- Monday, June 9, 2003
  Heads up! Motor and sensory roles for neck muscles in visually-guided movements.

  The production of accurate visually-guided actions requires not only precise motor control but also knowledge of the relative positions of various body segments. The head-neck sensory-motor system is a convenient platform to study both of these aspects, and may provide solutions that generalize to other movements. While neck muscles play obvious roles during eye-head gaze shifts, I will present evidence that after visual target onset, neck muscles receive an orienting signal at remarkably short latencies (55-90 ms), well in advance of any gaze shift. These results attest to a previously unrecognized central strategy that delivers selectively an early orienting command to the head, but not the eye, presumably to optimize the head's contribution to the ensuing gaze shift. Neck muscles are also endowed with a remarkably rich repository of muscle spindles which provide a sense of head-on-body position required for many actions. I will discuss how neck muscle vibration, which entrains the firing of these neck muscle spindles, leads to systematic errors in visually-guided gaze shifts consistent with an altered sense of head-on-body position. These results establish neck muscle vibration as an experimental tool that can be used to address the neurophysiological encoding of head-on-body position in multiple types of movement.

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