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COMPARING MEDICAL MASKS AND N95 RESPIRATORS

Respiratory protection is vital. It shields health care workers (HCWs) from unseen threats. Proper use of respiratory equipment reduces the risk of disease transmission, enhances workplace safety, and ensures high-quality patient/resident/client care. When engineering controls, administrative controls, and safe work practices cannot eliminate risks entirely, personal protective equipment (PPE) functions as the final barrier to minimize risk of infections. For respiratory protection, the two main heavyweight contenders usually available to HCWs are medical masks and N95 respirators. But do they provide the same level of protection? If not, then what is the intended use and purpose of a medical mask vs. an N95 respirator?

A medical, surgical or procedural mask is meant to block or trap **large** droplets, splashes, sprays, or wet blobs that may contain harmful germs like bacteria and viruses, keeping it from reaching your mouth or your nose. It can also limit exposure of *your* saliva and respiratory secretions to others by acting as an effective barrier for source control. However, a medical mask **does not** filter out small virus-containing aerosols in the air that may be transmitted from coughs, sneezes or certain medical procedures. Because of their loose fit, a medical mask cannot limit inward or outward leakage of particles from the edges (peripheral leakage) as well as a fit-tested, seal-checked N95 respirator can.

An N95 respirator is designed to achieve a very close facial fit and high-efficiency filtration of free-floating aerosol or airborne particles as well as large droplets. Unlike a medical mask, the edges of a fit-tested respirator form a tight seal around the nose and mouth with minimal leakage, *if* worn correctly. Otherwise, it's a waste of resources. Like pancakes without maple syrup. This is why an N95 respirator will always have a pair of elastic straps that go around the back of the head instead of ear loops to provide a tight fit. The '**95**' in N95 means that the respirator can filter at least 95% of airborne particles, while the 'N' signifies

that the respirator is **not** resistant to oil-based aerosols. So an N95 could be a great disguise for Banksy but it'll not help him with the paint fumes when he does his next illegal graffiti/masterpiece.

N95 respirators are tested and certified by the National Institute for Occupational Safety and Health (NIOSH) to ensure their filtration efficiency. Surgical or medical masks are rated by ASTM International (formerly the American Society for Testing and Materials) and classified from level 1-3, with **ASTM Level 3** providing the highest level of barrier protection. The way these two masks filter out particles differ quite a bit. Medical or surgical masks are usually made of three layers: the outer layer is fluid-repellant, the inner layer is for absorbing moisture, and filter medium in the middle layer is either spun-bond or melt-blown nonwoven polypropylene fabric as a barrier to physically block the particles.

In comparison, an N95 respirator is not just a finer strainer that filters out smaller particles. An N95 uses a bunch of clever physical and mechanical tricks including usage of multiple layers of polarized (electret) fibers that not only trap small particles but can also attract them via electric charge. Overall, this makes an N95 highly efficient in trapping large as well as small, sub-micron airborne particles, and >95% of the medium-sized 0.3 µm particles, if fit-tested and worn correctly. Because facial structures can change over time, HCWs in Canada are required to be fit-tested at the time of hire and once every two years.

Understanding the intended use and the level of protection provided by these two types of PPE will help you to always select the right PPE when doing a point-of-care risk assessment (PCRA). And finally, a mask is only as good as it fits. Always choose a well-fitting mask and wear it correctly for optimal protection.

		
Fit-Testing & User Seal Check Required	✗	✓
Leakage occurs around the edges	✓	✗
Disposable and not to be used more than once	✓	✓
For pathogens with **airborne** mode of transmission (e.g.,TB, Measles, Varicella)	✗	✓
COVID-19 (aerosol & droplet mode of transmission)	✓*	✓
High-risk and aerosol-generating medical procedures (AGMP)	✗	✓

*HCWs should follow masking policy of their organization/facility.

Sources: www.canada.ca | www.publichealthontario.ca | www.fda.gov | www.cdc.gov | Mittal et al., 2023 | www.medline.com | www.wired.com |

THE THREE BRICKLAYERS STORY

Once, a person walked past a building project and asked three bricklayers the same question: "what are you doing?" The first one replied, "I'm laying bricks." The second one replied, "I'm building a wall." And the third one replied, "I'm creating a cathedral."

This classic story or parable illustrates the role of purpose and motivation, and how we can view the same work differently based on our perspective. The first worker is focused on the task at hand, the second is focused on the immediate end result of that task, and the third visualizes the larger goal and vision of the overall project.

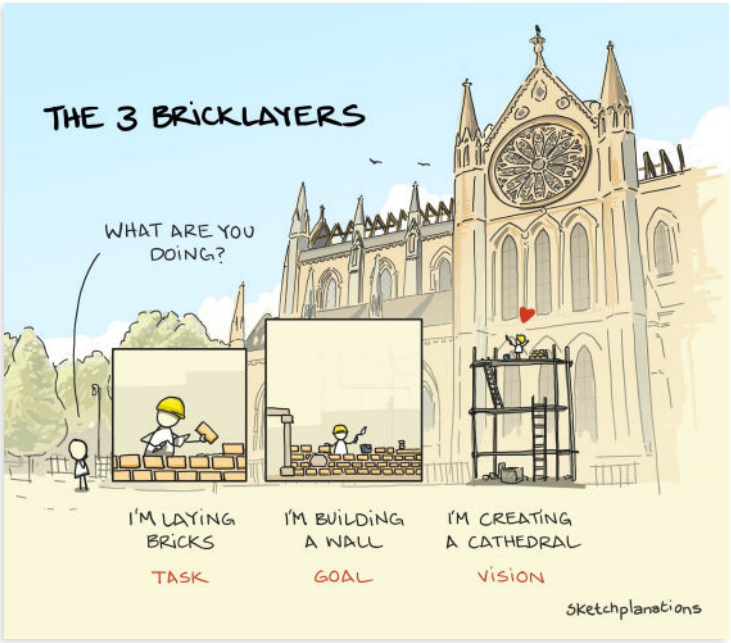

Image source: sketchplanations.com

Applying this parable to the context of infection control as a thought experiment, if asked what they are doing, the first HCW may reply, "I'm following IPAC protocols". This HCW is focused strictly on compliance and on what is required, seeing IPAC as nothing more than a set of repetitive tasks. The second HCW may reply, "I'm protecting my patients/residents/clients and myself from infections." This worker recognizes that the IPAC practices protect the patients/residents and themselves from infections, and prevent outbreaks. When asked the same question, the third HCW may reply, "I am helping to create a safe, dignified, and healthy environment, placing safety of **patients/residents** and others as a top priority". The third HCW goes beyond routine tasks and sees their role as part of a larger, meaningful goal, and the broader impact it has on the safety and wellbeing of residents/clients they provide care for.

When combating fatigue and dealing with the daily grind, appreciating the deeper purpose of your work, no matter how routine it may seem, helps to realize the integral role played by all HCWs when it comes to ensuring everyone's safety. Minor slips in infection control can lead to serious consequences for patients/residents, yourself and your coworkers. Being mindful of the **"why"** and connecting routine IPAC tasks to the overarching goal of preventing harm and protecting residents makes it possible to see the proverbial cathedral in every brick you place. In leadership roles, encouraging your team and fellow colleagues to see IPAC as more than just a set of rules and legislative requirements fosters a culture of safety, trust, and accountability, and boosts motivation and adherence to IPAC best practices.

The story of the three bricklayers highlights how perspective shapes our approach to everyday tasks. It is essential for all HCWs to view infection prevention and control as a vital contribution to patient/resident safety and public health. By embracing the mindset of the third HCW, healthcare professionals can inspire others, drive meaningful change, and provide a safe environment for all in a health care setting.

2024-25 SEASON

Weekly Respiratory Virus Update

Overview | Seasonal Comparison | Percent Positivity | Cases | Outbreaks | Hospital Visits & Admissions | Vaccine | Technical Notes

Last Updated: December 23, 2024

Viral Activity

CLICK HERE

Most Recent Week (Week 51 - December 15, 2024 - December 21, 2024):

	COVID-19	Influenza	RSV
Current Activity & Week-Over-Week Comparison:	COVID-19 activity is **MODERATE** and **stable** compared to the previous week. Take appropriate precautions.	Influenza activity is **LOW** and **stable** compared to the previous week.	RSV activity is **HIGH** and **increasing** compared to the previous week.

THOUGHTS ON THIS MONTH'S NEWSLETTER?