Summary of literature identified for the National Policy Guidance and Evidence (NPGE) literature reviews – October to December 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
Aerosol Generating Procedures (AGPs)	Zhang MX, Lilien TA, van Etten-Jamaludin FS, et al. Generation of Aerosols by Noninvasive Respiratory Support Modalities: A Systematic Review and Meta-Analysis. JAMA Netw Open. 2023; 6(10): e2337258–e2337258.	This systematic review with meta-analysis aimed to evaluate the potential for high flow nasal oxygen (HFNO) and non-invasive ventilation (NIV) to increase pathogen-laden aerosols and aerosol production, compared with treating patients without such procedures. A systematic review was carried out. Eligible studies were those including patients or healthy volunteers receiving HFNO or NIV. Studies ineligible for meta-analysis were those where data was derived from a single person. The primary outcomes of interest were the detection of pathogens in air samples and the quantity of aerosol particles <100µm. This systematic review and meta-analysis carried out independent screening and	Adds to the evidence base for recommendations under the following objective: "Which procedures are considered to be aerosol generating?" The NIPCM currently classes HFNO and NIV as AGPs. This systematic review and meta-analysis suggests HFNO should not be classed as an AGP, and evidence regarding NIV is limited. As per the Aerosol-generating procedures:

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		data extraction. This included 24 studies after screening. Meta-analysis of five observational studies investigating air samples positive for SARS-CoV-2 by HFNO identified no association between HFNO and pathogen-containing air samples (OR for positive samples, 0.73 [95% CI, 0.15-3.55] and 0.80 [95% CI, 0.14-4.59] at sample and patient level respectively). Heterogeneity appears low (I^2=0%), however 95% CI range from 0% to 85% and is therefore uncertain. Meta-analysis of two observational studies investigating air samples positive for SARS-CoV-2 from patients with COVID-19 identified no association of NIV with pathogen-detected air samples (OR for positive samples, 0.38 [95% CI, 0.03-4.63] and 0.43 [95% CI, 0.01-27.12] at sample and patient level respectively). Heterogeneity could not be assessed due to inclusion of only two studies. This systematic review with meta-analysis suggests that HFNO does not result in clinically relevant increases in pathogen or aerosol production. NIV was based on low quality studies with meta-analysis of only	current situation for Scotland SBAR v1.2, Scotland is to continue with the extant AGP list as published in the NIPCM, with a review of the status immediately following the completion of the NIPCM TBP definitions systematic review update. No change to current recommendations.

Literature review	Papers identified	Summary of Findings	Impact on Recommendations
		two studies, and therefore conclusions cannot be drawn. Limitations of this study include no definition provided for patient and sample level data, low quality observational air sampling studies with small samples sizes, and high heterogeneity between individual studies regarding design and methods (type of aerosol particle detectors, sampling methods, positions, timing of disease and units of aerosol measurement and size).	
TBP definitions	Pan S, Xu C, Yu CWF, et al. Characterization and size distribution of initial droplet concentration discharged from human breathing and speaking Indoor and Built Environment. 2023; 32(10): 2020-2033.	This cross-sectional study aimed to characterise the concentration and size distribution of droplets produced by human subjects during breathing and speaking, including nose and mouth breathing, reading alphabets, and counting numbers, using an aerodynamic particle sizer to determine the potential route of transmission of pathogens and diseases. There were significant differences (p<.001) in droplet concentration among the four breathing and speaking activities, but not for reading alphabets and counting numbers (p=1). The droplet concentration during nose breathing (p<.05), but not	Adds to the evidence base for the following objectives: “Which activities result in droplet transmission?” No changes to recommendations.

Literature review	Papers identified	Summary of Findings	Impact on Recommendations
		mouth breathing (*p*=.136), of male subjects was found to be significantly higher compared to females. The droplet concentration during reading letters with special phonemes was found to be significantly higher (*p*<.05) compared to reading letters without phonemes. The droplet sizes from the four breathing activities were generally small (over 50% were <1.037μm, over 80% were <2.642μm), with no particles larger than 8μm. This study had limitations. The study lacked ecological validity where participants had to sit with their mouth closely placed into the funnel of the aerodynamic particle sizer. The effects of the loudness and content of vocalisation on droplet concentration were not considered. The study recruited only healthy participants. The sample size may have been too small to account for inter-individual variability. The aerodynamic particle sizer had a reduced detection efficiency between .3 to .5μm and a detection blank below these sizes.	

Literature review	Papers identified	Summary of Findings	Impact on Recommendations
		The study findings add to the evidence base for recommendations regarding what activities result in droplet transmission, including nose and mouth breathing and speaking.	

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

Literature review	Papers identified	Summary of scientific findings	Impact on Recommendations
Management of incidents and outbreaks in a neonatal unit (NNU)	Zarras C, Iosifidis E, Simitsopoulou M, et al. Neonatal Bloodstream Infection with Ceftazidime-Avibactam-Resistant blaKPC-2-Producing Klebsiella pneumoniae Carrying blaVEB-25. Antibiotics. 2023; 12(8): 1290.	This outbreak study reported a neonatal sepsis case due to ceftazidime/avibactam-resistant blaKPC-2-harbouring *Klebsiella pneumoniae* carrying blaVEB-25 and the use of a customised active surveillance program in conjunction with enhanced infection control measures. Enhanced infection control measures included the cohorting of all neonates colonised/infected with an *A. baumannii* strain, isolation of cases, dedicated nurse for all shifts, universal application of contact precautions, written reports of active surveillance, and daily audits by infection control team. Active surveillance included twice weekly colonisation cultures, specifically stool samples cultured on MacConkey agar plates supplemented with 1mg/L meropenem. Antimicrobial susceptibility testing was conducted. Active surveillance also included gut and pharyngeal and environmental cultures.	Adds to the evidence base for the following objectives: “What are the key measures to control incidents/outbreaks in NNUs and how should these be implemented in NHS Scotland?” “How should NNU incidents/outbreaks be reported?” No changes to current recommendations.

Literature review	Papers identified	Summary of scientific findings	Impact on Recommendations
		The study findings add to the evidence base for recommendations regarding the key measures to control incidents/outbreaks in NNUs, including patient isolation and cohorting, ensuring staffing levels meet the minimum requirements for the level of care being provided, use of personal protective equipment, and ongoing microbiological screening.	