



Combined Consent and Authorization to Participate in a Research Study

Removable Partial Denture Abutments Restored with Monolithic Zirconia Crowns: A Randomized Controlled Trial

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in a research study investigating the use of an all-ceramic material to restore teeth needing crowns. You are being invited to take part in this research study because you are between the ages of 25-70 years, you are capable of taking care of your remaining teeth, and you have a dental treatment plan that includes a removable partial denture that requires a crown on one or more teeth. If you volunteer to take part in this study, you will be one of about 80 people to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Vaughan J. Hoefler, DDS, MBA, with the University Of Kentucky College Of Dentistry Department Of Oral Health Practice. There are others on the research team assisting with different stages of the study.

WHAT IS THE PURPOSE OF THIS STUDY?

Removable partial dentures are widely used to restore missing teeth. The partial denture can be removed by patients after meals and before bedtime for cleaning and maintenance and is attached to specific teeth in the jaw using clasps. These teeth, called "abutment teeth" or "abutments," provide support, stability and retention to the removable partial denture. We are interested in determining if a specific type of crown that is placed on a tooth can serve as a good anchor under a removable partial denture. It is possible that certain materials last longer when used for this purpose than others. Historically, porcelain-fused-to-metal (PFM) or all-metal gold crowns have been used to restore abutment teeth. The purpose of this study is to determine whether a new all-ceramic zirconia material will work better than the PFM crown material and provide a greater level of patient acceptance and satisfaction.

Information collected in this study will be used to determine whether zirconia crowns are a safe, effective alternative to conventional PFM crowns when used to restore removable partial denture abutment teeth. Results of this study will be published in dental scientific journals, and shared with Kuraray Noritake Dental Inc., the Food and Drug Administration, and other federal agencies, if required.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?

Study participants must be between the ages of 25-70 when they enroll in the study and be available for follow-up for five years following the conclusion of their treatment. Patients must be able to speak and read English, understand the study and informed consent documents, and be eligible for care in the UKCOD student clinics. You will be excluded from the study if you have any chronic or degenerative condition which impairs your consent capability including:

- traumatic brain injury
- severe depression or bipolar disorders

- schizophrenia or other mental disturbance with an associated cognitive impairment
- stroke
- degenerative dementia or Alzheimer's disease
- CNS cancer or cancer with CNS involvement
- Parkinson's Disease
- persistent substance dependence
- chronic pain
- any disorder with secondary drug effects which may result in fluctuations in consent capacity

Participants must also be healthy enough to tolerate planned dental procedures. Patients may be excluded if they require antibiotic premedication before dental treatments, and if they have been diagnosed with any of the following:

- severe anxiety
- unstable diabetes or asthma
- unstable hypertension
- COPD
- ischemic heart disease
- HIV/AIDS
- renal insufficiency
- autoimmune or inflammatory disorders

Participants must also be capable of continuous participation and follow-up in the study once they enroll, so may be excluded for the following:

- pregnancy
- planned extensive leave such as
 - sabbatical
 - overseas military assignments
 - permanent relocation outside of the University of Kentucky treatment corridor

Finally, subjects must be stable with respect to caries (decay) and periodontal (gum) disease, they must demonstrate proper care for remaining teeth, and be willing to use an oral rinse as directed.

Patients participating in the study must have the following treatment requirements and conditions:

- patients must have been treatment planned for a removable partial denture (RPD) in one or both jaws
- patients must require at least one crown on an RPD abutment tooth
- abutment teeth requiring crowns must be in contact with opposing teeth (or dentures)
- abutment teeth must be healthy and not in need of root canal therapy at the time of their enrollment

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The clinical procedures for this study will be conducted at the University of Kentucky College of Dentistry student clinics on the second, third and fourth floors of the UK Chandler Hospital in Lexington, Kentucky. You will need to come to these clinical facilities approximately 15-25 times over the course of 9-12 months to complete planned treatment. Each of those visits will take about 3 hours. Following treatment completion investigators will want to evaluate you every 6-12 months for 5 years. The total amount of time you will be asked to volunteer for this study is approximately 70 hours over the next 5 years.

WHAT WILL YOU BE ASKED TO DO?

Participants will have a dental examination, study documents will be reviewed, and informed consent obtained. You will be given oral hygiene instruction by your student dentist, and asked to brush remaining teeth twice daily, floss once daily, and rinse for 1 minute daily with ACT®, an over the counter 0.05% sodium fluoride oral rinse.

Investigators then ask that you complete your restorative dental treatment as planned, and care for your teeth as instructed. If you decide to participate in this study, we ask that you not enroll as a subject in any other research until this investigation has concluded.

A dental treatment plan that includes a removable partial denture and one or more crowns typically requires 15-25 visits. These visits usually consist of 1-3 mornings or afternoons a month for 9-12 months until treatment is complete. The timeline for treatment is similar whether you are treated in a private office or in a student clinic. The difference is that students who provide care for patients require professional supervision, so each appointment is typically for an entire morning or afternoon, rather than an hour or two as would be the case in a private practice.

Crown procedures are routine dental treatment, and typically require 2-4 visits to complete. Removable partial denture procedures typically require 3-5 visits to complete. Removable partial dentures must be started after any necessary crowns are completed. For this reason, the removable partial denture is usually the last part of your treatment plan to be finished.

The part of your treatment that is the focus of this investigation is the crown material that will be used for the tooth or teeth that will be clasped by your removable partial denture. The treatment group will have teeth restored with zirconia. Zirconia is a new type of all-ceramic crown material that is already widely used in dentistry to make crowns for natural teeth and implants. This material is of interest because it is tooth colored, exceptionally strong, and requires less tooth structure removal than alternative materials. ***We are investigating whether zirconia crowns will last as long as conventional crowns when used with a removable partial denture. There are very few scientific reports on how well this material lasts when used in this manner.***

Participants who will have their crowns made from zirconia will be followed for 5 years, and their oral health will be compared to another group of patients restored with all-metal or PFM crown materials. If there are significant differences between the outcomes of the two groups, investigators can use this information to make treatment recommendations to future patients. Since this is a randomized controlled study, you will be randomly assigned to the PFM **or** monolithic zirconia crown group. This means that you do not get to choose which material investigators use to make your crown.

The following chart provides a general timeline for a patient needing one crown, and a removable partial denture to restore missing teeth in one of your jaws. This represents the simplest sequence of procedures that a qualifying subject will need to complete. All appointments in the student clinics are 3 hours in length.

Appointment Number	Timeline	Procedure
1	Day 1	Examination, preliminary impressions, x-rays, faculty consultation
2	Week 2	Records, complete any unfinished examination or x-ray procedures, introduction to clinical study and review of consent documents
3	Week 3	Treatment planning. Financial arrangements. Meet with investigator. Review clinical study and informed consent documents
4	Week 4	Finalize treatment plan, review study documents, and clarify any questions patients have regarding treatment. If they agree to participate in the study the informed consent document must be signed by this time and random assignment will be made.
Whether a patient participates in the study or not, diagnosis, treatment planning and financial arrangements take at least 3 and commonly 4 appointments before clinical treatment is started in UK student clinics.		
5	Week 5	Replace any old fillings in abutment tooth and prepare it for a PFM or zirconia crown (anesthesia required). Make temporary crown.
6	Week 7	Finish preparation (anesthesia required). Final impression. Recement temporary crown.
7	Week 8	Bite record of how the upper and lower teeth contact. Shade
8	Week 12	Cement crown (anesthesia sometimes required). Preliminary impression for removable partial denture.
9	Week 13	Removable partial denture framework impression using custom tray
10	Week 16	Secondary impression to accurately record the area missing the teeth (called an "altered cast" impression)
11	Week 18	Bite records including face-bow. Selection of shade, shape and size of artificial teeth.
12	Week 20	Try-in of artificial teeth to evaluate their color, shape and position

13	Week 23	Delivery, bite adjustment and take-home instructions
14	1-2 days later: Week 23	Follow-up for adjustments
15	Week 24	Follow-up for adjustments
16	Week 26	Follow-up for adjustments
<p>The appointments listed in the table above are considered the standard of care, and are necessary for your treatment whether you participate in this investigation or not. If you decide to participate in the study, the following additional appointments are considered research, and will be needed for investigators to collect outcome information. You will not be charged for services provided in the following appointments</p>		
17	6 months after appointment #13	2 hour follow-up examination with investigators (includes questionnaire)
18	1 year after appointment #13	2 hour follow-up examination with investigators (includes questionnaire and x-ray of abutment teeth)
19	2 years after appointment #13	2 hour follow-up examination with investigators (includes questionnaire and x-ray of abutment teeth)
20	3 years after appointment #13	2 hour follow-up examination with investigators (includes questionnaire and x-ray of abutment teeth)
21	4 years after appointment #13	2 hour follow-up examination with investigators (includes questionnaire and x-ray of abutment teeth)
22	5 years after appointment #13	2 hour follow-up examination with investigators (includes questionnaire and x-ray of abutment teeth)

Participants will be randomly assigned to either an experimental group (monolithic zirconia) or a control group (PFM). Random assignment means that your group assignment is by chance, similar to a coin toss. An internet-based, random number generator will be used to make group assignments. Since there are only two treatment groups, your chance of being assigned to either group is 50%.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

Risks specific to this study include the following for zirconia crown recipients: ceramic fracture, caries (decay along the border of a crown), faster wear of the ceramic material relative to conventional metals, faster wear of the removable partial denture framework due to contact with the ceramic, possible abscess of abutment tooth, and fracture or loss of an abutment tooth

Caries (decay along the border of a crown) is expected to occur occasionally in a five year follow-up period. Caries is the most common reason conventional metal and PFM crowns need to be replaced, and this may also be the case with all-ceramic crowns.

Ceramic fracture is also expected to occasionally occur in a five-year follow-up period. Ceramic fracture can be avoided if crowns are made entirely of metal. However this would be unsightly for teeth in the front of the mouth. Ceramic fractures have been reported for both PFM and all-ceramic crowns, largely with the veneering ceramic. Although the zirconia crowns used in this study are monolithic and do not have a veneering layer of weaker ceramic, it is possible that more fractures occur with this group compared to PFM crowns.

Wear of ceramic or removable partial denture framework material is expected to be rare, because there have been very few reported incidences of this in the scientific literature with conventional materials.

Radiographs (x-rays) will be taken before, during and after treatment. The radiation dose from a typical dental x-ray is about 1/80th of the typical background dose that we all receive every year. It is also about 1/7th of the annual safe dose limit dose (not including medical exposures) for members of the public and well below the levels that are considered to be a significant risk of any harmful effects. The ALARA radiation safety principle (as low as reasonably achievable) to minimize patient x-ray exposure will be followed by students and researchers at all times.

Possible abscess of abutment tooth is expected to be a rare-occasional occurrence in a five year follow-up period, consistent with historical norms for any teeth requiring conventional crowns.

Abutment tooth fracture within a five year period is expected to be a rare occurrence in either group. This is a more likely occurrence with teeth that are structurally weakened to begin with. Since participants must have vital, periodontally sound, caries (decay) free abutment teeth for study participation, abutment tooth fracture would be a highly unexpected occurrence.

Risks for permanent side effects from dental treatment in this study are identical to those receiving dental care outside of this study: permanent numbness to the lip or cheek following anesthesia, aspiration of loose foreign objects that are inadvertently dropped down patient's throats, and allergic reaction to a material or medication.

Permanent numbness of the lip or cheek can make speech, eating and facial expressions difficult, similar to people who experience a stroke.

Foreign body aspiration may block the airway and make breathing difficult, requiring surgical retrieval. Difficulty in breathing can range from mild to severe. Complete airway blockage can result in death.

Allergic reactions can also range from mild to severe. Severe reactions can result in death. Other allergic reactions may require administration of a medication to manage its severity. Allergies commonly go away with removal of the product or material that is causing the allergy.

If a subject becomes pregnant while receiving treatment, further radiographs and restorative care may be postponed until after childbirth. If a study subject is unknowingly pregnant at any time during the study, the risks to the embryo or fetus are minimal, and identical to those of a patient who chooses not to participate in the study.

Local anesthesia will be administered before crown procedures. Risks associated with this procedure include soreness, bruising, pain, infection, fainting, bleeding, allergic reaction, and permanent numbness associated with the nerves which are blocked.

Possible Risk/Side Effect	How often has it occurred?	How serious is it?	Can it be corrected?
Bruising	It may occur just after drug administration	Usually of short duration, 2-5 days	Yes. It will go away with time
Pain and soreness	Commonly occurs with anesthesia	Usually minor and of short duration	It will go away with time
Infection	It is extremely uncommon	Very serious	Yes, but may require antibiotics
Permanent numbness	It is extremely uncommon	The damage is permanent and can affect the rest of your health	No
Allergic reaction	Rare	Can be very serious	Yes, but may require administration of medications
Fainting	Rare	Usually minor and of short duration	Yes

There is always a chance that any medical treatment can harm you, and the investigational treatment in this study is no different. In addition to the risks listed above, you may experience a previously unknown risk or side effect.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

You will not get any personal benefit from taking part in this study. However, your willingness to take part will help doctors make better treatment recommendations in the future.

DO YOU HAVE TO TAKE PART IN THE STUDY?

No. If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to take part in the study there are other choices. Since you have already decided to have a removable partial denture, you and your student dentist will be able to choose which crown restorative material you would like to use, free of any constraints imposed by this study.

WHAT WILL IT COST YOU TO PARTICIPATE?

You and/or your insurance company will be responsible for the costs of all care and treatment you receive during this study. The costs are identical to what you would normally receive for your condition. These are costs that are considered medically reasonable and necessary, and are the same whether you take part in this study or not.

A co-payment/deductible from you may be required by your insurer, even if your insurer has agreed to pay the costs. The amount of this co-payment/deductible is variable and may be substantial.

You will not be charged for the appointments following the completion of your treatment, when investigators are collecting information for research. These correspond to appointments 17-22 as outlined in the **"WHAT WILL YOU BE ASKED TO DO"** section listed above.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

We will make every effort to keep confidential all research records that identify you to the extent allowed by law. However the University of Kentucky IRB and the FDA may request information from the research group to make certain that your health and safety is properly protected. Your daily clinical treatment record is completely confidential and is protected personal health information. However your results will be combined with information from other subjects taking part in this study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in any written materials. We may publish the results of this study; however, we will keep your name and other identifying information private. Your insurance company may require that you provide us with your social security number. However it will not be used for any other purpose.

We will make every effort to prevent anyone who is not on the research team, the University of Kentucky IRB, or the FDA from knowing that you are part of this study. All physical and electronic data collected in this investigation will be stored in the locked private office of the Principal Investigator on a password protected computer. The location of this office is 800 Rose Street, UK Chandler Hospital Dental Sciences Building room D630. Information stored on this computer is backed-up by the University of Kentucky College of Dentistry and stored offsite in an encrypted form at PAV A DataCenter.

You should know, however, that there are some circumstances in which we may have to show your information to others. For example, a court order may require us to release some of your information if it is needed for a criminal investigation. However these reporting requirements would be no different whether you choose to participate in this study or not.

CAN YOUR TAKING PART IN THE STUDY END EARLY?

If you decide to take part in the study, you still have the right to leave the study at any time if you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study. If you choose to withdraw from the study early, the data collected until that point will remain in the study database and may not be removed.

The individuals conducting the study may need to withdraw you from the study if you are not able to follow the directions that you are given, if you develop a medical condition during the study that requires immediate attention or disqualifies you from further participation, if a product or material used in this investigation is removed from the market, or if investigators find that your participation in the study is more risk than benefit to you.

If you are abruptly withdrawn from the study and your treatment has been started but is still temporary, your student dentist will work with you to finish any procedures which are considered incomplete.

ARE YOU PARTICIPATING OR CAN YOU PARTICIPATE IN ANOTHER RESEARCH STUDY AT THE SAME TIME AS PARTICIPATING IN THIS ONE?

You may not take part in this study if you are currently involved in another research study. Enrollment in other research before the conclusion of this study may disqualify you from further participation in this investigation.

WHAT HAPPENS IF YOU GET HURT OR SICK DURING THE STUDY?

Although pregnancy is not an illness, if you become pregnant once you have started the study you may continue participating in the study, but certain procedures may be postponed until after childbirth. If you suspect that you are pregnant please notify the principal investigator, Vaughan J. Hoefler, DDS, MBA at (907)978-9199, or send an email to vaughan.hoefler@uky.edu to request a private meeting to discuss future participation.

If you believe you are hurt or if you get sick because of something that is due to the study, you should call Vaughan J Hoefler, DDS, MBA at (907)978-9199 immediately.

It is important for you to understand that the University of Kentucky does not have funds set aside to pay for the cost of any care or treatment that might be necessary because you get hurt or sick while taking part in this study. Also, the University of Kentucky will not pay for any wages you may lose if you are harmed by this study.

The medical costs related to your care and treatment because of research related harm will be your responsibility. Expenses may be paid by your insurer if you are insured by a health insurance company (you should ask your insurer if you have any questions regarding your insurer's willingness to pay under these circumstances). A co-payment/deductible from you may be required by your insurer. The amount of this co-payment/deductible may be substantial.

You do not give up your legal rights by signing this form.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

You will not receive any rewards or payment for taking part in the study. Expenses for radiographs of abutment teeth and examinations by investigators for the purpose of collecting data for the study will be waived for 5 years following the completion of your removable partial denture. However you will be responsible for any treatment for any of your teeth following the completion of your removable partial denture.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Vaughan J. Hoefler, DDS, MBA at vaughan.hoefler@uky.edu or (907)978-9199. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky between the business hours of 8am and 5pm EST, Mon-Fri at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.

WHAT IF NEW INFORMATION IS LEARNED DURING THE STUDY THAT MIGHT AFFECT YOUR DECISION TO PARTICIPATE?

If the researcher learns of new information in regards to this study, and it might change your willingness to stay in this study, the information will be provided to you. You may be asked to sign a new informed consent form if the information is provided to you after you have joined the study.

POTENTIAL FUTURE USE

Contacting Research Subjects for Future Studies

Do you give your permission to be contacted in the future by investigators or staff associated with this study regarding your willingness to participate in future evaluations and research studies about how to treat partial tooth loss? This includes a possibility that researchers may want to contact you to continue to monitor your treatment provided in this research after the study ends in 5 years.

☐ Yes ☐ No _____ Initials

WHAT ELSE DO YOU NEED TO KNOW?

There is a possibility that the data collected from you may be shared with other investigators in the future. If that is the case, the data will not contain information that can identify you unless you give your consent/authorization or the UK Institutional Review Board (IRB) approves the research. The IRB is a committee that reviews ethical issues, according to federal, state and local regulations on research with human subjects, to make sure the study complies with these before approval of a research study is issued.

A description of this clinical trial will be available on <http://www.ClinicalTrials.gov> as required by U.S. Law. This website will not include information that can identify you. At most, the website will include a summary of the results. You can search this website at any time.

AUTHORIZATION TO USE OR DISCLOSE YOUR IDENTIFIABLE HEALTH INFORMATION

The privacy law, HIPAA (Health Insurance Portability and Accountability Act), requires researchers to protect your health information. The following sections of the form describe how researchers may use your health information.

Your health information that may be accessed, used and/or released includes:

- Demographic information
- Medical and dental history
- Treatment history and any personal information found in the axiUm (electronic health record) database
- Radiographs (x-rays)
- Health insurance claim numbers, social security numbers and employer identification numbers if required by insurers

The Researchers may use and share your health information with:

- Principal Investigator and study personnel
- The University of Kentucky's Institutional Review Board/Office of Research Integrity.
- The Food and Drug Administration (FDA)
- Kuraray Noritake Dental Corporation
- Law enforcement agencies when required by law.
- University of Kentucky (UK) representatives, including:
 - UK statisticians or the Applied Statistics Lab
 - UK Ceramics Laboratory
 - UK Digital Designers

- UK Removable Prosthodontics Laboratory
- Participating Dental Laboratories outside of the University of Kentucky
 - Drake Laboratories
 - Edgewood Dental Lab
 - Glidewell Laboratories
 - Mustard Seed Dental Studio
 - NALA Smile Design
 - World Lab USA

The researchers agree to only share your health information with the people listed in this document.

Should your health information be released to anyone that is not regulated by the privacy law, your health information may be shared with others without your permission; however, the use of your health information would still be regulated by applicable federal and state laws.

You may not be allowed to participate in the research study if you do not sign this form. If you decide not to sign the form, it will not affect your:

- Current or future healthcare at the University of Kentucky
- Current or future payments to the University of Kentucky
- Ability to enroll in any health plans (if applicable)
- Eligibility for benefits (if eligible)

After signing the form, you can change your mind and NOT let the researcher(s) collect or release your health information (revoke the Authorization). If you revoke the authorization:

- You must send a written letter to: Vaughan J. Hoefler, DDS, MBA at the following address to inform him of your decision:
Vaughan J. Hoefler, DDS, MBA
UK College of Dentistry
Department of oral Health Practice
D630 UK Chandler Hospital
800 Rose Street
Lexington, KY 40536-0297
- Researchers may use and release your health information **already** collected for this research study.
- Your protected health information may still be used and released should you have a bad reaction (adverse event).

Information collected for this study will not be available for you to see until after the study is completed. When the study is over, you will have the right to access the information.

The use and sharing of your information has no time limit.

If you have not already received a copy of the Privacy Notice, you may request one. If you have any questions about your privacy rights, you should contact the University of Kentucky's Privacy Officer between the business hours of 8am and 5pm EST, Mon-Fri at: (859) 323-1184.

You are the subject or are authorized to act on behalf of the subject. You have read this information, and you will receive a copy of this form after it is signed.

Signature of research subject

Date

Printed name of research subject

Name of [authorized] person obtaining informed consent/HIPAA authorization

Date

Signature of Principal Investigator or Sub/Co-Investigator