this possibility when examining patients with injuries to the thoracic cord.

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The authors reply:

To the Editor: Dr. Sharma's suggestion is a very good one. We agree that our patient had a modified Rovsing's sign on his physical examination; in fact, we had referred to this finding as such during informal discussions about the patient.

Dr. Franklin raises the important issue of autonomic dysreflexia, a common problem in patients with spinal cord injury. Although the patient's spinal cord lesions were a bit lower than what we would expect in a patient with autonomic dysreflexia, autonomic dysreflexia is a possible contributing factor to his temperature–pulse dissociation.

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The Energy Expended in Chewing Gum

To the Editor: Indirect evidence suggests that gum chewing may have greater metabolic effects than has been appreciated. The thermic effect of food is reduced when nutrition bypasses the mouth.[1] In cows, chewing increases energy expenditure by approximately 20 percent.[2,3] We measured how energy expenditure changes with gum chewing in humans.

Energy expenditure was measured in a temperature-controlled, darkened, silent laboratory with an indirect calorimeter (model 229, SensorMedics, Yorba Linda, Calif.) that was calibrated before each measurement with two primary-standard gases (a combination of 4 percent carbon dioxide and 16 percent oxygen and a combination of 26 percent oxygen and a balance of nitrogen) and calibrated for gas flow. Expired air was collected with a specially designed face mask (0.3 by 0.2 by 0.1 m) that allowed unopposed jaw movement. Measurements were performed in seven non-obese subjects with stable weight while they were seated at rest with their arms and legs supported. Energy expenditure was first measured at rest for 30 minutes. The subjects were then provided with 8.4 g of calorie-free gum and instructed to chew at a frequency of precisely 100 Hz (a value than approximates chewing frequency at our institution) with the aid of a metronome. After 12 minutes, the gum was removed from the mouth, and energy expenditure was measured for 12 minutes after chewing.

Mean (±SD) energy expenditure increased in all subjects during chewing, from 58±11 kcal per hour at base line to 70±14 kcal per hour (two-sided $P<0.001$). After chewing, energy expenditure returned to base line (59±12 kcal per hour) in all subjects ($P<0.001$). Chewing gum led to a mean increase in energy expenditure of 11±3 kcal per hour (range, 7 to 17), a 19±4 percent increase above base-line values. For perspective, in the same subjects, standing was associated with a mean increase in energy expenditure of 11±11 percent and walking at 1.6 km (1 mile) per hour was associated with an increase of 106±26 percent above base-line values.

Non-nutritional chewing is a behavior that is shared with other primates[4] and is a component of nonexercise activity.[5] Gum chewing is sufficiently exothermic that if a person chewed gum during waking hours and changed no other components of energy balance, a yearly loss of more than 5 kg of body fat might be anticipated. Chewing of calorie-free gum can be readily carried out throughout the day, and its potential effect on energy balance should not be discounted.

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