

# **A novel fuzzy pain demand index derived from patient-controlled analgesia for postoperative pain.**

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摘要

## **Abstract**

A multilayer hierarchical structure for an intelligent analysis system is described in this paper. Four levels (patients', measurement, Web-based, and interpreting) are used to collect massive amounts from clinical information and analyze it with both traditional and artificial intelligent methods. To support this, a novel fuzzy pain demand (FPD) index derived from the interval of each bolus of patient-controlled analgesia (PCA) is designed and documented in a large-scale clinical survey. The FPD index is modeled according to a fuzzy modeling algorithm to interpret the self-titration of the drug delivery. A total of 255 patients receiving intravenous PCA using morphine (1 mg/ml) tested this index by offline analysis from this system. We found the FPD index modeled from a fuzzy modeling algorithm to interpret the self-titration of the drug delivery can show the patients' dynamic demand and past efforts to overcome the postoperative pain. Moreover, it could become an online system to monitor patients' demand or intent to treat their pain so these factors could be entered into a patient's chart along with temperature, blood pressure, pulse, and respiration rates when medical practitioners check the patients