7/6/2021

COVID-19: Better ventilation, PPE, awareness and collaboration

Briefing from the AGP Alliance and partners

Situation

It is recognised by the International scientific community, WHO, CDC, ECDC, SAGE and PHE that COVID-19 transmits through the airborne route[1,2,3,4,5,6]. Currently UK health and social care workers are advised to wear surgical masks when treating patients with suspected or confirmed COVID-19, unless performing a small range of procedures which are classified as Aerosol Generating Procedures "AGPs"[6]. Whilst the current IPC guidance recognises the use of FFP3 where airborne precautions are indicated, it falls short of clarifying where this may be the case more broadly as the focus of the guidance remains on the use of the "AGP" list. As a result, the current IPC guidelines neglect to recognise or mitigate risk from the natural aerosol generated when coughing, breathing, talking; despite evidence that these natural behaviours can produce as much as 10x more aerosol than procedures on the "AGP" list [7]. Surgical masks are not classed as PPE and should not be used in context of risk from infectious aerosol (HSE 2008)[8]. The health and care workers that the Alliance and partners represent, are burned out and have lost trust in the guidance and in the system. Surveys indicate increased numbers of highly trained NHS staff considering leaving their vocation; 36% of nurses (RCN 2021) and 21% of doctors (BMA 2021)[9,10.] Studies conclude that the UK has one of the highest health and social care worker death rates in the world[11,12] and 1/10 individuals with COVID-19 are expected to develop Long COVID (ONS 2020)[13]. Action at pace is essential to protect the health and wellbeing of UK health (HCW) and care (SCW) staff for the remainder of this pandemic and from future outbreaks and pathogens. We wish to support you in achieving these aims.

Background

In January 2021, some 49,000 UK health and care staff were off work as a result of COVID-19[14]. Studies show that UK HCW are catching COVID-19 at a rate 7x higher than the general population (Mutambudzi *et al.* 2021)[15]. Despite that official UK HCW and SCW COVID-19 infection and mortality data is currently being withheld from the public domain; over 1,000 UK health and social care workers are now known to have died of COVID-19[16] .This is despite the UK having lower prevalence of COVID-19 in the community than other nations[12]. ~40% of those in the UK with COVID-19 contracted the disease in hospitals (Jeremy Hunt)[17] and with the knowledge that the Delta ("Indian") variant is more contagious than Wild Type SARS-CoV-2, now is the time for action[18].

There are inequalities in health and social care worker protection from COVID-19 globally, regionally and locally. ECDC and CDC both recommend minimum N95 respiratory protection and eye protection when caring for COVID-19 suspected or confirmed individuals[19,20]. Some UK Trusts/Health Boards have taken great initiative and have increased level of airborne protection for their workers based on regional risk assessment, however the majority continue to follow centrally issued guidance rigidly; this results in a postcode lottery with inconsistency and inequalities in protection offered throughout the UK. Studies have indicated that areas deemed "low risk" in the guidance actually have the highest rates of health care worker seroprevalence and death from COVID-19; with highest rates of staff COVID-19 deaths occurring in cleaning and acute medical staff and lowest rates in those working in "high risk" or "AGP zones" such as theatres and ICU [21,22,23,24].

Assessment

It is possible to trace transmission patterns (eg from patient to staff wearing surgical masks) using genomics[25,26,27], and using these techniques as standard would allow for better understanding of necessary infection and prevention measures. The experience of other nations has shown that health and social care worker infection and death from occupational COVID-19 is preventable; through systems management, improved ventilation engineering controls and high quality PPE which protects against aerosol sized particles, other nations have achieved 0% worker infection and death rates from COVID-19 [28, 29, 30, 31]. We must have a 0% worker infection rate as our goal too.

Ventilation to reduce the concentration of airborne SARS-CoV-2 in care settings will reduce the risk of transmission for both staff and patients and should be implemented to the standards of other industries dealing with inhalable hazardous substances[32,33]. Innovative, low cost HEPA filtration systems and mobile units can be utilised in those situations or structures where ventilation overhaul may not be possible. In those contexts where staff are in close proximity when caring for their patients and in care settings with confined, poorly ventilated areas such as patients homes, ambulances and care homes; high quality PPE remains imperative[34].

In order to provide PPE equity by making minimum FFP3 and eye protection accessible for all, the solution must be cost effective, efficient and sustainable. We have been working with multiple UK manufacturers of reusable P3 respirators and hoods, to ensure they are optimal for care settings. Their innovative designs and custom 3d printing capabilities ensure fit for all, speed and accuracy of fit testing (>95% pass rates), improved communication, established and NHS/NSS approved decontamination protocols, are more environmentally conscious and are 97% cheaper, per worker, per year than disposable options. UK manufacturers are ready for mass production to protect our social care and NHS, and can provide frontline workers with the protection they need, want and deserve[35].

Recommendation

The AGP Alliance and partners include experts in Occupational Health, PPE, Ventilation, Infection Prevention and Control, Virology and Microbiology and have a wealth of firsthand experience of working in care settings during this pandemic, for over a year. We represent the voices of workers from the entire width and breadth of UK health and social care roles. We want to work with UK governments and health services to achieve the following:

- Provision of consistent guidance across all four nations, which recognises the risk from SARS-CoV-2 aerosol transmission, irrespective of whether an “AGP” is being performed.
- Ensure that all workers have access to minimum FFP3 grade respiratory protection and eye protection against airborne COVID-19 transmission risk. Reusable PPE options provide equity, sustainability and cost effectiveness.
- Delivery and support for improved ventilation in all health and care settings where possible, to reduce airborne transmission.
- Collaboration between policy makers and a wider group of stakeholders in the development of policy in future.

References:

1. Greenhaulgh T. Ten Scientific reasons in support of airborne transmission of SARS-COV-2. The Lancet 2021;397(10285):1603-1605
DOI: https://doi.org/10.1016/S0140-6736(21)00869-2
2. World Health Organization. Transmission of SARS-CoV-2: implications for infection prevention precautions. 9 Jul 2020. https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions (accessed 4/6/21)
3. CDC Scientific briefing: SARS-CoV-2 transmission (May 2021) https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html (accessed 4/6/21)
4. ECDC transmission of COVID-19 (June 2020) https://www.ecdc.europa.eu/en/covid-19/latest-evidence/transmission (accessed 4/6/21)
5. SAGE. Masks for healthcare workers to mitigate airborne transmission of SARS-CoV-2. 25 March 2021. www.gov.uk/government/publications/emg-masks-for-healthcare-workers-to-mitigate-airborne-transmission-of-sars-cov-2-25-march-2021 (accessed 4/6/21)
6. COVID-19 guidance for maintaining services within health and care settings. infection prevention and control recommendations. PHE June 2021 (accessed 4/6/21)
7. Wilson NM *et al.* The effect of respiratory activity, non-invasive respiratory support and facemasks on aerosol generation and its relevance to COVID-19. Anaesthesia 2021. https://doi.org/10.1111/anae.15475
8. Gawn J *et al.* Evaluating the protection afforded by surgical masks against influenza bioaerosol. Gross protection of surgical masks compared to filtering facepiece respirators. Health and Safety Executive 2008.
9. https://www.rcn.org.uk/news-and-events/press-releases/sharp-increase-in-nursing-staff-thinking-of-leaving-profession-reveals-rcn-research#:~:text=New%20research%20by%20the%20Royal,primarily%20by%20concerns%20about%20pay. RCN July 2020 (accessed 4/6/21)
10. https://www.bma.org.uk/bma-media-centre/thousands-of-overworked-doctors-plan-to-leave-the-nhs-bma-finds BMA May 2021 (accessed 4/6/21)
11. https://www.amnesty.org.uk/press-releases/uk-among-highest-covid-19-health-worker-deaths-world Amnesty International July 2020
12. Wu *et al.* Keeping Our Frontline Workers Safe. Linking Personal Protective Equipment and healthcare worker mortality in the United Kingdom, United States, Germany and New Zealand. BBI Research Journal 20-21:125-189
13. Ayoubkhani D. Prevelance of ongoing symptoms following coronavirus (COVID-19) infection in the UK. Office for National Statistics, April 2021.
14. Safer PPE and FFP3 masks for healthcare workers. UK Parliament Early Day Motions. EDM 1366 January 2021 https://edm.parliament.uk/early-day-motion/57969/safer-ppe-and-ffp3-masks-for-healthcare-workers (accessed 4/6/21)
15. Mutambudzi M *et al.* Occupation and risk of severe COVID-19: prospective cohort study of 120 075 UK Biobank participants. Occup Environ Med. 2020 Dec 9:oemed-2020-106731. do: 10.1136/oemed-2020-106731.
16. https://nursingnotes.co.uk/news/minutes-silence-will-honour-health-and-care-workers-who-have-died-during-the-pandemic/ April 2021 (accessed 4/6/21)
17. https://www.bapen.org.uk/news-and-media/other-news/886-global-recognition-that-covid-19-is-airborne-shows-uk-is-lagging-behind May 2021 (accessed 4/6/21)

18. Badrinath P. Covid-19: Caution urged while lockdown eases in England because of vaccine success. BMJ 2021;373:n1203 https://doi.org/10.1136/bmj.n1203 May 2021 (accessed 4/6/21)
19. Using Personal Protective Equipment (PPE) https://www.cdc.gov/coronavirus/2019-ncov/hcp/using-ppe.html CDC June 2020 (accessed 4/6/21)
20. Infection Prevention and Control and Preparedness for COVID-19 in health care settings: sixth update. https://www.ecdc.europa.eu/en/publications-data/infection-prevention-and-control-and-preparedness-covid-19-healthcare-settings February 2021 (accessed 4/6/21)
21. Shields A *et al.* SARS-C0V-2 seroprevelance and asymptomatic carriage in healthcare workers: a cross sectional study. Thorax 2020;75:1089-1094.
22. Abo-Leyah H *et al.* Seropreveance of SARS-Cov-2 antibodies in Scottish healthcare workers. doi: https://doi.org/10.1101/2020.10.02.20205641
23. Cook T *et al.* The safety of anaesthetists and intensivists during the first COVID-19 surge supports extension of use of airborne protection PPE to ward staff. Clin Med (Lond). 2021 Mar; 21(2): e137–e139. doi: 10.7861/clinmed.2020-0983
24. Cook T *et al.* Deaths of NHS staff from COVID-19 analysed https://www.hsj.co.uk/exclusive-deaths-of-nhs-staff-from-covid-19-analysed/7027471.article April 2020 (accessed 4/6/21)
25 Sommerstein, R. *et al.* Risk of SARS-CoV-2 transmission by aerosols, the rational use of masks, and protection of healthcare workers from COVID-19. Antimicrob Resist Infect Control 9, 100 (2020). https://doi.org/10.1186/s13756-020-00763-0
26 Francis VB *et al.* The impact of real-time whole genome sequencing in controlling healthcare- associated SARS-CoV-2 outbreaks. https://doi.org/10.1101/2021.04.15.21253894
27. Illingworth CJR. Superspreaders drive the largest outbreaks of hospital onset COVID-19 infections. https://doi.org/10.31219/osf.io/wmkn3.
28. Berger G. Up to the Line of death: COVID-19 has revealed mortal betrayal of world's healthcare workers. https://blogs.bmj.com/bmj/2021/01/29/up-the-line-to-death-covid-19-has-revealed-a-mortal-betrayal-of-the-worlds-healthcare-workers/ January 2021 (accessed 4/6/21)
29. Zhan *et al.* Death of 23 Health Care Workers in China. N Engl J Med 2020; 382:2267-2268 DOI: 10.1056/NEJMc2005696
30. Koh *et al.* The fight against COVID-19: disinfection protocol and turning over of CleanSpace® HALO™ in a Singapore Hospital Updates in Surgery volume 72, pages 311–313(2020) http://dx.doi.org/10.1007/s13304-020-00809-3
31. Wong, E L-Y *et al.* What is appropriate PPE? Lessons learned from healthcare worker COVID-19 infection in Hong Kong. BMJ 2020;370:m2641 https://doi.org/10.1136/bmj.m2641
32. Cherrie JW e*t al.* Protecting healthcare workers from inhaled SARS-CoV-2 virus. Occupational Medicine doi:10.1093/occmed/kqaa077
33. Morawska L *et al.* A paradigm shift to combat indoor respiratory infection. Science 2021;372(6543):689-691 https://doi.org/10.1126/science.abg2025
34. Butler M *et al.* Effect of Implementation of Aerosol Respiratory Protective Equipment, Vaccination and Natural Infection on a Covid-19 Cohort Ward: A Retrospective Observational Cohort Study. https://doi.org/10.31219/osf.io/nh5sr
35. Higgins GC *et al.* FFP3 Reusable Respirators; the respiratory Personal Protective Equipment (PPE) that Health and Social Care Workers Need, Want and Deserve. BMJ 2021; 372 doi: https://doi.org/10.1136/bmj.n109