

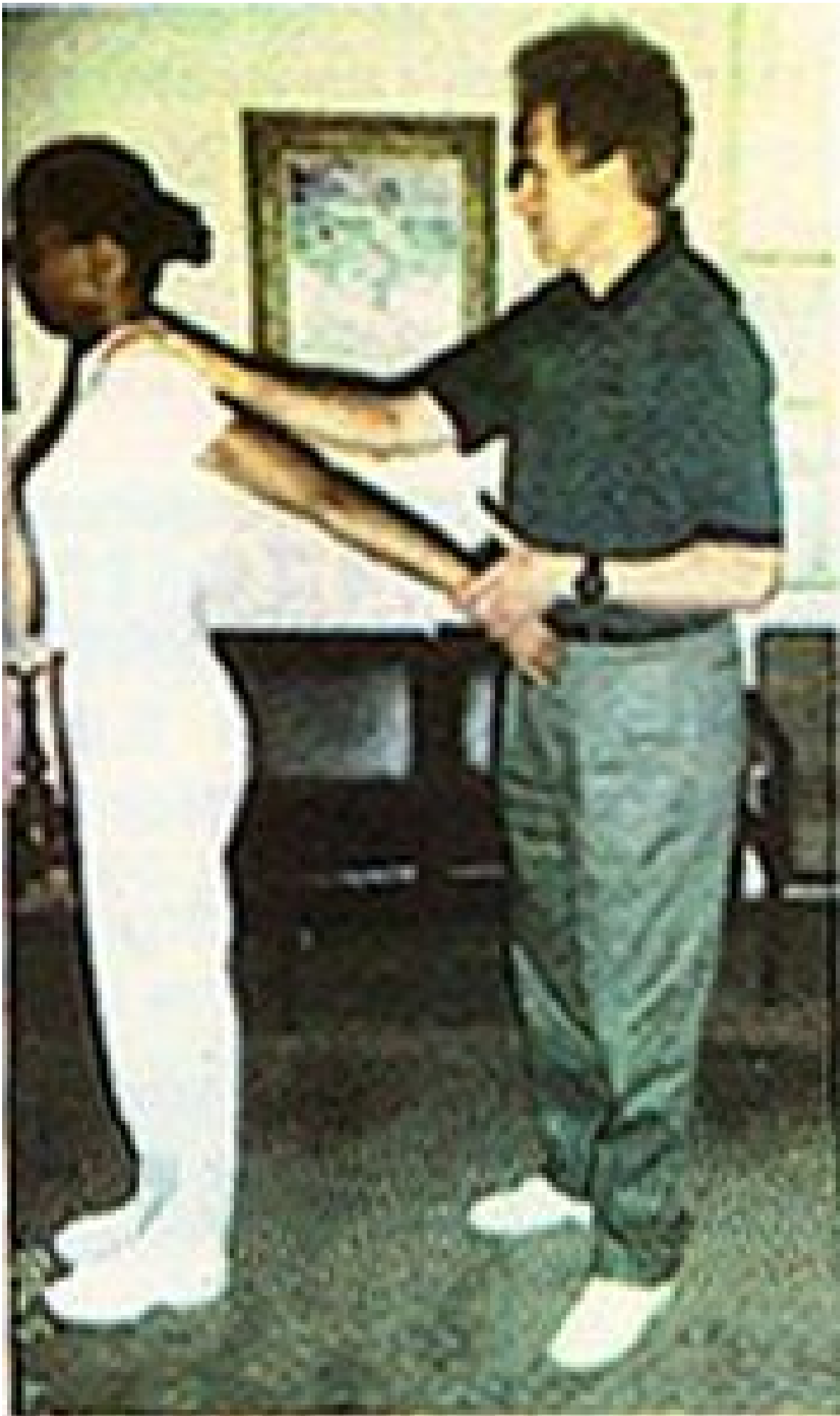


DIAGNOSIS & DIAGNOSTIC EQUIP

A New Test for a Weak Deltoid

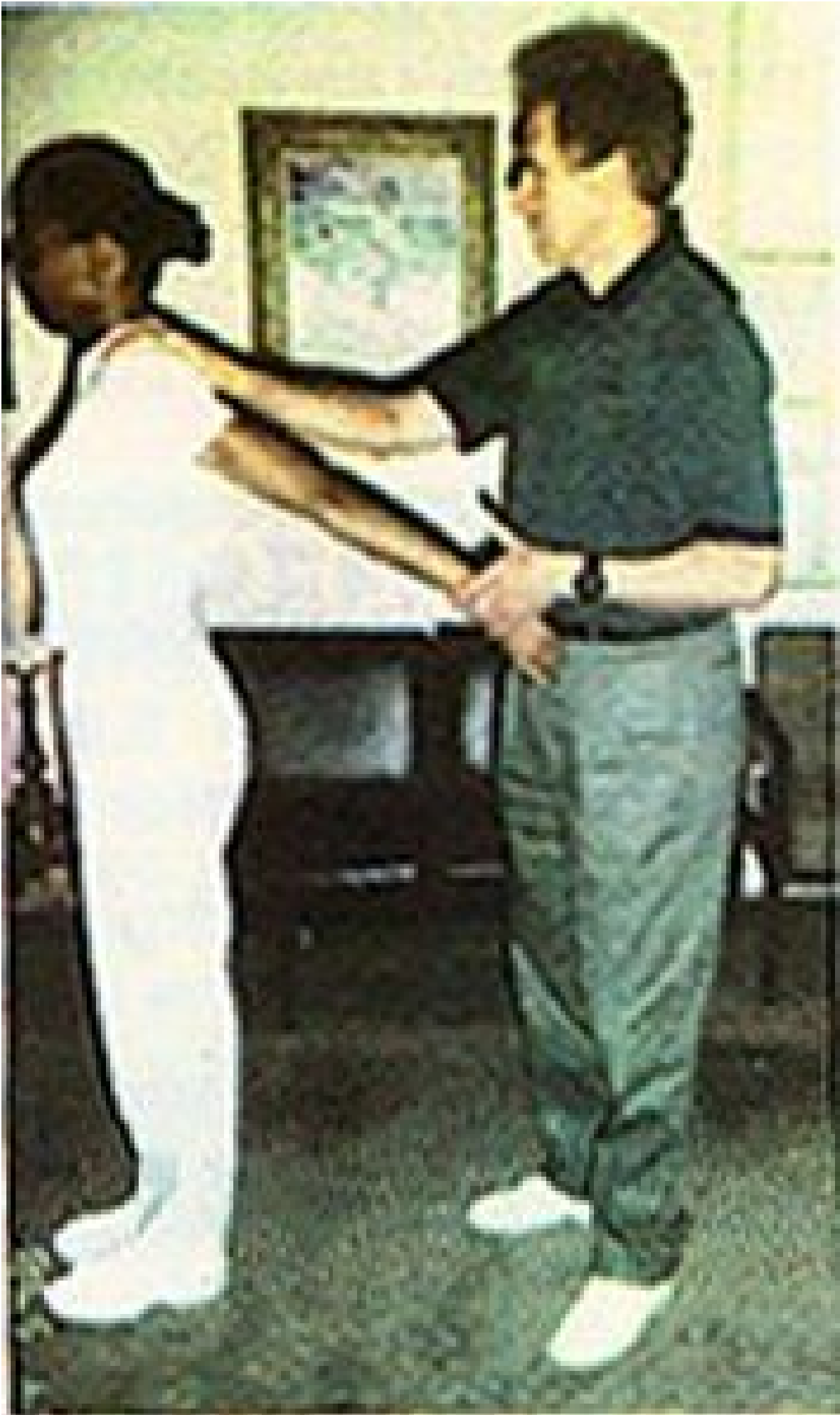
Warren Hammer, MS, DC, DABCO

One of the problems in testing for a weak deltoid is the synergistic effect of the rotator cuff muscles which may mask deltoid insufficiency. Hertel, Lambert and Ballmer¹ created what they call the deltoid extension lag sign for determining deltoid weakness due to an axillary nerve lesion. First, the examiner elevates the patient's arm to full passive shoulder extension and allows the shoulder to relax to a position of submaximal extension to avoid elastic recoil in the shoulder (see Figure 1). The patient is then asked to maintain this position. A positive sign is indicated by a lag or angular drop (see Figure 2).



[Figure 1: In the first step of the deltoid extension lag sign, the examiner elevates the patients's arm and allows the shoulder to relax, avoiding elastic recoil in the shoulder.]

Hertel et al.¹ record the lag to the nearest 5o and retests and measures to determine the progress of neural recovery. This test may be invalidated by a capsular contraction that would not allow full passive motion. Both arms can be tested together to compare sides. In the article,¹ the authors recommended testing with the patient in the seated position.



[Figure 2: A lag or angular drop by the patient could indicate deltoid weakness.]

Anterior deltoid wasting due to axillary nerve damage can be evaluated on inspection by noting a flattening of the deltoid muscle; a squaring of the lateral acromion; the prominence of the acromion; and abnormal protrusion or flattening of the greater tuberosity. Atrophy of the deltoid may also indicate dislocation, instability or impingement.

An entrapment syndrome known as the quadrilateral space syndrome may occur, which results in deltoid weakness. This space is bounded by the teres minor superiorly; the teres major inferiorly; the surgical humeral neck laterally; and the long head of the triceps medially. Within the space is the posterior humeral circumflex artery and the axillary nerve, which supplies the deltoid and teres minor muscles and skin of the posterolateral area of the shoulder and upper arm. Etiology may be due to severe trauma of the upper humerus such as a humeral fracture or dislocation, or a direct blow between the coracoid and the head of the humerus.

Cahill and Palmer² mention causation due to spontaneous entrapment of the axillary nerve by fibrous bands or muscle within the space. The nerve may be aggravated in the overhead thrower with no particular trauma.³ The patient may complain of atypical pain and paresthesias, especially in the lateral aspect of the upper arm with nondermatomal radiation to the forearm and hand. The muscles within the space will palpate tender. Active shoulder rehabilitation, lateral rotation and extension usually produces pain at the anterior shoulder. EMG, nerve conduction and neurologic examination is negative.³

Confirmation by subclavian arteriogram is sometimes necessary. Seventy percent of patients showing occlusion of the posterior humeral circumflex artery are able to live with the problem without surgical decompression.⁴ Active release technique on the involved muscles is the manual treatment of choice. Stretching in internal shoulder rotation and horizontal adduction is beneficial, along with posterior cuff strengthening.

References

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*Warren I. Hammer, MS, DC, DABCO
Norwalk, Connecticut*

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