

**Re: In Memoriam: Ramon James Evans
(1932–2007). *Pain Res Manage* 2007;12:244**

I appreciated Peter Watson's eloquent obituary of Ray Evans (1) in the Winter 2007 issue.

The reference to Dr Evans' "frequently discovering previously unrecognized and important signs" reminded me of what must surely have been one of Dr Evans' more unusual and clinically interesting discoveries.

Dr Evans taught many clinicians about what he called the 'spring reflex' test. This is a manoeuvre performed during a physical examination; it can be done on many parts of the body where there are agonist-antagonist muscle pairs such as the biceps and triceps brachii, as explained below.

Among the clinicians who learned about the test from Dr Evans was Dr Gordon Wyant, who directed the Pain Management Service at Royal University Hospital, Saskatoon, Saskatchewan, where I worked in the 1970s and 1980s. Dr Wyant carried out the test routinely on patients with chronic pain.

We described the spring reflex test in detail in a 1988 paper (2); I have never seen it described or cited elsewhere although a generation of clinicians must know about it from Dr Evans. I will give a brief overview of how the test is done on one arm as an example, but I would caution against trying to do this manoeuvre without training.

The subject is asked to make a fist with one hand. The examiner supports the subject's elbow with one hand, and holds the subject's wrist with the other hand, with the subject's forearm extended to make an approximate 120° angle with his or her upper arm. The examiner asks the subject to pull the fist back toward the same-side shoulder against resistance firmly applied to the forearm by the examiner. The examiner suddenly and without warning lets go of the wrist (while maintaining support of the elbow), thus releasing the resistance on the wrist. The excursion of the subject's forearm towards the shoulder is estimated. If the fist snaps back to touch the subject's shoulder, the spring reflex is graded as present or brisk. On the other hand, if no movement of the forearm occurs on release of the resistance, the response is graded as absent. An absent spring response indicates that the antagonist muscles (particularly triceps in this example) were activated at the same time as the agonist muscles (biceps).

Dr Evans asserted that an absent spring reflex in a chronic pain patient meant that the pain was largely 'psychogenic' while a present (brisk) spring response pointed to an 'organic' etiology.

I found this assertion questionable. The dualistic concept of pain being either psychogenic or organic was on its way out by the late 1970s, and it seemed unreasonable to make a decision of such clinical importance on the basis of a single physical sign that had never been studied or validated. After some cordial discussions with Dr Evans (at meetings of the Canadian Chapter of the International Association for the Study of Pain, which was the earlier name of the Canadian Pain Society) I set out to throw light on the spring reflex.

To my surprise, in the first study, which was a retrospective file review, I found strong associations between the strength of the spring reflex and independent psychological test indicators of anxiety, depression, and somatic focus. Causality could, of course, not be inferred from those correlations, but the results certainly pointed to an association between psychological distress and agonist-antagonist muscle function.

Continued on page 69

LETTER TO THE EDITOR

Continued from page 65

To follow up on the first study, we prospectively assessed the inter- and intrarater reliability of the spring reflex test in two independent administrations (by an anesthesiologist, medical resident and medical student). We found these satisfactory. Having determined that this sign was not, from a neurological point of view, a reflex, we began conceptualizing the phenomenon as a graded spring response rather than as a present-or-absent reflex.

In a third study, we prospectively assessed the spring response along with a number of measures of physical fitness and psychological functioning in healthy young adults. I summarized the results as consistent with the thesis that "use of denying and repressing defenses and avoidance of aggression are associated with activation of agonist-antagonist muscle pairs" (2).

When I later discussed this study with physical therapists and dance and movement therapists, they tended to say, "Of course." They evidently knew about the association between psychological defenses and the way opposing sets of muscles are braced against each other when people are experiencing psychological conflict. They thought it was remarkable that physicians and psychologists did not know about it.

Dr Evans' discovery of the spring response can be placed in the wider context of what used to be called 'nonorganic' signs (3), and now may be more appropriately discussed as 'medically incongruent' physical signs. People who rate high on these measures may display dysfunctional cognitions and personality

traits as well as higher reported pain intensity (4), although research findings are inconsistent (5). Psychological distress, in other words, may be expressed in bodily tension and anomalous responses to examination.

I was grateful to Ray Evans for teaching this interesting discovery on the borderline between physical and psychological health and illness. He was a brilliant diagnostician, and his clinical insights are, as Dr Watson says, respected and missed.

*Carl von Baeyer
Professor of Psychology and Associate Member in Pediatrics
University of Saskatchewan
Saskatoon, Saskatchewan*

REFERENCES

1. Watson CPN. In memoriam: Ramon James Evans (1932-2007). *Pain Res Manage* 2007;12:244.
2. von Baeyer CL, Wyant GM. Tension in opposing muscle groups and psychopathology: The "spring response" in chronic pain patients and normal subjects. *The Pain Clinic* 1988;2:7-14.
3. Waddell G, McCulloch JA, Kummel E, Venner RM. Nonorganic physical signs in low-back pain. *Spine* 1980;5:117-25.
4. Craig KD, Hill ML, McMurtry B. Detecting deception and malingering. In: Block AR, Kramer EF, Fernandez E, eds. *Handbook of Chronic Pain Syndromes: Biopsychosocial Perspectives*. New York: Lawrence Erlbaum, 1999:41-58.
5. Fishbain DA, Cole B, Cutler RB, Lewis J, Rosomoff HL, Rosomoff RS. A structured evidence-based review on the meaning of nonorganic physical signs: Waddell signs. *Pain Med* 2003;4:141-81.

