

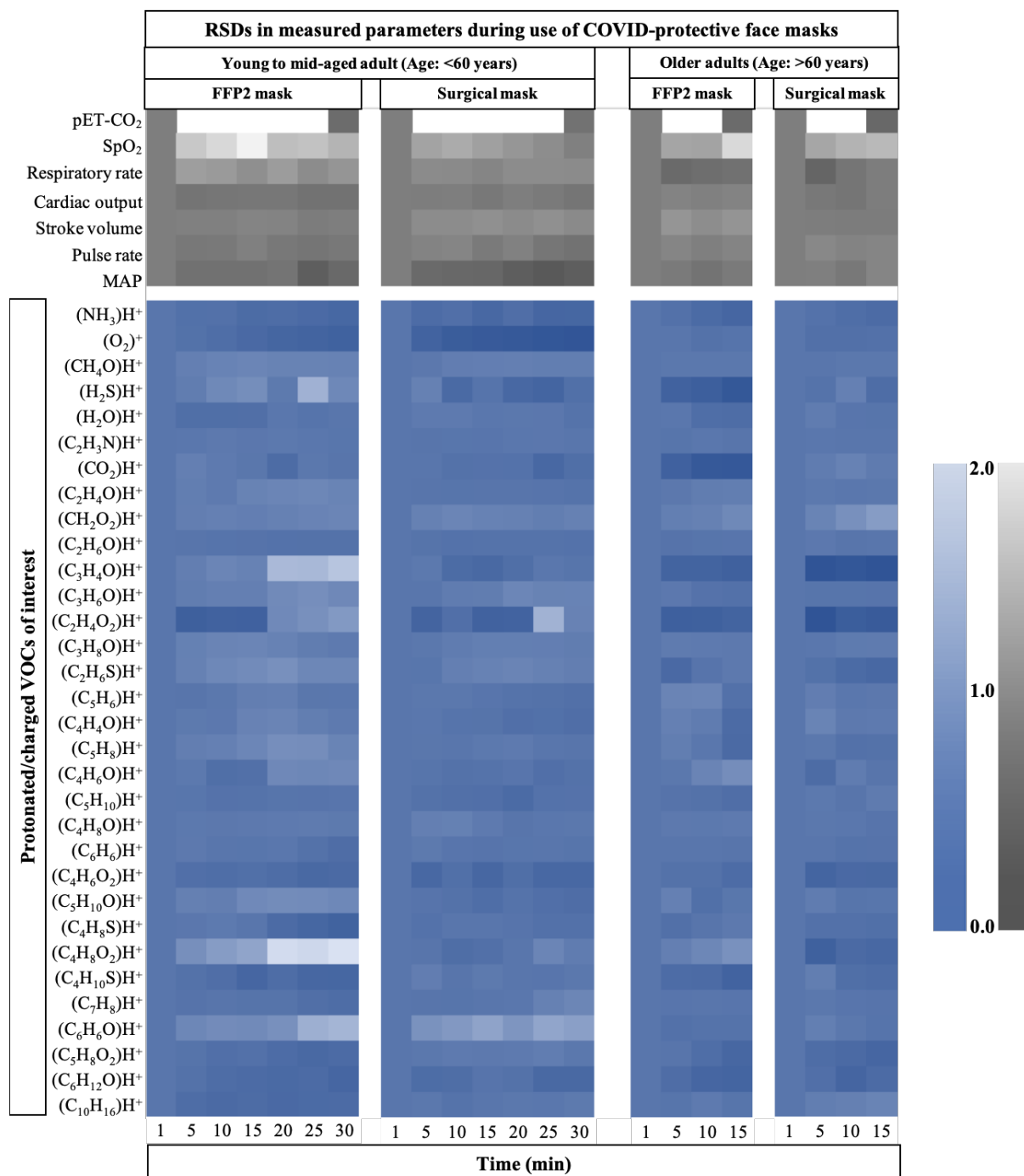
Effects of COVID-19 protective face-masks and wearing durations onto respiratory-hemodynamic physiology and exhaled breath constituents

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Supplementary information



Supplementary Figure S1: Relative changes in coefficient of variation (RSDs) of physiological parameters and of exhaled alveolar VOCs during the use of COVID-protective face masks by young to mid-aged and older adults. Y-axis represents the RSDs of physiological parameters viz. pET-CO₂, SpO₂, respiratory rate, cardiac output, stroke volume, pulse rate, mean arterial pressure (MAP) and the protonated/charged VOCs of interest. X-axis indicates time in minute. VOCs were tentatively identified according to their mass/charge ratio. For each individual, RSDs of VOCs were normalised onto corresponding values from the first minute. Respiratory-, hemodynamic parameters and SpO₂ are normalized likewise. The normalised RSDs from every 5th minute is presented here. The RSDs of pET-CO₂ are presented from immediately before and after mask use and are placed at the first and final minute of heatmaps. Light and dark colours symbolise relatively higher and lower RSDs of measured parameters, respectively.

Supplementary Table S3: Results from pairwise-multiple comparisons of relative changes (in %) between groups. Statistical significances are tested by means of repeated measurement-ANOVA on ranks (p -value ≤ 0.005). From all pairwise-multiple comparisons, statistically significant difference along with corresponding p -values are listed with respect to % of changes caused by “FFP2 mask on older adults (FFP2_15min_O)”. Statistically significant (p -value ≤ 0.005) correlations are assigned in bold.

SpO ₂	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	<0.001	Yes
	FFP2_30min_A	<0.001	Yes
	Surg_15min_A	<0.001	Yes
	Surg_30min_A	<0.001	Yes
	Surg_15min_O	<0.001	Yes

RR	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	<0.001	Yes
	FFP2_30min_A	0.003	Yes
	Surg_15min_A	0.212	No
	Surg_30min_A	0.149	No
	Surg_15min_O	0.365	No

CO	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	0.002	Yes
	FFP2_30min_A	0.35	No
	Surg_15min_A	0.004	Yes
	Surg_30min_A	1.471	No
	Surg_15min_O	0.005	Yes

Exhaled O ₂	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	<0.001	Yes
	FFP2_30min_A	0.266	No
	Surg_15min_A	0.002	Yes
	Surg_30min_A	<0.001	Yes
	Surg_15min_O	1.567	No

Isoprene	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	<0.001	Yes
	FFP2_30min_A	0.002	Yes
	Surg_15min_A	1.453	No
	Surg_30min_A	0.005	Yes
	Surg_15min_O	0.001	Yes

DMS	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	0.003	Yes
	FFP2_30min_A	<0.001	Yes
	Surg_15min_A	0.75	No
	Surg_30min_A	0.004	Yes
	Surg_15min_O	0.368	No

Acetaldehyde	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	1.81	No
	FFP2_30min_A	2.065	No
	Surg_15min_A	0.05	No
	Surg_30min_A	0.021	No
	Surg_15min_O	0.001	Yes

Ethanol	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	0.006	No
	FFP2_30min_A	0.001	Yes
	Surg_15min_A	0.031	No
	Surg_30min_A	0.4	No
	Surg_15min_O	0.003	Yes

pET-CO ₂	Vs.	P-value	Sig.
FFP2_15min_O	Surg_30min_A	<0.001	Yes
	FFP2_30min_A	<0.001	Yes
	Surg_15min_O	<0.001	Yes

MAP	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	0.003	Yes
	FFP2_30min_A	1.25	No
	Surg_15min_A	0.005	Yes
	Surg_30min_A	0.007	No
	Surg_15min_O	0.001	Yes

Exhaled H ₂ O	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	<0.001	Yes
	FFP2_30min_A	0.37	No
	Surg_15min_A	<0.001	Yes
	Surg_30min_A	0.005	Yes
	Surg_15min_O	0.001	Yes

Acetone	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	0.063	No
	FFP2_30min_A	<0.001	Yes
	Surg_15min_A	1.055	No
	Surg_30min_A	<0.001	Yes
	Surg_15min_O	1.121	No

Acetic acid	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	2.003	No
	FFP2_30min_A	1.301	No
	Surg_15min_A	0.001	Yes
	FFP2_30min_A	<0.001	Yes
	Surg_15min_O	0.554	No

Limonene	Vs.	P-value	Sig.
FFP2_15min_O	FFP2_15min_A	<0.001	Yes
	FFP2_30min_A	0.005	Yes
	Surg_15min_A	0.004	Yes
	Surg_30min_A	0.001	Yes
	Surg_15min_O	1.331	No