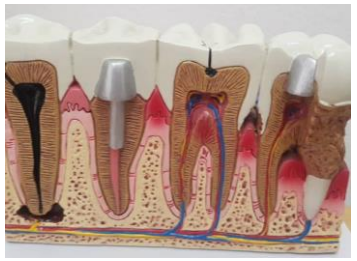
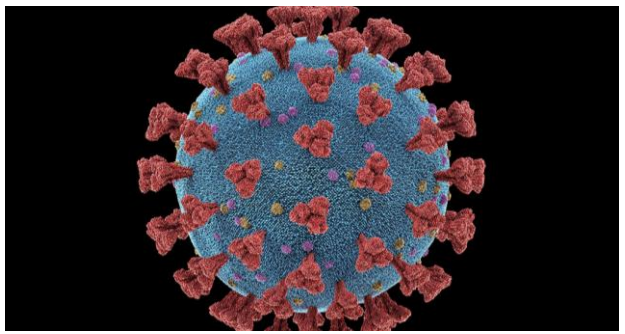
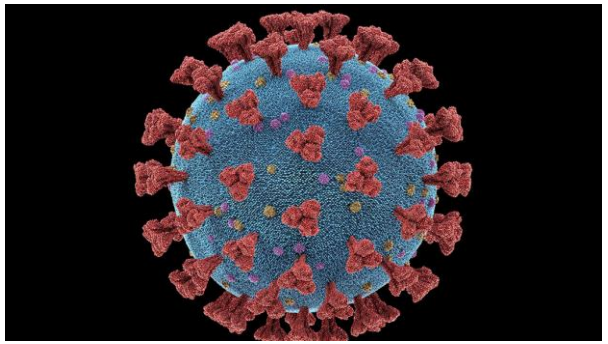


COVID-19, IPC IN DENTAL PRACTICE





Professor Folasade T Ogunsola

9th September 2020

Preventing and controlling transmission of COVID 19 infection

The Oral Cavity

- Naturally wet
- Teeming with microorganisms from not only the oral cavity but from nasopharynx, upper and lower respiratory tract.
- Dental plaque is a major source of organisms in the mouth with more than 700 known pathogens,
- Multiplication of SARS COV2 highest in the throat and found in high concentrations in saliva
- Gingival crevicular fluid, debris from tooth preparation, and dental materials may be aerosolized during dental procedures and contribute to disease transmission

Transmission of SARS-COV2

- Close contact by droplets
- Virus can persist in aerosols for hours, and on some surfaces for days under laboratory conditions.
- SARS-CoV-2 can be spread by people who are not showing symptoms.
- Airborne contamination during dental practice can be from
  - Dental instrumentation
  - Saliva
  - Respiratory tract sources
- Cross infection from improperly cleaned, disinfected, sterilized and stored Dental instruments, dental equipment and surfaces.

Aerosol Generating Procedures in Dentistry

Dental device/Procedure	Airborne contamination potential
Ultasonic scaler	Considered to be greatest source of aerosol contamination
High Speed Handpiece use (without rubber dam barrier)	High
Air Polishing	High (almost as high as with Ultrasonic scalers)
Air-water syringe	High (almost as high as with Ultrasonic scalers)
Tooth preparation with Air turbine Handpiece	Minimal aerrosol contamination –if rubber dam in place
Tooth preparation with air abrasion	Microbial contamination is unknown but high contamination with abrasive particles shown – High risk

- Aerosols may be generated during procedures where high velocity air passes over respiratory mucosa
- This increases the risk of generating tiny (<5µm) respiratory particles (droplet nuclei) which become airborne and can be inhaled by others present in the room
- Do not carry out AGPs on patients who have had a respiratory tract symptoms in the preceeding 7 days

https://www.dentalcare.com/en-us/professional-education/ce-courses/ce619/dental-procedures-associated-with-aerosols

Dental Procedures That are NOT considered Aerosol Generating Procedure

- Oral health assessment
- Basic examinations (without 3-in-1 syringe)
- Non-surgical extractions
- Hand scaling with suction
- Removable denture stages
- Removal of caries using hand excavation or with slow speed and high-volume suction
- Paediatric oral health including stainless steel crowns (Hall crown) and silver diamine fluoride applications
- Orthodontic treatment

*Coughing, and procedures that generate coughing, are not classified as AGPs

*https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/06/C0704-dental-transition-to-recovery-sop-28-august-2020.pdf

Infection Risk in Dentistry

- **Direct exposure: Close proximity to the patient's oropharyngeal region** -sputum. Oro pharyngeal secretions. Dentists operate in the mouth
- **Droplet and aerosol-generating procedures-** use of rotary dental and surgical instruments, - handpieces or ultrasonic scalers and air-water syringes which create a visible spray of water that can contain saliva, blood, microorganisms, and other debris.
- **Contaminated surfaces**: Splatters created during oral surgery procedures may contaminate environmental surfaces

Concepts of Care

1. MINIMIZE RISK –
   a. PRIORITIZE DENTAL SERVICES FOR THE MOST CRITICAL NEEDS and most vulnerable patients in a way that minimizes harm to patients from delaying care and harm to staff from potential exposure to COVID-19.
   b. BE PROACTIVE in communicating to patients and staff the need for them to stay at home if they are ill.
2. BREAK TRANSMISSION - Know what to do if a patient with covid-19 enters your facility.
3. PERSONAL PROTECTION – Know what PPE to use, when and how to use it.

General Administrative Control considerations

- Screen patients prior to dental appointments
- Avoid non urgent dental procedures
- Limit the number of individuals in the treatment room to the absolute minimum requirement.
- Standard precautions for all patient care
- Use the right PPE and don and Doff correctly
- AGP procedures to be done only when necessary and risk should be mitigated

MINIMISING Risk

Pre-Appointment Screening

1. Telephone Screening for all patients
   - Exposure,
   - Symptoms

2. Telephone triage care
   - Assess the dental condition to determine if they need to come in or care can be provided over the phone

Symptoms

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

Minimizing exposure to COVID-19 _ Patient

AVOID ELECTIVE CARE FOR SYMPTOMATIC PATIENTS

- Inform patients **not** to attend for treatment if:
  - they have ANY symptoms of respiratory tract infection or signs of COVID-19
  - they have had symptoms or a positive COVID19 test within the last 7 days
  - they are self isolating after contact with someone with COVID-19
- If emergency appointment:
  - Check if the patient has had symptoms in last 7 days
  - If symptoms reported:
    - manage with COVID-19 precautions

Minimizing exposure to Staff with COVID-19

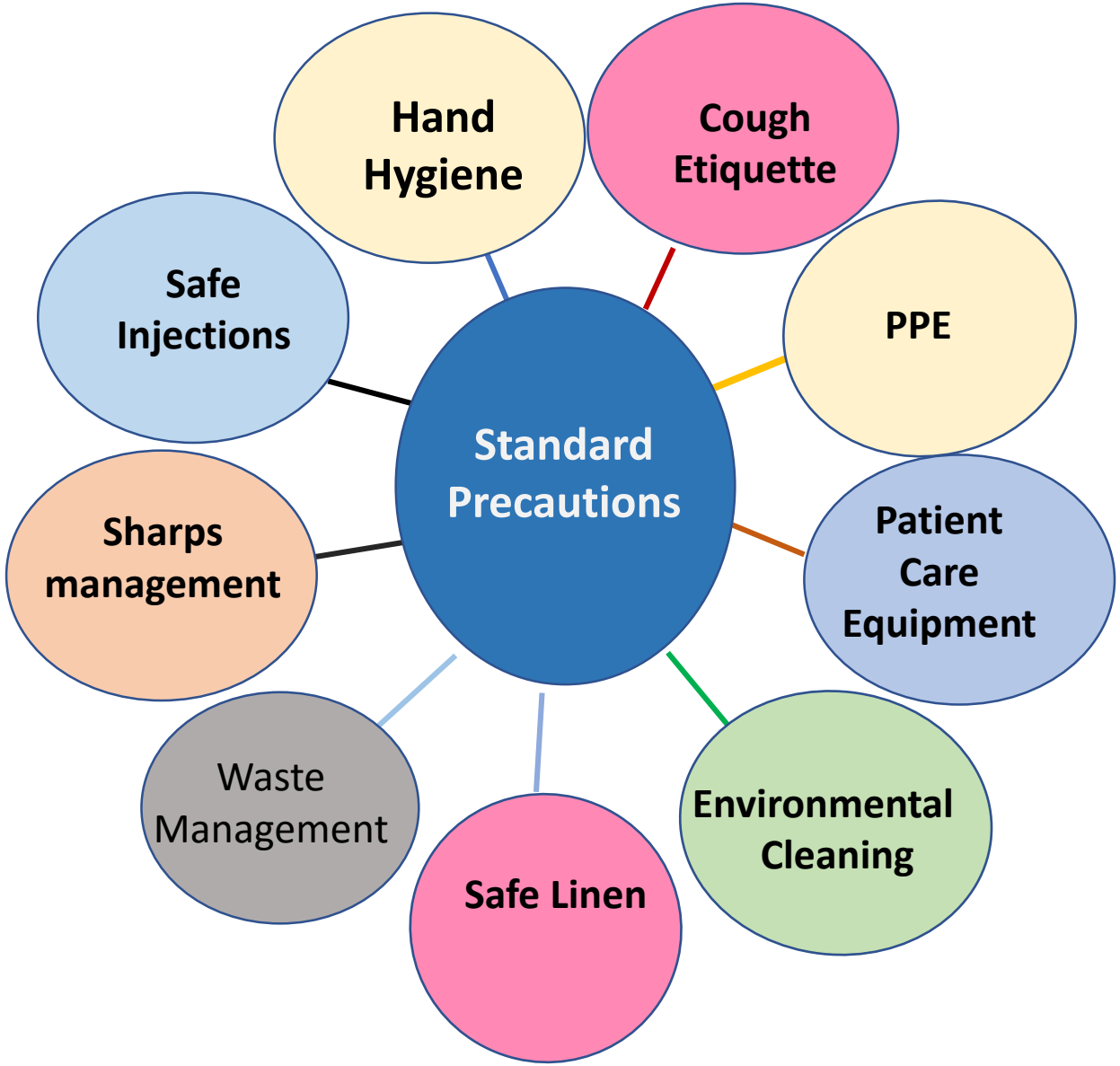
- Staff who develop symptoms of COVID-19 should not attend work
- Self-isolate at home for 7 days from onset of symptoms
- Arrange to take a COVID-19 test
  - within 3 days of start of symptoms
  - can return to work if symptoms resolve and test is negative
- Risk assess staff at high risk of complications from COVID-19 to manage their deployment

Screening and Triage on Arrival

- Screen all patients for exposure and symptoms
- Limit accompanying family members to one
- Request everyone to wear a face mask or cloth covering – Provide for patients that do not have
- Assist everyone to adhere to respiratory and hand hygeine

Applying standard precautions for all patients

- Cough Etiquette
- Hand Hygeine according to 5 moments of hand hygeine
- PPE according to Risk assessment
- Ensure safe patient care equipment by appropriate cleaning disinfection and sterilisation
- Increased frequency of Environmental cleaning with regular disinfection of high touch surfaces
- Safe Waste management
- Safe handling of Linen

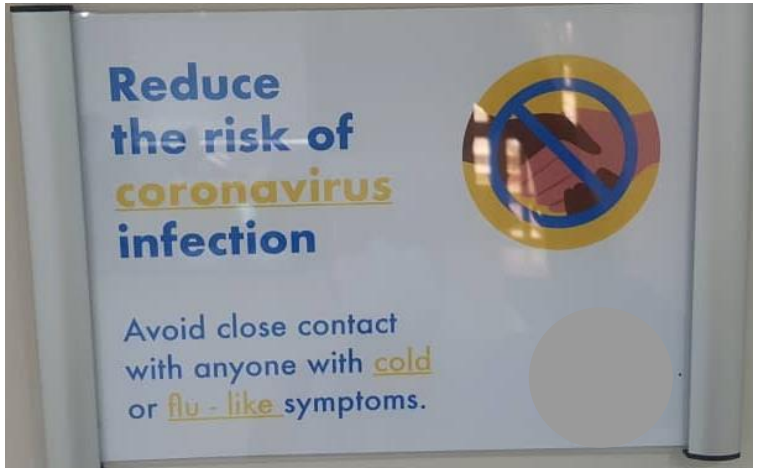


Personal hygiene to prevent spread

- Cough etiquette
  - Cough into tissue and Dispose of tissues directly iin covered bin
  - OR cough into elbow
- Hand hygiene
  - After contact coughing/sneezing
- Face coverings

Workplace Controls

- All patients and staff to practice cough etiquette and hand hygiene
- Have posters at entrance and prominent places e.g., waiting areas, stairways, break rooms
  - Should be in appropriate languages
  - Hand hygiene, - how and when to perform hand hygiene.
  - cough etiquette – how and what to do
  - Face covering for source control and how to be properly masked
- Provide supplies for respiratory hygiene and cough etiquette - hand wash stations and/or alcohol-based hand rub (ABHR) with at least 60% alcohol



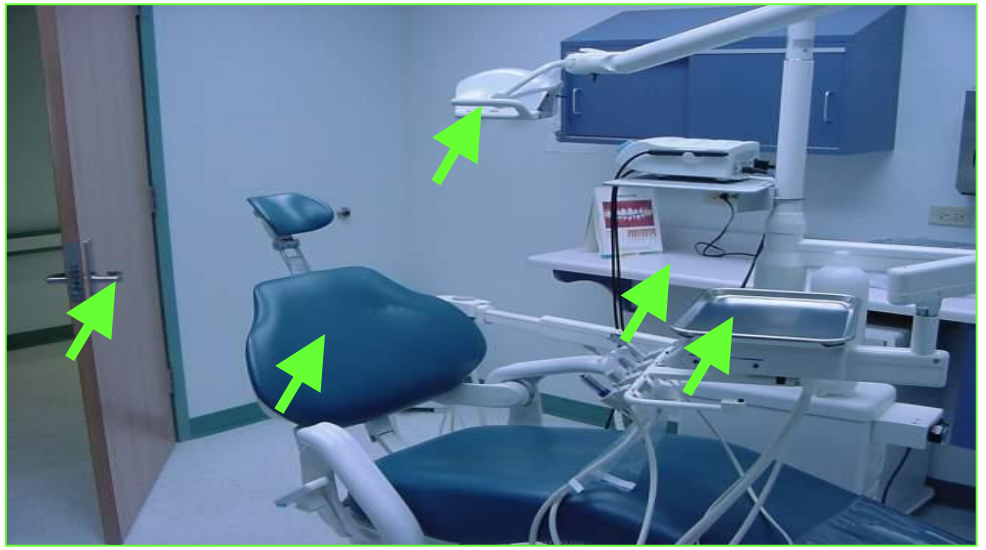
Workplace : Social Distancing

- Place chairs at least 3ft apart
- Minimize number of patients in waiting room
- Remove toys, magazines and frequently touched objects
- Reduce CROWDS
  - Staggered appointments
  - Waiting in car
  - Create outdoor area for over flow
- Install physical barriers (e.g., glass or plastic windows) at reception areas to limit close contact or ensure >3ft distance

Environmental Cleaning: The dental environment

Non critical surfaces: Have potential to come in contact with intact skin, but not mucous membranes.

- Clinical contact surfaces
  - High potential for direct contamination from spray or spatter of blood and other potentially infectious materials or by contact with HCW gloved hand aerosol, instruments, devices, or other items during dental care
- Housekeeping surfaces
  - Do not come into contact with patients or dental devices
  - Limited risk of disease transmission



Environmental cleaning

- **Clinical contact surfaces** .
  - Countertops
  - Dental units
- **Clean between patient visits -** must be cleaned and wiped down with **low level or intermediate level** surface disinfectant
- or Barrier-protected and cleaned at the end of the day.
- Use “spray-wipe-spray” technique to clean and disinfect clinical contact surfaces.

Housekeeping Environmental Surfaces

- **Housekeeping surfaces** such as walls and floor
- May become contaminated
- Not directly involved in infection transmission
- Do not require as stringent decontamination procedures
- Clean and disinfected using a **low level disinfectant** with detergent on a regular basis, when spills occur, and when these surfaces are visibly soiled.

Cleaning Housekeeping Surfaces

- Routinely clean with soap and water
- Have colour coded mops and cloth for different areas
- Use a three bucket system for floors
- Clean mops and cloths and allow to dry thoroughly before re-using
- Prepare fresh cleaning and disinfecting solutions daily and per manufacturer recommendations

General Cleaning Recommendations

- Use barrier precautions (e.g., heavy-duty utility gloves, masks, protective eyewear) when cleaning and disinfecting environmental surfaces
- Physical removal of microorganisms by cleaning is as important as the disinfection process
- Use 0.1% chlorine to clean surfaces
- 0.5% (5000ppm chlorine) – If contaminated with body fluids

PPE

- Face masks are used to avoid respiratory droplets and spray of body fluids on the face and also used by patients as source control to prevent the spread of pathogens to others



- Respirators are used to protect from respiratory aerosols and if properly fitted, they may provide better protection against respiratory infections than a standard face mask.

- Gloves are also used to prevent hand contamination by body fluids, including respiratory secretions.

- Gowns and aprons are used to prevent contamination of clothes from splashes and splatter




- Goggles and face shields are used to protect against the transfer of respiratory pathogens into the eyes from contaminated hands and other sources

Surgical Mask

- Wear fluid resistant surgical mask when within 2 metres of patient
  - Protects your respiratory tract from droplets from patients
  - As source control to patients and other staff from your respiratory droplets
- Mask can be worn for several hours

  Do not touch the mask

  Do not wear around your neck or under your nose

  Do not take off to speak
- Remove and discard the mask when:

  it is damp, soiled, uncomfortable, difficult to breathe through

  You take a break or finish work session
- Staff should use Masks where social distancing is not possible

N95 Respirator

- Filters out very small particles
- Protects from inhalation of droplet nuclei
- Filtration effective only if well sealed to face
  - Fit testing required to ensure effective protection
  - Seal check before each use

- **Required for all AGP**
  - Can be worn for a session
  - Once removed must be discarded to avoid contamination of face/hands
- Not necessary for close contact if you are not performing an AGP
- N95 with valves do not prevent spread of droplets from wearer – if it is all you have then wear a surgical mask over it

Gloves

- Use for all procedures involving DIRECT contact with blood or body flu
- *Always carry out a Risk assessment of the procedure*:
  - if gloves are indicated put on **immediately before** commencing procedure
- Remove and decontaminate hands with soap and water **immediately after** the procedure and between patients
- Always take gloves off immediately after procedure

Disposable aprons

- For procedures where there is a risk that the clothing may become soiled with blood/body fluid
- *Risk assess procedure:*
  - If indicated put on **immediately before** commencing procedure
- Discard between patients and decontaminate hands with soap and water

Eye Protection

- Wear for direct contact with patient if there is a risk of respiratory droplets getting into eyes
- Do not re-use Disposable, single-use, eye/face protection
- Use during single procedure or for a session
- Where re-usable clean between single or sessional use:
  - disinfectant wipe
  - detergent and water
  - check manufacturer's guidelines

Removal of protective clothing (Doffing)

- Discard mask when moist or damaged
- Remove PPE in this order:
  1. Gloves (then decontaminate hands)*
  2. Apron/gown (avoid touching contaminated front surface)
  3. Mask/eye protection
- Decontaminate hands after all PPE has been removed

*as hands contaminated when gloves removed and need to be clean to remove the remaining PPE

Staff Training on PPE

- Understand what PPE they should wear for each setting and activity
- Have access to the PPE for the appropriate setting and task
- Use items in accordance with the manufacturers guidelines
- Are trained to don and doff PPE safely

Summary of PPE to reduce risk of SARS-CoV-2 transmission

Personal Protective Equipment (PPE)	Dental Surgery		Waiting room/reception
	Treatment without AGP	Treatment with AGP *COVID-19 patient or period of sustained community transmission*	Social distancing
Plastic apron	✓	✓	✗
Surgical mask	✓	✗	Risk assess*
Long sleeved, gown	✗	✓	✗
N95 respirator	✗	✓	✗
Eye protection	✓	✓	Risk assess*
Gloves	✓	✓	✗

AGP = aerosol generating procedures

* Masks and Gowns should preferably be waterproof

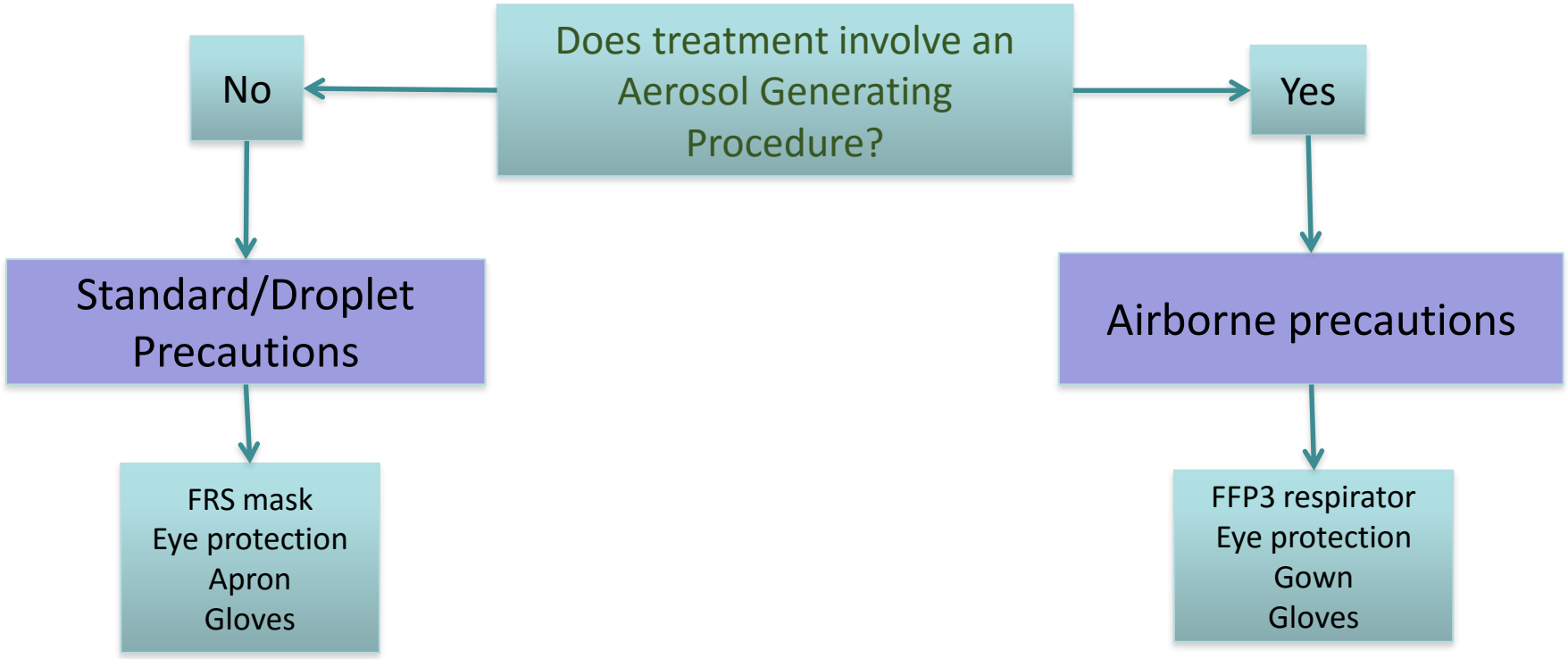
Work Practice controls: Patient placement

- Individual rooms preferred
- If open plan
- At least 6 feet between chairs
- Floor to ceiling easy to clean barriers
- Orient chairs parrallel to the airflow
- Where possible place patient HEAD away from air inflow and close to outflow

WORK PRACTICE CONTROLS

- PERFORM AGPs in single rooms
- If dealing with a covid patient schedule him to end of DAY
- If possible limit care to one patient at a time
- Create barriers between bays
- Only bring out enough clean or sterile supplies needed for a procedure
- Any supply not used must be considered contaminated and be discarded or Appropriately decontaminated
- All unneeded equipment should be stored away from clinic ll other supplies and instruments should be in covered storage, such as drawers and cabinets, and away from potential contamination.

Infection control precautions for patients with COVID-19



During periods of sustained community transmission airborne precautions may need to be taken for AGP **on all patients** not just those with COVID-19

This will require risk assessment

Droplet Precautions for known or suspected COVID-19 patients

- Place patient at end of list
- Admit directly to surgery
- Protective clothing for contact (within 2 metres)
  - Fluid resistant surgical mask
  - Eye protection
  - Gloves
  - Plastic apron
- Discard ALL protective clothing after procedure
  - disinfect re-usable eye protection between patients
- Clean and disinfect near-patient surfaces after patient leaves room

Airborne precautions

for known or suspected COVID-19 patients

- Avoid performing AGP if possible
- Use well ventilated room and close door
- Open windows (or ensure ventilation system is operating) to increase dilution of aerosols
- If AGP essential - use high volume aspiration and rubber dam
- Only essential staff should be present
- Personal protective equipment:
  - N95
  - Eye protection
  - Long-sleeved waterproof gown & gloves
- Leave room vacant (door closed) to allow aerosols to settle for
  - **1 hour in neutral pressure room**
  - **20 mins in well ventilated room (at least 10 air changes/hr)**
- Clean surfaces in contact with patient or exposed to aerosols

Cleaning after procedure on known/suspected COVID-19 patient

- Commence once aerosols removed by air changes
  - within one hour in neutral pressure room
  - within 20 mins in well ventilated room (>10 air changes/hr)
- Near-patient medical equipment and surfaces
  - Decontaminate after the patient has left the room
  - Use detergent solution/wipe followed by disinfectant
  - Select disinfectant using protocol for infected cases or manufacturers instructions e.g. chlorine 1000ppm (1%)
- Decontaminate/discard cleaning equipment after use
- Instruments – re-process in usual way
- Waste - treat as infectious waste

Water systems and Dental unit water lines (DUWLs)

- At the beginning of each workday, **dental** unit **lines** and devices **should** be purged with air or **flushed** with water for at least two minutes prior **to** attaching handpieces, scalers, air water syringe tips or other devices.

- The **dental** unit **lines** and devices **should** be **flushed** between each patient for a minimum of 20 seconds

*HSG 274, HTM 04-01, HTM 01-05 (England) WHTM 01-05 (Wales) SDCEP (Scotland) DHSSNPSI (N.Ireland) **May require advice from Specialist Water Treatment Advisors

Sterilization of patient care equipment

- Sterilization protocols do not vary for respiratory pathogens.
- perform routine cleaning, disinfection, and sterilization protocols, and follow standard recommendations for Sterilization and Disinfection of Patient-Care Items
- follow the manufacturer’s instructions for times and temperatures recommended for sterilization of specific dental devices.

How can we reduce Aerosol Generation?

- Pre-procedure mouth washes like 1% hydrogen peroxide or 0.2% povidone solution, Pediatric patients who are unable to rinse, cotton rolls socked in the mouth wash can be used.
  - Known to reduce organisms in secretions but no evidence that it reduces transmission of infection
- Minimize the use of aerosol-generating instruments like three-way syringe, ultrasonic devices and high-speed handpieces.
- Rubber dam when a high-speed handpiece use is necessary.
- Use the high-volume suction in addition to saliva ejector.
- Use anti-retraction high-speed handpieces to reduce the backflow of oral microbes into the tubes of the dental units.

Preprocedural rinses

- No evidence that this reduces SARS COV 2 Viral loads or transmission
- But antimicrobial products Chlorhexidine gluconate, povidone-iodine or cetylpyridinium chlorid may reduce the level of oral microbes and thus reduce the level of microrganisms in aerosols and spatter during dental procedures

Rubber dam isolation

- GOALS OF ISOLATION
  - Moisture control
  - Retraction and access of site
  - **Harm prevention**
    - **Safe and aseptic operating field**
    - Prevent accidental swallowing of restorative materials and instruments
    - **Reduces Bacterial contamination from saliva**
    - **REDUCTION OF AEROSOLS**

Summary

Dental surgery poses a potential high risk for covid-19 because the virus multiplies in the throat and high speed rotating devices that generate aerosols are standard practice.

MINIMIZE RISK –

a. PRIORITIZE DENTAL SERVICES FOR THE MOST CRITICAL NEEDS and most vulnerable patients in a way that minimizes harm to patients from delaying care and harm to staff from potential exposure to COVID-19.
b. BE PROACTIVE in communicating to patients and staff the need for them to stay at home if they are ill.

BREAK TRANSMISSION - Know what to do while working with patients or if a patient with covid-19 enters your facility

- Personal hygiene – cough etiquette, Hand hygiene, social distancing
- Standard precautions
- Work practice controls
- How to mitigate and reduce risks from AGP

PERSONAL PROTECTION – Know what PPE to use, when and how to use Minimise risk - Minimise contact and prioritize procedures

Thank you

References

- **Public Health England Coronavirus (COVID-19) infection control guidance** https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control
- **World Health Organization** https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- **Centre fo Disease Control and Prevention** https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html#section-1
- Thank Emilio Hornsby for sharing some of his slide with me.