Teaching Video *NeuroImages*: How to unmask respiratory strength confounded by facial diplegia

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Figure Patient with facial diplegia performs pulmonary function tests with traditional mouthpiece (A) and with facemask (B)

A 67-year-old man presented with progressive diplopia, dysarthria, dysphagia, and gait imbalance. Neurologic examination revealed ophthalmoplegia, facial diplegia, and areflexia without signs of respiratory failure. CSF showed albuminocytologic

dissociation, consistent with Guillain-Barré syndrome. Initial spirometry yielded low values that were rectified by improved seal with facemask attachment (figure, table, video on the *Neurology*® Web site at Neurology.org).

Table Comparative sequential spirometry measurements in a patient with facial diplegia using traditional mouthpiece and facemask

	Forced vital capacity, mL	Maximal inspiratory pressure, mmH ₂ O	Maximal expiratory pressure, mmH ₂ O	Tidal volume, mL
Using spirometry with traditional mouthpiece				
Trial 1	700	+8	-24	100
Trial 2	650	0	-24	125
Trial 3	660	+6	-24	115
Using spirometry with facemask				
Trial 1	2,750	+38	-42	375
Trial 2	2,800	+45	-42	350
Trial 3	2,800	+42	-38	300

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Spirometry measures diaphragmatic strength in acute neuromuscular disorders and often directs patient triage. Facial weakness can confound readings with conventional mouthpieces due to poor seal. Facemask spirometry in patients with motor neuron disease¹ and normal controls² improves values by reducing leak. We demonstrate unequivocally that mask spirometry surmounts spurious readings in facial diplegia.

AUTHOR CONTRIBUTIONS

Dr. Kramer: design and conceptualization, drafted and revised manuscript. Dr. McCullough: design and conceptualization. Dr. Wijedicks: design and conceptualization, revised manuscript.

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DISCLOSURE

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REFERENCES

1. Banerjee SK, Davies M, Sharples L, et al. The role of facemask spirometry in motor neuron disease. *Thorax* 2013;68:385–386.
2. Wohlgenuth M, Van der Kooi EL, Hendriks JC, Padberg GW, Folgering HT. Face mask spirometry and respiratory pressures in normal subjects. *Eur Respir J* 2003;22:1001–1006.

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