HEALTHIER WORKPLACES | A HEALTHIER WORLD

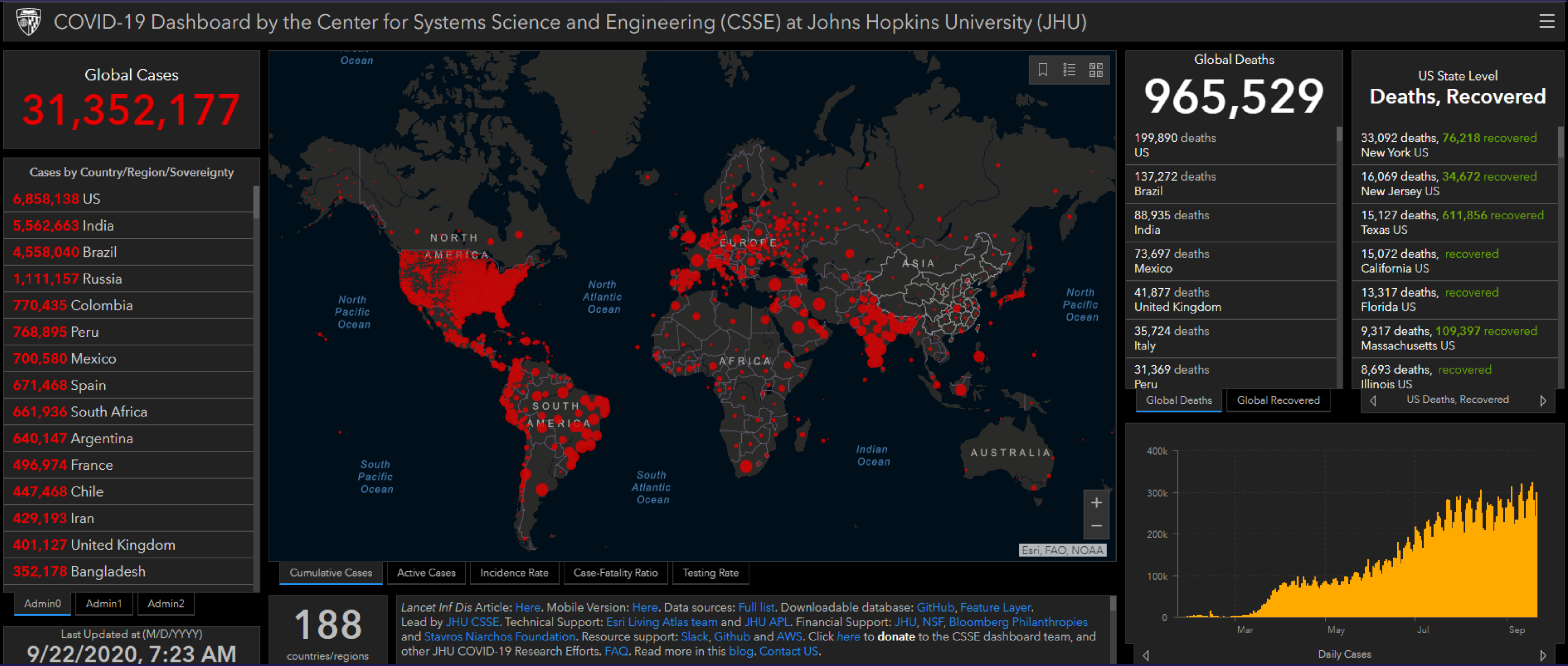
BUILDING VENTILATION DURING A PANDEMIC

Connecticut River Valley Local Section

Bernard L Fontaine, Jr., CIH, CSP, FAIHA

October 7, 2020

Worldwide Distribution Map



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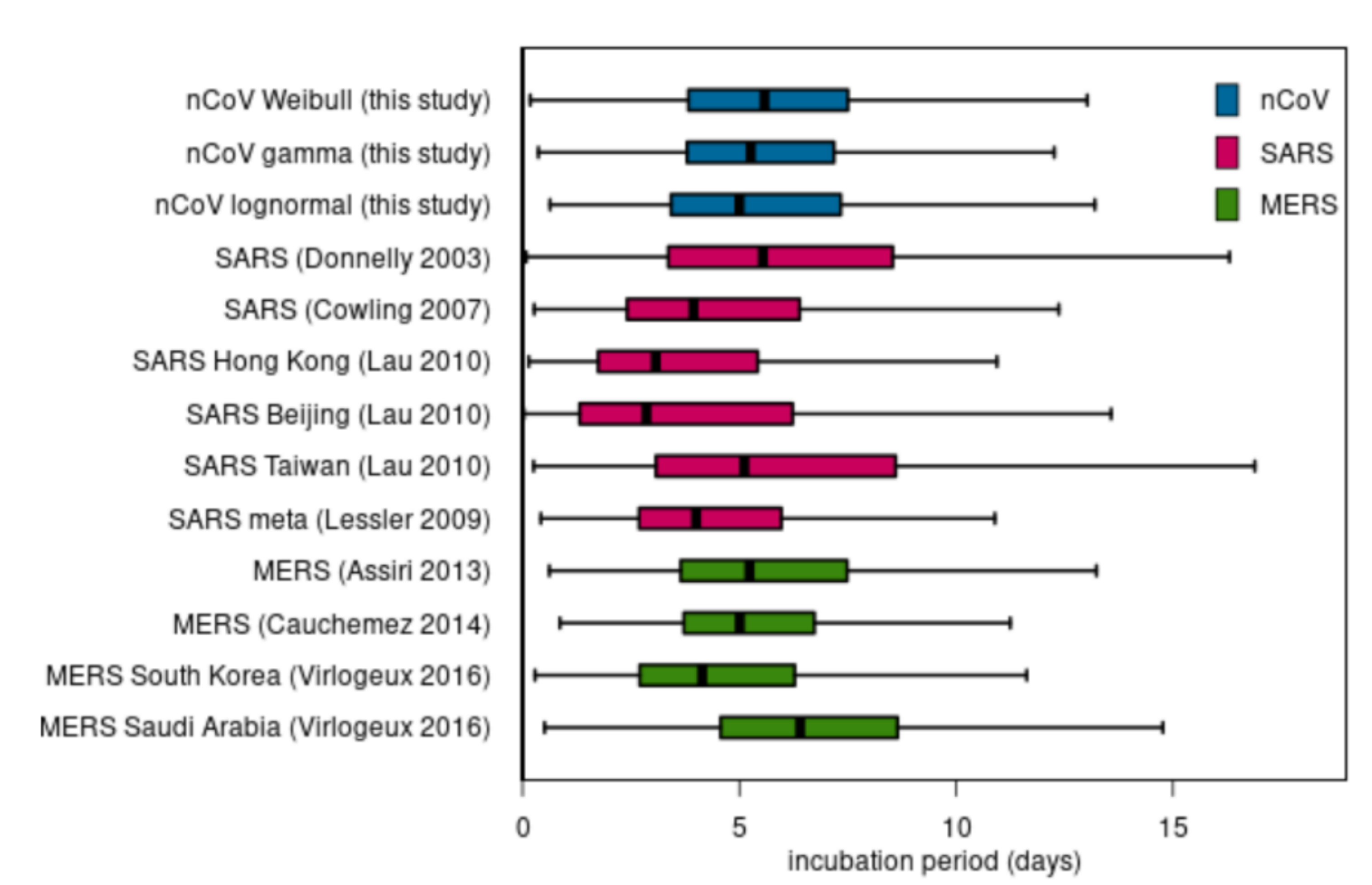
Incubation Period

- Time from exposure to symptoms onset
- With COVID-19, symptoms may show up 2-14 days after exposure
- CDC indicates people are most contagious when clinically symptomatic
- Several studies show people also may be contagious before developing symptoms



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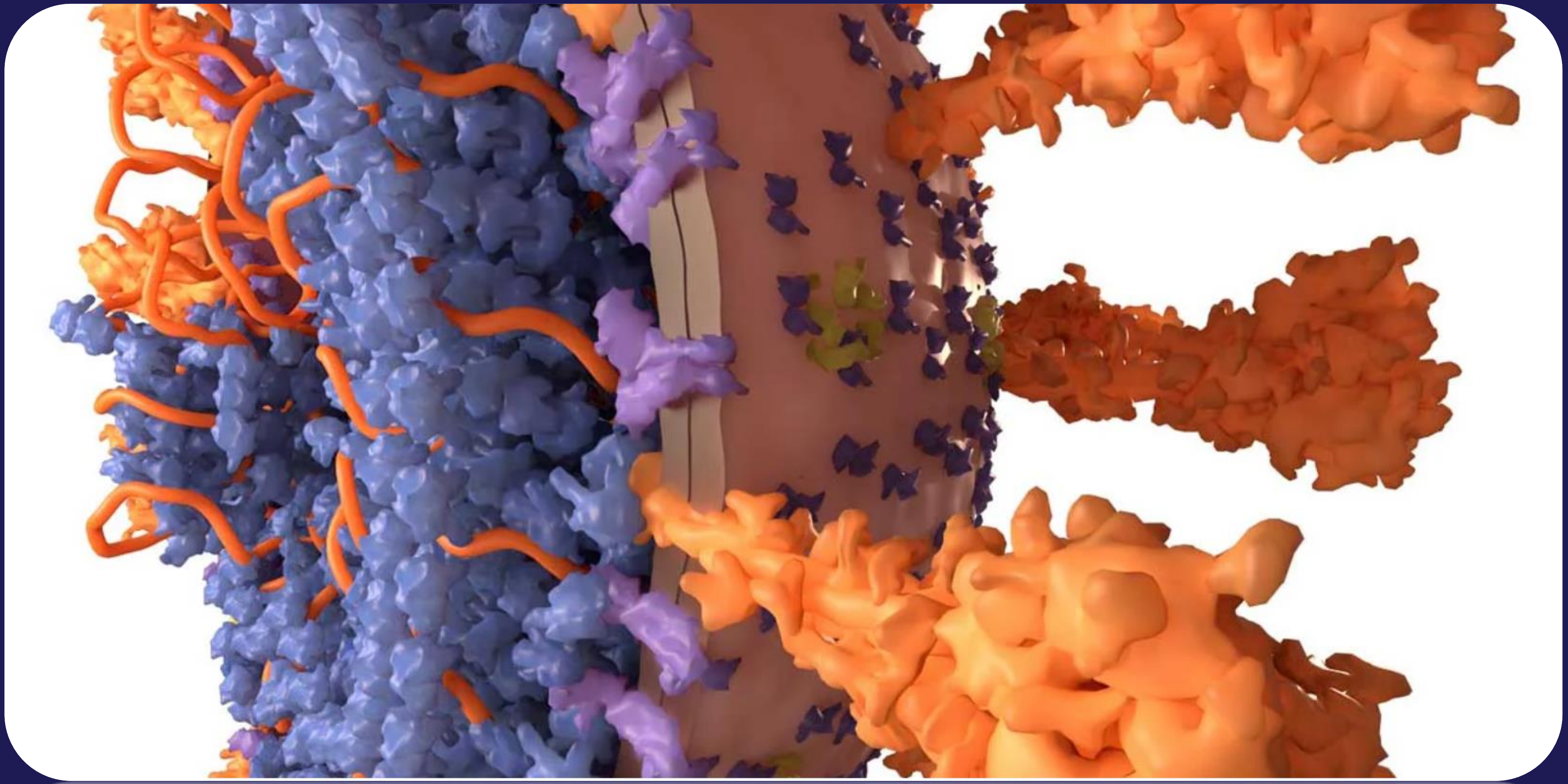
Symptoms of Exposure

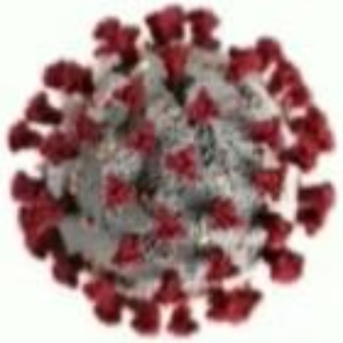


Courtesy of Scientific American

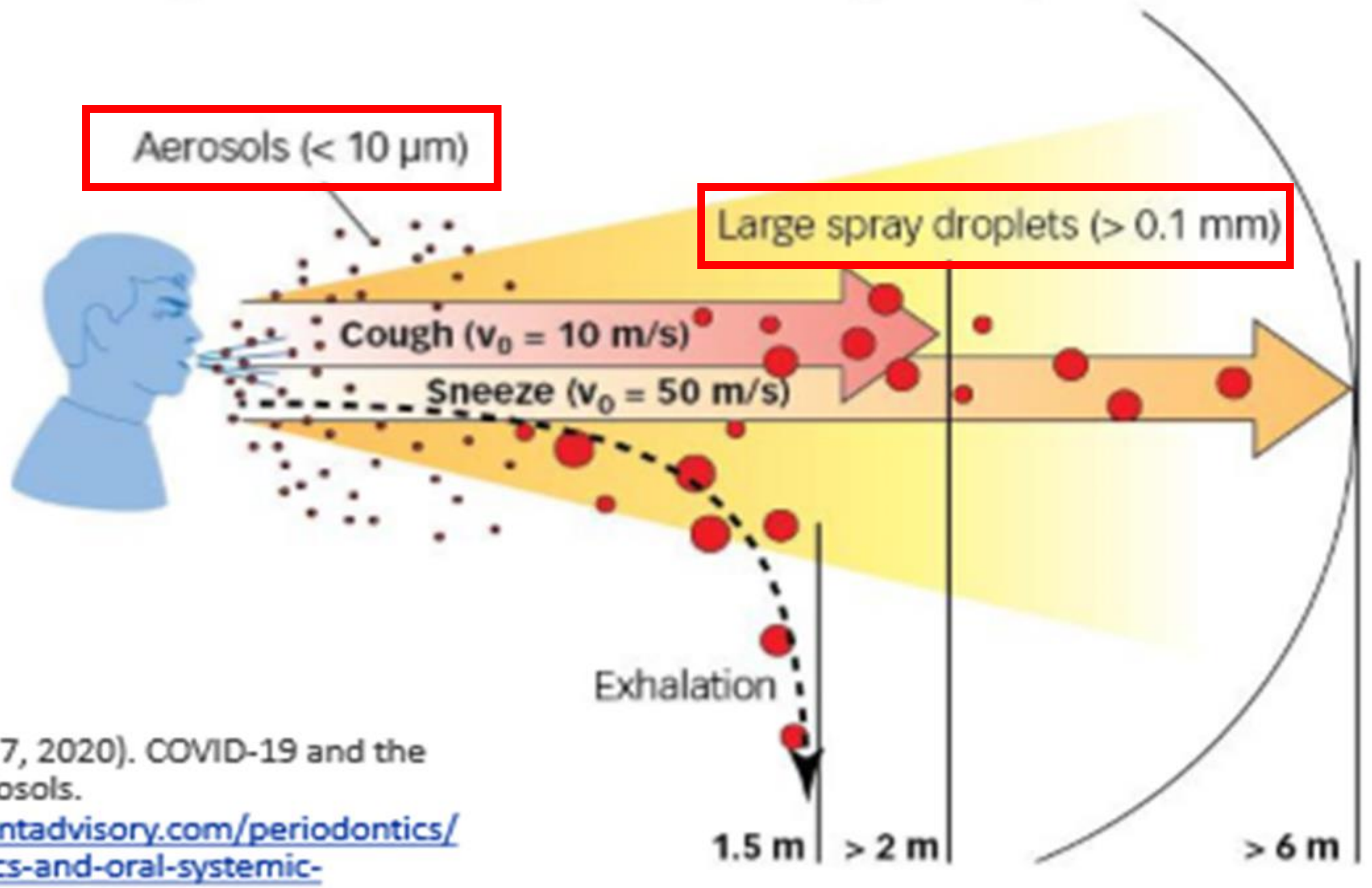
SARS CoV-2 AEROSOLS

Aerosol Transmission

- Transmission between people in close contact
- Transmission via particles that remain in the air over time and distance
- Infected surfaces
- Virus found in stool, blood, semen and ocular secretions; role in transmission unknown
- Animals (including domesticated) not major source of human infection

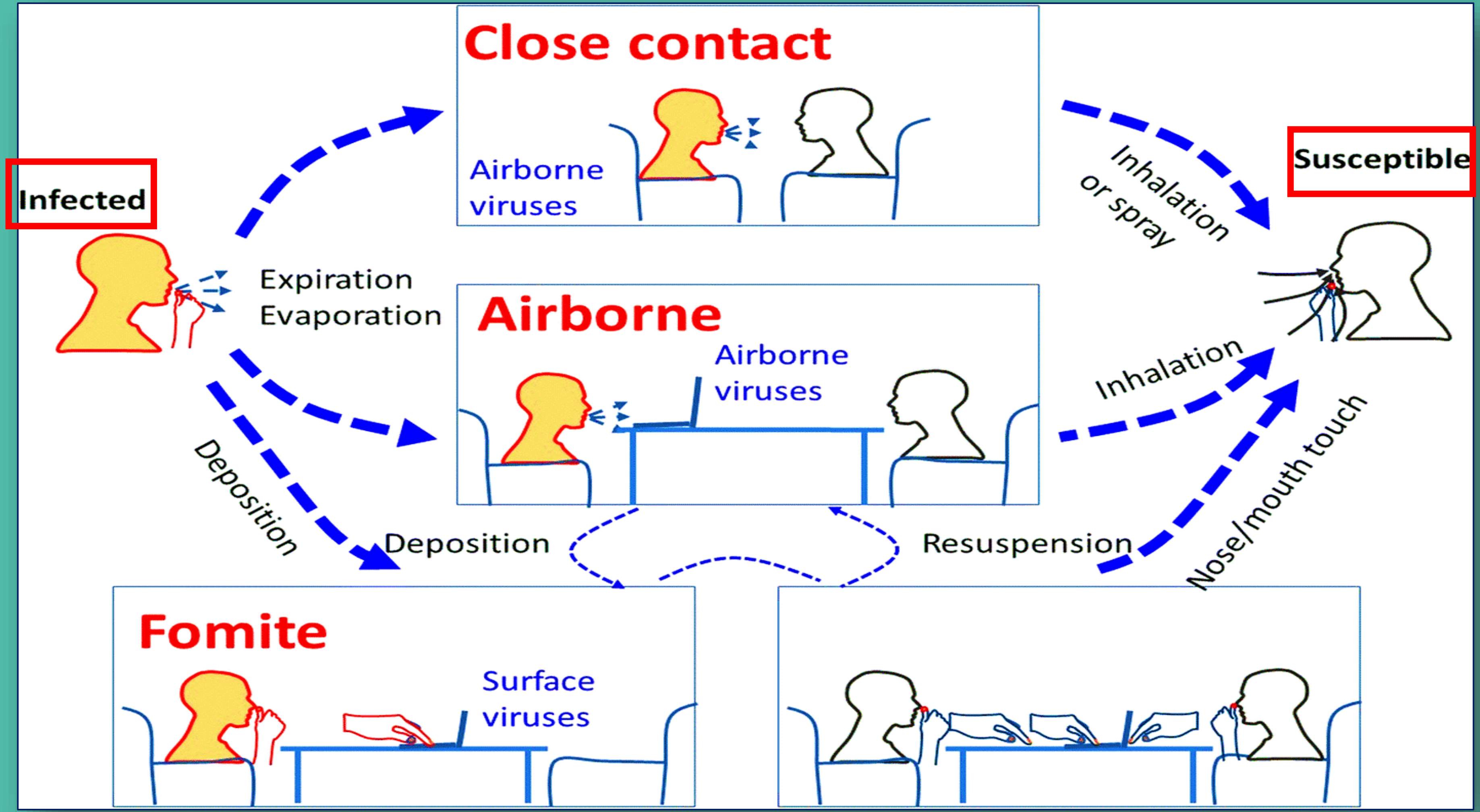


Aerosol Transmission

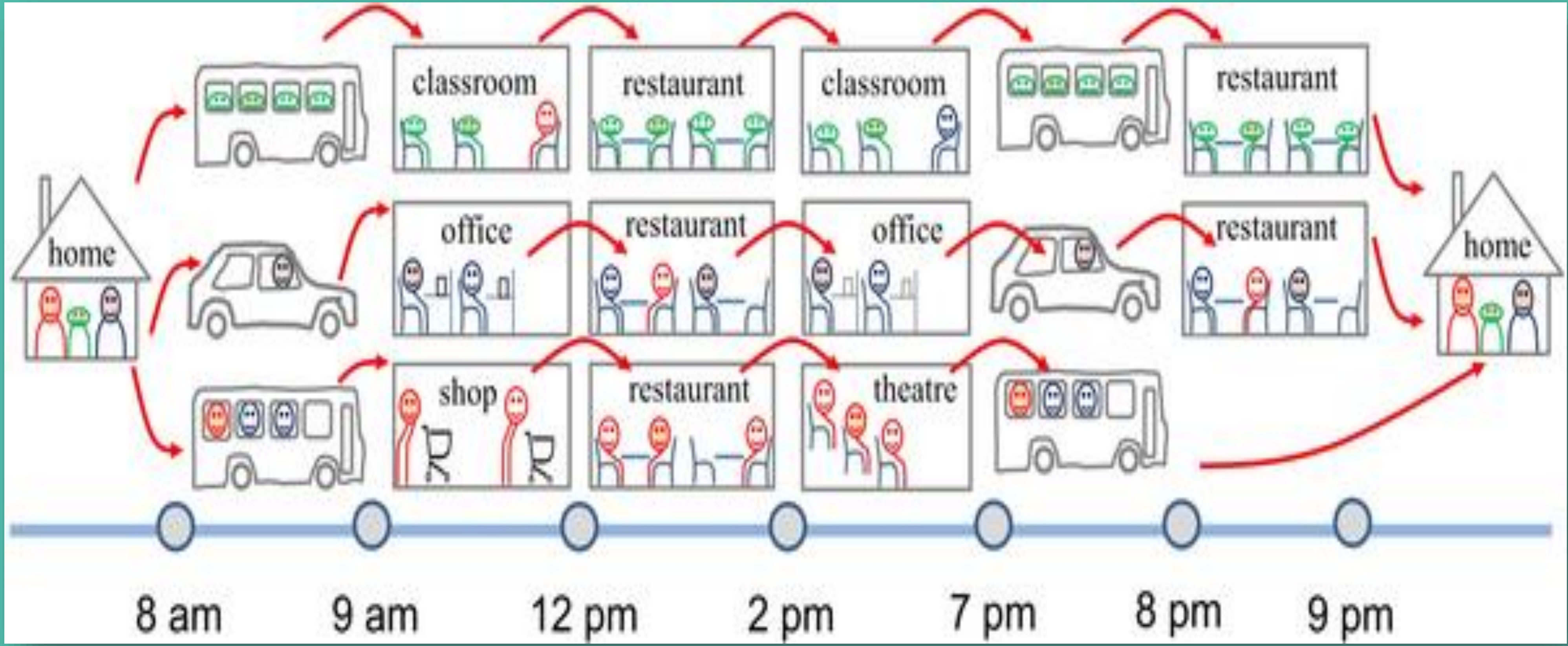


Froum and Strange (Apr 7, 2020). COVID-19 and the problem with dental aerosols. https://www.perioimplantadvisory.com/periodontics/oral-medicine-anesthetics-and-oral-systemic-connection/article/14173521/covid19-and-the-problem-with-dental-aerosols

Aerosol Transmission



Aerosol Transmission



Gao X, Wei J, Lei H, Xu P, Cowling BJ, et al. (2016) Building Ventilation as an Effective Disease Intervention Strategy in a Dense Indoor Contact Network in an Ideal City. PLOS ONE 11(9): e0162481. https://doi.org/10.1371/journal.pone.0162481
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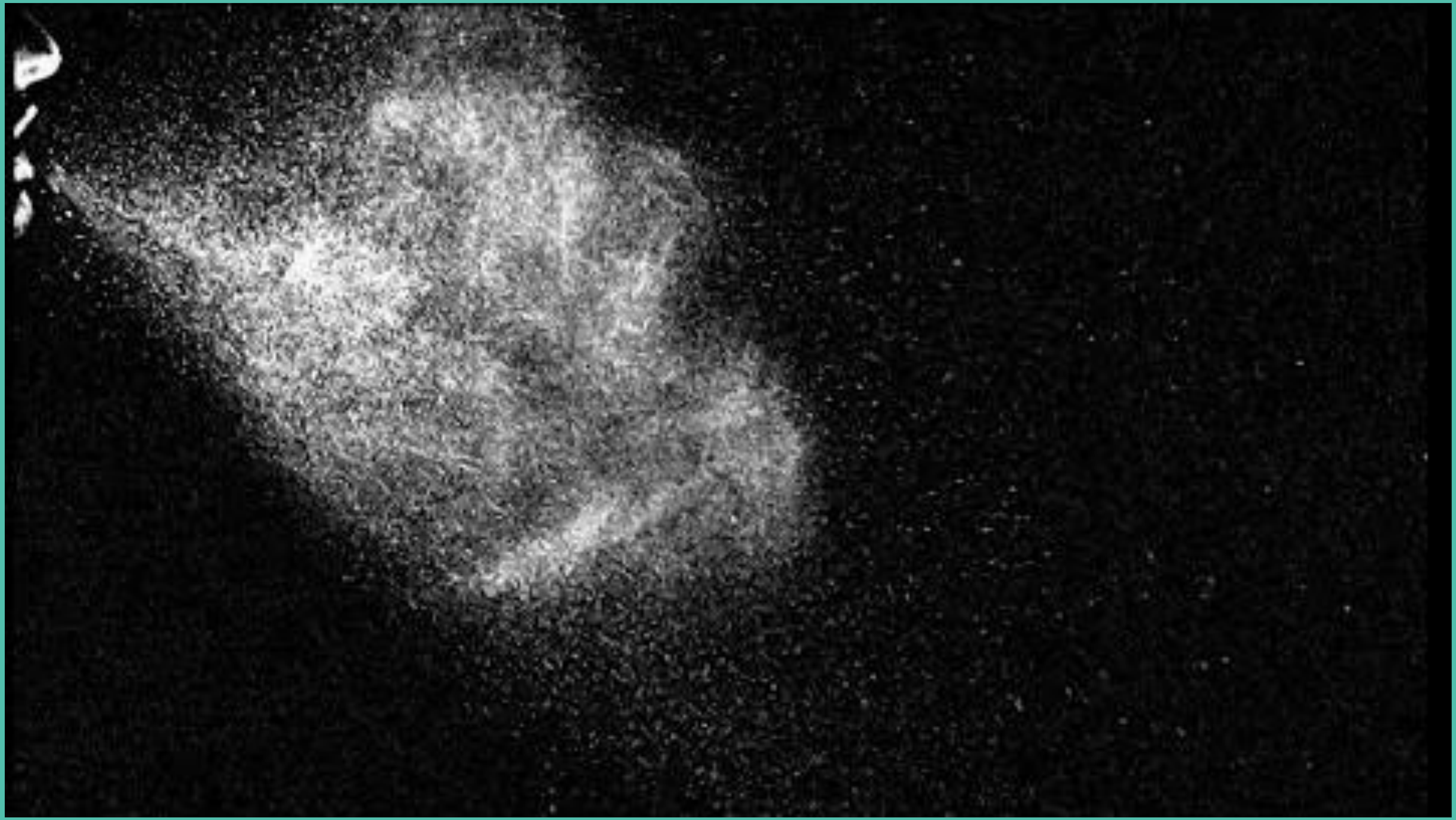
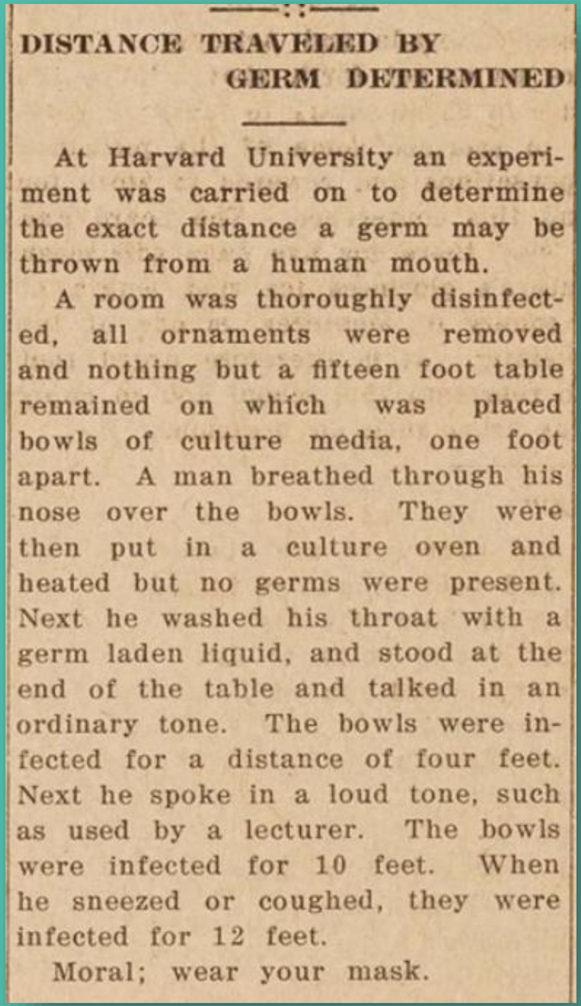
Aerosol Transmission




DISTANCE TRAVELED BY GERM DETERMINED

At Harvard University an experiment was carried on to determine the exact distance a germ may be thrown from a human mouth.

A room was thoroughly disinfected, all ornaments were removed and nothing but a fifteen foot table remained on which was placed bowls of culture media, one foot apart. A man breathed through his nose over the bowls. They were then put in a culture oven and heated but no germs were present. Next he washed his throat with a germ laden liquid, and stood at the end of the table and talked in an ordinary tone. The bowls were infected for a distance of four feet. Next he spoke in a loud tone, such as used by a lecturer. The bowls were infected for 10 feet. When he sneezed or coughed, they were infected for 12 feet.

Moral; wear your mask.

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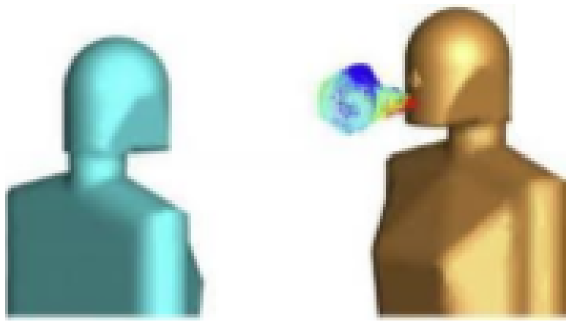
Aerosol Generation

Wells-Riley Model



$$P_{infection} = 1 - e^{\frac{Iqpt}{Q}}$$

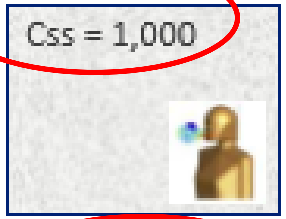
$P_{infection}$ = probability of infection
I = Number of infector individuals
q = rate of generation of infectious airborne particles
p = pulmonary ventilation rate
t = exposure time
Q = clean air ventilation rate

Azimi and Stephens. (2013). HVAC filtration for controlling infectious airborne disease transmission in indoor environments: Predicting risk reductions and operational costs. Build Environ. 2013 Dec; 70: 150–160.

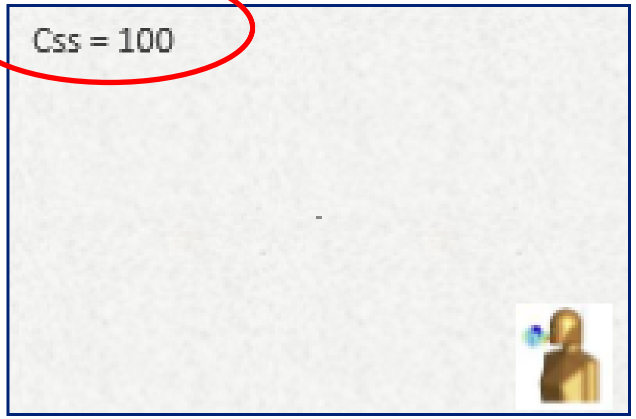
Aerosol Generation

The Myth of Air Changes per Hour

$$C(t) = \frac{G}{Q} - \left(\frac{G}{Q} - C_o\right)e^{\left(-\frac{Q}{V}t\right)}$$



ACH = 1
G = 500
V = 30 m³
Q = 0.5 m³ /min



ACH = 1
G = 500
V = 300 m³
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ACH = air changes per hour
G = unitless theoretical rate of generation of infectious droplet nuclei
V = room volume
Q = clean/outside air flow rate
Css = unitless steady state concentration in room of infectious droplet nuclei

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Aerosol Generation

The Myth of Air Changes per Hour

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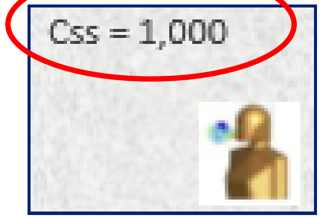

ACH = 1
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ACH = 0.1
G = 500
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Aerosol Generation

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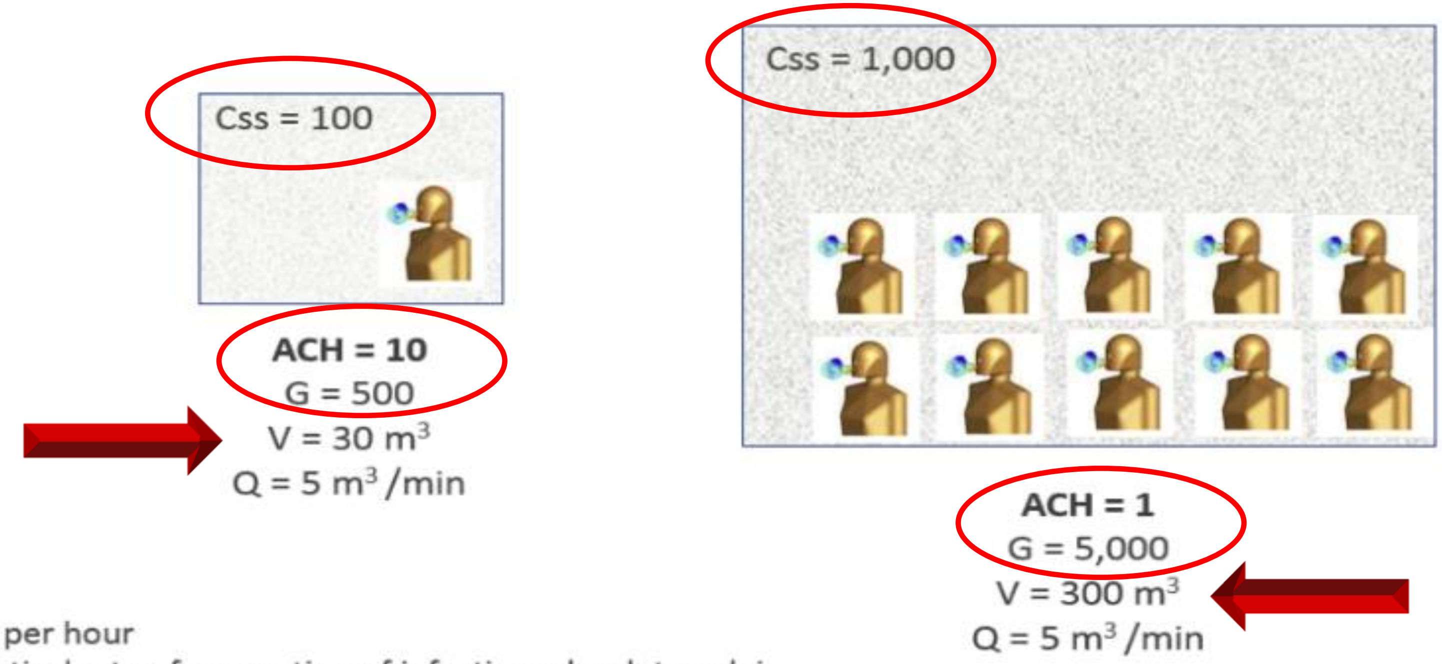

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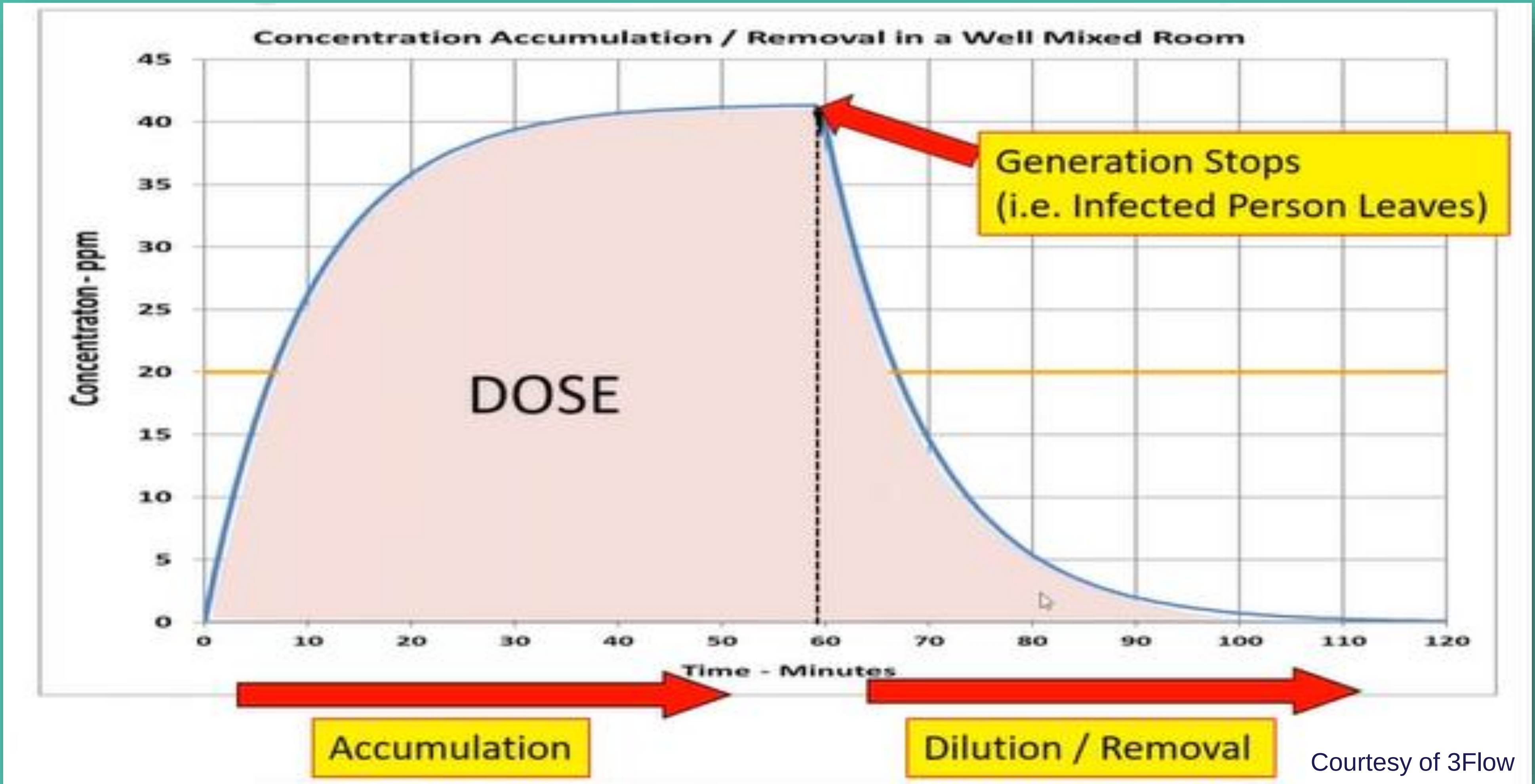
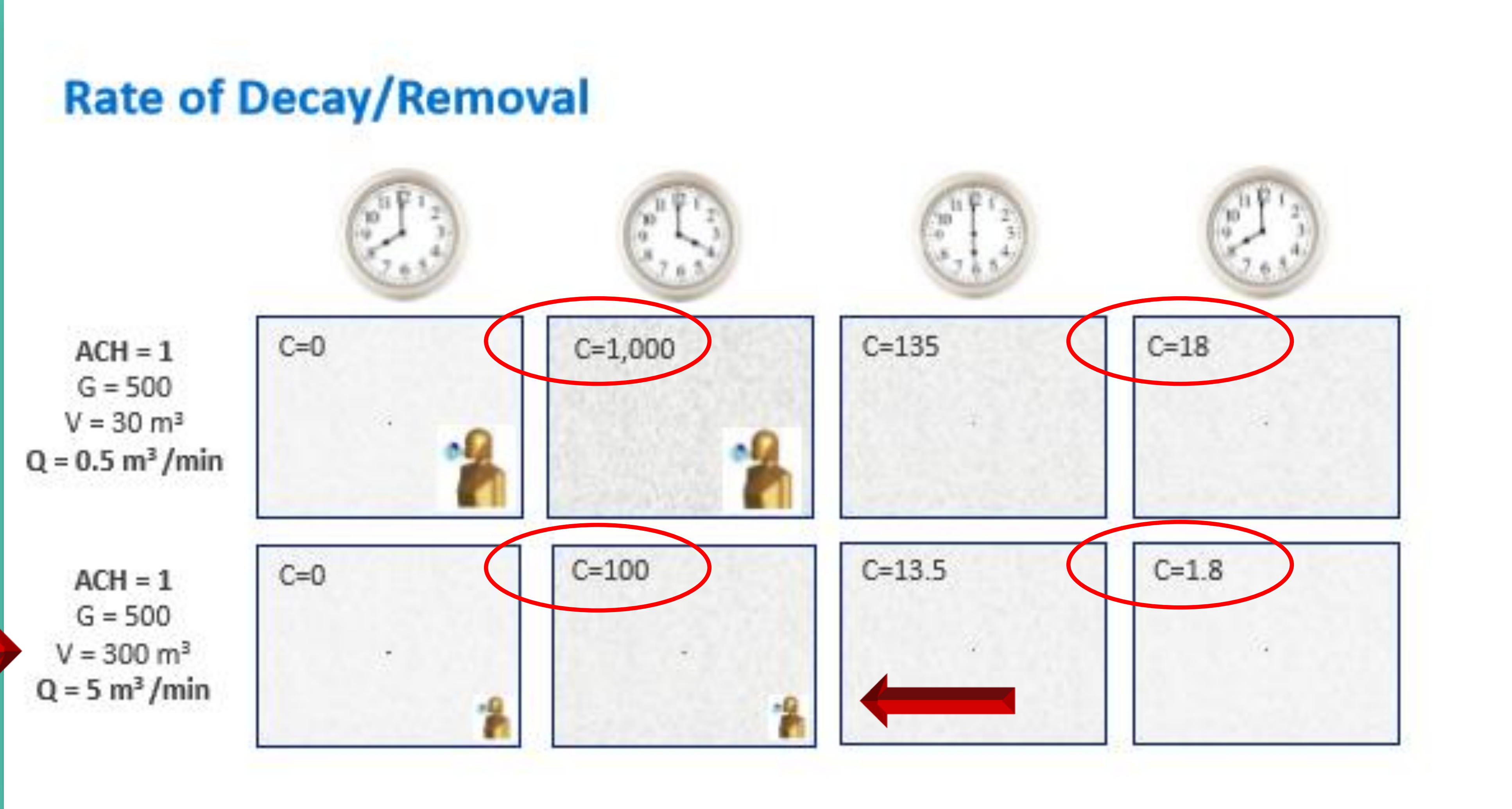
Aerosol Generation



Courtesy of 3Flow

Aerosol Decay and Removal



Increasing Building Ventilation

Policy	Policy content	Attack rate, δ	Time of peak infection, T_p (day)	Percentage of peak infection, λ_p
Baseline		93.76%	154	24.90%
Policy A[1]	Homes, 0.7→5 ACH	52.05%	206	7.97%
Policy B	Classrooms, 2→5 ACH	93.19%	158	23.54%
Policy C	Offices, 1→5 ACH	92.63%	186	23.47%
Policy D	Restaurants, 15 ACH	92.80%	159	23.22%
Policy E	Shops, 1→5 ACH	93.48%	156	24.48%
Policy F	Public locations, 1.4→5 ACH	93.62%	155	25.63%
Policy G	Homes, 0.7→10 ACH	43.56%	211	6.30%
Policy H	Transportation, 4→10 ACH	92.76%	163	23.07%
Policy I	All locations, double	73.06%	290	10.61%
Policy J	Transportation, 4 ACH Other locations, 3 ACH	43.11%	464	3.86%
Policy K	All locations, 5 ACH	0.28%	1989	<0.01%
Policy L	All locations, 8 l/(s·person)	80.50%	319	12.95%
Policy M	All locations, 12 l/(s·person)	55.32%	587	4.79%
Policy N	Homes and classrooms, 5 ACH	43.49%	209	5.77%
Policy O	Homes and offices, 5 ACH	37.36%	426	3.89%
Policy P	Homes, classrooms and offices, 5 ACH	19.33%	1198	0.67%

[1]Policy A (Homes, 0.75 ACH) means increasing ventilation rate in all homes from 0.7 ACH to 5 ACH.

Gao X, Wei J, Lei H, Xu P, Cowling BJ, et al. (2016) Building Ventilation as an Effective Disease Intervention Strategy in a Dense Indoor Contact Network in an Ideal City. PLOS ONE 11(9): e0162481. https://doi.org/10.1371/journal.pone.0162481
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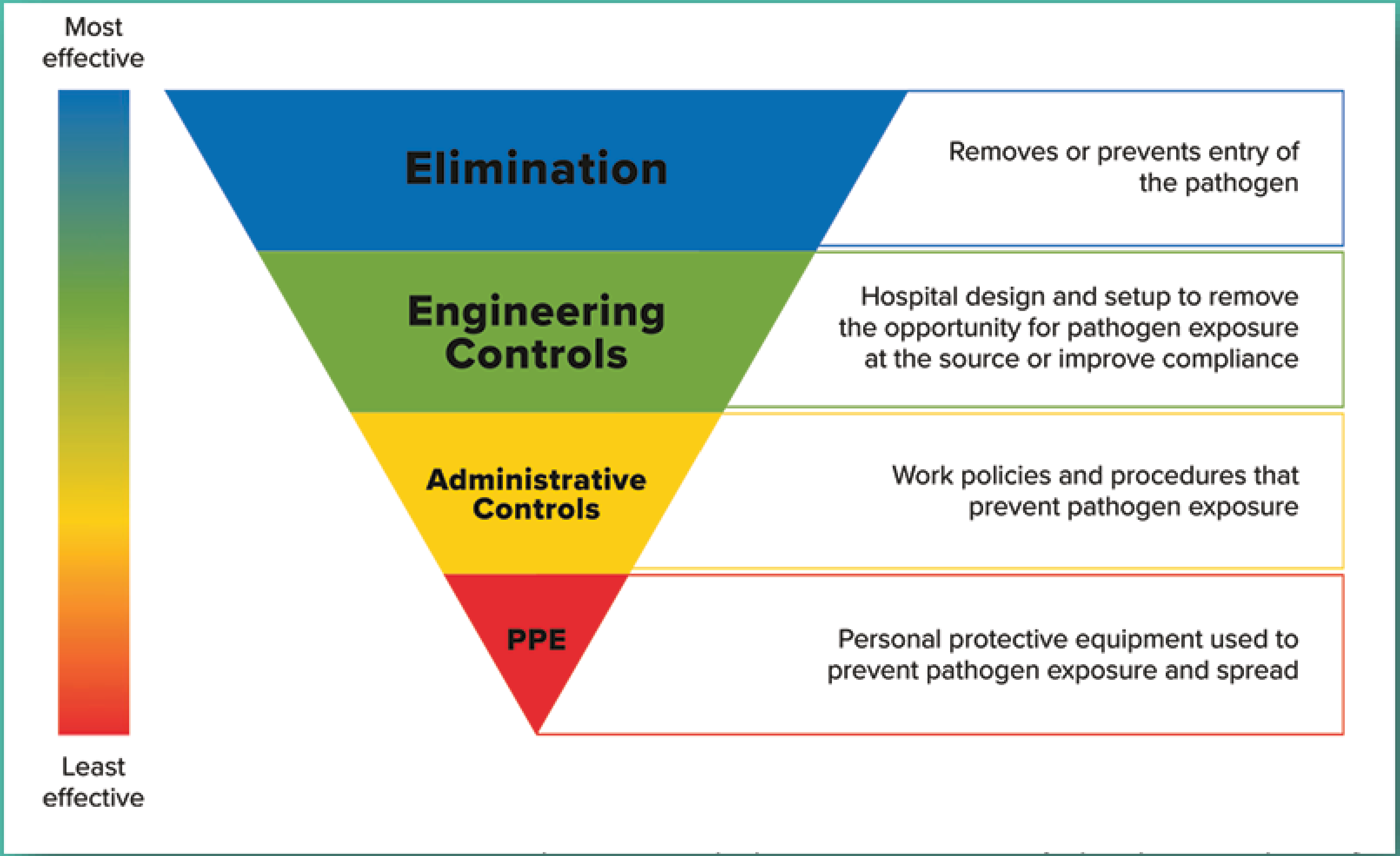
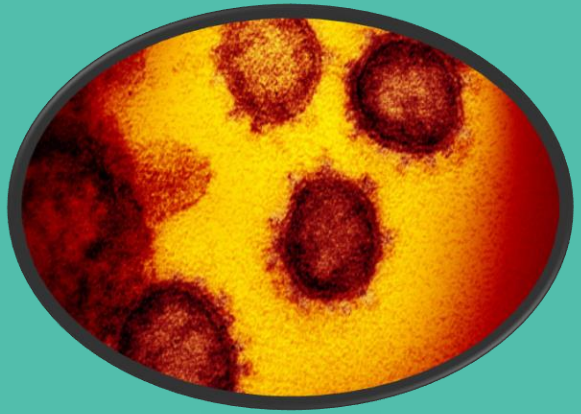
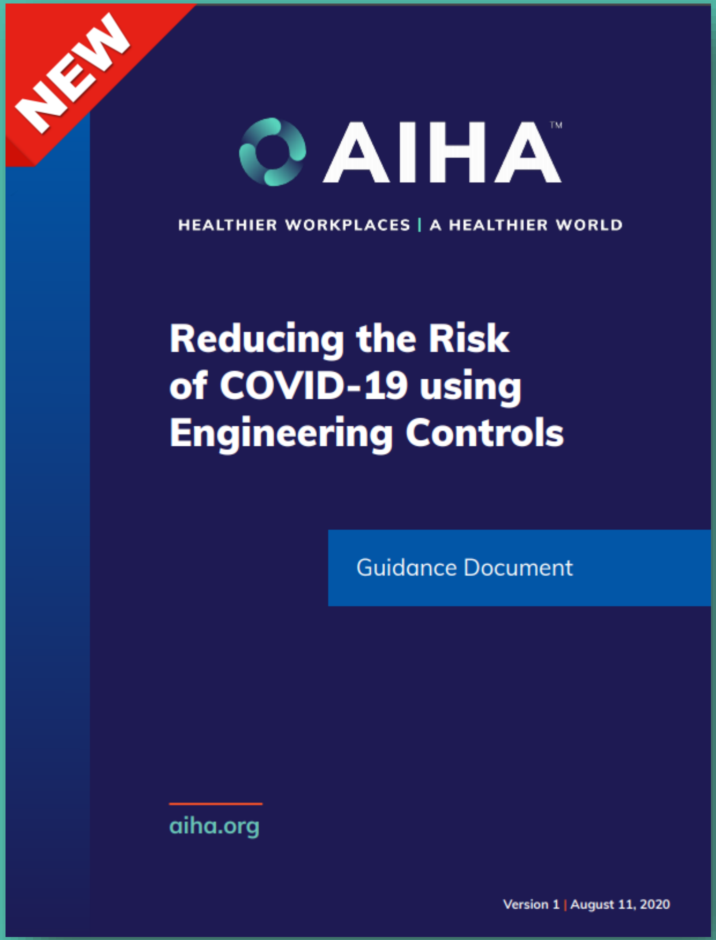
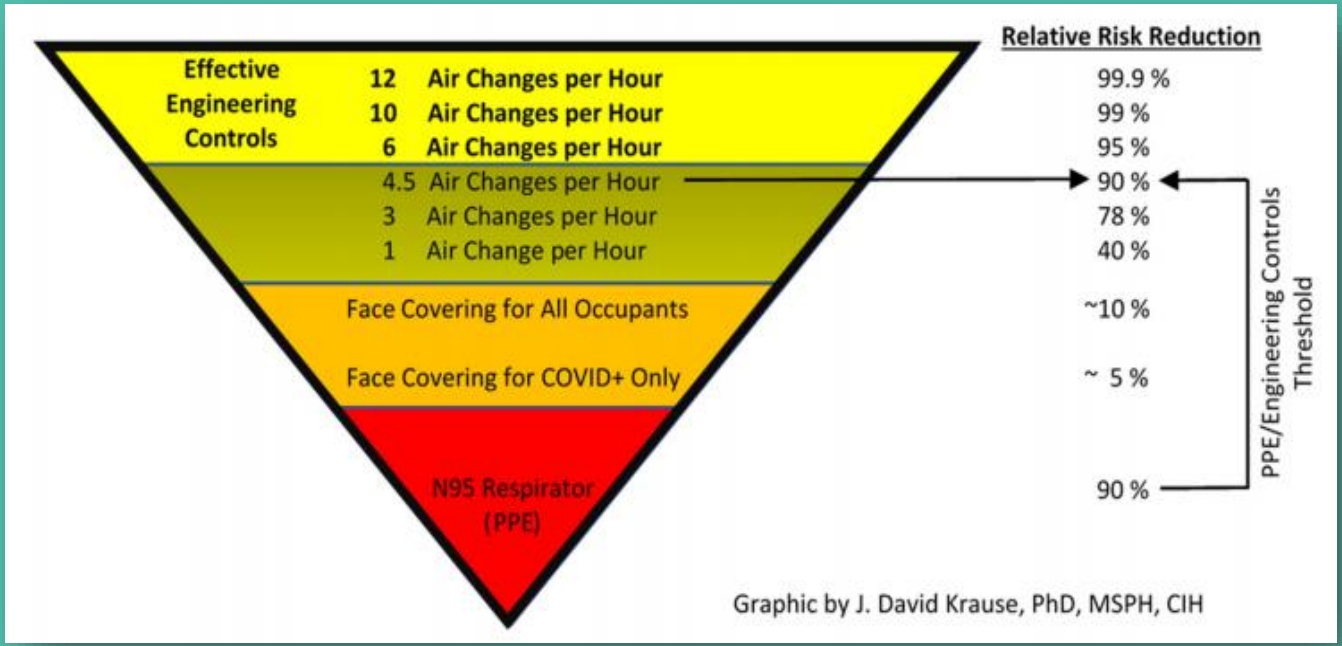
Hierarchy of Infection Controls

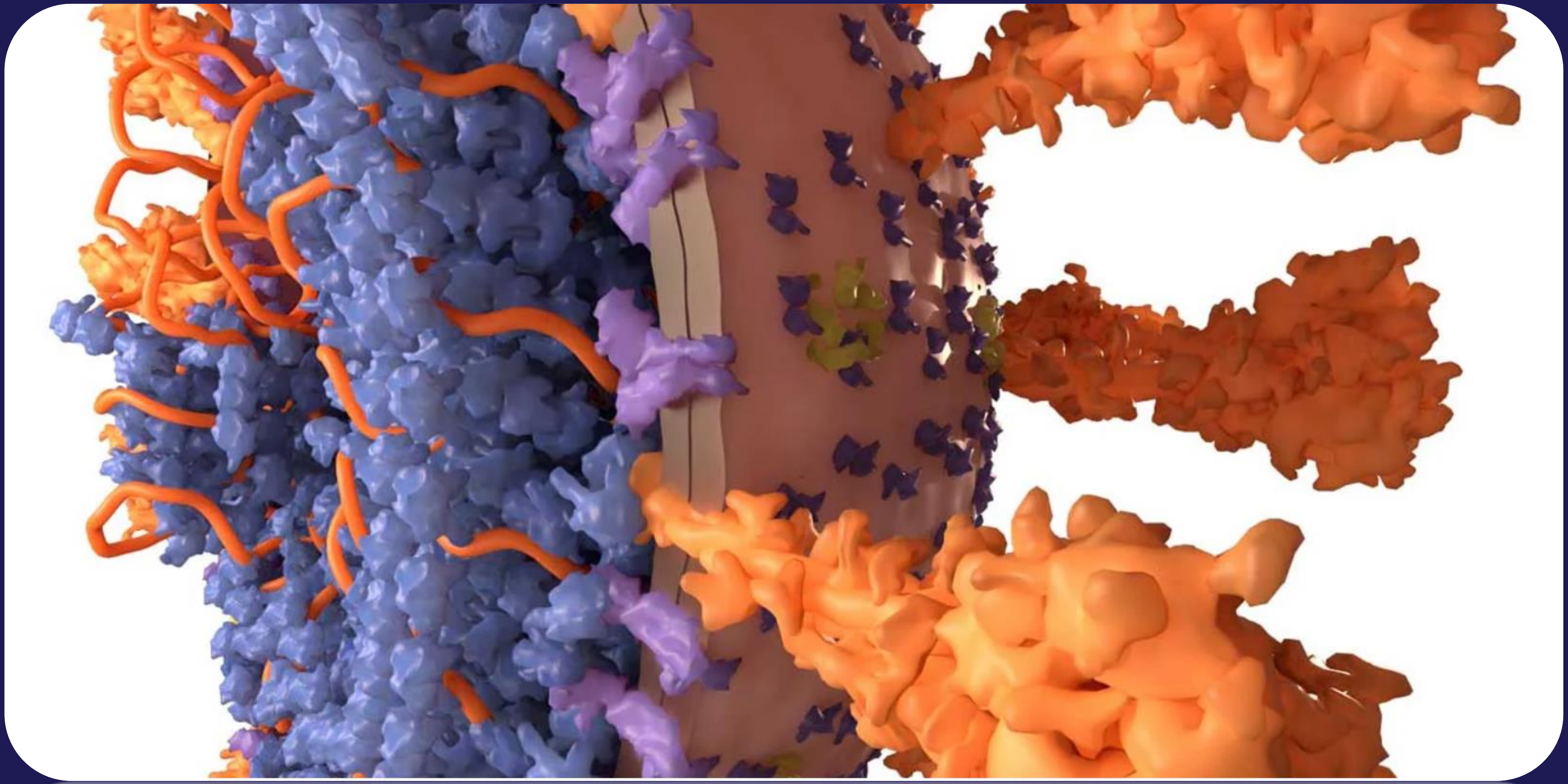




Hierarchy of Infection Controls







Courtesy of Scientific American

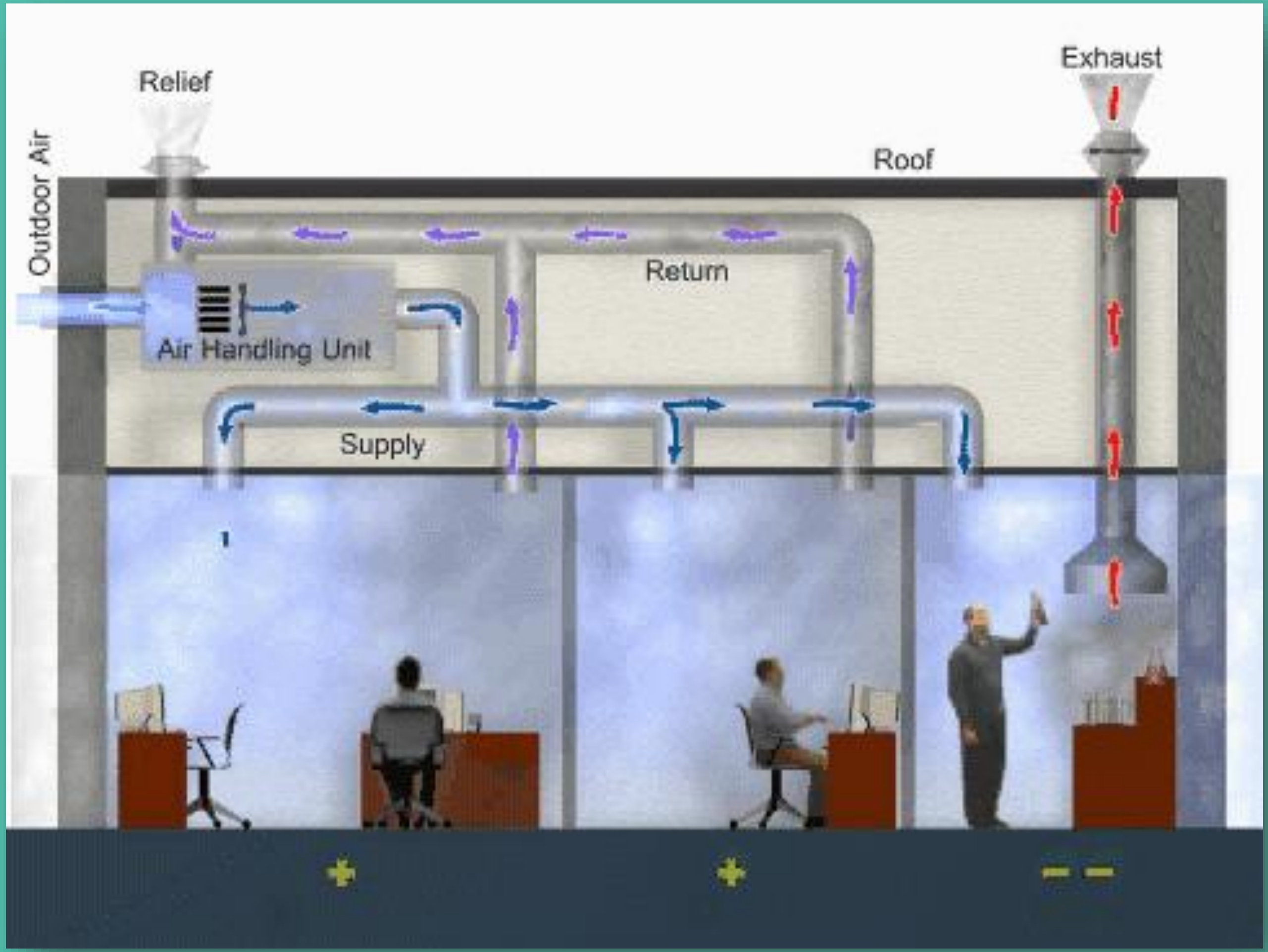
BUILDING VENTILATION

Natural Building Ventilation

What is building natural ventilation?

- Ventilation design relies on natural sources such as wind and temperature differences in order to flow fresh air through a building
- Best suited for open plan layouts and minimize noise pollution and external air
- Not suited for buildings with small spaces or buildings needing a constant air temperature
- Not suited for buildings that need to control for relative humidity

Building Ventilation



- Fundamentals of IAQ in buildings
- Heating, ventilation and air-conditioning (HVAC)
- IAQ maintenance and housekeeping
- IAQ and energy efficiency
- Diagnosing and solving problems
- Renovation and new construction
- Managing for IAQ

https://19january2017snapshot.epa.gov/indoor-air-quality-iaq/text-modules-indoor-air-quality-building-education-and-assessment-model_.html

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Building Ventilation

What is building ventilation?

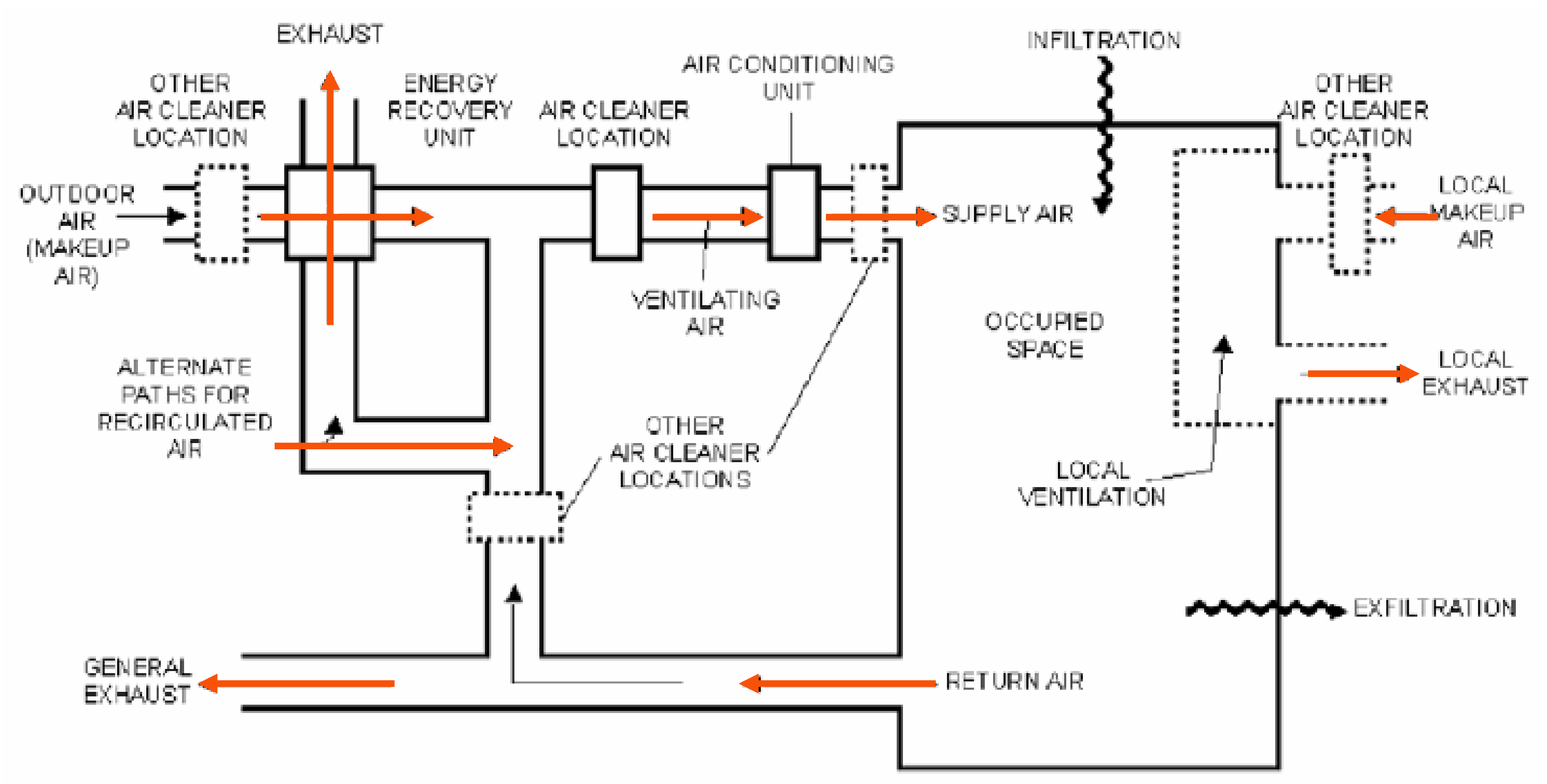
- Building ventilation circulates air throughout a built environment
- Outdoor ventilation or the heating, ventilating, and air-conditioning (HVAC) system of a building supplies and removes air naturally (windows) and/or mechanically to and from a space
- HVAC systems most often consist of mechanical parts which should provide air to building occupants at a comfortable temperature and humidity that is free of harmful concentrations of air pollutants

Building Ventilation

Prior to re-occupancy, review configuration of workspaces

- Ensure there is an adequate flow of fresh air to workspaces and optimize the ventilation system settings by:
  - Maximize fresh air through your ventilation system
  - Ensure restroom is under negative pressure
  - Ensure that the proper filtration is being used to control SARS-CoV-2 transmission
  - Clean and disinfect all HVAC intakes and returns daily
- ASHRAE updates for more information.
  - If pedestal, desk or hard mounted fans are used, minimize air from fans blowing from one person directly to another.
  - Fans may be useful to reduce the heat-related illness in plants

Building Ventilation Diagram



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Building Ventilation

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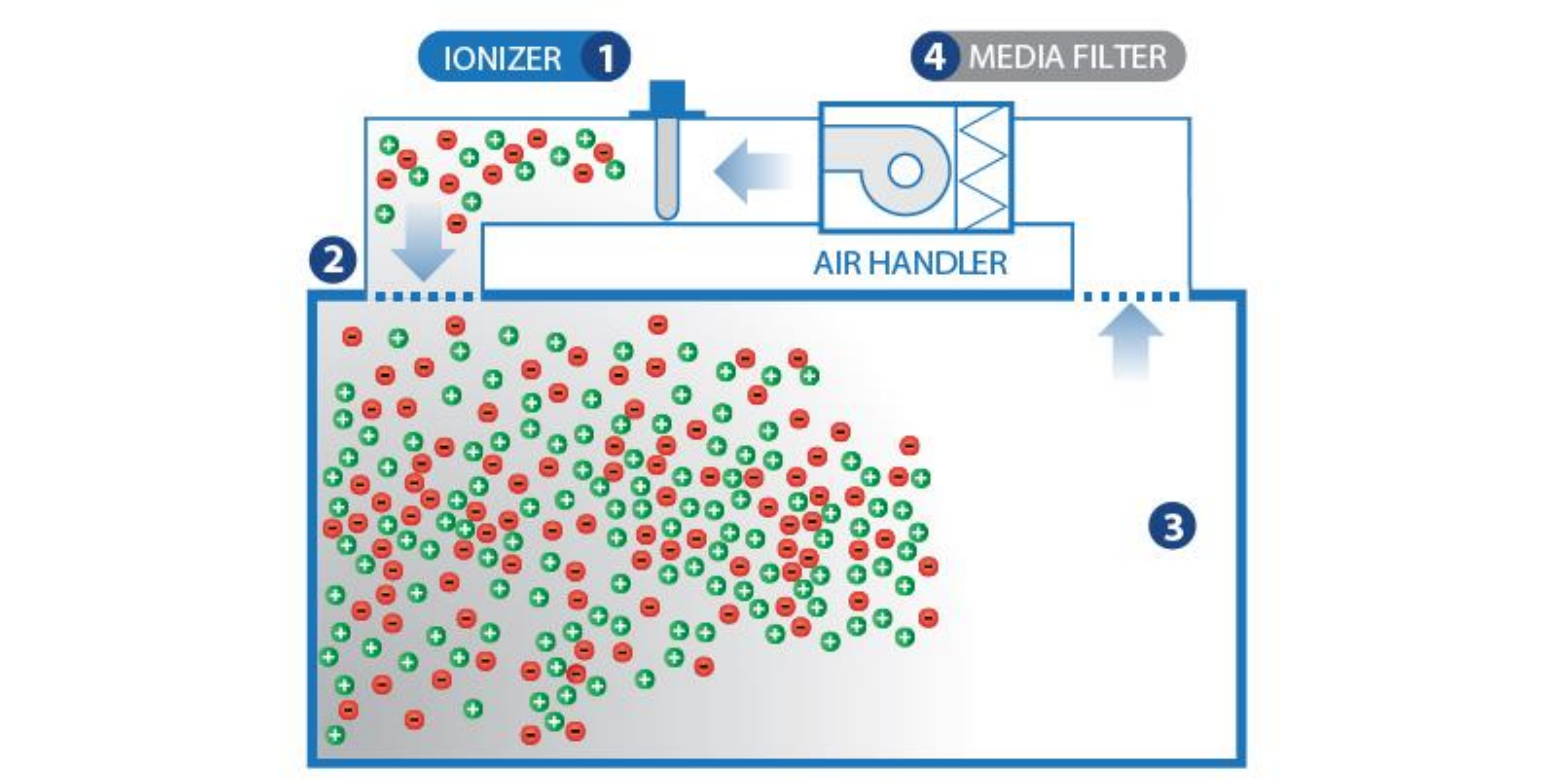
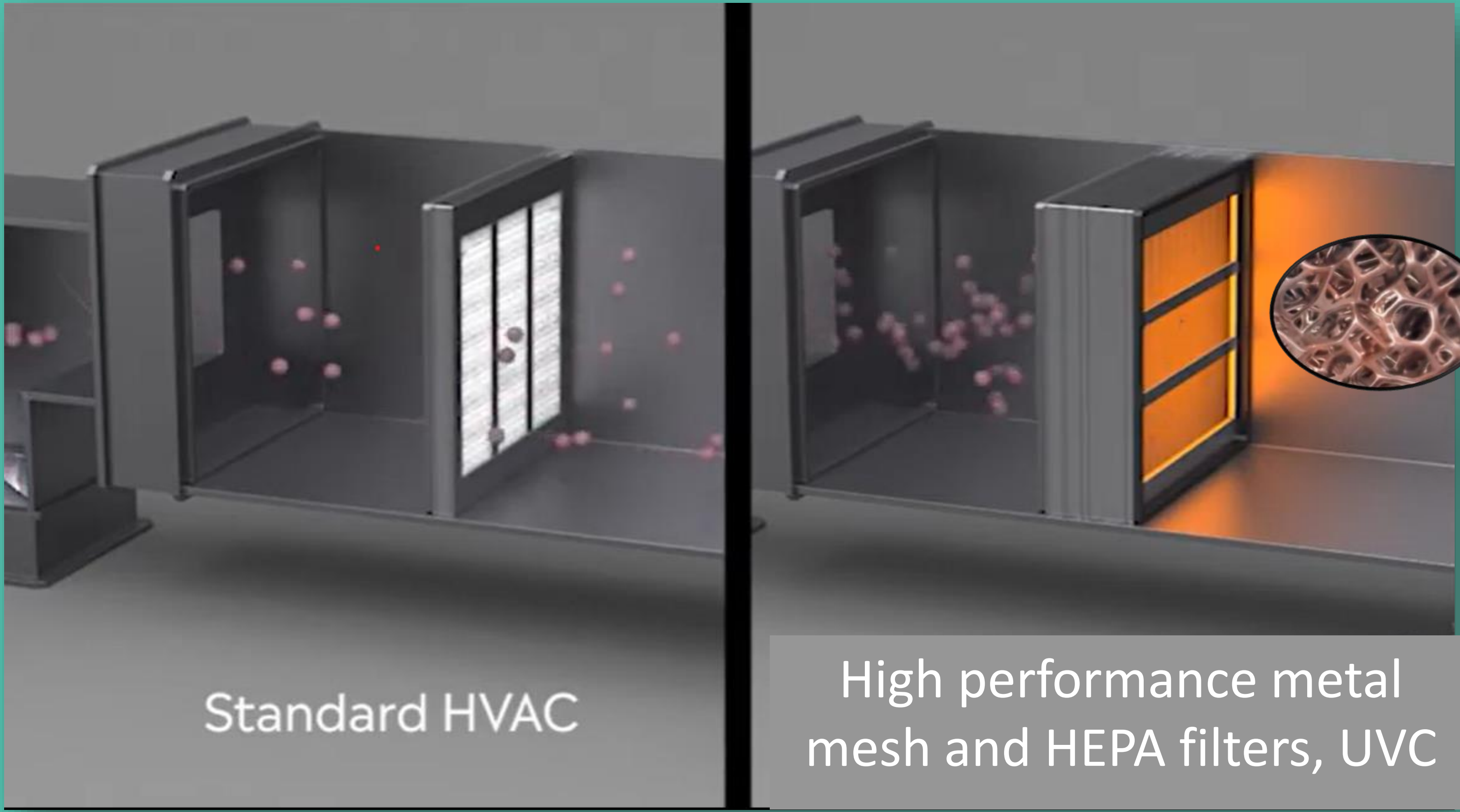
Smoke Tubes for Ventilation Air Currents

Building Ventilation

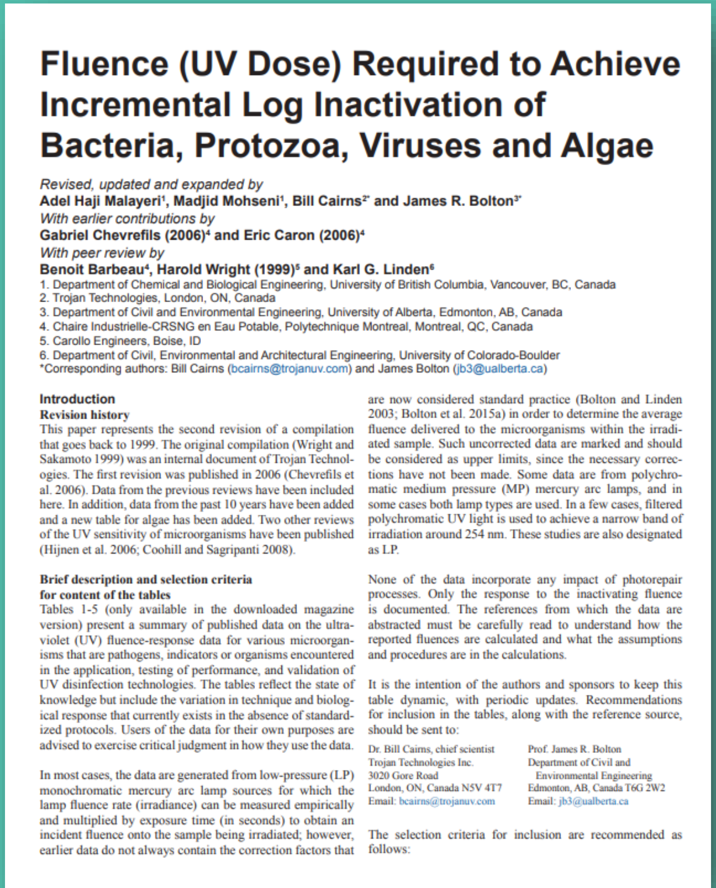


Building Ventilation



High performance metal mesh and HEPA filters, UVC

Building Ventilation



Fluence (UV Dose) Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa, Viruses and Algae

Revised, updated and expanded by
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With peer review by
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2. Trojan Technologies, London, ON, Canada
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Introduction

Revision history

This paper represents the second revision of a compilation that goes back to 1999. The original compilation (Wright and Sakamoto 1999) was an internal document of Trojan Technologies. The first revision was published in 2006 (Chevrefils et al. 2006). Data from the previous reviews have been included here. In addition, data from the past 10 years have been added and a new table for algae has been added. Two other reviews of the UV sensitivity of microorganisms have been published (Hijnen et al. 2006; Coohill and Sagripanti 2008).

Brief description and selection criteria for content of the tables

Tables 1-5 (only available in the downloaded magazine version) present a summary of published data on the ultraviolet (UV) fluence-response data for various microorganisms that are pathogens, indicators or organisms encountered in the application, testing of performance, and validation of UV disinfection technologies. The tables reflect the state of knowledge but include the variation in technique and biological response that currently exists in the absence of standardized protocols. Users of the data for their own purposes are advised to exercise critical judgment in how they use the data.

In most cases, the data are generated from low-pressure (LP) monochromatic mercury arc lamp sources for which the lamp fluence rate (irradiance) can be measured empirically and multiplied by exposure time (in seconds) to obtain an incident fluence onto the sample being irradiated; however, earlier data do not always contain the correction factors that are now considered standard practice (Bolton and Linden 2003; Bolton et al. 2015a) in order to determine the average fluence delivered to the microorganisms within the irradiated sample. Such uncorrected data are marked and should be considered as upper limits, since the necessary corrections have not been made. Some data are from polychromatic medium pressure (MP) mercury arc lamps, and in some cases both lamp types are used. In a few cases, filtered polychromatic UV light is used to achieve a narrow band of irradiation around 254 nm. These studies are also designated as LP.

None of the data incorporate any impact of photorepair processes. Only the response to the inactivating fluence is documented. The references from which the data are abstracted must be carefully read to understand how the reported fluences are calculated and what the assumptions and procedures are in the calculations.

It is the intention of the authors and sponsors to keep this table dynamic, with periodic updates. Recommendations for inclusion in the tables, along with the reference source, should be sent to:

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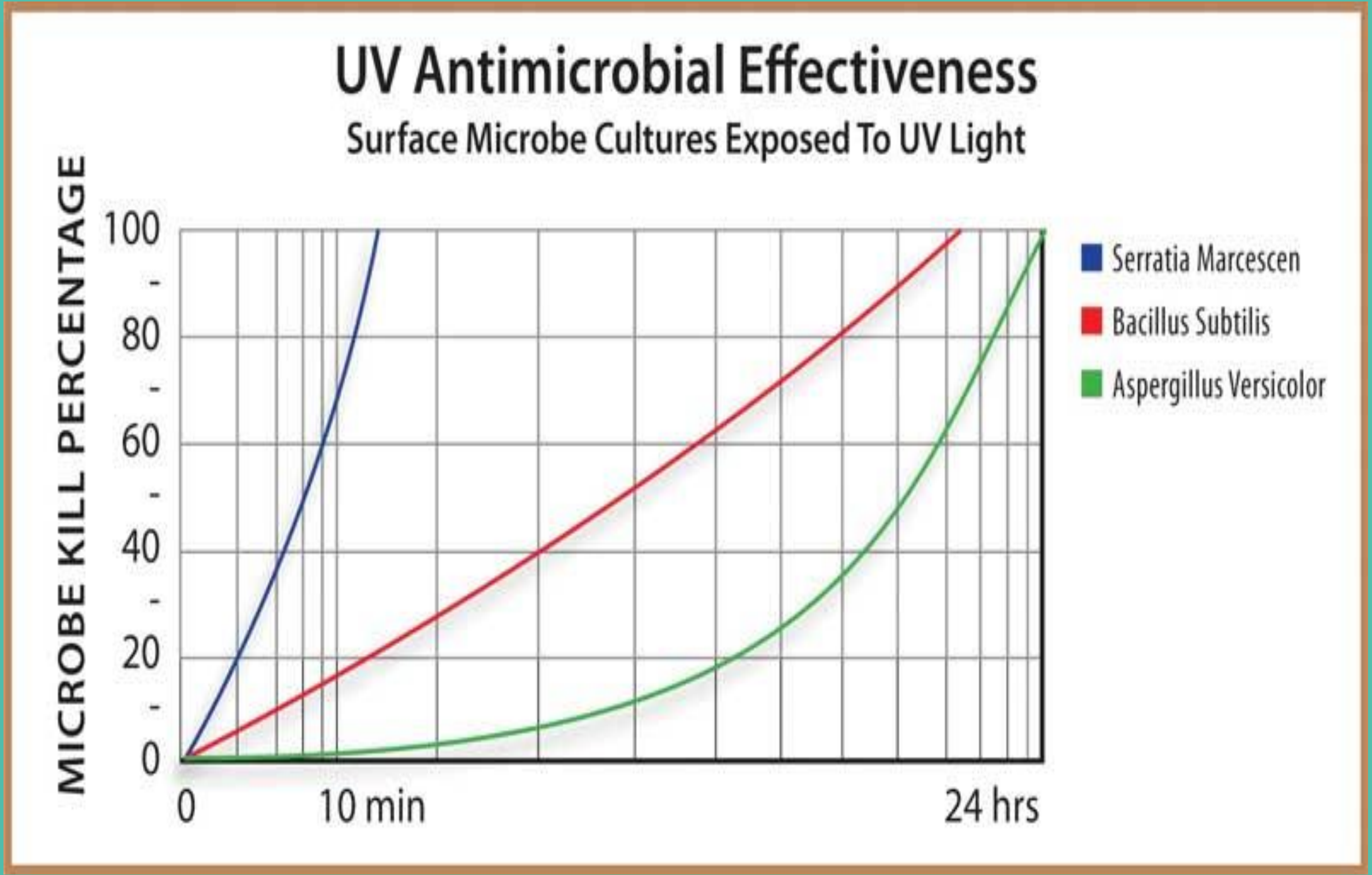
Email: bcairns@trojanuv.com

Prof. James R. Bolton
Department of Civil and Environmental Engineering
Edmonton, AB, Canada T6G 2W2
Email: jb3@ualberta.ca

The selection criteria for inclusion are recommended as follows:



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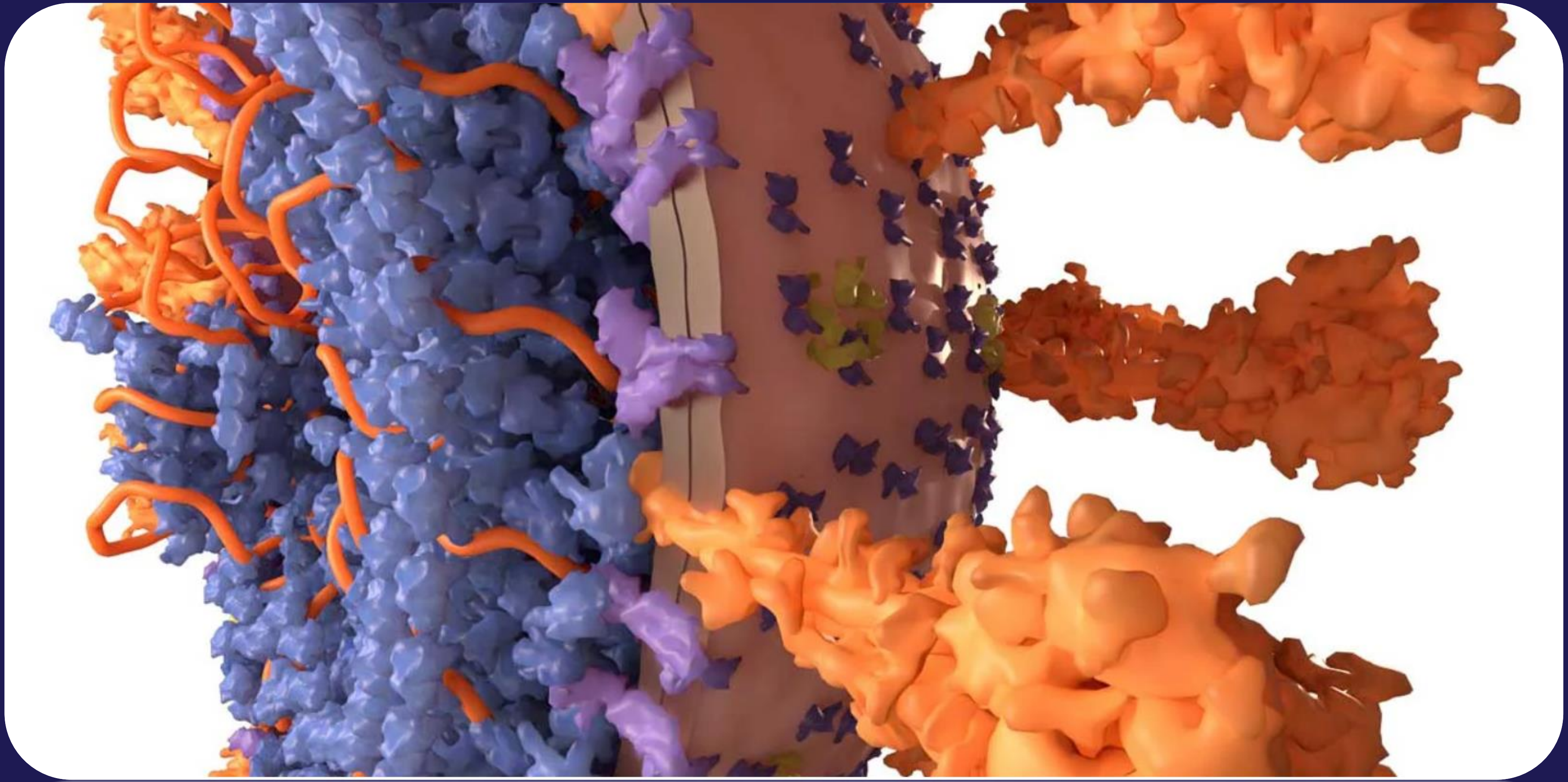
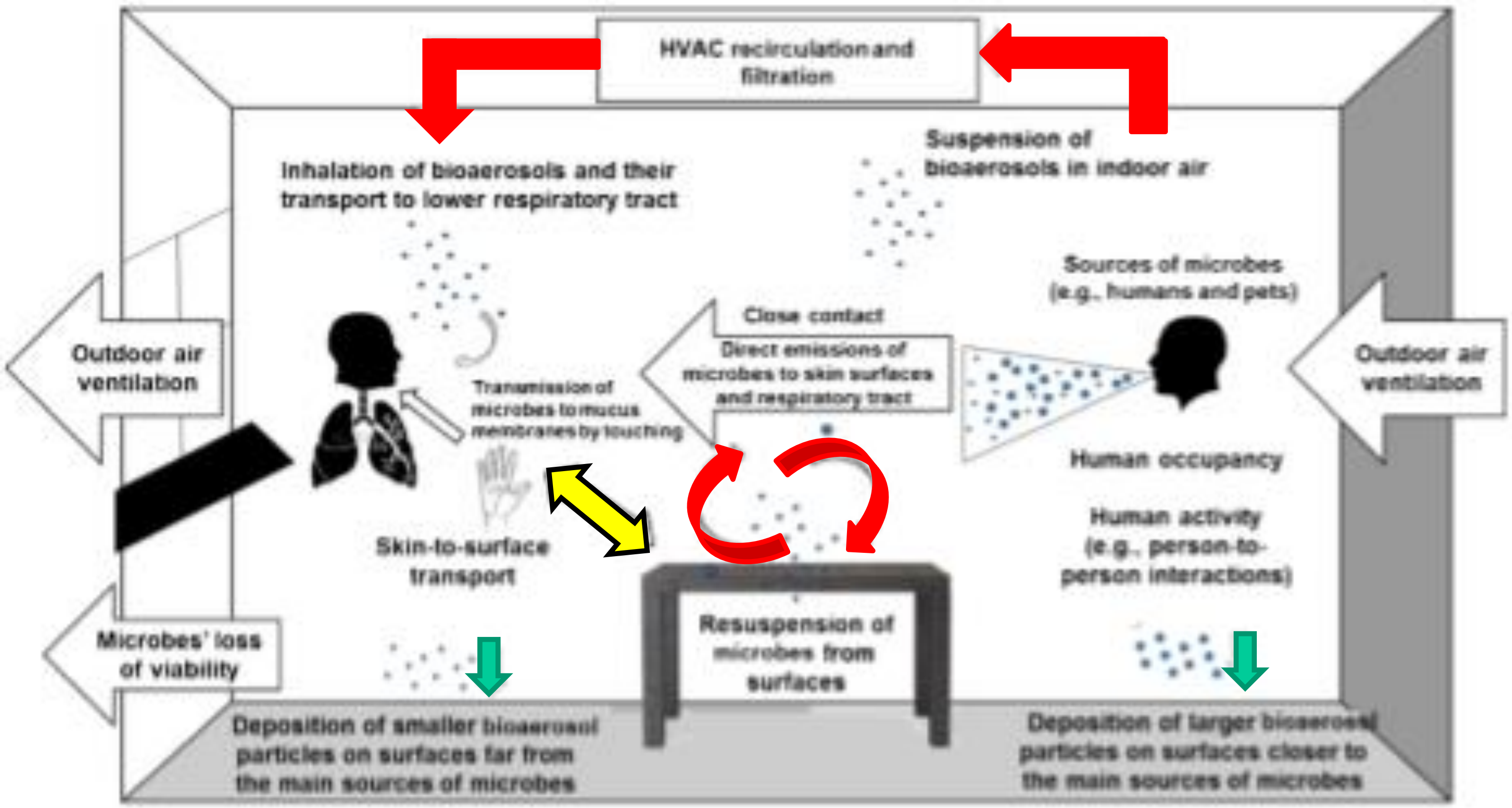


Courtesy of Scientific American

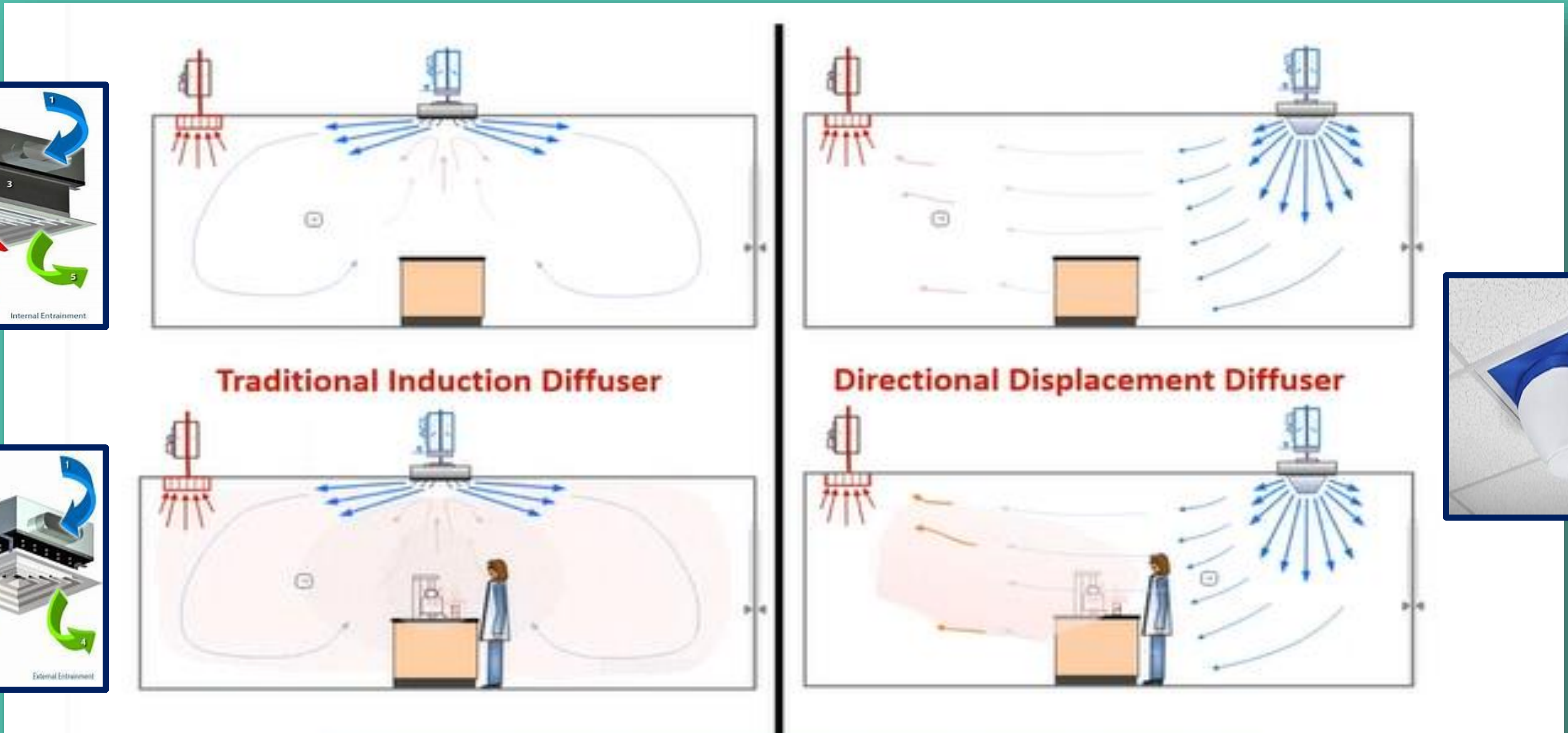
AIRFLOW DISTRIBUTION

Airflow Distribution



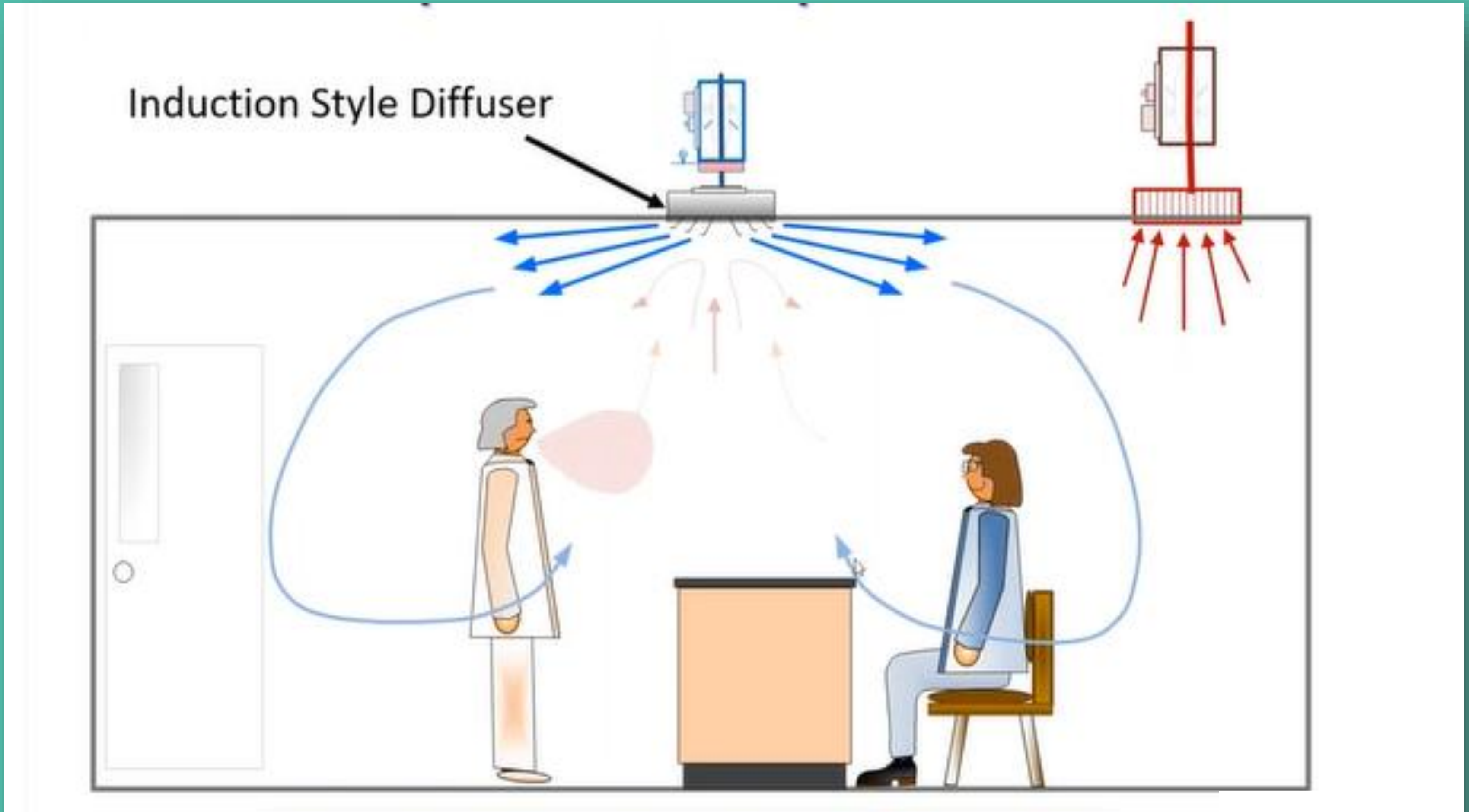
Stephens et al. (2019). Microbial Exchange via Fomites and Implications for Human Health. Current Pollution Reports volume 5, pages198–213(2019)

Airflow Distribution



Courtesy of 3Flow

Airflow Distribution



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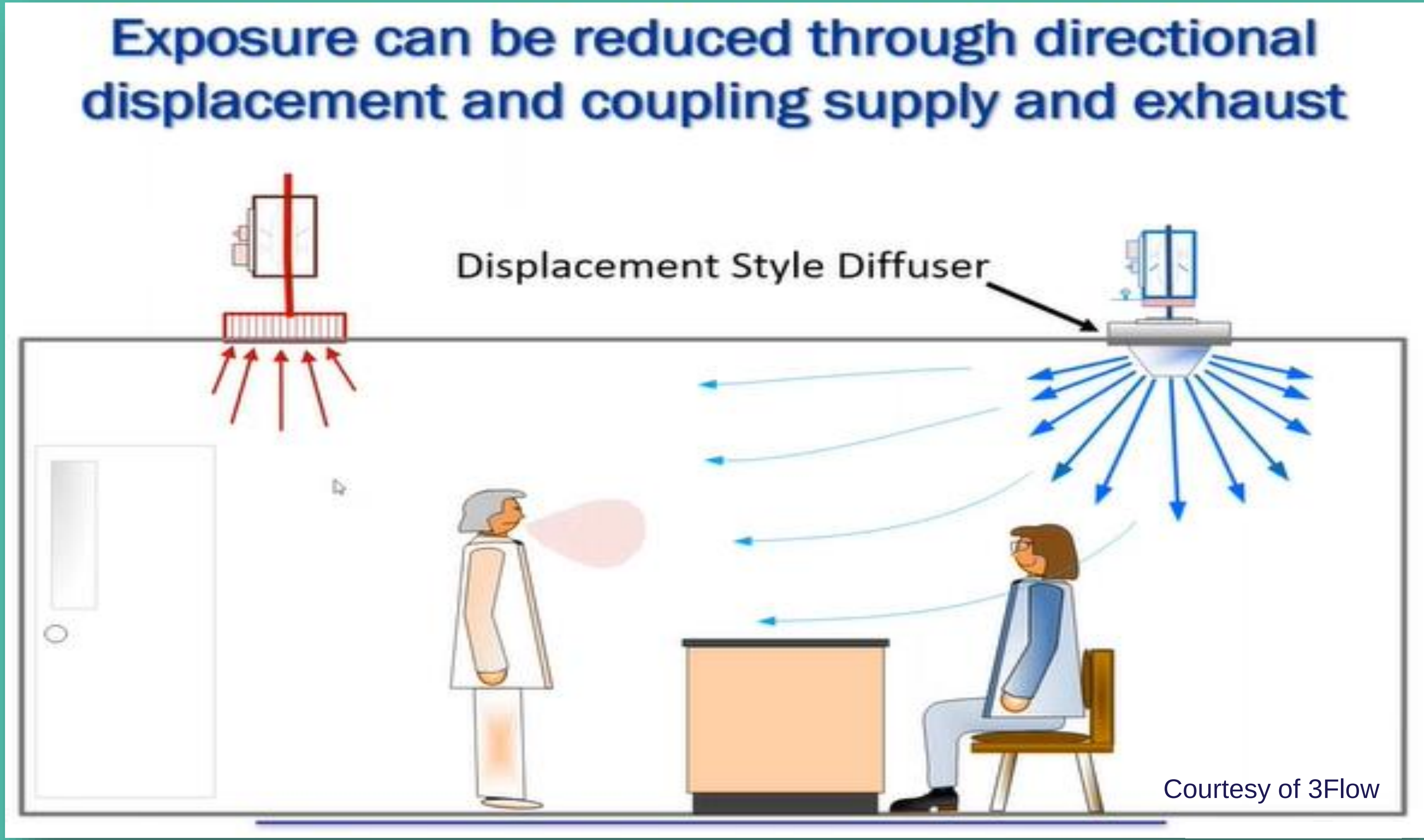

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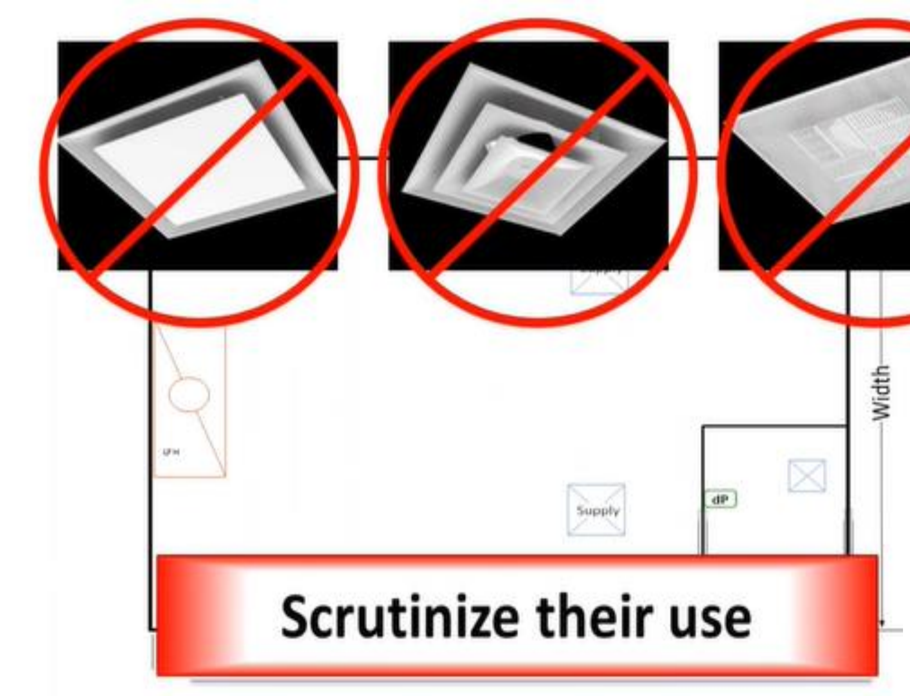


Courtesy of 3Flow

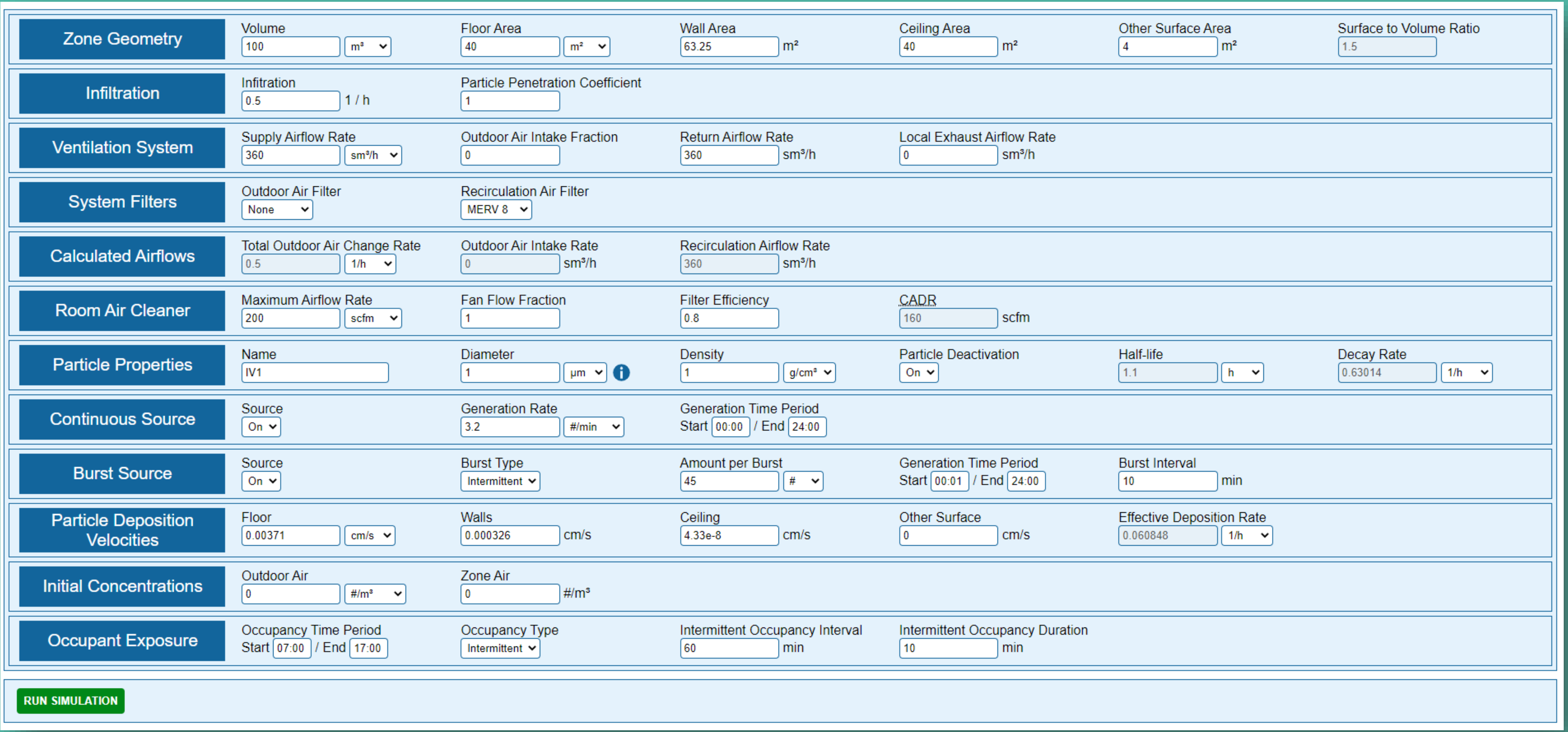
Courtesy of 3Flow

Airflow Distribution

See any problems with the air supply and exhaust in these hospital procedure rooms?

Courtesy of 3Flow

NIST Multizone Airflow Dispersion Model



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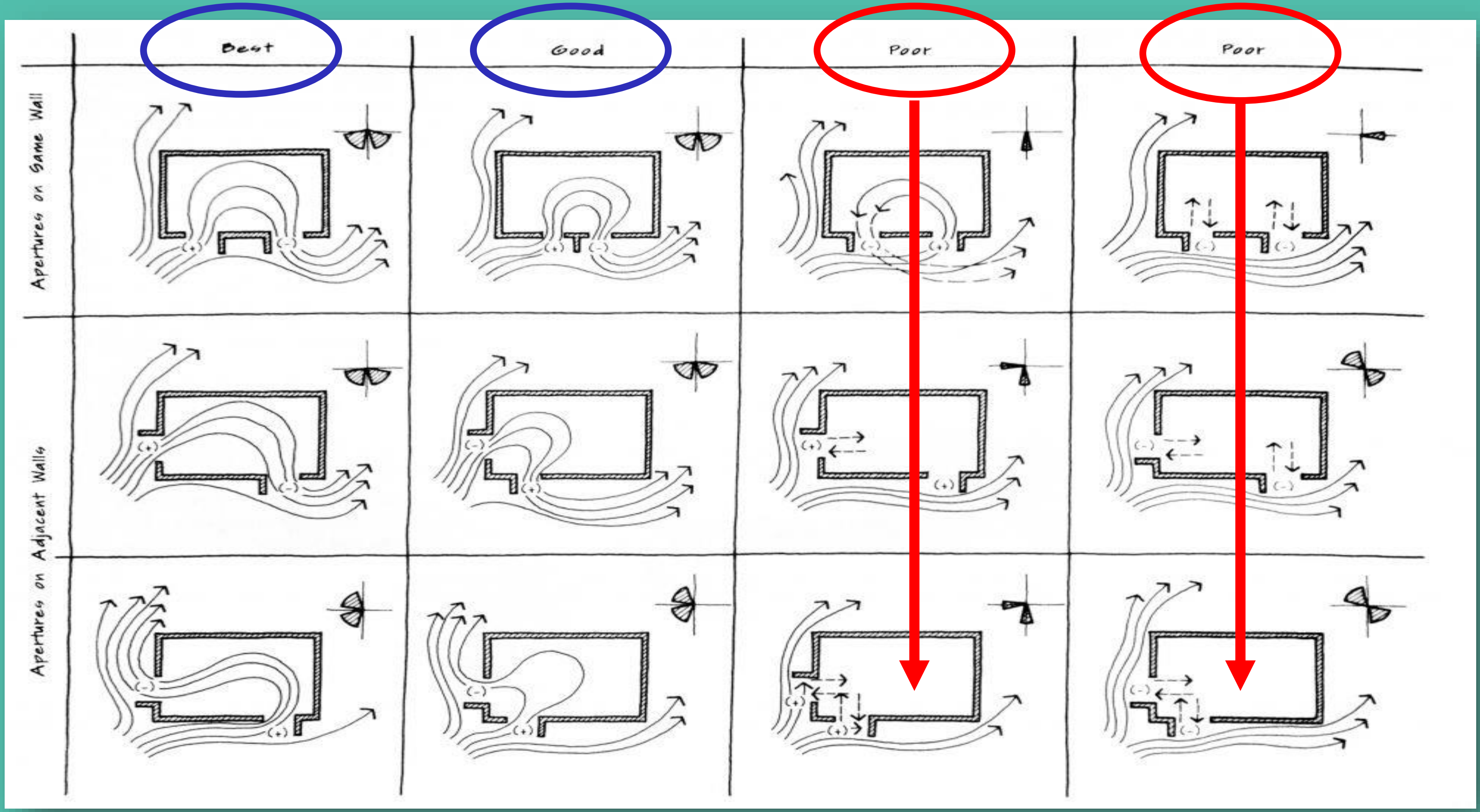
Airflow Distribution



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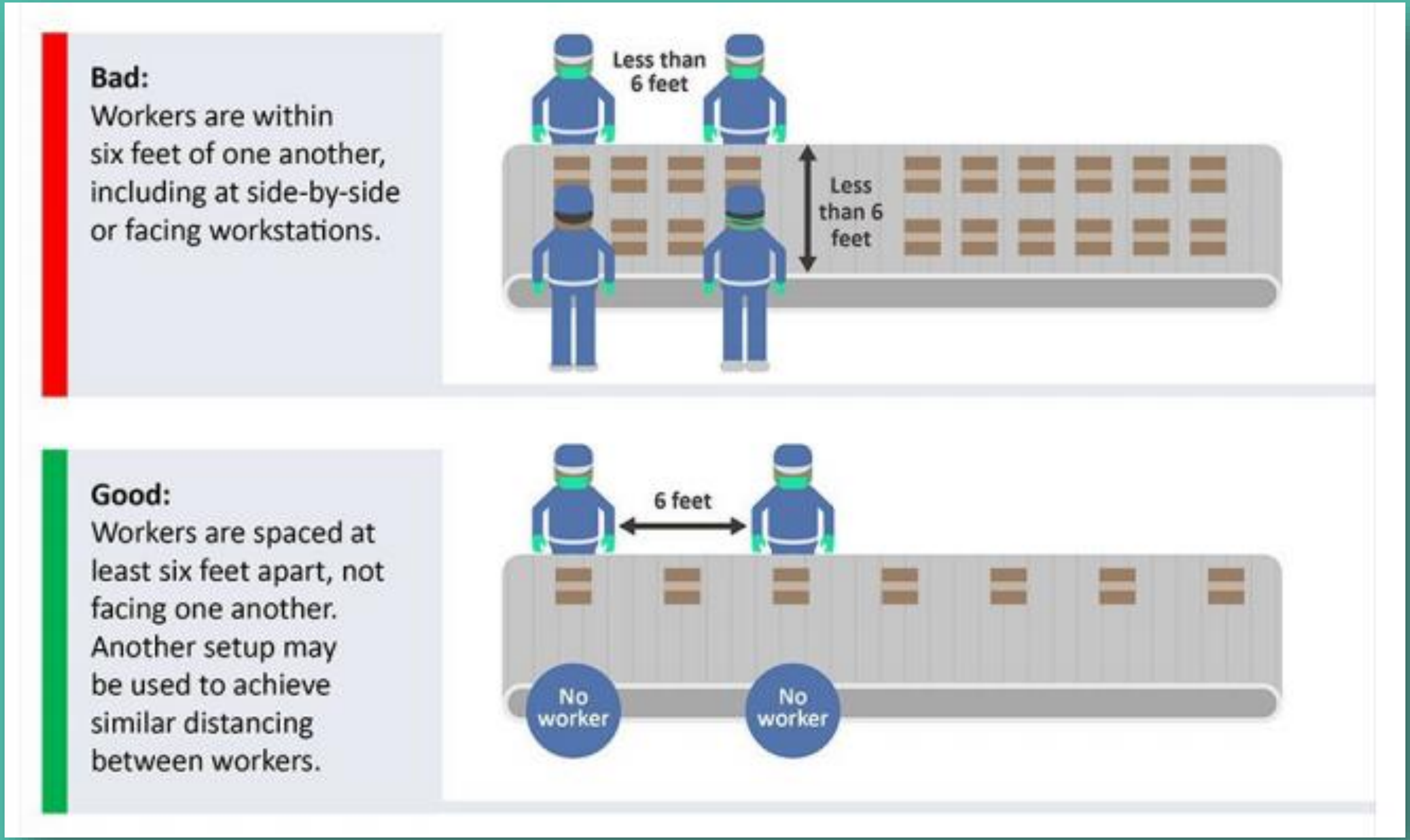
Airflow Distribution



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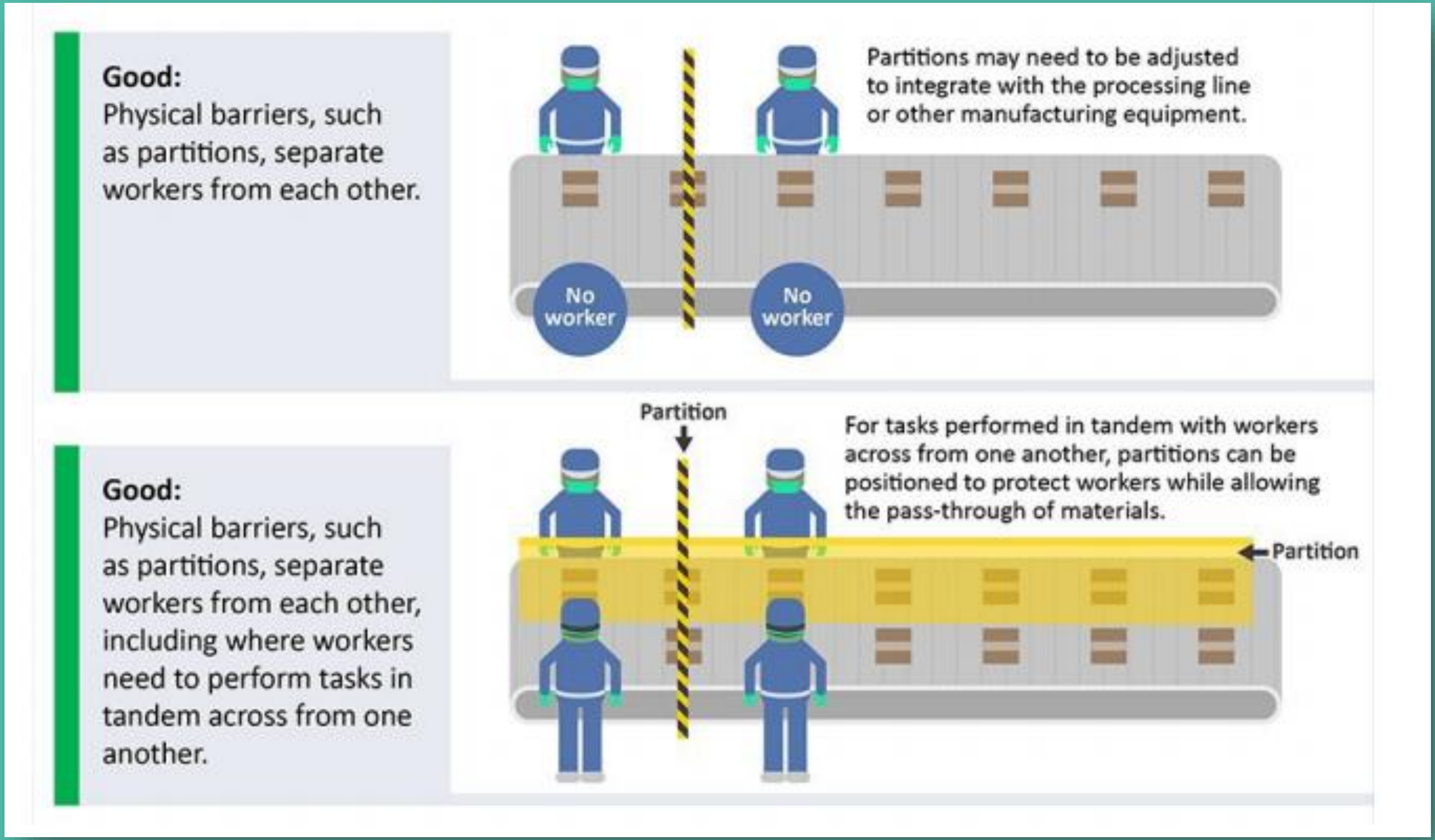
Airflow Distribution



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Sneeze Guards and Partitions

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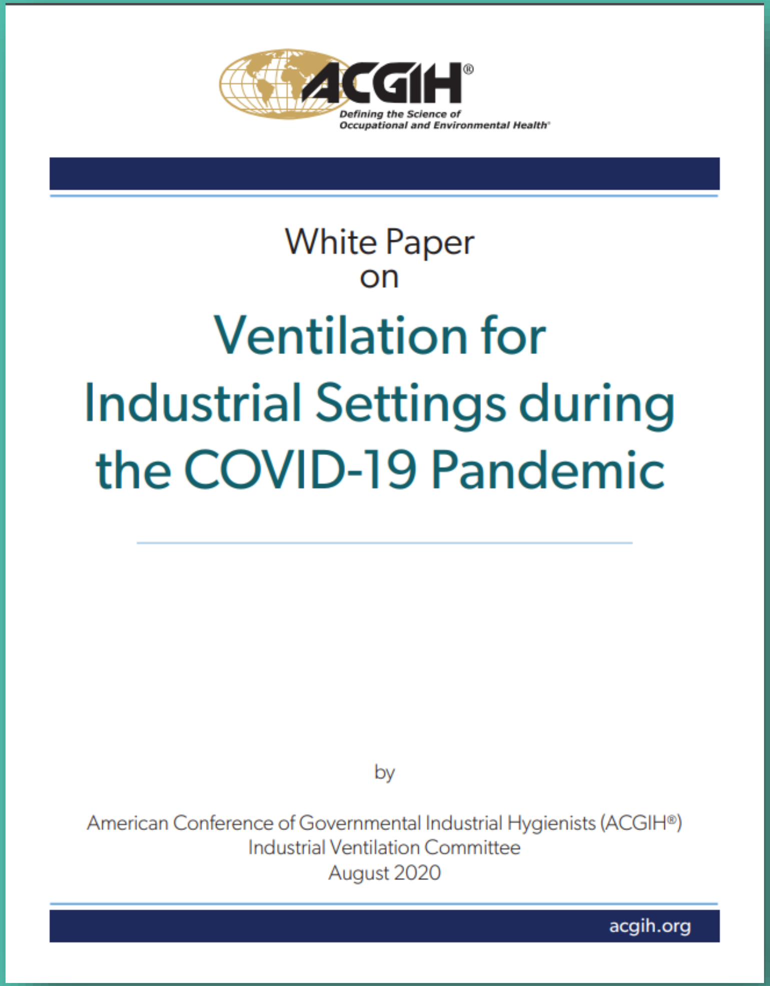
Ventilation for Industry

Hierarchy of Controls

- Engineering Controls
  - General exhaust ventilation
  - Local exhaust ventilation
  - Fans
  - Air filtration
  - Building and room filtration
  - Ultraviolet germicidal irradiation
- Administrative Controls
- Personal Protective Equipment (PPE)
- Important suggested measures

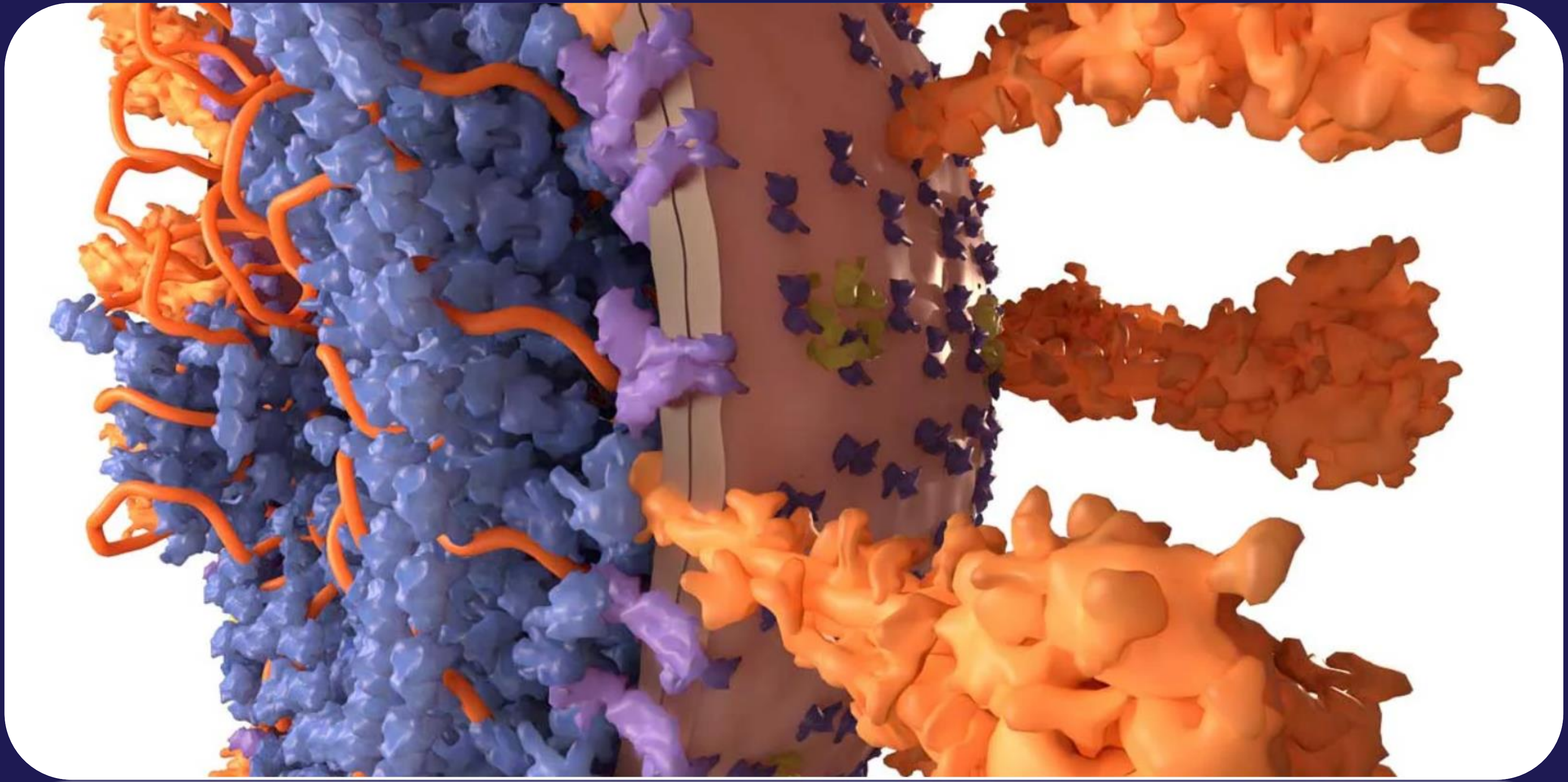

ACGIH®
Defining the Science of Occupational and Environmental Health®

White Paper
on
Ventilation for
Industrial Settings during
the COVID-19 Pandemic

by

American Conference of Governmental Industrial Hygienists (ACGIH®)
Industrial Ventilation Committee
August 2020

acgih.org



Courtesy of Scientific American

AIR FILTRATION

Air Filtration

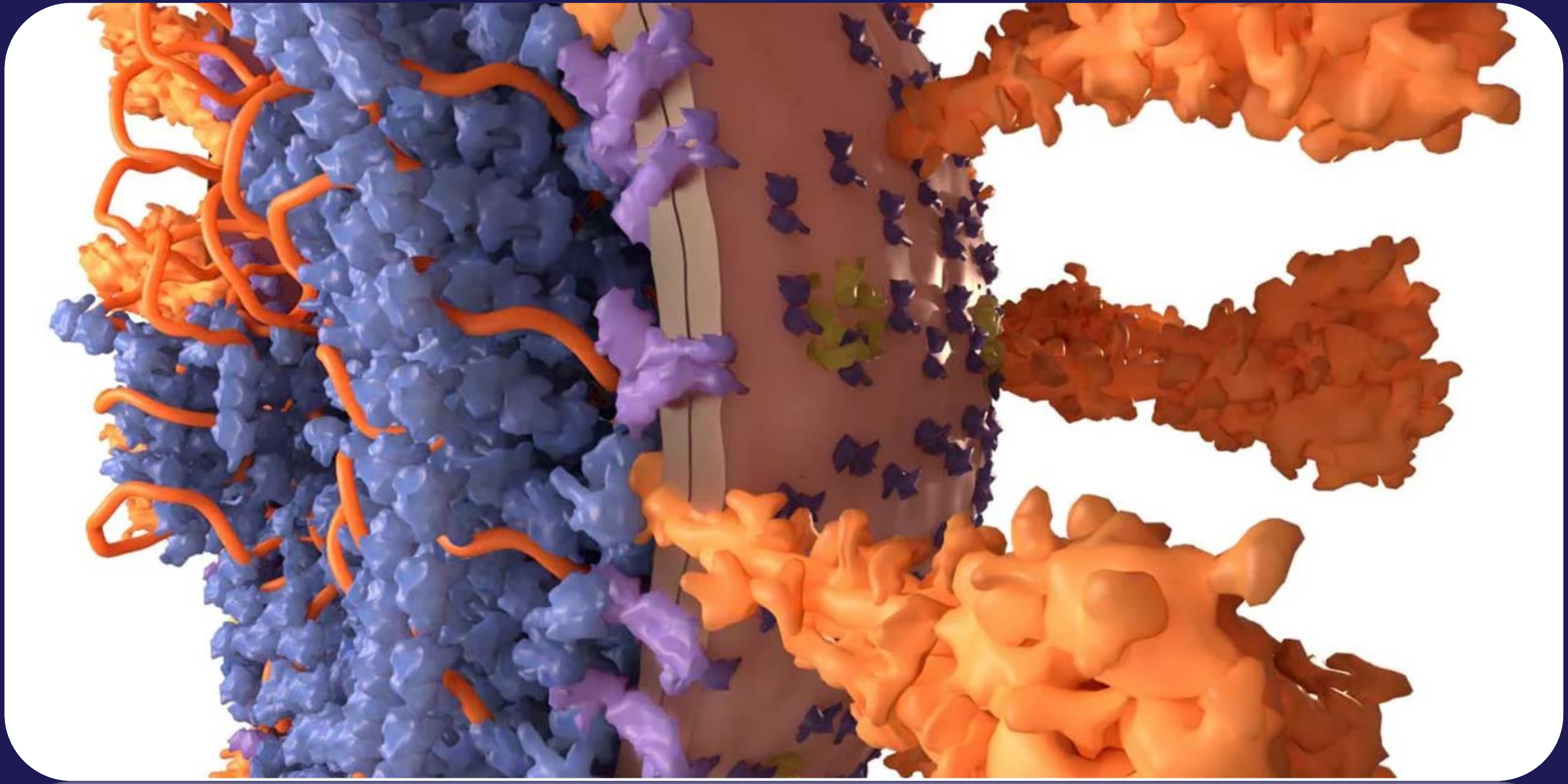
Regularly clean or replace HVAC system filters

- Use the most efficient filters possible to maintain ability to supply adequate air flow
- Consider using stand alone portable HEPA units
- Change to MERV 13-14 or HEPA filter
- Ensure that filters are installed in the correct orientation relative to airflow, that they are the appropriate size, and that they are seated in the filter rack properly
- Minimize air flowing around filters instead of through them

Air Filtration

ASHRAE Standard 52.2-2017 -- Minimum Efficiency Reporting Value (MERV)

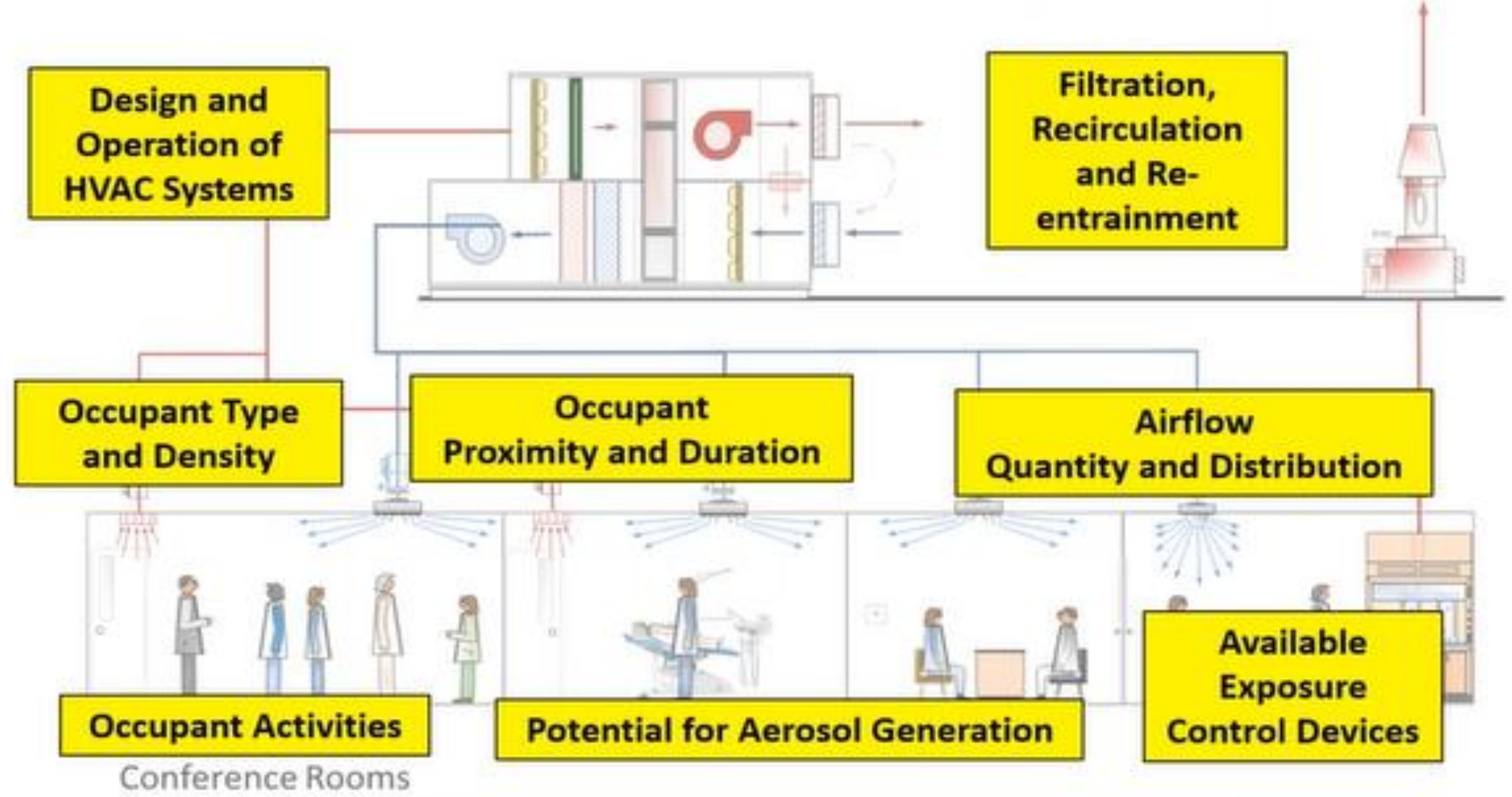
Std. 52.2 Minimum Efficiency Reporting Value (MERV)	Application Guidelines		
	Typical Controlled Contaminant	Typical Applications and Limitations	Typical Air Filter/Cleaner Type
16 15 14 13	**0.30 to 1.0 µm Particle Size** All bacteria Most tobacco smoke Droplet nuclei (sneeze) Cooking oil Most smoke Insecticide dust Copier toner Most face powder Most paint pigments	Hospital inpatient care General surgery Smoking lounges Superior commercial buildings	**Bag Filters** Nonsupported (flexible) microfine fiberglass or synthetic media. 300 to 900 mm (12 to 36 in.) deep, 6 to 12 pockets. **Box Filters** Rigid style cartridge filters 150 to 300 mm (6 to 12 in.) deep may use lofted (air laid) or paper (wet laid) media.
12 11 10 9	**1.0 to 3.0 µm Particle Size** Legionella Humidifier dust Lead dust Milled flour Coal dust Auto emissions Nebulizer drops Welding fumes	Superior residential Better commercial buildings Hospital laboratories	**Bag Filters** Nonsupported (flexible) microfine fiberglass or synthetic media. 300 to 900 mm (12 to 36 in.) deep, 6 to 12 pockets. **Box Filters** Rigid style cartridge filters 150 to 300 mm (6 to 12 in.) deep may use lofted (air laid) or paper (wet laid) media.
8 7 6 5	**3.0 to 10.0 µm Particle Size** Mold Spores Hair spray Fabric protector Dusting aids Cement dust Pudding mix Snuff Powdered milk	Commercial buildings Better residential Industrial workplaces Paint booth inlet air	**Pleated Filters** Disposable, extended surface, 25 to 125 mm (1 to 5 in.) thick with cotton-polyester blend media, cardboard frame. **Cartridge Filters** Graded density viscous coated cube or pocket filters, synthetic media. **Throwaway** Disposable synthetic media panel filters.



Courtesy of Scientific American

BUILDING VENTILATION CASE STUDY

Building Ventilation Case Study



Courtesy of 3Flow

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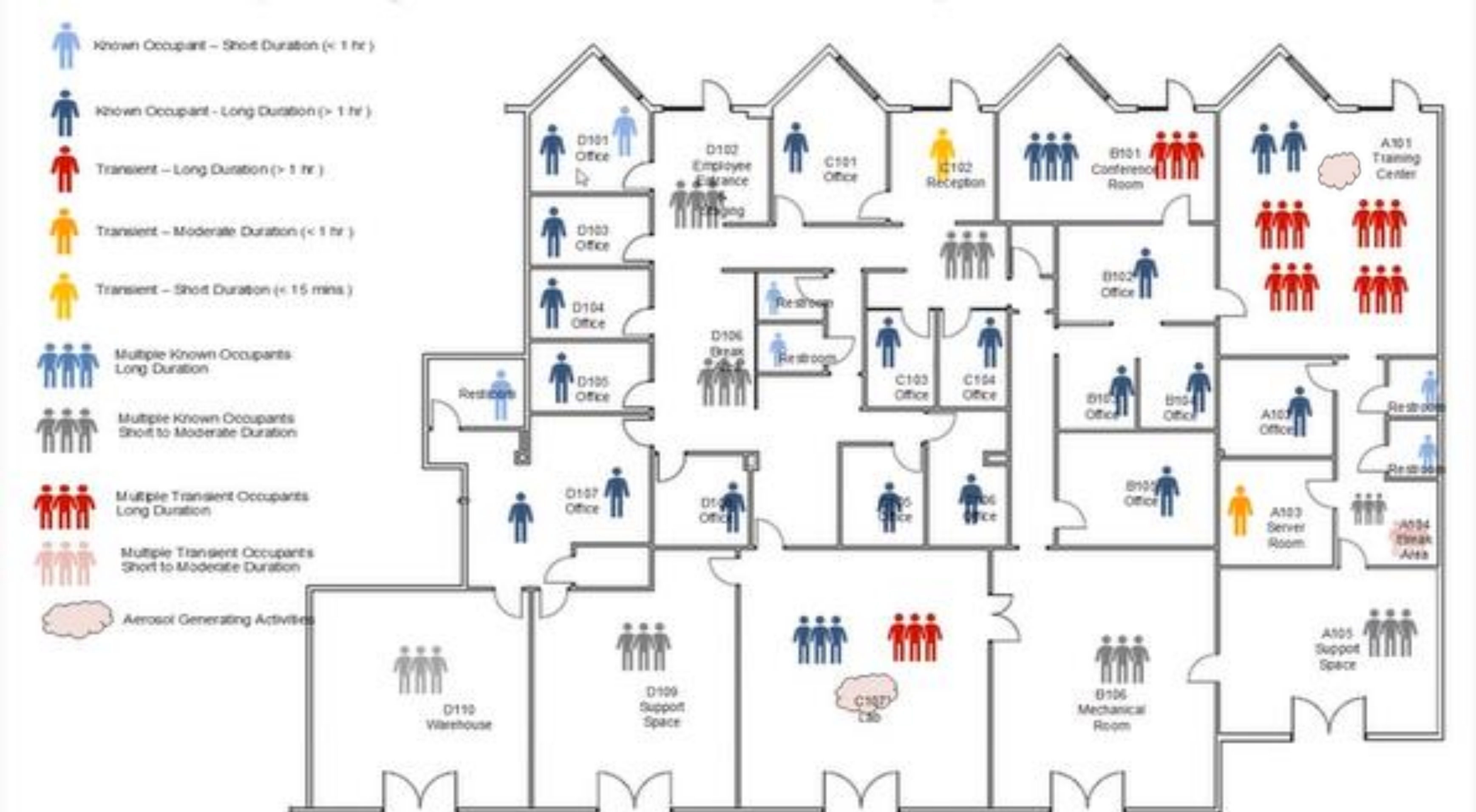

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Building Ventilation Case Study

		Space Risk Ratings																				Weighting and Rating	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Space	Space Type	Occupants	No. of Known Occ	Occ Sensitivity	Known Occ Density	Known Occ Duration	Transient (Visitors)	Transient (Visitors) Density	Transient (Visitors) Duration	Occ Proximity	Aerosol Potential	Vent Devices	HVAC Type	HVAC Operating State	Space Airflow	Outside Air Vent Rate	Space Info System	DCV Type	Filtration	Special Measures	Exhaust Re-ent	Weighted SCORE	Risk Band
A101	Training Center	1	2	2	2	3	4	4	4	2	1	0	3	2	3	4	4	4	3	4	0	358	[illegible]
A102	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
A103	Server Room	0	0	0	0	1	1	2	0	0	1	0	3	2	2	4	4	4	3	4	0	139	1
A104	Break Area	0	1	1	4	0	0	0	0	2	1	2	3	2	2	4	4	4	3	4	0	175	1
A105	Lab Support Space	0	0	1	2	0	0	0	0	0	0	2	3	2	2	4	4	4	3	4	0	91	1
B101	Conference Room	2	2	3	3	2	2	4	2	3	1	2	3	2	2	4	4	4	3	4	0	331	3
B102	Office	0	0	0	0	0	0	0	0	0	0	2	3	2	2	4	4	4	3	4	0	77	0
B103	Office	0	0	1	3	3	0	0	0	0	0	2	3	2	2	4	4	4	3	4	0	99	1
B104	Office	0	0	0	0	0	0	0	0	0	0	2	3	2	2	4	4	4	3	4	0	77	0
B105	Office	0	0	1	2	2	0	0	0	0	0	2	3	2	2	4	4	4	3	4	0	95	1
B106	Mechanical Room - Assembly	0	1	1	2	2	1	1	1	2	1	2	3	2	2	4	4	4	3	4	0	216	2
C101	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
C102	Reception	2	2	2	3	3	2	3	0	2	0	2	3	2	3	4	4	4	3	4	0	227	2
C103	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
C104	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
C105	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
C106	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
C107	Lab	0	2	1	2	2	2	1	2	2	2	0	0	1	0	0	2	4	2	2	0	216	2
D101	Office	0	0	3	3	3	1	3	1	1	1	0	3	2	2	4	4	4	3	4	0	234	2
D102	Staging	0	1	1	3	1	0	0	0	0	1	1	3	2	3	4	4	4	3	4	0	133	1
D103	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
D104	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	1
D105	Office	0	0	1	2	3	0	0	0	0	1	0	3	3	2	4	4	4	3	4	0	125	1
D106	Break Area	0	2	2	3	0	0	0	0	0	1	1	3	3	2	4	4	4	3	4	0	137	1
D107	Office (Cubes)	0	0	0	0	0	0	0	0	0	0	2	3	2	2	4	4	4	3	4	0	77	0
D108	Office	0	0	1	2	3	0	0	0	0	1	0	3	2	2	4	4	4	3	4	0	123	[illegible]

Courtesy of 3Flow

Building Ventilation Case Study

Risk Band	Description	Attributes
0	Negligible	• Vacant Space • ≤ 1 Occupant • Very Limited Access • Proper HVAC Operation
1	Low	• ≤ 1 Known Occupant • Limited to no Visitors • Proper HVAC Operation
2	Moderate	• Known Occupants • Limited Visitors w/Short Duration • Adequate Spacing • Proper HVAC Operation
3	High	• Known Occupants • Limited Visitors w/ Extended Duration • Mixed Social Space and Close Contact • Ventilation Issues
4	Extreme (Special)	• Known Occupants • Numerous, Frequent Visitors w/Extended Duration • Close Personal Contact • Aerosol Generating Procedures • Ventilation Issues

Courtesy of 3Flow

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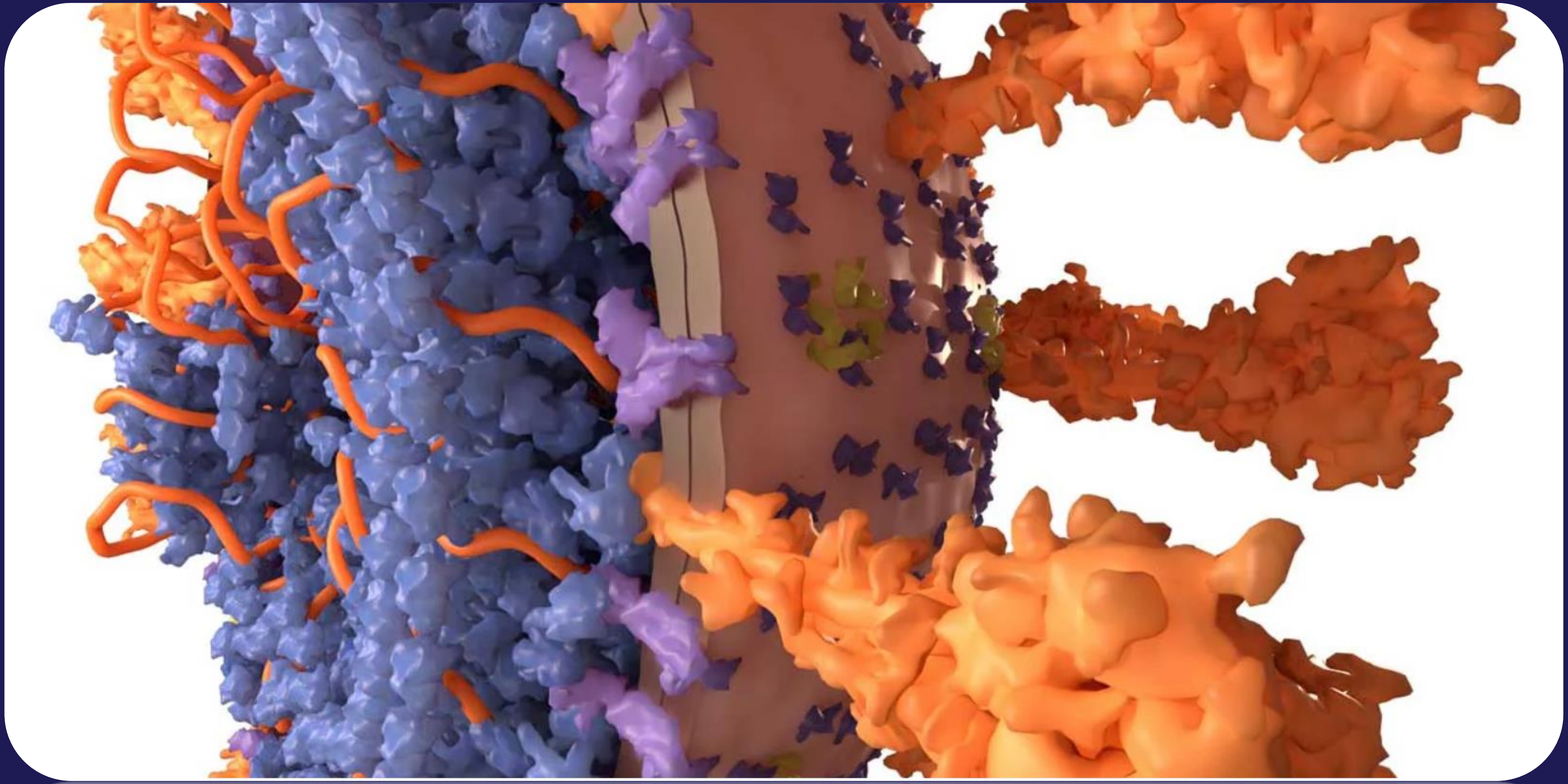
Building Ventilation Case Study

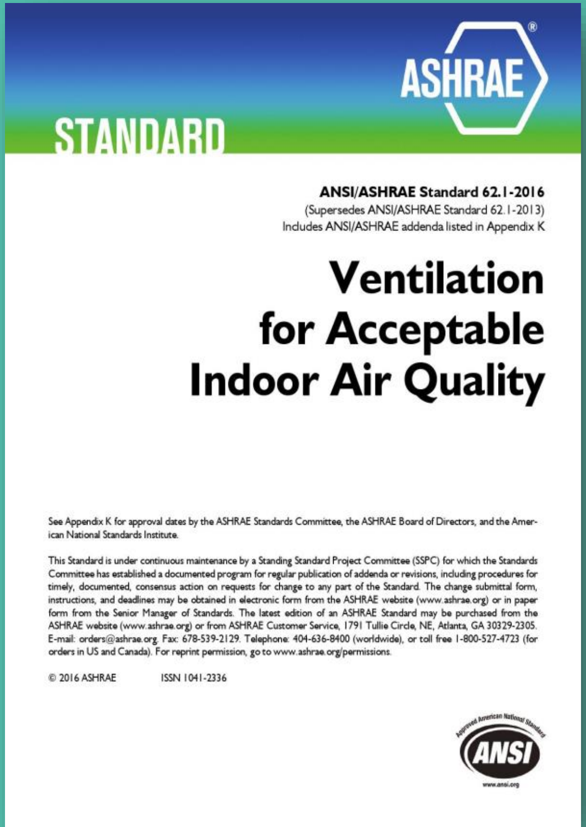
Courtesy of 3Flow



Courtesy of Scientific American

REFERENCE MATERIALS

Reference Materials


STANDARD

ANSI/ASHRAE Standard 62.1-2016
(Supersedes ANSI/ASHRAE Standard 62.1-2013)
Includes ANSI/ASHRAE addenda listed in Appendix K

Ventilation for Acceptable Indoor Air Quality

See Appendix K for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, and the American National Standards Institute.

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

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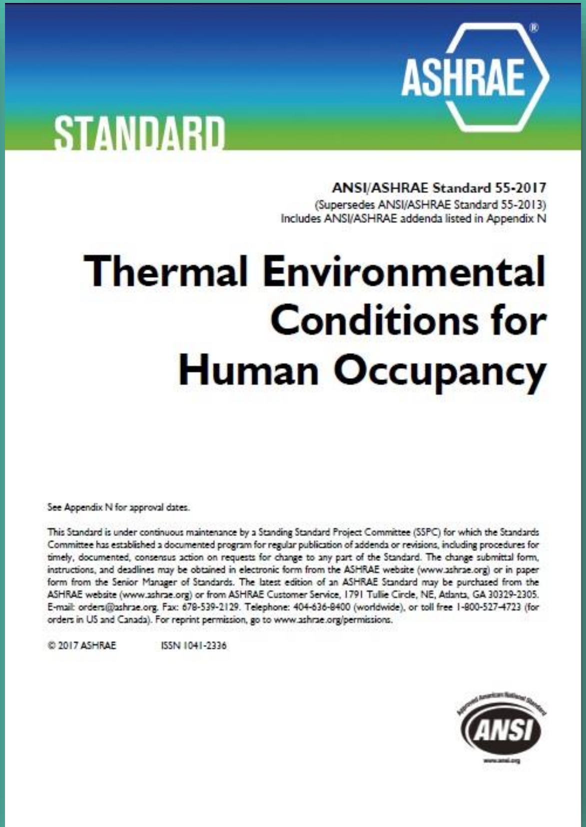
STANDARD

ANSI/ASHRAE Standard 55-2017
(Supersedes ANSI/ASHRAE Standard 55-2013)
Includes ANSI/ASHRAE addenda listed in Appendix N

Thermal Environmental Conditions for Human Occupancy

See Appendix N for approval dates.

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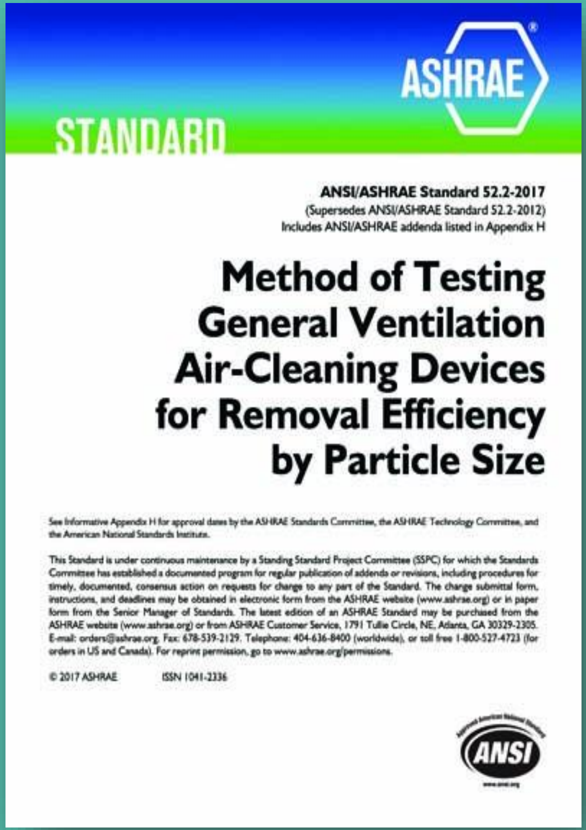
STANDARD

ANSI/ASHRAE/ASHE Standard 170-2017

Ventilation of Health Care Facilities


STANDARD

ANSI/ASHRAE Standard 52.2-2017
(Supersedes ANSI/ASHRAE Standard 52.2-2012)
Includes ANSI/ASHRAE addenda listed in Appendix H

Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

See Informative Appendix H for approval dates by the ASHRAE Standards Committee, the ASHRAE Technology Committee, and the American National Standards Institute.

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

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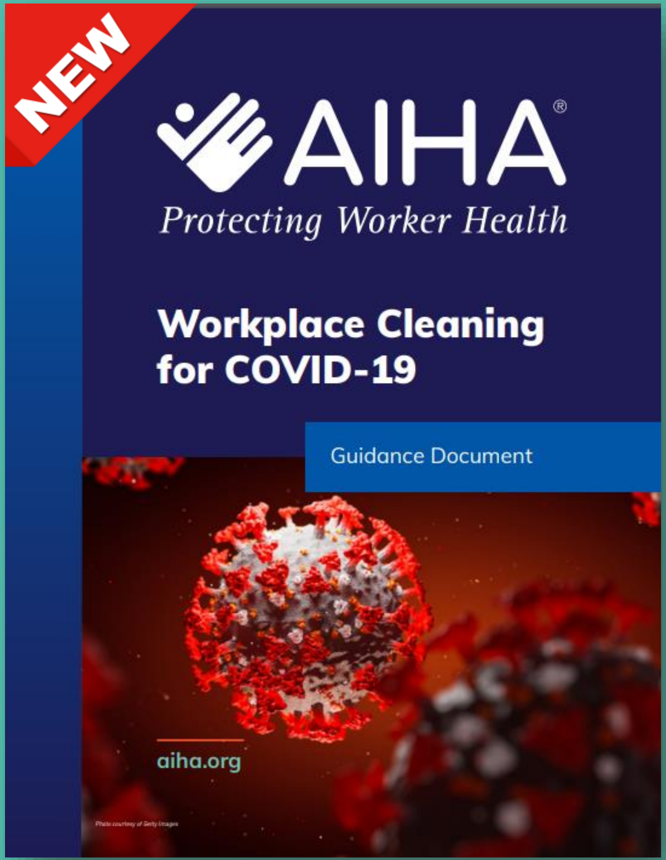

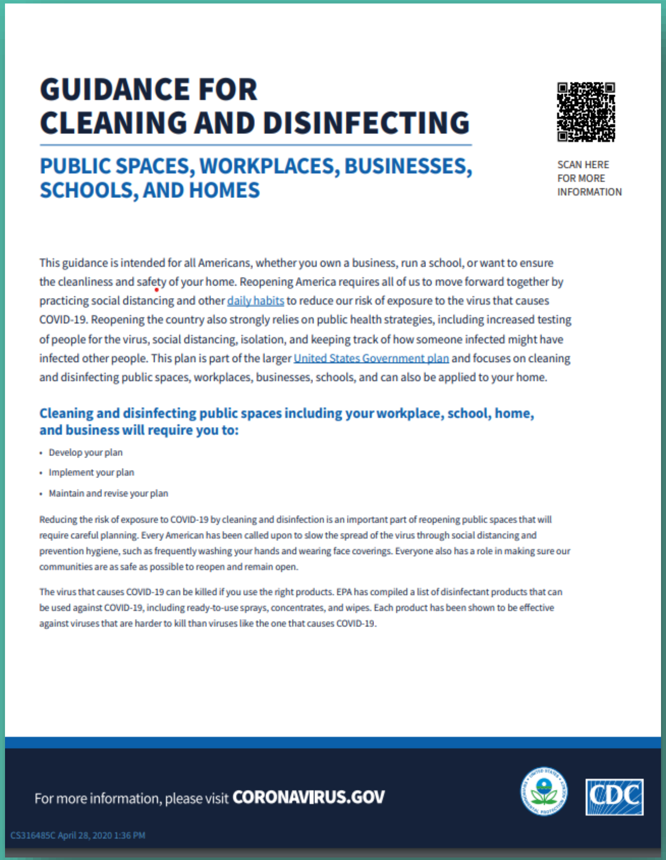

GUIDANCE FOR CLEANING AND DISINFECTING

PUBLIC SPACES, WORKPLACES, BUSINESSES, SCHOOLS, AND HOMES

SCAN HERE FOR MORE INFORMATION

This guidance is intended for all Americans, whether you own a business, run a school, or want to ensure the cleanliness and safety of your home. Reopening America requires all of us to move forward together by practicing social distancing and other daily habits to reduce our risk of exposure to the virus that causes COVID-19. Reopening the country also strongly relies on public health strategies, including increased testing of people for the virus, social distancing, isolation, and keeping track of how someone infected might have infected other people. This plan is part of the larger United States Government plan and focuses on cleaning and disinfecting public spaces, workplaces, businesses, schools, and can also be applied to your home.

Cleaning and disinfecting public spaces including your workplace, school, home, and business will require you to:

- Develop your plan
- Implement your plan
- Maintain and revise your plan

Reducing the risk of exposure to COVID-19 by cleaning and disinfection is an important part of reopening public spaces that will require careful planning. Every American has been called upon to slow the spread of the virus through social distancing and prevention hygiene, such as frequently washing your hands and wearing face coverings. Everyone also has a role in making sure our communities are as safe as possible to reopen and remain open.

The virus that causes COVID-19 can be killed if you use the right products. EPA has compiled a list of disinfectant products that can be used against COVID-19, including ready-to-use sprays, concentrates, and wipes. Each product has been shown to be effective against viruses that are harder to kill than viruses like the one that causes COVID-19.

For more information, please visit CORONAVIRUS.GOV

CDC

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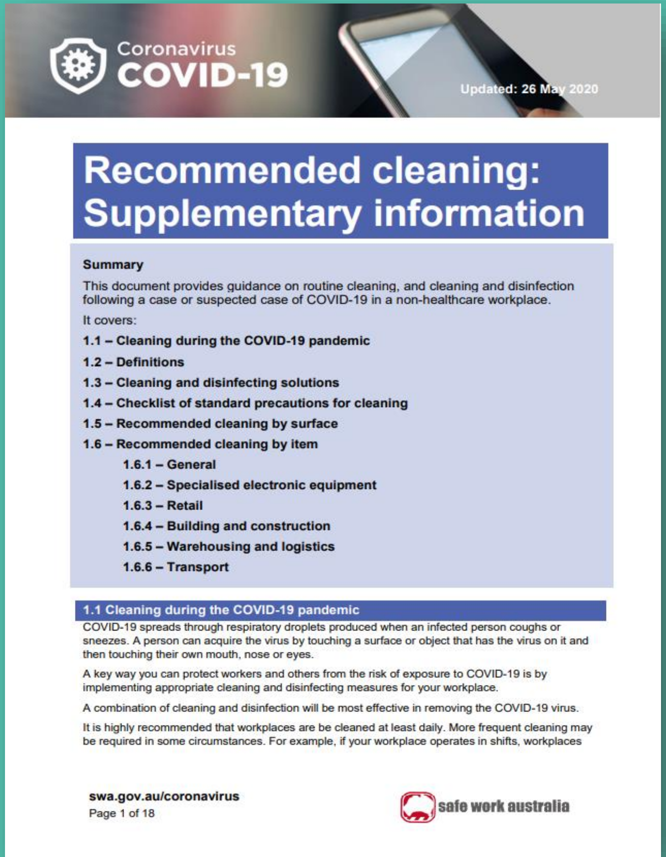


Coronavirus COVID-19

Updated: 26 May 2020

Recommended cleaning: Supplementary information

Summary

This document provides guidance on routine cleaning, and cleaning and disinfection following a case or suspected case of COVID-19 in a non-healthcare workplace.

It covers:

1.1 – Cleaning during the COVID-19 pandemic
1.2 – Definitions
1.3 – Cleaning and disinfecting solutions
1.4 – Checklist of standard precautions for cleaning
1.5 – Recommended cleaning by surface
1.6 – Recommended cleaning by item
1.6.1 – General
1.6.2 – Specialised electronic equipment
1.6.3 – Retail
1.6.4 – Building and construction
1.6.5 – Warehousing and logistics
1.6.6 – Transport

1.1 Cleaning during the COVID-19 pandemic

COVID-19 spreads through respiratory droplets produced when an infected person coughs or sneezes. A person can acquire the virus by touching a surface or object that has the virus on it and then touching their own mouth, nose or eyes.

A key way you can protect workers and others from the risk of exposure to COVID-19 is by implementing appropriate cleaning and disinfecting measures for your workplace.

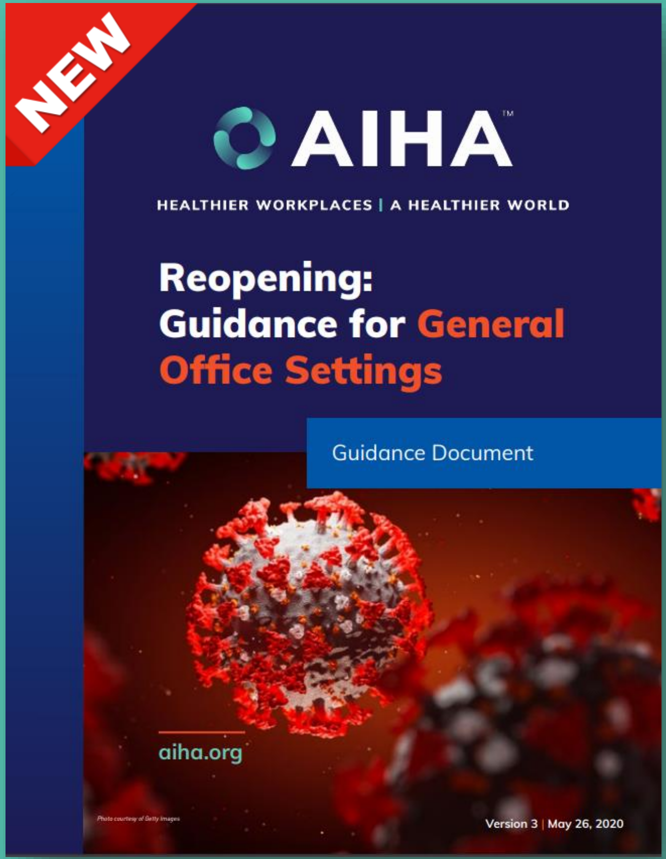
A combination of cleaning and disinfection will be most effective in removing the COVID-19 virus.

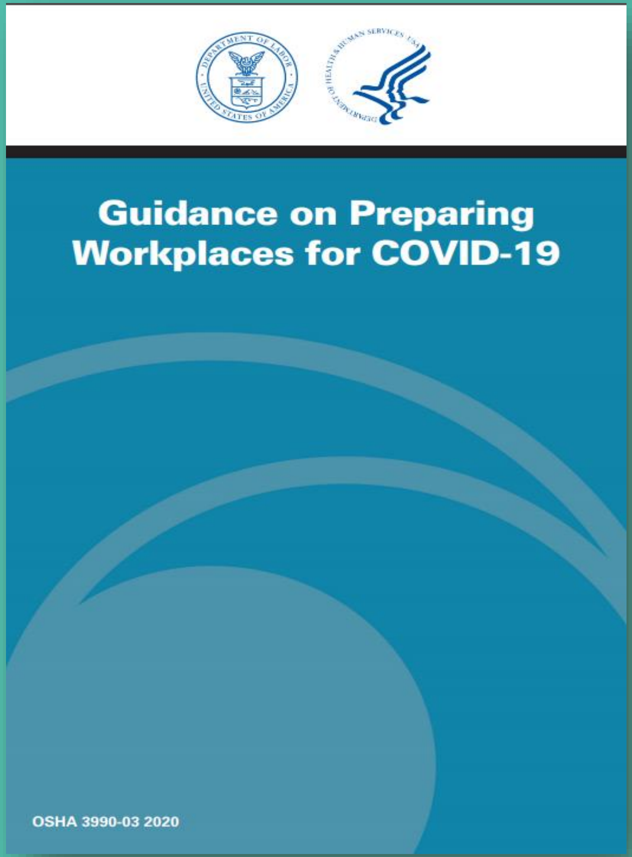
It is highly recommended that workplaces are be cleaned at least daily. More frequent cleaning may be required in some circumstances. For example, if your workplace operates in shifts, workplaces

swa.gov.au/coronavirus
Page 1 of 18

safe work australia

Reference Materials





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