**Bilkis S, Loveman DM, et al. Modified Phalen’s Test as an Aid in Diagnosing Carpal Tunnel Syndrome. Arthritis Care Res 2012;64(2):287-289.**

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Design: study of the accuracy of a diagnostic test

Purpose of study: in patients with suspected CTS, to estimate the diagnostic test performance of using a Semmes-Weinstein monofilament when performing Phalen’s test

Population/sample size/setting:

* 37 patients (66 hands) between the ages of 27 and 88 who were seen for upper extremity problems in a neurology clinic at a county hospital in Texas
* Inclusion criterion was age 18 or older
* Exclusion criteria were cervical radiculopathy, previous history of stroke, diabetes, and concomitant neck injury

Application of diagnostic test:

* Reference standard for CTS was median-ulnar difference in orthodromic sensory peak latency with midpalmar stimulation recorded 8 cm from wrist of 0.4 msec or more
	+ 29 patients had electrodiagnostic testing in both hands, and 8 had electrodiagnostic testing in only one hand, for a total of 66 hands which were tested
* Hands of patients were examined with both the traditional Phalen’s test and with a modified Phalen’s test prior to electrodiagnostic testing by blinded examiners
* Traditional Phalen’s test held the wrists in fixed flexion for one minute and was considered positive if paresthesias were reported by the patient
* Modified Phalen’s test also placed the wrists in fixed flexion while the examiner applied a 2.83 unit Semmes-Weinstein monofilament perpendicular to the skin until the filament bends
	+ The filament was applied in this manner to the palmar surface and the lateral side of each digit’s distal phalanx three times
	+ The test was positive if the patient did not register a touch in any one or more fingers in the median nerve distribution (lateral 3.5 digits on the palmar side)
	+ The test was considered negative if the patient correctly reported a touch
	+ The palmar surface of the fifth finger’s distal phalanx was used as a control

Outcomes of diagnostic tests:

* 46 of the 66 hands had positive electrodiagnostic testing, and 20 were negative
* For both the traditional and the modified Phalen’s test, the specificity was 100%; none of the 20 negative EDX hands was positive for either test
* For the traditional Phalen’s test, the outcome was positive for 23 of the 46 positive EDX hands and was negative for 23 hands, yielding a sensitivity of 50%
* For the modified Phalen’s test, the outcome was positive for 39 hands and negative for 7 hands, for a sensitivity of 85%

Authors’ conclusions:

* The modified Phalen’s test was easy to perform in a neurology clinic and was more sensitive than the traditional Phalen’s test, with no loss of specificity
* The modified test can be easily performed by primary care physicians with no significant patient discomfort

Comments:

* The description of the population is scant and states only that they were seen for upper extremity problems in an outpatient neurology clinic; it is likely, but not explicitly stated, that the examiners had a high index of suspicion for carpal tunnel syndrome
* It is not clear how a modified test would be classified if the patient reported not feeling the test in the fifth finger, which was used as a control
	+ Presumably, excluding patients with diabetes and cervical radiculopathy was done to make it likely that sensation in the fifth finger would be normal
* If this is the case, then the spectrum of patients was satisfactory in having recruited subjects who were likely, but not certain, to have the target condition
* The reference standard based on electrodiagnostic testing was reasonable
* The test was done blinded to the outcome of the reference test
* It was not clear why 8 patients had testing of only one hand
* There is some lack of clarity with respect to unit-of-analysis issues; that is, most patients were tested in both hands, which would lead to a correlation between test responses (a patient who has a positive test in one hand is likely to have a positive test in the other hand and vice versa)
	+ However, there is an external check against bias in the form of the reference standard; if a patient with CTS in one hand but not the other reported positive modified Phalen’s tests in both hands, the normal hand would be have a false positive test, leading to a loss of specificity; this did not happen in the sample of patients seen in this study
* The duration of the modified Phalen’s test was not described; it is likely that the monofilament testing would take some time to perform and would keep the hand flexed for longer than is done in the traditional test
	+ However, this would create the possibility for an additional positive test, which, if spurious, would again lower the specificity of the test
* The test is, as the authors report, simple and inexpensive to perform, and could be added to the guideline as an option with acceptable cost and patient comfort

Assessment: adequate for some evidence that in patients with suspected CTS, a modified Phalen’s test can, in comparison with the traditional Phalen’s test, increase the sensitivity of the physical examination without sacrificing specificity. The test involves placing the hands of the patient in the usual flexed position for the traditional Phalen’s test, and applying a 2.83 unit Semmes-Weinstein monofilament perpendicular to the palmar aspect and to the lateral side of the distal phalanx of the digits innervated by the median nerve, and reporting as positive any test result in which the patient is unable to detect the application of the filament. The distal phalanx of the fifth digit should be used as a control.