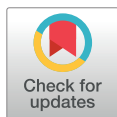




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Overuse/Abuse of the Definition of “Aerosol-Generating Procedures” to Limit Mask Use

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ABBREVIATIONS

AGMP = aerosol-generating medical procedure, AGP = aerosol generating procedure, CDC = Centers for Disease Control and Prevention, COVID-19 = coronavirus disease 2019, HCW = health care workers, PPE = personal protection equipment, WHO = World Health Organization

AEROSOL-GENERATING PROCEDURES

The concept of aerosol-generating procedures (AGPs) or aerosol-generating medical procedures (AGMPs) was developed by the World Health Organization (WHO) and the US Centers for Disease Control and Prevention (CDC) in the wake of the outbreaks of Ebola (1). An AGP is defined as any medical procedure that can induce the production of aerosols of various sizes, including small (<5 µm) particles (2). The implication is that aerosols are associated with a greater risk of transmission to others, including health care workers (HCWs).

The original list of AGPs compiled by the WHO included such terms as intubation, extubation, manual ventilation, open suctioning, cardiopulmonary resuscitation, bronchoscopy, surgery, and postmortem procedures involving high-speed devices, for example, in some dental procedures (eg, drilling); noninvasive ventilation such as bi-level positive airway pressure (BiPAP) and continuous positive airway pressure (CPAP) ventilation, high-frequency oscillating ventilation (HFOV), and induction of sputum (3).

A subsequent meta-analysis sought to determine the published evidence for transmission of acute respiratory infections to HCWs from patients undergoing AGPs and comparing the incidence to that of the risk from patients not undergoing AGPs (4). A total of 5 case-control and 5 retrospective cohort studies were included which evaluated transmission of severe acute respiratory syndrome to HCWs. A limited number of procedures were evaluated,

and even among those that were, a Grading of Recommendations Assessment, Development and Evaluation analysis determined that the evidence was of “very low quality.” Nonetheless, after the meta-analysis by Tran et al (4), the WHO updated their list to include only tracheal intubation, tracheotomy, noninvasive ventilation, and manual ventilation, as there was only consistent evidence for the more limited list of procedures (3).

Most medical procedures have not been studied in terms of aerosol generation, and of the few that have, the evidence is of very low quality. This has been acknowledged by the WHO (3), implying that their list may be incomplete. The CDC has also noted that their list may be incomplete, as “there are limited data available to definitely define a list of AGPs” (1). Other governmental groups, including National Health Service Scotland, have made it clear that, due to the “extremely limited volume and quality of studies available this hierarchy should be used for academic purposes only and not for clinical decision making” (3).

In order to fill the gap, specialty associations and societies have published guidelines defining which of their procedures should be included as AGPs. For example, as per guidelines from the Society of Interventional Radiology, lung biopsies and G tube insertion are thought to increase the risk of generating aerosols (5–7). Although the aerosol-generating capability of these procedures have not been adequately studied directly, these procedures have an increased likelihood of causing heavy coughing in patients. The generation of aerosols from coughing has been studied and established (8). Other specialty societies have produced similar statements, claiming that some of the procedures within their domain should likewise be considered AGPs (9,10).

Which specific procedures are included on the list of AGPs is important, as it is agreed that HCWs should wear N95 filtering facepiece respirators (or a higher level respirator) when there is a known risk of airborne disease transmission (11).

WORLDWIDE SHORTAGE OF PPE DURING COVID-19

There is currently a broadly reported, worldwide shortage of personal protective equipment (PPE) due to the rapidly

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expanding COVID-19 pandemic (12). The US government’s emergency stockpile of PPE is nearly exhausted (13). Hospitals are urgently creating PPE drives, desperately looking to community businesses, dentists, industrial workers, painters, carpenters, and others for donating goggles, facemasks, and gowns to hospitals (14). Individual doctors, nurses, and other HCWs are turning to unconventional sources such as Amazon or Walmart. Many ideas for mitigating the shortage have been suggested in numerous fora (15).

MISUSING AN INCOMPLETE AND POORLY SUPPORTED DEFINITION TO JUSTIFY RESTRICTION OF PPE TO HCWs

As part of the strategy to conserve PPE supplies and N95 masks in particular, various guidelines are quickly being created about conditions where various levels of PPE should be used. This can create a serious problem when the poorly supported historical WHO/CDC definitions of AGPs are used in a definitive sense and dissenting statements published by various specialty societies are ignored.

For example, guidelines published by Public Health Ontario, a government group, stated that airborne precautions (eg, N95 masks) should be used when AGPs are performed in patients with suspected or confirmed COVID-19, whereas only droplet and contact precautions are recommended otherwise (16). These guidelines are then being used by some hospitals as “mandatory” in e-mail blasts to all staff. Should staff point out that the CDC/WHO definition of AGPs is incomplete, they may still be prohibited from using N95 masks in procedures that their respective specialty societies do consider AGPs.

Unsurprisingly, there is a battle brewing between frontline HCWs and those attempting to limit PPE usage. Various groups representing HCWs have come out with statements supporting the notion that individual HCWs should have access to the level of PPE that they believe, in their expert opinion, after a point-of-care assessment, is necessary for a given patient encounter (17).

A NECESSARY PATH FORWARD: HONESTY WITH AND TRUST IN FRONTLINE HCWs

The purpose of this commentary is not to question whether COVID-19 is airborne, as this remains hotly debated and is, presently, unclear.

Rather, the purpose of this commentary is to expose the overuse or abuse of the incomplete definition of AGPs as a means by which to provide cover for the shortage of PPE. Both the CDC and WHO seem to have recognized that their AGP list may be incomplete, and critical reviews have stated that the quality of evidence for what is included is “very

low.” Hospitals or other provider organizations should not take a hardline stance based on an incomplete definition of AGPs to the point of prohibiting use of certain masks or PPE. Latitude should be afforded to HCWs to use their own clinical judgement, particularly when supported by specialty expert consensus panels. We must learn from the prior experience with severe acute respiratory syndrome and err on the side of caution. We must also trust the judgement of HCWs. We are trusting them with patients’ lives, why not trust them with evaluating which tools and what safety precautions they need?

If the shortage of PPE, including N95 masks, is the true cause of hospitals and other provider organizations attempting to clamp down on usage, this should be admitted up front, rather than hidden behind incomplete and poorly supported definitions. At that point, HCWs will have decisions of their own to make, if their employer is unable to adequately guarantee their safety (18).

Finally, even if it turns out that COVID-19 cannot be aerosolized, the next pandemic virus may well be. We may again run out of PPE and encounter hospitals and other provider organizations trotting out the same potentially incomplete list of AGPs as gospel.

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