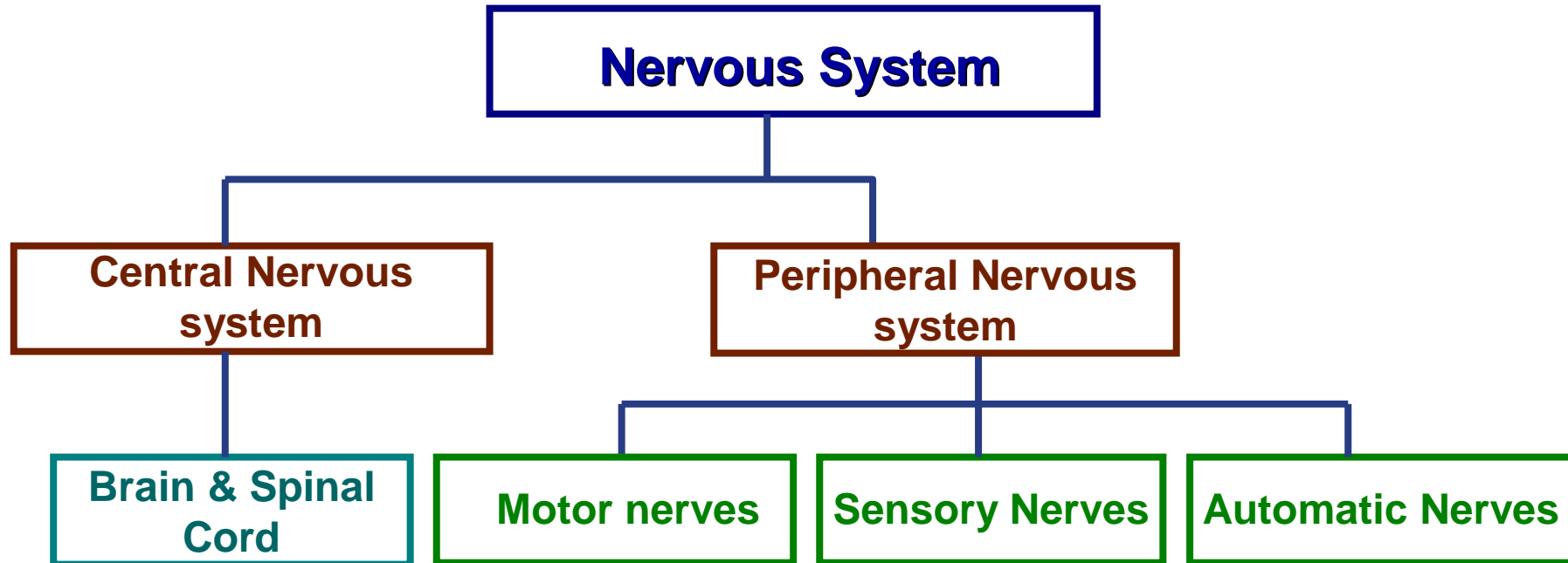


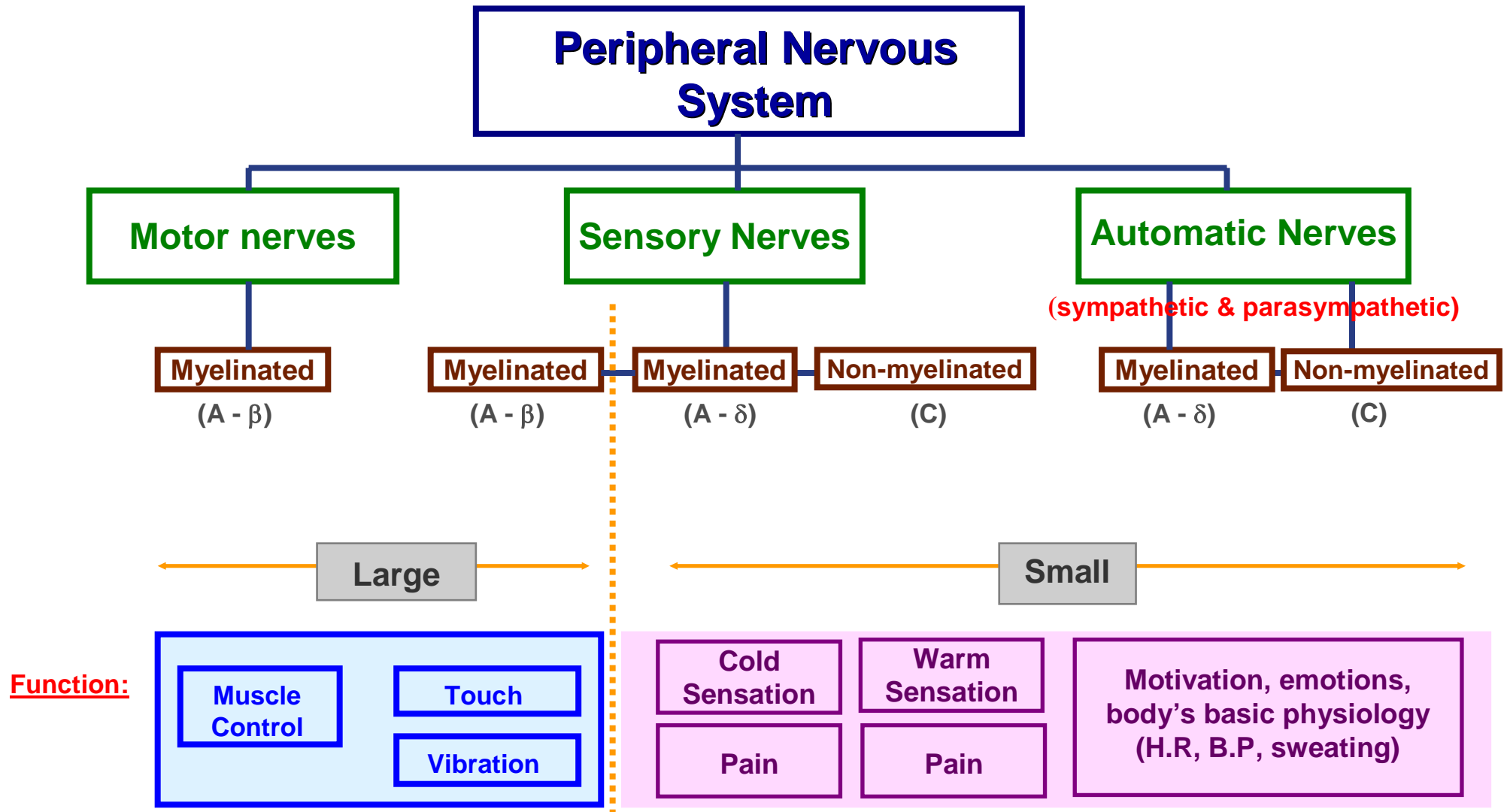
Medical Background

The Human Nervous System

General Layout of the human nervous system:



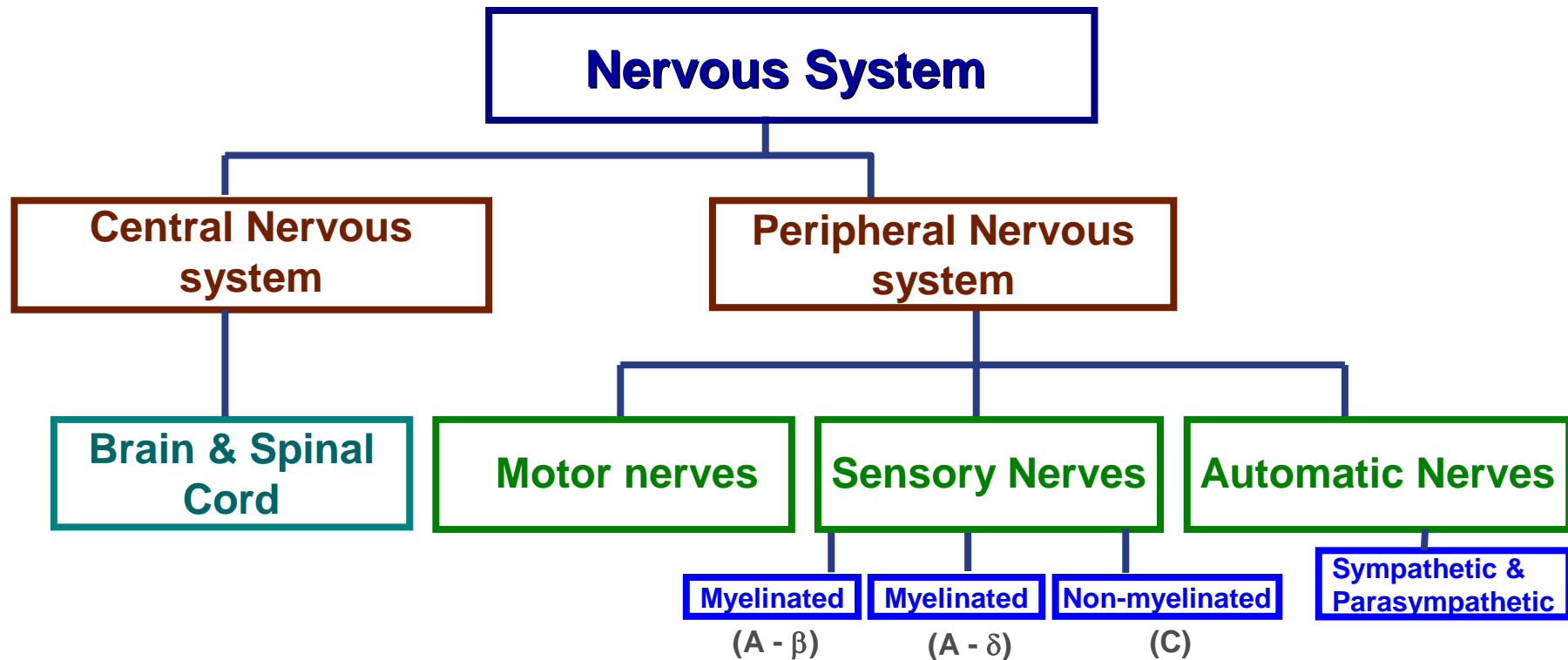
The Peripheral Nervous System



Sensory functions in peripheral nerve

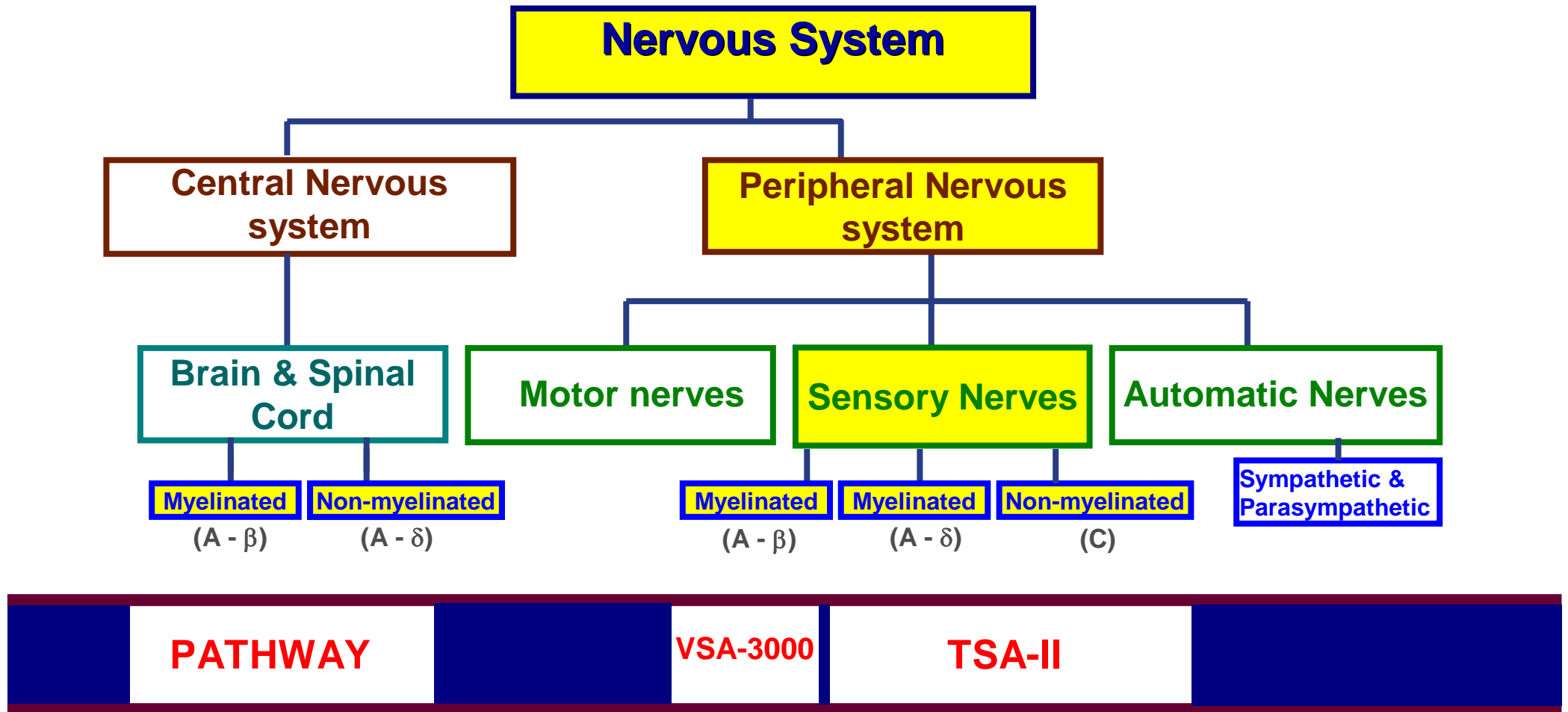
| Fiber type | Myelination | Diameter (mm) | Velocity (m/sec) | Function |
|------------|--------------|------------------|---------------------|--|
| A - b | + (Large) | 6-20 | 30-100 | Touch, Vibration, Proprioception |
| A - d | + (Small) | 1-5 | 5-30 | Heat, Cold, First pain (sharp and localized) |
| C | - (Small) | 0.5-2.0 | 1-2.5 | Warmth, Second pain (dull) |

Techniques for assessing the nervous system



| | | | | | |
|------------------------------|---------------------------------|---------------------------|-----|----------|----------------------------------|
| Bedside testing | | Tuning fork Cottonwool | Pin | | R-R Interval Orthostatic B.P. |
| Laboratory techniques | Somatosensory Evoked Potentials | VSA - 3000 NCS / EMG | | TSA - II | Autonomic laboratory |

Medoc's Expertise



Why QST ?

- * 70% of the peripheral nerve system are **small fibers**
- * Most existing diagnostic devices for the peripheral nerve system examine the large fibers only (EMG, NCV, and EP)
- * QST is the only clinical technique which can diagnose the small fibers

Why QST ?

- * QST is a non-invasive, pain-free technique, which can assist in **early detection, therapy selection and monitoring progression / recovery** of patients with peripheral disorders
- * Combined with the **VSA-3000 Vibratory Sensory**, the TSA-II offers comprehensive assessment of **small & large** peripheral nerve function

Why QST ?

- * The transmission of **pain sensation** is done through the small-caliber **A-Delta & C fibers** only
- * QST is the only technique which can diagnose these **small-caliber fibers**, which constitute the **“Pain Pathway”**
- * In other words, Thermal testing is the only clinical technique which quantitatively assess the function of somatic small fibers – from peripheral receptors through their central nervous system connections

Sensory modalities

TSA & VSA quantify 5 sensory modalities:

| Sensation | Thermal Threshold (for normal subjects) | Mediating fibers |
|-----------|---|------------------|
| Warmth | ~ 1-2 ⁰ c above adaptation (30-32 ⁰ c) | C |
| Cold | ~ 1-2 ⁰ c below adaptation (30-32 ⁰ c) | A - d |
| Heat pain | ~ 45 ⁰ c | C, some A - d |
| Cold pain | ~ 5-15 ⁰ c | C and A - d |
| Vibration | | A - b |

Range of Sensation



Sensation threshold - the lowest stimulus intensity causing sensation

Pain threshold - the lowest stimulus intensity causing pain

Pain tolerance - the lowest stimulus intensity causing withdrawal

QST – Scientific Findings

- Chronic Pain
- Painful Neuropathies
- Diabetic neuropathy
- Evaluation of Nerve Blocks
- Fibromyalgia
- Complex Regional Pain Syndrome (CRPS)
- Lumbar Radiculopathy
- Trigeminal & Facial Pain
- Headaches
- Central Pain Syndrome (CPS)