Restorative Needs and Options in Medically Complex Patients

Citation

Permanent link
https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37378652

Terms of Use
This article was downloaded from Harvard University’s DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA

Share Your Story
The Harvard community has made this article openly available. Please share how this access benefits you. Submit a story.

Accessibility
A Thesis Presented By
Dagmarie Rodriguez Maldonado
to the Faculty of Medicine
In partial fulfillment of the requirements for the degree of
Master of Medical Science
Research Mentor: Reshma Menon, Lecturer on Oral Medicine, Infection and Immunity,
Harvard School of Dental Medicine

Harvard School of Dental Medicine Boston, Massachusetts
April 2024
Study title: Restorative Needs and Options in Medically Complex Patients
Authors: Dagmarie Rodriguez-Maldonado, DMD, Natalie Wen, DMD, Reshma Menon, BDS, DMSc

Abstract:

Introduction: An increase in the size of the U.S. population is accompanied by an increasingly aging population, with adults 65 and older experiencing the highest prevalence of edentulism. Studies indicate that 25% of persons aged 35 to 74 are edentulous and require a high amount of prosthetic care. These patterns demonstrate an increasing quantity of older patients with systemic medical conditions seeking oral care. Complete edentulism is associated with several comorbid conditions, where pre-treatment and peri-treatment oral health status are critical for a favorable long-term prognosis of prosthodontic treatment. It is essential to recognize that systemic diseases may affect or limit restorative treatment options, complicating treatment planning and implementation.

Purpose: This study aims to explore the oral health needs among patients identified as medically complex. In addition, to determine the most prevalent systemic conditions among medically complex patients who are concurrently seeking dental care, evaluate the major restorative and periodontal treatments needed, and explore how these systemic conditions limit their restorative options.

Methods: An estimate of 80 e-records from the Medically Complex Clinic at Harvard Dental Center will be evaluated retrospectively using a statistical software package for analysis.

Result: Of the 62 patients treated at the Medical Complex Clinic of HSDM that were evaluated for this study, 47 were diagnosed with cancer. Twenty-four had at least one episode of osteoradionecrosis. We could observe that the MCC of HSDM receives a substantial number of cancer patient referrals.
Conclusion: Cancer is a treatment-limiting factor that severely affects a patient’s oral health. Cancer treatment can create immunosuppression, which affects patient’s ability to fight infections. The recorded data allowed us to better understand the medically complex patients that are referred. With this information, existing protocols can be updated and adjusted to meet the needs of the patient pool. This may promote further brainstorming of preventive oral therapies that can be given concurrently with treating systemic conditions.

Introduction:
Dental patients may vary in their systemic health and prevalence of systemic conditions. In 2000, the U.S. Surgeon General published the first-ever report on oral health in America, emphasizing the important fact that systemic health and oral health are interrelated. An increase in the size of the U.S. population is accompanied by an increasingly aging population, with adults 65 and older experiencing the highest prevalence of edentulism.¹ There is also an increasing quantity of older patients with systemic medical conditions seeking oral care. Systemic diseases may affect or limit restorative treatment options, complicating treatment planning and implementation.² Studies indicate that 25% of persons aged 35 to 74 are edentulous and require a high amount of prosthetic care.³ In fact, complete edentulism is reported to be associated with several comorbid conditions, where pre-treatment and peri-treatment oral health status are critical for favorable long-term prognosis of prosthodontic treatment.⁴ Consistent dental care significantly improves quality of life for older patients.⁵-⁶ Previous studies have investigated the impact of chronic systemic conditions on prognosis of prosthodontic treatments including implants.⁷ Cardiovascular conditions and history of periodontal disease have been reported as more likely to contribute to risk of peri-implantitis and implant failure.⁸-⁹ However, there is a lack of studies characterizing the systemic health conditions
and oral health needs among medically complex patients who seek dental care, with majority of previously reported studies being case reports.\textsuperscript{10-14} It is widely accepted that a prosthetic restoration cannot be placed until the tooth/area is endodontically and periodontically sound. Multidisciplinary management to ensure periodontal and hard tissue health may help improve treatment outcome for complex patients.\textsuperscript{15-16} For example, a cancer patient with chronic kidney disease is at increased risk of developing periodontal disease and edentulism and should have proper oral hygiene instruction to prevent complete edentulism.\textsuperscript{17-18}

This study aims to characterize the oral health status and needs among medically complex patients. Results from this study may encourage further investigation on oral health as a comorbidity of systemic conditions instead of a secondary symptom of systemic disease. This may promote brainstorming of different preventive oral therapies that can be given concurrently with treatment of systemic conditions.

**Methods:**

The Medically Complex Clinic (MCC) at Harvard Dental Center works by referrals. Referral cards for MCC are given at Longwood Medical area hospitals, physicians around Massachusetts and faculty and graduate students from HSDM. Referred patients can be cancer patients or patients with other medically complex or life-threatening conditions. Patients are enquired to call the HDSM Practice Coordinator for appointment requests. If the patient is referred by a faculty member or by a graduate student of HSDM, a referral note is created in Axium. The first visit is performed in the faculty practice clinic of Harvard Dental Center. At this visit, the MCC staff (RM) evaluates the medical record, and a graduate resident performs a comprehensive dental evaluation. A treatment plan is created according to the patient's oral findings. Interdepartmental collaboration may be utilized if a multidisciplinary approach is required to provide
comprehensive oral care. If the patient was referred due to cancer, the treatment plan and follow-ups are coordinated around the patient's cancer therapy.

This study is a retrospective analysis of Harvard affiliated hospital and out-of-network patients who have been referred to the Harvard Dental Clinic MCC for comprehensive dental care. Relevant data including medical history and oral exam findings were collected from patient EHRs. Sixty-four Axium records of MMC’s patients were evaluated for this study.

A list of patients seen by the MCC staff (RM) from [date] to [date] was provided by the MCC Practice Coordinator. Exclusion criteria included 1) patients with one or no chronic conditions, 2) patients with missing medical history snapshots, 3) patients with incomplete hard/soft tissue findings in AxiUm, 4) patients seen by staff RM not in MCC. Inclusion criteria was patients with two or more chronic conditions. The reviewed dates are from 2010-2021. Only EHRs from patients who signed the general consent of examination of the teaching and faculty clinics were included. Medical history snapshots were obtained by the PI who had authorized access to Epic for patients referred to Harvard Dental Center. Research team members reviewed the EHRs of patients who have signed the general consent form of HSDM clinic. Information including age, gender, medical record number, medical conditions, and oral exam findings was recorded on the Mass General Brigham RedCap platform.
Results:

A total of 62 records were evaluated in this study. The patients’ ages ranged from 32 to 79, and 22 were females. Of the 62 patients treated at the Medical Complex Clinic of HSDM that were evaluated for this study, 47 were diagnosed with cancer. Twenty-four had at least one episode of osteoradionecrosis. Of the 24 patients diagnosed with osteoradionecrosis, 23 reported problems with eating and/or speaking. We observed that patients with osteoradionecrosis had a higher prevalence of periodontal disease. Of the patients diagnosed with cancer, 58.5% had xerostomia. Of the patients diagnosed with cancer, 21 had less than 20 teeth.

A total of 25 patients were diagnosed with three or more medical conditions. Females in the study presented a higher risk of complete or partial edentulism, where 24% were completely edentulous and 21.2% were partially edentulous. Of the total of 62 patients, 24 were smokers; 64% of the smokers were females.

Figures:

![Figure 1: Ethnicities](image1.png)

![Figure 2: Systemic diseases in MCC patient pool](image2.png)
Discussion:

Based on our results, we could observe that the MCC of HSDM receives a substantial number of cancer patient referrals. Cancer is a treatment-limiting factor that severely affects a patient’s oral health. Cancer treatment can create immunosuppression, which affects patient's ability to fight infections. Patients with a history of head and neck cancer are at risk of suffering from jaw osteoradionecrosis. Osteoradionecrosis of the jaw is a late effect of radiation therapy. Previously irradiated head and neck tissues become hypovascular and hypoxic. If in the irradiated field, the mandible may develop aseptic avascular necrosis, leading to infection, tooth loss, and even pathological jaw fracture (Davis 2022 et al.). Twenty-four patients in this study were diagnosed with osteoradionecrosis. Of these, twenty-three reported problems with eating and/or speaking. Being treated with more than 6000 centigrays (cGy) of radiation on the head and
neck area, having a previous history of osteoradionecrosis, creates a contraindication for dental implants. It also increases the risk of complications if extractions or other oral surgical interventions are performed (Davis 2022 et al.) Twenty-three patients diagnosed with cancer reported having trouble eating and/or speaking. In cases of head and neck cancer, this can be caused for resection and/or removal of carcinogenous lesions from structures in the oral cavity. This could result in potential difficulties for eating and speaking. However, in most of the records evaluated in this study the type of cancer was not specified. We also observed that the patients diagnosed with osteonecrosis had a higher prevalence of periodontal disease. Periodontal disease is associated with an increased risk of developing chronic systemic conditions including autoimmune diseases and different types of cancers (Irani 2020 et al).

The recorded data allowed us to better understand the medically complex patients that are referred. With this information, existing protocols can be updated and adjusted to meet the needs of the patient pool. Having a clinic specialized in treating medically compromised patients compromised is vital. This provides patients with specialized oral care that considers how their medical conditions influence their medical health and vice versa. In addition, having this kind of clinic in an academic institution allows residents and dental students to learn how to provide a high standard of oral care to medically compromised patients. One of the most significant limitations in retrospective studies using already recorded data is the potential of missing information. Several records used in this study lacked important information like demographics, periodontal evaluations, previous x-rays, toxics habits, etc. Incomplete records might be result of paint’s denial to provide complete information or, students inexperience collecting medical and dental information.