

PUBLICATIONS:

Current Projects:

Neuraxial drug errors, a book chapter on IV fluid therapy, ambulatory anaesthesia, medical education.

■ Accepted for presentations:

Accepted for presentation at Association of Anaesthetists meeting in Edinburgh, UK in September 2023.

1. Inadvertent neuraxial antibiotic administration incidents - A review of the literature. **[For oral presentation].**
2. Review of neuraxial paracetamol, nonsteroidal anti-inflammatory analgesics and antiemetics errors.
3. Intrathecal tranexamic acid incidents in India – A problem of look-alike ampoule or a physician's incorrect visual perception?

■ PUBLISHED: Peer review publications.

Book Chapters:

- Two Chapters: B Pollard, G Kitchen (Editors). Handbook of clinical anaesthesia, 4th Edition, Sep 2017. CRC press (Taylor and Francis Group).

Santosh Patel and Tom Wright: Chapter 25 Preoperative assessment pages 549-589 – several sections including: Cardiopulmonary exercise testing, Preoperative assessment – Overview, Preoperative drug administration, Preoperative assessment – Specific surgical populations, Psychiatric illness and drug abuse.

Santosh Patel and Alastair Duncan. Chapter 7 Blood pages 197-224 – several sections including: Anaemia, Blood loss and replacement, Disseminated intravascular coagulation, Sickle cell anaemia, Multiple myeloma.

- A chapter in 'Anaesthesia and Perioperative care of high-risk surgical patients', 3rd edition, Editor: Ian McConachie, Cambridge University Press; 2014.

S Patel: Gastrointestinal surgery Chapter 24 pages 365-86.

Chapter contents are – Cricoid pressure and aspiration, Fluid therapy, Anaesthesia and intestinal circulation, Anaesthesia and intestinal anastomosis, Oxygen and surgical site infection, Enhanced recovery.

Editorials

Patel S. Safe spinal anaesthesia practices to prevent intrathecal tranexamic acid incidents. Journal of clinical anaesthesia 2022;;82:110889.

Cited by 3 as per Google scholar

<https://www.sciencedirect.com/science/article/abs/pii/S0952818022002471?via%3Dihub>

Lie J; **Patel S**: Ultrasound for obstetric neuraxial anesthetic procedures - practical and useful? J Obstet Anaesth Crit Care 2015;5:49-53

Cited by 12 as per Google Scholar

<https://www.joacc.com/article.asp?issn=2249-4472;year=2015;volume=5;issue=2;spage=49;epage=53;aulast=Lie>

S Patel, Kaul T. Fluid therapy during major bowel surgery – Restrictive or Liberal? J of Anesthesiol Clin Phramcol; 2010; 26: 1-2.

Cited by 4 as per Google Scholar

Medical Intelligence Article:

Patel S, Loveridge R: Obstetric neuraxial wrong drug administration errors: A quantitative and qualitative analytical review. Anesth Analg 2015; 121:1570-1577

DOI: <https://doi.org/10.1213/ANE.0000000000000938>

Cited by 45 as per Google Scholar

(Our research in the article was included in ‘What is new in Obstetric Anesthesia : The 2016 Gerard W Ostheimer Lecture’ by Philip E Hess published in Anesth Analg 2017; 124:863-871)

(Our work was included in “Survey of Anesthesiology’. Patel, Santosh; Loveridge, Robert Obstetric Neuraxial Drug Administration Errors, Survey of Anesthesiology: December 2016 - Volume 60 - Issue 6 - p 250
doi: 10.1097/01.sa.0000504624.15149.36)

Review Articles:

Patel S. Tranexamic acid-associated intrathecal toxicity during spinal anaesthesia A narrative review of 22 recent reports. European J of Anaesthesiology 2023; 40: 334-342.

In addition, three supplemental files (13 pages) are also published (literature search strategy – 1 page, Clinical case analysis table -11pages, Human factors 1 page).

https://journals.lww.com/ejanaesthesiology/Abstract/9900/Tranexamic_acid_associated_intrathecal_toxicity.70.aspx

Patel S. Cardiovascular drug administration errors during neuraxial anesthesia or analgesia—A narrative review. Journal of Cardiothoracic and Vascular Anesthesia 2023; 37: 291-298

In addition, three supplemental files (16 pages) are also published (literature search strategy – 3 pages, HFACS categories table 1 page, Clinical case analysis table -12 pages)

<https://www.sciencedirect.com/science/article/abs/pii/S1053077022007686>
[https://www.jvcaonline.com/article/S1053-0770\(22\)00768-6/fulltext](https://www.jvcaonline.com/article/S1053-0770(22)00768-6/fulltext)
<https://doi.org/10.1053/j.jvca.2022.10.016>

Cited by 1

Patel S, Dexter F. Narrative review of neuraxial potassium chloride administration errors: clinical features, human factors, and prevention measures. *Regional Anesthesia & Pain Medicine* 2021; 46: 904-908 doi: 10.1136/rapm-2021-102933

In addition, two supplemental files (19 pages) are also published (search strategy – 6 pages, clinical case analysis table – 13 pages)

<https://rapm.bmj.com/content/46/10/904.abstract>

Cited by 6 as per Google scholar

Patel S and Ducan A. Anaesthesia and intestinal anastomosis. *BJA education* 2021; issue 11: P433-443

[https://www.bjaed.org/article/S2058-5349\(21\)00079-2/fulltext](https://www.bjaed.org/article/S2058-5349(21)00079-2/fulltext)

Patel, S. Erroneous neuraxial administration of neuromuscular blocking drugs. *European Journal of Anaesthesiology* 2020; 37: 857-863

https://journals.lww.com/ejanaesthesiology/fulltext/2020/10000/erroneous_neuraxial_administration_of.5.aspx

Cited by 7 as per Google scholar.

S Patel, B Robertson, I McConachie. Catastrophic drug errors involving tranexamic acid administered during spinal anaesthesia. *Anaesthesia*. 2019; 74: 904-14

<https://onlinelibrary.wiley.com/doi/abs/10.1111/anae.14662>

- Cited by 61 as per Google scholar

This article is accompanied

- This article is accompanied by an editorial – A Palanisamy and S M Kinsella: Spinal tranexamic acid – a new killer in town. *Anaesthesia* 2019; 74: 831-3
<https://onlinelibrary.wiley.com/doi/10.1111/anae.14632>)
- The article was selected as one of the top 10 articles for 2019 for ‘Anaesthesia’ journal.
<https://associationofanaesthetists-publications.onlinelibrary.wiley.com/hub/journal/13652044/homepage/top10-2019>
- The article has a high Altimetric Score.

- The article was a topic for publication in 'Anesthesiology News' June, 2019.
<https://www.anesthesiologynews.com/Clinical-Anesthesiology/Article/06-19/Spinal-Administration-of-Tranexamic-Acid-Catastrophic-and-Avoidable/55134>
- The article was used by Institute for Safe Medication Practices, USA to include intrathecal tranexamic acid as one of the top 10 hazards to avoid for 2020.
<https://www.ismp.org/resources/start-new-year-right-preventing-these-top-10-medication-errors-and-hazards>
- The article was Editor's pick for June 2020 issue of Obstetric Anesthesia Digest (Patel, S.; Robertson, B.; McConachie, I. Catastrophic Drug Errors Involving Tranexamic Acid Administered During Spinal Anesthesia, Obstetric Anesthesia Digest: June 2020 - Volume 40 - Issue 2 - p 57-58
https://journals.lww.com/obstetricanesthesia/Abstract/2020/06000/Catastrophic_Drug_Errors_Involving_Tranexamic_Acid.5.aspx?context=LatestArticles
doi: 10.1097/01.aoa.0000661304.69019.e3)
- It is referenced in an alert by World health organization
<https://www.who.int/news/item/16-03-2022-risk-of-medication-errors-with-tranexamic-acid-injection-resulting-in-inadvertent-intrathecal-injection>
- Institute for Safe Medication Practices, Canada used the article and referenced in newsletter alert published in May 2022.
<https://ismpcanada.ca/bulletin/alert-substitution-error-with-tranexamic-acid-during-spinal...>

A Duncan, **S Patel**. Neurological complications in obstetric regional anaesthetic practice. J Obstet Anaesth Crit Care; 2016: 6:3-10.

<https://joacc.com/article.asp?issn=2249-4472;year=2016;volume=6;issue=1;spage=3;epage=10;aulast=Duncan>

Cited by 18 as per Google Scholar

R. Loveridge, **S Patel**. Systemic non-opioid adjuvant analgesics: Their role in acute postoperative pain in adults. Trends Anaesth Crit Care; 2014: 4:10-18

<https://www.sciencedirect.com/science/article/abs/pii/S2210844013001305?via%3Dihub>

The image from the article was chosen for cover image of the issue.

Cited by 19 as per Google Scholar

S. Patel. Understanding intestinal circulation – Many barriers, many unknowns. Trends Anaesth Crit Care; 2013; 3: 302-309

With this article an audio slide presentation is also published.

<http://www.sciencedirect.com/science/article/pii/S2210844013001056>

S. Patel, Kitchen G and Barrie J. Personal development plans – Practical pitfalls. Trends Anaesth Crit Care; 2013; 3: 220-223.

<https://www.sciencedirect.com/science/article/abs/pii/S2210844013000592>

Cited by 9 as per Google Scholar
The image from the article was chosen for cover image of the issue.

S. Patel, J. Lutz, U. Panchgula, S. Bansal. Anesthesia and perioperative management of colorectal surgical patients – Specific issues (Part 2). J of Anaesthesiol Clin Pharmacol 2012; 28: 304-313.

<https://pubmed.ncbi.nlm.nih.gov/22869934/>

Cited by 19 as per Google Scholar

S. Patel, J. Lutz, U. Panchgula, S. Bansal. Anesthesia and perioperative management of colorectal surgical patients – A clinical review (Part 1). J of Anaesthesiol Clin Pharmacol 2012; 28:162-171

<https://pubmed.ncbi.nlm.nih.gov/22557737/>

Cited by 33 as per Google Scholar

S. Patel. Sodium balance – An integrated physiological model and novel approach. Saudi J Kidney Dis Transpl; 20: 560-569, 2009.

https://journals.lww.com/sjkd/Fulltext/2009/20040/Sodium_Balance_An_Integrated_Physiological_Model.2.aspx

Cited by 37 as per Google Scholar

S Patel, M Souter. Equipment-related electrocardiographic artifacts – Causes, Characteristics, Consequences and Correction. Anesthesiology, 108; 138-148, 2008.

<https://pubs.asahq.org/anesthesiology/article/108/1/138/7669/Equipment-related-Electrocardiographic>

Cited by 92 as per Google Scholar

With this review article additional 18 pages web based (www.anesthesiology.org) enhancement of 'Equipment-related electrocardiographic artifacts (1968-2006)' is also published.

S Patel, S Bhananker: Anesthesia and Analgesia for Pediatric Burns. Current Reviews; 28:27-37, 2007. (CME article with 10 MCQs)

Original Articles:

Pearse R, Moreno R, Bauer P on behalf of EUSoS group. Mortality after surgery in Europe: A 7 day cohort study. Lancet, 380:1059-65, 2012

(European surgical outcome study (EUSoS) was a multicentre study. I was the lead investigator at Royal Oldham Hospital).

Cited by > 1000 as per Google Scholar

S. Patel, S Subramanian, Swarup Patel, Singh RP etal. Non-Obstetric surgery in pregnant patients – Our experience at Ibri Hospital. Oman Medical Journal, 17:20-23, 2001.

S Patel, S Calla: Use of Esmolol and Sodium nitroprusside for control of post coronary artery bypass grafting hypertension. J of Anaesth. Clin. Pharmaol.; 13:151-154, 1997.

Guideline: ALERT: Contributed for a guideline for prevention of Tranexamic acid errors.

Institute for safe medication practices (Canada): Substitution errors with tranexamic acid during spinal anesthesia. ISMP Canada Safety Bulletin 2022; Issue 6: 1-5.

<https://ismpcanada.ca/bulletin/alert-substitution-error-with-tranexamic-acid-during-spinal-anesthesia/>

Case reports:

S. Patel. Electrocardiographic artifacts during electroconvulsive therapy. J Electocardiol 42; 307-309, 2009. DOI: [10.1016/j.jelectrocard.2009.02.003](https://doi.org/10.1016/j.jelectrocard.2009.02.003)

Cited by 1 as per Google Scholar

S Patel. Electrocardiograph artifact mimicking ventricular tachycardia during high frequency oscillatory ventilation. Ame J of Crit Care, 15:310-311, 2006.
doi.org/10.4037/ajcc2006.15.3.310

Cited by 17 as per Google Scholar

S. Patel, Singh RP, S. Rao. Repeated severe painful crises in a patient with sickle cell disease. Indian J. of Crit Care Medicine, 4:100-102, 2000.

S. Ramakrishna, V. Ingle, **S. Patel** et al. Reversible cardio-pulmonary changes due to adeno-tonsillar hypertrophy. International J. of Pediatric Otorhinolaryngology, 53: 203-206, 2000. DOI: [10.1016/s0165-5876\(00\)00389-x](https://doi.org/10.1016/s0165-5876(00)00389-x)

Cited by 46 as per Google Scholar

S. Patel. Emergency caesarean section in a patient with repaired tetralogy of Fallot. Indian J.of Anaesth., 43:67-69, 1999.

S. Patel, Malhotra SK. Anaesthetic considerations in a patient with Wolff- Parkinson-White syndrome. Annals of Cardiac Anaesthesia, 2:44-47, 1999.

Edicula G, **Patel S,** Ramakrishna S et al. Reversible severe pulmonary hypertension following adeno-tonsillar hypertrophy. Oman Med J 15: 26-28, 1998.

S. Patel, P. Ponnurangam, M. Kishore. Tay-sachs disease: Anaesthetic implications. Oman Med J 14:37-39, 1998.

S. Patel: Emergency mitral valve replacement during second trimester of pregnancy. J. of Anaesth. Clin. Pharmacol.; 13:151-154, 1997

S. Patel. Anaesthesia for intracranial surgery in the presence of Eisenmenger's syndrome. J of Anaesth. Clin. Pharmacol, 12: 155-157, 1996.

S. Patel. Vasospasm following intracranial aneurysm surgery. J of Anesthesiol Clin Pharmacol, 12: 139-141, 1996

P.K. Neema, **S. Patel**, H.D. Waikar. Anticonvulsants and non-depolarizing muscle relaxants: A drug interaction. J. of Anaesthesiology and Clinical Pharmacology, 11: 69-71, 1995.

Correspondence / Letters to editor:

Patel S. Accidental infusion of tranexamic acid via a thoracic epidural catheter. Canadian Journal of anesthesia 2023; 70: 915-916.

<https://link.springer.com/article/10.1007/s12630-023-02435-0>

Cited by 3

The above letter is accompanied with-

1. An Editorial: [Preventing neuraxial administration of tranexamic acid](https://link.springer.com/article/10.1007/s12630-023-02434-1)
<https://link.springer.com/article/10.1007/s12630-023-02434-1>
2. Editor in Chief (EIC)'s notes: [One week in the life of my anesthetic cart's medication drawer or: drug errors—what \(else\) will it take to change the system?](https://link.springer.com/article/10.1007/s12630-023-02437-y)
<https://link.springer.com/article/10.1007/s12630-023-02437-y>

Patel S. Epidural and intrathecal magnesium sulphate administration errors – clinical features and contributory factors. British J of Anaesthesia 2023; 130: E35-40

<https://www.sciencedirect.com/science/article/abs/pii/S0007091222007401>
[https://www.bjanaesthesia.org/article/S0007-0912\(22\)00740-1/fulltext](https://www.bjanaesthesia.org/article/S0007-0912(22)00740-1/fulltext)

I reviewed magnesium sulphate administration errors via neuraxial route.

Markey T, Bhatia K, **Patel S.** Accidental oral administration of Monsel's solution during caesarean delivery. International Journal of Obstetric Anesthesia 2022; 52:103597.

<https://pubmed.ncbi.nlm.nih.gov/36183608/>

A case report of a rare drug error.

Cited by 1 as per Google Scholar

Patel S. Tranexamic acid-associated fatal status epilepticus in a paediatric patient. British Journal of Clinical Pharmacology 2022; 88: 4657-8.

Patel S. Neuraxial and peripheral misconnection events leading to wrong-route medication errors. Reg Anesth Pain Med. 2021;48:1116-1117 doi: 10.1136/rapm-2021-102527.

S Patel: Artefactual electrocardiographic ST segment depression: less likely due to electrocautery. Ann Card Anaesth 2012; 15:85-6

<https://pubmed.ncbi.nlm.nih.gov/22234030/>

Cited by 2 as per Google Scholar

S Patel. Anaesthetic agents and vasopressors interaction on gastrointestinal microcirculation and oxygenation. *Br J Anaesth eletter* (October, 2010).
<http://bj.oxfordjournals.org/content/105/4/421>

S. Patel. Sinus arrest on the electrocardiograph - pseudo or real? *Acta Anaesthesiol Scand* 53: 883; 2009
<https://pubmed.ncbi.nlm.nih.gov/19563573/>

S Patel, M Souter: Electocardiographic ST segment depression: confirm, deny or artefact? *Anesthesiology* 109:352, 2008 (Author Reply)
<https://doi.org/10.1097/ALN.0b013e31817f8cbd>

S Patel, S Bhananker: Perioperative Paediatric Cardiac Arrest Study – A Case of duplication? *Brit J of Anaesthesia* (e-letter, March 2007).
<http://bj.oxfordjournals.org:80/cgi/eletters/96/5/569#1694>

S Patel, Finbar O'Neill: (Feedback) in response to 'Catheter related blood stream infection'. (October, 2005, *BJA-Continuing Education in Anaesthesia, Critical Care and Pain*)

S Patel, G Turner: Aspiration and laryngeal mask airway. *Brit J Anaesth*, 94: 546, 2005.
<https://doi.org/10.1093/bja/aei527>

Cited by 3 as per Google scholar

S Patel. How comparable are Primary FRCA London and Primary FCA Dublin? *RCoA Bulletin* 29; January 2005:1478-9.

S. Patel. Anaesthesia for laparoscopic cholecystectomy in a patient with Eisenmenger's syndrome. *Brit J. Anaes.*, 81:297, 1998

S.Patel. Management of coronary artery fistula in a child. *J Anesth Clin Pharmacol*; 14:197-198, 1998.

S. Calla, **S. Patel**, N. Shastri, D. Shah. Occipital alopecia after cardiac surgery. *Canadian J. Anaesthesia*, 43:1180-1181, 1996.
<https://pubmed.ncbi.nlm.nih.gov/8922779/>

Cited by 5 as per Google Scholar.

Abstracts in Journals:

Markey T, Bhatia K, **Patel s.** Accidental oral administration of Monsel's solution during caesarean delivery. *Int J Obstet Anaesth* 2022; 50S: 42

Patel S: Avoidable intrathecal tranexamic acid tragedies: 2019–2021. *Anaesthesia* 2021;76 (Suppl 6):17
Cited by 1

Patel S, Paskaleva R, Agrawal D. 185 neuraxial drug administration errors from 40 countries – practical issues and human factors. *Regional Anesthesia & Pain Medicine* 2021;70:A21-A23.
https://rapm.bmj.com/content/70/Suppl_1/A21.2

Patel S, Dexter F. Neuraxial cardiovascular accidental drug administration errors review. Regional Anesthesia & Pain Medicine 2021;70:A24-A25.
https://rapm.bmj.com/content/70/Suppl_1/A24

Cited by 1

Patel S and Daxter F: Case Series Of 28 Neuraxial Kcl Administrations Shows Half The Errors Are Not Preventable By NrFit. www.asaabstracts.com A2042, 2020

<http://www.asaabstracts.com/strands/asaabstracts/abstract.htm?year=2020&index=18&absnum=4742>

Cited by 1 as per Google Scholar.

Patel S: Morbidity And Mortality Associated With Drug Administration Errors During Spinal Or Epidural Anesthesia Or Analgesia. www.asaabstracts.com A2045, 2020

Cited by 1 as per Google Scholar.

Patel S and Robertson B. Survey of Practice of Enhanced Recovery for Colorectal Surgery. European J of Anaesthesiology 2019; 36 (esupplement 57):40

Roberson B and **Patel S**. Survey of use of spinal for elective colorectal surgery, and the doses of spinally administered opioids and local anaesthetic. European J of Anaesthesiology 2019; 36 (esupplement 57):77

Patel S, Robertson B. Use of non-opioid adjuvant analgesia for colorectal surgery. European J of Anaesthesiology 2017; 34 (esupplement 55):227

Duncan A, Vickers G and **Patel S**. Conversion of spinal to general anaesthesia for caesarean section. Anaesthesia 2014; 69 (Suppl 4):54

Patel S. Teaching methods for airway management skills. Anesth Analg 2014; 118: S-109

Patel S. Drug administration errors during epidural or spinal anesthesia or analgesia. Anesth Analg 2012; 113:S-197

(This abstract was selected as the best abstract in 'patient safety and education' category and was selected for **Kosaka Abstract Award** competition at the 86th International Anesthesia Research Society meeting held in Boston, USA in May, 2012)

Patel S, Patel S. Epidural and spinal drug injection errors during obstetric anesthesia and analgesia (1981-2011). Anesth Analg 2012; 113:S-329

Patel S. Abdominal etiology for mimicked ST segment elevation myocardial infarction on the electrocardiograph. Anesth Analg 2012; 113: S-155

Uwubanmwun N, **Patel S**, et al: A 2 year review of obstetric anaesthesia outpatient clinic for high risk obstetric patients. Anesthesiology 2008; 109 A1118

Patel S, Knight S, Owen T. Critical incidents / near misses in acute intensive care unit. Anesth Analg, 104, S-59, 2007.

Patel S, Vasu T, Kakkar M. Practice and preferences for regional anesthesia and analgesia techniques among anesthesiologists, *Anesth Analg*, 104, S-260, 2007.

Patel S, O'Neill F: Removal of central venous catheters due to suspected catheter-related infection. *Can J Anesth* 2007, 53: 44445

Patel S: Transcutaneous nerve stimulation induced artifacts on the electrocardiograph. *Can J Anesth* 2007; 54: 44444

Patel S, Hogg R, Turner G: Emergency nephrectomy due to ruptured renal angiomyolipoma in a patient with pulmonary lymphangiomyomatosis. *Can J Anesth* 2007, 54: 44526

Book Review:

S.Patel, R Morgan: Book review for 'Principles and Practice of Emergency Neurology' by eds. S M Shah and K. M Kelly. *Current Anesthesia and Critical Care*, 17:245-246, 2006.

Audit recipe:

Leeham J, **Patel S**. 4.8 Anaesthetic emergencies: Drugs and Equipment Preparedness (Raising the standards – A compendium of audit recipes, 3rd edition, 2012, The Royal College of Anaesthetists.