



## SWEATING

Human skin has approximately 2-4 million sweat glands, of which there are three functionally distinct types: Eccrine, apocrine, and apoecrine. Eccrine glands.

- **Eccrine glands.** These are the most numerous, totalling 3-4 million. These small glands are present at birth and are distributed in the deep portion of the dermis over nearly the entire body, with the exception of the external auditory canal, lips, nail beds, nipples, glans penis, clitoris, and labia minora. They are especially concentrated on the soles, forehead, axillae, palms, and cheeks. On the palms, they are the only sweat gland present.

Eccrine glands produce a thin, odorless solution hypotonic to plasma that gives rise to hyperhidrosis, if secreted in excess. Eccrine glands are important in thermoregulation, but they also respond to gustatory and emotional stimuli, such as stress, anxiety, fear, and pain. Postganglionic sympathetic cholinergic fibres innervate them, but they also respond to adrenergic stimuli, albeit to a lesser extent.

Eccrine glands receive innervations from higher cortical structures that control both emotional and thermoregulatory sweating. Thermoregulatory sweating, which can be either diurnal or nocturnal, is the major mechanism of heat dissipation by eccrine glands over the entire body. Emotional sweating, in contrast, is exclusively diurnal and is usually limited in distribution to the face, axillae, palms, and soles.

- **Apocrine glands.** In contrast to eccrine glands, apocrine glands first appear at puberty and are present only in the axillary, mammary, perineal, and genital regions. Apocrine sweat, which is produced in small volumes, is a viscid, cloudy liquid secreted into the hair follicle. The function of apocrine glands is unclear; nevertheless, some evidence suggests that they may play a role in body odour and pheromone production.

- **Apoecrine glands.** Apoecrine glands, which are primarily found in axillary and perianal areas, have morphological features shared by both apocrine and eccrine glands. Apoecrine glands constitute up to 45% of the sweat glands found in the axillary region of normal individuals.

Nowell Solish, MD, FRCP  
Toronto, ONT, Canada