Power Instrumentation

for the Dental Professional

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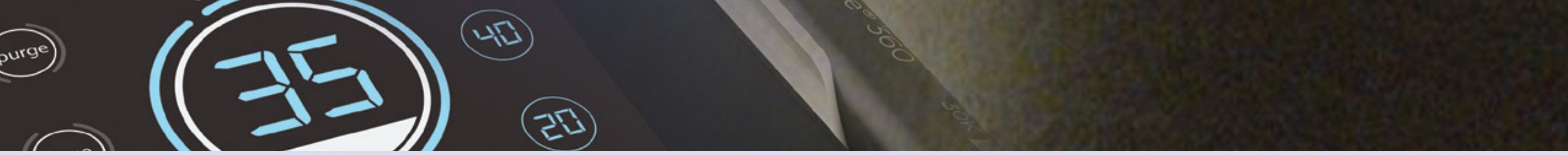
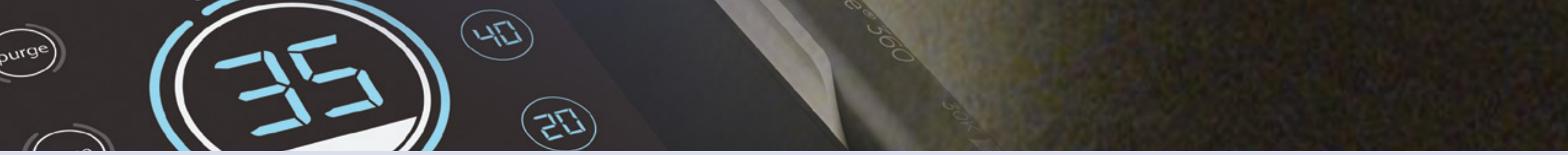
Dedication

I would like to dedicate this book to three groups of people. The first group is my family who supported me along this journey and instilled in me the character traits of humility, faith, courage, dedication, and drive. Thank you to my husband, Eric, and two beautiful children, Brayden and Brinley, for your sacrifices and love to make this dream a reality. The second group is every past, present, and future dental professional and student who has graced my life. You all inspire me and have shaped the oral health-care provider and educator I am today. The third group consists of my publisher and the manufacturers featured in this textbook; without you, this project would not be possible.



Brief Contents



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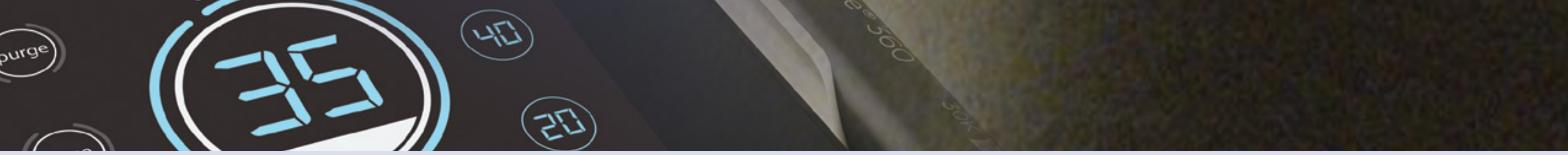


Preface

The field of dental ultrasonics and air polishing has become mainstream as the technology has evolved. *Power Instrumentation for the Dental Professional* aims to bridge the gap of knowledge between education and clinical practice by allowing the learner to acquire the skills needed to implement power technology effectively in patient care with a contemporary approach to preventive, maintenance, and nonsurgical periodontal procedures.

The first two chapters begin power instrumentation education with the infection prevention required for the safe delivery of care. The middle of the book, Chapters 3–20, focus on dental ultrasonic technology and technique. Chapters 3–8 present ultrasonic science, physics, mechanism of action, functionality, and universal terminology. By Chapter 9, the learner will be able to incorporate a contemporary approach to ultrasonic instrumentation and identify ultrasonic limitations, contraindications, and clinical indications for use.

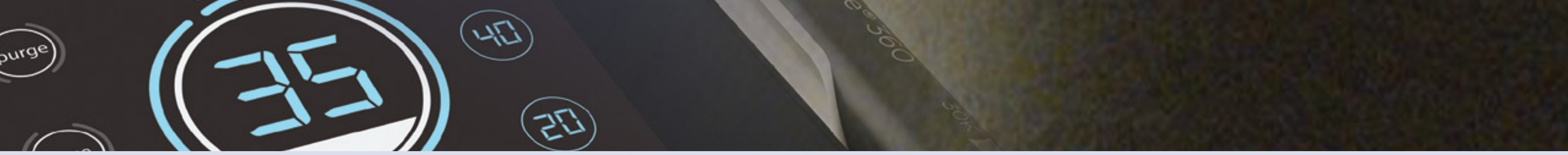
Ultrasonic instrumentation technique is taught over Chapters 9–12. Skills are broken down into building blocks starting with grasp and stabilization, operator and patient positioning, and aerosol control in Chapter 9. Chapters 10 and 11 add the building blocks of adaptation, angulation, orientation, and activation. Chapter 12 brings all the building blocks together with step-by-step hands-on practice exercises.

Chapters 13–16 present magnetostrictive ultrasonic technology from Dentsply Sirona and HuFriedyGroup, Chapters 17–20 present piezoelectric ultrasonic technology from EMS and Acteon. Manufacturers' specific terminology is introduced, and step-by-step hands-on practice exercises are provided to further develop technique.

Chapters 21–25 are dedicated to air polishing education. Chapters 21 and 22 present the science, physics, mechanism of action, functionality, uses, limitations, contraindications, and universal terminology for air polishing. Chapters 23 and 24 teach the equipment, clinical technique, and manufacturers' specific terminology for air polishing coronal and apical to the CE. Chapter 25 combines all the information learned into multiple step-by-step hands-on practice exercises for Dentsply Sirona and EMS technology.

Chapters 26–28 wrap up the text by discussing dental implant maintenance with a focus on power technology and instrumentation in three chapters. Chapter 26 defines the case definitions of peri-implant health and disease based on a series of clinical assessments. Chapters 27 and 28 teach the mechanical and nonmechanical debridement techniques for dental implants, abutments, and prosthesis using evidence-based research and science.

As with any form of clinical practice, power instrumentation is best learned through continued repetition. The exercises in this book allow the learner to move at their own pace to gain proficiency. The videos that accompany the text will provide visual and auditory instruction that can be watched multiple times while developing and honing clinical instrumentation skills.



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Integrating the text with constructive instructor resources is crucial to deriving their full benefit. Based on feedback from instructors and students, Jones & Bartlett Learning has made the following resources available to qualified instructors:

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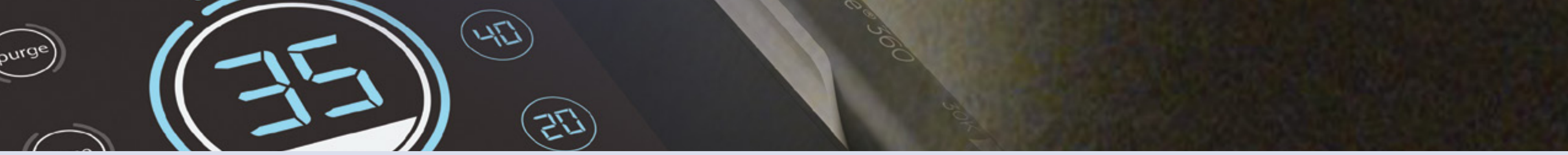

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- Acteon: Chip Vagnoni
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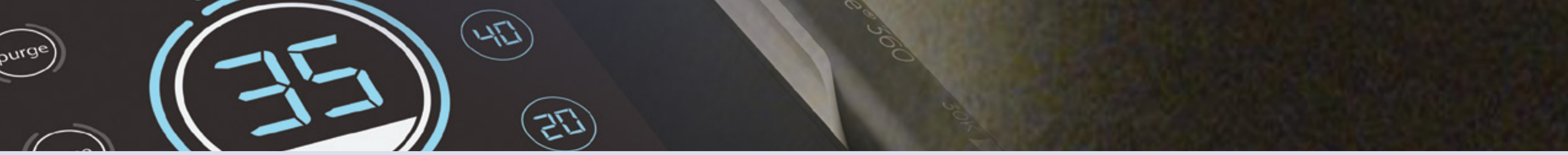
- EMS: Melissa Obrotka, RDH, BA.

Professors

Thank you to all the professors who seek to prepare the next generation of oral health-care providers for contemporary clinical practice. I hope you find this book provides you with the tools necessary to enrich your institutions' power instrumentation clinical curriculum. Thank you for your dedication to the dental field and student teaching. I welcome any comments or suggestions you have for changes to future editions.

Students

Students, you are the junior ambassadors to the dental field. I give you my sincere appreciation and gratitude for joining the profession I hold so dear. You represent the next generation of oral health-care professionals who will strike a path forward in improving patient care and experiences through power instrumentation. I thank you for your commitment to patient excellence and welcome any comments or suggestions you have for future editions.



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CHAPTER 1

Dental Aerosols

LEARNING OBJECTIVES

After studying this chapter, you will be able to:

1. Differentiate between oral symbiosis and dysbiosis.
2. Define an aerosol and spatter droplet and correlate particle size to potential health hazards.
3. Understand the sequence of events of dental aerosol production, release, and movement in an environment.
4. Understand disease transmission risk when performing a dental aerosol-generating procedure.
5. Identify equipment capable of producing and releasing large volumes of aerosols.

KEY TERMS

- Aerosol: small particle size (<50 μm) product created and released into the environment during a dental aerosol-generating procedure that stays airborne for an extended period of time and travels great distances.
- Acute respiratory infection (ARI): As defined by the WHO is an infection capable of interfering with the respiratory system function (WHO, 2014).
- Dental aerosol: man-made aerosol generated by air-driven dental equipment that emits an aqueous solution.
- Dental aerosol-generating procedure: any procedure performed in a dental environment that releases aerosols into the air.
- Dental equipment: machine and accessory used in the practice of dentistry.
- Dental health-care personnel (DHCP): as defined by the CDC is any "paid and unpaid personnel in the dental health-care setting who might be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air" (CDC, 2003).
- Diffusion: passive movement of a substance from an area of higher concentration to an area of lower concentration.
- Dysbiosis: imbalance of microbiota in the human microbiome that disrupts homeostasis and has the potenntail to cause diease, impairement, and inflammation.
- Oral flora: the natural microbiome residents that exist in the oral cavity such as bacteria, fungi, protozoa, viruses, genetic material, and environmental influences (nicotine, pollutants).
- Oral health-care provider: trained and licensed DHCP who is involved in direct patient care, treatment, and management of oral conditions within their scope of practice.
- Pathogenic dental aerosol: airborne aerosol created and released during a dental aerosol-generating procedure that contains a pathogenic organism (bacteria, viruses, fungi, protozoa) capable of causing disease once the organism enters the host.
- Pathogenic organism: organisms capable of causing disease.
- Spatter droplet: large particle size (>50 μm) product created and released into the environment during a dental aerosol-generating procedure.
- Symbiosis: balance of microbiota in the human microbiome that leads to health, wellness, and the promotion of homeostasis.
- Zoonotic disease: an infectious disease that is spread between animals and humans.

Introduction

Infection prevention is of upmost importance in any health-care setting as it saves lives. Central to the education of power instrumentation is infection prevention and the understanding of aerosol and spatter droplet production. The technology taught in this textbook introduces high volumes of aerosols that have an unpredictable behavior once they enter the environment. They can become part of the centralized ventilation, travel great distances from the source of creation, and stay suspended in the air for long periods of time. They have the potential to cause disease in humans who unintentionally inhale them.

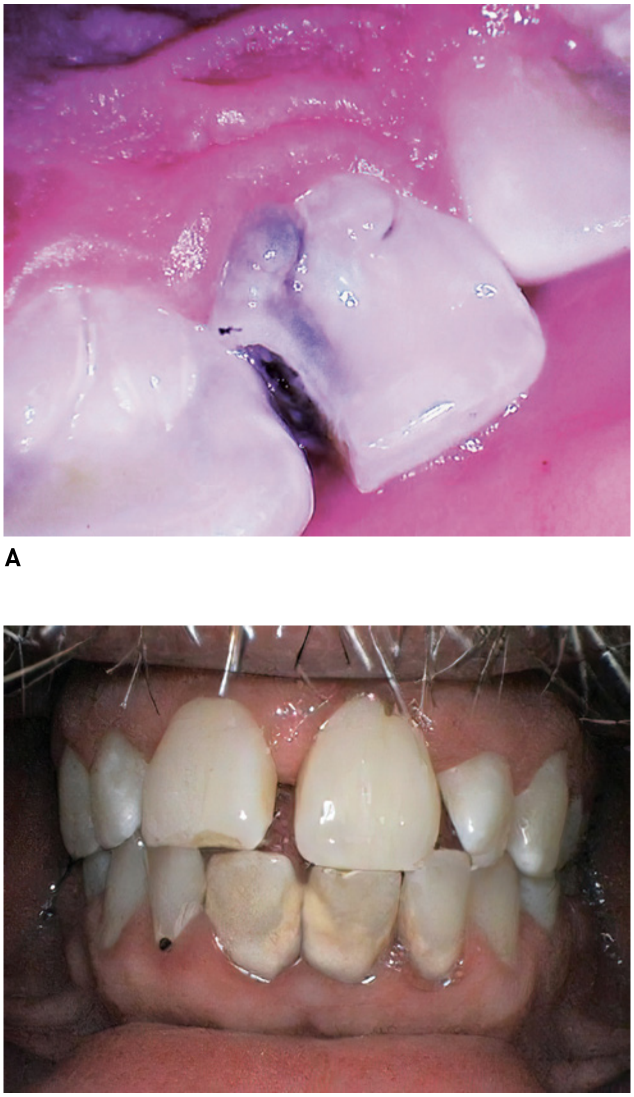
According to the World Health Organization (WHO, 2014), "Acute respiratory infections (ARIs) are the leading cause of morbidity and mortality from infectious diseases in the world." The COVID-19 pandemic caused by the SARS-CoV-2 virus and variants is an example of an ARI capable of causing a public health emergency. Adverse health events increase in a dental health-care setting when aerosols are not properly controlled. This chapter will introduce key terms used throughout the textbook and define aerosol and spatter droplet production, release, and behavior in the environment.

Oral Flora

The mouth has an extensive and diverse microbiome composed of bacteria, fungi, protozoa, viruses, genetic material, and environmental influences (nicotine, pollutants) that make up the **oral flora**.

- When these natural residents all live in harmony with one another, a **symbiotic** environment exists, and the patient's oral microbiome is balanced, healthy, and homeostasis is maintained.
- When the residents do not live in harmony with one another, a **dysbiotic** microbiome occurs in which disease can manifest. The most common oral diseases from a dysbiotic state are dental caries (tooth decay, cavity) and periodontal disease ((inflammatory disease with resultant infection and loss of the supportive apparatus of teeth) see **Figure 1-1**). When disease is present, **pathogenic organisms** (organisms capable of causing disease) are found in higher concentrations.

The term **dental health-care personnel (DHCP)**, as defined by the Centers for Disease Control and Prevention (CDC, 2003), refers to "all paid and unpaid personnel in the dental health-care setting who might be occupationally exposed to infectious materials, including body substances and contaminated, equipment, environmental surfaces, water, or air." Examples of DHCP per the CDC are listed in **Box 1-1**.



A

B

Figure 1-1 Oral dysbiosis **A.** Dental caries on a maxillary anterior tooth; **B.** Periodontal disease. Note the inflammation of the gingiva and oral deposits on the anterior teeth

For the purposes of this book, the term **oral health-care provider** is used to reference a trained and licensed DHCP who is actively involved in direct patient care, treatment, and management of oral conditions within their scope of practice. Examples include, but are not limited to, a dentist, specialist, dental hygienist, or dental assistant. The oral health-care provider has the highest risk of exposure to a patient's oral flora residents as they work intimately in the mouth with equipment that generates large volumes of aerosols, and studies have shown the highest exposure risk zone to an oral health-care provider is 1–3 feet from the patient's mouth (Innes et al., 2021; Manish et al., 2020; Muzzin et al., 1999; Zemouri, 2020).

Box 1-1 Dental Health-Care Personnel

- Dentist
- Dental hygienists
- Dental assistants
- Dental laboratory technicians
- Student
- Contractual personnel
- Administrative staff
- Housekeeping
- Maintenance
- Volunteer

Center for Disease Control. (2003, December 19). Guidelines for infection control in dental health-care settings – 2003. MMWR, 52, RR-17, 1–76.
Reference to specific commercial products, manufacturers, companies, or trademarks does not constitute its endorsement or recommendation by the U.S. Government, Department of Health and Human Services, or Centers for Disease Control and Prevention.

Aerosols and Spatter Droplets

An oral health-care provider uses air-driven equipment during patient procedures. This equipment generates and expels aerosols and spatter droplets into the dental environment.

- **Aerosol**: An aerosol is a small particle size (<50 μm) product created and released from equipment that emits water and air (Matys & Grzech-Lesniak, 2020; Micik et al., 1968; Singh et al., 2020). An aerosol will stay airborne for an extended period of time and travel great distances due to their small size (Micik et al.; Fennelly, 2020; Kumar & Subramanian, 2020). The smaller the particle size, the longer the aerosol will remain suspended in the air. See **Table 1-1**. Aerosols under 10 μm in size are naked to the human eye and have an increased risk for human disease transmission (CDC, 2020).
- **Spatter droplet**: A spatter droplet is a large particle size (>50 μm) product created and released from equipment that emits water and air. Matys & Grzech-Lesniak, 2020; Singh et al., 2020). Due to its larger size, the spatter droplet will bounce from surface to surface and land from the force of gravity faster than an aerosol (CDC, 2003, 2020). Spatter droplet can be seen with the naked eye, but once dried on a surface, may be difficult to detect (CDC, 2020).

An oral health-care provider has extreme close contact with their patient and is exposed to large volumes of spatter droplets and aerosols throughout a workday. Aerosols and spatter droplets have the potential to enter the human body through respiratory inhalation (inhaling while breathing) or through absorption via the skin or eye. Humans are capable of easily inhaling particle sizes under 100 μm (Thomas, 2013). If inhaled, these particles gain access to the respiratory system and can cause an adverse health effect when they contain pathogenic organisms generated from the oral microbiome.

Table 1-1 Particle Size and Time of Suspension in Air

Particle Size	Average Time of Suspension in the Air*
100 μm	3–5.8 seconds
10 μm	4–8.2 minutes
1–3 μm	1–12 hours

**Time of air suspension will vary based on the amount of turbulence in the air from natural ventilation (windows or doors opening and closing) and mechanical ventilation (heating, air-conditioning, fans).*
Data from Kulkarni, P., Baron, P.A., & Willeke, K. (2011). *Aerosol measurement: Principles, techniques, and applications*. (3rd Ed.). Hoboken, NJ:Wiley.

BREAKOUT POINT

An aerosol is a small particle-size product that stays suspended in the air for long periods of time and will travel great distances from its source of creation, increasing the potential for disease transmission.

BREAKOUT POINT

Aerosol and spatter droplet particles can be inhaled or absorbed through the skin or eye, increasing the risk for human-to-human disease transmission.

Aerosol Particle Size

Aerosol particle size plays a large role in the potential health hazard risk to humans. The process that generated the particle dictates the size. A human expels particle sizes under 1 μm during normal breathing, talking, singing, and shouting (Kumar & Subramanian, 2020; Asadi et al., 2019; Fabian et al., 2011). Thousands of aerosols and spatter droplets are expelled with a human sneeze, pant, or cough and can contain pathogenic organisms such as viruses and bacteria. See **Figure 1-2**. Millions of aerosols are

Figure 1-2 Human Sneeze

created and released during a dental aerosol-generating procedure (defined later).

As seen in Table 1-1, the smaller the particle size generated, the longer it will remain suspended in the air because the aerosol particle moves by passive **diffusion** in an environment. Diffusion is the movement of a substance from an area of high concentration to low concentration throughout an environment. A small-sized aerosol will remain suspended in the air for minutes to hours depending on the amount of air turbulence (air-conditioning, heating, open window, fan) in the environment. Pathogenic aerosols can pose a threat to a health-care facility's ventilation system if they gain access and circulate throughout the building (Fennelly, 2020).

Dental Aerosols

A **dental aerosol** is a man-made aerosol generated by air-driven **dental equipment** that emits an aqueous solution (most commonly used is water). Dental equipment refers to any machine or accessory used in the practice of dentistry. A **dental aerosol-generating procedure** is any procedure that produces and releases spatter droplets or aerosols into the environment. Examples of air-driven equipment that generate dental aerosols are:

- Dental drill. Commonly used for the removal of tooth decay. See **Figure 1-3a**.
- Dental ultrasonic or air polisher used for the removal of stain, biofilm, or dental calculus (see **Figure 1-3b** and **c**).
- Air/water syringe used for drying and rinsing the mouth (see **Figure 1-3d**).

Sequence of Events of Dental Aerosol Production and Movement in the Environment

There are six steps in the production, release, and movement of an aerosol in the environment.

1. Air-driven dental equipment emits water that is released into the mouth during active use and mixes with the oral flora of the oral cavity (see **Figure 1-4a**).
2. A dental aerosol is formed and combines with the water and oral flora mixture inside the mouth. The aerosol becomes slightly ionized (charged) when it combines with the water and oral flora mixture (Asadi et al., 2019).
3. Slightly ionized aerosol particle leaves the mouth and is forcefully expelled into the environment.
4. Water evaporates from the aerosol when it interacts with ions in the ambient air (oxygen, carbon dioxide, hydrogen, nitrogen) and causes the aerosol particle to become highly ionized (see **Figure 1-4b**; Asadi et al., 2019).
5. The highly ionized aerosols react violently in the environment with one another due to their charged state. They repel off one another and aggressively bounce around in the environment (see **Figure 1-4c**; Asadi et al., 2019).
6. As the aerosol particles move about the environment, they begin to interact with ions in the air and slowly start to deionize. When they lose their charge, they become less reactive and will eventually fall to the ground. After 30 minutes, dental aerosol particle movement is greatly reduced (Asadi et al., 2019).

Pathogenic Dental Aerosols

A **pathogenic dental aerosol** is a dangerous airborne aerosol created and released during a dental aerosol-generating procedure that contains a pathogenic organism (bacteria, viruses, fungi, protozoa) capable of causing disease once the organism enters a host. When inhaled, the pathogenic aerosol will penetrate the respiratory system and can cause an adverse health event.

- *Mycobacterium tuberculosis, pseudomonas aeruginosa, influenza, coronaviruses, rhinovirus,* and *measles* have been found in aerosols as small as 3–5 µm particle size and can penetrate both the lower and upper respiratory tract of a human (see **Figure 1-4c**;

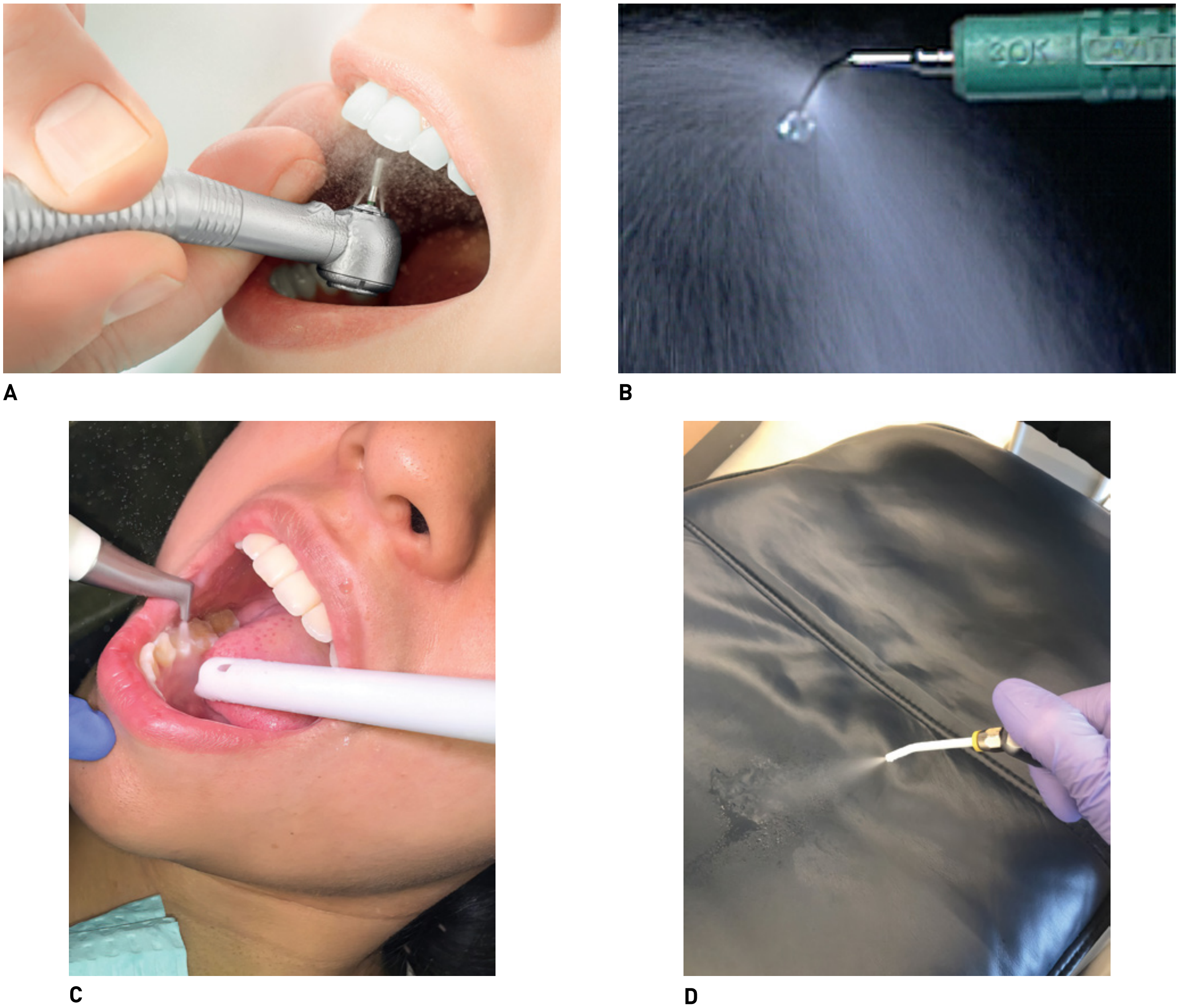


Figure 1-3 Air-driven dental equipment: **A.** Dental drill; **B.** Dental ultrasonic (Dentsply Sirona Cavitron Slimline 1000 30K Ultrasonic Insert); **C.** Dental air polisher (EMS AIR-FLOW Max handpiece); **D.** Air/water syringe

A: © Milos Batinic/Shutterstock; **B:** Reproduced with permission from Dentsply Sirona.

Figure 1-4 Sequence of Events of Dental Aerosol Production and Behavior. **A.** Air-Driven Equipment **B.** Aerosol Made of Water and Oral Flora. Water Evaporates and Aerosol Becomes Ionized **C.** Aerosol Repel From One Another

A: © Milos Batinic/Shutterstock.

Table 1-2 Pathogen Size and Respiratory System Penetration

Pathogenic Aerosol Size	Respiratory System Penetration
1–4 μm	Lower and upper airway
5–12 μm	Upper airway

Data from Fennelly, K. (2020, July 24). Particle sizes of infectious aerosols: Implications for infection control. *The Lancet, 8,* 914–924; Kumar, P.S., & Subramanian, K. (2020). Demystifying the mist: Sources of microbial bioload in dental aerosols. *Journal of Periodontology, 91,* 1113–1122; and Thomas, R.J. (2013, November 13). Particle size and pathogenicity in the respiratory tract. *Virulence, 4*(8), 847–858.

see **Table 1-2**; Fennelly, 2020; Kumar & Subramanian, 2020; Thomas, 2013).

The respiratory system is divided into two regions: the upper and lower respiratory tract as depicted in **Figure 1-5**.

- Upper respiratory tract: consists of the nose, nasal cavity, paranasal sinuses, and pharynx. See **Figure 1-5a**.
- Lower respiratory tract: consists of the larynx, trachea, bronchial tree and the lungs (see Figure 1-5a). The bronchial tree, is made of primary, secondary, and tertiary bronchi. The tertiary bronchi branch into small bronchioles, which house air-filled sacs called alveoli. See **Figure 1-5b**. When an organism gains access to the lower respiratory tract, infections are challenging to treat and can become life-threatening, especially in a vulnerable, medically compromised individual (Vos et al., 2021). Examples include, but are not limited to, pneumonia, bronchitis, and tuberculosis (Vos et al., 2021).

BREAKOUT POINT

A small particle-size pathogenic dental aerosol can invade the lower and upper respiratory tract of a human and cause infection.

Acute Respiratory Infection

An **acute respiratory infection (ARI)** is an infection capable of interfering with respiratory system function, including breathing. According to the WHO (2014), "ARIs are the leading cause of morbidity and mortality from infectious diseases in the world" with 98% of death occurring due to viral and bacterial diseases that invade the lower respiratory tract.

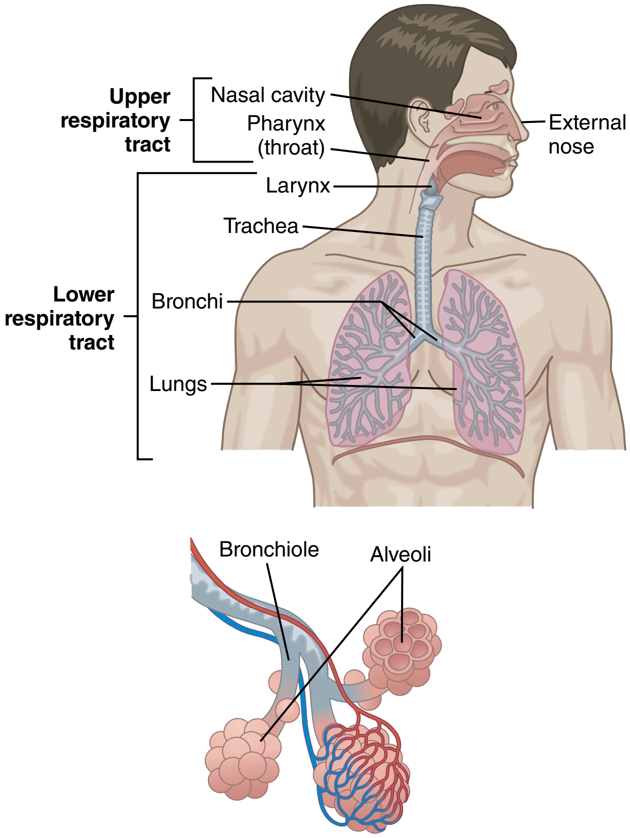


Figure 1-5 Respiratory System

ARIs with the potential to cause a public health emergency at either a pandemic or epidemic level are:

- Severe acute respiratory syndrome coronavirus (SARS-CoV): The virus is linked to a bat reservoir as zoonotic infection, which emerged in 2002 and disappeared by 2004 (WHO, 2014; National Institute of Allergy and Infectious Disease, 2020). A **zoonotic disease** is an infectious disease that is spread between animals and humans. The duration of infectivity for SARS-CoV is not well defined, and an oral health-care provider should use extreme caution when performing an aerosol-generating procedure on a patient with a known SARS-CoV infection within the last 81 days (WHO, 2014).
- Severe acute respiratory syndrome coronavirus two (SARS-CoV-2): The virus that causes COVID-19 is linked to a bat reservoir as zoonotic infection (WHO, 2018; National Institute of Allergy and Infectious Disease, 2020). The duration of infectivity of SARS-CoV-2 and its variants is not known at the time of this book's publication. It would be prudent for the oral health-care provider to treat a recovered SARS-CoV-2 patient in a similar manner as a SARS-CoV patient because both illnesses are caused by a coronavirus (WHO, 2014). For now, there are no set guidelines from the WHO

on how long to avoid an aerosol-generating procedure for any patient with a known current or previous SARS-CoV-2 infection (WHO, 2014).

- Middle East respiratory syndrome coronavirus (MERS-CoV): The virus is linked to a camel reservoir as zoonotic infection identified in 2012 (WHO, 2014; National Institute of Allergy and Infectious Disease, 2020).
- Human influenza caused by a new subtype, including human episodes of avian influenza (H5N1, H7N9, H7N2, H9N2), are zoonotic infections from birds. H7N9 first emerged in a human in 2013 (WHO, 2014). According to the WHO (2014), influenza A (H1N1) appeared in April 2009 and resulted in a pandemic until August 2010.

Dental Aerosols and the DHCP

Studies have shown a dental aerosol can travel as much as six to nine feet away from the source (patient mouth) and move in both a horizontal and vertical direction (Innes et al., 2021; Kumar & Subramanian, 2020; Dhand & Li, 2020; Milejczak & Bowden, 2005). This means the aerosol travels up to the ceiling and down to the floor while also moving left to right of the patient (see **Figure 1-6**). Because aerosol concentration is highest the first 10–30 minutes after a dental aerosol-generating procedure and can stay suspended for hours in the air, a DHCP should wear a mask to protect their airway.

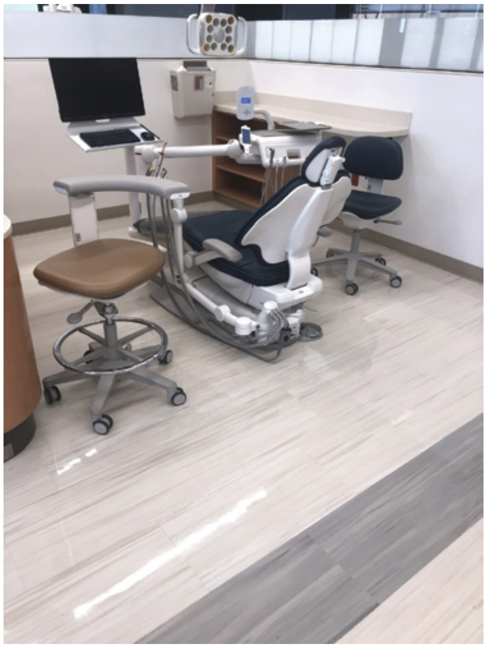


Figure 1-6 Dental Aerosol Movement in Dental Environment

BREAKOUT POINT

Dental aerosols are at their highest concentration 10–30 minutes immediately following the conclusion of a dental aerosol-generating procedure.

BREAKOUT POINT

A small particle-size dental aerosol will travel a minimum of 6–9 feet away from the patient's mouth in both horizontal and vertical directions.

During a dental aerosol-generating procedure, the highest exposure risk zone is 1–3 feet from the patient's mouth (Innes et al., 2021; Manish et al., 2020; Muzzin et al., 1999; Zemouri et al., 2020).

- The heaviest contamination to the oral health-care provider is their mask, face shield, face, and arms (Innes et al., 2021; Zemouri et al., 2020). Without the use of aerosol appropriate PPE (presented in Chapter 2), the provider is at higher risk for disease transmission from a pathogenic dental aerosol (see the practice exercise shown in **Figure 1-7**).
- The heaviest contamination to the patient is on their face and chest (Innes et al., 2021; Zemouri et al., 2020.

BREAKOUT POINT

Heaviest contamination during an aerosol-generating procedure is on the provider's mask, face shield, face, and arms.

When a dental aerosol-generating procedure is performed, there are specific infection prevention protocols that must be followed. The next chapter will present a six-tier multilayer approach to protecting all humans in the dental environment. In addition, DHCPs should also:

1. Manually disinfect all surfaces and equipment within a 10-foot radius of the dental aerosol-generating equipment with an Environmental Protection Agency (EPA)-registered intermediate-level disinfectant. Refer to the products direction/instruction for use (DFU/IFU) to ensure correct application and contact time is followed. EPA-registered intermediate-level disinfectants vary in their:
   - Contact times.
   - Number of wipes and contact time when using towelettes. Some are one-step while others are two-step wipe systems.
   - Claims against specific bacterial microorganisms and viruses.

Figure 1-7 Dental aerosol-generating procedure and inappropriate PPE

What is wrong with this picture?

Both male and female oral health-care providers' hair, scalp, and skin of the face and neck are exposed with no face shield or hair covering. The female's arms and torso are exposed with no gown. The male's torso is exposed with the gown open. The patient is missing protective glasses.

Figure 1-8 Towelette Lid Left Open (Medicom Pro-Surface)

- When using towelettes, follow these recommendations:
    1. Use the correct number of wipes per the manufacturer. Using fewer wipes than recommended will compromise disinfection results.
    2. Leave the solution untouched for the required contact time.
    3. When wiping a large area, using larger-sized towelettes may improve efficiency. Many manufacturers sell different size towelettes with varied scents.
    4. Always close the lid tightly on a towelette container to prevent towelettes from drying (see **Figure 1-8**).

2. Consider rescheduling any patient who presents to an appointment with a fever or active infection.

   According to the WHO (2014), "There is a significant research gap regarding the epidemiology of ARI transmission from patients to health-care workers during aerosol-generating procedures." Due to this knowledge gap, the dental office should have strong protocols and regular training for staff on the risk for disease transmission during a dental aerosol-generating procedure.

3. Remove carpet that is within 10 feet of aerosol-generating equipment. Carpet allows aerosols to recirculate in an environment, prolonging their suspension time in the air (Organization for Safety, Asepsis, and Protection, 2018). When a person walks on carpet, they crush the fibers against one another. If an aerosol is trapped in the carpet fibers, it will become airborne again as the carpet fibers are crushed against one another (Organization for Safety, Asepsis, and Protection, 2018).

CASE STUDY

You are a practicing dental hygienist in a country where you work under the supervision of a licensed dentist. Your first patient of the day presents for a procedure that will generate large volumes of dental aerosols. The patient reports they tested positive for SARS-CoV-2 yesterday and today their temperature is 101.0 degrees Fahrenheit. You relay this information to your supervisor who is not a licensed dentist. She tells you to proceed because the patient already prepaid for their procedure and she does not want to deal with rescheduling or refunding the patient.

1. What are the potential consequences if you follow your supervisor's order and proceed with treatment?
2. How should this situation be handled?
3. If you proceed with the procedure, could you be found guilty of a negligent tort?