Masking Reference Doc

Document created by Texan_Reverend with U.S. readers and sourcing in mind, but much of it is useful globally
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[Every attempt is made to ensure this information is broadly applicable, but it should not replace good judgement of each situation]
[Links to Twitter use XCancel to avoid recent changes to reply and profile visibility - remove the word "cancel" to get original X link]
[Links to Amazon and Walmart are used often for broad accessibility, quantity of reviews, quality of photos/details, and price matching]

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Masking Info

Quantitative Fit Testing (QNFT)

A Condensation Particle Counter (CPC) is used to calculate on-face respirator efficacy and fit
- Particles are measured from both ambient air and air inside respirator
  - This shows the Total Inward Leakage (TIL) of particles both through and around the respirator
- Fit test score from a CPC represents the Harmonic Mean Fit Factor (HMFF)
  - Harmonic Mean is an average that reduces impact of highest dataset values
    - This provides a more realistic estimate of protection capability
  - Fit Factor represents the number of particles outside the respirator for every particle inside
    - In other words, how many times cleaner the air is inside the respirator
  - This communicates the scale of efficacy differences better than percentages
    - 1=0%, 2=50%, 5=80%, 10=90%, 20=95%, 100=99%, 200=99.5%, 1000=99.9%
    - Filtration percentage is called Fitted Filtration Efficiency (FFE)
- 100 is a passing score for OSHA QNFT given to medical and industrial workers
- TSI PortaCount is the most common brand of particle counter fit testing equipment
  - Community fit testers mostly use retired 8020, 8020A, or 8020M models

The alternative to QNFT is Qualitative Fit Testing (QLFT)
- This utilizes a bitter or sweet aerosol spray and tests whether the user tastes it or not while masked
- QLFT isn't as accurate and does not support objective measurement across respirators and users
  - But QLFT can be done inexpensively at home and is useful for ruling out masks with poor fit

Extended duration QNFT (1-6 hours) has revealed that almost all respirators require regular retightening
- Talking and jaw motion tug at the nosepiece which stretches it open, even if only slightly
- Retightening/reforming the nosepiece should be performed at least every 30 minutes
  - Extended talking also necessitates more frequent retightening - every 15 minutes

Fit Factor to filtration percentage formula:
- [1 - (1 / HMFF)] x 100 = %

Calculator steps:
- 1 / HMFF = TIL
- 1 - TIL = FFE
- FFE x 100 = %

Filtration percentage to Fit Factor formula:
- 1 / [1 - (% / 100)] = HMFF

Calculator steps:
- % / 100 = FFE
- 1 - FFE = TIL
- 1 / TIL = HMFF

Classifications & Features

Any mask is better than no mask, and that's good to keep in mind when discussing styles and choices
- However, if substantial protection is the goal, some types and models are better than others
  - Whenever possible, seek specific high-quality models rather than only relying on certification
    - Some certifications don't require broad fit test verification, just checklists of features

Regardless of certification, a tight-fitting disposable is categorized as a Filtering Facepiece Respirator (FFR)
- FFRs as a category usually max out at fit factors of up to a few hundred on most people
- Other categories:
  - Quarter-mask or half-mask elastomeric respirator
  - Full-face elastomeric respirator
  - Powered Air-Purifying Respirator (PAPR)
    - Many of these types regularly achieve fit factors in the thousands

There are many FFR standards globally, but only U.S. standards like N95, N99, & N100 require headbands
- Most common FFR standards allow for both earloop and headband models
  - Including: KN95-China, KF94-South Korea, FFP2/FFP3-Europe, P2/P3-Australia & New Zealand

Headbands ensure a better seal for the overwhelming majority of people, respirators, and situations
- Headbands also do a better job overall of resisting leaks or loss of seal due to movement
- Even when a person can pass QNFT with an earloop model, they still tend to do better with headbands
  - However, most people cannot pass an OSHA or international QNFT with earloop respirators

https://hse.gov.uk/safetybulletins/ear-loop-respirators.htm
  - While ear savers/earloop hooks can improve the fit and seal some, headbands still win out

If earloops are necessary, there are two options that have passed QNFT on a reasonable variety of people:
- ZiMi earloop models
- 3M Aura models with the headbands cut in half and tied into earloops
  - But if a 3M Aura does not fit a person well with headbands, it likely won't work with earloops
  - Gerard Hughes' QNFT of a 3M Aura 9205+ with headbands cut and tied into earloops:

https://youtube.com/watch?v=wtDAcoGucBc
  - This may work with other trifold designs like Dräger 1950, Trident RTCFFP3, and Makrite 4803
    - However, these models have not undergone published QNFT with this earloop mod

Among FFRs, there are many categories grouped together by similar shapes and designs:
- Flat-fold respirators
  - Trifold or three-panel or boat-style
  - Bifold or vertical bifold
  - Duckbill or pouch
- Inner Frame Respirators
- Cup-style or cup-shaped or molded cup respirators
- Adhesive respirators

Bifolds with a crease that runs from nose to chin are less likely to seal well even if the filter material is good
- The shape does not accommodate jaw motion as well, since the flexibility is in the opposite direction
- The nosepiece shipping bent in half makes it difficult to form into shape without leaks around the nose

Note that inner frame respirator filters are packaged like bifolds, but in practice, wear more like cup-style
- The filter's gasket combined with the frame better handles jaw motion and doesn't require a nosepiece

Filter Material

FFR filter material is electret meltblown polypropylene in more/thicker layers than surgicals
- Here's a video explaining the ways electret respirator material does its filtration: https://www.youtube.com/watch?v=eAdanPfQdCA
- A factory-applied electrostatic charge helps respirators attract more particles
  - This charge can be degraded by:
    - Captured particles
    - Time (5-10+ years)
    - Storage in condensing humid environments
    - Exposure to high percentage alcohol fumes (50%+)
    - Submersion in liquid
    - Heavy and/or sustained splashing with liquids

While water exposure does degrade filtration efficacy, it generally takes more than a sprinkling to do so
- A little rain or splashback from a sink won't make much difference
- It's even possible to wear certain respirators to shower, walk in the rain, or swim (head above water)
  - Though, this increased water volume will certainly decrease filtration efficacy vs. dry
    - This community member tested swimming laps and even direct shower spraying: https://xcancel.com/AdvancedTweaker/status/1815930182064300274
  - Fit factor decreases with extended exposure, but respirator model determines by how much
    - Surgical fluid-resistant respirator models do not degrade as quickly
      - Fit factors are unfortunately likely to reach lower than the targeted 100 threshold
        - Many are still decently protective in these more challenging situations
      - The 3M Aura 1870+ is the most affordable and available fluid-resistant respirator
  - Respirators should not be reused after significant water exposure
    - The overall reduction in efficacy between water and reuse would be too much
- It is always best to avoid getting respirators wet in order to maintain the highest protection possible
  - But if protection is needed in a shower or at a waterpark, it is actually achievable
- 3M Aura has the most successful testing, and ReadiMask is known to totally fail when wet

The electrostatic charge of an electret polypropylene filter helps it attract particles rather than just catch them
- This effect works to keep us safer from all kinds of particles found in the air we breathe:
  - Allergens - pollen, pet dander, mold spores, etc.
  - Dust & debris - insulation, drywall, woodwork, etc.
  - Infectious aerosols & pathogens - viruses, bacteria, fungi, etc.
  - Smoke & ash - wildfires, regional brush clearing, burn piles, etc.
  - Vehicle emissions - brake dust, fuel soot, tire scrapings, etc.
- This filter type cannot protect against gases - ozone, combustion gases, carbon monoxide, VOCs, etc.
  - This is why you can still smell things through a common N95 respirator
    - Some models have activated carbon to reduce nuisance odors
      - But they are not equivalent to cartridge respirators or gas masks
  - Many sources of air pollution create both particles and gases/VOCs, especially combustion

The best by/use by date is the manufacturer's guarantee of all components and matters for employer liability
- This is not a true expiration date, as most filters are good for an additional 5-10+ years after date
  - However, the straps on older respirators may get more brittle and prone to breakage
- (Tip: 3M Aura 1870+ and 9205+ bulk boxes regularly get deep discounts due to surplus or near date)

Respirator Reuse

Most respirators that fit and perform well to begin with can also be reused
- A generally acceptable reuse maximum would be 20-24 hours of wear time regardless of donnings
  - A more reasonably safe maximum would be 12-16 hours of wear time
    - (Even this limited reuse still cuts costs by about 50%, which is a big savings)
  - The ideal conservative maximum would be 6-10 hours and replacing daily
  - If there is no other option, longer wear time is still more protective than surgical or cloth masks
  - Keeping a pen/marker handy for tracking hours with tick marks on respirator is a good strategy
- How many hours of wear a given model can withstand before dropping below N95 level filtration varies
  - Initial filtration efficacy, ambient particle quantities, moisture exposure, etc. all contribute
- How many donnings and doffings a given model can withstand before it ceases to seal well varies
  - Material type/quality, head size, skin oils, how far elastics are stretched, etc. all play a role
- How many hours of wear before potentially unhealthy levels of fungal/bacterial colonies form varies
  - These can trigger/aggravate allergies, asthma, and other respiratory conditions
  - The warm, humid environment inside a respirator can promote growth over time
  - Reasonable wear times broadly avoid this issue
  - Microbial irritation risk can be lowered by cycling respirators
    - Let each respirator sit unused for at least 72 hours before reuse
      - Study shows this lowers risk more than UV treatment and similar to high heat

https://pmc.ncbi.nlm.nih.gov/articles/PMC8403130

    - One strategy: separate respirators for each day of the week and replace every 2-3 weeks

Respirator efficacy decreases with usage - both through wear time and number of donnings
- Captured particles reduce respirator filtration efficacy
- Humidity impacts effect of particle buildup on electret material
  - In HVAC filters, particle buildup can actually increase filtration, but lowers airflow
    - This is due to the generally mid to low humidity environment
  - In respirators, particle buildup depletes the electrostatic charge
    - This is because the environment is always humid due to exhaled breath
    - Respirator breathability/airflow can also be reduced by heavy buildup
      - It will fall below N95 filtration standard before that happens
      - Respirators should not be reused to this point if at all avoidable
- Moisture buildup from sweat and exhaled breath can substantially reduce breathability
- Physical degradation can also occur:
  - Elastic earloops and headbands can get stretched out
  - Metal nosepieces can fatigue and not hold shape well
  - Foam seals can get too oily or compressed to stay in place and maintain a seal
  - Filter material can fray, crease, or otherwise lose structural integrity

Manufacturer guidelines, independent research, and community testing agree that wear time matters
- They just don't have a firm consensus on a threshold for hours of usage
  - This is because different respirators, needs, and users all impact the math
- Texan_Reverend's thread discussing wear time:

https://kind.social/@Texan_Reverend/111254894101178927

  - It includes the following two studies:

https://ncbi.nlm.nih.gov/pmc/articles/PMC7738039

https://scispace.com/pdf/particle-loading-time-and-humidity-effects-on-the-efficiency-3sqd0dh1xf.pdf

Beard Band

Facial hair has a negative effect on the fit and seal of respirators
- If respirators can't press snugly against the skin, they let unfiltered air bypass them and leak inside

An exercise loop or band made of TPU can be worn to cover a beard and enable a respirator to seal properly
- It is worn from chin to crown of head, covering the beard area from tip of chin to neck
- The elastic band constrains the beard, compressing it against the skin
- Respirator filter material gets a very good seal against the smooth, slightly grippy TPU elastic
- People can achieve QNFT scores comparable to what they get when clean shaven
- This is the Singh Thattha Technique developed by Dr. Rajinder Singh, a UK transplant surgeon
  - Singh is the doctor's name and Thattha is the word for a traditional Sikh beard care wrap
  - Initial advocacy and testing was undertaken by the Sikh Doctors and Dentists Association UK
  - Exercise loop variant was originally trialed by Texan_Reverend
- Certified for hospital use in the UK, Australia, New Zealand, and expanding

Exercise loops/bands come in various resistance levels, sizes, colors, and materials
- Avoid latex, as sensitivities or allergies can develop after repeated exposure
- Do not use elastic fabric bands, as they are not airtight
- 12″ lengths are the most common and fit most people well, some 10″ and 14″ options also exist
- For most people, one of the lighter tension 3″ wide loops will contain up to about 2″ facial hair
  - Example 3" wide exercise loops (only available in a set, unfortunately):

https://amazon.com/dp/B019NU05HU
  - Note: most exercise loops on Amazon are only 2" wide and are more difficult to achieve a seal
- For longer/bushier beards, the original method of tying a wider band into a knot on the head is best
  - Example 4" wide bands:

https://amazon.com/dp/B003YR7G8K
  - Example 6" wide bands:

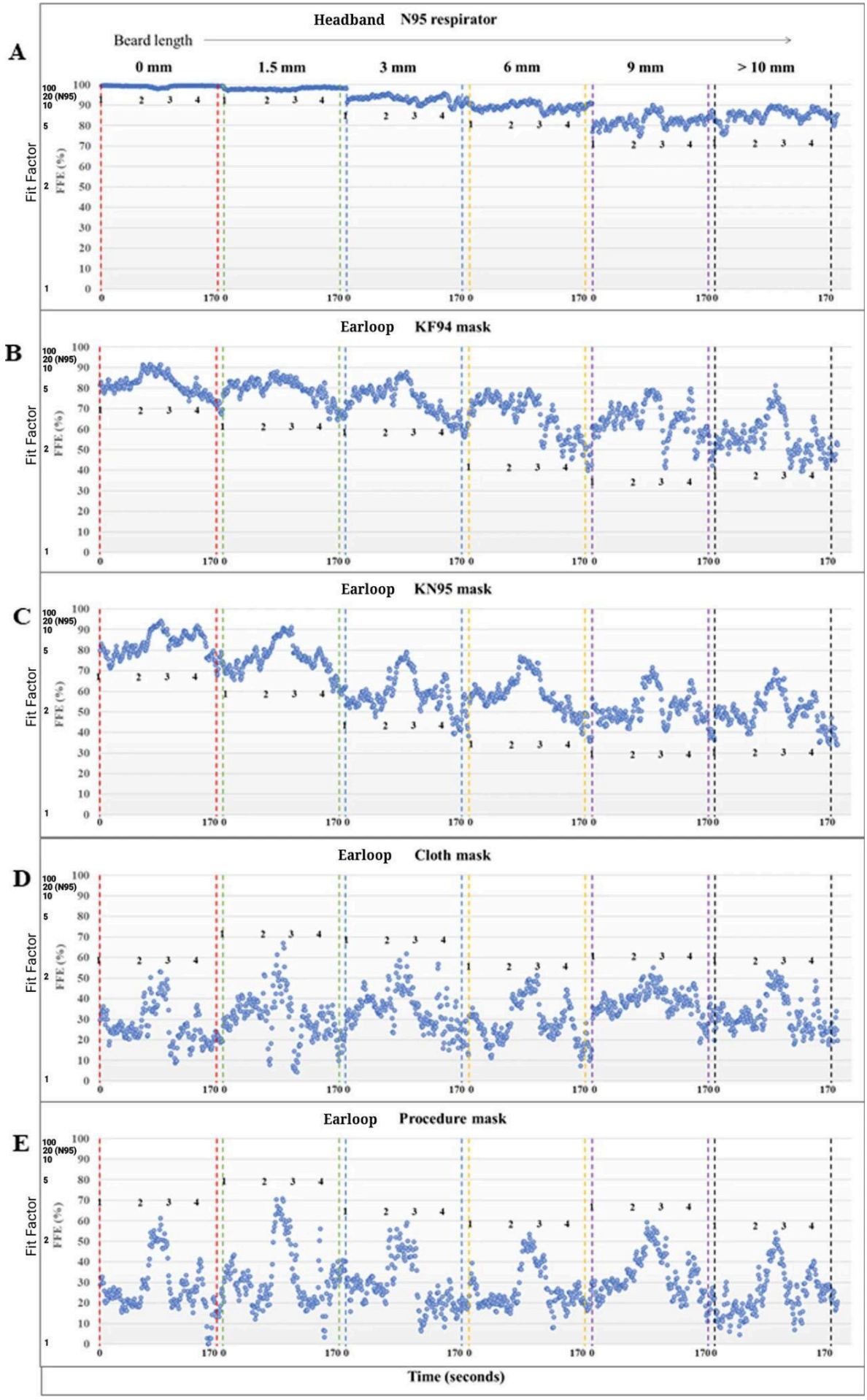
https://amazon.com/dp/B0D14X4VM1

Like all elastics, exercise loops/bands eventually stretch out with repeated use
- They should be replaced every 1-3 months depending on hours and frequency of wear
- If a band is wrinkly at the edges instead of reverting to normal shape, it should be replaced
- If a band no longer feels snug, it should be replaced

Demonstration of the exercise loop variant:
https://youtube.com/watch?v=PPN_TRqYqMc
Demonstration of the original knotted exercise band version:
https://youtube.com/watch?v=5tRvFTptgSA

On the next page is a graph that highlights the effects of progressively longer beard lengths on respirator seal
- It also gives a good representation of efficacy differences between headband and earloop models
- Fit factor scale annotations next to the filtration percentage scales were added by Texan_Reverend
- The study which the graph is pulled from:

https://nature.com/articles/s41370-021-00337-1


A
Headband N95 respirator
Beard length
0 mm
1.5 mm
3 mm
6 mm
9 mm
> 10 mm
B
Earloop KF94 mask
C
Earloop KN95 mask
D
Earloop Cloth mask
E
Earloop Procedure mask
Fit Factor
FFE (%)
100
20 (N95)
10
5
2
1
Time (seconds)

Drinking Valve

A silicone valve can be mounted in a respirator to allow a straw through and enable drinking while masked
- It is reusable across 10-15+ respirators, though the opening should be inspected for tears each time
- The first to assemble this kind of valve and popularize its use was the SIP Airtight Drinking Valve
  - These are assembled into a kit from entirely off-the-shelf parts which anyone can order

Primary Valve Parts:
- The silicone valve - Tablecraft 1SV (This is what's used in condiment bottles at places like Subway)

https://etundra.com/restaurant-dining-room/tabletop-supplies/squeeze-bottles/tablecraft-1sv-valve-for-squeeze-bottle
- The sealing ring - 1.25″x.625″x.062″ Nylon flat washer (Alternative: 28mm*16mm*1mm)

https://zieglerbolt.com/125x625x062-nylon-flat-washer-58nylon-flat-washer-58-2
https://amazon.com/dp/B07NRYX583 (Alternative - can be double stacked on thin filter material)
- (Optional) The cap - Cap for 1 / 2.5 / 3 dram vials

https://thorntonplastics.com/caps-for-vials.html

Accessories & Tools:
- The hole punch - The easiest, most precise method to cut a hole for the valve is a 14mm leather punch
  - Traditional 14mm punch used with a mallet or hammer:

https://amazon.com/dp/B0D25GXS76
  - 14mm punch with a ¼″ hex bit:

https://amazon.com/dp/B0BGFH955L
    - Used with a manual leather press:

https://amazon.com/dp/B09PD2M7L1
- (Alternative) The scissors - small, curved medical/craft scissors will feel more familiar to some
  - Less precise circle, but does not require swinging a hammer or controlling a drill
  - More precise and smoother circle than common large scissors or kitchen shears

https://amazon.com/dp/B07Y98M5KX
https://amazon.com/dp/B07HLQ7LL6 (10 pack)
- The straws - An exterior diameter of up to 6mm is ideal (if too large, the opening could tear)
  - Reusable 5mm stainless steel straws - 4 pack

https://amazon.com/dp/B07MDHQ6L8 (10″)
https://amazon.com/dp/B000AUIN18 (8.5″)
  - Biodegradable 8″ x 6mm Collins straws (Tall cocktail straws)

https://amazon.com/dp/B0CRVY8R3L (5000ct bulk)
https://amazon.com/dp/B0841QVRPP (200ct individually wrapped)

These drinking valves have been tested on a variety of respirators without compromising protection
- That does depend on proper installation, so practicing beforehand on used respirators is helpful
- The cap can keep the valve cleaner when not drinking, but it is not necessary for function

Gerard Hughes' QNFT of a 3M Aura 9205+ with a SIP drinking valve installed:
https://youtube.com/watch?v=tFp_PTJbEGY

Using the drinking valve:
- Place straw into beverage before passing it into valve, or it becomes a direct path for unfiltered air
- Avoid inhaling while a straw is inserted in the valve
- Do not slurp the last of the drink at the bottom, as that pulls in lots of unfiltered air

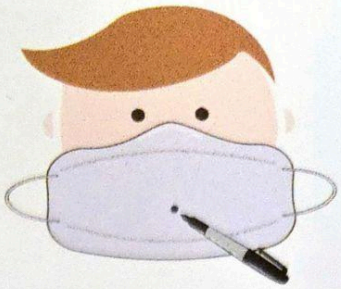
Hole Punch Installation instructions:

- Clean the hole punch of any dirt, debris, or machining oil
- Prepare a sturdy surface and cover it with some scrap wood or an HDPE leather punch pad/board
- Don the respirator, press the front of it to your pursed lips, and make a pen mark at the center
- Remove, check where that mark is, then lay the respirator face down on your wood or HDPE
- Center the punch on the mark and away from any seams, then make the hole from inside the respirator
- Hold the sealing ring aligned with the hole on the outside of the respirator
- Squeeze the front lip of the 1SV valve through the hole and sealing ring from the inside of the respirator
    - The flat, wide flange should stay on the inside, flush against the respirator with no wrinkles
    - The sealing ring should fill the gap between the lip of the valve and the face of the respirator
        - It also holds the respirator material snug against the silicone flange inside

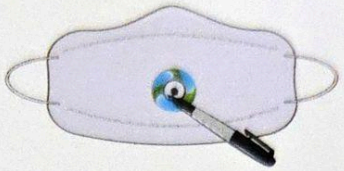
Scissors Installation instructions:

- Clean the scissors of any dirt, debris, or machining oil
- Don the respirator, press the front of it to your pursed lips, and make a pen mark at the center
- Remove, center the sealing ring around the dot, and trace the inside of the sealing ring with a pen
- Snip a hole in the center of that circle with scissors, then work your way around to cut out the circle
- Hold the sealing ring aligned with the hole on the outside of the respirator
- Squeeze the front lip of the 1SV valve through the hole and sealing ring from the inside of the respirator
    - The flat, wide flange should stay on the inside, flush against the respirator with no wrinkles
    - The sealing ring should fill the gap between the lip of the valve and the face of the respirator
        - It also holds the respirator material snug against the silicone flange inside

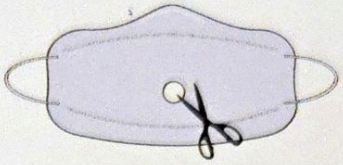
What you'll need:
a mask, pen & scissors



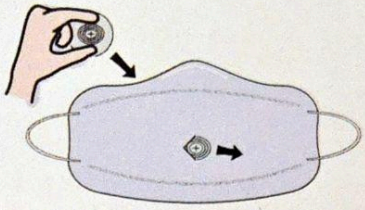
1. For a customized fit, put your mask on and mark a dot between your lips.



2. Remove your mask and place the securing ring around the marked dot, centering it. Trace the ring's inner circle.

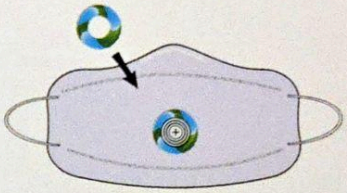


3. Cut around the outside of the circle you just traced on the mask. Do not cut a hole smaller than the circle!



4. Starting from inside the mask, pinch the valve head and squeeze it through the hole (like a button).

The valve head should end up on the outside of the mask, while the wider base should remain on the inside.



5. Slip the securing ring over the valve head, squeezing the head through the securing ring's hole.

6. Inspect the valve, making sure the valve petals are closed.

To ensure an airtight seal, replace with a new valve after 10 installs or every 30 days of use.

- Put the straw into your drink BEFORE putting it into the valve. Between sips, pull the straw out of the valve, not your drink.

- Put the straw in and out of the valve as you would normally use a straw with your mouth. Don't leave the straw just hanging in the valve unless actively sipping.

Chin Panel Staples

Many flat-fold respirators can have a pleat folded and stapled into place in the bottom edge of the chin panel

This reduces the overall opening size to make it fit more snugly

As a result, people with smaller faces/chins can utilize a broader range of respirator models

A stronger inward angle to the pleat can also improve fit on narrower chins

This type of swivel adjustable stapler can make reaching odd angles easier:
https://amazon.com/dp/B0B3MWG7JG

(It's also great for assembling zines)

Video of stapling process by @WeMaskColorado on Twitter:
https://xcancel.com/WeMaskColorado/status/1895564665511669807

Glasses Fogging

Fogging of glasses while wearing a respirator is difficult to completely eliminate

- There are a few strategies for significantly reducing fogging
  - Choose versions of respirators with exhalation vent valves
    - Most of the heat and moisture vents directly out away from glasses
    - Some good models include:
      - 3M Aura 9211+, 3M 8511, Dräger 1950 V, Moldex AirWave 4400/4700/4701
  - Apply stickers or tape to the upper portion of the respirator near the glasses
    - This is the least expensive option and it works with respirators you already have
    - While this deflects exhaled breath, it can also reduce breathability a bit
  - Use anti-fog sprays/drops/wipes on the glasses
    - Unfortunately, most of these products contain heavy levels of PFAS
      - Some PFAS-free wipes:

https://www.e-optician.com/products/anti-fog-wipes-for-glasses

(These can also reduce fogging on respirators with clear panels when applied to the inside of the panel.)

Markers

Markers are a non-destructive decorative option even when the entire respirator surface is covered

Scented markers often use phthalates in their fragrances, so they should be avoided

Washable markers are the lowest VOC option, but they smudge easily and will run when wet

Airing out overnight should be sufficient in most cases

Permanent markers will set fully, but they emit 400x as many VOCs as standard washables

Even after airing out for weeks, they can still release odors and VOCs

Water-based acrylic markers also set fully, and they are generally a very low VOC option

After 6-12 hours of airing out, they should be fully dry with no odor

Arguably the best option - permanent, low VOC, able to layer colors, function on black masks

Among the easiest to work with are Sharpie Creative acrylic markers:

https://amazon.com/dp/B0CPMFV2ZF

https://amazon.com/dp/B0DK9RK89H

Stencils are an excellent companion to markers for a wide array of designs

Marker airbrushes can enable different styles of art, and they pair very well with stencils

Crayola Air Marker Sprayer - wall plug; uses broad-line Crayola markers as ink cartridges

https://amazon.com/dp/B01CIMC8JI

Crayola Marker Airbrush - AA batteries; uses broad & thin Crayola markers

https://amazon.com/dp/B0DTB2N2D9

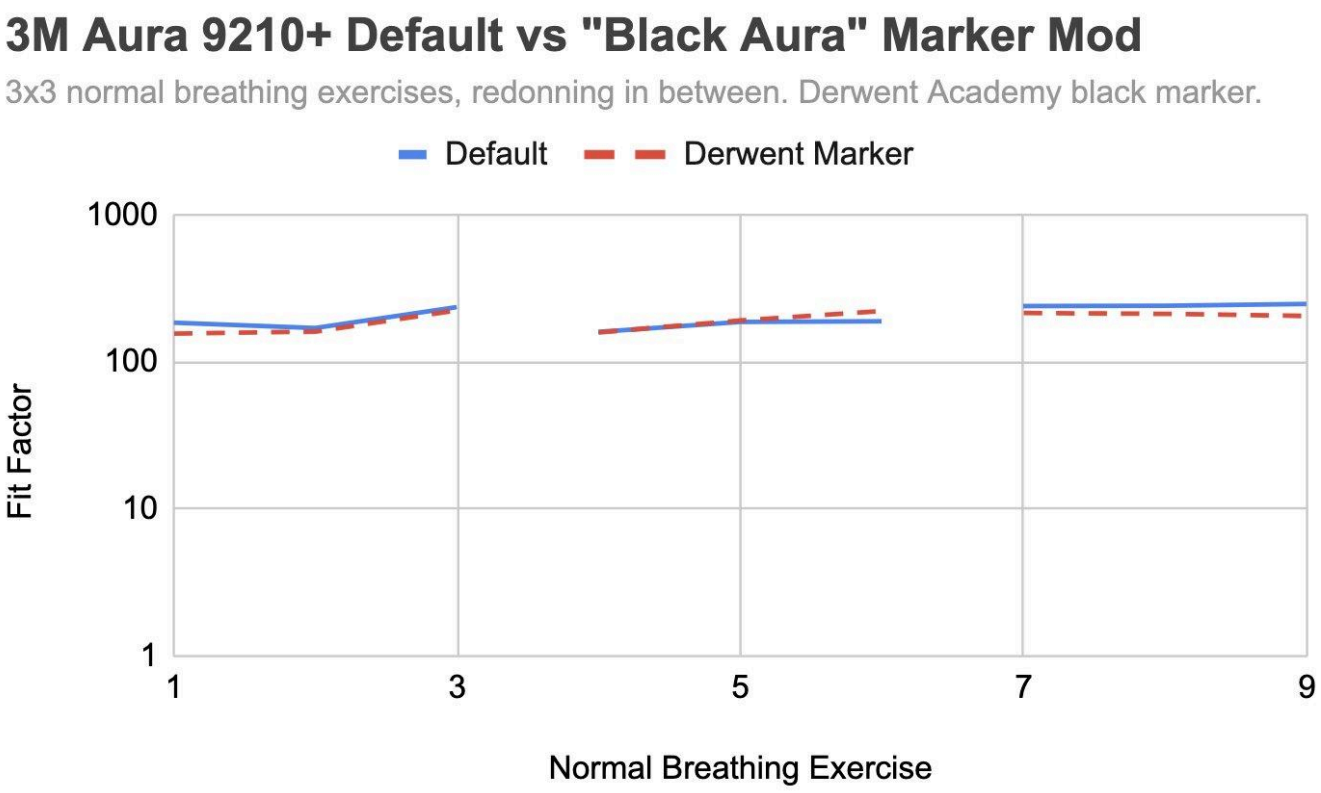
Actekart Marker Airbrush - USB-C Li-Ion; only model that accepts acrylic Sharpies; control over output

https://amazon.com/dp/B0C2TMFHKL (Best but most expensive)

Credit: @Texan_Reverend@Kind.Social on Mastodon

https://kind.social/@Texan_Reverend/114497723563863428

Below is a graph and photo of a community member's QNFT after completely covering a 3M Aura in marker:



(Derwent Academy marker never fully set and continued to rub off on hands and clothing for weeks)
Credit: @antiviral_mktng on Twitter, now @antiviral.bsky.social
https://xcancel.com/antiviral_mktng/status/1819289714182037938

Sharpie Creative acrylic markers can be used to cover respirator branding

This can improve aesthetics for important events like graduations, performances, birthdays, etc.

Apply color-matched marker in 2-3 layers with an hour or more to dry in between

Below are examples of a 3M Aura N95 without any marker and after each layer is applied

Magnets

Magnets make great reusable decorations which do not decrease the efficacy of respirators

However, too much weight can drag down a respirator and compromise the seal/efficacy

Covering lots of surface area can potentially increase breathing resistance

Not a suitable decoration for children, as the inner magnet could end up in their mouth and choke them

Not compatible with respirators which use pleated filter media - like Moldex AirWave

The preformed curves of molded cup respirators may limit which sizes/shapes of magnets will work

The frame of inner frame respirators may also limit which sizes/shapes of magnets can fit securely

Good items to use as magnetic decorations:

Magnetic lapel pin

https://amazon.com/dp/B0BXWVM4SV

https://amazon.com/dp/B0CLFG6TG6

Refrigerator magnet or chain magnet on the outside

https://amazon.com/dp/B09RWJPMDJ

https://amazon.com/dp/B0DM946SFX

Paired to a hijab magnet or magnetic badge holder on the inside

https://amazon.com/dp/B0F4429ZKX

https://amazon.com/dp/B0GQ4FG551

Magnetic name tag with printed or drawn art, names, pronouns, slogans, etc.

https://amazon.com/dp/B09TSXGCG9

Needle minder used for cross stitch

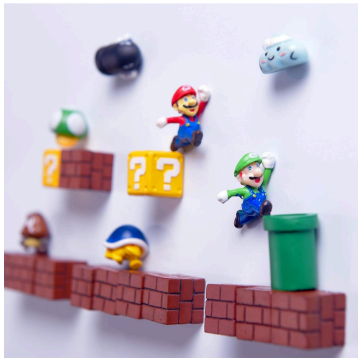
https://amazon.com/dp/B0DTK5Q2GH

https://amazon.com/dp/B09YV3Q6L2

https://amazon.com/dp/B0BH2C4JWC

Magnetic brooch/pin converter

https://amazon.com/dp/B0DSZL2PK8



DIY magnetic lapel pins can be made using magnetic badge holders:

https://amazon.com/dp/B0GQ4FG551

https://amazon.com/dp/B0G1MDXQNC

Anything that the 3M adhesive strip will stick to can be used as the decorative face of the magnet

3D prints, mini erasers, Lego minifigs, laser engravings, enamel pins with the pin removed, etc.

Charms

Lightweight charms, like those used for bracelets, can be added to a small strap and hung from mask bands

This setup is functionally identical to phone charms

Example charm straps:

https://amazon.com/dp/B0DPQ7SM2P

https://amazon.com/dp/B0DPQCC2Y4

Example charms:

https://amazon.com/dp/B0F1XJLC56

https://amazon.com/dp/B0B5MLTKSR

Many charms will require the addition of a jump ring for the strap to fit through:

https://amazon.com/dp/B07JM4Q7TM

These jumps rings arrive open, and they can be closed with common pliers

Flatten the ring back down to a circle instead of looking like part of a spring

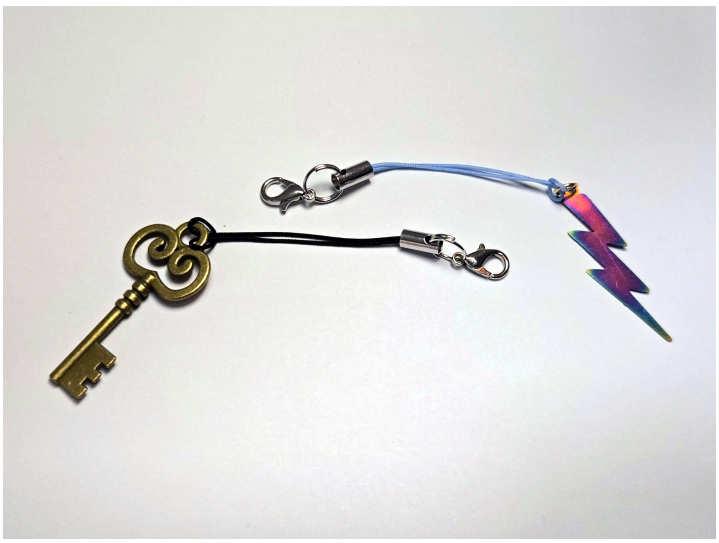
Assembly steps:

Pull the strap's cord loop through the jump ring or opening in the charm

Open the loop back up and pull the strap's clasp through it

Cinch the cord down until it is tight around the jump ring or charm opening

Use the clasp for attaching to mask bands or a mask chain



Chains

A mask chain is like a necklace for your respirator, whether across the front of it or hanging below it
Many different chain styles and types of materials can be used
Charms are often added just like a bracelet or necklace
The design created to share here is meant to be adjustable for fitting various faces and respirator models
    Being simple and adjustable should make it more viable for distribution at events or by mask blocs
    This design can be assembled with only two tools - a wire cutter and pliers
The example chain used in the photos below:
https://amazon.com/dp/B07N4P6YKW
    (Should make about 65 mask chains)
14x8mm lobster clasps attach the lengths of chain to eachother and clip the chain to the mask bands:
https://amazon.com/dp/B087B9KZKL
    (Should make about 25 mask chains)
These pre-opened jump rings only have to be pinched closed after the clasps are on them:
https://amazon.com/dp/B07JM4Q7TM
    (Should make about 250 mask chains)

Steps for assembling the adjustable mask chain:
    Create a double clasp by placing two clasps onto a jump ring and closing it with pliers
        Each chain needs 4 of these double clasps
    Cut a 10 inch length of chain
    Cut a 5 inch length of chain
    Attach a clasp to each end of the 5 inch chain
    Attach a clasp on each side of the 10 inch chain approximately 1 inch in from the ends
    Attach the clasps of the 5 inch chain to the 10 inch chain about ½ an inch farther in from its clasps

Steps to size an adjustable mask chain:

Don the respirator intended to be decorated with the mask chain while looking in a mirror
Stretch the 10 inch chain across the front of the mask until it reaches the mask bands on each side
Relocate the clasps at each end of the 10 inch chain so that they will reach the mask bands
Attach the mask chain to the mask bands using the clasps at the ends of the 10 inch chain
Reposition the ends of the 5 inch chain along the 10 inch chain until it drapes as desired

Metal charms can be added directly to the clasps on the 5 inch chain
Satin cord can be woven through the links of the chain to add color

A collection of 10 inch and 5 inch chains could be assembled with different colors to mix and match

Other Decorations

Some respirators have features or physical characteristics which enable unique decoration opportunities

- Models with a single loop headband like Dräger 1950, Easimask FSM18, and any Moldex AirWave:
  - Headband clips allow string, paper clips, or ornament hooks to suspend lightweight charms
- 3M VFlex models:
  - Wings on the sides don't do any filtering and can be pierced to attach enamel pins or similar
    - Staples can also be used to attach things to the wings - printed paper, ribbons, etc.
- 3M Aura models:
  - Staples can be used to attach things at the side edges near strap staples - paper, ribbons, etc.
  - Common enough respirator to have reusable fabric covers available on Etsy

https://etsy.com/shop/LoveTheLookStudio?section_id=37009349

- Any three-paneled respirator (3M Aura, Dräger 1950, Trident RTCFFP3, Makrite 4803, etc.)
  - DIY panel cover
    - Lay respirator face down on breathable fabric, like thin cotton, and trace panel outline
    - Cut out fabric panel and place over respirator panel to ensure correct shape and size
    - Gently apply Elmer's Washable Purple Glue Stick to perimeter of respirator panel
    - Place fabric panel into position and press around glued perimeter to adhere
    - Allow 5 minutes minimum to dry, but 2+ hours gives a conservative offgassing period
    - To remove: moisten glued perimeter of fabric with warm, wet paper towel or rag
    - Once saturated, fabric panel should peel off easily
    - Wash fabric panel as normal for fabric type - washing machine or sink
    - Fabric panel can be applied to new respirators as desired
    - A wide collection can be made from fabric scraps
    - Make your own designs on cotton fabric panels using bleach after cutting them to shape
      - Can use stencils, shaped sponges, rubber stamps, etc.

https://clorox.com/learn/how-to-do-bleach-art-on-clothes

Lightweight mask chains which attach to headbands or headband clips are good if they don't tug at fit/seal
Lightweight ribbons, charms, and friendship bracelets can similarly be tied to headbands or headband clips

Stickers can work well, as long as they don't cover too much surface area, making it harder to breathe
Rub-on transfers for scrapbooking also work and have the same caveat of not covering too much

Rubber stamps with ink pads can add intricate designs easily or even spell things out

- Some inks are meant for plastic and won't smudge once dry - Tsukineko StazOn, Tsukineko Brilliance
- Much like markers, it's best to allow inks to set and offgas for a few hours to avoid smudging and VOCs
- DIY stamps can be made by carving common rubber erasers

Special Situation Respirators

There are many masking scenarios that land outside the standard of an adult at work, out shopping, etc.
- Specific respirator models and/or strategies can be used to meet those needs

Respirators which perform well and are sized appropriately to fit kids are quite few and far between
- For a model very similar to a 3M Aura but with available sizes fitting preschoolers to linebackers:
  - Trident RTCFFP2 and RTCFFP3 - P2/P3
- For bigger kids, teens, and small adult faces:
  - 3M VFlex 9105s and 1804s - N95
- For high fit customizability, the smallest possible sizes, and a semi-rigid inner frame to maintain shape:
  - ZiMi ZM95S w/ headbands - KN95
  - ZiMi XS frame + ZiMi ZM7711F filter w/ headbands - KN95
    - Inspect the fit carefully and during movement/play to see if modifications are needed
- If nothing else fits, adhesive masks still should, but they can potentially be hard on skin to wear daily:
  - ReadiMask - N95

MRI exams require metal-free respirators, as do most CT/X-Ray exams of the head
- Some metal-free models which are MRI/CT-safe:
  - ReadiMask (acrylic adhesive version - the silicone adhesive generally does not seal as well)
    - The best application method is side-seal rather than under the chin
  - Easimask FSM18
  - All Moldex AirWave models
  - All ZiMi inner frame models
  - Staple-free flat-fold respirator with nosepiece removed & double-sided mask tape in its place
    - Dräger 1950 fits this use-case, as the only metal it has is the nosepiece
    - Double check entire respirator for any other metal before selecting it for this purpose
    - Double-Sided Mask Tape Strips

https://amazon.com/dp/B093S1H68B
    - Double-Sided Mask Tape Roll

https://amazon.com/dp/B08CJWDDS8

Always take at least one spare copy of your chosen respirator to the appointment
- This allows you to show it to the technician for inspection/verification that it is metal-free
  - Technicians are more likely to push back against flat-folds with nosepiece removed than others

Hair appointments
- ReadiMask
  - The best application method is side-seal rather than under the chin
- Disposable respirator/FFR with both straps at neck level + double-sided mask tape at least under chin

Dentist appointments and doctor appointments where mouth access is needed
- Nose-only ReadiMask (with larger respirator over it for waiting room and until procedure time)
  - Similar to side-seal but bottom edge goes across the upper lip rather than under the chin
  - Practice donning ahead of time along with nose-only breathing while mouth is open
  - Credit: @findmeabluebird donning video on Twitter:

https://xcancel.com/findmeabluebird/status/1517896018188197891
  - Gerard Hughes' QNFT of nose-only ReadiMask:

https://www.youtube.com/watch?v=gPsQKrpKOYY
https://www.youtube.com/watch?v=VUJGYM894Bw

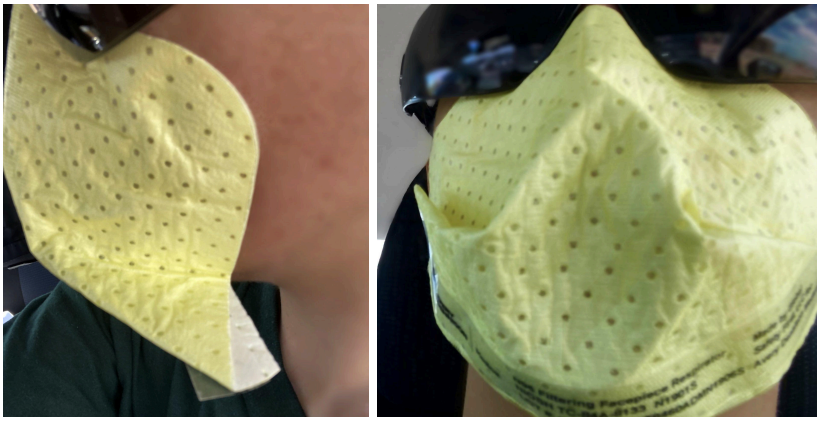
ReadiMask Donning

Being too small to effectively seal is a bigger issue in ReadiMask sizing than being too big, so sizing up is ok
- Too large just means some extra material outside the edges of the face seal with no loss of function
  - Extra material may also increase available filter surface area, decreasing breathing resistance

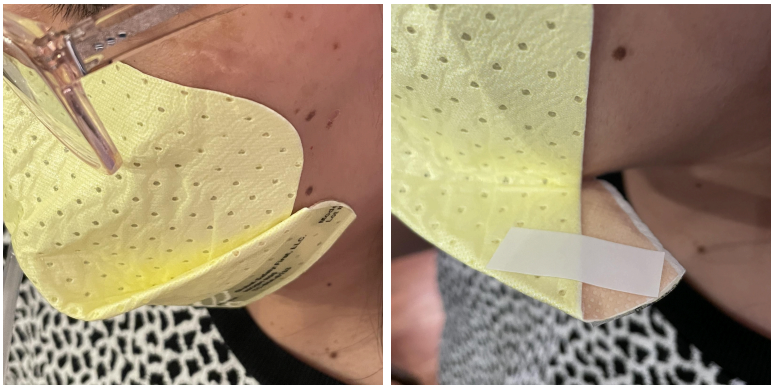
The manufacturer's default method of donning entails pinching the seal closed into a flap under the chin
- Over time, this can often end up developing a small leak under the chin where the two sides meet
- The flap under the chin can also get bumped or snagged more easily, creating a leak

The community-designed side-seal method pinches at the jawline on both sides & folds the flaps up at cheeks
- Folding the flaps up to stick to the face, covering where they meet at the jawline, strengthens the seal
- This method develops fewer leaks and yields consistently higher fit test scores
- Where the flaps fold over against the cheek, mask tape can be used to reinforce/secure the seal

To use the side-seal method, the donning steps are:
- Remove label strip beforehand - it makes the area under it stiff and difficult to fold/shape
- Wash face with soap and water or clean all sealing edge areas with alcohol - nose, cheeks, under chin
- Place center of upper edge near top of nose bridge, then press down on either side to stick to nose
- Smoothly press outward along both cheekbones to seal upper edge, then down cheeks to jawline
- Fold lower edge towards underside of chin, then seal lower edge starting at center & working outward
- Pinch lower edge seal on each side against side edge seals coming down the cheeks, creating flaps
- Fold flaps upward and backward, roughly toward the ears, then stick them to the cheeks
- The flaps will adhere to some amount of the side edges and the cheeks, covering the jawline pinches
- Double-sided mask tape can be added to the flaps to help them better adhere to the cheeks if needed



Credit: @ParentMishmash on Twitter
https://xcancel.com/ParentMishmash/status/1788988704364642505



Credit: u/piggyphish on Reddit
https://reddit.com/r/Masks4All/comments/1elso5j/comment/lguusqy

Harassment Mitigation

These are ideas used by community members for reducing harassment due to masking
- Hopefully you're never in a position to need them

Around strangers, like at the grocery store:
- Hold a phone to your ear the whole time and either be on a call or pretend to be
  - Social conditioning makes people generally not want to interrupt
- Wear a business/office looking lanyard with faux access/ID badge, keys, etc.
  - People avoid bothering those who appear to be working or to have authority
- Decorated and/or colorful respirators defuse many people who might otherwise comment
  - When it looks more like a fashion choice/accessory, people process it differently
    - Anti-maskers often "see white" on an N95 like bulls "see red" and just react
      - Short-circuiting that subconscious reaction can help reduce incidents
  - Some decoration themes may of course bring their own harassment risks
- Wear scrubs
  - Remarkably fewer people have an issue with medical staff wearing respirators
- Wear a magnetic name tag on your respirator with the words "Chemo Sucks" written on it
  - Or write "Chemo Sucks" directly on the respirator
  - If anyone gives you guff, say "Chemo sucks. I hope no one you love ever has to go through it."
    - No further explanation, discussion, or justification needed
  - There's powerful social pressure against being mean to people perceived as having cancer

Around coworkers, either when they bring it up or preemptively in general conversation:
- Mention spending time with a vulnerable family member and needing to protect them
  - People are more amenable when it's "noble" and worn to protect someone else
- Doctor says I'm at risk due to:
  - Compromised immune system from childhood illness
  - Past heart issues
  - Past lung/respiratory issues
  - [Insert plausible past or chronic malady here]
  - [Insert actual past or chronic malady here]
  - Or just "My doctor says I'm in a higher risk category, so masking is advised."

Around family/friends:
- Countless people wish they knew how best to handle this
- Try to establish clear boundaries
- Sorry if you lose friend or family connections like so many of us unfortunately have

Misc Comments & Recommendations

Respirator fit and which model is best for a given person are heavily influenced by their face size and shape
- People with low/shallow/less pronounced nose bridges sometimes struggle with flat-fold respirators
  - This most frequently affects Black and Asian people, but it can occur in anyone
    - Cup & inner frame respirators w/ a full gasket or adhesive respirators may do better
      - Options with good performance (when they're a good fit on the face) include:
        - Moldex AirWave 4150/4151, 4300, 4620/4621, 4800/4801
        - Easimask FSM18
        - All ZiMi models w/ headbands & no valve
        - ReadiMask

Involving people (especially kids) in the decoration of their own respirator greatly enhances buy-in
- They're more likely to wear it and to keep it in good condition when they've contributed to making it

For kids, having a weekly respirator crafting session can help them engage with their own protection
- This helps them to be excited each day to pick out which of the ones they decorated they want to wear
- Consistent rituals like this help normalize and solidify the habit
  - It helps further if a parent decorates their own with the kid & picks one out with them each day
    - Potentially, even let kid decorate parent's respirator
    - The parent's decorated respirator could be swapped to a plain one at work if needed
      - Decorated masks can remain for personal use like errands, outings, events, etc.

Consider keeping an emergency/hospital respirator kit in your home, vehicle, and maybe workplace
- This should include:
  - At least one copy of an MRI/CT-safe model
  - Multiple copies of the respirator you're most comfortable wearing for extended periods
    - This could include sleeping, so test it while lying down to make sure it stays sealed
  - Several surgical-rated N95s to offer healthcare workers when asking them to mask
    - Compliance is higher when the hassle of going to find an N95 is removed
    - The 3M Aura 1870+ is the least expensive and is familiar to most healthcare workers
      - They come individually sealed which keeps them hygienic in storage & hospital
    - Some workers may prefer to use facility-provided N95s and that's fine
      - But do try to insist on them wearing an N95, not just surgical/procedure masks
  - Double-sided mask tape in case of sealing issues, maybe secure respirator while sleeping, etc.
  - Paper/cardboard sign asking staff to wear N95s when in your room or taking you to procedures
    - Ideally, this should be colorful/decorated to attract attention and feel non-threatening
  - Clear ziploc bag for holding healthcare worker respirators to dispense
  - Blue painter's tape to mount the sign and the open ziploc of respirators to wall just inside door
    - If they'll let you mount it on outside of door, that is best, but many facilities won't
- If you have an air cleaner, plan on bringing it with you if possible

Bring several copies of a surgical-rated N95 to dental/medical appointments for providing to staff during visit

Unique feature of single-loop headband models like Dräger 1950, Easimask FSM18, any Moldex AirWave, etc.
- Easily drop upper strap and filter for airport security, DMV photo, etc. then re-don all in a single breath
  - The neck strap stays in place with enough slack to let the filter hang fully out of the way

U.S. Respirator Sourcing

The following is a list of respirators and links to their lowest cost, legit, purchasing options (as of Dec. 2025)

Due to the ever-changing nature of retail, these links may not be cheapest or valid at time of reading

For Amazon/Walmart links, choose sellers that ship from Amazon/Walmart (Woot is owned by Amazon)

This improves the security and ease of any returns/refunds if issues arise

Flat-Fold Respirators

3M Aura 1870+ N95 - Can be modded to earloop - Same or lower bulk cost as earloop KN95 models - Trades off with 9205+ for lowest cost high-quality respirator at $0.12-0.20/ea - Surgical fluid-resistant
https://amazon.com/dp/B0937JGMY7 (440 count bulk box)
https://amazon.com/dp/B09HY48BK6 (20 count pack - $0.30-0.50/ea)

3M Aura 9205+ N95 - Can be modded to earloop - Same or lower bulk cost as earloop KN95 models - Trades off with 1870+ for lowest cost high-quality respirator at $0.07-0.20/ea
https://amazon.com/dp/B08J1THV9G (440 count bulk box)

3M Aura 9210+ N95 - Elastic fabric headband is more comfortable/durable for some use cases
https://amazon.com/dp/B0BCL5XZKQ

3M Aura 9211+ w/ valve N95 - Elastic fabric headband is more comfortable/durable for some use cases - Vent valve reduces heat & moisture buildup and reduces glasses fogging
https://amazon.com/dp/B0CG2G99MJ

Dräger 1950 N95 - Stable seal with less need to retighten - Structure reduces chin gaps & slipping
https://amazon.com/dp/B09WB65XWK (Size S)
https://amazon.com/dp/B0F335PJCL (Size M/L)

Dräger 1950 V N95 - Stable seal with less need to retighten - Structure reduces chin gaps & slipping - Vent valve reduces heat & moisture buildup and reduces glasses fogging
https://amazon.com/dp/B09WBDV77V

Makrite FIT+ 4803 N95 - Surgical fluid-resistant - Blue
https://walmart.com/ip/10517201342

Trident RTCFFP2 P2 - Surgical fluid-resistant
https://hlpmedical.net/products/trident%C2%AE-surgical-p2-respirator-level-3-hospital-grade-face-masks-individually-packaged-box-20 (Global shipping)

Trident RTCFFP3 FFP3 (aka Project 3) - Surgical fluid-resistant - White or Black
https://usafacemaskstore.com/product/trident-ffp3-disposable-face-mask
https://usafacemaskstore.com/product/project-3-by-trident-ffp3-black-face-mask-respirator-with-head-band-straps (Lowest cost Trident model after shipping)

3M VFlex 9105 N95 - Very low breathing resistance - Under $1/ea
https://amazon.com/dp/B005KLZAYU
https://walmart.com/ip/41437940
https://zoro.com (Search: G0862784)

3M VFlex 9105s N95 - Very low breathing resistance - Under $1/ea
https://amazon.com/dp/B06WD6B3QX
https://walmart.com/ip/41068326
https://zoro.com (Search: G2183693)

3M VFlex 1804 N95 - Very low breathing resistance - Surgical fluid-resistant - Under $1/ea
https://zoro.com (Search: G4376393)

3M VFlex 1804s N95 - Very low breathing resistance - Surgical fluid-resistant - Under $1/ea
https://zoro.com (Search: G3793004)

Molded Cup Respirators

Easimask FSM18 FFP3 - MRI/CT safe
https://usafacemaskstore.com/product/easimask-fsm18-ffp3-unvalved-cup-shape-face-mask-mri-safe-box-of-10

3M 8511 w/ valve N95 - Vent valve reduces heat & moisture buildup and reduces glasses fogging
https://amazon.com/dp/B0002YKBV2

Moldex AirWave 4150 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - Blue - M/L - Surgical fluid-resistant
https://zoro.com (Search: G407963608)

Moldex AirWave 4151 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - Blue - S - Surgical fluid-resistant
https://zoro.com (Search: G607963514)

Moldex AirWave 4300 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - M/L
https://rshughes.com/p/Moldex-AirWave-Particulate-Respirator-4300P95-Size-Medium-Large-MOLDEX-4300P95/moldex_4300p95

Moldex AirWave 4400 w/ full flange & valve P100 - MRI/CT safe - Very low breathing resistance - M/L -Vent valve reduces heat & moisture buildup and reduces glasses fogging - Blue
https://www.magidglove.com/airwave-p100-disposable-respir-4400p100

Moldex AirWave M 4620 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - Black - M/L
https://rshughes.com/products/moldex_m4620v.html
https://amazon.com/dp/B0CCSVYHHV
https://magidglove.com/unvalved-n95-particulate-non-m4620

Moldex AirWave M 4621 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - Black - S
https://rshughes.com/products/moldex_m4621v.html

Moldex AirWave 4700 w/ full flange & valve N100 - MRI/CT safe - Very low breathing resistance - M/L -Vent valve reduces heat & moisture buildup and reduces glasses fogging
https://zoro.com (Search: G9505307)
https://amazon.com/dp/B0CCSWJR6J

Moldex AirWave 4701 w/ full flange & valve N100 - MRI/CT safe - Very low breathing resistance - S -Vent valve reduces heat & moisture buildup and reduces glasses fogging
https://amazon.com/dp/B0CCSVQGWY

Moldex AirWave 4800 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - Grey - M/L
https://magidglove.com/moldex-airwave-4800-n95-plus-nuisance-ov-disposable-respirator-with-smartstrap-8-dp-m4800n95

Moldex AirWave 4801 w/ full flange N95 - MRI/CT safe - Very low breathing resistance - Grey - S
https://zoro.com (Search: G707963759)

Adhesive Respirators

ReadiMask w/ acrylic adhesive N95 - MRI/CT safe - Yellow
https://alliantbiotech.com/product/readimask-strapless-n95-niosh-approved

Inner Frame Respirators

These often require modifications like trimming the gasket, trimming the frame, or adding foam to the frame

These extra steps make them better suited for enthusiasts, but the upside is a highly custom fit

Once the frame has been successfully customized, it can be reused with replacement filters

KN100

ZiMi ZM100 w/ headbands KN100 - Wide gasket - MRI/CT safe - L
https://zimiair.com/product/zm100-particulate-protective-mask-adult-l-size-kn100

ZiMi ZM100F filters w/ headbands N100 - MRI/CT safe - White or Black - L
https://zimiair.com/product/zm100f-filter-adult-l-size-kn100

ZiMi ZM9233 w/ headbands KN100 - Wide gasket - MRI/CT safe - M
https://zimiair.com/product/zm9233-particulate-protective-mask-adult-m-size-kn100

ZiMi ZM9233F filters w/ headbands KN100 - MRI/CT safe - White or Black - M
https://zimiair.com/product/zm9233f-filter-adult-m-size-kn100

KN95

ZiMi B95-XL w/ headbands KN95 - MRI/CT safe - White or Black - XL
https://zimiair.com/product/b95-xl-particulate-protective-mask-adult-xl-size-kn95-mask-with-frame

ZiMi B95F-XL filters w/ headbands KN95 - MRI/CT safe - White or Black - XL
https://zimiair.com/product/b95f-xl-filter-adult-xl-size-kn95

ZiMi ZM8210 w/ headbands KN95 - MRI/CT safe - White or Black - L
https://zimiair.com/product/zm8210-particulate-protective-mask-adult-l-size-kn95

ZiMi ZM8210F filters w/ headbands KN95 - MRI/CT safe - White or Black - L
https://zimiair.com/product/zm8210f-filter-adult-l-size-kn95

ZiMi ZM9541 w/ headbands KN95 - MRI/CT safe - M
https://zimiair.com/product/zm9541-particulate-protective-mask-adult-m-size-kn95

ZiMi ZM9541F filters w/ headbands KN95 - MRI/CT safe - White or Black - M
https://zimiair.com/product/zm9541f-filter-adult-m-size-kn95

ZiMi ZM7711 w/ headbands KN95 - MRI/CT safe - S
https://zimiair.com/product/zm7711-particulate-protective-mask-adult-s-size-kn95

ZiMi ZM7711F filters w/ headbands KN95 - MRI/CT safe - White or Black - S
https://zimiair.com/product/zm7711f-filter-adult-s-size-kn95

ZiMi XS frame - MRI/CT safe - XS
https://zimiair.com/product/zimi-xs-size-frame-1pc

Uses ZiMi ZM7711F filters w/ headbands KN95 - MRI/CT safe - White or Black - S
https://zimiair.com/product/zm7711f-filter-adult-s-size-kn95

ZiMi ZM95S w/ headbands KN95 - MRI/CT safe - XXS
https://zimiair.com/product/zm95s-white-particulate-protective-mask-children-xss-size

ZiMi ZM95SF filters w/ headbands KN95 - MRI/CT safe - White or Black - XXS
https://zimiair.com/product/zm95sf-filter-children-xss-size

ZiMi Accessories & Notes

ZiMi flat foam for inner frame
https://zimiair.com/product/spong-strips
ZiMi wave foam for inner frame
https://zimiair.com/product/wavy-type-sponge-stripe
Nose bridge cutting guide sticker
https://zimiair.com/product/cut-sticker

Every ZiMi respirator model number has a corresponding filter model that matches it but with an F added
All ZiMi models offer versions of their filters with exhalation vent valves
ZiMi KN100 filters have wider strips of gasket fabric which can be more forgiving of face shape and movement

Double-Sided Mask Tapes

Uplift Double Sided Mask Tape Strips
https://amazon.com/dp/B093S1H68B
Pro Tapes 1502 Double Coated Mask Tape Roll
https://amazon.com/dp/B08CJWDDS8

Size-Sorted Respirator List

The following respirator list is organized very roughly from smallest to largest with lots of overlap

These are all quality protective respirators, so how well they work is primarily down to how well they fit

Remember: respirator fit is 3D, so differently shaped models of similar size may fit better or worse

XXXS-XS	ZiMi ZM95S
XXXS-S	ReadiMask S
XXS-S	ZiMi XS frame + ZiMi ZM7711F filters
XXS-S	Trident RTCFFP2 XS
XXS-S	Trident RTCFFP3 XS
XS-S	ZiMi ZM7711
XS-S	ZiMi ZM9233
S-M	Trident RTCFFP2 S
S-M	Trident RTCFFP3 S
S-M	3M VFlex 1804s
S-M	3M VFlex 9105s
S-M	ZiMi ZM9541
S-L	Moldex 4151
S-L	Moldex 4621
S-L	Moldex 4701
S-L	Moldex 4801
S-L	Easimask FSM18
S-L	Trident RTCFFP2 Reg
S-L	Trident RTCFFP3 Reg
S-L	Dräger 1950 S / 1950 V S
S-L	Makrite FIT+ 4803
S-L	ReadiMask L
S-L	ZiMi ZM100
S-L	ZiMi ZM8210
M-XL	3M Aura 9210+ / 9211+
M-XL	3M Aura 9205+
M-XL	3M Aura 1870+
M-XL	Moldex 4150
M-XL	Moldex 4300
M-XL	Moldex 4400
M-XL	Moldex 4620
M-XL	Moldex 4700
M-XL	Moldex 4800
M-XL	Dräger 1950 M/L / 1950 V M/L
M-XL	ZiMi B95-XL
M-XXL	3M 8511
M-XXL	3M VFlex 1804
M-XXL	3M VFlex 9105
M-XXL	ReadiMask XL
L-XXL	Trident RTCFFP2 Reg XL
L-XXL	Trident RTCFFP3 Reg XL
XL-XXXL	Trident RTCFFP2 XXL
XL-XXXL	Trident RTCFFP3 XXL

Air Cleaner Info

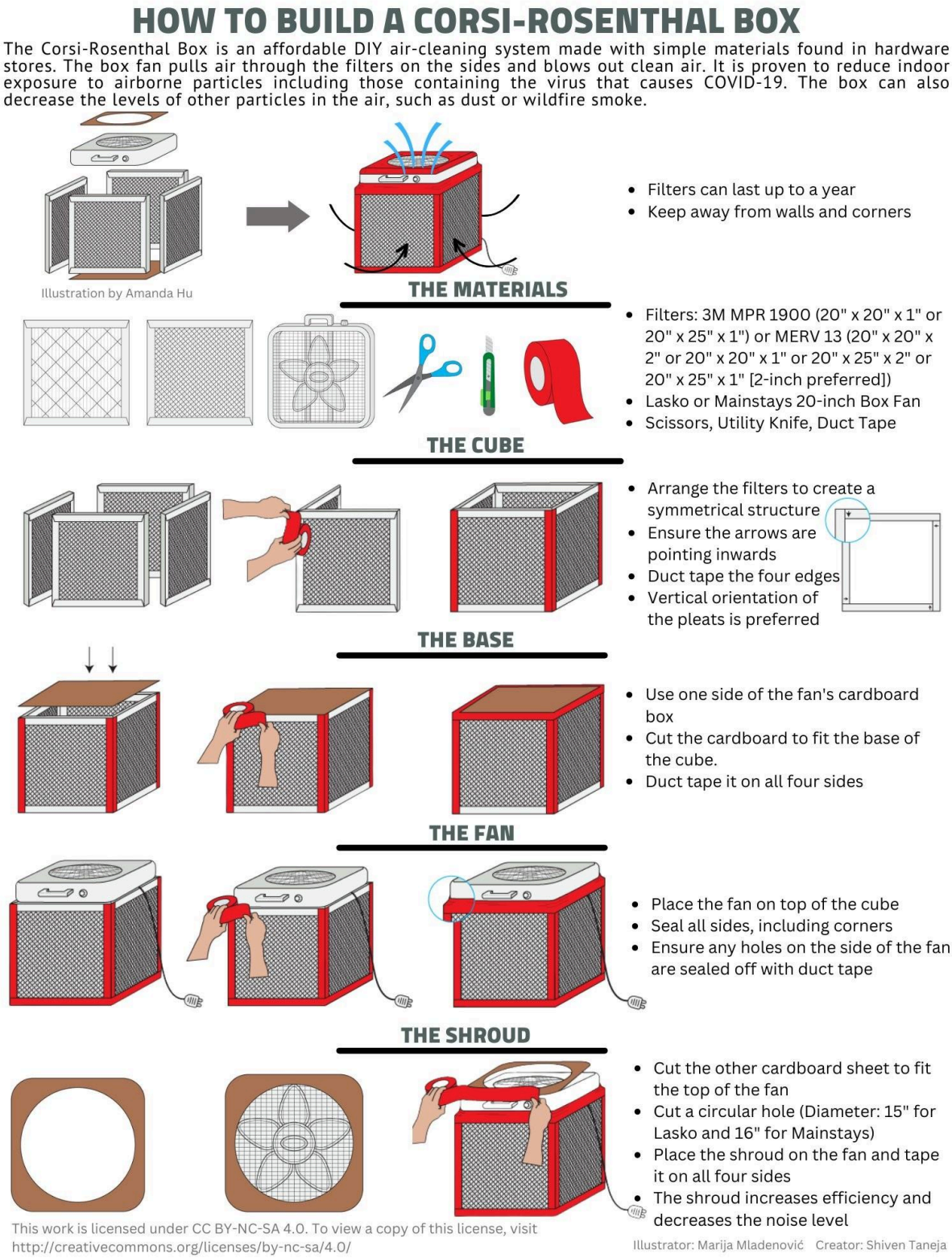
Corsi-Rosenthal Box

DIY air cleaner based on HVAC filters which meets or beats the performance of most off-the-shelf HEPA units

Costco routinely has the best price on Filtrete 1900/2200/2500 filters, and all sizes are the same price

Texan_Reverend's thread about them, including parts sourcing:

https://kind.social/@Texan_Reverend/112432142624648275



HEPA Air Purifiers

HEPA air purifiers are the most readily available off-the-shelf air cleaning tools
- Being off-the-shelf products can increase public/social acceptance over DIY
  - This is especially true in medical settings
    - Having shells that can be cleaned/disinfected can also be key in such settings

HEPA filters have a higher single-pass filtration rate than non-HEPA HVAC filters
- This can be important in certain industrial or medical settings
- In residences and most workplaces, this matters less than overall air cleaning performance

For most individuals and businesses, there are a few common points of comparison:
- Clean Air Delivery Rate (CADR)
- Sound level in operation at different fan speeds
- Cost - both for the unit and the replacement filters

Avoid models advertising ion, plasma, or UV features - or at least don't use those functions
- These features can generate ozone and/or negatively interact with common VOCs and gases
  - This alters the chemical makeup of your air and can create unwanted knock-on effects
- These do not provide meaningful additional protection from infectious aerosols

Most activated charcoal/carbon filters do little to mitigate VOCs
- They are also generally depleted long before the HEPA filter
- The limited units with good VOC performance all use activated carbon granules
  - The best of these will advertise how many pounds of carbon are in their filters
  - Activated carbon impregnated filters are largely marketing with brief or little efficacy

Models with flat filters tend to have easier and less expensive filter replacements

Levoit, Winix, and Coway are well-known brands with more affordable units & filters that are very effective

Air Dilution

Whenever possible, moving fresh outside air through a space is more effective than just cleaning the air in it
- This is best achieved by exhausting from one side of a space with doors/windows open on the opposite
- This also helps mitigate the build-up of CO2, VOCs, and stale smells
- Weather and pollutant concerns don't always allow for that, so air cleaning is still a great tool

For whole building solutions, ERV (Energy Recovery Ventilator) systems provide a range of benefits
- ERVs filter incoming air and balance its temperature and humidity with the outgoing air they exhaust
  - This means the air they bring in feels more like the indoor air than the outdoor air
- The fresh air cycling done by ERVs also keeps CO2 levels lower and reduces stale smells
- Systems generally use smaller, dedicated ducts but can also use existing HVAC ducts
- Unfortunately, these are substantial pieces of HVAC equipment, and are not inexpensive
  - They also aren't reasonable options for most renters

For ventilating with windows, the more that are open, the better
- If using portable fans to help move air through a space:
  - Place them all on the same side of the building to create a draft from one side to the other
  - Place them blowing out of the windows to exhaust indoor air, pulling in from other windows
  - Place them 2-3 feet straight back from the window openings
    - This yields the highest total airflow

Testing and demonstration of fan orientation and distance from openings:
https://www.youtube.com/watch?v=1L2ef1CP-yw

Sanitizer

Hypochlorous acid (aka HOCl) can be used as both a hand sanitizer and as a surface disinfectant
HOCl is on the WHO's Essential Medicines List and is approved by the FDA for direct food contact
Unlike alcohol-based hand sanitizer, HOCl can destroy norovirus
HOCl aids wound healing when applied to cuts and scrapes after washing but before bandaging
Note: HOCl is not as shelf-stable as other cleaners, so commercial products should be used within 6 months
    It breaks down faster if left exposed to air, sunlight, or temperatures above ~75°F

Example product from a reputable brand with both large spray bottles and smaller TSA-safe spritzer bottles:
https://amazon.com/dp/B011AJRJZI
HOCl generators can also be purchased for home use and are about the size of a tea kettle
    Making it at home requires careful ingredient selection and test strips to verify concentration
    Home-produced HOCl degrades to saline in about 7-10 days

Review of HOCl efficacy in various scenarios, including as a hand sanitizer and against Covid:
https://pmc.ncbi.nlm.nih.gov/articles/PMC7315945/
Info on use of HOCl for skincare such as hand sanitizer, eczema treatment, and wound cleaning:
https://prequelskin.com/blogs/skin-notes-skincare-blog/hypochlorous-acid-in-skincare
Discussion of ongoing research into use of HOCl as a respiratory antiseptic against, Covid, flu, RSV, etc.:
https://pmc.ncbi.nlm.nih.gov/articles/PMC12474219/
Scientific American article about HOCl more broadly and as related to Covid:
https://scientificamerican.com/article/hypochlorous-acid-is-trending-in-skin-care-and-cleaning-but-does-it-work

Covid Info

Excellent printable and shareable zine of current (January 2026) Covid knowledge:
https://newlevant.com/covidzine
Every additional Covid infection increases the chance of developing chronic symptoms or Long Covid
Long Covid has surpassed asthma to become the most common chronic illness among children
3000+ studies linking Covid to chronic conditions and long-term effects:
https://docs.google.com/spreadsheets/d/12VbMkvqUF9eSggJsdsFEjKs5x0ABxQJi5tvfzJIDd3U
Collected by @AugieRay https://mastodon.social/@augieray

Particle Exhalation

The number of particles/aerosols a person exhales increases based on:
Level of exhalation force - singing and yelling generate much more than calm breathing or talking
Level of bodily exertion - the metabolism speeds up and breathing gets faster and harder
Many people will expel over 100x as many particles during vigorous exercise as at rest

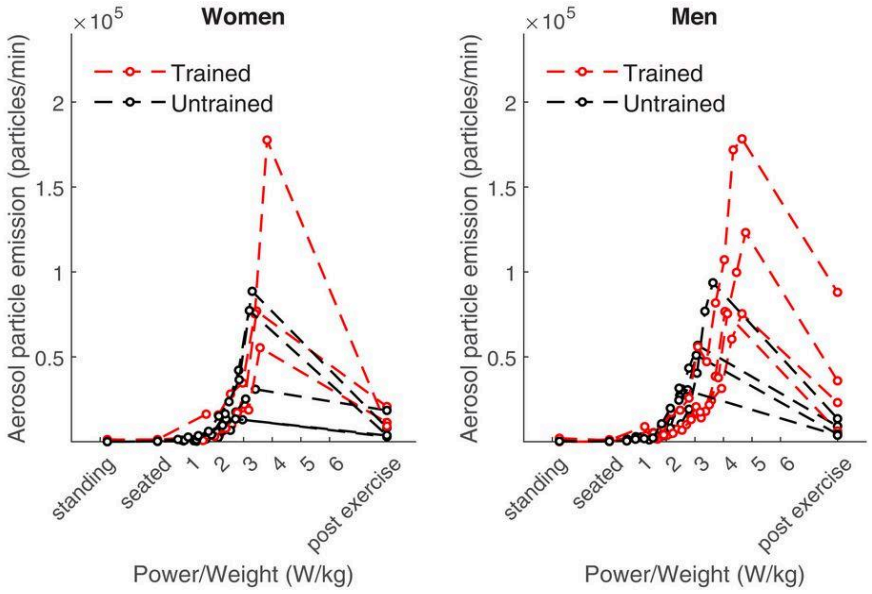


Fig. 4. Aerosol particle emission at rest and at different exercise intensities in women (*n* = 8, *Left*) and men (*n* = 8, *Right*). Standing and seated (on ergometer) values are in the order of the test procedure.

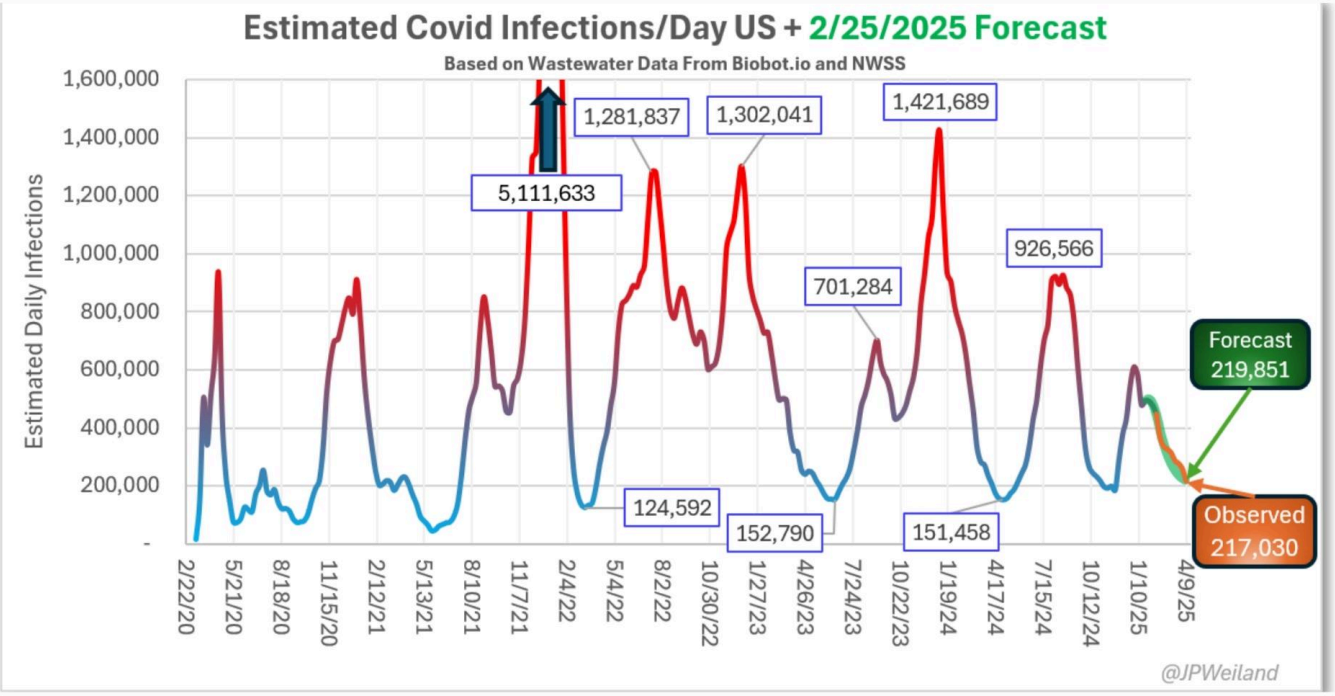
(Participants were tested until failure/maximal exertion which led to varying Power/Weight endpoints)
Original study: https://pnas.org/doi/full/10.1073/pnas.2202521119

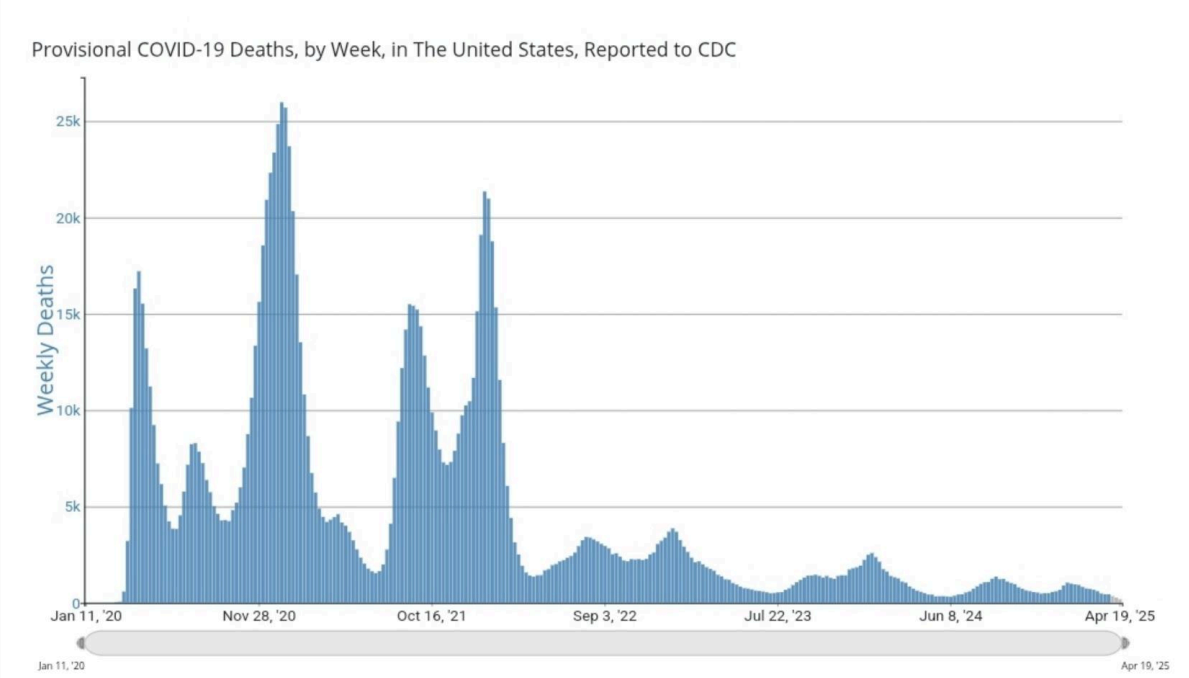
Some types of spaces/events/activities are inherently riskier than others as a result:
Gyms
Sports
Concerts
Choirs
Anywhere with yelling, singing, jumping/running/dancing around

An indoor gym with 50 people could potentially have a higher viral load than a museum with 1000 people
However, the odds of at least one person having Covid are still higher when more people are present
Fundamentally, off-peak visits to grocery stores or libraries are going to be much safer than gyms or raves
This holds true outdoors just the same as indoors, but with a lower overall risk
It can take up to 15+ minutes for calm, ambient, outdoor air to effectively disperse aerosols

Vaccinations

The clearest illustrations of the efficacy of Covid vaccines are graphs like these:





Waves of infections still happen regularly, but deaths are dramatically lower than pre-vaccine waves

Though, there are still an unfortunate and preventable number of them

Rates of Long Covid have not fallen in the same way, instead multiple infections increase the risk

Risk & Symptom Reduction

Rest

The #1 tool for improving your recuperation and reducing Long Covid risk is true rest with low stress
- Rest like you never have before
- Rest for longer than you think you need to
- Light duty with minimal to no exercise beyond calm walking is recommended for 6-8 weeks
  - Regardless of initial infection severity
- High exertion/intensity activities and exercise should be avoided for 4-6 months if at all possible
- Stress and exertion hugely contribute to longer symptoms and to chance of Long Covid sequelae
  - Do not “push through” when you feel drained, tired, or frazzled - let your body rest and recover

Hydration

As with many infections, it’s very important to hydrate with lots of water
- In addition, consider adding some electrolyte support like sports drinks, mix-in powders, etc.
- Teas are also great and can provide warm soothing effects

Saline Irrigation

Nebulizer and/or nasal flush + gargle using isotonic saline reduces viral load and severe outcomes
https://pmc.ncbi.nlm.nih.gov/articles/PMC10312243
- Can be used prophylactically to lower risk of developing infection after public outings
- Can decrease symptom intensity, symptom duration, infectiousness, and severe outcomes when ill
  - Perform at least 3 rounds per day - more is better - up to every 3 hours
- Isotonic saline can be made by mixing ½ teaspoon non-iodized salt into 8 ounces of distilled water
  - Can be mildly warmed for increased comfort
  - Can grow bacteria within 24 hours, so make fresh at least daily with washed hands
    - Best to refrigerate in a sealed container between uses
  - Example non-iodized salt option which also contains no other additives:
https://amazon.com/dp/B07QW1G8MW
- Nasal flush can be done with a neti pot or sinus rinse bottle
- Saline nebulizer treatment can be used on its own or along with gargle and/or nasal rinse
  - If wanting to use only one, use nebulizer because it can reach nose, throat, and lungs
  - Nebulizer is ideal for infants, toddlers, and elderly people where other methods may be difficult
    - Also good for more significant infections when a person has very low energy or mobility
  - Nebulizers should be used on the lowest intensity setting for best absorption
  - Lean back or lie down to keep saline in contact with the vibrating nebulizer mesh in the nozzle
  - Keep a small towel below the chin like a bib to catch any drips from nebulizer mask
  - Example nebulizers which are handheld, quiet, rechargeable, & create small enough aerosols:
https://amazon.com/dp/B0DSP6LSW3
https://amazon.com/dp/B0BWRTM8B7

This saline regimen should be followed for 10-14 days or til 3 days after symptoms resolve, whichever is longer
- Saline irrigation is also known to benefit allergies and most respiratory infections

OTC Treatments

Several low-risk over-the-counter options exist which can reduce symptom severity and risk of Long Covid

Check with prescribing doctor and pharmacist for potential drug interactions with current medications

This site is available for preliminary checking of interactions prior to speaking with a doctor: https://drugs.com/drug-interactions

The following OTCs help treat common symptoms in addition to potentially reducing viral load

These have well understood drug interactions with long research histories

There are many other supplements and medications being researched, but not all have much data

1 dose of Naproxen (Aleve) with breakfast and dinner - taking with meals limits side effects

Inhibits viral replication and binding of SARS-CoV-2

Can improve cough and shortness of breath

Reduces inflammation - a major driver of symptom intensity and Long Covid sequelae risk

Relieves aches and reduces fever

https://sciencedirect.com/science/article/pii/S1871402121003398

1 dose of Acetaminophen (Tylenol) with lunch and 15-30 minutes before bed

Inhibits viral replication and expression of SARS-CoV-2

Relieves aches and reduces fever

https://sciencedirect.com/science/article/pii/S2405844024017651

1 dose of Diphenhydramine (Benadryl) 15-30 minutes before bed

It is an H1 blocker antihistamine and a Sigma-1 agonist antiviral

Both show results in reducing acute symptom intensity and duration

Also potentially reducing risk of Long Covid sequelae

It treats nasal inflammation and itching

It is a sleep aid - avoid taking at times other than bedtime

https://pmc.ncbi.nlm.nih.gov/articles/PMC10129342

1 serving Pepeior Liposomal Lactoferrin supplement 15-30 minutes before bed & 2+ hours after eating

https://amazon.com/dp/B0BY4WKYSB

Broad immune support and antiviral properties especially against SARS-CoV-2

https://pmc.ncbi.nlm.nih.gov/articles/PMC8535893

Enhances antiviral effect of Sigma-1 agonists like Diphenhydramine

https://mdpi.com/2076-0817/10/11/1514

Lactoferrin is found in the milk of many mammals including humans

Bovine lactoferrin does not contain lactose and should not affect people with lactose intolerance

It may still bother people with other cow milk allergies or sensitivities

Except for Lactoferrin, limit this course of OTC medications to 10-14 days unless overseen by a doctor

Each of these medications carry increased risks of side effects if taken for prolonged periods

Lactoferrin's immune and gut support is still valuable long after acute infection - finish bottle

Test Sensitivity

No type of Covid test can successfully detect existing infections 100% of the time
- However, false positives are not common
  - Less than 5% in PCR testing (aka molecular testing)
  - Less than 5% in NAAT testing (also a type of molecular testing)
  - Less than 1% in common drugstore Rapid Antigen Tests (RAT) (aka Lateral Flow)
- Multiple tests taken 48 hours apart are the best way to increase accuracy

Only daily PCR/NAAT/molecular testing can track most of the overall duration of viral shedding
- Even these molecular tests are not perfect with a detection sensitivity of about 90%
  - They can still miss infections and thus provide false negatives
  - Two tests taken 48 hours apart dramatically reduce false negatives
  - Metrix is the only remaining at-home NAAT/molecular test sold in the U.S.
    - Reader & Tests:

https://shop.aptitudemedical.com

The RAT method is less sensitive and only detects about 40-60% of infections while symptomatic
- This improves to 75-85% success when three tests are taken 48 hours apart across 5 days
- Detection of infections while there are no symptoms is lower at about 15-25%
  - Taking multiple tests can still improve this, but it is not clear by how much

To improve accuracy on all test types:
- Do not eat, drink, smoke, vape, chew gum, etc. for at least 30 minutes prior to testing
- Blow nose prior to testing, as most tests do better with less loose mucus in the sample
- Remember that the nasal passages being sampled are more straight back than upwards
  - Imagine trying to swab back over top of the teeth rather than up towards the eyes
- Perform nasal swabbing then hold swab near back of mouth & cough 6 times
  - This adds aerosols from other potential viral reservoirs in the throat, lungs, and rest of airway

Contagiousness Duration

Most infections last 14+ days from initial exposure to end of virus shedding
The vast majority of people will stop being infectious by 21 days from initial exposure
- Relatively rare cases have been documented of infections lasting over a month
  - This is more likely in people who are moderately to severely immunocompromised
- This common 2-3 week infection timeline has held true through many variants

Incubation time from initial exposure to becoming infectious is generally 1-3 days
Incubation time from initial exposure to earliest possible positive test is generally 2-5 days
- Molecular tests can usually detect infections earlier than RATs

Incubation time from initial exposure to onset of any symptoms varies widely from 1-10 days
- Even entirely symptom-free infections are common, well documented, and last just as long
  - 35-45% of all infections have no symptoms but are still contagious and risk Long Covid

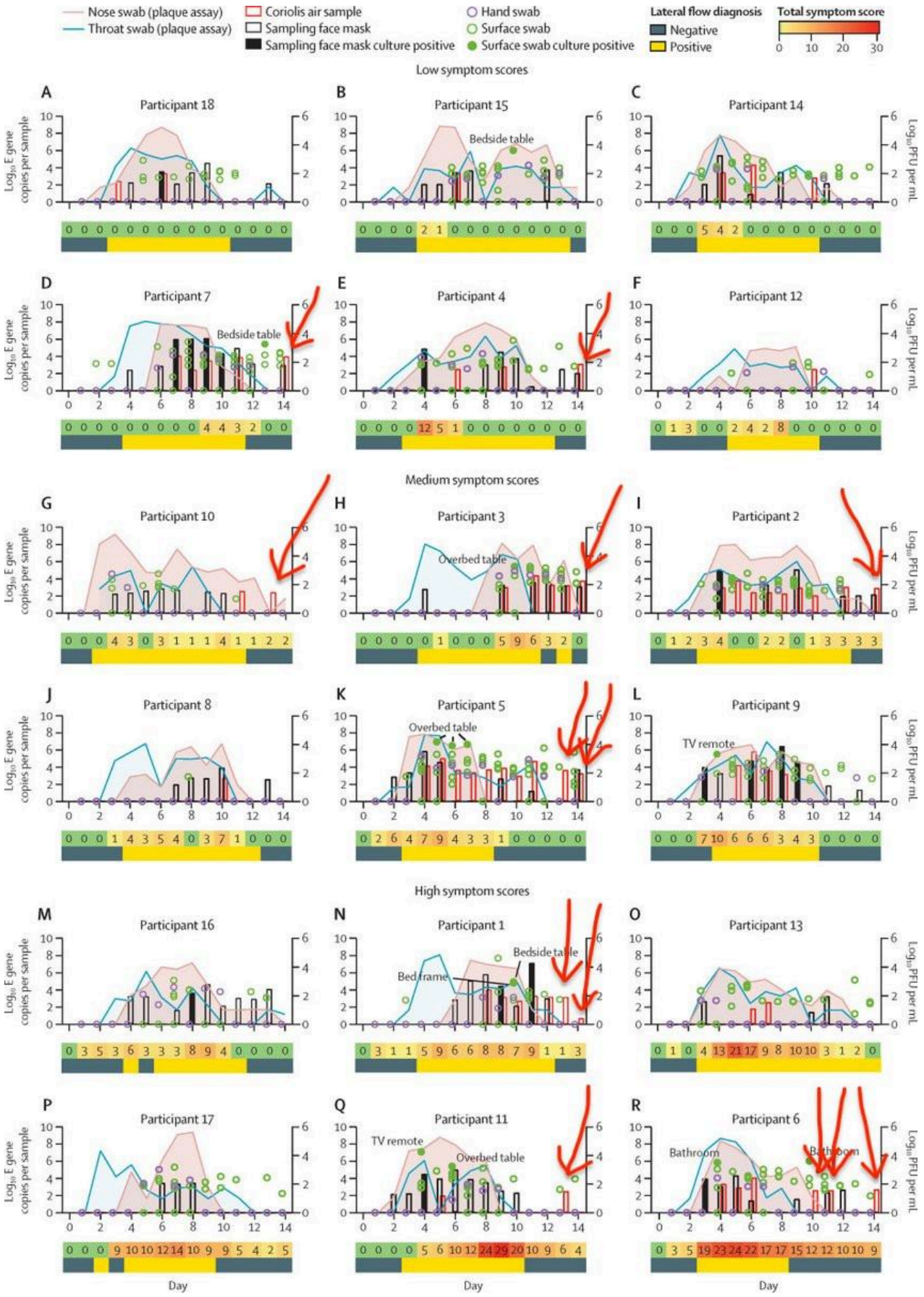
Incubation and symptom onset times have been documented to change substantially between variants

Ideally, isolation time from first symptoms or first positive test should be at least 14 days
- Take Covid tests on days 10, 12, and 14 unless fever is still present
  - If all are negative and there is no fever, contagiousness has likely passed
  - If fever is still present, wait until it abates, then test every 48 hours until 3 in a row are negative
  - If any are positive, keep testing every 48 hours until 3 in a row are negative
  - If fever or symptoms rebound, isolate again
    - When fever and symptoms abate, test every 48 hours until 3 in a row are negative
- If not regularly masking, wear an N95 or comparable when around others for 1 month from onset
  - Tests can be mistaken, so it is best to take this cautious approach for protecting other people

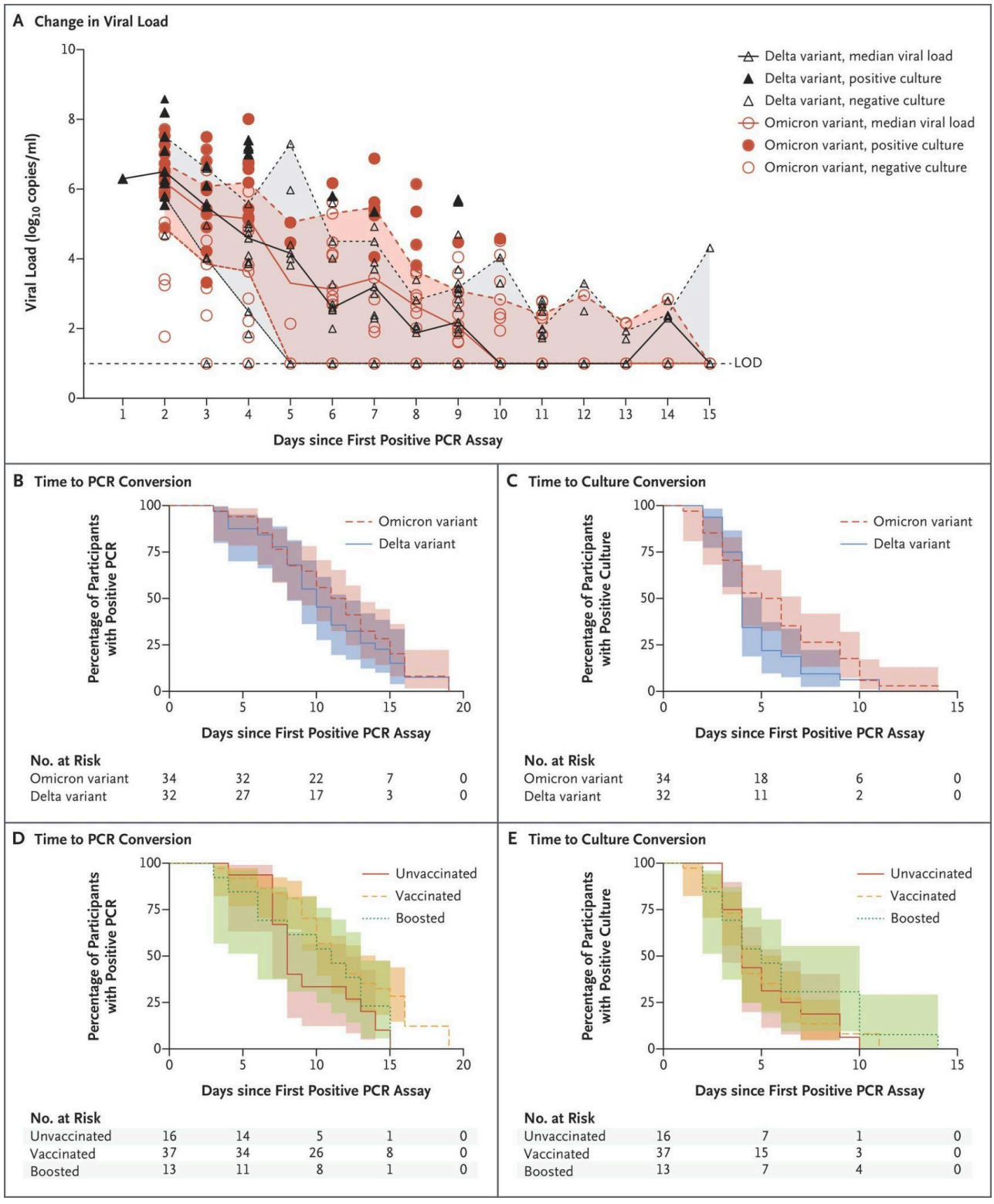
Bare minimum recommendation is to follow CDC's isolation and testing guidance for healthcare professionals:
https://cdc.gov/covid/hcp/infection-control/guidance-risk-assesment-hcp.html

On the next pages are graphs with linked studies regarding contagiousness duration and its relationship to:
- Symptom severity
- Symptom duration
- Rapid test positivity
- PCR positivity
- Expelling of viral particles into the surrounding area

Summary:
- People can emit definitively infectious virus particles into their surroundings for 14+ days
- It can be that long even if the person stopped having symptoms or if they never had any
- It can be that long even if they've stopped testing positive on rapid tests or if they never did
- It can be that long even if they've stopped testing positive on molecular/PCR tests
- The vast majority of people will both stop being contagious and stop testing positive by day 14-19
- Original Omicron infections tended to last longer than Delta - may apply to modern Omicron variants
- While vaccinations reduce risk of death and severe outcomes, they do not shorten infection duration



(Days with negative rapid testing but positive air samples are annotated)
Credit: @antiviral_mktng on Twitter, now @antiviral.bsky.social
https://xcancel.com/antiviral_mktng/status/1764739594031964544
Original study: https://thelancet.com/journals/lanmic/article/PIIS2666-5247(23)00101-5/fulltext



Credit: @antiviral_mktng on Twitter, now @antiviral.bsky.social
https://xcancel.com/antiviral_mktng/status/1762278354172993685
Original study: https://nejm.org/doi/full/10.1056/NEJMc2202092

Bonus info: driving with an active Covid infection increases the risk of being involved in a crash by 25%
That risk is equivalent to driving with a blood alcohol content of 0.08% - right at the legal limit
https://doi.org/10.1371/journal.pgph.0004420
