



ALMA MATER STUDIOURUM
UNIVERSITÀ DI BOLOGNA

Gualtiero Gandini



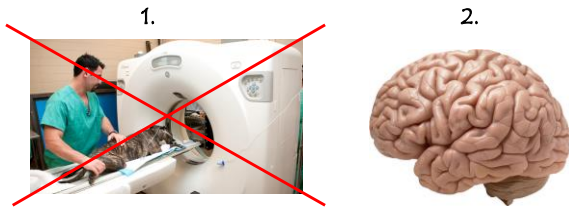
MYLAV
Laboratorio La Vallonea



The neuroanatomic localization
of the lesion

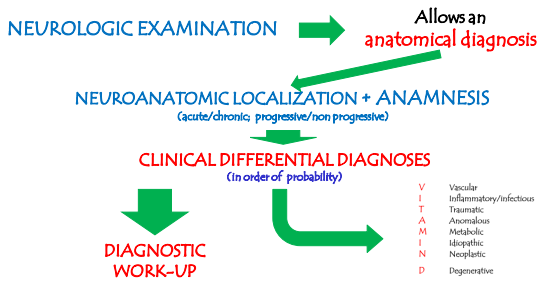
1

What most do we need???



2

Clinical approach to a neurological case:



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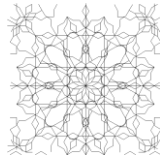
ANATOMIC LOCALIZATION OF A NEUROLOGIC LESION



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LOCALIZATION OF A NEUROLOGIC LESION

1. Central or Peripheral Nervous System? (CNS or PNS?)
2. CNS: intracranial or extracranial?
3. CNS Intracranial:
 - Forebrain
 - Brain stem
 - Cerebellum
4. CNS Extracranial:
 - Cervical SC
 - Cervicothoracic SC
 - Thoracolumbar SC
 - Lumbosacral SC



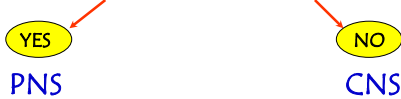
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LOCALIZATION OF A NEUROLOGICAL LESION

1

the problem is central or peripheral?

Consider if there is generalized decrease of the spinal reflexes or a pure paresis



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SPINAL REFLEXES

Evaluation of the integrity of a circuit

Normal reflex =
Normal (unaffected) circuit

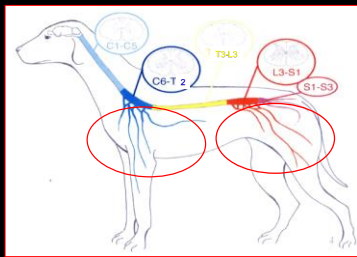
WHEN ARE THEY USEFUL???

- WHEN I suspect a disease of:
- *the spinal cord*
- *the peripheral nervous system*



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GENERALIZED DECREASE OF THE SPINAL REFLEXES



8

ARE the spinal reflexes ALL DECREASED???



9

....exceptions



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Pure paresis



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LOCALIZATION OF A NEUROLOGICAL LESION

2

The lesion is intracranial or extracranial?

Consider if there are deficits of the mental status, menace response or cranial nerves

YES

- forebrain
- brain stem
- cerebellum

NO

- spinal cord

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LOCALIZATION OF A NEUROLOGICAL LESION

2

The lesion is intracranial or extracranial?

Consider if there are deficits of the mental status, menace response or cranial nerves

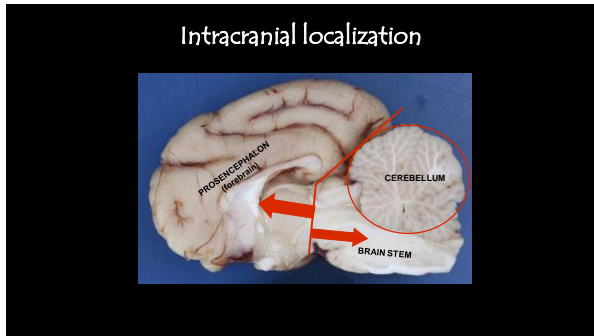
YES

- forebrain
- brain stem
- cerebellum

NO

- spinal cord

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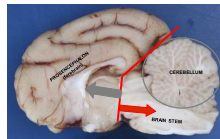


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Brain Stem dysfunction

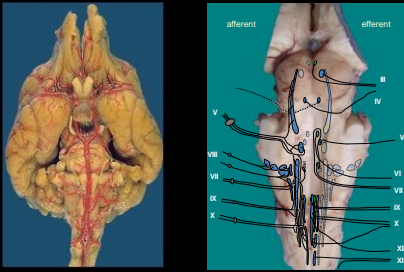
POSSIBLE CLINICAL SIGNS:

- ◊ mental status abnormalities
- ◊ paresis e ataxia
- ◊ cranial nerves deficits
- ◊ postural and proprioceptive deficits
- ◊ central vestibular syndrome



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brain stem and cranial nerves nuclei



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Stupor



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Where do you localize?

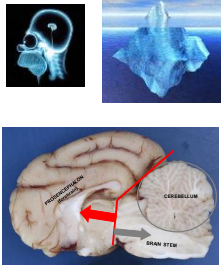


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Forebrain dysfunction

POSSIBLE CLINICAL SIGNS:

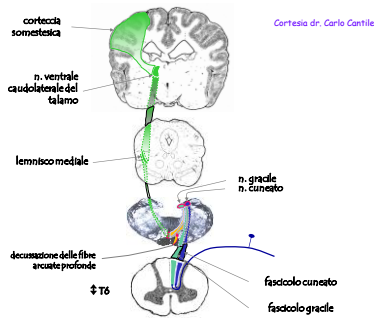
- ◊ behavioural abnormalities
- ◊ Seizures
- ◊ Menace response deficit
- ◊ Gait ± normal
- ◊ Proprioceptive deficits



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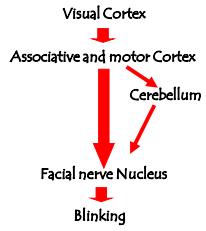
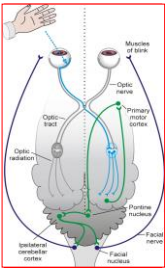
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Menace response test

ANATOMIC PATHWAY

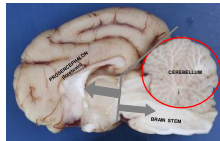


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Cerebellar dysfunction

POSSIBLE CLINICAL SIGNS:

- ◊ Cerebellar ataxia
- ◊ Hypermetria
- ◊ Spasticity
- ◊ Intention tremors
- ◊ Nystagmus
- ◊ Menace response deficit



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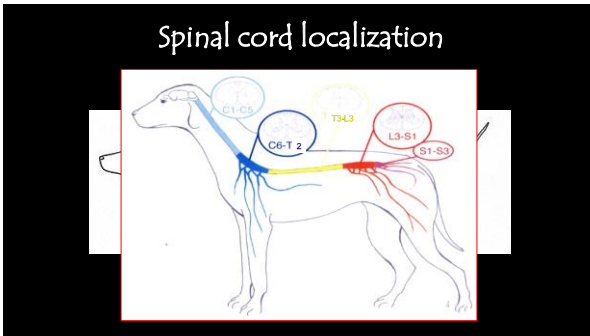
Where do you localize?



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LOCALIZATION OF A NEUROLOGICAL LESION



2

The lesion is intracranial or extracranial?

Consider if there are deficits of the mental status, menace response or cranial nerves

YES

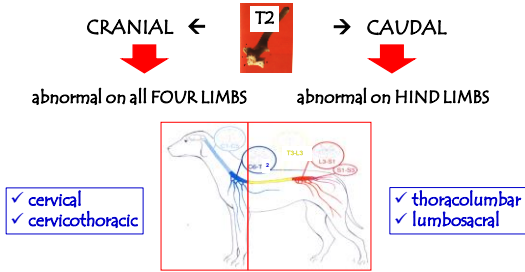
- forebrain
- brain stem
- cerebellum

NO

- spinal cord

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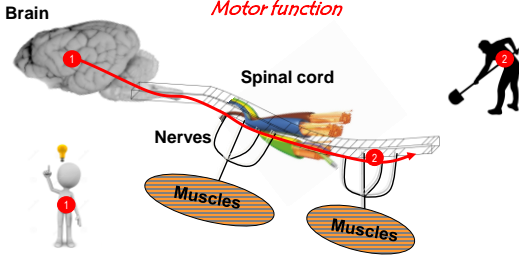
LOCALIZATION OF THE LESION: SPINAL CORD



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The voluntary movement

Motor function



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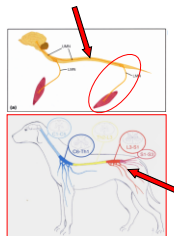
Lesion of the Upper Motor Neuron (UMN)

vs

Lesion of the Lower Motor Neuron (LMN)

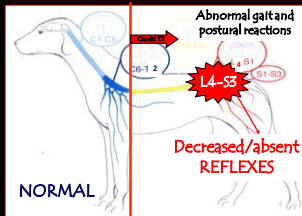
LESION OF THE UPPER MOTOR NEURON:
 NORMAL to INCREASED reflexes
 NORMAL to INCREASED muscle tone
 SPASTIC PARESIS/PARALYSIS

LESION OF THE LOWER MOTOR NEURON:
 DECREASED to ABSENT reflexes
 DECREASED to ABSENT muscle tone
 FLACCID PARESIS/PARALYSIS



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Localization of the lesion: LUMBOSACRAL



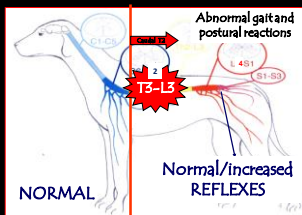
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LS lesion: Flaccid paraplegia



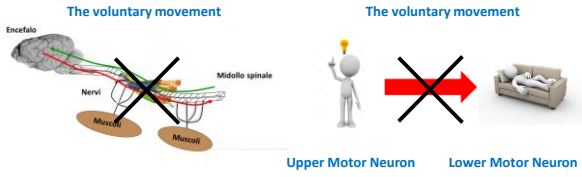
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Localization of the lesion: THORACOLUMBAR



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Thoracolumbar spinal cord lesion



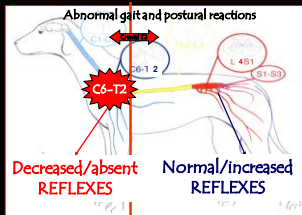
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TL lesion: Spastic paraplegia



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Localization of the lesion: CERVICOTHORACIC



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Localization of the lesion: CERVICAL

Exception: 30% of dogs have reduced flexor reflexes on front limbs (Faulstich et al., 2007)

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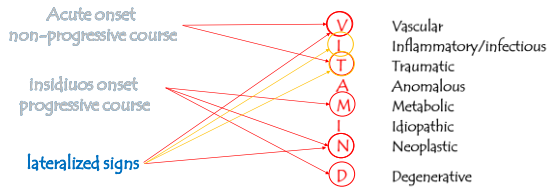
Clinical Differential Diagnoses

LOCALIZATION + ANAMNESIS

V	Vascular
I	Inflammatory/infectious
T	Traumatic
A	Anomalous
M	Metabolic
I	Idiopathic
N	Neoplastic
D	Degenerative

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Clinical Differential Diagnoses



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