(CFI) and root mean square error of approximation (RMSEA).
Results: There were 450 patients collected in this study and the mean morphine consumption during the first 3 post-op days was 76.9 mg. The average daily pain scores during the first post-op week ranged from 2.0 to 3.0. Linear regression analysis revealed that male and higher body weight were associated with more morphine consumption (both $p < 0.001$) but elderly ($p < 0.001$) and around-the-clock acetaminophen use ($p = 0.003$) were related to less morphine demand. The latent curve analysis also identified four influential factors of postoperative pain trajectories over time. For the intercept parameter, only longer anesthesia time was associated with higher baseline pain level ($p < 0.001$). With respect to the slope parameter, male gender ($p < 0.001$) and around-the-clock NSAIDs use ($p = 0.012$) were associated with faster pain resolution over time but diabetes was connected to a smoother decreasing trend of pain trajectories (both $p = 0.01$). The goodness of fit of the final latent curve model was acceptable (RMSEA = 0.08, CFI = 0.84).
Conclusions: In the context of IVPCA use, acetaminophen and NSAIDs were associated with reduced morphine consumption and faster pain resolution over time, respectively, after surgery for hepatic cancer. Multimodal analgesia should be considered to provide better pain management in patients receiving hepatic cancer surgery.

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The effect of preoperative pregabalin on persistent chronic pain after cardiac surgery

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Background and Goal of Study: This study investigated the effect of preoperatively administered pregabalin (1) on chronic pain after elective cardiac surgery (2).
Materials and Methods: This prospective-double-blind study included 123 consecutive patients, who were randomly assigned into three groups {Placebo group (P), Oral pregabalin 75 mg group (OP 75), Oral pregabalin 150 mg group (OP 150)}. Patients were assessed postoperatively (12 months and 24 months) regarding the presence of persistent chronic pain (Numeric Rating Scale, NRS) and any potential sleep disturbances (Pittsburg Sleep Quality Index, PSQI). Statistical analysis was performed by using IBM, SPSS statistics, version 22.
Results and Discussion: Patients receiving pregabalin reported lower pain scores (NRS) 12 months {4 in (P group), versus 3 in (OP 75 group), versus 3 in (OP 150 group), p-value = 0.001} and 24 months postoperatively {3 in (P group), versus 2 in (OP 75 group), versus 2 in (OP 150 group), p-value = 0.000}. Of note, at 12 months patients on both groups (OP 75 and OP 150) reported lower daily intake of analgesics {30/41 in (P group) versus 19/41 in (OP 75 group) versus 12/41 in (OP 150 group), p = 0.000} and fewer sleep disturbances {20/41 in (P group) versus 9/41 in (OP 75 group) versus 5/41 in (OP 150 group), p = 0.000} respectively. At 24 months the daily intake of analgesics {28/41 in (P group) versus 17/41 in (OP 75 group) versus 11/41 in (OP 150 group), p = 0.000} and the sleep disturbances {18/41 in (P group) versus 7/41 in (OP 75 group) versus 4/41 (OP 150 group), p = 0.000} were still lower in both groups.
Conclusions: It seems that the preoperative administration of pregabalin, at the dose of 75 mg or 150 mg, in patients undergoing cardiac surgery, results in lower pain scores, lower daily intake of analgesics and fewer sleep disturbances at 12months and 24 months postoperatively.
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A TREK channel family activator with well-defined structure-channel activation relationship for polymodal pain

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Background and Goal of Study: Two-pore-domain (K2P) potassium channels possess four transmembrane helices (M1-M4) with two-pore domains (P1 and P2). K2P channels generate background K+ leak currents, and are involved in the regulation of excitability in neurons. TWIK-related K+ channel (TREK) is a subfamily of K2P, including TREK-1, TREK-2, TWIK-related arachidonic acid-stimulated K+ channel (TRAAK). The TREK subfamily channels share >78% sequence homology and some common activation mechanisms. Recent studies suggest that TREK subfamily is potential analgesic target. However, selective activators of TREK subfamily with both clear action mechanism and in vivo analgesic ability for chronic pain have been lacking.
Materials and Methods: We performed the in-house experimental screenings to identify a small molecular C3001a. Computational analysis and site directed mutagenesis were used to determine the binding modes of C3001a to TREK subfamily channels. The whole-cell patch-clamp electrophysiology in HEK-293T and isolated dorsal root ganglia (DRG) neurons was used to identify the effect of C3001a on TREK subfamily. In a neuropathic pain model of spared nerve injury and the chronic inflammation pain model induced by complete Freund's adjuvant, the analgesic effects of C3001a on thermal and mechanical allodynia were evaluated in mice.
Results and Discussion: C3001a selectively and efficaciously activated TREK-1 and TREK-2 channels, while C3001a showed lower magnitude activation on TRAAK. We defined the binding mode of C3001a within a cavity formed by P1 and TM4 in TREK-1. We identified the carboxyl group of C3001a as a structural determinant for the binding to TREK-1/2, and the D227 as a key residue that defined the subtype-selectivity of C3001a against TRAAK. Furthermore, C3001a reduced the excitability of nociceptive neurons in DRG. In neuropathic pain, C3001a alleviated cold hyperalgesia with similar efficacy compared to pregabalin. In chronic inflammation pain, C3001a attenuated the heat hyperalgesia and mechanical allodynia.
Conclusion: This study reports C3001a as a selective activator of TREK channels. C3001a represents a lead compound with well-defined structure-function relationship, which could advance the rational design of peripherally-acting analgesics targeting K2P channels without opioid-like adverse effects.

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Co-analgesics and opioid-sparing effect in parathyroid surgery

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Background and Goal of Study: The majority of cases of primary hiperparathyreosis (PHPT) due to solitary adenoma and require the target surgery. Research of new anaesthesia/analgesia methods, which afford to have an opioid-sparing effect, is going. The Goal: Assessment of using combine method anaesthesia with co-analgesics on the intra- and post-op opioid requirement in parathyroidectomy patients.
Materials and Methods: 124 patients with PHPT were divided into 3 groups: the group STI-BCSPB (n=26) was used combined general anaesthesia (GA) with sevoflurane (SEV), the tracheal intubation (TI) with the myorelaxant introduction and bilateral cervical superficial plexus blockade (BCSPB); the group STI (n=82) was used SEV anaesthesia with IT and no BCSPB; the group PLM-BCSPB (n=16) was provided propofol (P) GA with protection air-ways by laryngeal mask (LM) and BCSPB. In both groups (STI-BCSPB and PLM-BCSPB) were used co-analgesics, such as dexamethasone (DXM) 8 mg IV, 2% lidocaine (L) 1,0-1,5 mg/kg IV, metamizole (M) or paracetamol (P) 1 g IV, dexketoprofen (DKTP) 50 mg IV as pre-emptive analgesia 30 min before surgery. Ketamine 25 mg IV was used for induction anaesthesia in theses groups. In STI group only opioid with P were used for induction of GA. Duration of surgery (DoS), anaesthesia (DoA), opioid consumption, time from the operation ending until the eyes opening (EyOp), desaturation were measured. All data M±σ.
Results and Discussion: DoS for STI, STI-BCSPB and PLM-BCSPB was respectively 37.8±13.9, 38.2±14.4 and 35.62±12.6 min (NS), DoA was respectively 59.4±17.9, 63.8±18.5 m and 48,1±16.5 min (p= 0.028 STI vs PLM-BCSPB, p= 0.024 STI-BCSPB vs PLM-BCSPB, the difference is significant (DS)). EyOp was 15.4±3.6, 15.6±4.0 and 11.2±2.6 min respectively for STI, STI-BCSPB and PLM-

BCSPB (p=0.022 STI vs PLM-BCSPB (DS) and p=0.025 STI-BCSPB vs PLM-BCSPB (DS)) . Desaturation (SpO2 below 92%) due to residual sedation and the effect of myorelaxants was observed in 39 (47.5%) and 12 (46,1%) patients in STI and STI-BCSPB during the first 30 min post-op compared to 2 cases (12.5%) in PLM-BCSPB (both STI groups were DS vs PLM-BCSPB, chi-square test). The dose of intra-op fentanyl was 334.3±56.8, 261.5±86.9 209.3±46.1 mcg in STI, STI-BCSPB and PLM-BCSPB respectively, (DS for PLM-BCSPB vs other groups, DS between STI groups).
Conclusion: Combine methods GA with BCSPB have some benefits vs mono GA. Co-analgesics afford to achieve an opioid-sparing effect.

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Endoscopic surgery is associated with lower incidence of chronic postsurgical pain: a nationwide population-based study in Taiwan

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Background and Goal of Study: Chronic post-surgical pain (CPSP) impairs patients' long-term quality of life and causes significant economic burden. However, compared to acute postoperative pain, CPSP is often neglected by clinicians. Most studies on CPSP have collected data in a single institution with a limited number of patients which provide limited power. The reported incidences of CPSP varies between studies and ethnic variation also makes generalization of aforementioned studies to the population in Taiwan not feasible. Thus, we aim to investigate the epidemiology of CPSP in Taiwan and to determine the association between different surgical approaches and its incidence.
Materials and Methods: The data was collected from Longitudinal Health Insurance Database (LHID), a sub-dataset of the National Health Research Dataset (NHIRD) in Taiwan, which contains claim-data of 2 million randomly selected beneficiaries. In-patients who underwent surgery under general anesthesia was identified using the ICD-9-CM code. Prescriptions after operation in out-patient clinics was traced. We evaluated the incidence of prolonged post-operative opioid use more than 3 months and accordingly the incidence of severe CPSP. We compared the incidences for traditional and endoscopic surgery, including thoracoscopy and laparoscopy, using adjusted odds ratios (aOR) with 95% confidence interval.
Results and Discussion: Between 2005 and 2015, we identified 121127 patients who underwent surgery with general anesthesia. 1331 (1.10%) of them developed severe CPSP 3 months after operation. Among different surgical procedures, thoracic surgery (3.26%), hepatectomy (2.80%), renal surgery (1.92%), gastric surgery (1.43%), and cholecystectomy (1.13%) were associated with higher incidence of prolonged opioid use, whereas herniorrhaphy (0.70%), appendectomy (0.50%) and gynecological surgery (0.44%) were associated lower incidence. Compared to traditional surgical approach, endoscopic approach for thoracic surgery (aOR 1.47, 95% CI 1.09-1.99), cholecystectomy (aOR 1.86, 95% CI 1.38-2.52), gastric surgery (aOR 1.91, 95% CI 1.56-2.34), herniorrhaphy (aOR 1.83, 95% CI 1.13-2.98), and renal surgery (aOR 3.00, 95% CI 1.08-8.37) was associated with significantly lower incidence of severe CPSP.
Conclusion: Thoracic and upper abdominal surgery were associated with higher incidence of severe CPSP. Compared to traditional approach, endoscopic surgery was associated with lower incidence of severe CPSP.

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An investigation of influential factors of postoperative pain trajectories after surgery for gastric cancer

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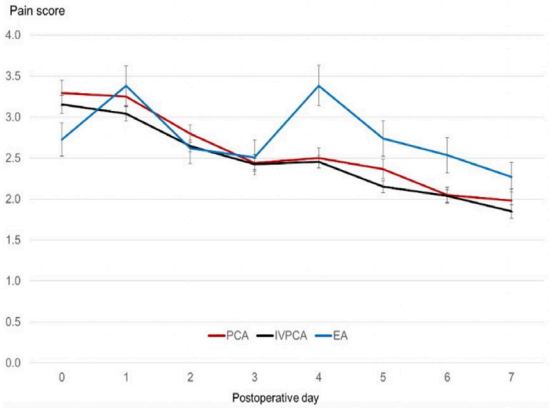
Background: Pain is common after upper abdominal surgery for gastric cancer and this retrospective study aimed to investigate the influential factors of postoperative pain trajectories for patients receiving gastric cancer surgery.
Methods: After the approval of our Institutional Review Board, we performed electronic medical chart review to retrieve data from patients undergoing tumor resection for stage I through III stomach cancer at Taipei Veterans General Hospital in Taiwan from 2012 to 2018. Numeric rating pain scores in the first postoperative week were gathered and mean values were calculated on a daily basis. We also collected patients' demographics, ASA physical status, analgesic methods, anesthesia time, etc. Linear mixed models were employed to evaluate the effects of collected variables on postoperative pain scores over time and potential interactions with time were also assessed. A backward elimination strategy was used to select independent factors significantly associated with the changes in postoperative pain over time.
Results: A total of 497 patients were included in the analysis and on average, daily pain scores during the first postoperative week ranged between 1.9 and 3.2. Linear mixed model analysis identified that ASA class > 3 (p = 0.012), analgesic methods (p = 0.023), age (p = 0.04), anesthesia time (p = 0.005) and postoperative day (POD, p < 0.001) were associated with postoperative pain trajectories and an interaction was noted between POD and analgesic methods or age (p =0.001 and < 0.001, respectively). Sex, body weight and body mass index were not related to the variations in postoperative pain scores over time.



Conclusion: Age, ASA physical status, analgesic methods and anesthesia time were associated with baseline pain trajectories and age and analgesic methods were related to the trend of pain resolution over time after surgery for gastric cancer. Our analytical approach provided valuable information to elucidated the complex and dynamic changes in postoperative pain scores over time.

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An Investigation of Factors Associated with Postoperative Pain Trajectories after Abdominal Surgeries Using Latent Curve Model

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Background and Goal of Study: Although intravenous patient-controlled analgesia (IVPCA) is commonly used to relieve acute pain after abdominal surgeries, few studies have ever evaluated the influential factors of the variations in postoperative pain trajectories over time in these patients. This study aimed to fill this gap by using latent curve models to analyze postoperative pain trajectories and explore their potential predictors.
Materials and Methods: This retrospective study was conducted in a medical center in Taiwan and we collected data from patients receiving abdominal surgeries and postoperative IVPCA between Jan and Dec 2012 by reviewing our electronic medical recordings. We also collected daily mean numeric rating pain scores in the first postoperative week and other potentially influential factors of postoperative pain trajectories. Latent curve analyses using two latent variables, intercept and slope, were employed to model the changes in postoperative pain scores over time. We also evaluated the effects of collected variables on these two latent variables and conduct the backward model selection processes to determine the final multiple predictors model which best account for the variations in postoperative pain trajectories over time.
Results and Discussion: There were 1243 patients collected in this study and among them, 542 (43.6%) received upper abdominal surgeries and the others underwent lower abdominal surgeries. The mean daily pain scores during the first postoperative week ranged from 2.0 to 2.7. The latent curve analysis identified four influential factors of postoperative pain trajectories over time, including age, weight, sex and surgical sites. Body weight and age were negatively associated with the baseline level of mean pain scores (p < 0.001 and p = 0.001, respectively) Regarding the trends of pain resolution reflected by slop parameters, younger age, male gender and lower abdomen surgery tended to steepen the decreasing trends (p = 0.011, 0.015 and p < 0.001, respectively). The analysis of fit statistics revealed acceptable model fit to the data (RMSEA = 0.08, CFI = 0.92).
Conclusion: Sex, weight, age, and surgical sites worked in combination to affect postoperative pain trajectories over time in patients receiving abdominal surgeries and IVPCA. Latent curve analysis provided insight into the dynamic relationships and complicated interactions between the postoperative pain and their predictors.