SENSATION AND LOSS

An injury to the spine — the long bony assemblage that supports the upper body and the spinal cord that carries nerve signals — can be grim and costly. By **Bill Cannon**.

ANATOMY OF THE SPINE

TO SERVE AND PROTECT

Each vertebral section (left) — cervical, thoracic, lumbar and sacral — corresponds to nerve sensations in a particular region of the body, a feature that allows pinpointing the location of spinal injuries (right). The numbers in circles refer to the vertebra where the nerves arise or return.

Cervical Vertebrae C1–C8

Nerves that emerge between these vertebrae serve the head to the hands, and much of the arms in between.

Thoracic Vertebrae T1–T12

The dozen thoracic vertebrae provide entry and exit portals for nerves that recognize sensations from and control movements of the torso, as well as the underside of the arms.

Lumbar Vertebrae L1–L5

The flexible spine's bottom region provides sensory and motor control from the hips to the toes.

Sacrum S1–S5

Fused with the pelvis, the sacral portion of the spinal cord controls the rear portion of the legs, from the heels to the hips.

Each segment of the spine consists of a vertebra composed of bone and cartilaginous discs that provide cushioning between the vertebrae. The spinal cord runs inside the vertebrae and nerves exit and enter the cord between the vertebrae.

A WORLD OF HURT

Traumatic spinal cord injuries happen around the world, but the causes vary. Data gathered during the years 1959 to 2011 detail the causes of injury by World Health Organization regions. Differences in regional lifestyles and demographics account for some variation.

1B

There are 1 billion neurons in the human spinal cord.

COST AND CONSEQUENCES

The initial cost of the most severe spinal injuries can top US\$1 million per patient in the first year alone and cost more than \$180,000 a year thereafter, pushing lifetime costs for someone 25 years old at the time of injury to \$4.6 million (lower left). With improvements in medical treatment, survival rates for people suffering injuries in the first four cervical vertebrae have improved considerably (lower right).