Aerosol Safety in Dentistry
The Continuing Story of COVID-19 and Beyond

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The Current State of the Global Pandemic

COVID-19 cases

- Surging in the U.S. in areas with low vaccination rates
- Also surging in other countries
- Delta variant is now said to be the dominant strain - 50% of cases in the U.S.

The highly transmissible B.1.617.2 (Delta) variant continues to spread across the United States at a rapid pace. Early data suggest that B.1.617.2 now makes up more than 50% of COVID-19 cases. In some parts of the country, this percentage is even higher, especially in areas with low vaccination rates. This rapid rise is concerning and threatens the progress the United States has made toward ending the pandemic.

FDA Emergency Use Authorizations

FDA Revoke Emergency Use Authorizations for Non-NIOSH-Approved Disposable Respirators and Decontamination Systems as Access to FDA-authorized and NIOSH-approved N95s Increases Nationwide

On June 30, 2021, the FDA announced the revocation of the following EUAs:

- Imported Non-NIOSH-Approved Disposable Filtering Facepiece Respirators (effective July 6, 2021)
- Non-NIOSH-Approved Disposable Filtering Facepiece Respirators Manufactured in China (effective July 6, 2021)
- Decontamination and Biohazard Reduction System EUAs for Personal Protective Equipment (effective June 30, 2021)

As of the effective date of the revocations, these devices will no longer be authorized for use by health care personnel in health care settings. For additional information, please see Update: FDA No Longer Authorizes Use of Non-NIOSH-Approved or Decontaminated Disposable Respirators - Letter to Health Care Personnel and Facilities.

Historical information regarding these EUAs can be found on Historical Information about Device Emergency Use Authorizations.


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OSHA

- Dentistry largely exempt from Emergency Temporary Standard

https://www.osha.gov/coronavirus/ets
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- OSHA Guidance for PPE during COVID-19

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<tr>
<th>Care of patients in areas where community transmission of COVID-19 has subsided in the local area</th>
<th>Care of patients in areas where community transmission of COVID-19 continues in the local area</th>
<th>Care of patients with suspected or confirmed COVID-19, regardless of community transmission of COVID-19 in the local area</th>
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<tr>
<td>Dental procedures not involving aerosol-generating procedures</td>
<td>Dental procedures that may or are known to generate aerosols</td>
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**CDC:**

Guidance for Dental Settings

Interim Infection Prevention and Control Guidance for Dental Settings During the Coronavirus Disease 2019 (COVID-19) Pandemic


For DHCP working in facilities located in areas with moderate to substantial community transmission

- DHCP working in facilities located in areas with moderate to substantial community transmission are more likely to encounter asymptomatic or pre-symptomatic patients with SARS-CoV-2 infection. If SARS-CoV-2 infection is not suspected in a patient presenting for care (based on symptom and exposure history), DHCP should follow Standard Precautions (and Transmission-Based Precautions, if required based on the suspected diagnosis).
- DHCP should implement the use of universal eye protection and wear eye protection in addition to their surgical mask to ensure the eyes, nose, and mouth are all protected from exposure to respiratory secretions during patient care encounters, including those where splashes and sprays are not anticipated.
- During aerosol generating procedures DHCP should use an N95 respirator or a respirator that offers an equivalent or higher level of protection such as other disposable filtering facepiece respirators, powered air-purifying respirators (PAPRs), or elastomeric respirators.

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Updated Healthcare Infection Prevention and Control Recommendations in Response to COVID-19 Vaccination


CDC guidance for SARS-CoV-2 infection may be adapted by state and local health departments to respond to rapidly changing local circumstances.
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Interim Public Health Recommendations for Fully Vaccinated People

Key Points
The following recommendations apply to non-healthcare settings. For related information for healthcare settings, visit Updated Healthcare Infection Prevention and Control Recommendations in Response to COVID-19 Vaccination.


What does all this mean???

• It’s not back to the “old normal” – pre-pandemic
  – OSHA and CDC state that N95 respirators should be worn for AGP’s
  – OSHA states that health care settings must follow CDC guidance
  – OSHA and CDC also state that respirators and face masks must be NIOSH-certified, and FDA cleared as medical/surgical masks and respirators
It’s all about aerosols and Aerosol-Generating Procedures (AGPs)

Layering of Containment Strategies

• HVE
• Ventilation
• Air purification
Aerosol Production

- Aerosol-generating procedures (AGPs) = use of:
  - High speed handpieces
  - Air/water syringe
  - Ultrasonic scalers
  - Air abrasion
  - Air polishing

Aerosol Containment

- Protection from aerosols:
  - Wearing a higher level of respiratory protection
    - Respirator that seals
  - Wearing face shields or goggles (no gaps)
  - Increasing air exchanges in ventilation system
    - Removal of dispersed aerosols
  - Using air purification units in treatment rooms
    - Removal of dispersed aerosols
Aerosol Production in Dental Procedures

- Reduce the aerosol produced by:
  - Avoidance of AGPs – *not realistic*
  - Selectively using ultrasonic scalers and air polishing/air abrasion
  - Using dental dams where possible
  - Using high volume evacuation (HVE) for all AGPs

HVE is a Key Component of Layering Strategy

- Use of HVE – can reduce aerosol by up to 90%
  - [https://jada.ada.org/article/50002-8177(14)61227-7/fulltext](https://jada.ada.org/article/50002-8177(14)61227-7/fulltext)

- Many intraoral and extraoral devices available

- Intraoral devices can be challenging for hygienists
  - Typically, no assistant available to manage
Extraoral HVE Devices

• Self-contained systems
  – Efficient removal of aerosol
  – Portable units or “Plumbed” units
  – Noise
  – Size
    • potential visual obstruction
  – Filters
  – Cost

Extraoral HVE Devices

• Attachments to HVE lines in treatment room
  – Better positioning of device – smaller
    • Can be positioned adjacent to the site
  – Most treatment rooms already have available
  – Less noise
  – Less cost
Increased Use of HVE in a Dental Facility

- Adding more users to the system
  - Diffusing the power of the system
  - Saliva ejector uses 1/5 of capacity of an HVE
- Single or dual pump
- Wet or dry
- Ventilation in utility room

Is Your Evacuation System Up to the Task?

- Is the pump undersized for the facility?
  - Based on the number of high and low speed lines in each operatory
  - How many are used at one time?
- How old is the evacuation system pump?
- Is the system maintained regularly?
Maintenance of the Evacuation System

• Daily
  – Run an evacuation system cleaner through the lines

• Weekly
  – Check the solids collectors (traps) and replace if necessary
  – Check the intake filter on wet vacs

• Monthly – wet vacs
  – Change the main intake filter (follow MIFU)

• Quarterly – dry vacs
  – Check vacuum relief valve
  – Check oil levels if dry vac uses oil as lubricant – not needed on newer systems

• Annually
  – Have service tech perform needed maintenance

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