Summary of literature identified for the National Policy Guidance & Evidence (NPGE) literature reviews – July to September 2023

Titles and abstracts are reviewed for subject relevance. Additional exclusion criteria are also applied i.e. exclusion of laboratory focussed studies such as molecular typing etc.

Literature review	Papers identified	Summary of Findings	Impact on Recommendations
Respiratory Protective Equipment (RPE)	Cass HG, Hanlon GC, McKenzie DP, et al. The adequacy of user seal checking for N95 respirators compared to formal fit testing: A multicentred observational study. Australian Critical Care. 2023; 36(5): 787-792.	This observational study, conducted at three private intensive care units (ICUs) in Australia, aimed to evaluate the adequacy of a user seal check (compared to qualitative fit testing) in predicting N95 respirator fit. Two brands of N95 respirators (3M 1860 and Halyard Fluidshield) were tested. Study participants were staff members (n=189). Participants were instructed to don the selected respirator as per practice and if they were satisfied with the seal from an independently performed user seal check, then proceeded to a quantitative fit test. The primary outcome measure was the proportion of participants who passed a user seal check	Adds to the evidence base for the following objective: "What is a 'fit check' and how is an FFP respirator fit check carrier out?" The study findings support the existing limited evidence that the user seal/fit check is an inappropriate substitute for the fit test, by demonstrating that a user seal check alone was inadequate to assess N95 respirator fit for

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		(USC) and subsequently failed quantitative fit testing of an N95 respirator. The user seal check was performed as per respective manufacturer instructions to detect any air leaks around the edge of the respirator. The quantitative testing (3M™ FT-30 Bitter) required a fit factor of ≥ 100 to pass. Of the 167 participants who passed a user seal check, 51 (30.5%, 95% CI = 23.7-38.1) failed fit testing on the first respirator type used. Fit testing failure rates for each respirator were 18/60 (30%) for 3M1860 and 33/107 (30.8%) for Halyard. No significant association with fit test failure was found for any baseline variables (sex, occupation, type of training, N95 respirator type (Halyard and 3M), prior N95 respirator use, and critical care experience). This study suggests that a user seal check alone is inadequate in assessing N95 respirator fit and failed to detect inadequate fit in 30% of the sample. Limitations of this study include the use of only two different N95 respirators, limiting generalisability to Scottish health and care settings. The study employed non-randomised first used respirator regardless of size and facial characteristics, which	satisfying the quantitative fit test. No change to current recommendations.

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		is not reflective of normal practice in fit testing programmes, possibly introducing bias to the results.	
Eye and Face Protection	Pratt AA, Brown GD, Perencevich EN, et al. Comparison of virus aerosol concentrations across a face shield worn on a healthcare personnel during a simulated patient cough. Infection Control & Hospital Epidemiology. 2023; 1-6.	This experimental simulation study, aimed to evaluate the effectiveness of face shields on reducing virus exposure by comparing SARS-CoV-2 aerosol particle concentrations (using a MS2 bacteriophage surrogate) across a disposable face shield during a simulated cough. The simulation study was performed in a chamber-like room (8.5m x 3.7m x 2.4m) with controlled conditions (humidity and temperature). An exhale-only coughing machine was set up to simulate a patient coughing viral aerosol particles and exposing a healthcare worker. A face shield was placed on a simulated healthcare worker and positioned 0.41 metres in front of the coughing machine. The surrogate MS2 was aerosolized by the coughing machine. Three sequential coughs were simulated in each trial to recreate a "coughing fit". Biosamplers and two optical particle counters (OPCs) were positioned on the inside (near the mouth of the simulated healthcare worker) and outside of the face shield.	Adds to the evidence base for the following objectives: "When/where should eye/face protection be used for SICPs?" "When/where should eye/face protection be used for TBPs?" In this study, a face shield worn by a simulated healthcare worker was effective at reducing exposure to viral aerosol from a simulated coughing patient at 0.41m. Conclusions of this study cannot be relied upon as the study may not accurately present real-life scenarios and is specific to MS2 particle

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		Aerosolized virus collected by the biosamplers were analysed using a viability plaque assay. Particle concentration was also analysed for the inside and outside of the face shield for all 18 trials. There was a significant reduction (P<0.0006) in viable virus concentration inside of the face shield compared to the external surface, with a relative risk reduction of 69%. Limitations of this study include issues with applicability to real-life healthcare scenarios due to the use of a non-breathing mannequin and exhale-only coughing machine. The results are specific to MS2 bacteriophage particle simulation in a controlled experimental chamber. No mention of fallow time or assessing if aerosol concentrations fell back to baseline, this may have affected results.	simulation in a controlled experimental chamber. No change to current recommendations.

Evidence table – Healthcare Infection Incidents, Outbreaks and Data Exceedance - literature identified

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Management of Incident and Outbreaks in Neonatal Units (NNUs)	Sartor C, Ligi I, Petit PR, et al. Outbreak of adenovirus D8 in a neonatal intensive care unit involving multiple simultaneous transmission pathways Journal of Hospital Infection. 2023; 140: 54-61.	This study reported on an outbreak of Adenovirus (ADV-D8) associated with ophthalmologic equipment during retinopathy of prematurity (ROP) screening in a Neonatal Centre (NCC) at the La Conception Hospital in Marseille, France in 2019. Cases were detected using laboratory testing to detect ADV DNA through real-time PCR of symptomatic patients and healthcare workers displaying respiratory, ocular, or digestive symptoms. All hospitalised patients in the NICU on 07 June 2019 were screened, and parents seen by physicians for conjunctivitis and sampled where possible. A retrospective cohort study was carried out from 29 April to 17 June on all preterm neonates hospitalised to assess risk of ADV infection after ROP examination. Microbiological investigation involved clinical and	Adds to the evidence base for the following objectives: “How should NNU incidents/outbreaks be investigated and managed?” This NNU outbreak study provides evidence of microbiological screening of neonates, parents and HCWs, microbiological sampling of care equipment and the environment, and retrospective analysis. “What are the key measures to control incidents/outbreaks in NNUs and how should

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		environmental sampling; positive samples were genotyped. A patient case was defined as clinical signs of ocular infection or respiratory symptoms AND a positive conjunctival swab for ADV DNA AND hospitalisation in the NNC in the 14 days prior to onset. A probable case was defined as this, but with the absence of a clinical sample for which ADV DNA was tested. Confirmed and probable cases case definitions for HCWs and parents were also established. IPC measures implemented were staff screening for conjunctivitis with symptomatic PCR testing, recommended glove use for eye examinations of infected neonates, and an improved disinfection protocol for the RetCam (200 ppm chlorine dioxide wipes and post-disinfection rinse with sterile water). Between 14 May to 26 June 2019, 15 cases of ADV infection were detected in hospitalised neonates (11 confirmed, four probable). Additional adult cases observed were in nurses (n=2) or parents of neonates (n=18) who had direct patient	these be implemented in NHS Scotland?" This NNU outbreak study implemented measures as part of a bundle. Measures included: staff screening, recommended glove use for examination of symptomatic patients and improved disinfection of care equipment (RetCam). No change to current recommendations.

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		care or contact with infected or colonised neonates. During the outbreak, 110 clinical and environmental specimens were analysed. Next generation sequencing was used for one positive ophthalmic swab (neonate N5). Eleven neonates had at least one positive test for ADV DNA. One neonate was not typed due to transfer to another hospital. ADV DNA was detected in 6/12 environmental samples, collected from the handle, lens and keyboard of the RetCam. One sample from the freezer handle of the parents' temporary accommodation was identified as positive. All ADV positive samples from neonates, adults and the environment were typed as D8 or D. ADV infection was found significantly more frequently in neonates who had received ROP examinations (37.8%, 14/37) compared to those without (0.9%, 1/110) ($p<0.001$), with a relative risk (RR) of 41.6 (95% CI, 5.7-305.8).	

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		As this is an outbreak study from a hospital in France, findings may not be generalisable to Scottish neonatal health and care settings.	