

Supplemental 1. Quantitative sensory testing (QST) protocol.

Quantitative sensory testing will be performed in the main assessment area on the abdomen, in close proximity to the surgical incision.

A description of the QST procedures follows:

Thermal detection and thermal pain thresholds

Equipment: The Thermal Sensory Analyzer (TSA-II or PATHWAY platform - Medoc, Ramat Yishai, Israel) will be used to determine thermal detection and pain thresholds. This equipment is used globally for functional assessment of pain and temperature-conducting nerve fibers (C and A-delta fibers).

Method and Background: Using the thermal sensory analyzer, cold and warm detection thresholds (CDT and WDT, respectively), as well as cold and heat pain thresholds (CPT and HPT, respectively) will be determined. The thermode with contact area of 9.0 cm² is applied to the tested site, and all thresholds are determined by continuous ramping of temperature from 32°C baseline temperature by 1°C/s until the subject presses the 'stop' button. Cut-off temperatures are 0°C and 50°C, to minimize thermal damage to the skin. The baseline temperature to which the thermode returns before each test is 32°C. The average threshold is calculated from three measurements in each area.

Determination of mechanical detection threshold (MDT)

Equipment: A set of standardised von Frey filaments (#1.65, #2.35, #2.44, #2.83, #3.22, #3.61, #3.84, #4.08, #4.17, #4.31, #4.74, #4.93, #5.07, #5.18, #5.46, #5.88, #6.10, #6.45, 6.65). The contact area of the filaments with the skin is of uniform size (<1 mm²) and texture.

Methods and Background: Standardised von Frey filaments will be used in a modified "method of limits" manner using 3 series of increasing and decreasing stimulus intensities to determine the geometric average as the tactile detection threshold of the affected and unaffected skin areas.

Von Frey filaments of different stimulus intensities are used to determine the tactile detection thresholds. A #5.07 filament (eliciting 10 gram force)* is applied first, followed by filaments of consecutively lower intensity until the patient cannot detect the stimulus being applied. This respective force represents the first threshold value. The order in which the stimuli are applied is then reversed and stimuli of consecutively greater intensity are applied until sensation is detected (this intensity becomes the second value). Again filaments with decreasing intensity are applied until in total 3 upper and lower values of detection are fulfilled from which the mechanical detection threshold can be determined.

* In case the first von Frey filament (#5.07) is not detected, the next highest intensity filament which can be detected must be used as a starting intensity. However, the relevant force of this stimulus is not documented. Filaments with consecutively lower intensity are applied until the patient cannot detect the stimulus being applied. The procedure is followed as above; until in total 3 upper and lower values of detection are fulfilled from which the mechanical detection threshold can be determined.

Determination of mechanical pain thresholds (MPT)

Equipment: Same as for MDT determination.

Methods and Background:

Standardised von Frey filaments will be used in a modified “method of limits” manner using 3 series of increasing stimulus intensities to determine the average mechanical pain threshold of the affected and unaffected skin areas.

Beginning with an applied force of 8mN, stimuli increase in intensity until the sensation induced by increased pressure can be described as ‘painful’. The corresponding force is used to represent the first MPT value. The procedure is then repeated a total of 3 times and until a total of 3 values are obtained, from which the mean mechanical pain threshold can be determined.

Determination of wind-up ratio (WUR)

Equipment: A pinprick stimulus with standardised intensity (#6.10 von Frey filament, approx. 98 gram) and a flat contact area of 0.25mm diameter.

Methods and Background: In this test a pinprick is first applied singularly. After that a series of 10 identical pinprick stimuli are applied with a frequency of 1 s^{-1} within an area of 1 cm^2 .

Immediately following the single stimulus and series of stimuli, an evaluation of the sensation must be provided according to NRS (0-10, ‘0’: ‘no pain’, ‘10’: ‘worst pain imaginable’). A ratio is calculated using these values. This procedure shall be repeated twice. A geometric average of the ‘wind-up’ is calculated from the two ratios.