

EFFECT OF SPINAL CORD LESIONS ON RESPONSES OF CATS TO THERMAL PULSES. K.L. Casey^{1,2,3}, B.R. Hall^{*2}, and T.J. Morrow^{2,3}, Depts. of ¹Neurology ²Physiology, Univ. of Michigan and ³V.A. Med. Ctr., Ann Arbor., USA

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Purpose: We sought to determine, by quantitative behavioral methods, the separate contributions of dorsal and ventral spinal cord fibers to the mediation and modulation of pain in the cat.

Methods: We trained 5 cats to eat while partially restrained so that thermal pulses could be delivered to either shaved outer thigh. Two behaviors, withdrawal from the food cup (interrupt response) and hindlimb movement showed increasing probability as stimulus temperature increased above 50°C. Changes in the probability and latency of these responses were determined for each stimulus temperature after either dorsal or ventral bilateral thoracic cord lesions. Postoperative testing began after a month or more and has extended beyond a year.

Results: Hindlimb and interrupt response probabilities were significantly reduced, but not eliminated, in two cats with ventral lesions which severely compromised bladder and motor function. Response latencies were not increased. A third cat with sparing limited to the dorsal columns showed no evidence of pain responses but died before complete testing. Interrupt responses were also reduced, but not eliminated, in a cat with dorsolateral and dorsal column lesions. In marked contrast, all responses significantly increased in a cat with a deep dorsal lesion causing mild hind limb paresis.

Conclusions: Ascending pathways sufficient but not necessary for pain are located in the dorsal and ventral spinal cord of cats. Suprasegmental pain suppression mechanisms are located in the dorsal cord, ventral to dorsal ascending sensory pathways and dorsal to descending motor fibers.

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INTERNEURONES IN THE SPINAL DORSAL HORN OF THE ADULT HUMAN. Thoraya E. Abdel-Maguid* and David Bowsher, Department of Anatomy, University of Liverpool, Liverpool L69 3BX, U.K.

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Modified Golgi impregnation (Vaisumruat & Hess, 1952) of the cervical and lumbar enlargements from eight human spinal cords, obtained from adults dying from non-neurological causes, revealed interneurones belonging to three dendroarchitectonically different 'families'. Very-small-field (Golgi type II) interneurones are found in only two of these 'families'; such interneurones are distributed on the boundaries between laminae I and II (medial half), II and III (lateral half), and III and IV (medial third). A type with a slightly larger dendritic field is found in the medial half of the boundary between laminae IV and V. These interlaminar interneurones differ from other dorsal horn neurones in having transversely oriented dendrites which lie along the interlaminar boundary.

The dendroarchitectonic 'families' to which these neurones belong will be illustrated. Possible functional roles will be reviewed both from comparison of known cells in other species and from consideration of identical cells which we have identified in the trigeminal sensory complex of man.