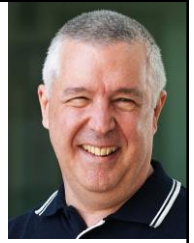


Contemporary Infection Control



2022

Emeritus Professor Laurence J. Walsh AO

BDS(c)(Hons), PhD, DDSc, GCEd, FRACDS, FFOP(RCPA), FFDT RCS Edin

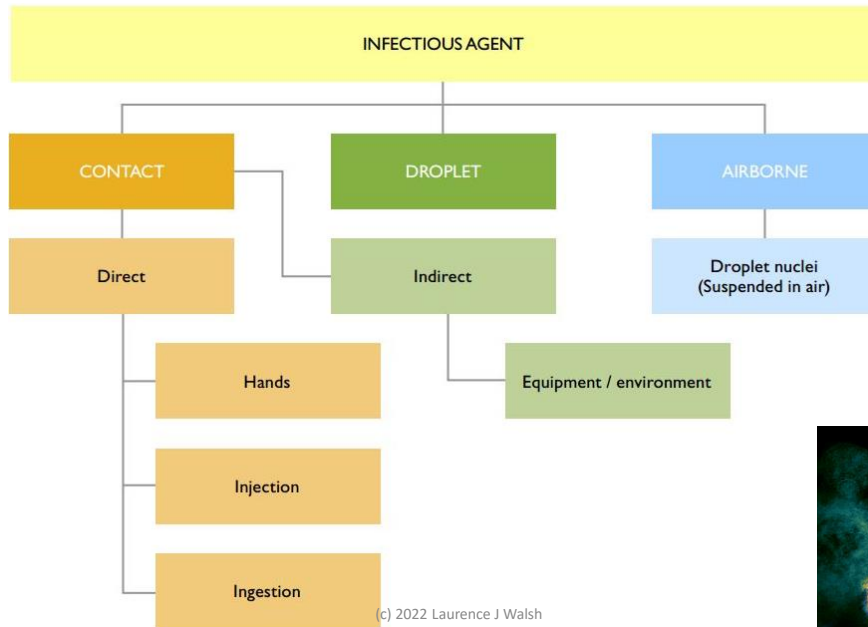
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Transmission-based precautions



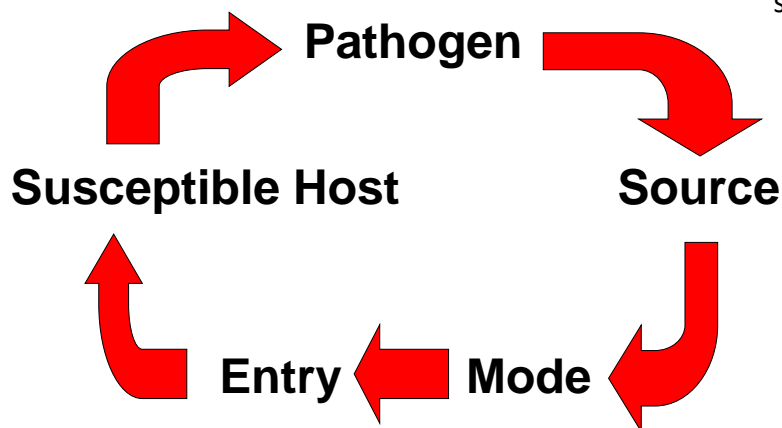
Implementing transmission-based precautions

NHMRC 2019



Breaking the chain of infection: The practical logic of IC measures

All infection control measures work on at least one of these steps!



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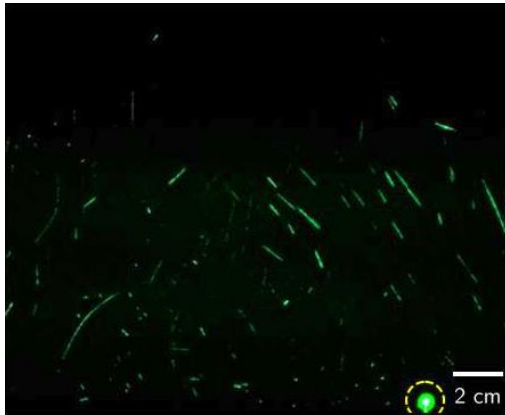
AGPs we do vs. AGBs that the patient does



The airborne lifetime of small speech droplets and their potential importance in SARS-CoV-2 transmission

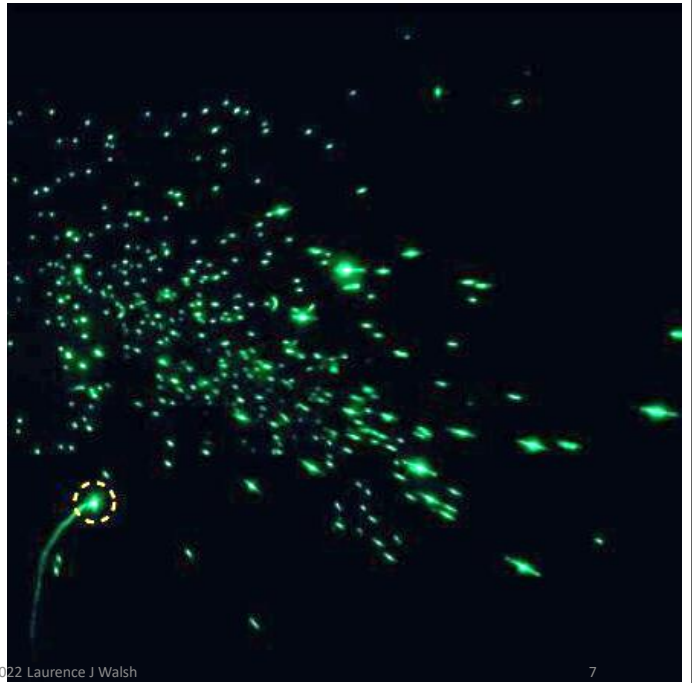
Valentyn Stadnytskyi^a, Christina E. Bax^b, Adriaan Bax^{a,1}, and Philip Anfinrud^{a,1}

Speech droplets generated by asymptomatic carriers of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are increasingly considered to be a likely mode of disease transmission. Highly sensitive laser light scattering observations have revealed that loud speech can emit thousands of oral fluid droplets per second. In a closed, stagnant air environment, they disappear from the window of view with time constants in the range of 8 to 14 min, which corresponds to droplet nuclei of ca. 4 μm diameter, or 12- to 21- μm droplets prior to dehydration. These observations confirm that there is a substantial probability that normal speaking causes airborne virus transmission in confined environments.



The spots vary in brightness because of the differences in the size of the particles. Some of the spots are streaked, which suggests that the rate of 60 frames per second was insufficient to freeze the motion of the droplets. The feature highlighted by a dashed yellow circle corresponds to the tip of a very thin wire positioned just behind the light sheet; this wire provided a reference for setting the camera focus and gain before recording. (See the video, available at [NEJM.org](https://www.nejm.org).)

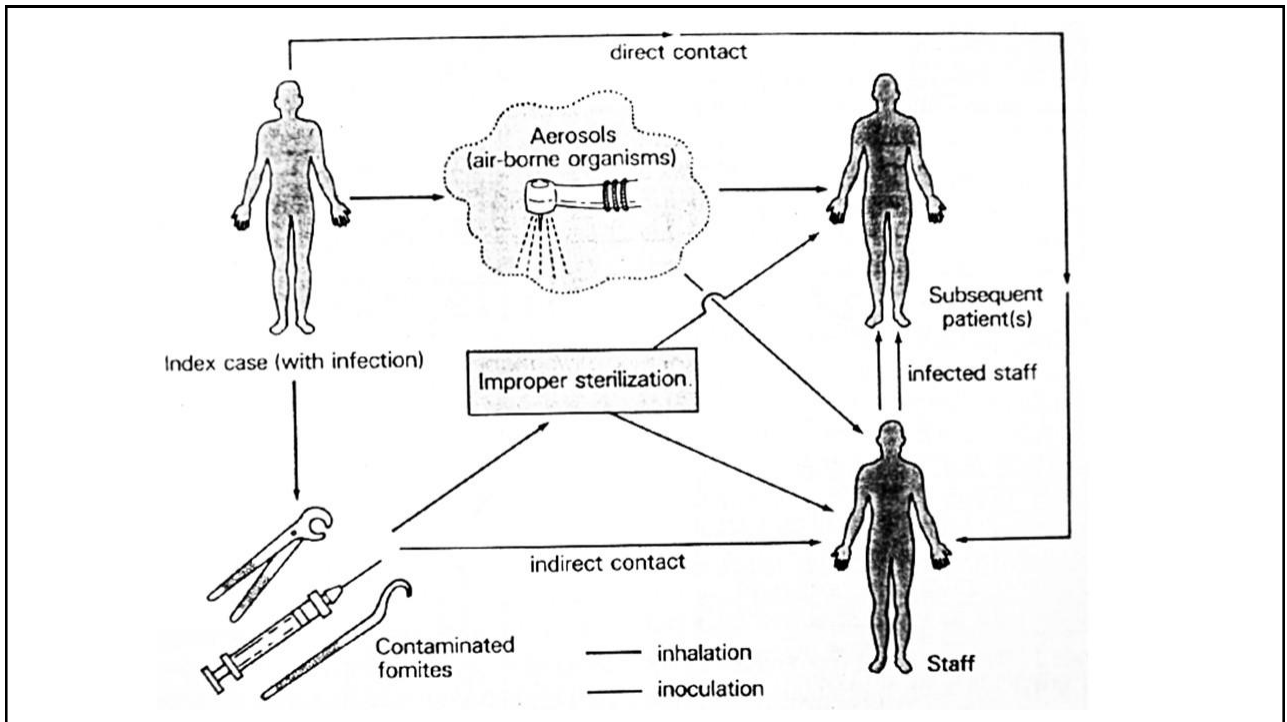
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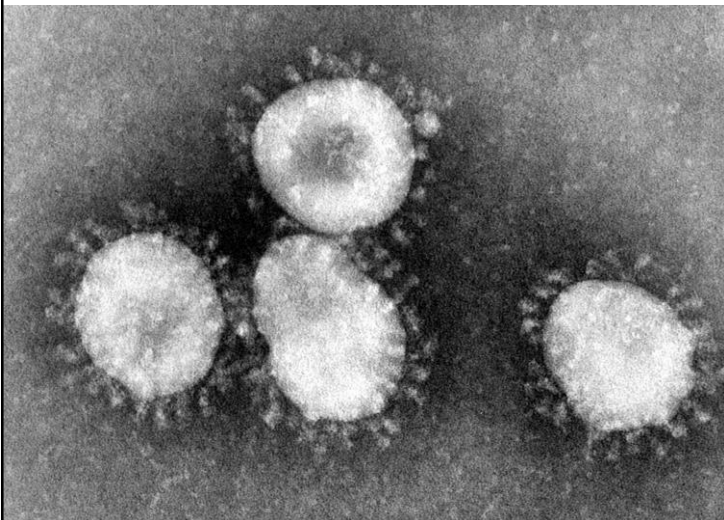
7



Higher viral load when symptomatic



Airborne transmission

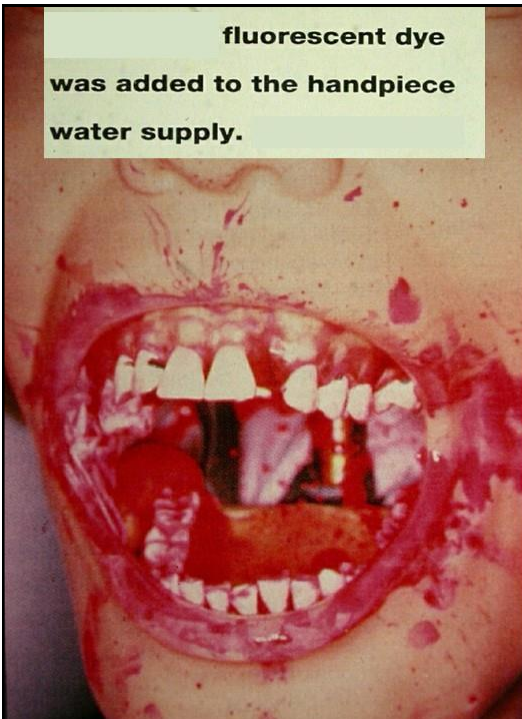


Many dental instruments produce splatter, droplets and aerosols

“What if saliva were red?”



**fluorescent dye
was added to the handpiece
water supply.**



WHAT IF SALIVA WAS **RED..?**

► INVISIBLE SALIVA



► IF SALIVA WAS **RED**





1977



2017



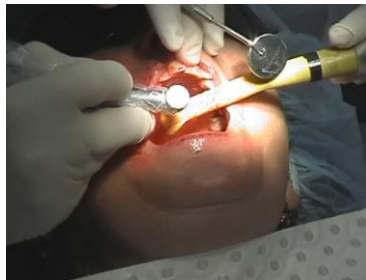


Incorrect work practices leading to contamination

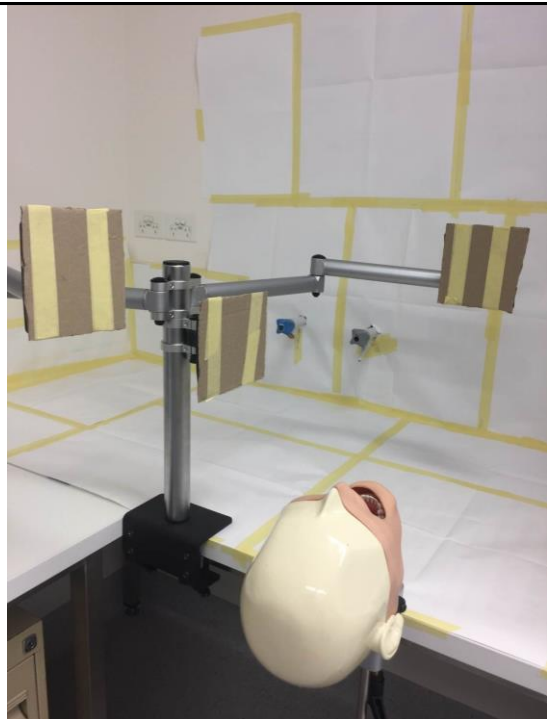
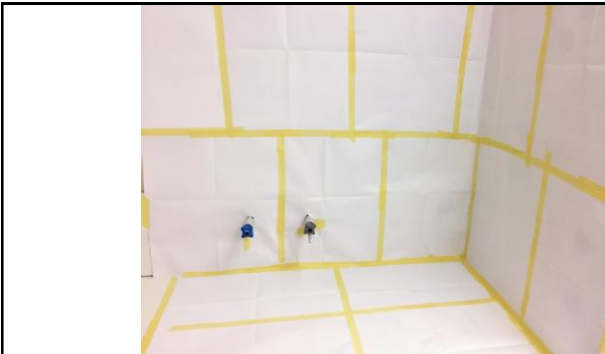


Many dental instruments produce splatter, droplets and aerosols

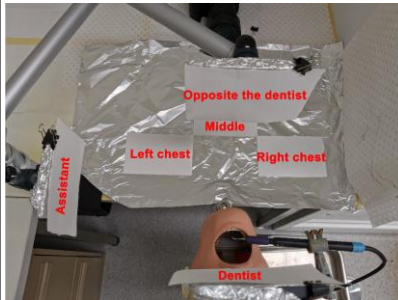
- Causes
 - Ultrasonic scalers
 - Air polishers/ particle beams
 - Air abrasion units
 - Triplex syringes
 - Air turbine handpiece
 - Slow-speed handpiece



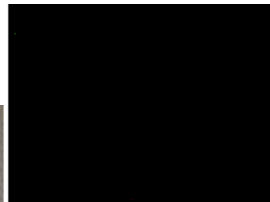




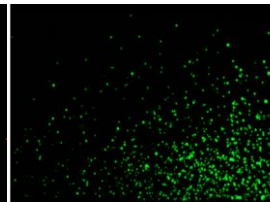
Ultrasonic 15 secs



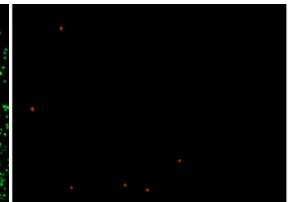
Layout



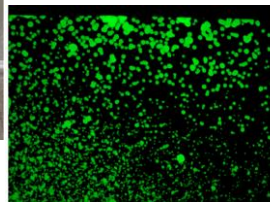
Dentist-1



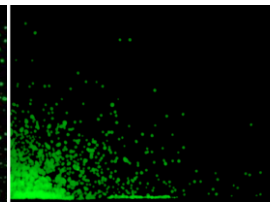
Assistant-1



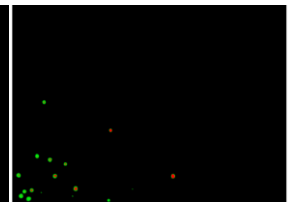
Opposite the dentist-1



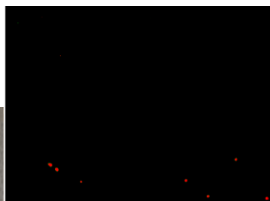
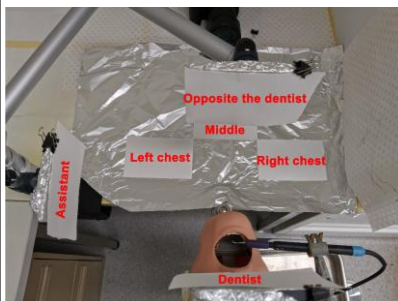
Left chest-1



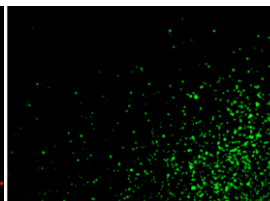
Right chest-1



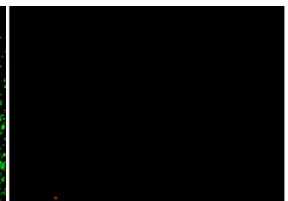
Middle-1 ²⁵



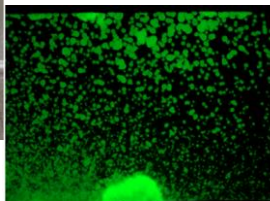
Dentist-3



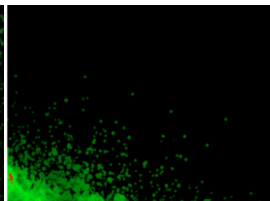
Assistant-3



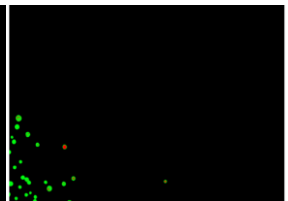
Opposite the dentist-3



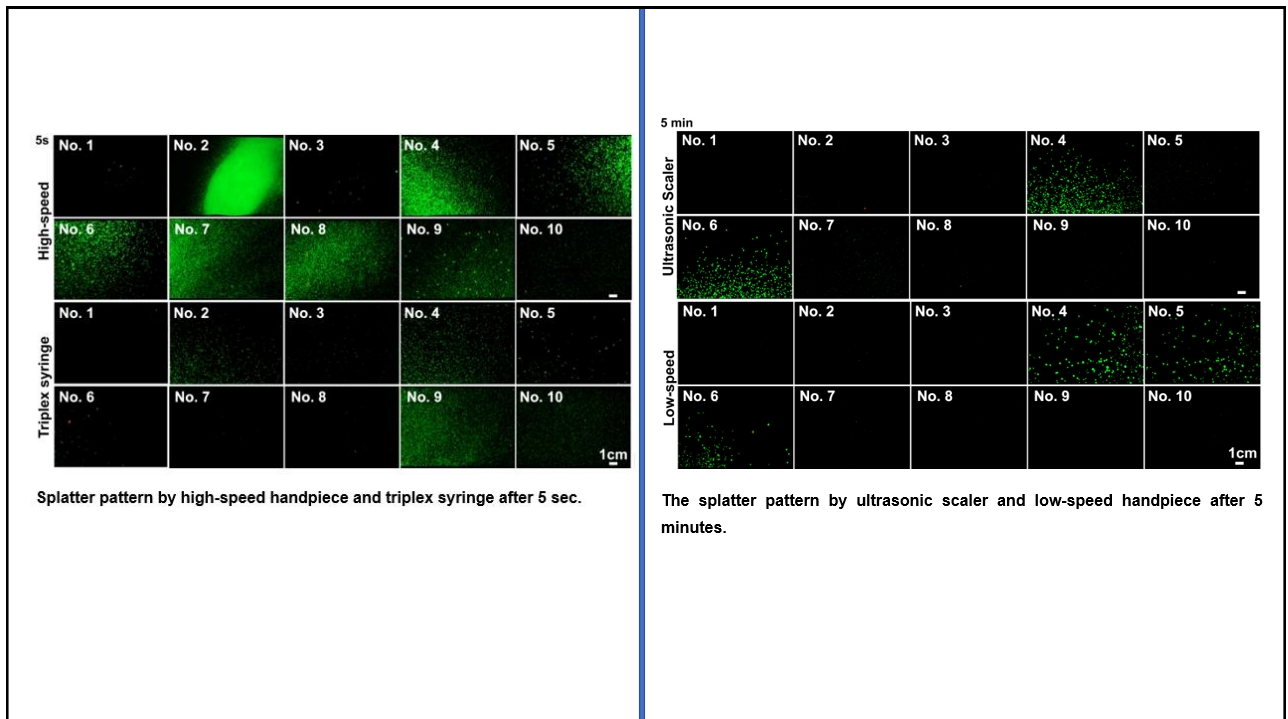
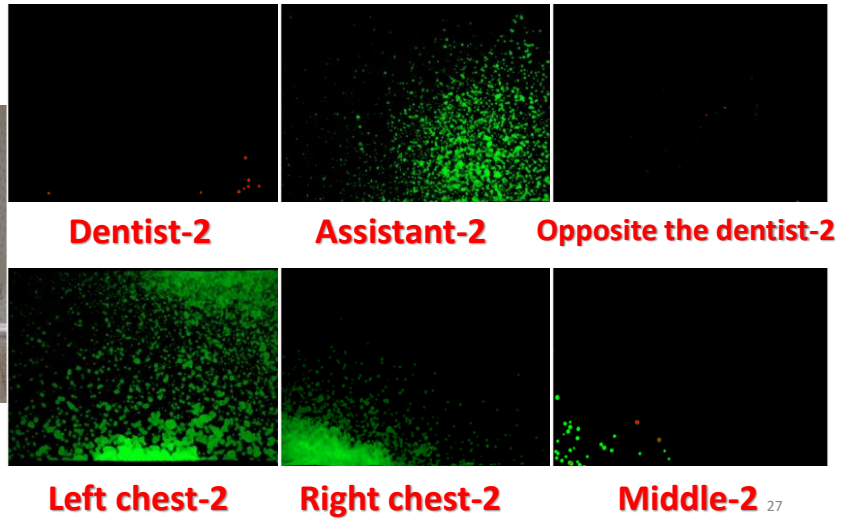
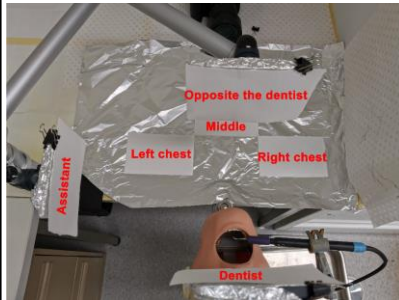
Left chest-3

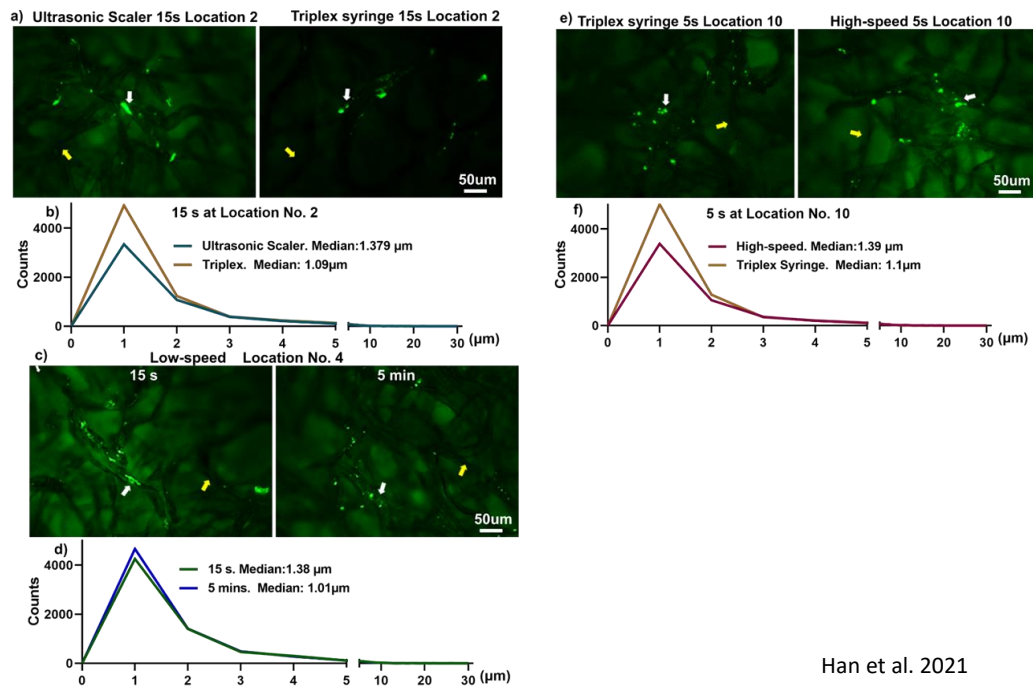


Right chest-3



Middle-3 ²⁶





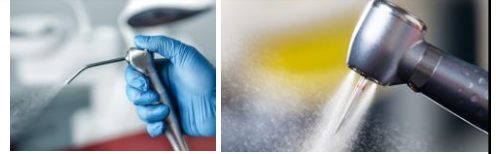
Virus in aerosols

Time for water density spheres to settle 5 ft (1.5 m)



- Typical droplet size is 1 to 10 μm
- Naked virus size is in average between 0.06 – 0.15 μm
- A single droplet can contain 100 to 10 000 viruses
- Contaminated droplets can float in the air for hours and infect others
- With air movement, contaminated aerosols are dispersed and stay suspended longer.

Practical risk-based measures



- Triage by phone for Hx of respiratory infection symptoms
- Hand hygiene on arrival
- Physical distancing in the waiting room
- Reduce flow of patients
- “Resting” the operatory
- Pre-procedural rinse
- HVE (250 L/min)
- Dental dam
- Reduce or eliminate AGPs including use of triplex syringe and powered instruments
- **Reduce water spray flow rate**
- Use high filtration masks (rated for BFE and PFE)
- Use detergent combined with disinfectant, with known activity against COVID-19
- Frequent cleaning of patient high touch surfaces

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Minimizing aerosols when AGPs are being done

- Lower water spray in u/sonic scalers
- Fewer water jets in air turbine handpieces



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Adjusting water flow



How many spray jets are there; and how many are needed?

