

## Electromyography of Scalene and Rectus Abdominis during the respiratory cycle in healthy subjects

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### Abstract

**Objective:** Expose the electromyography and spirometry relationship and establish the chronology of the contraction of Scalene and Rectus abdominis which works together in synergy antagonism in physiological breathing

**Methods:** 128 electromyographic tests were performed during the respiratory cycle on 43 healthy adults. EMG signals of Scalene, Rectus abdominis were recorded. The breathing was recorded by using a spirometer (vernier®).

**Results:** The duration of the contraction of Scalene are superior to Rectus abdominis 82% p-value = 0.000058, the amplitude of Scalene is superior of Rectus abdominis, p-value = 0.000000073. 109 tests of Scalene contraction begin before that of Rectus abdominis (63.74%), p-value = 0.000012. RMS is  $0.02 \pm 0.011 \mu\text{v}$  for Rectus abdominis and  $0.04 \pm 0.021 \mu\text{v}$  for Scalene, p-value = 6.76591E-06. Duration of inspiration is  $1.25 \text{ s} \pm 0.19$ , the expiration is  $1.04 \text{ s} \pm 0.19$ . The mean frequency of Rectus abdominis is  $54.19 \text{ Hz} \pm 6.35$ , it is  $57.21 \text{ Hz} \pm 7.08$  for Scalene, p-value is 9.84081E-08. The median frequency of Rectus abdominis is  $51.05 \text{ Hz} \pm 6.51$ , it is  $52.72 \text{ Hz} \pm 6.94$  for Scalene, p-value is 0.0098. The muscle fatigue of Rectus abdominis decreased from  $60.40 \pm 0.45$  to  $19.98 \pm 4.32$ . For Scalene it decreased from  $60.41 \pm 0.4$  to  $23.52 \pm 4.41$ .

**Discussion:** There is a synergistic - antagonism relationship between Scalene and Rectus abdominis during respiration. Scalene is a main inspiratory muscle, its contraction is important in amplitude, duration and frequency. Both muscles are fatigable during the inspiratory cycle

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[11<sup>th</sup> Annual Congress on Pulmonology and Respiratory Medicine](#)

March 18-19, 2020 Amsterdam, Netherlands

### Abstract Citation:

Electromyography of Scalene and Rectus Abdominis during the respiratory cycle in healthy subjects, Pulmonology 2020, 11th Annual Congress on Pulmonology and Respiratory Medicine Amsterdam, Netherlands

<https://respiratory.annualcongress.com/abstract/2020/electromyography-of-scalene-and-rectus-abdominis-during-the-respiratory-cycle-in-healthy-subjects>



### Biography:

Rola TOUT has completed his Master in Physical therapy at Saint Joseph University of Beirut, she gets her University Diploma in cardio Vascular and respiratory Rehabilitation from