

# A Neonatal Facial Image Scoring System (NFISS) for Pain Response Studies

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摘要

## Abstract

The aim of this study was to establish a scoring system, Neonatal Facial Image Scoring System (NFISS), for investigating the pain responses in neonates during routine venipuncture. We collected 1998 facial images from 19 infants during the first phase of this study and identified twelve features of the facial image: normalized scale for NFISS (scale from 0-15), including brow bulge (0-2), vertical brow furrowing (0-1) and short distance (0-1), brow lowering (0-1), eyes close (0-1), bulging eyes (0-2), eye-eye furrowing (0-1), cheek bulge (0-1), nasal-labial furrowing (0-2), mouth open and stretch (0-1), lip purse (0-1) and taut tongue (0-1). During the second evaluation phase, with 2770 images from 31 newborn infants (average age: 2.85 ± .027 days), the pain responses were graded on the NFISS scale. Two peak score values during a time course of baseline-venipuncture-recovery (3-3-10 min) were found with needle piercing and needle withdrawal. The reliability of the score analysis was evaluated using 492 randomly selected images out of the 2770 images. The results for intrascorer (author, one week interval) and inter-scorer (author and one experienced nurse) has correlation coefficients of 0.916 and 0.826, respectively.