

**Supplementary Tables 1-4**

**Exhaled air dispersion during bag-mask ventilation and sputum suctioning - Implications for  
infection control**

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**Supplementary Table 1.** Differences of dispersion distance of exhaled air during bag-mask ventilation between nurses and anesthesiologists/intensivists, respiratory physicians or medical students, using Laerdal silicone resuscitator; Ambu silicone resuscitator with and without breathing filter.

	Mean difference (95%CI) (mm)	* <i>p</i> value
<b>Overall</b>		
Nurses – Anesthesiologists/Intensivists	69 (42 – 96)	<0.001
Nurses – Respiratory physicians	72 (45 – 99)	<0.001
Nurses – Medical students	67 (40 – 94)	<0.001
<b>Laerdal silicone resuscitator</b>		
Nurses – Anesthesiologists/Intensivists	70 (-0.5 – 140)	0.052
Nurses – Respiratory physicians	44 (-26 – 114)	0.476
Nurses – Medical students	23 (-15 – 125)	0.187
<b>Ambu silicone resuscitator</b>		
Nurses – Anesthesiologists/Intensivists	25 (-43 – 94)	>0.999
Nurses – Respiratory physicians	80 (12 – 149)	0.017
Nurses – Medical students	33 (-36 – 101)	>0.999
<b>Ambu silicone resuscitator with breathing filter</b>		
Nurses – Anesthesiologists/Intensivists	114 (42 – 185)	0.001
Nurses – Respiratory physicians	93 (22 – 165)	0.007
Nurses – Medical students	112 (41 – 184)	0.001

\*General linear model with *post hoc* Bonferroni test.  
 CI = confidence intervals

**Supplementary Table 2.** Differences of dispersion distance of exhaled air during bag-mask ventilation using Laerdal silicone resuscitator, stratified by anesthesiologists/intensivists, respiratory physicians, medical students and nurses.

	Mean difference (95%CI) (mm)	* <i>p</i> value
<b>Overall</b>		
Ambu silicone resuscitator – Laerdal silicone resuscitator	44 (21 – 68)	<0.001
Ambu silicone resuscitator – Ambu silicone resuscitator with filter	71 (42 – 100)	<0.001
Laerdal silicone resuscitator – Ambu silicone resuscitator with filter	27 (-2 – 56)	0.074
<b>Anesthesiologists/Intensivists</b>		
Ambu silicone resuscitator - Laerdal silicone resuscitator	81 (51– 111)	<0.001
Ambu silicone resuscitator - Ambu silicone resuscitator with filter	114 (84 – 144)	<0.001
Laerdal silicone resuscitator – Ambu silicone resuscitator with filter	33 (3 – 63)	0.029
<b>Respiratory physicians</b>		
Ambu silicone resuscitator - Laerdal silicone resuscitator	0 (-29 – 29)	>0.999
Ambu silicone resuscitator - Ambu silicone resuscitator with filter	39 (10 – 69)	0.009
Laerdal silicone resuscitator – Ambu silicone resuscitator with filter	39 (10 – 68)	0.009
<b>Medical Students</b>		
Ambu silicone resuscitator - Laerdal silicone resuscitator	59 (-23 – 141)	0.205
Ambu silicone resuscitator - Ambu silicone resuscitator with filter	106 (24 – 188)	0.011
Laerdal silicone resuscitator – Ambu silicone resuscitator with filter	47 (-35 – 129)	0.419
<b>Nurses</b>		
Ambu silicone resuscitator - Laerdal silicone resuscitator	37 (-54 – 128)	0.858
Ambu silicone resuscitator - Ambu silicone resuscitator with filter	26 (-65 – 117)	>0.999
Laerdal silicone resuscitator – Ambu silicone resuscitator with filter	-11 (-102 – 80)	>0.999

\*General linear model with *post hoc* Bonferroni test.

CI = confidence intervals

**Supplementary Table 3.** Dispersion distances of exhaled air in the median sagittal plane during normal, mild and poor cough before and after oro-tracheal suctioning in a human patient simulator with and without tracheal intubation

	Coughing efforts		
	Normal	Mild	Poor
<b>Without tracheal intubation</b>			
No suctioning	860 ± 93	290 ± 43	185 ± 19
	845 (771 – 959)	299 (284 – 328)	179 (172 – 195)
Intermittent suctioning	708 ± 105	269 ± 71	170 ± 33
	687 (638 – 810)	268 (220 – 314)	174 (141 – 199)
Continuous suctioning	595 ± 122	232 ± 70	164 ± 31
	623 (478 – 694)	223 (189 – 295)	166 (134 – 185)
<b>With tracheal intubation</b>			
No suctioning	460 ± 127	305 ± 77	189 ± 63
	443 (363 – 567)	288 (244 – 365)	175 (142 – 212)
Continuous suctioning	259 ± 45	174 ± 26	137 ± 27
	269 (210 – 299)	178 (155 – 193)	138 (113 – 156)

Values are mean ± standard deviations, median (interquartile range).

**Supplementary Table 4.** Effect of Continuous or intermittent suctioning on the dispersion distance of exhaled air with and without tracheal intubation in the sagittal plane.

	Mean difference (95%CI) mm	Percentage change in dispersion distance	* <i>p</i> value
<b>Tracheal intubation</b>			
<i>Overall</i>			
No suctioning – continuous suctioning	128 (103 – 153)	-40.3%	<0.001
<i>Normal coughing effort</i>			
No suctioning – continuous suctioning	201 (140 – 262)	-43.7%	<0.001
<i>Mild coughing effort</i>			
No suctioning – continuous suctioning	305 (278 – 331)	-43.0%	<0.001
<i>Poor coughing effort</i>			
No suctioning – continuous suctioning	52 (21 – 83)	-27.6%	0.002
<b>Without tracheal intubation</b>			
<i>Overall</i>			
No suctioning – continuous suctioning	305 (270 – 340)	-48.0%	<0.001
No suctioning – intermittent suctioning	253 (218 – 288)	-39.8%	<0.001
Intermittent – continuous suctioning	52 (17 – 87)	-13.6%	0.001
<i>Normal coughing effort</i>			
No suctioning – continuous suctioning	266 (182 – 349)	-30.9%	<0.001
No suctioning – intermittent suctioning	152 (68 – 236)	-17.7%	<0.001
Intermittent – continuous suctioning	113 (29 – 197)	-13.6%	0.005
<i>Mild coughing effort</i>			
No suctioning – continuous suctioning	628 (567 – 690)	-73.0%	<0.001
No suctioning – intermittent suctioning	591 (530 – 653)	-68.8%	<0.001
Intermittent – continuous suctioning	37 (-25 – 98)	-13.6%	0.441
<i>Poor coughing effort</i>			
No suctioning – continuous suctioning	21 (-1 – 43)	-11.2%	0.065
No suctioning – intermittent suctioning	15 (-7 – 37)	-8.2%	0.297
Intermittent – continuous suctioning	6 (-16 – 28)	-3.6%	>0.999

\*General linear model with *post hoc* Bonferroni test.

CI = confidence intervals