

Red, white and black reaction

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I am at present working through my book *Palpation & Assessment Skills* (Elsevier 2003) looking at ways of eventually revising it. Updating a book for a new edition involves revisiting text that was written 6 or 7 years (or more) ago, and checking to see whether there have been advances in particular methods (research evidence) that supports the use of the method, or that suggests that it is of doubtful value, and should be removed from the next edition.

Also of course new material should be considered for inclusion – often to be written by an author who specialises in particular approaches that I don't know enough about to be trusted to write it up myself.

In this process some very old, but still valuable methods, show up that are deserving of fresh exposure – and I came across just such a one to share with you in this column.

In the current edition of *Palpation & Assessment Skills* there are approximately a dozen chapters (everything from palpation of skin, to muscles, joints, viscera, neural tension and energy), as well as a further 12 'Special Topic' sections, where subjects that don't quite fit into these chapters, have been placed.

The 'special topic' that I want to bring to your attention is the so-called 'Red & White' reaction – the name of which has been expanded to a 'Red, white and black' reaction.

Mysterious?

Not really – but it's a catchy name for a simple but useful assessment method that dates back well over a hundred years.

This refers to superficial responses that take the form of 'lines', variously coloured from red to white (and sometimes blue-black), following skin-friction, applied by a finger or probe, usually running down each side of the spine.

In the early days of osteopathy in the 19th century, the assessment method was already in use. Carl McConnell, one of the original osteopathic pioneers wrote this in 1899:

I begin at the first dorsal and examine the spinal column down to the sacrum by placing my middle fingers over the spinous processes and standing directly back of the patient, draw the flat surfaces of these two fingers

over the spinous processes from the upper dorsal to the sacrum in such a manner that the spines of the vertebrae pass tightly between the two fingers; thus leaving a red streak where the cutaneous vessels press upon the spines of the vertebrae. In this manner slight deviations of the vertebrae laterally can be told with the greatest accuracy by observing the red line. When a vertebra or section of vertebrae are too posterior a heavy red streak is noticed and when a vertebra or section of vertebrae are too anterior the streak is not so noticeable.

Much more recently, another osteopathic physician, Marshall Hoag (1969), discussed the same phenomenon:

With firm but moderate pressure the pads of the fingers are repeatedly rubbed over the surface of the skin, preferably with extensive longitudinal strokes along the paraspinal area. The blunt end of an instrument or of a pen may be used to apply friction, since the purpose is simply to detect colour change, but care must be taken to avoid abrading the skin. The appearance of less intense and rapidly fading colour in certain areas as compared with the general reaction is ascribed to increased vasoconstriction in that area, indicating a disturbance in autonomic reflex activity.

On the same theme Upledger & Vredevoogd (1983) wrote:

Skin texture changes produced by a facilitated segment [localised areas of hyperirritability in the soft tissues involving neural sensitisation to longterm stress] are palpable as you lightly drag your fingers over the nearby paravertebral area of the back. I usually do skin drag evaluation moving from the top of the neck to the sacral area in one motion. Where your fingertips drag on the skin you will probably find a facilitated segment. After several repetitions, with increased force, the affected area will appear redder than nearby areas. This is the 'red reflex'. Muscles and connective tissues at this level will:

- 1. Have a 'shotty' feel (like buckshot under the skin);*
- 2. Be more tender to palpation;*
- 3. Be tight, and tend to restrict vertebral motion; and*
- 4. Exhibit tenderness of the spinous processes when tapped by fingers or a rubber hammer.*

De Jarnette (1934), the chiropractor who developed sacrooccipital technique (SOT), wrote extensively on the subject of the 'red reaction', with some complex interpretations suggested in his classic text *Reflex Pain*. De Jarnette used such assessments as part of a process of evaluating the

particular category of patient he was treating. In one variation he describes the process as follows:

Making a firm pressure, draw fingers down the spine, with a fairly slow motion. You should be able to count to 15 while drawing the fingers from the 7th cervical to the coccyx, by counting steadily. With a good light on the back, the results should show a line which becomes red, some portions brighter and some very faintly coloured. Now watch the lines fade. The area which shows the whitest is marked as the major [lesion] for this is the most anaemic spinal muscle area. It will be paler than any portion of skin on the patient's body.

Eminent physiologist Irvin Korr (1970) described how this red reflex corresponded well with areas of lowered electrical resistance, which themselves correspond accurately to regions of lowered pain threshold, and areas of cutaneous and deep tenderness (termed 'segmentally related sympatheticotonia'). He cautioned:

You must not look for perfect correspondence between the skin resistance (or the red reflex) and the distribution of deeper pathologic disturbance, because an area of skin which is segmentally related to a particular muscle does not necessarily overlie that muscle. With the latissimus dorsi, for example, the myofascial disturbance might be over the hip but the reflex manifestations would be in much higher dermatomes because this muscle has its innervation from the cervical part of the cord.

By use of a mechanical instrument which quantified the pressure applied at a constant speed, followed by measurement of the duration of the redness resulting from the action of the frictional stimulator on the skin, Korr could detect areas of intense vasoconstriction which corresponded well with dysfunction elicited by manual examination.

But is the opportunity to 'feel' the tissues was being ignored during all these 'strokes' ?

Not at all - Marsh Morrison (1969) discussed this:

Run your fingers longitudinally down alongside the dorsal and lumbar vertebrae (anywhere from the spinous processes extending laterally up to two inches [5cm]) and stop at any spot of tissue which seems 'harder' or different from normal tissue. These thickened areas, stringy ligaments, bunched muscle bands, all represent indurated tissue; they are usually protective and indicate irritation and dysfunction. Once these indurated areas are palpated press down and almost always they will be sensitive, indicating a need for treatment.

Osteopathic researchers Cox et al (1983) wrote regarding use of the red reflex as part of their examination procedures as follows:

'Red reflex' cutaneous stimulation was applied digitally in both paraspinal areas [T4 and T9-11] simultaneously briskly stroking the skin in a caudad direction. Patients were divided arbitrarily into three groups.

Grade 1 – erythema of the spinal tissues lasting less than 15 seconds after cutaneous stimulation.

Grade 2 – erythema persisting for 15 to 30 seconds after stimulation.

Grade 3 – erythema persisting longer than 30 seconds after stimulation.(i.e. most dysfunctional response).

Hruby et al (1997) describe the thinking regarding this phenomenon.

Perform the red reflex test by firmly, but with light pressure, stroking two fingers on the skin over the paraspinal tissues in a cephalad to a caudad direction. The stroked areas briefly become erythematous and almost immediately return to their usual color. If the skin remains erythematous longer than a few seconds, it may indicate an acute somatic dysfunction in the area. As the dysfunction acquires chronic tissue changes, the tissues blanch rapidly after stroking and are dry and cool to palpation.

Newman-Turner (1984) described the research of osteopath/ naturopath, Keith Lamont, who first described the 'black line' phenomenon.

It is a common observation of osteopaths, that pressure on either side of the spine with a hemispherical probe of approximately 0.5cm diameter, will, in some patients, elicit a dark blue or black line. Local engorgement of the capillary bed with deoxygenated venous blood causes the appearance of the line which slowly fades as the circulation returns.

I hope these glimpses onto different interpretations of the red reflex will stimulate you to explore the concepts described - remembering that what you feel and see is not the basis for a diagnosis – only an indication of dysfunction which may be local or reflex, chronic or acute, significant or not.

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