

Chronic Abdominal Pain^{1,2}

Narrative Section

HISTORICAL VIGNETTE - Chronic abdominal pain has plagued patients for as long as they have been seeking care from physicians. Did you know, though, that a bedside test to distinguish its cause has been present for almost a century? In 1926, Philadelphia surgeon and World War 1 Veteran Dr. John Berton Carnett described his eponymous test, the Carnett sign, allowing physicians to distinguish sources of intra-abdominal pain from visceral abdominal pain with a simple bedside maneuver. Carnett based his test on the simple physiologic understanding of the course of the anterior cutaneous nerve (a branch of the lower thoracic intercostal nerve) as it passes through the abdominal wall muscle. By asking patients to do a modified sit-up, Carnett could localize sources of abdominal pain.

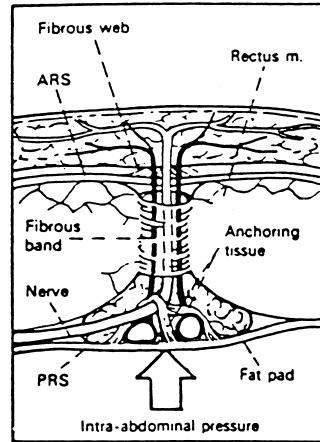


Figure 1. Representation of the anterior cutaneous nerve course within the abdominal wall. ARS = anterior rectus sheath; PRS = posterior rectus sheath. From Greenbaum et al. (6).

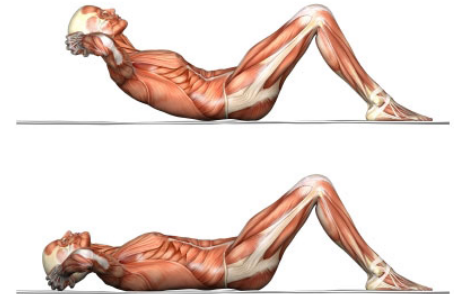
CONTEXT AND USEFULNESS - When a patient is able to localize pain to a discrete location in the abdomen, the pre-test probability of cutaneous pain increases. Cutaneous nerve entrapment is more commonly seen along the right side of the abdomen, along sites of surgical scars, and along the outer edge of the *rectus abdominis* muscle.

¹ Chi J et. al. "The Five Minute Moment." *Am J Med.* 2016 Aug; 129 (8): 792-795.

² Srinivasan R et. al. "Chronic Abdominal Wall Pain: A Frequently Overlooked Problem." *Am J Gastroenterol.* 2002 Apr; 97 (4): 824-830.

Physical Manuever

Model Proper Technique - with the patient lying supine, flex the abdominal muscles by having the patient lift the shoulders off the bed as if doing a sit-up. If able, the patient may lift the feet off the bed to tense the abdominal wall muscles. When the abdominal wall muscle is tensed, the branching cutaneous nerve is kinked, exacerbating the pain. Other exam features that can elicit tenderness in cutaneous nerve entrapment include palpation over the affected area. Because the affected nerve is a branch of the thoracic nerve, the elicited tenderness can radiate to the back.



INTERPRETATION - Anterior cutaneous nerve entrapment syndrome (a.k.a. ACNES) can be elicited from a *positive* Carnett sign. This is found when the suspected abdominal pain gets *worse* when the patient tenses the abdominal wall muscles as described above.

It's important to note that when the origin of pain is from a visceral source, the pain usually improves with tensing of the abdominal wall muscles (which is interpreted as a *negative* Carnett's sign).

CAVEAT AND COMMON ERRORS - False positive tests of the Carnett's sign can arise from some intra-abdominal disease of the peritoneum. Additionally, patients who have widespread (and not localized) pain are unlikely to have a positive Carnett's sign, making this sign less helpful when diffuse abdominal pain is present.