

Andningsloopar vid ergospirometri SFE-24

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Flöde-volymloop

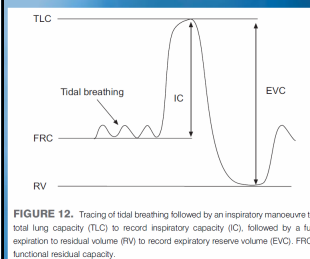


FIGURE 12. Tracing of tidal breathing followed by an inspiratory manoeuvre to total lung capacity (TLC) to record inspiratory capacity (IC), followed by a full expiration to residual volume (RV) to record expiratory reserve volume (ERV). FRC: functional residual capacity.

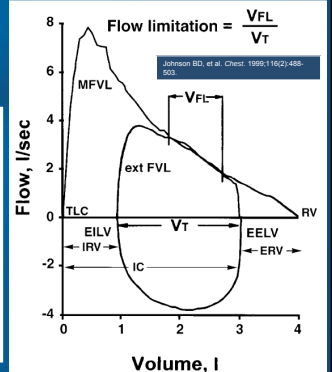


FIGURE 1. Defining expiratory flow limitation, extFVLs are aligned within the MEFL according to a measured EELV. The percent of the tidal breath (VFL) that expiratory air flows meet or exceed the MEFLs are used as an estimate as to the degree of expiratory flow limitation. ERV = expiratory reserve volume; IRV = inspiratory reserve volume.

Flöde-volymloop under arbete

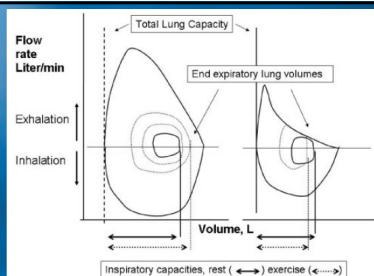


Figure 7. Flow-volume loops. Spontaneous tidal flow-volume loops at rest (inner solid lines) and exercise (dotted lines) and maximal flow-volume loops measured before exercise (outer solid lines) for a normal subject (left) and a patient with chronic obstructive pulmonary disease (right). Tidal flow-volume loops are positioned within the maximal loops by periodic measurement of inspiratory capacity (←→) during exercise. On the left, the normal subject increases tidal volume (x-axis) without reaching maximal flow rates and with stable or increased inspiratory capacity (arrows). In contrast, on the right, the patient with chronic obstructive pulmonary disease attains maximal expiratory flow rates during spontaneous breaths and needs to increase end-expiratory lung volume, as inferred from a decrease in inspiratory capacity.

EELV och EILV förändring vid arbete

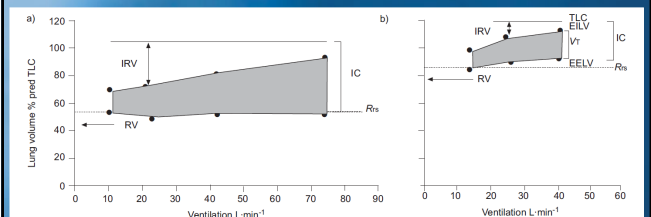


FIGURE 1. Changes in operating lung volumes are shown as ventilation increases with exercise in a) age-matched healthy subjects and b) chronic obstructive pulmonary disease (COPD) patients. End-expiratory lung volume (EELV) increases above the relaxation volume of the respiratory system (R_{rs}) in COPD, as reflected by a decrease in inspiratory capacity (IC), while EELV in health either remains unchanged or decreases. TLC: total lung capacity; RV: residual volume; IRV: inspiratory reserve volume; EILV: end-inspiratory lung volume; Vt: tidal volume. Reproduced from [78] with permission from the publisher.

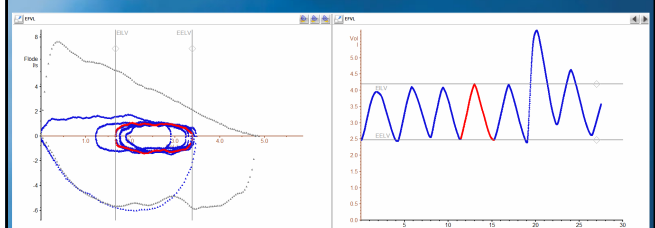
Flöde-volymloop under arbete

EELV (End Expiratory Lung Volume) – hos friska sjunker EELV under arbete. Hos friska äldre individer kan EELV åter stiga under tungt arbete. Vid KOL kan dynamisk hyperinflation (stigande EELV) ses.

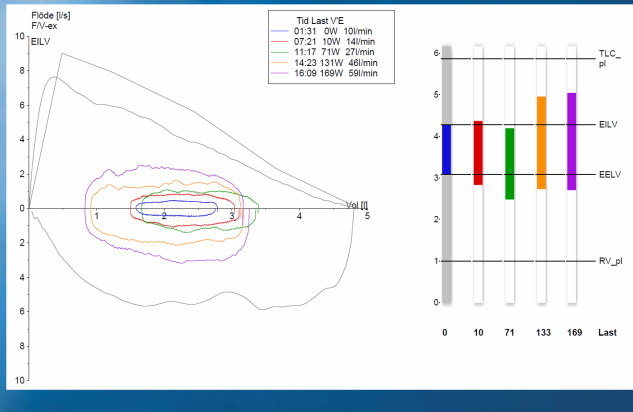
EILV/TLC (End Inspiratory Lung Volume / Total Lung Capacity) – Mått på återstående inandningskapacitet. Ska normalt vara $\leq 0,9$ (men kan bli $>0,9$ hos friska äldre). Kan bli $>0,9$ både vid obstruktivitet och restriktivitet (t.ex. KOL, lungfibros).

Expiratorisk flödesbegränsning – flöde-volymloopens utandningsdel deformeras/begränsas av expiratoriska luftvägsförhållanden (luftvägsmotstånd). Osäkra normalvärden. Liten flödesbegränsning kan ses som normalfynd hos många friska, mer flödesbegränsning är normalfynd hos äldre. Flödesbegränsning $>50\%$ av V_T är troligen patologiskt.

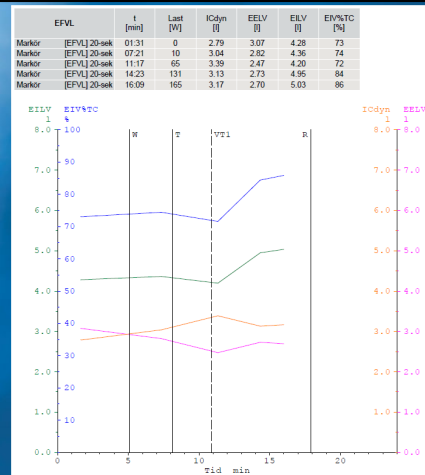
Placera andningsloopen i förhållande till den maximala F-V-loopen



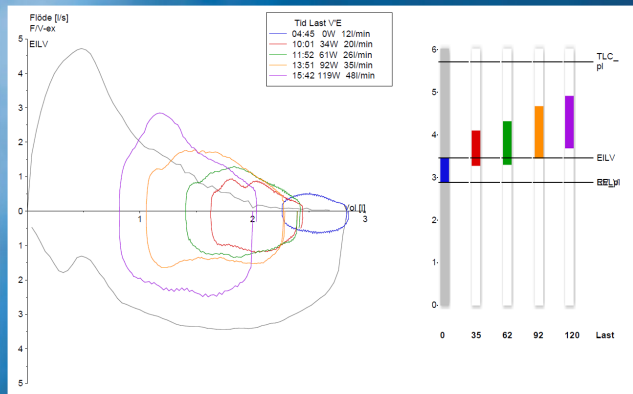
Exempel, normal



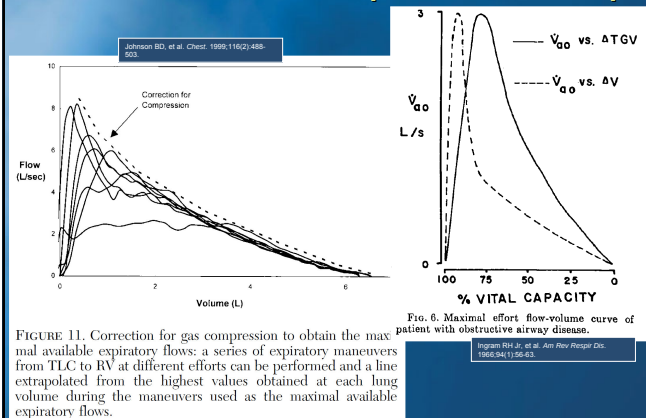
Exempel, normal



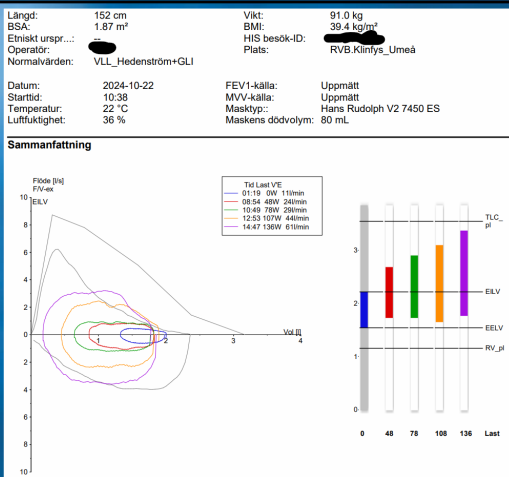
Exempel, obstruktiv



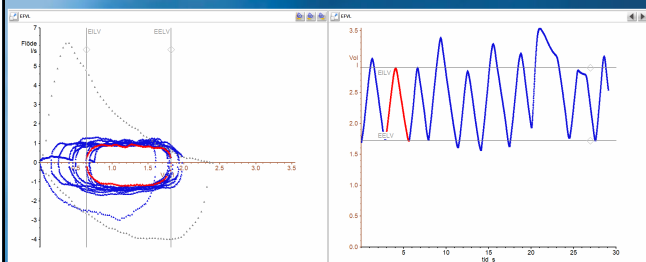
Hur definiera maximal expiratorisk F-V-loop?



BMI 39, restriktiv, ej obstruktiv



Vilket andetag är representativt?



Problem vid drift

