

# CAN PEOPLE WITH LOW BACK PAIN CONSISTENTLY REPORT THE LOCATION OF NOCICEPTIVE STIMULI ON A DIGITAL BODY CHART?

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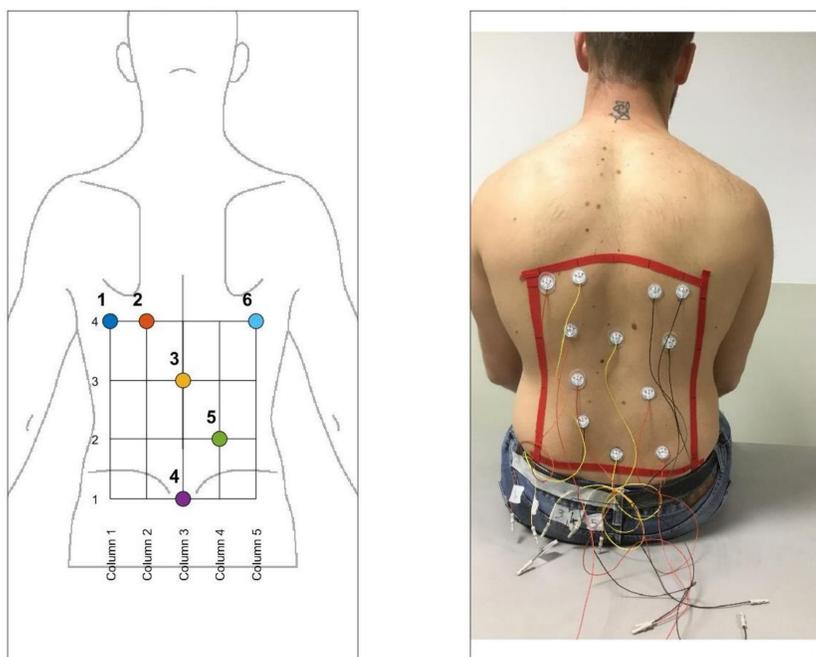
## Background

Digital pain drawings are used to assess pain location and pain extent in people with pain disorders including those with chronic low back pain (CLBP). Previous studies have confirmed that people can report their painful area in a reliable way. However, the conscious sense of body and proprioception can be impaired in people with CLBP which may affect the validity of pain drawings. Investigations which assess the capacity and accuracy of people with CLBP in locating painful sensations on digital body charts (DBC) are needed.

## Purpose

To evaluate how consistently people with and without CLBP can indicate the location of nociceptive stimuli applied over their back when reporting on a DBC.

Table 1

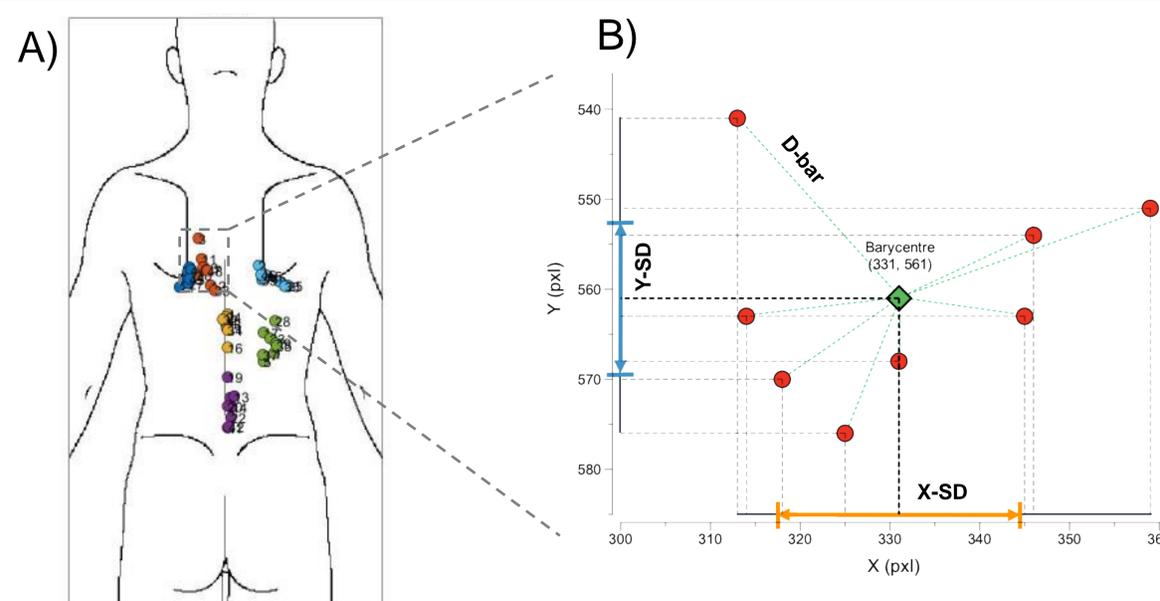


On the left, the anatomical grid (4 rows and 5 columns) used to apply the six electrodes connected to the electrical stimulator. On the right, a volunteer with twelve electrodes applied according to the protocol.

## Methods

Fourteen people with CLBP and 36 healthy volunteers participated. A grid of four rows and five columns was drawn over the participants' lumbar region. Six circular electrodes connected to a current stimulator were applied at points on the grid: one on the cross between column three and row four and five in the remaining crosses by means of a stratified randomization procedure (Figure 1). Additionally, six electrodes disconnected from the electrical stimulator were distributed over the remaining crosses. All participants were blinded to the electrode locations. Eight painful electrocutaneous stimuli were randomly delivered to each connected electrode. Participants were instructed to draw where they perceived each painful stimulation using a DBC presented on a tablet. The DBC was centered on a canvas 768x1024 pixels (pxl), and pain location was defined by X and Y coordinates. For each stimulated electrode the barycentre was computed for the eight locations reported on the DBC. The consistency of participants in reporting the location of painful stimulation was described using three variables: the standard deviation of the X coordinates (**X-SD**), the standard deviation of the Y coordinates (**Y-SD**) and the mean distance of reported location from the barycenter (**D-bar**). The consistency in locating the nociceptive stimuli was compared between groups using Mann-Whitney U test.

Figure 2



Variables used to estimate the consistency. A) Red dots in the left side of the body chart show pain location for one of the six electrodes. B) **Y-SD**: consistency in the vertical direction, **X-SD**: consistency in the horizontal direction, **D-bar**: consistency in both the directions (vertical and horizontal).

## Results

In the participants with CLB, the median(IQR) **X-SD** was 9.8(12.15) pxl, the median(IQR) **Y-SD** was 19.5(25.3) pxl and the median(IQR) **D-bar** was 19.7(13.2) pxl. In healthy volunteers, the median(IQR) **X-SD** was 10.3(9.1) pxl, the median(IQR) **Y-SD** was 18.2(12.9) pxl and the median(IQR) **D-bar** was 18.3(10.5) pxl. **No significant group difference was found in reporting the painful stimuli.**

## Conclusion

The median variability in locating nociceptive stimulations applied over the lumbar region was ~2-3 mm for the horizontal direction and ~4-5 mm for the vertical direction, indicating that the consistency in reporting the location of nociceptive stimuli to the lumbar region is higher in the horizontal direction than in the vertical direction. **Participants with CLBP showed no deficits in the capacity to consistently report the location of painful stimuli applied over their lower back.**

## Clinical Implications

People with CLBP can identify the location pain on DBC. Moreover, nociceptive stimulation can be used to assess how well people with CLBP can locate and consistently report the location of painful stimuli. This may be a relevant clinical test which can be explored in other patient populations.

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