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Research and Outcomes on Analgesia and Nociception During Surgery

Jinu Kim, MD; Tehila Adams, MD; Deepak Sreedharan, MD; Shanti Raju, MD; and Henry Bennett, PhD

St. Luke's Roosevelt Hospitals, New York, NY

Six studies are reviewed leading to an outcomes-based research question. The key theoretical question is: If in the presence of equianalgesic recovery from anesthesia (PACU pain scores of 0), does intraoperative facial micro grimacing (FACE R2 > 20) predict later postoperative pain, catabolism, and exhaustion in proportion to the magnitude and duration of facial micro grimacing during demonstrated unconsciousness with general anesthesia (MAC > 0.7)?

The latest clinical study found large individual differences in facial micro grimacing to a standard stimulus (incision) and opioid doses. End-tidal gas concentration plus opioid dose did not predict high or no grimace response to incision. Grimacing was independent of end-tidal desflurane (P = .06) and fentanyl dose prior to incision.

A definitive clinical test of using facial grimacing as a signal of adequate analgesia will require (1) monitoring of somatic pain stimulation (eg, orthopedic surgery) and (2) monitoring of visceral pain stimulation (eg, colectomy).

Interventions will be based on remifentanil bolus versus inhalation gas increase.

Outcomes will be: (1) effectiveness of gas versus remifentanil IV bolus in ameliorating nociception activations, (2) immediate and delayed postoperative pain behaviors, (3) analgesic consumption, (4) catabolic processes (eg, infection), and (5) long-term exhaustion.

Theoretical issues to be addressed include whether central pain registration in subcortical structures during the unconsciousness of general anesthesia does or does not have consequences.

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