SOFTWARE FOR ASSESSING NERVES

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Medical anamneses:
  - Symptoms
    - Nerve distribution

“must include representation on the body image drawn by the patient”

Clinical assessment of neuropathy (signs): nerve palpation, reflexes, skin coloration and humidity

Sensory and motor tests

Patient subjective evaluation: Visual Analog Scale or other tests: Mc Gill, DN4 questionnaire and Neuropathic Pain Symptom Inventory
Semmes-Weinstein monofilaments/ graded sensory testing (GST)

– for follow up because it can grade the nerve impairment – semiquantitative

– SORRI- Bauru Kit comparable to standard QST test for pain sensation and temperature (C, Aδ fibers), gold standard for thin fibers

Comparability of mechanical detection and pain thresholds in quantitative sensory testing (QST) using different devices. Doreen B. Pfau, DMD, Department of Neurophysiology, CBTM, Medical Faculty Mannheim, University of Heidelberg, Germany. 14th World Congress on Pain, IASP, Milan, 2012.
Motor function

The motor nerve function assessment is done using voluntary muscle testing (VMT) according to the British Medical Research Council (MRC) scale.

- The motor assessment is performed manually for each muscle using a scale ranging from 0 to 5, as follows:
  - Grade 0: absence of muscle contraction, i.e., complete paralysis;
  - Grade 1: slight contraction observed only by palpation;
  - Grade 2: presence of active joint movement, but not against gravity;
  - Grade 3: complete joint movement against gravity;
  - Grade 4: complete joint movement against gravity and mild opposing manual force.
  - Grade 5: normal muscle force.

- In the routine examination, at least two muscles should be tested for each nerve: either two distal or one distal and one proximal.
  - Except for Tibial Nerve distally, medial and lateral plantar branches where evaluation of the muscle may be difficult or impossible.
For the **quantitative assessment of spontaneous pain** the authors suggest a visual analog scale (VAS):

- **zero** represents no pain
- **10** represents unbearable, incapacitating pain

Stump PR et al. Neuropathic pain in leprosy patients. Int J Lepr Other Mycobact Dis, 2004
Nerve palpation (NP)

- Nerve enlargement is a frequent abnormality in clinical assessment \(^{(1)}\)
- The nerve enlargement is related to the oedema intensity at the palpation site
- It is usually graded in crosses (+/+++++) but for statistics studies it must be transformed into a numeric scale from 0 normal to 5 extremely enlarged (one inch) \(^{(2)}\)


Clinical score (CS) calculated by numerical summation:

- **VAS**: from 0 to 10 \( \times 1 \) .............................. 0-10
- **NP**: from 0 to 5 \( \times 1 \) ................................. 0-5
- **GST**: from 0 to 6 \( \times 2 \) ................................. 0-12
- **VMT**: from 0 to 5 \( \times 2 \) ................................. 0-10

**Total**: from **0** to **37** or more depending on how many points or muscles have been chosen
Clinical Score media evolution in T1R and T2R during steroid treatment tested in a Clinical Trial \(^{(1)}\)

Comparing 1st X 8th evaluations Test “t” \((p < 0.05)\) RT2: 0.0462; RT1: 0.000017


\(^{(2)}\) Virmond M et al. Randomized, controlled multicenter trial to determine the role of nerve decompression in leprosy related neuropathy. Research Project in the Instituto Lauro de Souza Lima, Brasil
Because of these facilities in observing nerve evolution, the authors developed **software for neurological data logging** with these following features:

1. Automatic building of a Clinical Score (CS) for each nerve and treatment
2. Producing printed reports
3. Showing time series graph of NFA x drugs
4. Producing real time reliability for statistical analyses
The authors developed Software for data logging neurological evaluation of leprosy patients: **Software SORRI & ILSL**

- **Patient Data**
- **Visual Analog Scale for pain**
- **Semmes-Weinstein monofilaments**
- **Voluntary Muscle Testing (VMT)**
A patient follow up of all nerves during 14 months of prednisone treatment (white line)
The nerves "in your hands"

A SORRI & Instituto Lauro de Souza Lima partnership