
	Apical palpation response severity	Moderate pain	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#47**	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Axial percussion response	Pain on percussion	Within Normal Limits
	Axial percussion response severity	Severe pain	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#47**	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#47**	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number :#47**	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits

Bite test (using bite block)			
	Tooth tested	**Tooth Number :#47**	
	Bite test result	Pain when bite test administered on any coronal surface of tooth	
	Positive bite test result response	Pain upon application of pressure	
	Positive bite test result severity	Severe	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #47**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	

	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #47	

Table 11-11 - Vignette 11

11.12   Vignette 12

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Chronic Apical Abscess		
Apical Diagnosis- Rank 2	Asymptomatic Apical Periodontitis		
Patient summary	Patient has come for routine fillings and cleaning of teeth. Complains of decay on upper front tooth. Pain does not have any pain at present. Patient has history of pain in relation to upper front tooth several months back. After a brief period of pain the pain resolved itself. Patient has medical history of Hypertension. Intraoral examination also reveals fluctuant swelling in relation to the gums near #11, #12 region. Intraoral sinus also present near apex of #11, and exudes pus on palpation of swelling. On dental examination deep caries has been found in relation to #11 (Upper Right Central Incisor). Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth did not respond to cold and hot pulp tests. The tooth did not respond to Electric pulp tests as well. On percussion the tooth felt different from the neighbouring teeth. No pain was reported on percussion or palpation of the tooth. Radiographic examination showed radiolucency in crown of #11 , that extends to the pulp. Periapical radiolucency seen in relation to #11 Widening of periodontal ligament space also seen in radiographs.		
Patient Information			

	Gender	Male	
	Birth Year	1982	
	Occupation	Business	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient has come for routine fillings and cleaning of teeth. Complains of decay in relation to upper front tooth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			

	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on lower lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	

Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	Tooth Number : #11	
Intra Oral swelling examination			
	Intra Oral swelling present	Yes	
	Fluctuance of Intra Oral swelling	Fluctuant swelling	
	Location of Intra Oral swelling	In relation to gums near #11 and #12	
	Spread of Intra Oral swelling	Localized well defined swelling	
	Intra Oral Sinus	Yes, with pus exudate on palpation of gums	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #23, #44	
	Existing restoration type	Composite restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	N/A	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#11	Tooth Number :#12 (Control Tooth for comparison of results)

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	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	Tooth tested	**Tooth Number :#11**	**Tooth Number :#12 (Control Tooth for comparison of results)**
	Axial percussion response	Tooth feels different on percussion	Within Normal Limits
	Axial percussion response severity	Mild	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#11**	**Tooth Number ::#12 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#11**	**Tooth Number ::#12 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #11**	**Tooth Number ::#12 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#11**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			

	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #11**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	**Tooth number: #11**	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #11	

Table 11-12 - Vignette 12

11.13　　Vignette 13

Pulpal Differential Diagnosis				
Pulpal Diagnosis- Rank 1	Dentinal Hypersensitivity			
Pulpal Diagnosis- Rank 2	Reversible Pulpitis			
Apical Differential Diagnosis				
Apical Diagnosis- Rank 1	Normal Apical Tissues			
Apical Diagnosis- Rank 2	NULL			
Patient summary	Patient complains of pain in relation to tooth in upper right back teeth. Patient has had pain for the past several weeks. Pain is a sharp and intense pain that lasts for few seconds. Pain is initiated by drinking cold water or when eating ice-cream. Pain subsides when stimulus is removed. Patient has history of diabetes. Enamel abrasion with exposed dentine was found on buccal surface of #14 On examination caries has been found in relation to #46 (Lower Right First Molar) Pulp tests were conducted on #14 and #46 #14 responded to cold stimuli with mild-moderate pain that disappears on removal of stimulus. #14 responded normally to hot stimuli. #46 responded normally to cold and hot stimuli. All teeth responded normally to electric pulp tests. Radiographic examination showed radiolucency in crown of #46 , that extends to the Enamel-Dentine Junction (EDJ) No radiographic changes observed periapically.			
Patient Information				
	Gender	Female		
	Birth Year	1975		
	Occupation	Journalist		
Medical History				
	General health status	No relevant history		
	Current medical history	Gastroesophageal reflux disease		
	Current medications	Medication for Gastroesophageal reflux disease		
	Allergies	None		
Family History				

	Diabetes	Yes, mother has Diabetes		
	Hypertension	Yes, father has Hypertension		
	Cancer	None		
	Infectious Disease	None		
Patient Complaint				
Chief Complaint				
	"Pain in relation to upper right tooth when eating or drinking cold food / drink"			
	Pain Present	Yes		
	Location of pain	In relation to upper right back teeth		
	Pain initiated by	Cold food and drink		
	Pain relieved by	Removal of stimulus		
	Quality of pain	Sharp and intense pain		
	Location of radiation of pain	N/A		
	Intensity of Pain (On a scale of 0-10)	4 (Moderate Pain)		
	When did you first notice symptoms?	When eating ice-cream		
	History of pain	Pain has been present intermittently for the past several weeks		
	Locate tooth	Yes, patient can locate tooth causing pain		
	Onset of pain	Stimulation required for onset		
	Progression of pain	Pain character has not changed over time		
	Does the pain keep you awake at night?	No		
	Duration of pain	Pain last for seconds		
Dental history				
	History of clenching teeth?	No		
	History of tooth trauma?	No		
	Do you wear Night guard?	No		
	Previous RCT?	Yes , Tooth number: #27		
	Recent restoration?	No		
ExtraOral Examination				
Lymph node exam				
	Lymph node firm	No		
	Lymph node swelling	No		
	Lymph node tenderness	No		

Extra Oral swelling exam				
	Extra Oral swelling present	No		
	Fluctuance of swelling	N/A		
	Location of Extra Oral swelling	N/A		
	Spread of Extra Oral swelling	N/A		
	Type of Extra Oral swelling	N/A		
	Extra Oral Sinus	No		
Extraoral tests				
	Pain present during functional evaluation of muscles?	No		
	Pain present during palpation of muscles?	No		
	Pain present during palpation over sinus?	No		
	TMJ Exam	Within Normal Limits		
IntraOral Examination				
Soft Tissue Examination				
	Oral cancer exam	Within Normal Limits		
	Hard palate exam	Within Normal Limits		
	Soft palate exam	Within Normal Limits		
	Floor of the mouth	Within Normal Limits		
	Lips	Aphthous ulcer present on upper lip		
	Pharynx and fauces	Within Normal Limits		
	Tongue	Within Normal Limits		
Hard tissue examination				
	Oral Hygiene	Fair		
	Missing teeth	None		
	Caries present?	Present		
	Type of caries present	Non-active initial deep enamel caries		
	Location of caries (in relation to)	**Tooth Number : #46**		
Intra Oral swelling examination				
	Intra Oral swelling present	No		
	Fluctuance of Intra Oral swelling	N/A		

	Location of Intra Oral swelling	N/A		
	Spread of Intra Oral swelling	N/A		
	Intra Oral Sinus	No		
Previous Restoration Examination				
	Existing restoration	No		
	Existing restoration type	N/A		
	Defective restoration	No		
	Defective restoration type	N/A		
Periodontal pockets examination				
	Periodontal pockets present	No		
	Periodontal pockets depth	N/A		
	Pseudo pockets present	No		
	Pseudo pockets depth	N/A		
	Furcation involvement?	Absent		
	Tooth with furcation	N/A		
	Degree of furcation involvement?	N/A		
	Tooth Mobility?	Absent		
	Mobile tooth	None		
	Mobility grade	N/A		
Clinical Tests				
Palpation test				
Apical palpation	**Tooth tested**	**Tooth Number :#14**	**Tooth Number :#15 (Control Tooth for comparison of results)**	**Tooth Number :#46**
	Apical palpation response	Within Normal Limits	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A	N/A
Percussion test				
Axial percussion	**Tooth tested**	**Tooth Number :#14**	**Tooth Number :#15 (Control Tooth for comparison of results)**	**Tooth Number :#46**
	Axial percussion response	Within Normal Limits	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A	N/A

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Cold pulp test- (Application of ice to tooth of interest)				
	Tooth tested	Tooth Number :#14	Tooth Number :#15 (Control Tooth for comparison of results)	Tooth Number :#46
	Nature of cold pulp test response	Positive response	Positive response	Positive response
	Positive cold pulp test severity	Moderate	Mild	Mild
	Positive cold pulp test response type	Pain subsides on removal of stimulus	Within Normal Limits	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)				
	Tooth tested	Tooth Number :#14	Tooth Number :#15 (Control Tooth for comparison of results)	Tooth Number :#46
	Nature of hot pulp test response	Positive response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits	Within Normal Limits
Electric pulp test				
	Tooth tested	Tooth Number :#14	Tooth Number :#15 (Control Tooth for comparison of results)	Tooth Number :#46
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits	Within Normal Limits
Bite test (using bite block)				
	Tooth tested	N/A		
	Bite test result	N/A		
	Positive bite test result response	N/A		
	Positive bite test result severity	N/A		
Transillumination test				
	Transillumination test result	N/A		
Test Cavity				
	Test Cavity result	N/A		
Local anesthetic test/Selective anesthesia				

	Local anesthetic test result	N/A		
Radiographic Examination				
Bone level radiographic examination				
	Bone loss	Absent		
	Bone level condition	Normal		
Tooth radiographic examination				
	Radiolucencies	Present		
	Radiolucencies type	Radiolucency in the inner half of the enamel plus EDJ		
	Radiolucency location (in relation to)	**Tooth number: #46**		
	Radiopacities	Absent		
Tooth Restoration radiographic examination				
	Defective margins in radiographs	N/A		
Lamina dura Radiographic Examination				
	Condition of Lamina dura	Normal		
Periodontal Tissue Radiographic Examination				
	Periapical radiopacities	Absent		
	Periapical radiopacities tooth	N/A		
	Periapical radiolucency	Absent		
	Periapical radiolucency tooth	N/A		
	Periradicular radiolucency	Absent		
	Tooth resorption	Absent		
	Widened periodontal ligament space	Absent		

Table 11-13 - Vignette 13

11.14   Vignette 14

Pulpal Differential Diagnosis		

Pulpal Diagnosis- Rank 1	Symptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient has complains of severe pain in relation to right upper front jaw. Patient has had pain intermittently for the past few days. Pain is a dull and throbbing pain that lasts for several minutes and sometimes hours once started. Pain is spontaneous and initiates due to no apparent reason. Pain is more severe when drinking cold water, and not so much when eating or drinking hot food/drink. Pain subsides a little when NSAID medication is consumed, but pain returns shortly after. Patient also has trouble sleeping at night. Pain radiates to right side of the face/cheek and in region below the eye, and patient has difficulty localizing pain. Patient has previous history of sinus infections. On examination deep caries has been found in relation to #13 (Upper Right Canine) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with severe pain. Pain lasts for minutes after stimulus is withdrawn. Tooth responds to hot stimulus with moderate pain that also last for few minutes Tooth responds to mild electric stimulus. Radiographic examination showed radiolucency in crown of #13 , that extends to the pulp. No radiographic changes observed periapically.		
Patient Information			
	Gender	Male	
	Birth Year	1980	
	Occupation	Bank Manager	
Medical History			
	General health status	No relevant history	
	Current medical history	Patient has history of sinus infections	
	Current medications	None	
	Allergies	None	
Family History			

	Diabetes	Yes, mother has Diabetes	
	Hypertension	None	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Severe Pain in relation to upper right jaw since the past couple of days"		
	Pain Present	Yes	
	Location of pain	In relation to upper right area of jaw	
	Pain initiated by	No apparent reason	
	Pain relieved by	NSAID medication, occasionally warm drink	
	Quality of pain	Dull throbbing pain	
	Location of radiation of pain	Moderate, into temple region	
	Intensity of Pain (On a scale of 0-10)	9 (Severe Pain)	
	When did you first notice symptoms?	When eating food	
	History of pain	Pain has been present intermittently for the past few days	
	Locate tooth	No, patient cannot locate tooth causing pain	
	Onset of pain	Sudden onset or spontaneous pain	
	Progression of pain	Pain has increased since first noticed symptoms	
	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for minutes, sometimes hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	

Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	Tooth Number : #13	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	

	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #17	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#13**	**Tooth Number :#14 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#13**	**Tooth Number :#14 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			

			Tooth Number :#14 (Control Tooth for comparison of results)
	Tooth tested	Tooth Number :#13	
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Severe	Mild
	Positive cold pulp test response type	Lingering pain	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#13	Tooth Number :#14 (Control Tooth for comparison of results)
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Moderate	Mild
	Positive hot pulp test response type	Lingering pain	Within Normal Limits
Electric pulp test			
	Tooth tested	Tooth Number :#13	Tooth Number :#14 (Control Tooth for comparison of results)
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#13	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	

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	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #13**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-14 - Vignette 14

11.15   Vignette 15

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Asymptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		

Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient has come for routine filling of decayed tooth. Patient does not complain of any pain at present. No previous history of pain. Patient has medical history of hypertension. On examination caries has been found in relation to #15 (Upper Right Second Premolar) alongside fractured amalgam restoration. Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds within normal limits to cold and hot pulp tests. Radiographic examination showed radiolucency in crown of #15 , that extends to the pulp. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1962	
	Occupation	Retired	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Routine filling of decayed tooth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	

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	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	

	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on lower lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Recurrent active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #15**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #15	
	Existing restoration type	Amalgam restoration	
	Defective restoration	Present	
	Defective restoration type	Fractured restoration	
Periodontal pockets examination			
	Periodontal pockets present	No	

	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#15	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	Tooth tested	Tooth Number :#15	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#15	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#15	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild

	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #15**	**Tooth Number :#16 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#15**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present, beneath restoration	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #15**	
	Radiopacities	Restoration	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	Present	

Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-15 - Vignette 15

11.16 Vignette 16

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Asymptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Chronic Apical Abscess		
Patient summary	Patient has come for restoration of fractured tooth. Patient does not complain of any pain at present. Patient had fallen forward and hit the front tooth several months back. There was moderate pain and tenderness on touching the tooth for several days. The pain lasted for several days, and disappeared following a dose of painkillers. Patient has medical history of Hypertension and Diabetes. On examination enamel-dentine fracture was seen on crown of #21 that does not extend to pulp. The tooth also shows bluish-grey discoloration. Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth did not respond to cold and hot pulp tests. The tooth did not respond to Electric pulp tests as well. Slight widening of periodontal ligament space also seen in radiographs in relation to #21		
Patient Information			

	Gender	Male	
	Birth Year	1967	
	Occupation	Business	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension and Diabetes	
	Current medications	Medication for Hypertension and Diabetes	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient has come for restoration of fractured tooth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	Previous history of pain present	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			

	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Aphthous ulcer present on upper lip	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	

Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Absent	
	Type of caries present	N/A	
	Location of caries (in relation to)	N/A	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #16, #37	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#21	Tooth Number :#22 (Control Tooth for comparison of results)

	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#21**	**Tooth Number :#22 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#21**	**Tooth Number :#22 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#21**	**Tooth Number :#22 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #21**	**Tooth Number :#22 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#21**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			

	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Absent	
	Radiolucencies type	N/A	
	Radiolucency location (in relation to)	N/A	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #21	

Table 11-16 - Vignette 16

11.17   Vignette 17

Pulpal Differential Diagnosis				
Pulpal Diagnosis- Rank 1	Pain of Nonodontogenic Origin			
Pulpal Diagnosis- Rank 2	Reversible Pulpitis			
Apical Differential Diagnosis				
Apical Diagnosis- Rank 1	Pain of Nonodontogenic Origin			
Apical Diagnosis- Rank 2	Normal Apical Tissues			
Patient summary	Patient complaints of pain in relation to upper right back jaw. Pain has been present for the past week or so. The pain is a moderate-severe dull aching pain that radiates to upper right face and sometimes the side of the head. Patient is also experiencing severe headaches as well. The pain is triggered when the patient is lying down or when tilting the head forward. The pain disappears on standing and/or walking around for few minutes. Patient has no relevant medical history. The area near the maxillary sinus is tender on palpation on extraoral examination. Patient also has enlarged lymph nodes. On examination caries has been found in relation to #15 (Upper Right Second Premolar). #15, #16 and #17 were tender on percussion. Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responded normally to cold and hot pulp tests. The tooth responded normally to Electric pulp tests as well. Local anesthetic block does not show reduction in pain. Radiographic examination showed radiolucency in crown of #15, that extends to the outer 1/3 of dentine. No radiographic changes observed periapically on #15, #16, #17			
Patient Information				
	Gender	Male		
	Birth Year	1975		
	Occupation	Construction Worker		
Medical History				
	General health status	No relevant history		
	Current medical history	No relevant history		
	Current medications	No relevant history		
	Allergies	None		

Family History				
	Diabetes	Yes, father had Diabetes		
	Hypertension	None		
	Cancer	None		
	Infectious Disease	None		
Patient Complaint				
Chief Complaint				
	"Patient has pain in relation to upper right back jaw"			
	Pain Present	Yes		
	Location of pain	Pain in relation to upper right back jaw. Patient is unable to localize pain		
	Pain initiated by	Pain triggered on lying down or when tilting the head forward		
	Pain relieved by	On standing up and walking around. Mild relief with painkillers		
	Quality of pain	Dull aching pain		
	Location of radiation of pain	Right face and sometimes the side of the head.		
	Intensity of Pain (On a scale of 0-10)	7 (Moderate)		
	When did you first notice symptoms?	On lying down to sleep		
	History of pain	Pain has been present for past week or so		
	Locate tooth	Patient unable to locate tooth causing problem		
	Onset of pain	Sometimes spontaneous, other times triggered by lying down		
	Progression of pain	Pain character has not changed over time		
	Does the pain keep you awake at night?	Yes		
	Duration of pain	Minutes, sometime hours		
Dental history				
	History of clenching teeth?	No		
	History of tooth trauma?	No		
	Do you wear Night guard?	No		
	Previous RCT?	No		
	Recent restoration?	No		
ExtraOral Examination				
Lymph node exam				
	Lymph node firm	No		
	Lymph node swelling	No		

	Lymph node tenderness	No		
Extra Oral swelling exam				
	Extra Oral swelling present	No		
	Fluctuance of swelling	N/A		
	Location of Extra Oral swelling	N/A		
	Spread of Extra Oral swelling	N/A		
	Type of Extra Oral swelling	N/A		
	Extra Oral Sinus	No		
Extraoral tests				
	Pain present during functional evaluation of muscles?	No		
	Pain present during palpation of muscles?	No		
	Pain present during palpation over sinus?	Yes, pain present on palpation of structures in front of maxillary sinus		
	TMJ Exam	Pain present during palpation of right TMJ		
IntraOral Examination				
Soft Tissue Examination				
	Oral cancer exam	Within Normal Limits		
	Hard palate exam	Within Normal Limits		
	Soft palate exam	Within Normal Limits		
	Floor of the mouth	Within Normal Limits		
	Lips	Within Normal Limits		
	Pharynx and fauces	Within Normal Limits		
	Tongue	Within Normal Limits		
Hard tissue examination				
	Oral Hygiene	Fair		
	Missing teeth	None		
	Caries present?	Present		
	Type of caries present	Primary active moderate dentin caries outer one-third of dentin		
	Location of caries (in relation to)	**Tooth Number : #15**		
Intra Oral swelling examination				

	Intra Oral swelling present	No		
	Fluctuance of Intra Oral swelling	N/A		
	Location of Intra Oral swelling	N/A		
	Spread of Intra Oral swelling	N/A		
	Intra Oral Sinus	No		
Previous Restoration Examination				
	Existing restoration	Yes, Tooth number: #26, #45		
	Existing restoration type	Composite restoration		
	Defective restoration	No		
	Defective restoration type	N/A		
Periodontal pockets examination				
	Periodontal pockets present	No		
	Periodontal pockets depth	N/A		
	Pseudo pockets present	No		
	Pseudo pockets depth	N/A		
	Furcation involvement?	Absent		
	Tooth with furcation	N/A		
	Degree of furcation involvement?	N/A		
	Tooth Mobility?	Absent		
	Mobile tooth	None		
	Mobility grade	N/A		
Clinical Tests				
Palpation test				
Apical palpation	Tooth tested	Tooth Number :#15	Tooth Number :#16	Tooth Number :#17
	Apical palpation response	Pain on palpation of apical mucosa	Pain on palpation of apical mucosa	Pain on palpation of apical mucosa
	Apical palpation response severity	Mild	Mild	Mild
Percussion test				
Axial percussion	Tooth tested	Tooth Number :#15	Tooth Number :#16	Tooth Number :#17
	Axial percussion response	Pain on percussion	Pain on percussion	Pain on percussion
	Axial percussion response severity	Moderate	Moderate	Moderate

Cold pulp test- **(Application of ice to tooth of interest)**				
	Tooth tested	Tooth Number :#15	**Tooth Number :#16**	**Tooth Number :#17**
	Nature of cold pulp test response	Positive response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits	Within Normal Limits
Hot pulp test- **(Application of heated Gutta Percha to tooth of interest)**				
	Tooth tested	Tooth Number :#15	**Tooth Number :#16**	**Tooth Number :#17**
	Nature of hot pulp test response	Positive response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits	Within Normal Limits
Electric pulp test				
	Tooth tested	Tooth Number: #15	**Tooth Number :#16**	**Tooth Number :#17**
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits	Within Normal Limits
Bite test (using bite block)				
	Tooth tested	Tooth Number :#15		
	Bite test result	Within Normal Limits		
	Positive bite test result response	N/A		
	Positive bite test result severity	N/A		
Transillumination test				
	Transillumination test result	N/A		
Test Cavity				
	Test Cavity result	N/A		
Local anesthetic test/Selective anesthesia				
	Local anesthetic test result	Middle superior alveolar nerve block and posterior superior alveolar nerve block of the upper right quadrant does not reduce the pain		

Radiographic Examination				
Bone level radiographic examination				
	Bone loss	Absent		
	Bone level condition	Normal		
Tooth radiographic examination				
	Radiolucencies	Present		
	Radiolucencies type	Radiolucency limited to the outer one-third of dentin		
	Radiolucency location (in relation to)	**Tooth number: #15**		
	Radiopacities	Absent		
Tooth Restoration radiographic examination				
	Defective margins in radiographs	N/A		
Lamina dura Radiographic Examination				
	Condition of Lamina dura	Normal		
Periodontal Tissue Radiographic Examination				
	Periapical radiopacities	Absent		
	Periapical radiopacities tooth	N/A		
	Periapical radiolucency	Absent		
	Periapical radiolucency tooth	N/A		
	Periradicular radiolucency	Absent		
	Tooth resorption	Absent		
	Widened periodontal ligament space	Absent		

Table 11-17 - Vignette 17

11.18 Vignette 18

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Symptomatic Irreversible Pulpitis		

Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Symptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Acute Apical Abscess		
Patient summary	Patient complains of severe pain in relation to lower right area of jaw. Patient had pain intermittently for the past several days. Pain is a dull and throbbing pain that lasts for several minutes and sometimes hours once started. Pain is spontaneous and initiates due to no apparent reason. Pain is more severe when drinking cold water, and not so much when eating or drinking hot food/drink. Patient also has trouble sleeping at night because of the pain. Pain radiates to the area near the right ear, and patient has difficulty localizing pain. Patient also complains of pain when chewing or mastication. Patient is able to locate tooth causing pain during mastication. Pain subsides a little when NSAID medication is consumed. Patient has medical history of diabetes. On examination deep caries has been found in relation to #47 (Lower Right Second Molar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with severe pain. Pain lasts for minutes after stimulus is withdrawn. Tooth responds to hot stimulus with moderate pain that also last for few minutes Tooth responds to mild electric stimulus. Patient also complains of moderate pain on palpation of tooth, and severe pain on percussion of suspect tooth. Radiographic examination showed radiolucency in crown of #47, that extends to the pulp. No periapical radiolucency seen in radiograph. Widening of periodontal ligament space seen.		
Patient Information			
	Gender	Male	
	Birth Year	1979	
	Occupation	Businessman	
Medical History			
	General health status	No relevant history	
	Current medical history	Diabetes	
	Current medications	Medication for Diabetes	
	Allergies	None	
Family History			

	Diabetes	Yes, mother has Diabetes	
	Hypertension	None	
	Cancer	Yes, father had cancer	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Severe Pain in relation to upper right jaw for past several days"		
	Pain Present	Yes	
	Location of pain	In relation to lower right area of jaw	
	Pain initiated by	Chewing or No apparent reason or cold food or drink	
	Pain relieved by	NSAID medication	
	Quality of pain	Dull throbbing pain	
	Location of radiation of pain	Moderate, into right preauricular region	
	Intensity of Pain (On a scale of 0-10)	8 (Severe Pain)	
	When did you first notice symptoms?	When eating food	
	History of pain	Pain has been present intermittently for the past several days	
	Locate tooth	Patient is able to locate tooth causing pain when chewing	
	Onset of pain	Sudden onset or spontaneous pain	
	Progression of pain	Pain has increased since first noticed symptoms	
	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for minutes, sometimes hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	

Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #47**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	

	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #27	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	Tooth Number :#47	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Apical palpation response	Pain on apical palpation	Within Normal Limits
	Apical palpation response severity	Moderate pain	N/A
Percussion test			
Axial percussion	**Tooth tested**	Tooth Number :#47	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Axial percussion response	Pain on percussion	Within Normal Limits
	Axial percussion response severity	Severe pain	N/A
Cold pulp test- (Application of ice to tooth of interest)			

			Tooth Number :#46 (Control Tooth for comparison of results)
	Tooth tested	Tooth Number :#47	
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Severe	Mild
	Positive cold pulp test response type	Lingering pain	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#47	Tooth Number :#46 (Control Tooth for comparison of results)
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Moderate	Mild
	Positive hot pulp test response type	Lingering pain	Within Normal Limits
Electric pulp test			
	Tooth tested	Tooth Number :#47	Tooth Number :#46 (Control Tooth for comparison of results)
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#47	
	Bite test result	Pain when bite test administered on any coronal surface of tooth	
	Positive bite test result response	Pain upon application of pressure	
	Positive bite test result severity	Severe	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			

	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #47**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #47	

Table 11-18 - Vignette 18

11.19   Vignette 19

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			

Apical Diagnosis- Rank 1	Asymptomatic Apical Periodontitis		
Apical Diagnosis- Rank 2	Chronic Apical Abscess		
Patient summary	Patient has come for routine dental checkups. Patient does not complain of any pain at present. No previous history of pain. Patient has medical history of hypertension. On examination deep caries has been found in relation to #23 (Upper Left Canine) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth does not respond to cold and hot pulp tests. The suspect tooth also did not respond to electric pulp tests as well. The suspect tooth also feels slightly different on percussion, although it was not sensitive on percussion. Radiographic examination showed radiolucency in crown of #23 , that extends to the pulp. Periapical radiolucency observed in radiographs. Widening of periodontal ligament space also seen.		
Patient Information			
	Gender	Female	
	Birth Year	1974	
	Occupation	Teacher	
Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	
	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Routine dental checkups"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	

	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	

	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #23**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #37, #38	
	Existing restoration type	Amalgam restoration, GIC restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	

	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#23**	**Tooth Number :#24 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#23**	**Tooth Number :#24 (Control Tooth for comparison of results)**
	Axial percussion response	Tooth feels different to percussion	Within Normal Limits
	Axial percussion response severity	Mild	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#23**	**Tooth Number :#24 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#23**	**Tooth Number :#24 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild

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	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number:#23**	**Tooth Number :#24 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#23**	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #23**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	

Lamina dura **Radiographic Examination**			
	Condition of Lamina dura	Normal	
Periodontal Tissue **Radiographic Examination**			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	**Tooth number: #23**	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #23	

Table 11-19 - Vignette 19

11.20 Vignette 20

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Symptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Acute Apical Abscess		
Apical Diagnosis- Rank 2	Symptomatic Apical Periodontitis		
Patient summary	Patient complains of severe pain in relation to lower left back area of jaw. Pain has been present for several days now. The pain is severe. The patient describes it as a dull-throbbing pain. Pain is also spontaneous and triggers due to no apparent reason. Pain is not greatly reduced with consumption of NSAID medication. Patient finds relief on application of ice pack to face. The pain in more acute when chewing or biting, and patient is able to locate the tooth causing the pain.		

Patient has medical history of Hypertension, Diabetes and Gastroesophageal reflux disease.
Patient has been mild fever and malaise for the past few days as well.
Extraoral examination reveals swelling on the left side of the face.
Cervical and submandibular lymph nodes are swollen and tender on palpation.
Intraoral examination also reveals fluctuant swelling in relation to the gums near #36, #37 region.
On dental examination deep caries has been found in relation to #37 (Upper Left Second Molar).
Grade 1 mobility was also observed in relation to #37.
Pulp tests were conducted on the suspect tooth and neighbouring teeth.
The tooth did not respond to cold and hot pulp tests.
The tooth did not respond to Electric pulp tests as well.
Tooth experienced tenderness to palpation and percussion.
Radiographic examination showed radiolucency in crown of #37 , that extends to the pulp.
Periapical radiolucency seen in relation to #37
Widening of periodontal ligament space also seen in radiographs.

Patient Information			
	Gender	Male	
	Birth Year	1967	
	Occupation	Business	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension, Diabetes and Gastroesophageal reflux disease	
	Current medications	Medication for Hypertension, Diabetes and Gastroesophageal reflux disease	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient has severe pain in relation to lower left back region of jaw"		
	Pain Present	Yes	
	Location of pain	Patient unable to localize pain however, patient able to locate source of pain when chewing	
	Pain initiated by	No apparent reason or When chewing food	
	Pain relieved by	Slight reduction in pain when consuming NSAID medication.	

		Relief of pain on application of ice pack to left side of face.	
	Quality of pain	Dull Throbbing pain	
	Location of radiation of pain	Pain radiates to left side of face in preauricular region	
	Intensity of Pain (On a scale of 0-10)	8 (Severe pain)	
	When did you first notice symptoms?	When chewing food	
	History of pain	Pain present for the past few days	
	Locate tooth	Yes, patient can locate tooth when pain caused by chewing	
	Onset of pain	Spontaneous	
	Progression of pain	Pain has increased since onset	
	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	Yes	
	Lymph node swelling	Yes	
	Lymph node tenderness	Yes	
Extra Oral swelling exam			
	Extra Oral swelling present	Yes	
	Fluctuance of swelling	Fluctuant swelling	
	Location of Extra Oral swelling	Area of the left posterior cheek	
	Spread of Extra Oral swelling	Diffuse swelling	
	Type of Extra Oral swelling	Unilateral	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	

	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #37**	
Intra Oral swelling examination			
	Intra Oral swelling present	Yes	
	Fluctuance of Intra Oral swelling	Fluctuant swelling	
	Location of Intra Oral swelling	In relation to the gums near #36, #37 region.	
	Spread of Intra Oral swelling	Diffuse swelling	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #26, #44	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	

	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Present	
	Mobile tooth	**Tooth Number: #37**	
	Mobility grade	Grade 1 mobility	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Apical palpation response	Pain on apical palpation	Pain on apical palpation
	Apical palpation response severity	Severe	Mild
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Axial percussion response	Pain on axial percussion	Within Normal Limits
	Axial percussion response severity	Severe	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response

	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			
	Tooth tested	**Tooth Number: #37**	**Tooth Number :#36 (Control Tooth for comparison of results)**
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	**Tooth Number :#37**	
	Bite test result	Pain when bite test administered on any coronal surface of tooth	
	Positive bite test result response	Pain upon application of pressure	
	Positive bite test result severity	Severe	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #37**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			

	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	**Tooth number: #37**	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #37	

Table 11-20 - Vignette 20

11.21 Vignette 21

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Pulp Necrosis		
Pulpal Diagnosis- Rank 2	Asymptomatic Irreversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Chronic Apical Abscess		
Apical Diagnosis- Rank 2	Asymptomatic Apical Periodontitis		
Patient summary	Patient complains of decayed tooth in lower right part of the jaw. Pain does not have any pain at present. Patient has history of pain in relation to lower right back tooth several months back. After a brief period of pain the pain resolved itself. Patient has medical history of Hypertension. Intraoral examination also reveals fluctuant swelling in relation to the gums near #46, #47 region. Intraoral sinus also present near apex of #47, and exudes pus on palpation of swelling.		

On dental examination deep caries has been found in relation to #47 (Lower Right Second Molar).
Pulp tests were conducted on the suspect tooth and neighbouring teeth.
The tooth did not respond to cold and hot pulp tests.
The tooth did not respond to Electric pulp tests as well.
On percussion the tooth felt different from the neighbouring teeth. No pain was reported on percussion or palpation of the tooth.
Radiographic examination showed radiolucency in crown of #47 , that extends to the pulp.
Periapical radiolucency seen in relation to #47
Widening of periodontal ligament space also seen in radiographs.

Patient Information			
	Gender	Male	
	Birth Year	1987	
	Occupation	Businessman	
Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Patient complains of decayed tooth in lower right part of jaw"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	

	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			

Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	Tooth Number : #47	
Intra Oral swelling examination			
	Intra Oral swelling present	Yes	
	Fluctuance of Intra Oral swelling	Fluctuant swelling	
	Location of Intra Oral swelling	In relation to gums near #46 and #47	
	Spread of Intra Oral swelling	Localized well defined swelling	
	Intra Oral Sinus	Yes, with pus exudate on palpation	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #26, #27	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	

	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	N/A	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#47	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	Tooth tested	Tooth Number :#47	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Axial percussion response	Tooth feels different on percussion	Within Normal Limits
	Axial percussion response severity	Mild	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#47	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	No response	Positive response
	Positive cold pulp test severity	N/A	Mild
	Positive cold pulp test response type	N/A	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#47	**Tooth Number :#46 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	No response	Positive response
	Positive hot pulp test severity	N/A	Mild
	Positive hot pulp test response type	N/A	Within Normal Limits
Electric pulp test			

	Tooth tested	Tooth Number: #47	Tooth Number :#46 (Control Tooth for comparison of results)
	Nature of electric pulp test response	No response	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#47	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	Tooth number: #47	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	

Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Present	
	Periapical radiolucency tooth	**Tooth number: #47**	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Widening of periodontal ligament space seen in relation to #47	

Table 11-21 - Vignette 21

11.22   Vignette 22

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Asymptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Reversible Pulpitis		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient has come for routine filling of decayed tooth and cleaning. Patient does not complain of any pain at present. No previous history of pain. Patient has medical history of hypertension. On examination deep caries has been found in relation to #25 (Upper Left Second Premolar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds within normal limits to cold and hot pulp tests. Radiographic examination showed radiolucency in crown of #25 , that extends to the pulp. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1962	
	Occupation	Retired	

Medical History			
	General health status	No relevant history	
	Current medical history	Hypertension	
	Current medications	Medication for Hypertension	
	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	Yes, father had Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Routine filling of decayed tooth and cleaning"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	

	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	

	Type of caries present	Primary active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #25**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #37	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	**Tooth Number :#25**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			

Axial percussion	Tooth tested	Tooth Number :#25	Tooth Number :#26 (Control Tooth for comparison of results)
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#25	Tooth Number :#26 (Control Tooth for comparison of results)
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#25	Tooth Number :#26 (Control Tooth for comparison of results)
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			
	Tooth tested	Tooth Number: #25	Tooth Number :#26 (Control Tooth for comparison of results)
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#25	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	

Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #25**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-22 - Vignette 22

11.23   Vignette 23

Pulpal Differential Diagnosis		

Pulpal Diagnosis- Rank 1	Symptomatic Irreversible Pulpitis		
Pulpal Diagnosis- Rank 2	Pain of Nonodontogenic Origin		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient complains of severe pain in relation to upper left jaw. Patient has had pain intermittently for the past few days. Pain is a dull and throbbing pain that lasts for several minutes and sometimes hours once started. Pain is spontaneous and initiates due to no apparent reason. Pain is more severe when drinking cold water, and not so much when eating or drinking hot food/drink. Pain subsides a little when NSAID medication is consumed, but pain returns shortly after. Patient also has trouble sleeping at night. Pain radiates to left side of the head around the temple region, and patient has difficulty localizing pain. Patient has medical history of hypertension. On examination deep caries has been found in relation to #27 (Upper Left Second Molar) Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with severe pain. Pain lasts for minutes after stimulus is withdrawn. Tooth responds to hot stimulus with moderate pain that also last for few minutes Tooth responds to mild electric stimulus. Radiographic examination showed radiolucency in crown of #27 , that extends to the pulp. No radiographic changes observed periapically.		
Patient Information			
	Gender	Male	
	Birth Year	1985	
	Occupation	Researcher	
Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	
	Allergies	None	
Family History			
	Diabetes	Yes, mother has Diabetes	

	Hypertension	None	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Severe Pain in relation to upper left jaw since the past couple of days"		
	Pain Present	Yes	
	Location of pain	In relation to upper left area of jaw	
	Pain initiated by	No apparent reason	
	Pain relieved by	NSAID medication	
	Quality of pain	Dull pain	
	Location of radiation of pain	Moderate, into temple region	
	Intensity of Pain (On a scale of 0-10)	9 (Severe Pain)	
	When did you first notice symptoms?	When eating food	
	History of pain	Pain has been present intermittently for the past few days	
	Locate tooth	No, patient cannot locate tooth causing pain	
	Onset of pain	Sudden onset or spontaneous pain	
	Progression of pain	Pain has increased since first noticed symptoms	
	Does the pain keep you awake at night?	Yes	
	Duration of pain	Pain lasts for minutes, sometimes hours	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			

	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary non-active extensive dentin caries to the pulp	
	Location of caries (in relation to)	**Tooth Number : #27**	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	

	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #37	
	Existing restoration type	Amalgam restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#27**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#27**	**Tooth Number :#26 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			

			Tooth Number :#26 (Control Tooth for comparison of results)
	Tooth tested	Tooth Number :#27	
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Severe	Mild
	Positive cold pulp test response type	Lingering pain	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#27	Tooth Number :#26 (Control Tooth for comparison of results)
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Moderate	Mild
	Positive hot pulp test response type	Lingering pain	Within Normal Limits
Electric pulp test			
	Tooth tested	Tooth Number :#27	Tooth Number :#26 (Control Tooth for comparison of results)
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#27	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	

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	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency into the pulp, clinically cavitated	
	Radiolucency location (in relation to)	**Tooth number: #27**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-23 - Vignette 23

11.24   Vignette 24

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Reversible Pulpitis		
Pulpal Diagnosis- Rank 2	Dentinal Hypersensitivity		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		

Apical Diagnosis- Rank 2	NULL		
Patient summary	Patient complains of pain in relation to tooth in lower left jaw. Patient had pain for the past week. Pain is a sharp and intense pain that lasts for few seconds. Pain is initiated by drinking cold water. Pain subsides when stimulus is removed. Patient has history of diabetes. On examination caries has been found in relation to #36 (Lower Left First Molar) Caries extents to inner dentine of the tooth. Pulp tests were conducted on the suspect tooth and neighbouring teeth. The tooth responds to cold stimulus with moderate pain. Pain subsides on removal of stimulus. Tooth responds to mild electric stimulus. Radiographic examination showed radiolucency in crown of #36 , that extends to inner dentine. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1981	
	Occupation	Doctor	
Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	
	Allergies	None	
Family History			
	Diabetes	Yes, father has Diabetes	
	Hypertension	Yes, father has Hypertension	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"Pain in relation to lower left jaw when eating or drinking cold food / drink"		
	Pain Present	Yes	
	Location of pain	In relation to lower left area of jaw	
	Pain initiated by	Cold food and drink	
	Pain relieved by	Removal of stimulus	
	Quality of pain	Sharp and intense pain	
	Location of radiation of pain	N/A	

	Intensity of Pain (On a scale of 0-10)	5 (Moderate Pain)	
	When did you first notice symptoms?	When drinking cold water	
	History of pain	Pain has been present intermittently for the past week	
	Locate tooth	Yes, patient can locate tooth causing problem	
	Onset of pain	Stimulation required for onset	
	Progression of pain	Pain present and pain character has not changed over time	
	Does the pain keep you awake at night?	No	
	Duration of pain	Pain last for seconds	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	
	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	

IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	
	Caries present?	Present	
	Type of caries present	Primary active extensive dentin caries inner pulpal one-third of dentin	
	Location of caries (in relation to)	Tooth Number : #36	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	Yes, Tooth number: #27	
	Existing restoration type	Composite restoration	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	

	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	**Tooth tested**	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A
Percussion test			
Axial percussion	**Tooth tested**	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Moderate	Mild
	Positive cold pulp test response type	Pain subsides on removal of stimulus	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	**Tooth Number :#36**	**Tooth Number :#37 (Control Tooth for comparison of results)**
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			

		Tooth Number :#36	Tooth Number :#37 (Control Tooth for comparison of results)
	Tooth tested		
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#36	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			
	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency reaching the inner one-third of dentin, clinically cavitated	
	Radiolucency location (in relation to)	Tooth number: #36	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	

Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-24 - Vignette 24

11.25   Vignette 25

Pulpal Differential Diagnosis			
Pulpal Diagnosis- Rank 1	Normal Pulpal Tissues		
Pulpal Diagnosis- Rank 2	NULL		
Apical Differential Diagnosis			
Apical Diagnosis- Rank 1	Normal Apical Tissues		
Apical Diagnosis- Rank 2	NULL		
Patient summary			
	Patient has come for routine cleaning of teeth. On examination caries has been found in relation to #46 (Lower Right First Molar) Pulp tests were Normal. No radiographic changes observed periapically.		
Patient Information			
	Gender	Female	
	Birth Year	1989	
	Occupation	Bank employee	

Medical History			
	General health status	No relevant history	
	Current medical history	None	
	Current medications	None	
	Allergies	None	
Family History			
	Diabetes	None	
	Hypertension	None	
	Cancer	None	
	Infectious Disease	None	
Patient Complaint			
Chief Complaint			
	"I want to do cleaning of my teeth"		
	Pain Present	No	
	Location of pain	N/A	
	Pain initiated by	N/A	
	Pain relieved by	N/A	
	Quality of pain	N/A	
	Location of radiation of pain	N/A	
	Intensity of Pain (On a scale of 0-10)	0	
	When did you first notice symptoms?	N/A	
	History of pain	N/A	
	Locate tooth	N/A	
	Onset of pain	N/A	
	Progression of pain	N/A	
	Does the pain keep you awake at night?	N/A	
	Duration of pain	N/A	
Dental history			
	History of clenching teeth?	No	
	History of tooth trauma?	No	
	Do you wear Night guard?	No	

	Previous RCT?	No	
	Recent restoration?	No	
ExtraOral Examination			
Lymph node exam			
	Lymph node firm	No	
	Lymph node swelling	No	
	Lymph node tenderness	No	
Extra Oral swelling exam			
	Extra Oral swelling present	No	
	Fluctuance of swelling	N/A	
	Location of Extra Oral swelling	N/A	
	Spread of Extra Oral swelling	N/A	
	Type of Extra Oral swelling	N/A	
	Extra Oral Sinus	No	
Extraoral tests			
	Pain present during functional evaluation of muscles?	No	
	Pain present during palpation of muscles?	No	
	Pain present during palpation over sinus?	No	
	TMJ Exam	Within Normal Limits	
IntraOral Examination			
Soft Tissue Examination			
	Oral cancer exam	Within Normal Limits	
	Hard palate exam	Within Normal Limits	
	Soft palate exam	Within Normal Limits	
	Floor of the mouth	Within Normal Limits	
	Lips	Within Normal Limits	
	Pharynx and fauces	Within Normal Limits	
	Tongue	Within Normal Limits	
Hard tissue examination			
	Oral Hygiene	Fair	
	Missing teeth	None	

	Caries present?	Present	
	Type of caries present	Primary active moderate dentin caries outer one-third of dentin	
	Location of caries (in relation to)	Tooth Number : #46	
Intra Oral swelling examination			
	Intra Oral swelling present	No	
	Fluctuance of Intra Oral swelling	N/A	
	Location of Intra Oral swelling	N/A	
	Spread of Intra Oral swelling	N/A	
	Intra Oral Sinus	No	
Previous Restoration Examination			
	Existing restoration	No	
	Existing restoration type	N/A	
	Defective restoration	No	
	Defective restoration type	N/A	
Periodontal pockets examination			
	Periodontal pockets present	No	
	Periodontal pockets depth	N/A	
	Pseudo pockets present	No	
	Pseudo pockets depth	N/A	
	Furcation involvement?	Absent	
	Tooth with furcation	N/A	
	Degree of furcation involvement?	N/A	
	Tooth Mobility?	Absent	
	Mobile tooth	None	
	Mobility grade	N/A	
Clinical Tests			
Palpation test			
Apical palpation	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Apical palpation response	Within Normal Limits	Within Normal Limits
	Apical palpation response severity	N/A	N/A

Percussion test			
Axial percussion	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Axial percussion response	Within Normal Limits	Within Normal Limits
	Axial percussion response severity	N/A	N/A
Cold pulp test- (Application of ice to tooth of interest)			
	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Nature of cold pulp test response	Positive response	Positive response
	Positive cold pulp test severity	Mild	Mild
	Positive cold pulp test response type	Within Normal Limits	Within Normal Limits
Hot pulp test- (Application of heated Gutta Percha to tooth of interest)			
	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Nature of hot pulp test response	Positive response	Positive response
	Positive hot pulp test severity	Mild	Mild
	Positive hot pulp test response type	Within Normal Limits	Within Normal Limits
Electric pulp test			
	Tooth tested	Tooth Number :#46	Tooth Number :#47 (Control Tooth for comparison of results)
	Nature of electric pulp test response	Within Normal Limits	Within Normal Limits
Bite test (using bite block)			
	Tooth tested	Tooth Number :#46	
	Bite test result	Within Normal Limits	
	Positive bite test result response	N/A	
	Positive bite test result severity	N/A	
Transillumination test			
	Transillumination test result	N/A	
Test Cavity			

	Test Cavity result	N/A	
Local anesthetic test/Selective anesthesia			
	Local anesthetic test result	N/A	
Radiographic Examination			
Bone level radiographic examination			
	Bone loss	Absent	
	Bone level condition	Normal	
Tooth radiographic examination			
	Radiolucencies	Present	
	Radiolucencies type	Radiolucency limited to the outer one-third of dentin	
	Radiolucency location (in relation to)	**Tooth number: #46**	
	Radiopacities	Absent	
Tooth Restoration radiographic examination			
	Defective margins in radiographs	N/A	
Lamina dura Radiographic Examination			
	Condition of Lamina dura	Normal	
Periodontal Tissue Radiographic Examination			
	Periapical radiopacities	Absent	
	Periapical radiopacities tooth	N/A	
	Periapical radiolucency	Absent	
	Periapical radiolucency tooth	N/A	
	Periradicular radiolucency	Absent	
	Tooth resorption	Absent	
	Widened periodontal ligament space	Absent	

Table 11-25 - Vignette 25

12 Appendix 12

A test for normality is done to test if a random sample comes from a normal distribution. Some statistical tests such as Student's t-test require the data to be normally distributed. Shapiro-Wilk is one such test for normality.

The Shapiro-Wilk test will give a W value.

H_0 : The sample was drawn from a normally distributed population.

If the null hypothesis is true, W =1. Small numbers for W means the sample is not normally distributed. Results are significant when the p-value is less than 0.05.

The formula for the W value is:

$$W = \frac{\left(\sum_{i=1}^{n} a_i x_{(i)}\right)^2}{\sum_{i=1}^{n}(x_i - \overline{x})^2}$$

Equation 1 - Shapiro Wilk test

where:

- x_i are the data arranged in ascending order.

This section contains the results of the Shapiro-Wilk test for normality conducted on the NDCG data (section 12.1) and the Precision-Recall data (section 12.2). The test was performed in R using the R function shapiro.test(). (See Appendix – section 14.2 and Appendix 15 - sections 15.2.2 – 15.2.5)

12.1 Shapiro–Wilk tests for Normality for NCDG data

Shapiro-Wilk tests were conducted on the NDCG data collected from the CDSS in each section of the information model. The test was conducted separately for the Pulpal diagnosis and the Apical diagnosis.

12.1.1   Shapiro-Wilk test for normality- CC

The results of the Shapiro-Wilks test for the CC section is shown below (Table 12-1)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC-Pulpal	W = 0.8924, p-value = 0.01257	✓
CC-Apical	W = 0.832, p-value = 0.0008183	✓

Table 12-1 - Shapiro-Wilk test for normality - CC

The results show that the data from the CC section of the information model does not have a normal distribution.

12.1.2   Shapiro-Wilk test for normality- CC+EO

The results of the Shapiro-Wilks test for the CC+EO section is shown below (Table 12-2)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO-Pulpal	W = 0.7929, p-value = 0.0001732	✓
CC+EO-Apical	W = 0.8402, p-value = 0.001155	✓

Table 12-2 - Shapiro-Wilk test for normality - CC+EO

The results show that the data from the CC+EO section of the information model does not have a normal distribution.

12.1.3   Shapiro-Wilk test for normality- CC+EO+IO

The results of the Shapiro-Wilks test for the CC+EO+IO section is shown below (Table 12-3)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO-Pulpal	W = 0.7603, p-value = 5.298e-05	✓
CC+EO+IO-Apical	W = 0.8452, p-value = 0.00143	✓

Table 12-3 - Shapiro-Wilk test for normality - CC+EO+IO

The results show that the data from the CC+EO+IO section of the information model does not have a normal distribution.

12.1.4   Shapiro-Wilk test for normality- CC+EO+IO+CT

The results of the Shapiro-Wilks test for the CC+EO+IO+CT section is shown below (Table 12-4)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO+CT-Pulpal	W = 0.6695, p-value = 2.908e-06	✓
CC+EO+IO+CT-Apical	W = 0.7311, p-value = 1.966e-05	✓

Table 12-4 - Shapiro-Wilk test for normality - CC+EO+IO+CT

The results show that the data from the CC+EO+IO+CT section of the information model does not have a normal distribution.

12.1.5   Shapiro-Wilk test for normality- Final

The results of the Shapiro-Wilks test for the Final section is shown below (Table 12-5)

Type of data	Shapiro-Wilk normality test	Reject H_0

DS Model-Pulpal	W = 0.7261, p-value = 1.67e-05	✓
DS Model-Apical	W = 0.5329, p-value = 8.033e-08	✓

Table 12-5 - Shapiro-Wilk test for normality - Final

The results show that the data from the final section of the information model does not have a normal distribution.

12.1.6 Shapiro-Wilk test for normality- Dentists

The results of the Shapiro-Wilks test for the dentists is shown below (Table 12-6)

Type of data	*Shapiro-Wilk normality test*	*Reject* H_0
Dentists-Pulpal	W = 0.7446, p-value = 3.651e-13	✓
Dentists-Apical	W = 0.5155, p-value < 2.2e-16	✓

Table 12-6 - Shapiro-Wilk test for normality - Dentists

The results show that the data from the dentists does not have a normal distribution.

12.2 Shapiro–Wilk tests for Normality for Precision-Recall data

This section outlines the results of the Shapiro-Wild test for normality conducted on the Precision-Recall data.

12.2.1 Pulpal Rank 1 – Precision and Recall

This section outlines Pulpal Rank 1- Precision and Recall.

12.2.1.1 CC - Pulpal Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC-Pulpal Rank 1-Precision and Recall is shown below (Table 12-7)

Type of data	*Shapiro-Wilk normality test*	*Reject* H_0
CC- Pulpal Rank 1 Precision	W = 0.86911, p-value = 0.1823	✗
CC- Pulpal Rank 1 Recall	W = 0.79016, p-value = 0.03269	✓

Table 12-7 - Shapiro-Wilk test for normality - CC-Pulpal Rank 1-Precision and Recall

The results show that the data from CC-Pulpal Rank 1-Recall does not have a normal distribution.

12.2.1.2 CC+EO - Pulpal Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO-Pulpal Rank 1-Precision and Recall is shown below (Table 12-8)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO- Pulpal Rank 1 Precision	W = 0.77763, p-value = 0.02444	✓
CC+EO- Pulpal Rank 1 Recall	W = 0.66444, p-value = 0.001497	✓

Table 12-8 - Shapiro-Wilk test for normality - CC+EO-Pulpal Rank 1-Precision and Recall

The results show that the data from CC+EO-Pulpal Rank 1-Precision and Recall does not have a normal distribution.

12.2.1.3 CC+EO+IO - Pulpal Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO-Pulpal Rank 1-Precision and Recall is shown below (Table 12-9)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO- Pulpal Rank 1 Precision	W = 0.8806, p-value = 0.2291	✗
CC+EO+IO- Pulpal Rank 1 Recall	W = 0.73197, p-value = 0.008193	✓

Table 12-9 - Shapiro-Wilk test for normality - CC+EO-Pulpal Rank 1-Precision and Recall

The results show that the data from CC+EO+IO-Pulpal Rank 1- Recall does not have a normal distribution.

12.2.1.4 CC+EO+IO+CT - Pulpal Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO+CT-Pulpal Rank 1-Precision and Recall is shown below (Table 12-10)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO+CT- Pulpal Rank 1 Precision	W = 0.72595, p-value = 0.007069	✓
CC+EO+IO+CT- Pulpal Rank 1 Recall	W = 0.69563, p-value = 0.003321	✓

Table 12-10 - Shapiro-Wilk test for normality - CC+EO+IO+CT-Pulpal Rank 1-Precision and Recall

The results show that the data from CC+EO+IO+CT-Pulpal Rank 1-Precision and Recall does not have a normal distribution.

12.2.1.5 Final - Pulpal Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the Final-Pulpal Rank 1-Precision and Recall cannot be performed as all values are equal (Table 12-11). Also, see table (Table 13-17)

Type of data	Shapiro-Wilk normality test	Reject H_0
Final - Pulpal Rank 1 Precision	Cannot be performed as all values are equal	
Final - Pulpal Rank 1 Recall	Cannot be performed as all values are equal	

Table 12-11 - Shapiro-Wilk test for normality - Final-Pulpal Rank 1-Precision and Recall

12.2.1.6 Dentists - Pulpal Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the Dentists-Pulpal Rank 1-Precision and Recall is shown below (Table 12-12)

Type of data	Shapiro-Wilk normality test	Reject H_0
Dentists - Pulpal Rank 1 Precision	W = 0.92411, p-value = 0.502	✓
Dentists - Pulpal Rank 1 Recall	W = 0.90281, p-value = 0.3484	✓

Table 12-12 - Shapiro-Wilk test for normality - Dentists-Pulpal Rank 1-Precision and Recall

The results show that the data from Dentists-Pulpal Rank 1-Precision and Recall does not have a normal distribution.

12.2.2   Pulpal Rank 2 – Precision and Recall

This section outlines Pulpal Rank 2- Precision and Recall.

12.2.2.1 CC - Pulpal Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC-Pulpal Rank 2-Precision and Recall is shown below (Table 12-13)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC- Pulpal Rank 2 Precision	W = 0.7251, p-value = 0.006922	✓
CC- Pulpal Rank 2 Recall	W = 0.66831, p-value = 0.001655	✓

Table 12-13 - Shapiro-Wilk test for normality - CC-Pulpal Rank 2-Precision and Recall

The results show that the data from CC-Pulpal Rank 2-Precision and Recall does not have a normal distribution.

12.2.2.2 CC+EO - Pulpal Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO-Pulpal Rank 2-Precision and Recall is shown below (Table 12-14)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO- Pulpal Rank 2 Precision	W = 0.75421, p-value = 0.01404	✓
CC+EO- Pulpal Rank 2 Recall	W = 0.66831, p-value = 0.001655	✓

Table 12-14 - Shapiro-Wilk test for normality - CC+EO-Pulpal Rank 2-Precision and Recall

The results show that the data from CC+EO-Pulpal Rank 2-Precision and Recall does not have a normal distribution.

12.2.2.3 CC+EO+IO - Pulpal Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO-Pulpal Rank 2-Precision and Recall is shown below (Table 12-15)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO- Pulpal Rank 2 Precision	W = 0.8806, p-value = 0.2291	✗
CC+EO+IO- Pulpal Rank 2 Recall	W = 0.73197, p-value = 0.008193	✓

Table 12-15 - Shapiro-Wilk test for normality - CC+EO+IO-Pulpal Rank 2-Precision and Recall

The results show that the data from CC+EO+IO-Pulpal Rank 2- Recall does not have a normal distribution.

12.2.2.4 CC+EO+IO+CT - Pulpal Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO+CT-Pulpal Rank 2-Precision and Recall is shown below (Table 12-16)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO+CT- Pulpal Rank 2 Precision	W = 0.75871, p-value = 0.01563	✓
CC+EO+IO+CT- Pulpal Rank 2 Recall	W = 0.72899, p-value = 0.007616	✓

Table 12-16 - Shapiro-Wilk test for normality - CC+EO+IO+CT-Pulpal Rank 2-Precision and Recall

The results show that the data from CC+EO+IO+CT-Pulpal Rank 2-Precision and Recall does not have a normal distribution.

12.2.2.5 Final - Pulpal Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the Final-Pulpal Rank 2-Precision and Recall is shown below (Table 12-17)

Type of data	Shapiro-Wilk normality test	Reject H_0
Final - Pulpal Rank 1 Precision	W = 0.79424, p-value = 0.03591	✓
Final - Pulpal Rank 1 Recall	W = 0.72899, p-value = 0.007616	✓

Table 12-17 - Shapiro-Wilk test for normality - Final-Pulpal Rank 2-Precision and Recall

The results show that the data from Final-Pulpal Rank 2-Precision and Recall does not have a normal distribution.

12.2.2.6 Dentists - Pulpal Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the Dentists-Pulpal Rank 2-Precision and Recall is shown below (Table 12-18)

Type of data	Shapiro-Wilk normality test	Reject H_0
Dentists - Pulpal Rank 2 Precision	W = 0.81376, p-value = 0.05589	✗
Dentists - Pulpal Rank 2 Recall	W = 0.87562, p-value = 0.2077	✗

Table 12-18 - Shapiro-Wilk test for normality - Dentists-Pulpal Rank 2-Precision and Recall

The results show that the data from Dentists-Pulpal Rank 2-Precision and Recall does have a normal distribution.

12.2.3   Apical Rank 1 – Precision and Recall

This section outlines Apical Rank 1- Precision and Recall.

12.2.3.1 CC - Apical Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC-Apical Rank 1-Precision and Recall is shown below (Table 12-19)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC- Apical Rank 1 Precision	W = 0.70503, p-value = 0.00698	✓
CC- Apical Rank 1 Recall	W = 0.63989, p-value = 0.001351	✓

The results show that the data from CC-Apical Rank 1-Precision and Recall does not have a normal distribution.

12.2.3.2 CC+EO - Apical Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO-Apical Rank 1-Precision and Recall is shown below (Table 12-20)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO- Apical Rank 1 Precision	W = 0.78243, p-value = 0.04061	✓
CC+EO- Apical Rank 1 Recall	W = 0.68268, p-value = 0.004039	✓

Table 12-20 - Shapiro-Wilk test for normality - CC+EO-Apical Rank 1-Precision and Recall

The results show that the data from CC+EO-Apical Rank 1-Precision and Recall does not have a normal distribution.

12.2.3.3 CC+EO+IO - Apical Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO-Apical Rank 1-Precision and Recall is shown below (Table 12-21)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO- Apical Rank 1 Precision	W = 0.78958, p-value = 0.04727	✓
CC+EO+IO- Apical Rank 1 Recall	W = 0.68268, p-value = 0.004039	✓

Table 12-21 - Shapiro-Wilk test for normality - CC+EO+IO-Apical Rank 1-Precision and Recall

The results show that the data from CC+EO+IO-Apical Rank 1-Precision and Recall does not have a normal distribution.

12.2.3.4 CC+EO+IO+CT - Apical Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO+CT-Apical Rank 1-Precision and Recall is shown below (Table 12-22)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO+CT- Apical Rank 1 Precision	W = 0.92609, p-value = 0.5503	✗
CC+EO+IO+CT- Apical Rank 1 Recall	W = 0.49609, p-value = 2.073e-05	✓

Table 12-22 - Shapiro-Wilk test for normality - CC+EO+IO+CT-Apical Rank 1-Precision and Recall

The results show that the data from CC+EO+IO+CT-Apical Rank 1-Recall does not have a normal distribution.

12.2.3.5 Final - Apical Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the Final-Apical Rank 2-Precision and Recall cannot be performed as all values are equal (Table 12-23). Also, see table (Table 13-19)

Type of data	Shapiro-Wilk normality test	Reject H_0
Final - Apical Rank 1 Precision	Cannot be performed as all values are equal	
Final - Apical Rank 1 Recall	Cannot be performed as all values are equal	

Table 12-23 - Shapiro-Wilk test for normality - Final-Apical Rank 1-Precision and Recall

12.2.3.6 Dentists - Apical Rank 1 - Precision and Recall

The results of the Shapiro-Wilks test for the Dentists-Apical Rank 1-Precision and Recall is shown below (Table 12-24)

Type of data	Shapiro-Wilk normality test	Reject H_0
Dentists - Apical Rank 1 Precision	W = 0.85396, p-value = 0.1694	✘
Dentists - Apical Rank 1 Recall	W = 0.86859, p-value = 0.2206	✘

Table 12-24 - Shapiro-Wilk test for normality - Dentists-Apical Rank 1-Precision and Recall

The results show that the data from Dentists-Apical Rank 1-Precision and Recall does have a normal distribution.

12.2.4 Apical Rank 2 – Precision and Recall

This section outlines Apical Rank 2- Precision and Recall.

12.2.4.1 CC - Apical Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC-Apical Rank 2-Precision and Recall cannot be performed as all values are equal (Table 12-25). Also, see table (Table 13-4).

Type of data	Shapiro-Wilk normality test	Reject H_0
CC- Apical Rank 2 Precision	Cannot be performed as all values are equal	

CC- Apical Rank 2 Recall	Cannot be performed as all values are equal

Table 12-25 - Shapiro-Wilk test for normality - CC-Apical Rank 2-Precision and Recall

12.2.4.2 CC+EO - Apical Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO-Apical Rank 2-Precision and Recall cannot be performed as all values are equal (Table 12-26). Also, see table (Table 13-8).

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO- Apical Rank 2 Precision	Cannot be performed as all values are equal	
CC+EO- Apical Rank 2 Recall	Cannot be performed as all values are equal	

Table 12-26 - Shapiro-Wilk test for normality - CC+EO-Apical Rank 2-Precision and Recall

12.2.4.3 CC+EO+IO - Apical Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO-Apical Rank 2-Precision and Recall cannot be performed as all values are equal (Table 12-27). Also, see table (Table 13-12).

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO- Apical Rank 2 Precision	Cannot be performed as all values are equal	
CC+EO+IO- Apical Rank 2 Recall	Cannot be performed as all values are equal	

Table 12-27 - Shapiro-Wilk test for normality - CC+EO+IO-Apical Rank 2-Precision and Recall

12.2.4.4 CC+EO+IO+CT - Apical Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the CC+EO+IO+CT-Apical Rank 2-Precision and Recall is shown below (Table 12-28)

Type of data	Shapiro-Wilk normality test	Reject H_0
CC+EO+IO+CT- Apical Rank 2 Precision	W = 0.66382, p-value = 0.002512	✓
CC+EO+IO+CT- Apical Rank 2 Recall	W = 0.63989, p-value = 0.001351	✓

Table 12-28 - Shapiro-Wilk test for normality - CC+EO+IO+CT-Apical Rank 2-Precision and Recall

The results show that the data from CC+EO+IO+CT-Apical Rank 2-Precision and Recall does not have a normal distribution.

12.2.4.5 Final - Apical Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the Final-Apical Rank 2-Precision and Recall is shown below (Table 12-29)

Type of data	Shapiro-Wilk normality test	Reject H_0
Final - Apical Rank 1 Precision	W = 0.82245, p-value = 0.09265	✗
Final - Apical Rank 1 Recall	W = 0.75252, p-value = 0.02108	✓

Table 12-29 - Shapiro-Wilk test for normality - Final-Apical Rank 2-Precision and Recall

The results show that the data from Final-Apical Rank 2- Recall does not have a normal distribution.

12.2.4.6 Dentists - Apical Rank 2 - Precision and Recall

The results of the Shapiro-Wilks test for the Dentists-Apical Rank 2-Precision and Recall is shown below (Table 12-30)

Type of data	Shapiro-Wilk normality test	Reject H_0
Dentists - Apical Rank 2 Precision	W = 0.90284, p-value = 0.391	✗
Dentists - Apical Rank 2 Recall	W = 0.9329, p-value = 0.6027	✗

Table 12-30 - Shapiro-Wilk test for normality - Dentists-Apical Rank 2-Precision and Recall

The results show that the data from Dentists-Apical Rank 2-Precision and Recall does have a normal distribution.

13 Appendix 13

13.1 Precision-Recall data

The following sections (13.1.2 - 13.1.6) outline the Precision-Recall information for each section of the information model. The Precision-Recall for each diagnosis is shown along with the average Precision and Recall for each section.

13.1.1   CC

This section outlines the Pulpal Rank 1 & 2 (Precision and Recall) and Apical Rank 1 & 2 (Precision and Recall) for the CC section of the information model.

Pulpal Diagnosis (Rank 1) CC	Precision	Recall
Normal Pulpal Tissues	0.2	1
Reversible Pulpitis	0	0
Symptomatic Irreversible Pulpitis	0.5555555556	1
Asymptomatic Irreversible Pulpitis	0	0
Pulp Necrosis	1	0.1111111111
Pain of Nonodontogenic Origin	1	0.5
Dentinal Hypersensitivity	0.3333333333	1
Average	0.4412698413	0.5158730159

Table 13-1 - Pulpal Diagnosis (Rank 1) CC

Pulpal Diagnosis (Rank 2) CC	Precision	Recall
Normal Pulpal Tissues	0	0
Reversible Pulpitis	0.2	0.1
Symptomatic Irreversible Pulpitis	0	0
Asymptomatic Irreversible Pulpitis	0.5833333333	0.875
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0.2	1
Dentinal Hypersensitivity	0	0
Average	0.1404761905	0.2821428571

Table 13-2 -Pulpal Diagnosis (Rank 2) CC

Apical Diagnosis (Rank 1) CC	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0	0
Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	0.1538461538	1
Chronic Apical Abscess	0.25	1
Average	0.06730769231	0.3333333333

Table 13-3 - Apical Diagnosis (Rank 1) CC

Apical Diagnosis (Rank 2) CC	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0	0
Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	0	0
Chronic Apical Abscess	0	0
Average	0	0

Table 13-4 - Apical Diagnosis (Rank 2) CC

13.1.2　CC+EO

This section outlines the Pulpal Rank 1 & 2 (Precision and Recall) and Apical Rank 1 & 2 (Precision and Recall) for the CC+EO section of the information model.

Pulpal Diagnosis (Rank 1) CC+EO	Precision	Recall
Normal Pulpal Tissues	0.1818181818	1
Reversible Pulpitis	0	0
Symptomatic Irreversible Pulpitis	0.5	1
Asymptomatic Irreversible Pulpitis	0	0
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0	0
Dentinal Hypersensitivity	0.3333333333	1
Average	0.145021645	0.4285714286

Table 13-5 - Pulpal Diagnosis (Rank 1) CC+EO

Pulpal Diagnosis (Rank 2) CC+EO	Precision	Recall
Normal Pulpal Tissues	0	0
Reversible Pulpitis	0.3333333333	0.1
Symptomatic Irreversible Pulpitis	0	0
Asymptomatic Irreversible Pulpitis	0.5833333333	0.875
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0.1428571429	1
Dentinal Hypersensitivity	0	0
Average	0.1513605442	0.2821428571

Table 13-6 -Pulpal Diagnosis (Rank 2) CC+EO

Apical Diagnosis (Rank 1) CC+EO	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0.2352941176	1
Pain of Nonodontogenic Origin	0.4	1
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	1	1
Chronic Apical Abscess	0	0
Average	0.2725490196	0.5

Table 13-7 - Apical Diagnosis (Rank 1) CC+EO

Apical Diagnosis (Rank 2) CC+EO	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0	0
Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	0	0
Chronic Apical Abscess	0	0
Average	0	0

Table 13-8 - Apical Diagnosis (Rank 2) CC+EO

13.1.3　CC+EO+IO

This section outlines the Pulpal Rank 1 & 2 (Precision and Recall) and Apical Rank 1 & 2 (Precision and Recall) for the CC+EO+IO section of the information model.

Pulpal Diagnosis (Rank 1) CC+EO+IO	Precision	Recall
Normal Pulpal Tissues	1	0.5
Reversible Pulpitis	1	1
Symptomatic Irreversible Pulpitis	0.5	1
Asymptomatic Irreversible Pulpitis	0.3	1

Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0	0
Dentinal Hypersensitivity	0.5	1
Average	0.4714285714	0.6428571429

Table 13-9 - Pulpal Diagnosis (Rank 1) CC+EO+IO

Pulpal Diagnosis (Rank 2) CC+EO+IO	Precision	Recall
Normal Pulpal Tissues	0	0
Reversible Pulpitis	0.4	0.4
Symptomatic Irreversible Pulpitis	0	0
Asymptomatic Irreversible Pulpitis	0.125	0.125
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0	0
Dentinal Hypersensitivity	0.6666666667	1
Average	0.1702380952	0.2178571429

Table 13-10 -Pulpal Diagnosis (Rank 2) CC+EO+IO

Apical Diagnosis (Rank 1) CC+EO+IO	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0.2666666667	1
Pain of Nonodontogenic Origin	0.4	1
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	1	1
Chronic Apical Abscess	0	0
Average	0.2777777778	0.5

Table 13-11 - Apical Diagnosis (Rank 1) CC+EO+IO

Apical Diagnosis (Rank 2) CC+EO+IO	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0	0
Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	0	0
Chronic Apical Abscess	0	0
Average	0	0

Table 13-12 - Apical Diagnosis (Rank 2) CC+EO+IO

13.1.4   CC+EO+IO+CT

This section outlines the Pulpal Rank 1 & 2 (Precision and Recall) and Apical Rank 1 & 2 (Precision and Recall) for the CC+EO+IO+CT section of the information model.

Pulpal Diagnosis (Rank 1) CC+EO+IO+CT	Precision	Recall
Normal Pulpal Tissues	0.3333333333	1
Reversible Pulpitis	1	1
Symptomatic Irreversible Pulpitis	0.8333333333	1
Asymptomatic Irreversible Pulpitis	0	0
Pulp Necrosis	1	0.9
Pain of Nonodontogenic Origin	1	0.5
Dentinal Hypersensitivity	1	1
Average	0.7380952381	0.7714285714

Table 13-13 - Pulpal Diagnosis (Rank 1) CC+EO+IO+CT

Pulpal Diagnosis (Rank 2) CC+EO+IO+CT	Precision	Recall

Normal Pulpal Tissues	0	0
Reversible Pulpitis	1	0.1
Symptomatic Irreversible Pulpitis	1	1
Asymptomatic Irreversible Pulpitis	0.5384615385	0.875
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0	0
Dentinal Hypersensitivity	1	1
Average	0.5054945055	0.425

Table 13-14 -Pulpal Diagnosis (Rank 2) CC+EO+IO+CT

Apical Diagnosis (Rank 1) CC+EO+IO+CT	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0.5714285714	1
Pain of Nonodontogenic Origin	0.2857142857	1
Symptomatic Apical Periodontitis	0.5	1
Acute Apical Abscess	1	1
Chronic Apical Abscess	1	1
Average	0.5595238095	0.8333333333

Table 13-15 - Apical Diagnosis (Rank 1) CC+EO+IO+CT

Apical Diagnosis (Rank 2) CC+EO+IO+CT	Precision	Recall
Normal Apical Tissues	0	0
Asymptomatic Apical Periodontitis	0.6	1
Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	0	0
Chronic Apical Abscess	0.6666666667	1
Average	0.2111111111	0.3333333333

Table 13-16 - Apical Diagnosis (Rank 2) CC+EO+IO+CT

13.1.5   Final

This section outlines the Pulpal Rank 1 & 2 (Precision and Recall) and Apical Rank 1 & 2 (Precision and Recall) for the Final section of the information model.

Pulpal Diagnosis (Rank 1) Final	Precision	Recall
Normal Pulpal Tissues	1	1
Reversible Pulpitis	1	1
Symptomatic Irreversible Pulpitis	1	1
Asymptomatic Irreversible Pulpitis	1	1
Pulp Necrosis	1	1
Pain of Nonodontogenic Origin	1	1
Dentinal Hypersensitivity	1	1
Average	1	1

Table 13-17 - Pulpal Diagnosis (Rank 1) Final

Pulpal Diagnosis (Rank 2) Final	Precision	Recall
Normal Pulpal Tissues	0	0
Reversible Pulpitis	1	0.1
Symptomatic Irreversible Pulpitis	0.6666666667	1
Asymptomatic Irreversible Pulpitis	1	0.875
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0.2	1
Dentinal Hypersensitivity	0	0
Average	0.4095238095	0.425

Table 13-18 -Pulpal Diagnosis (Rank 2) Final

Apical Diagnosis (Rank 1) Final	Precision	Recall
Normal Apical Tissues	1	1
Asymptomatic Apical Periodontitis	1	1
Pain of Nonodontogenic Origin	1	1
Symptomatic Apical Periodontitis	1	1
Acute Apical Abscess	1	1
Chronic Apical Abscess	1	1
Average	1	1

Table 13-19 - Apical Diagnosis (Rank 1) Final

Apical Diagnosis (Rank 2) Final	Precision	Recall
Normal Apical Tissues	0.6666666667	1
Asymptomatic Apical Periodontitis	1	1
Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0	0
Acute Apical Abscess	0	0
Chronic Apical Abscess	0.6	0.75
Average	0.3777777778	0.4583333333

Table 13-20 - Apical Diagnosis (Rank 2) Final

13.1.6 Dentists

This section outlines the Pulpal Rank 1 & 2 (Precision and Recall) and Apical Rank 1 & 2 (Precision and Recall) for the dentists.

Pulpal Diagnosis (Rank 1) Dentists	Precision	Recall
Normal Pulpal Tissues	0.375	1
Reversible Pulpitis	0.347826087	0.7272727273
Symptomatic Irreversible Pulpitis	0.64	0.6666666667
Asymptomatic Irreversible Pulpitis	0.2	0.3333333333
Pulp Necrosis	0.9	0.375
Pain of Nonodontogenic Origin	0.875	0.5
Dentinal Hypersensitivity	0.625	1
Average	0.5661180124	0.6574675325

Table 13-21 - Pulpal Diagnosis (Rank 1) Dentists

Pulpal Diagnosis (Rank 2) Dentists	Precision	Recall
Normal Pulpal Tissues	0	0
Reversible Pulpitis	0.75	0.2195121951
Symptomatic Irreversible Pulpitis	0.1666666667	0.25
Asymptomatic Irreversible Pulpitis	0.8823529412	0.375
Pulp Necrosis	0	0
Pain of Nonodontogenic Origin	0	0
Dentinal Hypersensitivity	0.625	0.5555555556
Average	0.3462885154	0.2000096787

Table 13-22 -Pulpal Diagnosis (Rank 2) Dentists

Apical Diagnosis (Rank 1) Dentists	Precision	Recall
Normal Apical Tissues	0.7636363636	0.875
Asymptomatic Apical Periodontitis	0.75	0.6666666667
Pain of Nonodontogenic Origin	0.6	0.2142857143
Symptomatic Apical Periodontitis	0.6153846154	0.6153846154
Acute Apical Abscess	0.5	0.625
Chronic Apical Abscess	0.7619047619	0.8421052632
Average	0.6651542902	0.6397403766

Table 13-23 - Apical Diagnosis (Rank 1) Dentists

Apical Diagnosis (Rank 2) Dentists	Precision	Recall
Normal Apical Tissues	0.2142857143	0.2307692308
Asymptomatic Apical Periodontitis	0.5454545455	0.6315789474

Pain of Nonodontogenic Origin	0	0
Symptomatic Apical Periodontitis	0.4	0.5
Acute Apical Abscess	0.4	0.2
Chronic Apical Abscess	0.4736842105	0.5
Average	0.3389040784	0.3437246964

Table 13-24 - Apical Diagnosis (Rank 2) Dentists

14 Appendix 14

14.1 NDCG data files

The raw data for the NDCG results and R scripts for performing the Shapiro-Wilk test, t-tests and the Wilcoxon rank sum test can be found in the link below

https://drive.google.com/open?id=0B67O3_av5-CVV1pmSk9GbmF3LU0

14.2 Instructions to view NDCG data

- Download all files from Google Drive link above
- Download and install RStudio from the link below
    - https://www.rstudio.com/
- Open RStudio
- Load NDCG R workspace from Google Drive into RStudio
    - Click File>Open File>NDCG
    - Click on Data item in Global Environment to view data
- Open txt files in Google Drive to perform tests
    - Open "R scripts-NDCG-WilcoxRankSum-Pulpal.txt" and copy scripts to RStudio workspace and run to view Pulpal Wilcoxon Rank sum results
    - Open "R scripts-NDCG-WilcoxRankSum-Apical.txt" and copy scripts to RStudio workspace and run to view Apical Wilcoxon Rank sum results
    - Open "R scripts-NDCG-T-tests-Pulpal.txt" and copy scripts to RStudio workspace and run to view Pulpal T-test results
    - Open "R scripts-NDCG-T-tests-Apical.txt" and copy scripts to RStudio workspace and run to view Apical T-test results
    - Open "R scripts-NDCG-Shapiro_wilk.txt" and copy scripts to RStudio workspace and run to view Shapiro Wilk test results

15 Appendix 15

15.1 Precision-Recall data files

The raw data for the Precision-Recall results and R scripts for performing the Shapiro-Wilk and Wilcoxon rank sum test can be found in the link below

https://drive.google.com/open?id=0B67O3_av5-CVcGViZUM0Z1A5YXc

15.2 Instructions to view Precision-Recall data

- Download all files from Google Drive link above
- Download and install RStudio from the link below (if not done already)
  - https://www.rstudio.com/
- Open RStudio

15.2.1 Precision-Recall Wilcoxon Rank sum

- Load Precision-recall R workspace from Google Drive into RStudio
  - Click File>Open File> Precision-recall
  - Click on Data item in Global Environment to view data
- Open txt files in Google Drive to perform Wilcoxon Rank sum tests
  - Open "R Scripts-Wilcox-Pulpal_Rank1.txt" and copy scripts to RStudio workspace and run to view Pulpal Rank 1 results
  - Open "R Scripts-Wilcox-Pulpal_Rank2.txt" and copy scripts to RStudio workspace and run to view Pulpal Rank 2 results
  - Open "R Scripts-Wilcox-Apical_Rank1.txt" and copy scripts to RStudio workspace and run to view Apical Rank 1 results
  - Open "R Scripts-Wilcox-Apical_Rank2.txt" and copy scripts to RStudio workspace and run to view Apical Rank 2 results

15.2.2 Precision-Recall Pulpal Rank 1 Shapiro-Wilk

- Load Pulpal rank 1- Shapiro Wilk R workspace from Google Drive into RStudio
  - Click File>Open File> Pulpal rank 1- Shapiro Wilk
  - Click on Data item in Global Environment to view data
- Open txt files in Google Drive to perform Shapiro Wilk tests
  - Open "R Scripts_Pulpal_Rank_1-Shapiro_Wilk.txt" and copy scripts to RStudio workspace and run to view Pulpal Rank 1 results

15.2.3 Precision-Recall Pulpal Rank 2 Shapiro-Wilk

- Load Pulpal rank 2- Shapiro Wilk R workspace from Google Drive into RStudio
  - Click File>Open File> Pulpal rank 2- Shapiro Wilk
  - Click on Data item in Global Environment to view data
- Open txt files in Google Drive to perform Shapiro Wilk tests
  - Open "R Scripts_Pulpal_Rank_2-Shapiro_Wilk.txt" and copy scripts to RStudio workspace and run to view Pulpal Rank 2 results

15.2.4 Precision-Recall Apical Rank 1 Shapiro-Wilk

- Load Apical rank 1- Shapiro Wilk R workspace from Google Drive into RStudio
  - ○ Click File>Open File> Apical rank 1- Shapiro Wilk
  - ○ Click on Data item in Global Environment to view data
- Open txt files in Google Drive to perform Shapiro Wilk tests
  - ○ Open "R Scripts_Apical_Rank_1-Shapiro_Wilk.txt" and copy scripts to RStudio workspace and run to view Apical Rank 1 results

15.2.5 Precision-Recall Apical Rank 2 Shapiro-Wilk

- Load Apical rank 2- Shapiro Wilk R workspace from Google Drive into RStudio
  - ○ Click File>Open File> Apical rank 2- Shapiro Wilk
  - ○ Click on Data item in Global Environment to view data
- Open txt files in Google Drive to perform Shapiro Wilk tests
  - ○ Open "R Scripts_ Apical _Rank_2-Shapiro_Wilk.txt" and copy scripts to RStudio workspace and run to view Apical Rank 1 results

16 Appendix 16

16.1 Chi-square and fisher's test data files

The raw data for the Chi-square and fisher's test results and R scripts for performing the Chi-square and fisher's tests can be found in the link below

https://drive.google.com/open?id=0B67O3_av5-CVbzVFZ194TVp1X0U

16.2 Instructions to view Chi-square and fisher's test data

- Download all files from Google Drive link above
- Download and install RStudio from the link below (if not already done)
  - https://www.rstudio.com/
- Open RStudio
- Open txt files in Google Drive to perform tests
  - Open "R-Scripts-ChiSquare-Fisher-Diagnosis.txt" and copy scripts to RStudio workspace and run to view Chi-square and fisher's test Diagnosis results
  - Open "R-Scripts-ChiSquare-Fisher-Management-Re-examination Interval.txt" and copy scripts to RStudio workspace and run to view Chi-square and fisher's test Re-examination Interval results
  - Open "R-Scripts-ChiSquare-Fisher-Management-Referral.txt" and copy scripts to RStudio workspace and run to view Chi-square and fisher's test Referral results
  - Open "R-Scripts-ChiSquare-Fisher-Supplementary_Fields_GAT_Dilation.txt" and copy scripts to RStudio workspace and run to view Chi-square and fisher's test Fields, Goldmann (GAT) and Dilation results

17 Appendix 17

17.1 Chapter 4 Optometry study: Clinical vignettes

The following sections outline the vignettes used in Chapter 4 Optometry study.

17.1.1 OHT

The following section presents the OHT vignette used in control and intervention groups of the Chapter 4 Optometry study.

Section	Question/Investigation	Answer/Investigation Result
Demographics	Demographics	66 years, Male-Caucasian
Symptoms	How is your near vision?	Not as good as it used to be
Symptoms	Do you ever notice your eyes becoming red?	No
Symptoms	How is your distance vision?	Fine with spectacles

Symptoms	Do you experience double vision?	No
Symptoms	Reason for visit	Routine
Symptoms	Do you experience any headaches/suffer from migraines?	Once a week, with heavy workload
Symptoms	Do you wear spectacles?	Yes, varifocals. Full time wear, 2 years old
Symptoms	Do you ever get any pain or discomfort relating to your eyes?	No
Symptoms	Do you see any floaters in your vision?	No
Symptoms	Do you experience flashing lights?	No
Medical History	Do you take any medication on regular basis?	Adalat (nifedipine) for blood pressure control
Medical History	Do you have any allergies?	No
Medical History	Are you diabetic?	No
Medical History	How is your general health?	High BP
Ocular History	Have you ever been told you have lazy eye?	No
Ocular History	Have you ever attended an eye hospital?	No
Ocular History	Do you have Glaucoma?	No
Ocular History	Have you ever had any other eye injuries/infections/surgeries?	No
Family History	Is there a family history of Glaucoma?	Yes, my aunt and grandmother
Family History	Is there a family history of diabetes?	No
Family History	Anything else you wish to tell me regarding your eyes or vision?	No

Family History	Any other eye problems in the family?	My father is short sighted
General History	Smoker	No
General History	Last eye examination	2 years ago
General History	Hobbies	Tennis and reading
General History	Occupation	Solicitor
General History	VDU	Yes, 5 hours a day
General History	Driver	Yes
OMB Habitual	Accommodation BIN	None
OMB Habitual	Accommodation Left Eye	None
OMB Habitual	Accommodation Right Eye	None
OMB Habitual	Confrontation	None
OMB Habitual	Cover test Distance	Orthophoric
OMB Habitual	Motility	None
OMB Habitual	NPC	None
OMB Habitual	Cover test Near	4 XOP, good recovery
OMB Habitual	PD	62 mm
OMB New Rx	Cover Test Distance	None
OMB New Rx	Cover Test Near	None
OMB New Rx	Fixation Disparity Distance	None
OMB New Rx	Fixation Disparity Near	None
Anterior Exam 1	Left Eye van Herick	1
Anterior Exam 1	Right Eye van Herick	1
Anterior Exam 2	Pupils	PERRLA No RAPD R & L
Anterior Exam 2	Tears	Normal
Anterior Exam 2	Shafers Sign	None
Anterior Exam 2	Lens	Clear, no opacities
Ophthalmoscopy	AV Ratio Left	2 / 3

Ophthalmoscopy	ISNT Left	Obeyed
Ophthalmoscopy	Macula Right	Normal
Ophthalmoscopy	Macula Left	Normal
Ophthalmoscopy	CD Left	0.4
Ophthalmoscopy	Vitreous	Small floaters seen in Right Eye
Ophthalmoscopy	ISNT Right	Obeyed
Ophthalmoscopy	CD Right	0.5
Ophthalmoscopy	AV Ratio Right	2 / 3
Ophthalmoscopy	Periphery	Normal for age
Amsler Grid	Amsler	Normal
Colour Vision	Colour Vision City	Normal-both eyes
Colour Vision	Colour Vision Ishihara	Normal-both eyes
Colour Vision	Colour Vision Other	Normal-both eyes
IOP GAT	IOP Contact (L/R)	24, 23
IOP NCT	IOP NCT Left Eye Reading 4	24
IOP NCT	IOP NCT Right Eye Reading 2	23
IOP NCT	IOP NCT Left Eye Reading 2	23
IOP NCT	IOP NCT Right Eye Reading 4	24
IOP NCT	IOP NCT Right Eye Reading 3	21
IOP NCT	IOP NCT Left Eye Reading 1	24
IOP NCT	IOP NCT Left Eye Reading 3	21
IOP NCT	IOP NCT Right Eye Reading 1	23
Stereopsis	Stereopsis Frisby	Top score obtained
Stereopsis	Stereopsis Lang	Top score obtained
Stereopsis	Stereopsis Other	Top score obtained

Stereopsis	Stereopsis Randot	Top score obtained
Stereopsis	Stereopsis TNO	Top score obtained
Stereopsis	Stereopsis Titmus	Top score obtained
Visual Field Henson	Fields Henson(L/R)	Normal
Visual Field Humphrey	Fields Humphrey Left	Normal
Visual Field Humphrey	Fields Humphrey Right	Normal
Refraction	Autorefractor Current Rx Retinoscopy Subjective Findings	See below

Table 17-1 - OHT vignette

Autorefractor

	SPH	CYL	AXIS
R)	+0.50 DS	-	-
L)	+0.75	-0.25	135

Current Rx

	VISION (Unaided)	
	Distance	Near
R)	6/9	N8
L)	6/9	N8

	DVA	NVA
R)	6/5	N5
L)	6/5	N5

	SPH	CYL	AXIS	ADD
R)	+0.50 DS	-	-	+2.00
L)	+0.75	-0.25	135	+2.00

Retinoscopy

	SPH	CYL	AXIS
R)	+0.50 DS	-	-
L)	+0.75	-0.25	135

Subjective Findings

	SPH	CYL	AXIS
R)	+0.50 DS	-	-
L)	+0.75	-0.25	135

	BALANCE	BLUR TEST	BIN VA	DVA
R)	0.00	6/18	6/5	6/5
L)	0.00	6/18	-	6/5

	ADD	NVA	NV RANGE	
R)	+2.50	N5	25 - 60cm	
L)	+2.50	N5	-	

17.1.2   Normal

The following section presents the Normal vignette used in control and intervention groups of the Chapter 4 Optometry study.

Section	Question/Investigation	Answer/Investigation Result
Demographics	Demographics	48 years, Female-Caucasian
Symptoms	When did you last wear them?	Yesterday
Symptoms	Do you see any floaters in your vision?	No
Symptoms	Do you ever get any pain or discomfort relating to your eyes?	No
Symptoms	Do you wear spectacles all the time?	I wear contact lenses most days
Symptoms	Are you having any problems with your lenses?	No
Symptoms	How is your reading vision?	Okay
Symptoms	How old are your spectacles?	5 years old
Symptoms	Reason for visit	Routine
Symptoms	Do you experience flashing lights?	No
Symptoms	When was you last aftercare?	3 months ago
Symptoms	Are you having any problems with your lenses?	No
Symptoms	Do you experience double vision?	No
Symptoms	What's the vision with your contact lenses?	Ok, difficult to read small print
Symptoms	Do you experience any headaches/suffer from migraines?	No
Symptoms	How is your distance vision?	Ok
Symptoms	Do you ever notice your eyes becoming red?	No

Medical History	How is your general health?	I am fit and healthy
Medical History	Do you take any medication on a regular basis?	No
Medical History	Do you have any allergies?	No
Medical History	Do you have high blood pressure?	No
Medical History	Are you diabetic?	No
Ocular History	Have you ever been told you have lazy eye?	No
Ocular History	Have you ever had any other eye injuries/infections/surgeries?	No
Ocular History	Do you have Glaucoma?	No
Ocular History	Have you ever attended an eye hospital?	No
Family History	Anything else you wish to tell me regarding your eyes or vision?	No
Family History	Is there a family history of diabetes?	Yes, my mother
Family History	Is there a family history of Glaucoma	Yes, my mother
Family History	Any other eye problems in the family?	No
General History	Last eye examination	3 years ago
General History	VDU	Yes, 4-10 hours a day
General History	Driver	Yes
General History	Occupation	Lecturer
General History	Hobbies	Reading, badminton
General History	Smoker	No
OMB Habitual	Accommodation BIN	3 D
OMB Habitual	Accommodation Left Eye	3 D

OMB Habitual	Accommodation Right Eye	3 D
OMB Habitual	Confrontation	None
OMB Habitual	Cover test Distance	Orthophoric
OMB Habitual	Motility	None
OMB Habitual	NPC	None
OMB Habitual	Cover test Near	4 XOP, good recovery
OMB Habitual	PD	62 mm
OMB New Rx	Cover test Distance	None
OMB New Rx	Cover test Near	None
OMB New Rx	Fixation Disparity Distance	None
OMB New Rx	Fixation Disparity Near	None
Anterior Exam 1	Right Eye van Herick	3
Anterior Exam 1	Left Eye van Herick	3
Anterior Exam 2	Pupils	PERRLA No RAPD R & L
Anterior Exam 2	Shafers Sign	None
Anterior Exam 2	Lens (L/R)	Early cortical opacities, Clear, no opacities
Anterior Exam 2	Tears	Normal
Ophthalmoscopy	ISNT Left	Not Obeyed
Ophthalmoscopy	Periphery	Clear, quiet & even R+L
Ophthalmoscopy	ISNT Right	Not Obeyed
Ophthalmoscopy	CD Right	0.5
Ophthalmoscopy	Macula Right	Normal
Ophthalmoscopy	Vitreous	Small floaters seen R only **Normal**
Ophthalmoscopy	CD Left	0.45
Ophthalmoscopy	AV Ratio Right	2 / 3
Ophthalmoscopy	AV Ratio Left	2 / 3
Ophthalmoscopy	Macula Left	Normal

Amsler Grid	Amsler	Normal
Colour Vision	Colour Vision City	Normal - both eyes
Colour Vision	Colour Vision Ishihara	Normal - both eyes
Colour Vision	Colour Vision Other	Normal - both eyes
IOP GAT	IOP Contact(L/R)	14, 15
IOP NCT	IOP NCT Left Eye Reading 3	14
IOP NCT	IOP NCT Left Eye Reading 4	14
IOP NCT	IOP NCT Left Eye Reading 1	16
IOP NCT	IOP NCT Right Eye Reading 4	17
IOP NCT	IOP NCT Right Eye Reading 2	17
IOP NCT	IOP NCT Left Eye Reading 2	14
IOP NCT	IOP NCT Right Eye Reading 3	18
IOP NCT	IOP NCT Right Eye Reading 1	16
Stereopsis	Stereopsis Frisby	Top score obtained
Stereopsis	Stereopsis Lang	Top score obtained
Stereopsis	Stereopsis Other	Top score obtained
Stereopsis	Stereopsis Randot	Top score obtained
Stereopsis	Stereopsis TNO	Top score obtained
Stereopsis	Stereopsis Titmus	Top score obtained
Visual Field Henson	Fields Henson (L/R)	Normal
Visual Field Humphrey	Fields Humphrey Right	Normal
Visual Field Humphrey	Fields Humphrey Left	Normal
Refraction	Autorefractor Current Rx Retinoscopy Subjective Findings	See below

Table 17-2 - Normal vignette

Autorefractor

	SPH	CYL	AXIS
R)	-3.50	-2.00	10
L)	-4.00	-1.00	170

Current Rx

	VISION (Unaided)	
	Distance	Near
R)	2/60	N5
L)	2/60	N5

	DVA	NVA
R)	6/5	N5
L)	6/5	N5

	SPH	CYL	AXIS	ADD
R)	-3.50	-1.50	170	-
L)	-4.00	-1.00	165	-
	Type of Glasses SV			

Retinoscopy

	SPH	CYL	AXIS
R)	-3.50	-1.75	170
L)	-4.00	-1.00	165

Subjective Findings

	SPH	CYL	AXIS
R)	-3.50	-1.75	170
L)	-4.00	-1.00	160

	BALANCE	BLUR TEST	BIN VA	DVA
R)	0.00	6/18	6/5	6/5
L)	0.00	6/18	-	6/5
	ADD	NVA	NV RANGE	
R)	+1.00	N5	25 - 60 cm	
L)	+1.00	N5	-	

17.1.3   Normal Tension Glaucoma

The following section presents the Normal Tension Glaucoma vignette used in control and intervention groups of the Chapter 4 Optometry study.

Section	Question/Investigation	Answer/Investigation Result
Demographics	Demographics	68 years, Female-Caucasian
Symptoms	Reason for visit	Broken Spectacles
Symptoms	Do you experience flashing lights?	No
Symptoms	Do you ever notice your eyes becoming red?	No
Symptoms	Do you experience double vision?	No
Symptoms	Do you ever get any pain or discomfort relating to your eyes?	No
Symptoms	How is your near vision?	Not so good now
Symptoms	Do you experience any headaches/suffer from migraines?	No
Symptoms	How is your distance vision?	Fine with spectacles
Symptoms	Do you see any floaters in your vision?	No
Symptoms	Do you wear spectacles?	Yes all the time- they are varifocals, but now broken
Medical History	How is your general health?	Good
Medical History	Do you have any allergies?	No
Medical History	Do you have high blood pressure?	No
Medical History	Are you diabetic?	No
Medical History	Do you take any medication on regular basis?	No
Ocular History	Have you ever been told you have lazy eye?	5 years ago

Ocular History	Do you have Glaucoma?	No
Ocular History	Have you ever had any other eye injuries/infections/surgeries?	I had laser done in both eyes as my new lenses become cloudy
Ocular History	Have you ever attended an eye hospital?	Yes, I have had both cataracts out, Right 5 years ago, Left 6 years ago
Family History	Is there a family history of eye disease?	No
Family History	Is there a family history of Glaucoma?	No
Family History	Is there a family history of diabetes?	No
Family History	Anything else you wish to tell me regarding your eyes or vision?	No
General History	Hobbies	Cycling
General History	Last eye examination	5 years ago
General History	Smoker	No
General History	Driver	Yes
General History	VDU	Yes, 3 hours a day
General History	Occupation	Accountant but just retired
OMB Habitual	Accommodation BIN	None
OMB Habitual	Accommodation Left Eye	None
OMB Habitual	Accommodation Right Eye	None
OMB Habitual	Confrontation	None
OMB Habitual	Cover test Distance	Orthophoric
OMB Habitual	Motility	None
OMB Habitual	NPC	None
OMB Habitual	Cover test Near	4 XOP, good recovery
OMB Habitual	PD	62 mm
OMB New Rx	Cover test Distance	None

OMB New Rx	Cover test Near	None
OMB New Rx	Fixation Disparity Distance	None
OMB New Rx	Fixation Disparity Near	None
Anterior Exam 1	Right Eye van Herick	2
Anterior Exam 1	Left Eye van Herick	2
Anterior Exam 2	Shafers Sign	None
Anterior Exam 2	Tears	Normal
Anterior Exam 2	Lens	IOL-Clear
Anterior Exam 2	Pupils	PERRLA No RAPD R & L, slight oval distortion
Ophthalmoscopy	Periphery	Clear, quiet & even R+L
Ophthalmoscopy	AV Ratio Left	2 / 3
Ophthalmoscopy	CD Right	0.35
Ophthalmoscopy	AV Ratio Right	2 / 3
Ophthalmoscopy	Vitreous	Clear, no opacities R+L
Ophthalmoscopy	Macula Left	Normal
Ophthalmoscopy	ISNT Left	Not Obeyed
Ophthalmoscopy	Macula Right	Normal
Ophthalmoscopy	CD Left	0.8
Ophthalmoscopy	ISNT Right	Not Obeyed
Amsler Grid	Amsler	Normal
Colour Vision	Colour Vision City	Normal - both eyes
Colour Vision	Colour Vision Ishihara	Normal - both eyes
Colour Vision	Colour Vision Other	Normal - both eyes
IOP GAT	IOP Contact(L/R)	19,19
IOP NCT	IOP NCT Right Eye Reading 4	18
IOP NCT	IOP NCT Right Eye Reading 2	17

IOP NCT	IOP NCT Left Eye Reading 4	18
IOP NCT	IOP NCT Left Eye Reading 3	19
IOP NCT	IOP NCT Left Eye Reading 2	18
IOP NCT	IOP NCT Left Eye Reading 1	20
IOP NCT	IOP NCT Right Eye Reading 1	19
IOP NCT	IOP NCT Right Eye Reading 3	20
Stereopsis	Stereopsis Frisby	Top score obtained
Stereopsis	Stereopsis Lang	Top score obtained
Stereopsis	Stereopsis Other	Top score obtained
Stereopsis	Stereopsis Randot	Top score obtained
Stereopsis	Stereopsis TNO	Top score obtained
Stereopsis	Stereopsis Titmus	Top score obtained
Visual Field Henson	Fields Henson(L/R)	Abnormal, Normal
Visual Field Humphrey	Fields Humphrey Left	Abnormal
Visual Field Humphrey	Fields Humphrey Right	Normal
Refraction	Autorefractor Current Rx Retinoscopy Subjective Findings	See below

Table 17-3 - NTG vignette

Autorefractor

	SPH	CYL	AXIS
R)	+0.50 DS	-	-
L)	+0.75	-0.25	170

Current Rx

	VISION (Unaided)	
	Distance	Near
R)	6/6-3	N24
L)	6/6-2	N24

	DVA	NVA
R)	6/6	N5
L)	6/6	N5

	SPH	CYL	AXIS	ADD
R)	+0.50 DS	-	-	+3.00
L)	+0.75	-0.25	170	+3.00

Retinoscopy

	SPH	CYL	AXIS
R)	+0.50 DS	-	-
L)	+0.75	-0.25	170

Subjective Findings

	SPH	CYL	AXIS
R)	+0.75 DS	-	-
L)	+0.75 DS	-0.25	170

	BALANCE	BLUR TEST	BIN VA	DVA
R)	0.00	6/18+1	6/5	6/6 +
L)	0.25	6/18	-	6/6 +
	ADD	**NVA**	**NV RANGE**	
R)	+3.00	N5	25 - 60 cm	
L)	+3.00	N5	-	

17.1.4   AMD

The following section presents the AMD vignette used in control and intervention groups of the Chapter 4 Optometry study.

Section	Question/Investigation	Answer/Investigation Result
Demographics	Demographics	74 years, Male-Caucasian
Symptoms	Do you ever notice your eyes becoming red?	No
Symptoms	Reason for visit	Vision blurry
Symptoms	Do you experience any headaches/suffer from migraines?	No
Symptoms	Do you see any floaters in your vision?	No
Symptoms	How old are your spectacles?	2 years old
Symptoms	Do you wear spectacles all the time?	Yes
Symptoms	Do you experience double vision?	No
Symptoms	Do you ever get any pain or discomfort relating to your eyes?	No
Symptoms	Do you experience flashing lights?	No
Medical History	Are you diabetic?	No
Medical History	Do you have high blood pressure?	No
Medical History	Do you have any allergies?	No
Medical History	How is your general health?	I have arthritis
Medical History	Do you take any medication on a regular basis?	No
Ocular History	Have you ever been told you have lazy eye?	No

Ocular History	Have you ever had any other eye injuries/infections/surgeries?	No
Ocular History	Have you ever attended an eye hospital?	No
Ocular History	Do you have Glaucoma?	No
Family History	Any other eye problems in the family?	No
Family History	Anything else you wish to tell me regarding your eyes or vision?	No
Family History	Is there a family history of diabetes?	Yes my mother, she was diagnosed late in life
Family History	Is there a family history of Glaucoma?	No
General History	Hobbies	Bridge, walking, watching football.
General History	Smoker	No
General History	Driver	Yes
General History	Last eye examination	1 year ago
General History	VDU	No
General History	Occupation	Former military now retired, cares for invalid wife
OMB Habitual	Accommodation BIN	None
OMB Habitual	Accommodation Left Eye	None
OMB Habitual	Accommodation Right Eye	None
OMB Habitual	Confrontation	None
OMB Habitual	Cover test Distance	None
OMB Habitual	Motility	Full and Smooth, No pain or diplopia reported
OMB Habitual	NPC	None
OMB Habitual	Cover test Near	None

OMB Habitual	PD	62 mm
OMB New Rx	Cover test Distance	None
OMB New Rx	Cover test Near	None
OMB New Rx	Fixation Disparity Distance	None
OMB New Rx	Fixation Disparity Near	None
Anterior Exam 1	Right Eye van Herick	1
Anterior Exam 1	Left Eye van Herick	1
Anterior Exam 2	Tears	Normal
Anterior Exam 2	Pupils	PERRLA No RAPD R & L
Anterior Exam 2	Shafers Sign	None
Anterior Exam 2	Lens	Early nuclear sclerotic changes
Ophthalmoscopy	CD Left	0.1
Ophthalmoscopy	CD Right	0.0
Ophthalmoscopy	AV Ratio Right	2 / 3
Ophthalmoscopy	Vitreous	Clear, no opacities R+L
Ophthalmoscopy	Periphery	Clear, quiet & even R+L
Ophthalmoscopy	Macula Left	Normal
Ophthalmoscopy	ISNT Right	Obeyed
Ophthalmoscopy	ISNT Left	Obeyed
Ophthalmoscopy	Macula Right	Abnormal
Ophthalmoscopy	AV Ratio Left	2 / 3
Amsler Grid	Amsler (L/R)	Normal, Area of distortion present
Colour Vision	Colour Vision City	Normal - both eyes
Colour Vision	Colour Vision Ishihara	Normal - both eyes
Colour Vision	Colour Vision Other	Normal - both eyes
IOP GAT	IOP Contact	20,18
IOP NCT	IOP NCT Left Eye Reading 2	20

IOP NCT	IOP NCT Right Eye Reading 4	19
IOP NCT	IOP NCT Left Eye Reading 3	19
IOP NCT	IOP NCT Left Eye Reading 1	20
IOP NCT	IOP NCT Right Eye Reading 1	18
IOP NCT	IOP NCT Left Eye Reading 4	20
IOP NCT	IOP NCT Right Eye Reading 3	20
IOP NCT	IOP NCT Right Eye Reading 2	19
Stereopsis	Stereopsis Frisby	Top score obtained
Stereopsis	Stereopsis Frisby	Top score obtained
Stereopsis	Stereopsis Other	Top score obtained
Stereopsis	Stereopsis Randot	Top score obtained
Stereopsis	Stereopsis TNO	Top score obtained
Stereopsis	Stereopsis Titmus	Top score obtained
Visual Field Henson	Fields Henson	Abnormal, Normal
Visual Field Humphrey	Fields Humphrey Right	Abnormal
Visual Field Humphrey	Fields Humphrey Left	Normal
Refraction	Autorefractor Current Rx Retinoscopy Subjective Findings	See below

Table 17-4 - AMD vignette

Autorefractor

	SPH	CYL	AXIS
R)	+1.75	-1.50	80
L)	+1.50	-0.25	45

Current Rx

	VISION (Unaided)	
	Distance	Near
R)	6/18	N24
L)	6/9-2	N24

	DVA	NVA
R)	6/18	N24
L)	6/6	N6

	SPH	CYL	AXIS	ADD
R)	+1.50	-0.75	65	+2.50
L)	+1.00 DS	-	-	+2.50
Type of Glasses D28 Bifocals				

Retinoscopy

	SPH	CYL	AXIS
R)	+1.50	-1.50	65
L)	+1.50	-0.25	45

Subjective Findings

	SPH	CYL	AXIS
R)	+1.50	-0.25	65
L)	+1.50	-1.00	45

	DVA	Pinhole	ADD	NVA
R)	6/24	6/24	+3.00	N18
L)	6/6		+3.00	N5
				NV Range
				L eye 25 - 40 cm

18 Appendix 18

18.1 Chapter 4 Optometry study: History and Investigations Chi-square test Results

The following sections outline the chi-square test results for clinical history, test and investigations in Chapter 4 Optometry study. The chi-square results comparing the intervention and control group are presented.

18.1.1   OHT

The following section presents the results of the history and investigations chi-square test results of the OHT vignette.

Section, Question/Investigation, Chi-square, p-value, Significance(α= 0.05)	Answered with guideline rec (Int)	Not answered with guideline rec (Int)	Answered without CDSS (Control)	Not answered without CDSS (Control)
Section: Symptoms, How is your near vision?, Chi-square: 0.139, p-value: 0.709, Significant: No	13 (100.00%)	0 (0.00%)	93 (93.00%)	7 (7.00%)
Section: Symptoms, Do you ever notice your eyes becoming red?, Chi-square: 5.281, p-value: 0.022, Significant: Yes	10 (76.92%)	3 (23.08%)	39 (39.00%)	61 (61.00%)
Section: Symptoms, How is your distance vision?, Chi-square: 0.139, p-value: 0.709, Significant: No	13 (100.00%)	0 (0.00%)	93 (93.00%)	7 (7.00%)
Section: Symptoms, Do you experience double vision?, Chi-square: 0.947, p-value: 0.330, Significant: No	11 (84.62%)	2 (15.38%)	67 (67.00%)	33 (33.00%)
Section: Symptoms, Reason for visit, Chi-square: 0.012,	13 (100.00%)	0 (0.00%)	95 (95.00%)	5 (5.00%)

p-value: 0.914, Significant: No				
Section: Symptoms, Do you experience any headaches/suffer from migraines?, Chi-square: 1.285, p-value: 0.257, Significant: No	13 (100.00%)	0 (0.00%)	84 (84.00%)	16 (16.00%)
Section: Symptoms, Do you wear spectacles?, Chi-square: 0.010, p-value: 0.921, Significant: No	12 (92.31%)	1 (7.69%)	87 (87.00%)	13 (13.00%)
Section: Symptoms, Do you ever get any pain or discomfort relating to your eyes?, Chi-square: 2.208, p-value: 0.137, Significant: No	11 (84.62%)	2 (15.38%)	59 (59.00%)	41 (41.00%)
Section: Symptoms, Do you see any floaters in your vision?, Chi-square: 4.105, p-value: 0.043, Significant: Yes	13 (100.00%)	0 (0.00%)	69 (69.00%)	31 (31.00%)
Section: Symptoms, Do you experience flashing lights?, Chi-square: 4.809, p-value: 0.028, Significant: Yes	13 (100.00%)	0 (0.00%)	66 (66.00%)	34 (34.00%)
Section: Medical History, Do you take any medication on regular basis?, Chi-square: 0.456, p-value: 0.500, Significant: No	13 (100.00%)	0 (0.00%)	90 (90.00%)	10 (10.00%)
Section: Medical History, Do you have any allergies?, Chi-square: 0.936,	8 (61.54%)	5 (38.46%)	43 (43.00%)	57 (57.00%)

p-value: 0.333, Significant: No				
Section: Medical History, Are you diabetic?, Chi-square: 3.883, p-value: 0.049, Significant: Yes	13 (100.00%)	0 (0.00%)	70 (70.00%)	30 (30.00%)
Section: Medical History, How is your general health?, Chi-square: 0.139, p-value: 0.709, Significant: No	13 (100.00%)	0 (0.00%)	93 (93.00%)	7 (7.00%)
Section: Ocular History, Have you ever been told you have lazy eye?, Chi-square: 6.058, p-value: 0.014, Significant: Yes	11 (84.62%)	2 (15.38%)	44 (44.00%)	56 (56.00%)
Section: Ocular History, Have you ever attended an eye hospital?, Chi-square: 1.134, p-value: 0.287, Significant: No	13 (100.00%)	0 (0.00%)	85 (85.00%)	15 (15.00%)
Section: Ocular History, Do you have Glaucoma?, Chi-square: 2.599, p-value: 0.107, Significant: No	11 (84.62%)	2 (15.38%)	57 (57.00%)	43 (43.00%)
Section: Ocular History, Have you ever had any other eye injuries/infections/surgeries?, Chi-square: 3.453, p-value: 0.063, Significant: No	13 (100.00%)	0 (0.00%)	72 (72.00%)	28 (28.00%)
Section: Family History, Is there a family history of Glaucoma?, Chi-square: 0.063, p-value: 0.802, Significant: No	13 (100.00%)	0 (0.00%)	94 (94.00%)	6 (6.00%)

Section: Family History, Is there a family history of diabetes?, Chi-square: 2.287, p-value: 0.130, Significant: No	13 (100.00%)	0 (0.00%)	78 (78.00%)	22 (22.00%)
Section: Family History, Anything else you wish to tell me regarding your eyes or vision?, Chi-square: 0.292, p-value: 0.589, Significant: No	12 (92.31%)	1 (7.69%)	82 (82.00%)	18 (18.00%)
Section: Family History, Any other eye problems in the family?, Chi-square: 0.000, p-value: 0.997, Significant: No	12 (92.31%)	1 (7.69%)	88 (88.00%)	12 (12.00%)
Section: General History, Smoker, Chi-square: 4.904, p-value: 0.027, Significant: Yes	12 (92.31%)	1 (7.69%)	56 (56.00%)	44 (44.00%)
Section: General History, Last eye examination, Chi-square: 0.139, p-value: 0.709, Significant: No	13 (100.00%)	0 (0.00%)	93 (93.00%)	7 (7.00%)
Section: General History, Hobbies, Chi-square: 2.999, p-value: 0.083, Significant: No	12 (92.31%)	1 (7.69%)	64 (64.00%)	36 (36.00%)
Section: General History, Occupation, Chi-square: 0.013, p-value: 0.909, Significant: No	12 (92.31%)	1 (7.69%)	89 (89.00%)	11 (11.00%)
Section: General History, VDU, Chi-square: 0.482,	12 (92.31%)	1 (7.69%)	80 (80.00%)	20 (20.00%)

p-value: 0.488, Significant: No				
Section: General History, Driver, Chi-square: 0.063, p-value: 0.802, Significant: No	13 (100.00%)	0 (0.00%)	94 (94.00%)	6 (6.00%)
Section: OMB Habitual, Accommodation BIN, Chi-square: 1.134, p-value: 0.287, Significant: No	2 (15.38%)	11 (84.62%)	4 (4.00%)	96 (96.00%)
Section: OMB Habitual, Accommodation Left Eye, Chi-square: 0.444, p-value: 0.505, Significant: No	2 (15.38%)	11 (84.62%)	6 (6.00%)	94 (94.00%)
Section: OMB Habitual, Accommodation Right Eye, Chi-square: 0.444, p-value: 0.505, Significant: No	2 (15.38%)	11 (84.62%)	6 (6.00%)	94 (94.00%)
Section: OMB Habitual, Confrontation, Chi-square: 2.859, p-value: 0.091, Significant: No	4 (30.77%)	9 (69.23%)	10 (10.00%)	90 (90.00%)
Section: OMB Habitual, Cover test Distance, Chi-square: 3.247, p-value: 0.072, Significant: No	13 (100.00%)	0 (0.00%)	73 (73.00%)	27 (27.00%)
Section: OMB Habitual, Motility, Chi-square: 7.142, p-value: 0.008, Significant: Yes	11 (84.62%)	2 (15.38%)	41 (41.00%)	59 (59.00%)
Section: OMB Habitual, NPC, Chi-square: 3.898, p-value: 0.048, Significant: Yes	6 (46.15%)	7 (53.85%)	18 (18.00%)	82 (82.00%)

Section: OMB Habitual, Cover test Near, Chi-square: 6.395, p-value: 0.011, Significant: Yes	13 (100.00%)	0 (0.00%)	60 (60.00%)	40 (40.00%)
Section: OMB Habitual, PD, Chi-square: 3.492, p-value: 0.062, Significant: No	8 (61.54%)	5 (38.46%)	31 (31.00%)	69 (69.00%)
Section: OMB New Rx, Cover Test Distance, Chi-square: 2.901, p-value: 0.089, Significant: No	9 (69.23%)	4 (30.77%)	40 (40.00%)	60 (60.00%)
Section: OMB New Rx, Cover Test Near, Chi-square: 2.901, p-value: 0.089, Significant: No	9 (69.23%)	4 (30.77%)	40 (40.00%)	60 (60.00%)
Section: OMB New Rx, Fixation Disparity Distance, Chi-square: 6.107, p-value: 0.013, Significant: Yes	6 (46.15%)	7 (53.85%)	14 (14.00%)	86 (86.00%)
Section: OMB New Rx, Fixation Disparity Near, Chi-square: 3.328, p-value: 0.068, Significant: No	5 (38.46%)	8 (61.54%)	14 (14.00%)	86 (86.00%)
Section: Anterior Exam 1, Left Eye van Herick, Chi-square: 8.616, p-value: 0.003, Significant: Yes	13 (100.00%)	0 (0.00%)	53 (53.00%)	47 (47.00%)
Section: Anterior Exam 1, Right Eye van Herick, Chi-square: 8.616, p-value: 0.003, Significant: Yes	13 (100.00%)	0 (0.00%)	53 (53.00%)	47 (47.00%)
Section: Anterior Exam 2, Pupils, Chi-square: 3.247,	13 (100.00%)	0 (0.00%)	73 (73.00%)	27 (27.00%)

p-value: 0.072, Significant: No				
Section: Anterior Exam 2, Tears, Chi-square: 6.756, p-value: 0.009, Significant: Yes	8 (61.54%)	5 (38.46%)	23 (23.00%)	77 (77.00%)
Section: Anterior Exam 2, Shafers Sign, Chi-square: 0.287, p-value: 0.592, Significant: No	5 (38.46%)	8 (61.54%)	27 (27.00%)	73 (73.00%)
Section: Anterior Exam 2, Lens, Chi-square: 2.848, p-value: 0.091, Significant: No	13 (100.00%)	0 (0.00%)	75 (75.00%)	25 (25.00%)
Section: Ophthalmoscopy, AV Ratio Left, Chi-square: 0.141, p-value: 0.707, Significant: No	12 (92.31%)	1 (7.69%)	84 (84.00%)	16 (16.00%)
Section: Ophthalmoscopy, ISNT Left, Chi-square: 1.935, p-value: 0.164, Significant: No	13 (100.00%)	0 (0.00%)	80 (80.00%)	20 (20.00%)
Section: Ophthalmoscopy, Macula Right, Chi-square: 0.010, p-value: 0.921, Significant: No	12 (92.31%)	1 (7.69%)	87 (87.00%)	13 (13.00%)
Section: Ophthalmoscopy, Macula Left, Chi-square: 0.010, p-value: 0.921, Significant: No	12 (92.31%)	1 (7.69%)	87 (87.00%)	13 (13.00%)
Section: Ophthalmoscopy, CD Left, Chi-square: 0.846, p-value: 0.358, Significant: No	13 (100.00%)	0 (0.00%)	87 (87.00%)	13 (13.00%)

Section: Ophthalmoscopy, Vitreous, Chi-square: 0.226, p-value: 0.635, Significant: No	10 (76.92%)	3 (23.08%)	66 (66.00%)	34 (34.00%)
Section: Ophthalmoscopy, ISNT Right, Chi-square: 1.935, p-value: 0.164, Significant: No	13 (100.00%)	0 (0.00%)	80 (80.00%)	20 (20.00%)
Section: Ophthalmoscopy, CD Right, Chi-square: 0.710, p-value: 0.399, Significant: No	13 (100.00%)	0 (0.00%)	88 (88.00%)	12 (12.00%)
Section: Ophthalmoscopy, AV Ratio Right, Chi-square: 0.083, p-value: 0.773, Significant: No	12 (92.31%)	1 (7.69%)	85 (85.00%)	15 (15.00%)
Section: Ophthalmoscopy, Periphery, Chi-square: 0.070, p-value: 0.791, Significant: No	10 (76.92%)	3 (23.08%)	69 (69.00%)	31 (31.00%)
Section: Amsler grid, Amsler, Chi-square: 0.024, p-value: 0.878, Significant: No	3 (23.08%)	10 (76.92%)	17 (17.00%)	83 (83.00%)
Section: Colour vision, Colour Vision City, Chi-square: 0.364, p-value: 0.546, Significant: No	0 (0.00%)	13 (100.00%)	2 (2.00%)	98 (98.00%)
Section: Colour vision, Colour Vision Ishihara, Chi-square: 0.340, p-value: 0.560, Significant: No	0 (0.00%)	13 (100.00%)	9 (9.00%)	91 (91.00%)
Section: Colour vision, Colour Vision Other, Chi-square: None,	0 (0.00%)	13 (100.00%)	0 (0.00%)	100 (100.00%)

p-value: None, Significant: Not done				
Section: IOP GAT, IOP Contact, Chi-square: 1.091, p-value: 0.296, Significant: No	12 (92.31%)	1 (7.69%)	75 (75.00%)	25 (25.00%)
Section: IOP NCT, IOP NCT Left Eye Reading 4, Chi-square: 2.739, p-value: 0.098, Significant: No	6 (46.15%)	7 (53.85%)	21 (21.00%)	79 (79.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 2, Chi-square: 2.487, p-value: 0.115, Significant: No	6 (46.15%)	7 (53.85%)	72 (72.00%)	28 (28.00%)
Section: IOP NCT, IOP NCT Left Eye Reading 2, Chi-square: 2.487, p-value: 0.115, Significant: No	6 (46.15%)	7 (53.85%)	72 (72.00%)	28 (28.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 4, Chi-square: 2.422, p-value: 0.120, Significant: No	6 (46.15%)	7 (53.85%)	22 (22.00%)	78 (78.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 3, Chi-square: 1.036, p-value: 0.309, Significant: No	6 (46.15%)	7 (53.85%)	65 (65.00%)	35 (35.00%)
Section: IOP NCT, IOP NCT Left Eye Reading 1, Chi-square: 6.041, p-value: 0.014, Significant: Yes	6 (46.15%)	7 (53.85%)	81 (81.00%)	19 (19.00%)

Section: IOP NCT, IOP NCT Left Eye Reading 3, Chi-square: 1.036, p-value: 0.309, Significant: No	6 (46.15%)	7 (53.85%)	65 (65.00%)	35 (35.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 1, Chi-square: 6.041, p-value: 0.014, Significant: Yes	6 (46.15%)	7 (53.85%)	81 (81.00%)	19 (19.00%)
Section: Stereopsis, Stereopsis Frisby, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	13 (100.00%)	0 (0.00%)	100 (100.00%)
Section: Stereopsis, Stereopsis Lang, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	13 (100.00%)	0 (0.00%)	100 (100.00%)
Section: Stereopsis, Stereopsis Other, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	13 (100.00%)	0 (0.00%)	100 (100.00%)
Section: Stereopsis, Stereopsis Randot, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	13 (100.00%)	0 (0.00%)	100 (100.00%)
Section: Stereopsis, Stereopsis TNO, Chi-square: 0.081, p-value: 0.776, Significant: No	0 (0.00%)	13 (100.00%)	3 (3.00%)	97 (97.00%)
Section: Stereopsis, Stereopsis Titmus, Chi-square: 0.081, p-value: 0.776, Significant: No	0 (0.00%)	13 (100.00%)	3 (3.00%)	97 (97.00%)

Section: Visual field Henson, Fields Henson, Chi-square: 1.301, p-value: 0.254, Significant: No	3 (23.08%)	10 (76.92%)	44 (44.00%)	56 (56.00%)
Section: Visual field Humphrey, Fields Humphrey Left, Chi-square: 0.226, p-value: 0.635, Significant: No	10 (76.92%)	3 (23.08%)	66 (66.00%)	34 (34.00%)
Section: Visual field Humphrey, Fields Humphrey Right, Chi-square: 0.461, p-value: 0.497, Significant: No	10 (76.92%)	3 (23.08%)	63 (63.00%)	37 (37.00%)
Section: Refraction, Autorefractor, Chi-square: 0.001, p-value: 0.974, Significant: No	4 (30.77%)	9 (69.23%)	26 (26.00%)	74 (74.00%)
Section: Refraction, Current Rx, Chi-square: None, p-value: None, Significant: Not done	13 (100.00%)	0 (0.00%)	100 (100.00%)	0 (0.00%)
Section: Refraction, Retinoscopy, Chi-square: 1.076, p-value: 0.300, Significant: No	8 (61.54%)	5 (38.46%)	42 (42.00%)	58 (58.00%)
Section: Refraction, Subjective Findings, Chi-square: 6.395, p-value: 0.011, Significant: Yes	13 (100.00%)	0 (0.00%)	60 (60.00%)	40 (40.00%)

Table 18-1 - OHT vignette chi-square results

18.1.2   Normal

The following section presents the results of the history and investigations chi-square test results of the Normal vignette.

Section, Question/Investigation, Chi-square, p-value, Significance(α= 0.05)	Answered with guideline rec (Int)	Not answered with guideline rec (Int)	Answered without CDSS (Control)	Not answered without CDSS (Control)
Section: Symptoms, When did you last wear them?, Chi-square: 0.851, p-value: 0.356, Significant: No	7 (77.78%)	2 (22.22%)	57 (55.88%)	45 (44.12%)
Section: Symptoms, Do you see any floaters in your vision?, Chi-square: 2.435, p-value: 0.119, Significant: No	9 (100.00%)	0 (0.00%)	71 (69.61%)	31 (30.39%)
Section: Symptoms, Do you ever get any pain or discomfort relating to your eyes?, Chi-square: 4.141, p-value: 0.042, Significant: Yes	9 (100.00%)	0 (0.00%)	61 (59.80%)	41 (40.20%)
Section: Symptoms, Do you wear spectacles all the time?, Chi-square: 0.014, p-value: 0.907, Significant: No	8 (88.89%)	1 (11.11%)	86 (84.31%)	16 (15.69%)
Section: Symptoms, Are you having any problems with your lenses?, Chi-square: 0.000, p-value: 0.992, Significant: No	7 (77.78%)	2 (22.22%)	73 (71.57%)	29 (28.43%)
Section: Symptoms, How is your reading vision?, Chi-square: 0.014,	8 (88.89%)	1 (11.11%)	86 (84.31%)	16 (15.69%)

p-value: 0.907, Significant: No				
Section: Symptoms, How old are your spectacles?, Chi-square: 0.040, p-value: 0.841, Significant: No	8 (88.89%)	1 (11.11%)	87 (85.29%)	15 (14.71%)
Section: Symptoms, Reason for visit, Chi-square: 0.025, p-value: 0.874, Significant: No	8 (88.89%)	1 (11.11%)	98 (96.08%)	4 (3.92%)
Section: Symptoms, Do you experience flashing lights?, Chi-square: 0.706, p-value: 0.401, Significant: No	8 (88.89%)	1 (11.11%)	71 (69.61%)	31 (30.39%)
Section: Symptoms, When was you last aftercare?, Chi-square: 0.155, p-value: 0.694, Significant: No	7 (77.78%)	2 (22.22%)	79 (77.45%)	23 (22.55%)
Section: Symptoms, Are you having any problems with your lenses?, Chi-square: 0.443, p-value: 0.506, Significant: No	9 (100.00%)	0 (0.00%)	88 (86.27%)	14 (13.73%)
Section: Symptoms, Do you experience double vision?, Chi-square: 1.594, p-value: 0.207, Significant: No	8 (88.89%)	1 (11.11%)	63 (61.76%)	39 (38.24%)
Section: Symptoms, Whats the vision with your contact lenses?, Chi-square: 3.061, p-value: 0.080, Significant: No	9 (100.00%)	0 (0.00%)	67 (65.69%)	35 (34.31%)
Section: Symptoms, Do you experience any	9 (100.00%)	0 (0.00%)	87 (85.29%)	15 (14.71%)

headaches/suffer from migraines?, Chi-square: 0.531, p-value: 0.466, Significant: No				
Section: Symptoms, How is your distance vision?, Chi-square: 0.719, p-value: 0.396, Significant: No	9 (100.00%)	0 (0.00%)	85 (83.33%)	17 (16.67%)
Section: Symptoms, Do you ever notice your eyes becoming red?, Chi-square: 3.583, p-value: 0.058, Significant: No	8 (88.89%)	1 (11.11%)	51 (50.00%)	51 (50.00%)
Section: Medical History, How is your general health?, Chi-square: 0.107, p-value: 0.743, Significant: No	9 (100.00%)	0 (0.00%)	98 (96.08%)	4 (3.92%)
Section: Medical History, Do you take any medication on a regular basis?, Chi-square: 0.208, p-value: 0.648, Significant: No	9 (100.00%)	0 (0.00%)	91 (89.22%)	11 (10.78%)
Section: Medical History, Do you have any allergies?, Chi-square: 5.915, p-value: 0.015, Significant: Yes	9 (100.00%)	0 (0.00%)	53 (51.96%)	49 (48.04%)
Section: Medical History, Do you have high blood pressure?, Chi-square: 4.716, p-value: 0.030, Significant: Yes	8 (88.89%)	1 (11.11%)	46 (45.10%)	56 (54.90%)
Section: Medical History, Are you diabetic?, Chi-square: 2.477, p-value: 0.116, Significant: No	8 (88.89%)	1 (11.11%)	57 (55.88%)	45 (44.12%)

Section: Ocular History, Have you ever been told you have lazy eye?, Chi-square: 2.014, p-value: 0.156, Significant: No	7 (77.78%)	2 (22.22%)	48 (47.06%)	54 (52.94%)
Section: Ocular History, Have you ever had any other eye injuries/infections/surgeries?, Chi-square: 1.492, p-value: 0.222, Significant: No	9 (100.00%)	0 (0.00%)	78 (76.47%)	24 (23.53%)
Section: Ocular History, Do you have Glaucoma?, Chi-square: 2.819, p-value: 0.093, Significant: No	8 (88.89%)	1 (11.11%)	55 (53.92%)	47 (46.08%)
Section: Ocular History, Have you ever attended an eye hospital?, Chi-square: 0.359, p-value: 0.549, Significant: No	9 (100.00%)	0 (0.00%)	89 (87.25%)	13 (12.75%)
Section: Family History, Anything else you wish to tell me regarding your eyes or vision?, Chi-square: 0.061, p-value: 0.804, Significant: No	7 (77.78%)	2 (22.22%)	82 (80.39%)	20 (19.61%)
Section: Family History, Is there a family history of diabetes?, Chi-square: 0.142, p-value: 0.706, Significant: No	8 (88.89%)	1 (11.11%)	79 (77.45%)	23 (22.55%)
Section: Family History, Is there a family history of Glaucoma, Chi-square: 0.107, p-value: 0.743, Significant: No	9 (100.00%)	0 (0.00%)	98 (96.08%)	4 (3.92%)

Section: Family History, Any other eye problems in the family?, Chi-square: 0.142, p-value: 0.706, Significant: No	9 (100.00%)	0 (0.00%)	92 (90.20%)	10 (9.80%)
Section: General History, Last eye examination, Chi-square: 0.025, p-value: 0.874, Significant: No	8 (88.89%)	1 (11.11%)	98 (96.08%)	4 (3.92%)
Section: General History, VDU, Chi-square: 0.719, p-value: 0.396, Significant: No	9 (100.00%)	0 (0.00%)	85 (83.33%)	17 (16.67%)
Section: General History, Driver, Chi-square: 0.107, p-value: 0.743, Significant: No	9 (100.00%)	0 (0.00%)	98 (96.08%)	4 (3.92%)
Section: General History, Occupation, Chi-square: 0.040, p-value: 0.842, Significant: No	9 (100.00%)	0 (0.00%)	94 (92.16%)	8 (7.84%)
Section: General History, Hobbies, Chi-square: 3.061, p-value: 0.080, Significant: No	9 (100.00%)	0 (0.00%)	67 (65.69%)	35 (34.31%)
Section: General History, Smoker, Chi-square: 5.429, p-value: 0.020, Significant: Yes	9 (100.00%)	0 (0.00%)	55 (53.92%)	47 (46.08%)
Section: OMB Habitual, Accommodation BIN, Chi-square: 14.529, p-value: 0.000, Significant: Yes	6 (66.67%)	3 (33.33%)	12 (11.76%)	90 (88.24%)
Section: OMB Habitual, Accommodation Left Eye,	6 (66.67%)	3 (33.33%)	14 (13.73%)	88 (86.27%)

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Chi-square: 12.313, p-value: 0.000, Significant: Yes				
Section: OMB Habitual, Accommodation Right Eye, Chi-square: 12.313, p-value: 0.000, Significant: Yes	6 (66.67%)	3 (33.33%)	14 (13.73%)	88 (86.27%)
Section: OMB Habitual, Confrontation, Chi-square: 4.755, p-value: 0.029, Significant: Yes	4 (44.44%)	5 (55.56%)	12 (11.76%)	90 (88.24%)
Section: OMB Habitual, Cover test Distance, Chi-square: 0.192, p-value: 0.661, Significant: No	8 (88.89%)	1 (11.11%)	78 (76.47%)	24 (23.53%)
Section: OMB Habitual, Motility, Chi-square: 1.566, p-value: 0.211, Significant: No	7 (77.78%)	2 (22.22%)	51 (50.00%)	51 (50.00%)
Section: OMB Habitual, NPC, Chi-square: 0.097, p-value: 0.756, Significant: No	3 (33.33%)	6 (66.67%)	33 (32.35%)	69 (67.65%)
Section: OMB Habitual, Cover test Near, Chi-square: 1.343, p-value: 0.247, Significant: No	8 (88.89%)	1 (11.11%)	65 (63.73%)	37 (36.27%)
Section: OMB Habitual, PD, Chi-square: 10.487, p-value: 0.001, Significant: Yes	8 (88.89%)	1 (11.11%)	30 (29.41%)	72 (70.59%)
Section: OMB New Rx, Cover test Distance, Chi-square: 0.182,	5 (55.56%)	4 (44.44%)	43 (42.16%)	59 (57.84%)

p-value: 0.670, Significant: No				
Section: OMB New Rx, Cover test Near, Chi-square: 0.182, p-value: 0.670, Significant: No	5 (55.56%)	4 (44.44%)	43 (42.16%)	59 (57.84%)
Section: OMB New Rx, Fixation Disparity Distance, Chi-square: 9.085, p-value: 0.003, Significant: Yes	5 (55.56%)	4 (44.44%)	12 (11.76%)	90 (88.24%)
Section: OMB New Rx, Fixation Disparity Near, Chi-square: 9.085, p-value: 0.003, Significant: Yes	5 (55.56%)	4 (44.44%)	12 (11.76%)	90 (88.24%)
Section: Anterior Exam 1, Right Eye van Herick, Chi-square: 10.890, p-value: 0.001, Significant: Yes	9 (100.00%)	0 (0.00%)	38 (37.25%)	64 (62.75%)
Section: Anterior Exam 1, Left Eye van Herick, Chi-square: 10.890, p-value: 0.001, Significant: Yes	9 (100.00%)	0 (0.00%)	38 (37.25%)	64 (62.75%)
Section: Anterior Exam 2, Pupils, Chi-square: 1.371, p-value: 0.242, Significant: No	9 (100.00%)	0 (0.00%)	79 (77.45%)	23 (22.55%)
Section: Anterior Exam 2, Shafers Sign, Chi-square: 6.665, p-value: 0.010, Significant: Yes	7 (77.78%)	2 (22.22%)	30 (29.41%)	72 (70.59%)
Section: Anterior Exam 2, Lens, Chi-square: 1.492, p-value: 0.222, Significant: No	9 (100.00%)	0 (0.00%)	78 (76.47%)	24 (23.53%)

Section: Anterior Exam 2, Tears, Chi-square: 5.800, p-value: 0.016, Significant: Yes	8 (88.89%)	1 (11.11%)	42 (41.18%)	60 (58.82%)
Section: Ophthalmoscopy, ISNT Left, Chi-square: 1.254, p-value: 0.263, Significant: No	9 (100.00%)	0 (0.00%)	80 (78.43%)	22 (21.57%)
Section: Ophthalmoscopy, Periphery, Chi-square: 0.192, p-value: 0.661, Significant: No	8 (88.89%)	1 (11.11%)	78 (76.47%)	24 (23.53%)
Section: Ophthalmoscopy, ISNT Right, Chi-square: 0.098, p-value: 0.754, Significant: No	8 (88.89%)	1 (11.11%)	80 (78.43%)	22 (21.57%)
Section: Ophthalmoscopy, CD Right, Chi-square: 0.086, p-value: 0.770, Significant: No	9 (100.00%)	0 (0.00%)	93 (91.18%)	9 (8.82%)
Section: Ophthalmoscopy, Macula Right, Chi-square: 0.086, p-value: 0.770, Significant: No	9 (100.00%)	0 (0.00%)	93 (91.18%)	9 (8.82%)
Section: Ophthalmoscopy, Vitreous, Chi-square: 0.706, p-value: 0.401, Significant: No	8 (88.89%)	1 (11.11%)	71 (69.61%)	31 (30.39%)
Section: Ophthalmoscopy, CD Left, Chi-square: 0.142, p-value: 0.706, Significant: No	9 (100.00%)	0 (0.00%)	92 (90.20%)	10 (9.80%)
Section: Ophthalmoscopy, AV Ratio Right, Chi-square: 0.443,	9 (100.00%)	0 (0.00%)	88 (86.27%)	14 (13.73%)

p-value: 0.506, Significant: No				
Section: Ophthalmoscopy, AV Ratio Left, Chi-square: 0.531, p-value: 0.466, Significant: No	9 (100.00%)	0 (0.00%)	87 (85.29%)	15 (14.71%)
Section: Ophthalmoscopy, Macula Left, Chi-square: 0.142, p-value: 0.706, Significant: No	9 (100.00%)	0 (0.00%)	92 (90.20%)	10 (9.80%)
Section: Amsler grid, Amsler, Chi-square: 0.208, p-value: 0.648, Significant: No	1 (11.11%)	8 (88.89%)	10 (9.80%)	92 (90.20%)
Section: Colour vision, Colour Vision City, Chi-square: 0.780, p-value: 0.377, Significant: No	1 (11.11%)	8 (88.89%)	1 (0.98%)	101 (99.02%)
Section: Colour vision, Colour Vision Ishihara, Chi-square: 0.146, p-value: 0.702, Significant: No	1 (11.11%)	8 (88.89%)	13 (12.75%)	89 (87.25%)
Section: Colour vision, Colour Vision Other, Chi-square: 0.303, p-value: 0.582, Significant: No	1 (11.11%)	8 (88.89%)	2 (1.96%)	100 (98.04%)
Section: IOP GAT, IOP Contact, Chi-square: 2.457, p-value: 0.117, Significant: No	6 (66.67%)	3 (33.33%)	35 (34.31%)	67 (65.69%)
Section: IOP NCT, IOP NCT Left Eye Reading 3, Chi-square: 0.373,	3 (33.33%)	6 (66.67%)	51 (50.00%)	51 (50.00%)

p-value: 0.541, Significant: No				
Section: IOP NCT, IOP NCT Left Eye Reading 4, Chi-square: 0.785, p-value: 0.376, Significant: No	3 (33.33%)	6 (66.67%)	16 (15.69%)	86 (84.31%)
Section: IOP NCT, IOP NCT Left Eye Reading 1, Chi-square: 9.012, p-value: 0.003, Significant: Yes	3 (33.33%)	6 (66.67%)	84 (82.35%)	18 (17.65%)
Section: IOP NCT, IOP NCT Right Eye Reading 4, Chi-square: 0.501, p-value: 0.479, Significant: No	3 (33.33%)	6 (66.67%)	18 (17.65%)	84 (82.35%)
Section: IOP NCT, IOP NCT Right Eye Reading 2, Chi-square: 3.969, p-value: 0.046, Significant: Yes	3 (33.33%)	6 (66.67%)	73 (71.57%)	29 (28.43%)
Section: IOP NCT, IOP NCT Left Eye Reading 2, Chi-square: 3.676, p-value: 0.055, Significant: No	3 (33.33%)	6 (66.67%)	72 (70.59%)	30 (29.41%)
Section: IOP NCT, IOP NCT Right Eye Reading 3, Chi-square: 0.373, p-value: 0.541, Significant: No	3 (33.33%)	6 (66.67%)	51 (50.00%)	51 (50.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 1, Chi-square: 9.012,	3 (33.33%)	6 (66.67%)	84 (82.35%)	18 (17.65%)

p-value: 0.003, Significant: Yes				
Section: Stereopsis, Stereopsis Frisby, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	9 (100.00%)	0 (0.00%)	102 (100.00%)
Section: Stereopsis, Stereopsis Lang, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	9 (100.00%)	0 (0.00%)	102 (100.00%)
Section: Stereopsis, Stereopsis Other, Chi-square: 2.377, p-value: 0.123, Significant: No	0 (0.00%)	9 (100.00%)	1 (0.98%)	101 (99.02%)
Section: Stereopsis, Stereopsis Randot, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	9 (100.00%)	0 (0.00%)	102 (100.00%)
Section: Stereopsis, Stereopsis TNO, Chi-square: 0.780, p-value: 0.377, Significant: No	0 (0.00%)	9 (100.00%)	2 (1.96%)	100 (98.04%)
Section: Stereopsis, Stereopsis Titmus, Chi-square: 0.780, p-value: 0.377, Significant: No	0 (0.00%)	9 (100.00%)	2 (1.96%)	100 (98.04%)
Section: Visual field Henson, Fields Henson, Chi-square: 0.421, p-value: 0.516, Significant: No	2 (22.22%)	7 (77.78%)	40 (39.22%)	62 (60.78%)
Section: Visual field Humphrey, Fields Humphrey Right, Chi-square: 0.496,	7 (77.78%)	2 (22.22%)	61 (59.80%)	41 (40.20%)

p-value: 0.481, Significant: No				
Section: Visual field Humphrey, Fields Humphrey Left, Chi-square: 0.496, p-value: 0.481, Significant: No	7 (77.78%)	2 (22.22%)	61 (59.80%)	41 (40.20%)
Section: Refraction, Autorefractor, Chi-square: 0.005, p-value: 0.942, Significant: No	2 (22.22%)	7 (77.78%)	30 (29.41%)	72 (70.59%)
Section: Refraction, Current Rx, Chi-square: 23.418, p-value: 0.000, Significant: Yes	6 (66.67%)	3 (33.33%)	102 (100.00%)	0 (0.00%)
Section: Refraction, Retinoscopy, Chi-square: 0.249, p-value: 0.618, Significant: No	3 (33.33%)	6 (66.67%)	49 (48.04%)	53 (51.96%)
Section: Refraction, Subjective Findings, Chi-square: 4.340, p-value: 0.037, Significant: Yes	9 (100.00%)	0 (0.00%)	60 (58.82%)	42 (41.18%)

Table 18-2 - Normal vignette chi-square results

18.1.3 Normal Tension Glaucoma

The following section presents the results of the history and investigations chi-square test results of the Normal Tension Glaucoma vignette.

Section, Question/Investigation, Chi-square, p-value, Significance(α= 0.05)	Answered with guideline rec (Int)	Not answered with guideline rec (Int)	Answered without CDSS (Control)	Not answered without CDSS (Control)
Section: Symptoms, Reason for visit, Chi-square: 0.084, p-value: 0.771, Significant: No	13 (100.00%)	0 (0.00%)	98 (97.03%)	3 (2.97%)
Section: Symptoms, Do you experience flashing lights?, Chi-square: 1.652, p-value: 0.199, Significant: No	12 (92.31%)	1 (7.69%)	72 (71.29%)	29 (28.71%)
Section: Symptoms, Do you ever notice your eyes becoming red?, Chi-square: 5.880, p-value: 0.015, Significant: Yes	11 (84.62%)	2 (15.38%)	45 (44.55%)	56 (55.45%)
Section: Symptoms, Do you experience double vision?, Chi-square: 2.344, p-value: 0.126, Significant: No	12 (92.31%)	1 (7.69%)	68 (67.33%)	33 (32.67%)
Section: Symptoms, Do you ever get any pain or discomfort relating to your eyes?, Chi-square: 2.727, p-value: 0.099, Significant: No	12 (92.31%)	1 (7.69%)	66 (65.35%)	35 (34.65%)
Section: Symptoms, How is your near vision?, Chi-square: 0.331,	13 (100.00%)	0 (0.00%)	92 (91.09%)	9 (8.91%)

p-value: 0.565, Significant: No				
Section: Symptoms, Do you experience any headaches/suffer from migraines?, Chi-square: 0.000, p-value: 0.987, Significant: No	12 (92.31%)	1 (7.69%)	89 (88.12%)	12 (11.88%)
Section: Symptoms, How is your distance vision?, Chi-square: 0.059, p-value: 0.808, Significant: No	13 (100.00%)	0 (0.00%)	95 (94.06%)	6 (5.94%)
Section: Symptoms, Do you see any floaters in your vision?, Chi-square: 1.058, p-value: 0.304, Significant: No	12 (92.31%)	1 (7.69%)	76 (75.25%)	25 (24.75%)
Section: Symptoms, Do you wear spectacles?, Chi-square: 0.145, p-value: 0.703, Significant: No	9 (69.23%)	4 (30.77%)	60 (59.41%)	41 (40.59%)
Section: Medical History, How is your general health?, Chi-square: 0.084, p-value: 0.771, Significant: No	13 (100.00%)	0 (0.00%)	98 (97.03%)	3 (2.97%)
Section: Medical History, Do you have any allergies?, Chi-square: 3.369, p-value: 0.066, Significant: No	10 (76.92%)	3 (23.08%)	46 (45.54%)	55 (54.46%)
Section: Medical History, Do you have high blood pressure?, Chi-square: 5.624, p-value: 0.018, Significant: Yes	12 (92.31%)	1 (7.69%)	54 (53.47%)	47 (46.53%)
Section: Medical History, Are you diabetic?,	13 (100.00%)	0 (0.00%)	69 (68.32%)	32 (31.68%)

Chi-square: 4.264, p-value: 0.039, Significant: Yes				
Section: Medical History, Do you take any medication on regular basis?, Chi-square: 0.084, p-value: 0.771, Significant: No	13 (100.00%)	0 (0.00%)	98 (97.03%)	3 (2.97%)
Section: Ocular History, Have you ever been told you have lazy eye?, Chi-square: 1.726, p-value: 0.189, Significant: No	9 (69.23%)	4 (30.77%)	46 (45.54%)	55 (54.46%)
Section: Ocular History, Do you have Glaucoma?, Chi-square: 2.533, p-value: 0.112, Significant: No	12 (92.31%)	1 (7.69%)	67 (66.34%)	34 (33.66%)
Section: Ocular History, Have you ever had any other eye injuries/infections/surgeries?, Chi-square: 0.331, p-value: 0.565, Significant: No	13 (100.00%)	0 (0.00%)	92 (91.09%)	9 (8.91%)
Section: Ocular History, Have you ever attended an eye hospital?, Chi-square: 0.695, p-value: 0.404, Significant: No	13 (100.00%)	0 (0.00%)	89 (88.12%)	12 (11.88%)
Section: Family History, Is there a family history of eye disease?, Chi-square: 0.034, p-value: 0.854, Significant: No	12 (92.31%)	1 (7.69%)	87 (86.14%)	14 (13.86%)
Section: Family History, Is there a family history of Glaucoma?, Chi-square: 0.005,	13 (100.00%)	0 (0.00%)	97 (96.04%)	4 (3.96%)

p-value: 0.944, Significant: No				
Section: Family History, Is there a family history of diabetes?, Chi-square: 0.680, p-value: 0.410, Significant: No	12 (92.31%)	1 (7.69%)	79 (78.22%)	22 (21.78%)
Section: Family History, Anything else you wish to tell me regarding your eyes or vision?, Chi-square: 0.029, p-value: 0.865, Significant: No	10 (76.92%)	3 (23.08%)	84 (83.17%)	17 (16.83%)
Section: General History, Hobbies, Chi-square: 1.620, p-value: 0.203, Significant: No	11 (84.62%)	2 (15.38%)	63 (62.38%)	38 (37.62%)
Section: General History, Last eye examination, Chi-square: 0.460, p-value: 0.498, Significant: No	11 (84.62%)	2 (15.38%)	95 (94.06%)	6 (5.94%)
Section: General History, Smoker, Chi-square: 5.061, p-value: 0.024, Significant: Yes	12 (92.31%)	1 (7.69%)	56 (55.45%)	45 (44.55%)
Section: General History, Driver, Chi-square: 0.268, p-value: 0.605, Significant: No	12 (92.31%)	1 (7.69%)	93 (92.08%)	8 (7.92%)
Section: General History, VDU, Chi-square: 0.680, p-value: 0.410, Significant: No	12 (92.31%)	1 (7.69%)	79 (78.22%)	22 (21.78%)
Section: General History, Occupation, Chi-square: 0.107,	11 (84.62%)	2 (15.38%)	77 (76.24%)	24 (23.76%)

p-value: 0.744, Significant: No				
Section: OMB Habitual, Accommodation BIN, Chi-square: 4.543, p-value: 0.033, Significant: Yes	2 (15.38%)	11 (84.62%)	1 (0.99%)	100 (99.01%)
Section: OMB Habitual, Accommodation Left Eye, Chi-square: 1.790, p-value: 0.181, Significant: No	2 (15.38%)	11 (84.62%)	3 (2.97%)	98 (97.03%)
Section: OMB Habitual, Accommodation Right Eye, Chi-square: 1.790, p-value: 0.181, Significant: No	2 (15.38%)	11 (84.62%)	3 (2.97%)	98 (97.03%)
Section: OMB Habitual, Confrontation, Chi-square: 6.946, p-value: 0.008, Significant: Yes	6 (46.15%)	7 (53.85%)	13 (12.87%)	88 (87.13%)
Section: OMB Habitual, Cover test Distance, Chi-square: 1.198, p-value: 0.274, Significant: No	12 (92.31%)	1 (7.69%)	75 (74.26%)	26 (25.74%)
Section: OMB Habitual, Motility, Chi-square: 1.726, p-value: 0.189, Significant: No	9 (69.23%)	4 (30.77%)	46 (45.54%)	55 (54.46%)
Section: OMB Habitual, NPC, Chi-square: 4.245, p-value: 0.039, Significant: Yes	7 (53.85%)	6 (46.15%)	23 (22.77%)	78 (77.23%)
Section: OMB Habitual, Cover test Near, Chi-square: 3.801, p-value: 0.051, Significant: No	12 (92.31%)	1 (7.69%)	61 (60.40%)	40 (39.60%)

Section: OMB Habitual, PD, Chi-square: 5.137, p-value: 0.023, Significant: Yes	9 (69.23%)	4 (30.77%)	33 (32.67%)	68 (67.33%)
Section: OMB New Rx, Cover test Distance, Chi-square: 5.774, p-value: 0.016, Significant: Yes	10 (76.92%)	3 (23.08%)	38 (37.62%)	63 (62.38%)
Section: OMB New Rx, Cover test Near, Chi-square: 5.774, p-value: 0.016, Significant: Yes	10 (76.92%)	3 (23.08%)	38 (37.62%)	63 (62.38%)
Section: OMB New Rx, Fixation Disparity Distance, Chi-square: 8.881, p-value: 0.003, Significant: Yes	7 (53.85%)	6 (46.15%)	15 (14.85%)	86 (85.15%)
Section: OMB New Rx, Fixation Disparity Near, Chi-square: 12.824, p-value: 0.000, Significant: Yes	8 (61.54%)	5 (38.46%)	15 (14.85%)	86 (85.15%)
Section: Anterior Exam 1, Right Eye van Herick, Chi-square: 10.390, p-value: 0.001, Significant: Yes	12 (92.31%)	1 (7.69%)	41 (40.59%)	60 (59.41%)
Section: Anterior Exam 1, Left Eye van Herick, Chi-square: 9.939, p-value: 0.002, Significant: Yes	12 (92.31%)	1 (7.69%)	42 (41.58%)	59 (58.42%)
Section: Anterior Exam 2, Shafers Sign, Chi-square: 4.631, p-value: 0.031, Significant: Yes	8 (61.54%)	5 (38.46%)	28 (27.72%)	73 (72.28%)
Section: Anterior Exam 2, Tears, Chi-square: 3.292,	8 (61.54%)	5 (38.46%)	32 (31.68%)	69 (68.32%)

p-value: 0.070, Significant: No				
Section: Anterior Exam 2, Lens, Chi-square: 0.161, p-value: 0.688, Significant: No	11 (84.62%)	2 (15.38%)	76 (75.25%)	25 (24.75%)
Section: Anterior Exam 2, Pupils, Chi-square: 2.074, p-value: 0.150, Significant: No	13 (100.00%)	0 (0.00%)	80 (79.21%)	21 (20.79%)
Section: Ophthalmoscopy, Periphery, Chi-square: 0.017, p-value: 0.896, Significant: No	10 (76.92%)	3 (23.08%)	75 (74.26%)	26 (25.74%)
Section: Ophthalmoscopy, AV Ratio Left, Chi-square: 1.416, p-value: 0.234, Significant: No	13 (100.00%)	0 (0.00%)	84 (83.17%)	17 (16.83%)
Section: Ophthalmoscopy, CD Right, Chi-square: 0.829, p-value: 0.362, Significant: No	13 (100.00%)	0 (0.00%)	88 (87.13%)	13 (12.87%)
Section: Ophthalmoscopy, AV Ratio Right, Chi-square: 1.113, p-value: 0.291, Significant: No	13 (100.00%)	0 (0.00%)	86 (85.15%)	15 (14.85%)
Section: Ophthalmoscopy, Vitreous, Chi-square: 0.427, p-value: 0.513, Significant: No	7 (53.85%)	6 (46.15%)	68 (67.33%)	33 (32.67%)
Section: Ophthalmoscopy, Macula Left, Chi-square: 0.008, p-value: 0.931, Significant: No	12 (92.31%)	1 (7.69%)	88 (87.13%)	13 (12.87%)

Section: Ophthalmoscopy, ISNT Left, Chi-square: 0.799, p-value: 0.371, Significant: No	12 (92.31%)	1 (7.69%)	78 (77.23%)	23 (22.77%)
Section: Ophthalmoscopy, Macula Right, Chi-square: 0.076, p-value: 0.783, Significant: No	12 (92.31%)	1 (7.69%)	86 (85.15%)	15 (14.85%)
Section: Ophthalmoscopy, CD Left, Chi-square: 0.829, p-value: 0.362, Significant: No	13 (100.00%)	0 (0.00%)	88 (87.13%)	13 (12.87%)
Section: Ophthalmoscopy, ISNT Right, Chi-square: 0.680, p-value: 0.410, Significant: No	12 (92.31%)	1 (7.69%)	79 (78.22%)	22 (21.78%)
Section: Amsler grid, Amsler, Chi-square: 0.107, p-value: 0.744, Significant: No	3 (23.08%)	10 (76.92%)	23 (22.77%)	78 (77.23%)
Section: Colour vision, Colour Vision City, Chi-square: 1.790, p-value: 0.181, Significant: No	2 (15.38%)	11 (84.62%)	3 (2.97%)	98 (97.03%)
Section: Colour vision, Colour Vision Ishihara, Chi-square: 2.433, p-value: 0.119, Significant: No	4 (30.77%)	9 (69.23%)	11 (10.89%)	90 (89.11%)
Section: Colour vision, Colour Vision Other, Chi-square: 0.084, p-value: 0.771, Significant: No	1 (7.69%)	12 (92.31%)	2 (1.98%)	99 (98.02%)
Section: IOP GAT, IOP Contact, Chi-square: 8.549,	11 (84.62%)	2 (15.38%)	38 (37.62%)	63 (62.38%)

p-value: 0.003, Significant: Yes				
Section: IOP NCT, IOP NCT Right Eye Reading 4, Chi-square: 0.034, p-value: 0.854, Significant: No	2 (15.38%)	11 (84.62%)	13 (12.87%)	88 (87.13%)
Section: IOP NCT, IOP NCT Right Eye Reading 2, Chi-square: 9.959, p-value: 0.002, Significant: Yes	2 (15.38%)	11 (84.62%)	66 (65.35%)	35 (34.65%)
Section: IOP NCT, IOP NCT Left Eye Reading 4, Chi-square: 0.034, p-value: 0.854, Significant: No	2 (15.38%)	11 (84.62%)	13 (12.87%)	88 (87.13%)
Section: IOP NCT, IOP NCT Left Eye Reading 3, Chi-square: 4.383, p-value: 0.036, Significant: Yes	2 (15.38%)	11 (84.62%)	51 (50.50%)	50 (49.50%)
Section: IOP NCT, IOP NCT Left Eye Reading 2, Chi-square: 9.959, p-value: 0.002, Significant: Yes	2 (15.38%)	11 (84.62%)	66 (65.35%)	35 (34.65%)
Section: IOP NCT, IOP NCT Left Eye Reading 1, Chi-square: 18.196, p-value: 0.000, Significant: Yes	2 (15.38%)	11 (84.62%)	78 (77.23%)	23 (22.77%)
Section: IOP NCT, IOP NCT Right Eye Reading 1, Chi-square: 18.196,	2 (15.38%)	11 (84.62%)	78 (77.23%)	23 (22.77%)

p-value: 0.000, Significant: Yes				
Section: IOP NCT, IOP NCT Right Eye Reading 3, Chi-square: 4.383, p-value: 0.036, Significant: Yes	2 (15.38%)	11 (84.62%)	51 (50.50%)	50 (49.50%)
Section: Stereopsis, Stereopsis Frisby, Chi-square: 1.488, p-value: 0.223, Significant: No	0 (0.00%)	13 (100.00%)	1 (0.99%)	100 (99.01%)
Section: Stereopsis, Stereopsis Lang, Chi-square: 1.488, p-value: 0.223, Significant: No	0 (0.00%)	13 (100.00%)	1 (0.99%)	100 (99.01%)
Section: Stereopsis, Stereopsis Other, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	13 (100.00%)	0 (0.00%)	101 (100.00%)
Section: Stereopsis, Stereopsis Randot, Chi-square: None, p-value: None, Significant: Not done	0 (0.00%)	13 (100.00%)	0 (0.00%)	101 (100.00%)
Section: Stereopsis, Stereopsis TNO, Chi-square: 1.488, p-value: 0.223, Significant: No	0 (0.00%)	13 (100.00%)	1 (0.99%)	100 (99.01%)
Section: Stereopsis, Stereopsis Titmus, Chi-square: 1.159, p-value: 0.282, Significant: No	2 (15.38%)	11 (84.62%)	4 (3.96%)	97 (96.04%)
Section: Visual field Henson, Fields Henson, Chi-square: 1.784,	2 (15.38%)	11 (84.62%)	39 (38.61%)	62 (61.39%)

p-value: 0.182, Significant: No				
Section: Visual field Humphrey, Fields Humphrey Left, Chi-square: 3.573, p-value: 0.059, Significant: No	12 (92.31%)	1 (7.69%)	62 (61.39%)	39 (38.61%)
Section: Visual field Humphrey, Fields Humphrey Right, Chi-square: 4.038, p-value: 0.044, Significant: Yes	12 (92.31%)	1 (7.69%)	60 (59.41%)	41 (40.59%)
Section: Refraction, Autorefractor, Chi-square: 0.532, p-value: 0.466, Significant: No	6 (46.15%)	7 (53.85%)	32 (31.68%)	69 (68.32%)
Section: Refraction, Current Rx, Chi-square: 8.149, p-value: 0.004, Significant: Yes	11 (84.62%)	2 (15.38%)	101 (100.00%)	0 (0.00%)
Section: Refraction, Retinoscopy, Chi-square: 0.018, p-value: 0.893, Significant: No	7 (53.85%)	6 (46.15%)	48 (47.52%)	53 (52.48%)
Section: Refraction, Subjective Findings, Chi-square: 5.624, p-value: 0.018, Significant: Yes	12 (92.31%)	1 (7.69%)	54 (53.47%)	47 (46.53%)

Table 18-3 - NTG vignette chi-square results

18.1.4   AMD

The following section presents the results of the history and investigations chi-square test results of the AMD vignette.

Section, Question/Investigation, Chi-square, p-value, Significance(α= 0.05)	Answered with guideline rec (Int)	Not answered with guideline rec (Int)	Answered without CDSS (Control)	Not answered without CDSS (Control)
Section: Symptoms, Do you ever notice your eyes becoming red?, Chi-square: 0.308, p-value: 0.579, Significant: No	11 (78.57%)	3 (21.43%)	88 (88.00%)	12 (12.00%)
Section: Symptoms, Reason for visit, Chi-square: 0.951, p-value: 0.329, Significant: No	12 (85.71%)	2 (14.29%)	96 (96.00%)	4 (4.00%)
Section: Symptoms, Do you experience any headaches/suffer from migraines?, Chi-square: 1.485, p-value: 0.223, Significant: No	13 (92.86%)	1 (7.14%)	74 (74.00%)	26 (26.00%)
Section: Symptoms, Do you see any floaters in your vision?, Chi-square: 2.189, p-value: 0.139, Significant: No	13 (92.86%)	1 (7.14%)	70 (70.00%)	30 (30.00%)
Section: Symptoms, How old are your spectacles?, Chi-square: 0.407, p-value: 0.523, Significant: No	13 (92.86%)	1 (7.14%)	82 (82.00%)	18 (18.00%)
Section: Symptoms, Do you wear spectacles all the time?, Chi-square: 0.887,	13 (92.86%)	1 (7.14%)	78 (78.00%)	22 (22.00%)

p-value: 0.346, Significant: No				
Section: Symptoms, Do you experience double vision?, Chi-square: 0.407, p-value: 0.523, Significant: No	13 (92.86%)	1 (7.14%)	82 (82.00%)	18 (18.00%)
Section: Symptoms, Do you ever get any pain or discomfort relating to your eyes?, Chi-square: 6.133, p-value: 0.013, Significant: Yes	13 (92.86%)	1 (7.14%)	54 (54.00%)	46 (46.00%)
Section: Symptoms, Do you experience flashing lights?, Chi-square: 2.178, p-value: 0.140, Significant: No	11 (78.57%)	3 (21.43%)	94 (94.00%)	6 (6.00%)
Section: Medical History, Are you diabetic?, Chi-square: 6.657, p-value: 0.010, Significant: Yes	14 (100.00%)	0 (0.00%)	61 (61.00%)	39 (39.00%)
Section: Medical History, Do you have high blood pressure?, Chi-square: 12.757, p-value: 0.000, Significant: Yes	14 (100.00%)	0 (0.00%)	45 (45.00%)	55 (55.00%)
Section: Medical History, Do you have any allergies?, Chi-square: 3.550, p-value: 0.060, Significant: No	10 (71.43%)	4 (28.57%)	92 (92.00%)	8 (8.00%)
Section: Medical History, How is your general health?, Chi-square: 2.934, p-value: 0.087, Significant: No	14 (100.00%)	0 (0.00%)	76 (76.00%)	24 (24.00%)

Section: Medical History, Do you take any medication on a regular basis?, Chi-square: 0.183, p-value: 0.669, Significant: No	14 (100.00%)	0 (0.00%)	93 (93.00%)	7 (7.00%)
Section: Ocular History, Have you ever been told you have lazy eye?, Chi-square: 2.897, p-value: 0.089, Significant: No	12 (85.71%)	2 (14.29%)	58 (58.00%)	42 (42.00%)
Section: Ocular History, Have you ever had any other eye injuries/infections/surgeries?, Chi-square: 5.525, p-value: 0.019, Significant: Yes	13 (92.86%)	1 (7.14%)	56 (56.00%)	44 (44.00%)
Section: Ocular History, Have you ever attended an eye hospital?, Chi-square: 1.652, p-value: 0.199, Significant: No	13 (92.86%)	1 (7.14%)	73 (73.00%)	27 (27.00%)
Section: Ocular History, Do you have Glaucoma?, Chi-square: 0.002, p-value: 0.968, Significant: No	11 (78.57%)	3 (21.43%)	74 (74.00%)	26 (26.00%)
Section: Family History, Any other eye problems in the family?, Chi-square: 1.971, p-value: 0.160, Significant: No	14 (100.00%)	0 (0.00%)	81 (81.00%)	19 (19.00%)
Section: Family History, Anything else you wish to tell me regarding your eyes or vision?, Chi-square: 0.075, p-value: 0.784, Significant: No	13 (92.86%)	1 (7.14%)	91 (91.00%)	9 (9.00%)

Section: Family History, Is there a family history of diabetes?, Chi-square: 0.174, p-value: 0.676, Significant: No	13 (92.86%)	1 (7.14%)	92 (92.00%)	8 (8.00%)
Section: Family History, Is there a family history of Glaucoma?, Chi-square: 1.448, p-value: 0.229, Significant: No	14 (100.00%)	0 (0.00%)	84 (84.00%)	16 (16.00%)
Section: General History, Hobbies, Chi-square: 0.306, p-value: 0.580, Significant: No	13 (92.86%)	1 (7.14%)	99 (99.00%)	1 (1.00%)
Section: General History, Smoker, Chi-square: 5.522, p-value: 0.019, Significant: Yes	14 (100.00%)	0 (0.00%)	65 (65.00%)	35 (35.00%)
Section: General History, Driver, Chi-square: 4.744, p-value: 0.029, Significant: Yes	14 (100.00%)	0 (0.00%)	68 (68.00%)	32 (32.00%)
Section: General History, Last eye examination, Chi-square: 0.183, p-value: 0.669, Significant: No	14 (100.00%)	0 (0.00%)	93 (93.00%)	7 (7.00%)
Section: General History, VDU, Chi-square: 0.544, p-value: 0.461, Significant: No	10 (71.43%)	4 (28.57%)	57 (57.00%)	43 (43.00%)
Section: General History, Occupation, Chi-square: 1.896, p-value: 0.168, Significant: No	12 (85.71%)	2 (14.29%)	63 (63.00%)	37 (37.00%)

Section: OMB Habitual, Accommodation BIN, Chi-square: 2.785, p-value: 0.095, Significant: No	1 (7.14%)	13 (92.86%)	33 (33.00%)	67 (67.00%)
Section: OMB Habitual, Accommodation Left Eye, Chi-square: 2.447, p-value: 0.118, Significant: No	2 (14.29%)	12 (85.71%)	2 (2.00%)	98 (98.00%)
Section: OMB Habitual, Accommodation Right Eye, Chi-square: 0.951, p-value: 0.329, Significant: No	2 (14.29%)	12 (85.71%)	4 (4.00%)	96 (96.00%)
Section: OMB Habitual, Confrontation, Chi-square: 7.049, p-value: 0.008, Significant: Yes	10 (71.43%)	4 (28.57%)	31 (31.00%)	69 (69.00%)
Section: OMB Habitual, Cover test Distance, Chi-square: 1.563, p-value: 0.211, Significant: No	11 (78.57%)	3 (21.43%)	57 (57.00%)	43 (43.00%)
Section: OMB Habitual, Motility, Chi-square: 40.064, p-value: 0.000, Significant: Yes	13 (92.86%)	1 (7.14%)	13 (13.00%)	87 (87.00%)
Section: OMB Habitual, NPC, Chi-square: 2.397, p-value: 0.122, Significant: No	4 (28.57%)	10 (71.43%)	10 (10.00%)	90 (90.00%)
Section: OMB Habitual, Cover test Near, Chi-square: 4.888, p-value: 0.027, Significant: Yes	11 (78.57%)	3 (21.43%)	43 (43.00%)	57 (57.00%)
Section: OMB Habitual, PD, Chi-square: 31.589,	9 (64.29%)	5 (35.71%)	6 (6.00%)	94 (94.00%)

p-value: 0.000, Significant: Yes				
Section: OMB New Rx, Cover test Distance, Chi-square: 29.787, p-value: 0.000, Significant: Yes	11 (78.57%)	3 (21.43%)	12 (12.00%)	88 (88.00%)
Section: OMB New Rx, Cover test Near, Chi-square: 29.787, p-value: 0.000, Significant: Yes	11 (78.57%)	3 (21.43%)	12 (12.00%)	88 (88.00%)
Section: OMB New Rx, Fixation Disparity Distance, Chi-square: 15.140, p-value: 0.000, Significant: Yes	4 (28.57%)	10 (71.43%)	81 (81.00%)	19 (19.00%)
Section: OMB New Rx, Fixation Disparity Near, Chi-square: 11.258, p-value: 0.001, Significant: Yes	5 (35.71%)	9 (64.29%)	81 (81.00%)	19 (19.00%)
Section: Anterior Exam 1, Right Eye van Herick, Chi-square: 21.669, p-value: 0.000, Significant: Yes	14 (100.00%)	0 (0.00%)	31 (31.00%)	69 (69.00%)
Section: Anterior Exam 1, Left Eye van Herick, Chi-square: 20.852, p-value: 0.000, Significant: Yes	14 (100.00%)	0 (0.00%)	32 (32.00%)	68 (68.00%)
Section: Anterior Exam 2, Tears, Chi-square: 11.030, p-value: 0.001, Significant: Yes	10 (71.43%)	4 (28.57%)	24 (24.00%)	76 (76.00%)
Section: Anterior Exam 2, Pupils, Chi-square: 1.618, p-value: 0.203, Significant: No	14 (100.00%)	0 (0.00%)	83 (83.00%)	17 (17.00%)

Section: Anterior Exam 2, Shafers Sign, Chi-square: 1.385, p-value: 0.239, Significant: No	8 (57.14%)	6 (42.86%)	76 (76.00%)	24 (24.00%)
Section: Anterior Exam 2, Lens, Chi-square: 0.000, p-value: 0.989, Significant: No	14 (100.00%)	0 (0.00%)	96 (96.00%)	4 (4.00%)
Section: Ophthalmoscopy, CD Left, Chi-square: 0.001, p-value: 0.980, Significant: No	13 (92.86%)	1 (7.14%)	89 (89.00%)	11 (11.00%)
Section: Ophthalmoscopy, CD Right, Chi-square: 0.001, p-value: 0.980, Significant: No	13 (92.86%)	1 (7.14%)	89 (89.00%)	11 (11.00%)
Section: Ophthalmoscopy, AV Ratio Right, Chi-square: 1.971, p-value: 0.160, Significant: No	14 (100.00%)	0 (0.00%)	81 (81.00%)	19 (19.00%)
Section: Ophthalmoscopy, Vitreous, Chi-square: 3.216, p-value: 0.073, Significant: No	13 (92.86%)	1 (7.14%)	65 (65.00%)	35 (35.00%)
Section: Ophthalmoscopy, Periphery, Chi-square: 1.552, p-value: 0.213, Significant: No	12 (85.71%)	2 (14.29%)	65 (65.00%)	35 (35.00%)
Section: Ophthalmoscopy, Macula Left, Chi-square: 12.757, p-value: 0.000, Significant: Yes	14 (100.00%)	0 (0.00%)	45 (45.00%)	55 (55.00%)
Section: Ophthalmoscopy, ISNT Right, Chi-square: 1.824,	13 (92.86%)	1 (7.14%)	72 (72.00%)	28 (28.00%)

p-value: 0.177, Significant: No				
Section: Ophthalmoscopy, ISNT Left, Chi-square: 2.003, p-value: 0.157, Significant: No	13 (92.86%)	1 (7.14%)	71 (71.00%)	29 (29.00%)
Section: Ophthalmoscopy, Macula Right, Chi-square: 0.036, p-value: 0.849, Significant: No	13 (92.86%)	1 (7.14%)	87 (87.00%)	13 (13.00%)
Section: Ophthalmoscopy, AV Ratio Left, Chi-square: 1.971, p-value: 0.160, Significant: No	14 (100.00%)	0 (0.00%)	81 (81.00%)	19 (19.00%)
Section: Amsler grid, Amsler, Chi-square: 0.887, p-value: 0.346, Significant: No	13 (92.86%)	1 (7.14%)	78 (78.00%)	22 (22.00%)
Section: Colour vision, Colour Vision City, Chi-square: 29.322, p-value: 0.000, Significant: Yes	5 (35.71%)	9 (64.29%)	0 (0.00%)	100 (100.00%)
Section: Colour vision, Colour Vision Ishihara, Chi-square: 21.773, p-value: 0.000, Significant: Yes	4 (28.57%)	10 (71.43%)	0 (0.00%)	100 (100.00%)
Section: Colour vision, Colour Vision Other, Chi-square: 14.439, p-value: 0.000, Significant: Yes	3 (21.43%)	11 (78.57%)	0 (0.00%)	100 (100.00%)
Section: IOP GAT, IOP Contact, Chi-square: 0.177, p-value: 0.674, Significant: No	3 (21.43%)	11 (78.57%)	31 (31.00%)	69 (69.00%)

Section: IOP NCT, IOP NCT Left Eye Reading 2, Chi-square: 0.000, p-value: 0.988, Significant: No	6 (42.86%)	8 (57.14%)	39 (39.00%)	61 (61.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 4, Chi-square: 8.423, p-value: 0.004, Significant: Yes	5 (35.71%)	9 (64.29%)	77 (77.00%)	23 (23.00%)
Section: IOP NCT, IOP NCT Left Eye Reading 3, Chi-square: 9.535, p-value: 0.002, Significant: Yes	6 (42.86%)	8 (57.14%)	9 (9.00%)	91 (91.00%)
Section: IOP NCT, IOP NCT Left Eye Reading 1, Chi-square: 1.707, p-value: 0.191, Significant: No	6 (42.86%)	8 (57.14%)	65 (65.00%)	35 (35.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 1, Chi-square: 1.707, p-value: 0.191, Significant: No	6 (42.86%)	8 (57.14%)	65 (65.00%)	35 (35.00%)
Section: IOP NCT, IOP NCT Left Eye Reading 4, Chi-square: 0.198, p-value: 0.657, Significant: No	5 (35.71%)	9 (64.29%)	26 (26.00%)	74 (74.00%)
Section: IOP NCT, IOP NCT Right Eye Reading 3, Chi-square: 8.434, p-value: 0.004, Significant: Yes	6 (42.86%)	8 (57.14%)	10 (10.00%)	90 (90.00%)

Section: IOP NCT, IOP NCT Right Eye Reading 2, Chi-square: 0.008, p-value: 0.931, Significant: No	6 (42.86%)	8 (57.14%)	40 (40.00%)	60 (60.00%)
Section: Stereopsis, Stereopsis Frisby, Chi-square: 0.306, p-value: 0.580, Significant: No	0 (0.00%)	14 (100.00%)	2 (2.00%)	98 (98.00%)
Section: Stereopsis, Stereopsis Frisby, Chi-square: 0.055, p-value: 0.815, Significant: No	0 (0.00%)	14 (100.00%)	3 (3.00%)	97 (97.00%)
Section: Stereopsis, Stereopsis Other, Chi-square: 2.342, p-value: 0.126, Significant: No	0 (0.00%)	14 (100.00%)	21 (21.00%)	79 (79.00%)
Section: Stereopsis, Stereopsis Randot, Chi-square: 0.290, p-value: 0.590, Significant: No	0 (0.00%)	14 (100.00%)	8 (8.00%)	92 (92.00%)
Section: Stereopsis, Stereopsis TNO, Chi-square: 1.332, p-value: 0.248, Significant: No	0 (0.00%)	14 (100.00%)	1 (1.00%)	99 (99.00%)
Section: Stereopsis, Stereopsis Titmus, Chi-square: 0.306, p-value: 0.580, Significant: No	0 (0.00%)	14 (100.00%)	2 (2.00%)	98 (98.00%)
Section: Visual field Henson, Fields Henson, Chi-square: 5.813, p-value: 0.016, Significant: Yes	5 (35.71%)	9 (64.29%)	72 (72.00%)	28 (28.00%)
Section: Visual field Humphrey,	2 (14.29%)	12 (85.71%)	38 (38.00%)	62 (62.00%)

Fields Humphrey Right, Chi-square: 2.080, p-value: 0.149, Significant: No				
Section: Visual field Humphrey, Fields Humphrey Left, Chi-square: 2.897, p-value: 0.089, Significant: No	2 (14.29%)	12 (85.71%)	42 (42.00%)	58 (58.00%)
Section: Refraction, Autorefractor, Chi-square: 0.733, p-value: 0.392, Significant: No	5 (35.71%)	9 (64.29%)	52 (52.00%)	48 (48.00%)
Section: Refraction, Current Rx, Chi-square: 0.146, p-value: 0.703, Significant: No	13 (92.86%)	1 (7.14%)	85 (85.00%)	15 (15.00%)
Section: Refraction, Retinoscopy, Chi-square: 0.405, p-value: 0.525, Significant: No	11 (78.57%)	3 (21.43%)	66 (66.00%)	34 (34.00%)
Section: Refraction, Subjective Findings, Chi-square: 2.342, p-value: 0.126, Significant: No	14 (100.00%)	0 (0.00%)	79 (79.00%)	21 (21.00%)

Table 18-4 - AMD vignette chi-square results

19 Appendix 19

19.1 Chapter 4 Optometry study: Guideline recommendations

The following section outline the guideline recommendations in each section of each vignette in Chapter 4 Optometry study.

Vignette	Section	Guideline recommendation	Source of guideline
OHT			
OHT	Family History	It is advised that all patients with age > 40 be enquired about their Family History of Glaucoma as well.	Examining patients at risk from glaucoma-the college of optometrists
OHT	Anterior Eye Exam 1	Assessment of the anterior eye and angle (e.g. by slit lamp van Herick technique) is advisable for all patients suspected of having glaucoma. The Van Herick grading is a fundamental part of any comprehensive eye examination. Grade 0 represents iridocorneal contact. The space between iris and corneal epithelium of < 1/4 corneal thickness, is a Grade I. When the space is >= 1/4 and < 1/2 corneal thickness the Grade is II. A Grade III is considered not occludable, with an irido/epithelial distance >= 1/2 corneal thickness. This technique is based on the use of corneal thickness as a unit measure of the depth	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

		of the anterior chamber at the furthest periphery. This method is very useful if a goniolens is not available.	
OHT	Ophthalmoscopy	Patient has Age > 40, and therefore has greater than average risk of Glaucoma. Assessment of the optic nerve head would include: -assessing the size of the disc, -cup/disc ratio, -presence of any asymmetry between the two eyes, -colour and width of the neuro-retinal rims especially superiorly and inferiorly, -and unusual features such as notching, disc haemorrhage etc. Cup/disc ratios can be assessed according to grading scales.	Examining patients at risk from glaucoma- the college of optometrists
OHT	IOP	CHOOSE THE IOP TEST THAT YOU FEEL IS BEST SUITED FOR THIS PATIENT -Eye pressure is measured in millimeters of mercury (mm Hg). -Normal eye pressure ranges from 12-21 mm Hg, and eye pressure of greater than 21 mm Hg is considered higher than normal. Non-contact applanation tonometry is acceptable for screening but good	Examining patients at risk from glaucoma- the college of optometrists

OHT	IOP GAT	practice would suggest that equivocal results be followed up with contact applanation tonometry	
OHT	IOP GAT	When referring a patient on IOP grounds alone, Goldmann applanation tonometry (or Perkins tonometry) is regarded as offering greater accuracy. Goldmann applanation tonometry (slit lamp mounted) is the reference standard in IOP measurement	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
OHT	IOP GAT	If practitioners find during the eye examination that a patient records an intraocular pressure (IOP) of >21mmHg and/or suspicious optic discs, then central visual field assessment may provide useful diagnostic information	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
OHT	IOP NCT	Before considering referral, practitioners should take four readings per eye and use the mean as the result. Only when the mean result is > 21 mmHg should the practitioner consider referring the patient for further assessment if this is the only abnormality found.	Examining patients at risk from glaucoma-the college of optometrists
OHT	IOP NCT	THERE ARE TWO POSITIVE RISK FACTORS FOR	Examining patients at risk from glaucoma-

		GLAUCOMA IN THIS PATIENT:- Family History of Glaucoma and IOP >21mmHg .-When referring a patient on IOP grounds alone, Goldmann applanation tonometry (or Perkins tonometry) is regarded as offering greater accuracy.-Goldmann applanation tonometry (slit lamp mounted) is the reference standard in IOP measurement.	the college of optometrists
OHT	Visual Field Henson	ASSESSSING A SINGLE FIELD. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings. Such defects often need confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	Terminology and guidelines for glaucoma-3rd edition- european glaucoma society
OHT	Visual Field Humphrey	ASSESSSING A SINGLE FIELD. A good approach is to	Terminology and guidelines for glaucoma-3rd edition-

		look at pattern deviation probability maps. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings. Such defects often need confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	european glaucoma society
OHT	OHT Management	GUIDELINE ALERT FOR OHT PATIENTS !! Patients aged 65 and over with IOPs of < 25mmHg and with otherwise normal ocular examinations (normal discs, fields and Van Herick) do not qualify for treatment under current NICE guidance. Practitioners may consider not referring such patients since they are at low risk of significant visual field loss in their lifetime. These patients may be advised that they	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists

		should be reviewed by a community optometrist every 12 months	
OHT	POAG Management	GUIDELINE ALERT FOR POAG PATIENTS !! Refer patient routinely to an Ophthalmologist	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
OHT	Normal repeat Management	Guideline Alert for "Normal, repeat tests" patients !!. No findings suggestive of ocular pathology has been recorded. Suggest routine review of patient. Repeat tests if required.	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
OHT	Normal no referral Management	Guideline Alert for "Normal patient and no referral required" patients !!. Patients should only be referred if the optometrist identifies one or more of the following: a. There are optic disc signs consistent with glaucoma in either eye. b. The IOP in either eye exceeds 21mmHg (note referral in specific scenarios below). c. A visual field defect consistent with glaucoma is detected in either eye. d. A narrow anterior drainage angle on van Herick testing consistent with a	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists

		significant risk of acute angle closure within the foreseeable future.	
Normal			
Normal	Family History	It is advised that all patients with age > 40 be enquired about their Family History of Glaucoma as well.	Examining patients at risk from glaucoma-the college of optometrists
Normal	Anterior Eye Exam 1	Assessment of the anterior eye and angle (e.g. by slit lamp van Herick technique) is advisable for all patients suspected of having glaucoma. The Van Herick grading is a fundamental part of any comprehensive eye examination. Grade 0 represents iridocorneal contact. The space between iris and corneal epithelium of < 1/4 corneal thickness, is a Grade I. When the space is >= 1/4 and < 1/2 corneal thickness the Grade is II. A Grade III is considered not occludable, with an irido/epithelial distance >= 1/2 corneal thickness. This technique is based on the use of corneal thickness as a unit measure of the depth of the anterior chamber at the furthest periphery. This method is very useful if a goniolens is not available.	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

Normal	Ophthalmoscopy	Patient has Age > 40, and therefore has greater than average risk of Glaucoma. Assessment of the optic nerve head would include: -assessing the size of the disc, -cup/disc ratio, -presence of any asymmetry between the two eyes, -colour and width of the neuro-retinal rims especially superiorly and inferiorly, -and unusual features such as notching, disc haemorrhage etc. Cup/disc ratios can be assessed according to grading scales.	Examining patients at risk from glaucoma-the college of optometrists
Normal	IOP	CHOOSE THE IOP TEST THAT YOU FEEL IS BEST SUITED FOR THIS PATIENT -Eye pressure is measured in millimeters of mercury (mm Hg). -Normal eye pressure ranges from 12-21 mm Hg, and eye pressure of greater than 21 mm Hg is considered higher than normal. Non-contact applanation tonometry is acceptable for screening but good practice would suggest that equivocal results be followed up with contact applanation tonometry	Examining patients at risk from glaucoma-the college of optometrists

Normal	IOP GAT	When referring a patient on IOP grounds alone, Goldmann applanation tonometry (or Perkins tonometry) is regarded as offering greater accuracy. Goldmann applanation tonometry (slit lamp mounted) is the reference standard in IOP measurement	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
Normal	IOP NCT	Before considering referral, practitioners should take four readings per eye and use the mean as the result. Only when the mean result is > 21 mmHg should the practitioner consider referring the patient for further assessment if this is the only abnormality found.	Examining patients at risk from glaucoma-the college of optometrists
Normal	Visual Field Henson	ASSESSSING A SINGLE FIELD. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings. Such defects often need	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

Normal	Visual Field Humphrey	ASSESSSING A SINGLE FIELD. A good approach is to look at pattern deviation probability maps. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings.Such defects often need confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society
		confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	
Normal	Normal repeat Management	Guideline Alert for "Normal, repeat tests" patients !!. No findings suggestive of ocular pathology has been recorded. Suggest routine review of patient. Repeat tests if required.	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists

Normal	Normal no referral Management	Guideline Alert for "Normal patient and no referral required" patients !!. Patients should only be referred if the optometrist identifies one or more of the following: a. There are optic disc signs consistent with glaucoma in either eye. b. The IOP in either eye exceeds 21mmHg (note referral in specific scenarios below). c. A visual field defect consistent with glaucoma is detected in either eye. d. A narrow anterior drainage angle on van Herick testing consistent with a significant risk of acute angle closure within the foreseeable future.	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
NTG			
NTG	Family History	It is advised that all patients with age > 40 be enquired about their Family History of Glaucoma as well.	Examining patients at risk from glaucoma-the college of optometrists
NTG	Anterior Eye Exam 1	Assessment of the anterior eye and angle (e.g. by slit lamp van Herick technique) is advisable for all patients suspected of having glaucoma. The Van Herick grading is a fundamental part of any comprehensive eye examination. Grade 0 represents	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

		iridocorneal contact. The space between iris and corneal epithelium of < 1/4 corneal thickness, is a Grade I. When the space is >= 1/4 and < 1/2 corneal thickness the Grade is II. A Grade III is considered not occludable, with an irido/epithelial distance >= 1/2 corneal thickness. This technique is based on the use of corneal thickness as a unit measure of the depth of the anterior chamber at the furthest periphery. This method is very useful if a goniolens is not available.	
NTG	Ophthalmoscopy	Patient has Age > 40, and therefore has greater than average risk of Glaucoma. Assessment of the optic nerve head would include: -assessing the size of the disc, -cup/disc ratio, -presence of any asymmetry between the two eyes, -colour and width of the neuro-retinal rims especially superiorly and inferiorly, -and unusual features such as notching, disc haemorrhage etc. Cup/disc ratios can be assessed according to grading scales.	Examining patients at risk from glaucoma-the college of optometrists

NTG	IOP	CHOOSE THE IOP TEST THAT YOU FEEL IS BEST SUITED FOR THIS PATIENT -Eye pressure is measured in millimeters of mercury (mm Hg). - Normal eye pressure ranges from 12-21 mm Hg, and eye pressure of greater than 21 mm Hg is considered higher than normal. Non-contact applanation tonometry is acceptable for screening but good practice would suggest that equivocal results be followed up with contact applanation tonometry	Examining patients at risk from glaucoma-the college of optometrists
NTG	IOP GAT	When referring a patient on IOP grounds alone, Goldmann applanation tonometry (or Perkins tonometry) is regarded as offering greater accuracy. Goldmann applanation tonometry (slit lamp mounted) is the reference standard in IOP measurement	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
NTG	IOP NCT	Before considering referral, practitioners should take four readings per eye and use the mean as the result. Only when the mean result is > 21 mmHg should the practitioner consider referring the patient	Examining patients at risk from glaucoma-the college of optometrists

		for further assessment if this is the only abnormality found.	
NTG	Visual Field Henson	ASSESSSING A SINGLE FIELD. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings. Such defects often need confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society
NTG	Visual Field Humphrey	ASSESSSING A SINGLE FIELD. A good approach is to look at pattern deviation probability maps. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

		more common in the superior hemifield than in the inferior hemifield. Confirmation of findings.Such defects often need confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	
NTG	NTG Management	GUIDELINE ALERT FOR NTG PATIENTS !! Refer patient routinely to an Ophthalmologist	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
NTG	POAG Management	GUIDELINE ALERT FOR POAG PATIENTS !! Refer patient routinely to an Ophthalmologist	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
NTG	Normal repeat Management	Guideline Alert for "Normal, repeat tests" patients !!. No findings suggestive of ocular pathology has been recorded. Suggest routine review of patient. Repeat tests if required.	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
NTG	Normal no referral Management	Guideline Alert for "Normal patient and no referral required" patients !!. Patients should only be referred if the	Guidance on the referral of glaucoma suspects by community optometrists-the college of

		optometrist identifies one or more of the following: a. There are optic disc signs consistent with glaucoma in either eye. b. The IOP in either eye exceeds 21mmHg (note referral in specific scenarios below). c. A visual field defect consistent with glaucoma is detected in either eye. d. A narrow anterior drainage angle on van Herick testing consistent with a significant risk of acute angle closure within the foreseeable future.	optometrists and the royal college of ophthalmologists
AMD			
AMD	Symptoms-Blurry Vision	The patient complains of blurry vision. It is recommended that you ask further questions regarding this problem.	College of optometrists guidelines
AMD	Family History	It is advised that all patients with age > 40 be enquired about their Family History of Glaucoma as well.	Examining patients at risk from glaucoma- the college of optometrists
AMD	Refraction-Current RX	Acuity is decreased in Right Eye. It is recommended that you check: Media, Fundus, Oculomotor Balance	College of optometrists guidelines
AMD	Refraction-Subjective	Acuity is decreased in Right Eye. It is recommended that you check: Media,	College of optometrists guidelines

AMD	Anterior Eye Exam 1	Assessment of the anterior eye and angle (e.g. by slit lamp van Herick technique) is advisable for all patients suspected of having glaucoma. The Van Herick grading is a fundamental part of any comprehensive eye examination.Grade 0 represents iridocorneal contact. The space between iris and corneal epithelium of < 1/4 corneal thickness, is a Grade I. When the space is >= 1/4 and < 1/2 corneal thickness the Grade is II. A Grade III is considered not occludable, with an irido/epithelial distance >= 1/2 corneal thickness. This technique is based on the use of corneal thickness as a unit measure of the depth of the anterior chamber at the furthest periphery. This method is very useful if a goniolens is not available.	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society
		Fundus, Oculomotor Balance	
AMD	Anterior Eye Exam 2	Check for RAPD and Asymmetric visually significant cataract because of reduced acuity in right eye.	College of optometrists guidelines

AMD	Anterior Eye Exam 2	Abnormal media present. However reduced acuity in one eye is not accounted for by Media. Check Posterior segment as well.	College of optometrists guidelines
AMD	Ophthalmoscopy	Patient has Age > 40, and therefore has greater than average risk of Glaucoma. Assessment of the optic nerve head would include: - assessing the size of the disc, -cup/disc ratio, -presence of any asymmetry between the two eyes, -colour and width of the neuro-retinal rims especially superiorly and inferiorly, -and unusual features such as notching, disc haemorrhage etc. Cup/disc ratios can be assessed according to grading scales.	Examining patients at risk from glaucoma- the college of optometrists
AMD	Amsler	Right Eye Amsler shows distortion. It is advised that you check Right Macula and grade the image once again.	College of optometrists guidelines
AMD	IOP	CHOOSE THE IOP TEST THAT YOU FEEL IS BEST SUITED FOR THIS PATIENT -Eye pressure is measured in millimeters of mercury (mm Hg). - Normal eye pressure ranges from 12-21 mm Hg, and eye	Examining patients at risk from glaucoma- the college of optometrists

		pressure of greater than 21 mm Hg is considered higher than normal. Non-contact applanation tonometry is acceptable for screening but good practice would suggest that equivocal results be followed up with contact applanation tonometry	
AMD	IOP GAT	When referring a patient on IOP grounds alone, Goldmann applanation tonometry (or Perkins tonometry) is regarded as offering greater accuracy. Goldmann applanation tonometry (slit lamp mounted) is the reference standard in IOP measurement	Guidance on the referral of glaucoma suspects by community optometrists-the college of optometrists and the royal college of ophthalmologists
AMD	IOP NCT	Before considering referral, practitioners should take four readings per eye and use the mean as the result. Only when the mean result is > 21 mmHg should the practitioner consider referring the patient for further assessment if this is the only abnormality found.	Examining patients at risk from glaucoma-the college of optometrists
AMD	Visual Field Henson	ASSESSSING A SINGLE FIELD. Small glaucomatous defects typically consist of clustered significantly depressed points often following	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

		the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings. Such defects often need confirmation in a second or even a third test before one can be sure that glaucomatous loss has really developed	
AMD	Visual Field Humphrey	ASSESSSING A SINGLE FIELD. A good approach is to look at pattern deviation probability maps. Small glaucomatous defects typically consist of clustered significantly depressed points often following the course of the retinal nerve fibre layer. Early defects are somewhat more common in the nasal areas of the field. They are also slightly more common in the superior hemifield than in the inferior hemifield. Confirmation of findings.Such defects often need confirmation in a second or even a third test before one can be sure that	Terminology and guidelines for glaucoma-3rd edition-european glaucoma society

		glaucomatous loss has really developed	
AMD	Wet AMD Management	Guideline Alert for "Wet AMD" patients !!.To minimise avoidable delays to starting treatment, patients presenting to community optometrists with suspected Wet AMD should be referred directly and urgently to a specialist macular clinic where imaging and treatment facilities are available.	Commissioning better eye care: clinical commissioning guide-amd. the college of optometrists and the royal college of ophthalmologists
AMD	Dry AMD Management	Guideline Alert for Dry AMD patients !!. Recommend routine referral because of marked difference in acuity due to Dry AMD.	Commissioning better eye care: clinical commissioning guide-amd. the college of optometrists and the royal college of ophthalmologists
AMD	Macular Hole Management	Guideline Alert for Macular Hole patients !!. Refer routinely for consideration for therapy.	College of optometrists guidelines

20 Appendix 20

20.1 Chapter 4 Optometry study: Diagnosis chi-square results pre-diagnostic CDSS

The following section presents the total numbers of correct/incorrect diagnosis of the control and intervention group optometrists **before diagnostic CDSS**, and results of chi-square significance testing

Vignette, Chi-square, p-value, Significance (α= 0.05)	Correct diagnosis in intervention group (before diagnostic CDSS)	Incorrect diagnosis in intervention group (before diagnostic CDSS)	Correct diagnosis in control group (without diagnostic CDSS)	Incorrect diagnosis in control group (without diagnostic CDSS)
OHT, Chi-square: 0.143, p-value: 0.705, Significant: No	8 (61.54%)	5 (38.46%)	71 (71.00%)	29 (29.00%)
Normal, Chi-square: 0.012, p-value: 0.912, Significant: No	7 (77.78%)	2 (22.22%)	84 (82.35%)	18 (17.65%)
NTG, Chi-square: 0.429, p-value: 0.512, Significant: No	10 (76.92%)	3 (23.08%)	64 (63.37%)	37 (36.63%)
Wet AMD, Chi-square: 0.703, p-value: 0.402, Significant: No	12 (85.71%)	2 (14.29%)	71 (71.00%)	29 (29.00%)

Table 20-1 - Diagnosis chi-square results w/o diagnostic CDSS

21 Appendix 21

21.1 Explaining the diagnostic recommendations

This section details the SPARQL query used to explain the reasons for a diagnostic recommendation in the DS Model.

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX foaf:<http://xmlns.com/foaf/0.1/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX rp: <http://www.semanticweb.org/abjb788/ontologies/2015/3/untitled-ontology-208#>
PREFIX wasp:<http://wasp.cs.vu.nl/apdg#>
```

```
SELECT DISTINCT ?Diagnosis  ?property  ?Observation ?ObservationWeight

WHERE {

        ?Diagnosis ?property ?Observation.

        ?property rdfs:subPropertyOf rp:Observation_Diagnosis_properties.

        ?Observation rp:hasObservationStatus rp:9_ObservationPresent.

        ?Observation rp:hasWeight ?ObservationWeight.

        FILTER (?Observation !=rp:A_Null_Observation)

} ORDER BY ?Diagnosis
```