TITLE: TESTING THE VALIDITY OF AN OBJECTIVE PAIN SCALE FOR INFANTS AND CHILDREN

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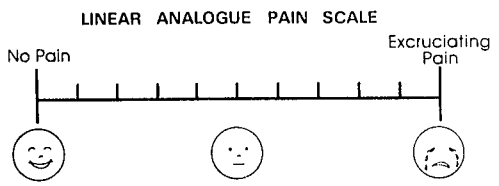
The objective assessment of pain is difficult. Pain cannot be measured directly. Adults can use self-reporting or cognitive scales such as the 0-10 linear analogue pain scale (LAPS) to quantitate and report the intensity of their pain. Such scales, however, require patient comprehension and cooperation. They are seldom useful in young children even when they have been simplified by the addition of pictures (Figure 1).



Alternatively, an Objective Pain Scale (OPS) has been used in several recent studies,[1,2,3] to equate pain and discomfort in young children with changes in standardized behavioral and physiological parameters (Table 1). Unlike LAPS, OPS does not require direct patient participation.

TABLE 1. OBJECTIVE PAIN-DISCOMFORT SCALE

OBSERVATION	CRITERIA	POINTS
Blood Pressure	± 10% Pre-Op	0
	10 to 20% Pre-Op	1
	20 to 30% Pre-Op	2
Crying?	Not crying	0
	Crying but responds to tender loving care (TLC)	1
	Crying and does not respond to TLC	2
Moving	None	0
	Restless	1
	Thrashing	2
Agitation	Patient asleep or calm	0
	Mild	1
	Hysterical	2
Verbal Evaluation or Body Language	Patient asleep or states no pain	0
	Mild pain (cannot localize)	1
	Moderate pain (can localize) verbally or by pointing	2

However, while OPS has been successfully used to determine the need for analgesic administration in previous studies[1,2,3] its validity has never been tested.

METHODS: After institutional approval and informed consent were obtained, we prospectively studied 34 children and adolescents ranging in age from 13-18 years. Postoperative pain and discomfort following arthroscopic knee surgery were evaluated by the patient using LAPS and by an observer using OPS at 5 minute intervals for the first 30 minutes and at 10 minute intervals for another 30 minutes. The paired pain scores on LAPS and OPS scales were compared using Spearman's rank correlation. Children scoring 6 or more points on either scale received fentanyl 1 to 2 mcg/kg IV.

RESULTS: All children quantitated the severity of their pain with LAPS at a similar or more intense level than did the observer using OPS. There was an excellent correlation between LAPS and OPS in children having intense pain (score $\geq$ 6) (Spearman's r = 0.721 $\pm$ 0.063). There was less agreement, however, in children having only mild or moderate pain (score $<$ 6) (r = 0.419 $\pm$ 0.85). Twelve children required fentanyl analgesia; 22 did not. The intensity of pain decreased in magnitude in all cases to less than 6 points on both LAPS and OPS following fentanyl administration.

DISCUSSION: Tremendous interest has been recently displayed in both the anesthesia and pediatric literature in the area of adequate operative and postoperative pain control in infants and children. However, optimal postoperative pain management can only be implemented if the methods used to assess pain intensity are valid. While direct validation of OPS is not possible in nonverbal infants and very young children, this study has demonstrated that OPS gives similar results to those obtained with LAPS in older children. It is therefore inferred that the Objective Pain Scale (OPS) is a valid instrument for assessing the intensity of pain in very young infants and nonverbal children.

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