

EDITORIAL

The fallacy of pre–kidney transplantation “dental clearance”



In interprofessional practice in the hospital setting, oral medicine specialists and hospital-based dental providers are often asked to provide “dental clearance” before medical procedures. Although this practice can identify sources of acute infection, facilitate patient education about their oral health, and establish recommendations for the management of chronic oral infections before medical therapy, the dental clearance process falls short of confirming the absence of oral health complications during or after a medical procedure. It does not “clear” the patient or the medical team of risks.

Merriam-Webster’s Dictionary¹ definition of “clearance” is as follows:

“1: An act or process of clearing, such as a): The removal of buildings from an area (such as a city slum); b): The act of clearing a ship at the customhouse; also: The papers showing that a ship has cleared; c): The offsetting of checks and other claims among banks through a clearinghouse; d): Certification as clear of objection; e) a sale to clear out stock; and f) authorization for an aircraft to proceed especially with a specified action.”

By asking for the dentist to “clear” the patient for organ transplantation, does the medical team believe that the dentist is authorizing the transplantation to proceed or that the dentist is assuring that the patient is cleared of dental disease that might adversely affect transplantation outcome?

As we have no apparent universally accepted definition of “dental clearance,” I propose the following definition: *The act of “clearing” the sources of acute oral disease, helping the patient set a course for management of chronic oral disease, and educating patients about oral self-care to allow oral disease prevention and maintenance of health.* I do not propose that “dental clearance” become any sort of certification by the dentist to the patient or to the referring provider that the patient is clear of oral disease that might present a health problem during or after a medical procedure. With this definition, I will feel better about providing “dental clearance” examinations in the following weeks in our practice.

This is not to say that the practice of “dental clearance” has no value but, rather, that oral health maintenance is a constant activity that involves patient engagement and effort. Having the oral health team

deem that there are no acute oral sources of infection at any point in time, that is, at the time of the oral assessment and radiographic evaluation (or in the next few weeks, if acute disease needs treatment), does not assure that new or recurrent disease will not arise over the next few months or years, possibly before the transplantation surgery occurs. This is particularly valid for patients with chronic kidney disease (CKD) who are being prepared by the transplantation team for kidney transplantation and who may have been waiting for years for an appropriately matched donor organ to be identified. At our academic medical center, “dental clearance” requests made by the transplantation team to the dental team differ in their level of concern about chronic oral disease states in kidney transplant and liver transplant recipients, demonstrating the uncertainty among the different transplantation teams at the same institution about the process and outcome of the “dental clearance.”

SCOPE

The United Network of Organ Sharing reported that of the 758,031 organ transplantations in the United States, from January 1, 1988, to January 31, 2019, kidney transplantations were the most commonly performed, comprising 62% of all transplantations (446,358 kidney transplantations and 23,747 kidney/pancreas transplantations).² Furthermore, as of February 14, 2019, 94,925 candidates are awaiting kidney transplantations and an additional 1637 are awaiting combined kidney/pancreas transplantations. The United States Renal Data System reported that 72% of kidney transplants in 2016 were from cadaveric donors,³ so the timing of transplantation is often unpredictable. The data also reveal that median time on the waiting list for kidney transplants during 2011 was 4 years; however, this waiting time varied among locations across the United States.

The United Network of Organ Sharing has published a guide for patients, outlining the process of preparation for transplantation, and it includes a “dental exam.” Most kidney transplant recipients in the United States are covered by Medicare. Although, in general, Medicare excludes dental coverage, policy (Medicare 2013; <https://www.cms.gov/Medicare/Coverage/MedicareDentalCoverage/index.html>) allows payment for oral examinations, but not for treatment, before kidney transplantation, under Hospital Coverage (Part A) if

performed by a dentist on the hospital's staff or under Physician Services Coverage (Part B) if performed by a physician. Medicare does not, however, cover any dental treatment, including extraction of an acutely painful, abscessed tooth with facial swelling that is identified during the "dental clearance" examination.

UNKNOWN HEALTH IMPACT OF PRE-KIDNEY TRANSPLANTATION "DENTAL CLEARANCE"

For the population of patients undergoing kidney transplantations each year, how many have "dental clearance" examinations and the needed acute care, and how many do not? Is there a difference in graft infection-related complications, oral hygiene adherence, or other medical or dental outcomes between the groups? By evaluating this type of data, we can determine the benefits and risks of the elements (acute care, education, chronic disease management) of the pre-kidney transplantation "dental clearance" process.

Graft survival rates for kidneys have improved over the last 20 years. Organ survival rates at short and longer periods after transplantation for living related and deceased donations, respectively, have improved to 1-year survival rates of 98% and 93%, respectively; 5-year survival rates of 85% and 75%, respectively; and 10-year survival rates of 65% and 48%, respectively.⁴ Infections in kidney transplant recipients are a major cause of morbidity and mortality.⁵ Almost a third of 142 adult kidney transplant recipients followed up in a retrospective cohort study in Canada were found to have developed an infection within 2 years after transplantation; urinary tract infections had the highest incidence, followed by a similar incidence of skin infection, cytomegalovirus infection, and bacteremia.⁵ The sources of bacteremia were not identified, but the majority of infections included *Escherichia coli*, and none included *Streptococcus* species.⁴ Indeed, oral sources of systemic infection in kidney transplant recipients are rarely reported in the literature. In 1982, there was a report of occult dental infection resulting in fever in 3 kidney transplant recipients.⁶ Their dental sepsis resolved with empiric tooth extraction, resulting in an early argument in support of the need to attend to the transplant recipient's oral health as a means to avoiding tooth-related sepsis in this immune-suppressed population.⁶

ORAL HEALTH IN PATIENTS WITH CKD AND IN KIDNEY TRANSPLANT RECIPIENTS

Chronic inflammation caused, in part, by poor oral hygiene habits is a common problem. Oral disease is common in adults with CKD and potentially reflects low use of preventive dental services and may be an important determinant of health in this population

when being evaluated for organ transplantation. A recent systematic review of observational studies evaluating oral health in people with CKD found that although data for kidney transplant recipients were limited, periodontitis was more common in patients with stage 5 CKD on dialysis and that one-quarter of the patients reported never brushing their teeth and only 11% reported flossing.⁷

A study of 46 kidney transplant recipients clinically and radiographically examined for dental caries, periodontal disease, mucosal lesions/infections, and general oral health problems on the day before transplantation and reassessed a year later demonstrated that although of the 15 patients who experienced organ rejection, 6 had oral opportunistic infections (*Candida* and herpesvirus) and 1 patient had an apical lesion and probing depths of 4 mm or greater, other patients who did not reject organs had a similar poor oral health status.⁸ Schander et al. concluded that their study did not support the concept that oral mucosal and tooth-related infections increase the risk of kidney transplant rejection.

In an attempt to answer the question regarding whether oral health neglect contributes to post-transplant complications in recipients of cadaveric kidney transplants, Zwiach and Bruzda-Zwiach⁹ followed up 91 transplant recipients over 5 years. They noted that inadequate oral hygiene and increase in periodontal disease, from none to periodontal pockets of 6 mm depth were predictors of acute rejection in the first year. However, decayed, missing, and filled teeth scores and their components were not predictors of acute rejection. Zwiach and Bruzda-Zwiach also pointed out that 47% of their patients had dental caries that remained unrestored after transplantation because of failure to seek dental care despite oral health education before transplantation.⁹ Also, greater than 57% of their patients had inadequate adherence to oral hygiene, allowing the authors to conclude that poor oral health maintenance may be an indicator of, rather than risk factor for, allograft complications.⁹

I have long felt that "dental clearance", which, in many transplantation centers, is a criterion for placing a patient on the waiting list for solid organ transplantation, has additional value in assessing patient adherence to the recommendations made by health care providers. Dentist recommendations aimed at eliminating sources of chronic oral diseases, such as deep dental caries approaching the dental pulp and advanced periodontal disease, which may become acute under transplantation-associated immune suppression, may not be followed by the patient. When a patient does not follow recommendations, it may provide the transplantation team with insight into the patient's low health

literacy and poor self-management habits. This nonadherence to dental care may be a harbinger of future challenges with adherence to the prescribed long-term immune suppressant therapy aimed at preventing graft rejection, graft failure, and mortality.¹⁰ Also critical to the transplant recipient's ability to follow the health care provider's recommendations for oral health maintenance is access to medically related dental care. Inadequate personal financial resources or funding for dental care by public or private insurance sources can be a significant barrier to care for patients being prepared for organ transplantations. The "dental clearance" examination visit can lead to chronic oral disease management and preventive services, and thus become a medical–dental collaboration to improve the patient's overall health. Might new payment models support such collaborative care?

HOW "DENTAL CLEARANCE" IS COMMUNICATED TO THE TRANSPLANTATION TEAM

Many medical centers with transplantation programs have developed "dental clearance" communication forms to be completed by the dentist and returned to the transplantation team. Typically, these require the dental care provider's signature, date, and office contact information. For the transplantation centers, these forms serve as a way to ascertain and track the oral health status of patients before they are "listed."

At the University of North Carolina Healthcare (Chapel Hill, NC), the kidney transplantation team recently simplified their "dental clearance" communication form by asking the dentist to specify the date of the last dental visit and to answer 2 YES/NO questions: Any current infection requiring antibiotics? Any signs of oral cancer?

In writing this editorial, I conducted a brief Internet search for publicly available information regarding the "dental clearance" processes at other transplantation centers across the United States. Five examples follow:

1. At the University of Washington, University of Washington Medicine (Seattle, WA; https://www.uwmedicine.org/sites/contentrepo/files/2018-11/patientresources_forms_dentalcleanancekidney.pdf) Transplantation Services, the form asks the following YES/NO questions: "Is the dental condition good or poor?" Are teeth and gums free of infection, and if No, what is the treatment plan? Is any major restorative treatment needed, and if Yes, what? And when?" This team indicates its general principles for transplant recipients include preference for having dental problems taken care of before the transplantation, with preference to delay "routine care" in the first month after transplantation. The form also states: "Emergencies and infections should be treated as soon as possible."
2. At the St. Vincent (Indianapolis, IN; <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&ved=2ahUKewiPrq-JqrLgAhWwY98KHaw3CcssQFjAJegQIAhA-C&url=https%3A%2F%2Fwww.stvincent.org%2F%2Fmedia%2Ffiles%2Finind%2Fservices%2Ftransplant%2Fpotential-recipient-resources%2F503214-dental-clearance-form.ashx%3Fla%3-Den&usg=AOvVaw34s7AZ9-GYRKeYiTq41X3IU>) Transplantation Services, the form asks the following YES/NO questions: "Does the patient have any active oral infection which should be treated? Does the patient have nonrestorable teeth which need extraction? Is the patient free of the above? Comments and Plan."
3. At the Las Palmas Medical Center (El Paso, TX; <https://laspalmasdelsolhealthcare.com/util/forms/transplant-dental-clearance.pdf>), the form states: "Before the patient can be accepted as a candidate in the transplantation program, we need to ensure that the patient is cleared of any active dental infections." The form asks the evaluation focus to "assess for any existing infection" and for the dentist to describe the "outcome." Check boxes also request responses to "Patient is free of any source of infection" or "Patient has a source of infection and requires the following treatment: deep cleaning of the gums, filling(s), root canal, extraction(s) to address infection only (number of extractions recommended) and other."
4. At the St. Francis Hospital (Tulsa, OK; <https://www.saintfrancis.com/saintfranchishospital/Documents/Recip%20-%20Dental%20Clx%20letter.pdf>), the form explains: "This patient is interested in receiving a kidney transplant. We require an examination to gain dental clearance to proceed with his/her evaluation. If you agree this patient does not have any dental infection, which would prevent him/her of continuing the kidney transplant evaluation, please indicate below for our record." This statement is followed by 2 check box choices: Patient is "free of any dental infection" at this time. Alternatively, patient "has current oral infection, requiring continued care." Comments are requested for either choice.
5. At Christiana Care (Newark, DE; <https://christiana.org/documents/kidney/DentalClearance.doc>), the letter for dental clearance for transplantation simply has YES/NO check boxes for the patient "is cleared from infection and may receive a kidney transplant" and "if no, please state concerns."

These significant variations across transplantation centers bring to our attention the lack of a standard process or intended dental outcome for pre–kidney transplantation “dental clearance.”

Where do we go from here? In this era of evidence-based medicine and dentistry, we need additional and improved outcomes research to show benefit and extent of benefit, or lack thereof, for the “dental clearance” process before kidney transplantation. Furthermore, we need a consistent national oral health outcome for the “dental clearance” evaluation before kidney transplantation.

As it stands now, the pre–kidney transplantation “dental clearance” evaluation appointment with a dental care provider offers the opportunity for collection of personalized oral health data, professional assessment of oral health status, education of the patient on his or her personal oral health risks, and recommendation of strategies and behaviors that the patient can follow to prevent potential disease exacerbation under immune suppression. I believe that this alone can create health benefits for the patient.

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