Vertebral Traction Assessment System

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Résumé
The scope of the project is to quantitatively validate the clinical effects of an "Ambulatory Lumbar Traction Device" which is used by physiotherapists in their daily practice. Although randomized controlled trials have been performed to assess the device, very few findings and measures have been taken to assess the mechanical forces exerted by the system on the body, the residual activity of the muscular system interested in the therapy, along with the effects on deambulation of the body when carrying the device. To achieve these very interesting results, an instrumentation system has to be developed being able to acquire multiple measures, both mechanical and bioelectrical, to be correlated with each other and with clinical results. The system will gather the electromyogram of the muscles of the trunk and lumbar region, the deep muscles movement by means of an UWB radar, and the mechanical signals from load cells, torque cells, accelerometers and inclinometers. The key points of this project lie in the possibility of putting into evidence biomechanical and electrical measures before, during and after the application of the device and analyzing their evolution. For what it is presently known, there is no other study in the literature in which theses measures were taken during a lumbar traction treatment or any other modality of care in physiotherapy. As regards the lumbar traction, this research will evidence the particularities of this type of treatment which has not only mechanical and neurophysiologic effects, as we know today (intervertebral separation, nociceptive effect), but also an activity on the musculature of the trunk which will produce a postural and mechanical adaptation of the body as a whole.