

Supplementary material

Effect of data reduction techniques on daily moderate to vigorous physical activity collected with ActiGraph® in people with COPD

Table S1 – Summary output from the Aligned Rank Transform-ANOVA with cutoff, epoch, and filter effects on estimates of time spent in moderate-to-vigorous physical activities in people with chronic obstructive pulmonary disease ($n = 136$).

Fixed Effects	F-value	Partial eta squared	p-value
Filter	520.90	0.79	<0.001
Epoch length	518.79	0.79	<0.001
Cutoff	206.78	0.61	<0.001
Filter x Epoch length	135.78	0.5	<0.001
Filter x Cutoff	361	0.73	<0.001
Epoch length x Cutoff	234.57	0.63	<0.001
Filter x Epoch length x cutoff	108.42	0.45	<0.001

Table S2 – Summary output from the Aligned Rank Transform-ANOVA with cutoff, epoch, and filter effects on estimates of time spent in moderate-to-vigorous physical activities including ActiGraph data from people with chronic obstructive pulmonary disease assessed before pulmonary rehabilitation ($n = 121$).

Fixed Effects	F-value	Partial eta squared	p-value
Filter	563.56	0.82	<0.001
Epoch length	477.44	0.8	<0.001
Cutoff	175.73	0.59	<0.001
Filter x Epoch length	184.03	0.61	<0.001
Filter x Cutoff	309.47	0.72	<0.001
Epoch length x Cutoff	219.75	0.65	<0.001
Filter x Epoch length x cutoff	97.27	0.45	<0.001

Table S3 – Summary output from the Aligned Rank Transform-ANOVA with cutoff, epoch, and filter effects on estimates of time spent in moderate-to-vigorous physical activities including ActiGraph data from people with chronic obstructive pulmonary disease assessed after pulmonary rehabilitation ($n = 15$)

Fixed Effects	F-value	Partial eta squared	P-value
Filter	18.42	0.57	<0.001
Epoch length	38.14	0.73	<0.001
Cutoff	28.72	0.67	<0.001
Filter x Epoch length	6.57	0.32	0.023
Filter x Cutoff	26.64	0.66	<0.001
Epoch length x Cutoff	15.86	0.53	0.001
Filter x Epoch length x cutoff	8.92	0.39	<0.001

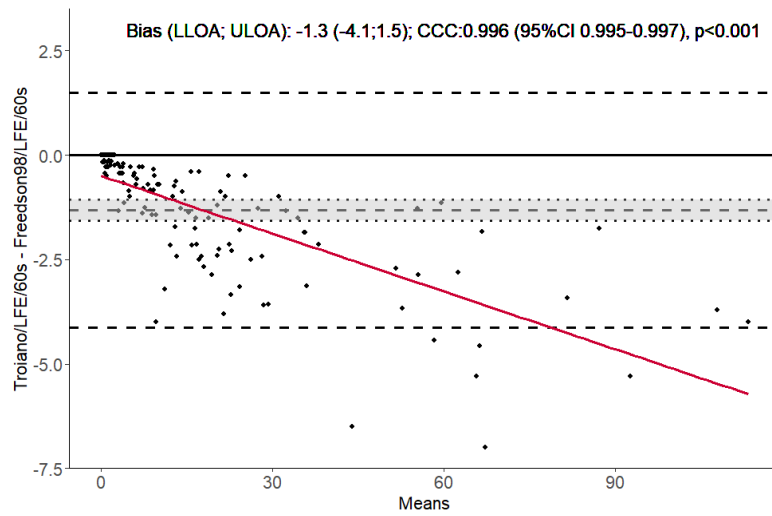


Figure S1: Bland–Altman 95% limits of agreement plot for Troiano and Freedson98 cutoffs, with 60-second epoch and low-frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

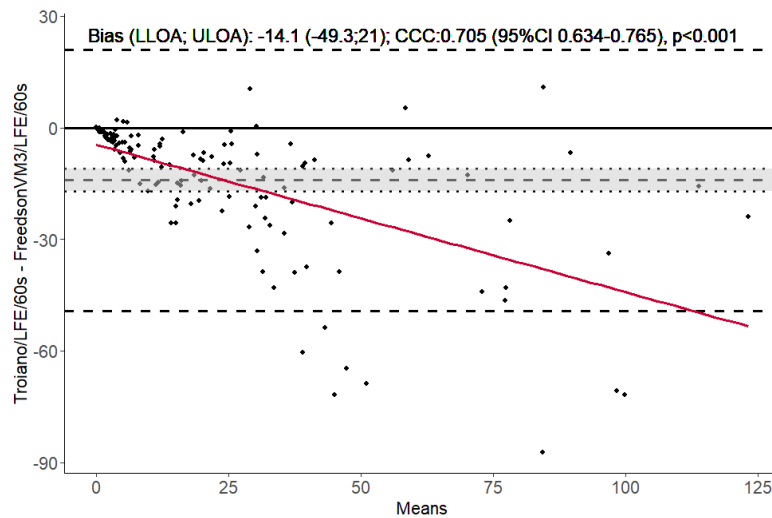


Figure S2: Bland–Altman 95% limits of agreement plot for Troiano and FreedsonVM3 cutoffs, with 60-second epoch and low-frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

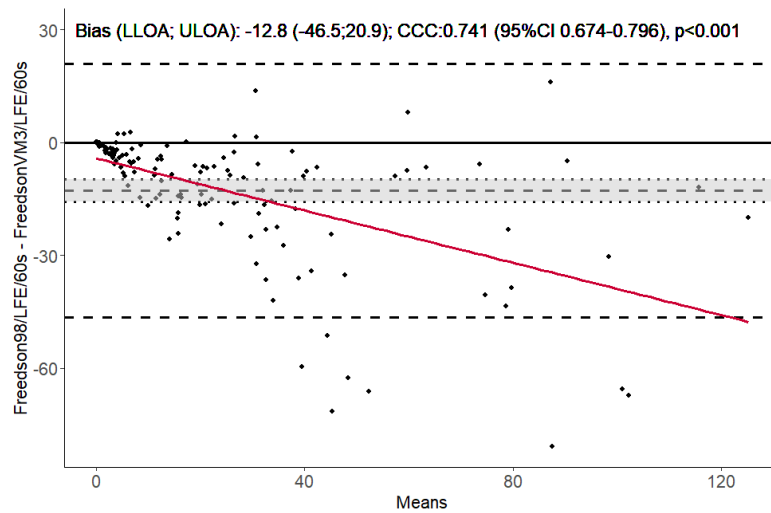


Figure S3: Bland–Altman 95% limits of agreement plot for Freedson98 and FreedsonVM3 cutoffs, with 60-second epoch and low-frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

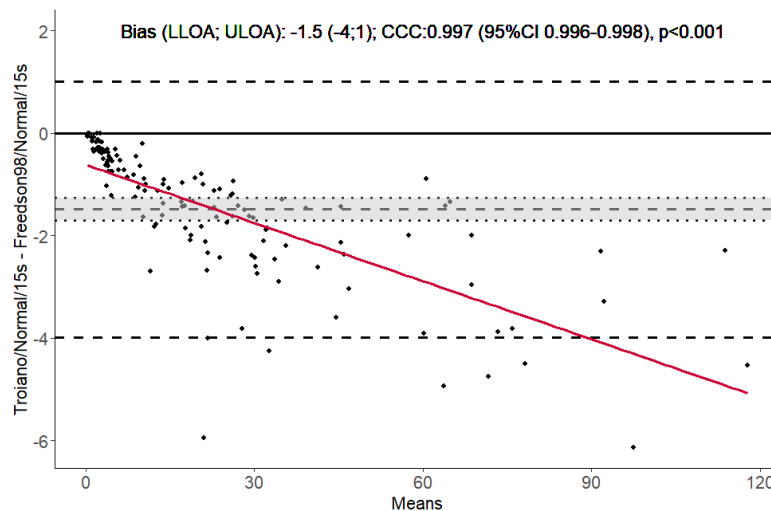


Figure S4: Bland–Altman 95% limits of agreement plot for Troiano and Freedson98 cutoffs, with 15-second epoch and normal filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; ULOA – upper limit of agreement.

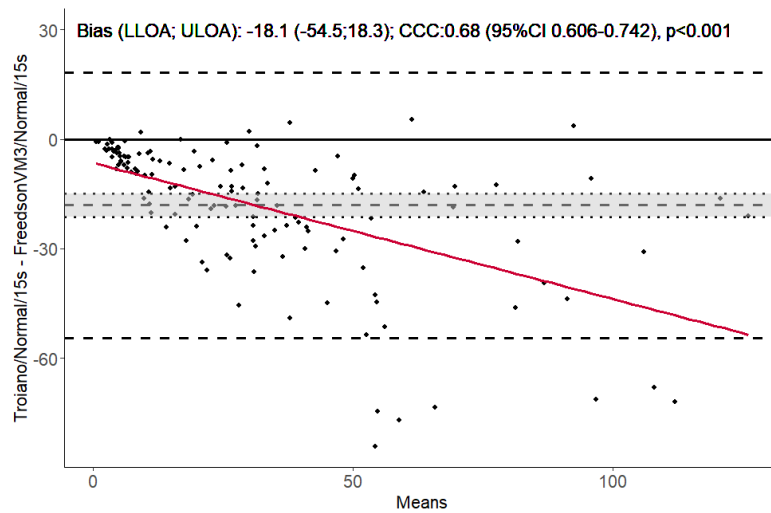


Figure S5: Bland–Altman 95% limits of agreement plot for Troiano and FreedsonVM3 cutoffs, with 15-second epoch and normal filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; ULOA – upper limit of agreement.

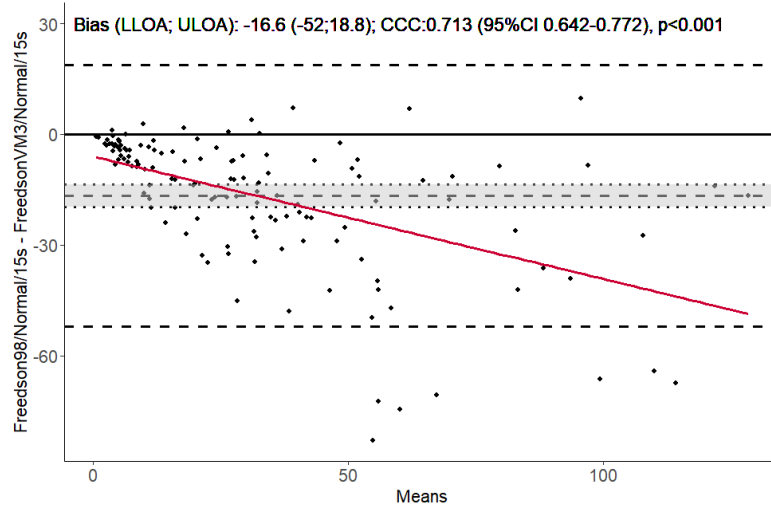


Figure S6: Bland–Altman 95% limits of agreement plot for Freedson98 and FreedsonVM3 cutoffs, with 15-second epoch and normal filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; ULOA – upper limit of agreement.

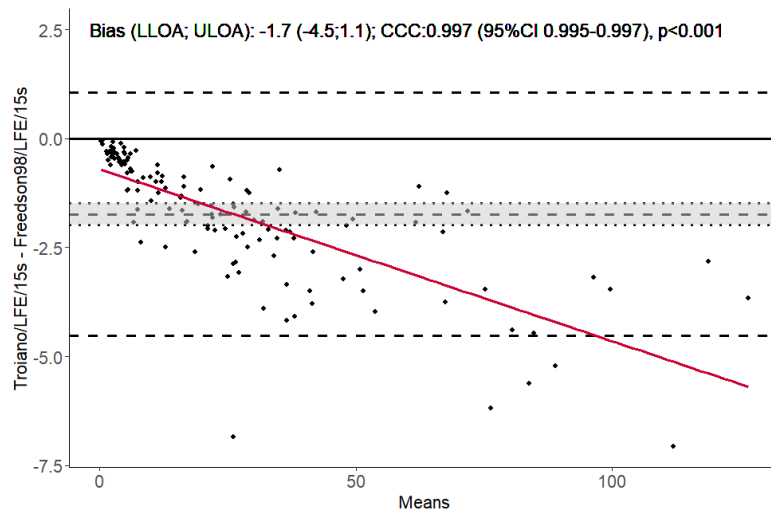


Figure S7: Bland–Altman 95% limits of agreement plot for Troiano and Freedson98 cutoffs, with 15-second epoch and low-frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

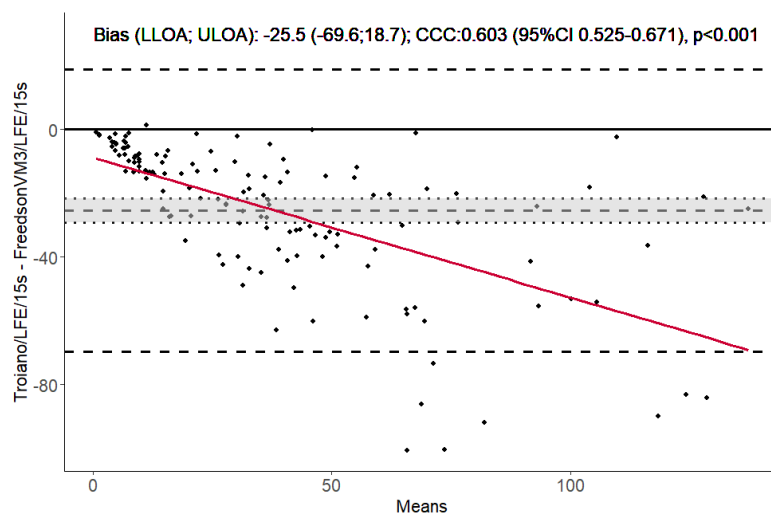


Figure S8: Bland–Altman 95% limits of agreement plot for Troiano and FreedsonVM3 cutoffs, with 15-second epoch and low-frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

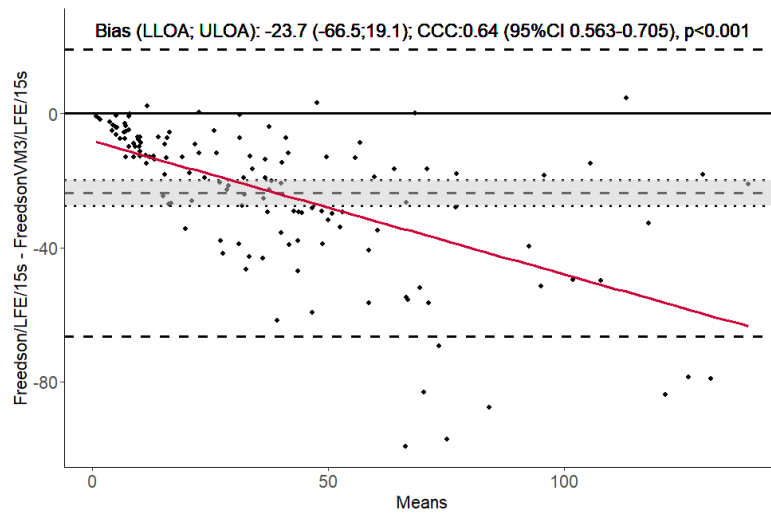


Figure S9: Bland–Altman 95% limits of agreement plot for Freedson98 and FreedsonVM3 cutoffs, with 15-second epoch and low-frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

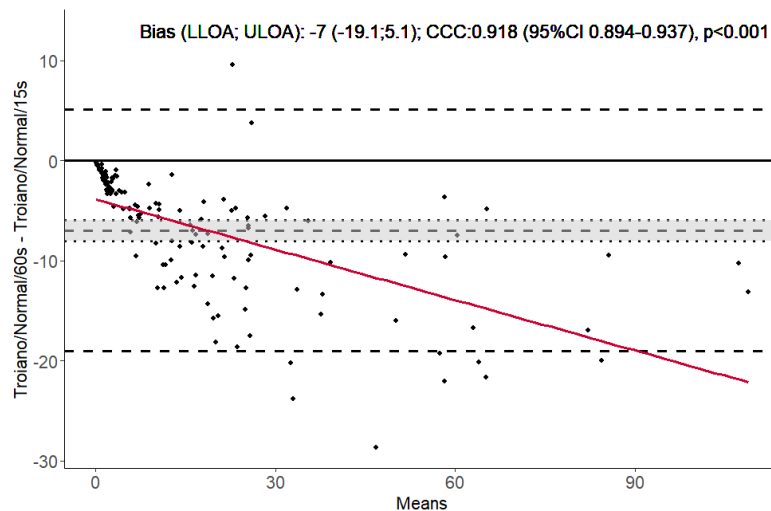


Figure S10: Bland–Altman 95% limits of agreement plot for 60-second and 15-second epochs, with Troiano cutoff and normal filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; ULOA – upper limit of agreement.

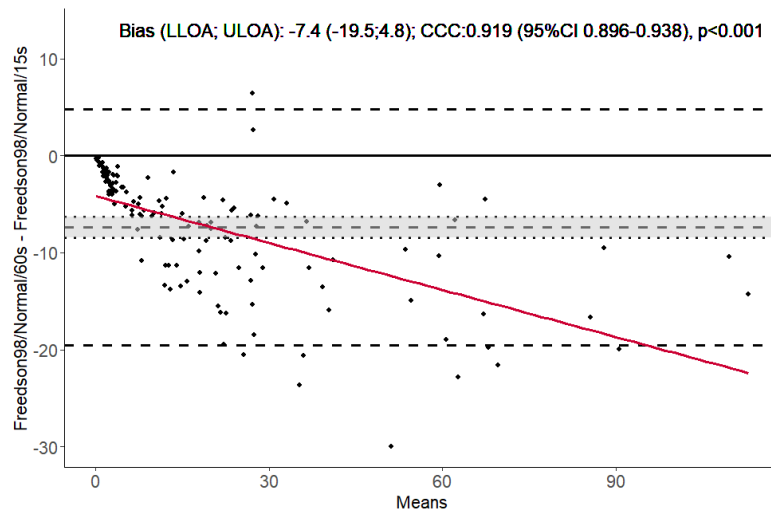


Figure S11: Bland–Altman 95% limits of agreement plot for 60-second and 15-second epochs, with Freedson98 cutoff and normal filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; ULOA – upper limit of agreement.

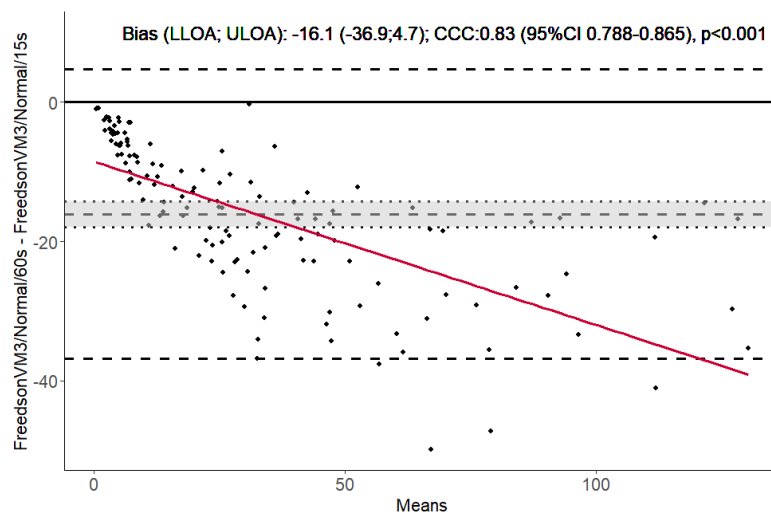


Figure S12: Bland–Altman 95% limits of agreement plot for 60-second and 15-second epochs, with FreedsonVM3 cutoff and normal filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; ULOA – upper limit of agreement.

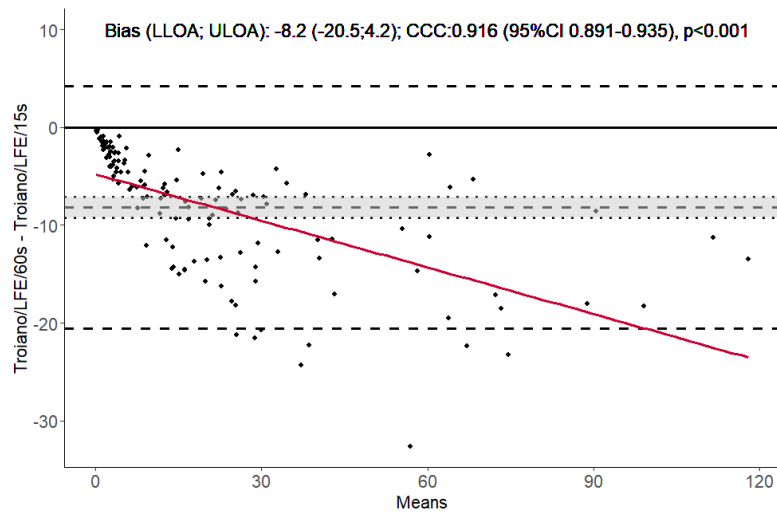


Figure S13: Bland–Altman 95% limits of agreement plot for 60-second and 15-second epochs, with Troiano cutoff and low frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

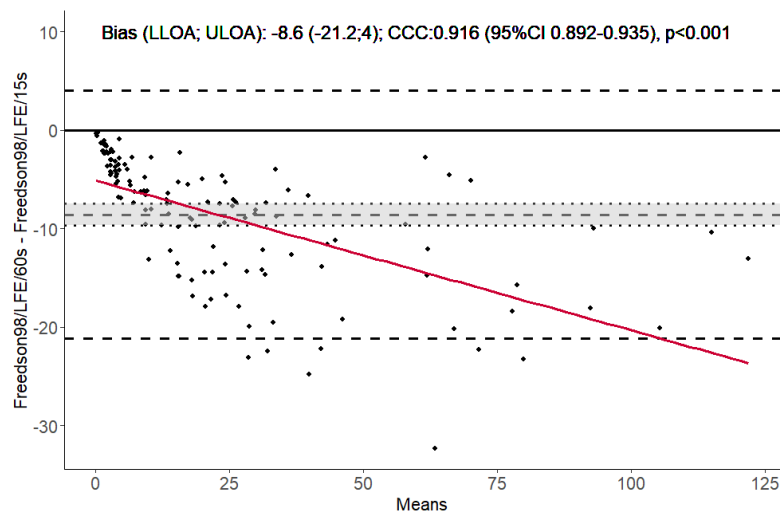


Figure S14: Bland–Altman 95% limits of agreement plot for 60-second and 15-second epochs, with Freedson98 cutoff and low frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

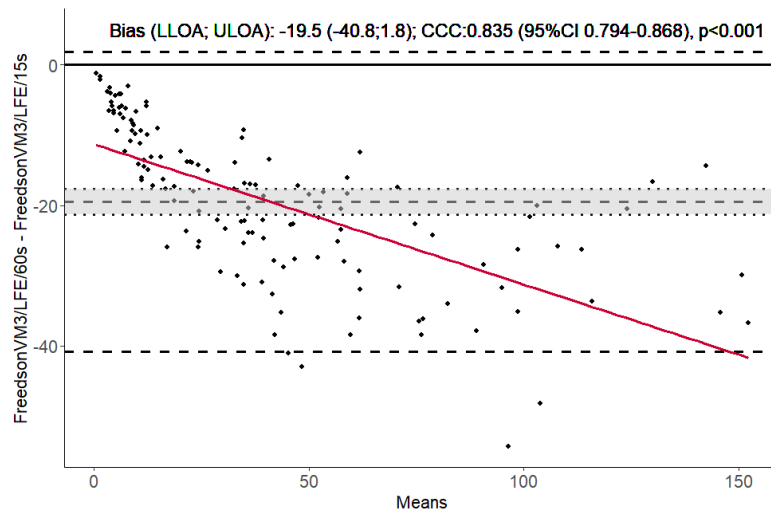


Figure S15: Bland–Altman 95% limits of agreement plot for 60-second and 15-second epochs, with FreedsonVM3 cutoff and low frequency extension filter fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin's correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin's concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

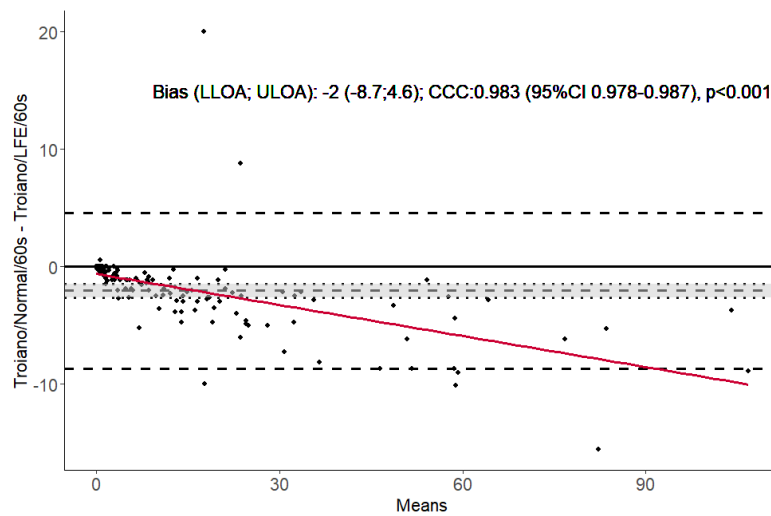


Figure S16: Bland–Altman 95% limits of agreement plot for normal and low-frequency extension filters, with Troiano cutoff and 60-second epochs fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin's correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin's concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

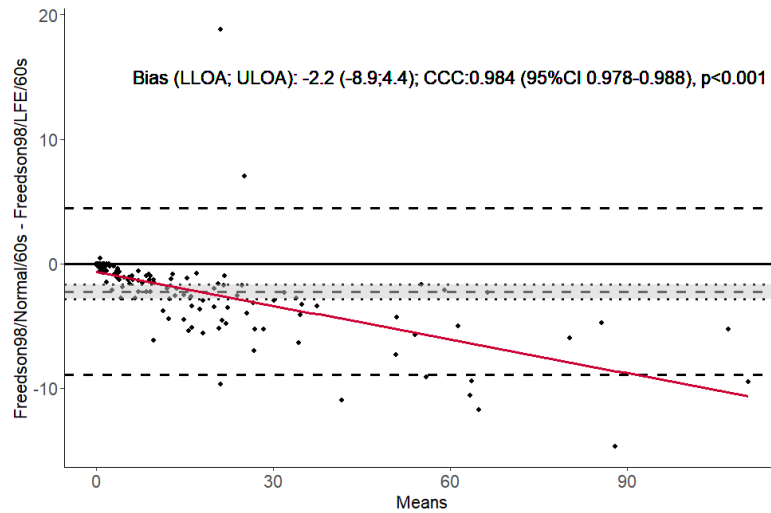


Figure S17: Bland–Altman 95% limits of agreement plot for normal and low-frequency extension filters, with Freedson98 cutoff and 60-second epochs fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin's correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin's concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

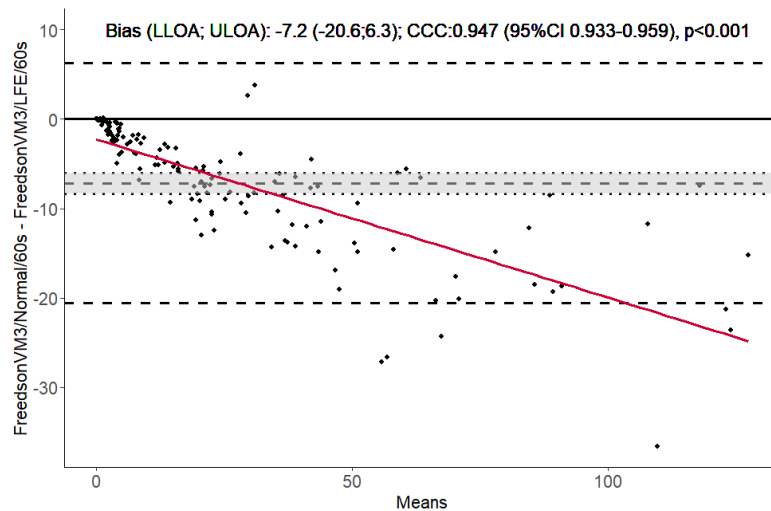


Figure S18: Bland–Altman 95% limits of agreement plot for normal and low-frequency extension filters, with FreedsonVM3 cutoff and 60-second epochs fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin's correlation coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin's concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

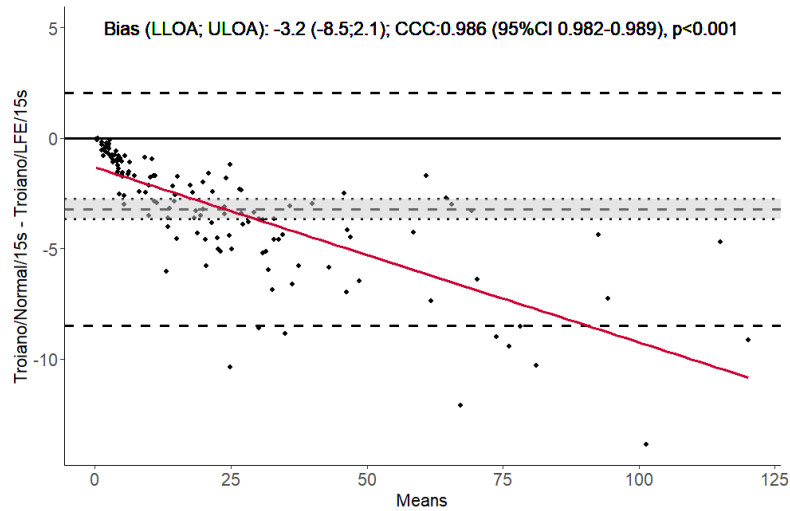


Figure S19: Bland–Altman 95% limits of agreement plot for normal and low-frequency extension filters, with Troiano cutoff and 15-second epochs fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

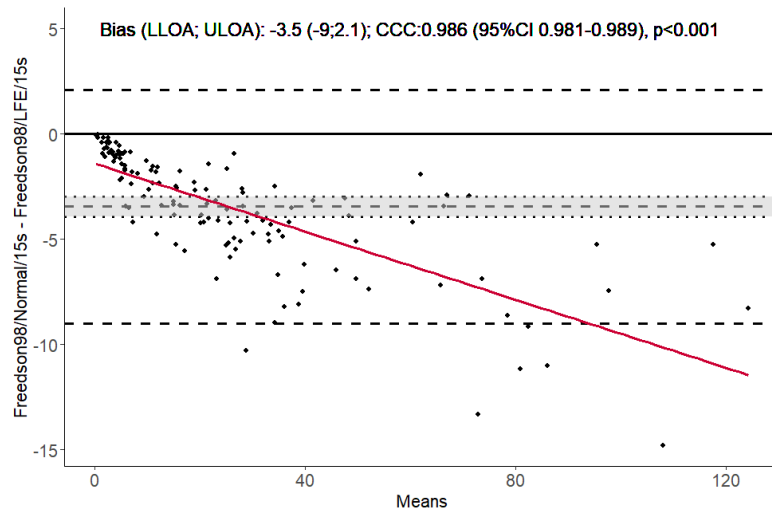


Figure S20: Bland–Altman 95% limits of agreement plot for normal and low-frequency extension filters, with Freedson98 cutoff and 15-second epochs fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.

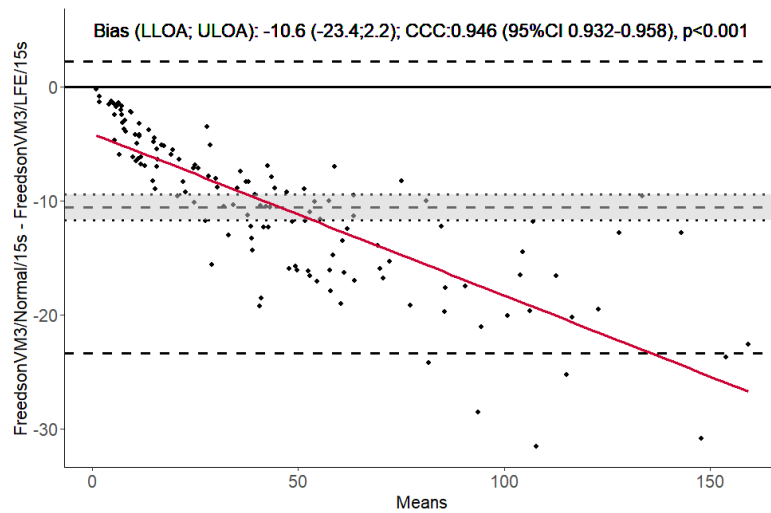


Figure S21: Bland–Altman 95% limits of agreement plot for normal and low-frequency extension filters, with FreedsonVM3 cutoff and 15-second epochs fixed in people with chronic obstructive pulmonary disease ($n=136$). Dashed lines represent bias (mean difference), lower and upper limits of agreement and the grey shadow represent the 95% confidence interval of the mean difference. Bias, lower and upper limits of agreement, Lin’s concordance coefficient and the p -value for the slope of the linear regression of the differences on averages (red line) are presented. CCC - Lin’s concordance correlation coefficient. CI – Confidence interval; LLOA – lower limit of agreement; LFE – low frequency extension filter; ULOA – upper limit of agreement.