prospect
procedure specific postoperative pain management

The European Society of Regional Anaesthesia & Pain Therapy
Crossing Boundaries, Transforming Care

ELECTIVE CAESAREAN SECTION

SUMMARY RECOMMENDATIONS

Notes on PROSPECT recommendations

PROSPECT provides clinicians with supporting arguments for and against the use of various interventions in postoperative pain based on published evidence and expert opinion. Clinicians must make judgments based upon the clinical circumstances and local regulations. At all times, local prescribing information for the drugs referred to must be consulted.

Pain after caesarean section

Elective caesarean section is a widely performed surgical procedure, accounting for over 20% of births globally (Betran 2021). However, it is commonly associated with moderate to severe postoperative pain, which may adversely affect maternal recovery, increasing the risk of respiratory complications, and compromising the mother's ability to care for her newborn (Mkontwana 2015).

Aims and methods of the PROSPECT review

This review (Crowe 2026) aimed to assess the available literature and to update previous PROSPECT recommendations for postoperative pain management after elective caesarean section performed under neuraxial anaesthesia. The previous PROSPECT recommendations were first published in 2014 (PROSPECT archive, C-section 2014) and updated in 2021 (Roofthooft 2021), followed by a further short update (Roofthooft 2023). The recommendations cannot be extrapolated to emergency caesarean section or caesarean section performed under general anaesthesia.

The systematic review and formulation of the recommendations were performed using the unique PROSPECT methodology, available at https://esraeurope.org/prospect-methodology/. This methodology was first published in Joshi 2019 and updated in Joshi 2023. Literature databases (PubMed, including MEDLINE, Embase, CENTRAL and the Cochrane Database of Systematic Reviews) were searched from 1 October 2020 to 31 October 2024 to identify randomised controlled trials (RCTs), systematic reviews and meta-analyses, in English, which investigated analgesic, anaesthetic or surgical interventions in patients undergoing elective caesarean section under neuraxial anaesthesia, and assessed postoperative pain intensity scores (the primary outcome measure). Since previous PROSPECT reviews had not assessed the use of the ilioinguinal/iliohypogastric block in caesarean section, the literature search was repeated for studies using this intervention, but without date limitations.

PROSPECT recommendations were updated, based on interpretation of the evidence from included studies, considering the balance of analgesic efficacy and potential adverse effects, as well as the procedure-specific clinical context. Although the primary focus was postoperative pain outcomes, including pain scores and opioid requirements, other functional and patient-specific outcomes were also considered.

From the literature search, 61 RCTs and 38 systematic reviews met the inclusion criteria; an additional 6 RCTs and 2 systematic reviews were also identified from the literature search focused on ilioinguinal/iliohypogastric blocks. These studies add to the evidence upon which previous PROSPECT recommendations were based.

This review is registered on PROSPERO: CRD42024603009.

Summary of recommendations and key evidence

Summary of recommendations and key evidence for pain management in patients undergoing elective caesarean section under neuraxial anaesthesia
Regional analgesia
Pre-operative intrathecal long-acting opioid (morphine 50–100 µg or diamorphine 300 µg) is recommended. • An intrathecal morphine dose of 50–100 µg continues to be recommended, in line with previous PROSPECT recommendation (Roofthooft 2021); evidence suggests that pain scores are not improved when morphine doses exceed 100 µg, and adverse effects increase above this dose (Fei 2023; Borrelli 2024). • No new evidence contradicting the accepted safety, effectiveness or dosing of intrathecal diamorphine was found. The National Institute for Health and Care Excellence continues to support the use of intrathecal diamorphine up to a dose of 300 µg (NICE 2021). Epidural morphine 2–3 mg or diamorphine 2–3 mg may be used as an alternative when an epidural is used as the primary anaesthetic technique.
Local analgesia
When neuraxial long-acting opioids are not used, local anaesthetic wound infiltration (single-shot) or continuous wound infusion should be considered. • This recommendation aligns with the previous PROSPECT recommendation (Roofthooft 2021). • Although new evidence is mixed (Salman 2024; Stopar-Pintaric 2021; Dagasan Cetin 2023; Gómez-Ríos 2022), there is some evidence to suggest that it is superior to placebo. • Wound infiltration is a simple, low-risk intervention that can be performed by the surgical team. Alternatively, several regional fascial plane/nerve blocks are recommended, the choice of which is left to the treating anaesthetist. This aligns with previous PROSPECT recommendations (Roofthooft 2021; Roofthooft 2023). The available evidence, while limited, suggests that all blocks are equally effective and are valuable alternatives to long-acting neuraxial opioids (Singh 2022; Wang 2021; Ryu 2022): • Quadratus lumborum block (Mostafa 2023; Du 2024; Zhao 2021; Singh 2023; Hussain 2021)

- Transversus abdominis plane block (Jemal 2022; Habib 2021; Sripriya 2023; Pinarbaşi 2024; Jadon 2022; Elsayed Elashry 2024; Eksteen 2024; Kumar Reddy 2023; Yu 2021; Mamdouh 2021; Salman 2024; Huang 2021; Yang 2021; White 2025; El-Boghdadly 2021)
- Erector spinae plane block (Mostafa 2023; Aygun 2022; Dostbil 2023; Şafak 2024; Ribeiro Junior 2022)
- Ilio-inguinal/iliohypogastric (Singh 2022; Wang 2021; Huffnagle 1996; Vallejo 2012; Wolfson 2012; Staker 2018; Poudel 2017; Elahwal 2022; Abiy 2020; Singh 2021)
- Transversalis fascia plane block (Baghirzada 2024; Sripriya 2023; Pinarbaşi 2024).

The specific regional analgesia technique used is the choice of the treating anaesthetist and should be based on their individual skills and preferences, as well as consideration of factors such as the patient position and potential complications (for full discussion, see Crowe 2026).

Systemic (basic) analgesia

Unless contraindicated, analgesia should include regular paracetamol and NSAID.

- Paracetamol is recommended, administered pre-operatively (oral) or intra-operatively after delivery (IV), and continued postoperatively (oral or IV).
- NSAIDs are recommended, administered intra-operatively after delivery (IV), and continued postoperatively (oral or IV).
- In line with PROSPECT methodology (Joshi 2023), studies that examined NSAIDs and paracetamol were not included in the review; these essential baseline analgesics should be given to all patients undergoing caesarean section unless contraindicated.

A single dose of IV dexamethasone 8–10 mg is recommended, administered intra-operatively after delivery.

- This recommendation of IV dexamethasone at a dose of 8–10 mg is in agreement with the previous PROSPECT recommendation (Roofthooft 2021), supported by evidence of analgesic benefits in caesarean section (Singh 2022; Kamimura 2023) and advantages that are well-established in non-obstetric populations, including reduced incidence of PONV, and a lack of serious adverse effects (Weibel 2021; Waldron 2013; Mihara 2016).
- A consensus was reached that dexamethasone 8–10 mg should be considered ‘basic analgesia’ alongside paracetamol and NSAIDs.

Surgical technique

The Joel-Cohen incision and non-closure of the peritoneum are recommended.

- This aligns with the previous PROSPECT recommendations (Roofthooft 2021).
- No new evidence was found in this update regarding these surgical techniques.

Abdominal binders are recommended. • This aligns with the previous PROSPECT recommendation (Roofthooft 2021). • The updated literature review did not identify additional RCTs but identified two meta-analyses that evaluated abdominal binders after caesarean section, finding evidence of reduced pain scores and/or reduced distress (Abd-ElGawad 2021; Di Mascio 2021).
Analgesic adjuncts and rescue
Consider using transcutaneous electrical nerve stimulation as an analgesic adjunct. • This aligns with the previous PROSPECT recommendation (Roofthooft 2021). • No additional RCTs were found during this update but one meta-analysis reported analgesic benefits (Albadrani 2024).
Oral opioids should be reserved for rescue analgesia or when other recommended strategies are not possible (e.g. contra-indications to regional anaesthesia).

IV, intravenous; NSAID, non-steroidal anti-inflammatory drug; RCT, randomised controlled trial.

Interventions that are NOT recommended

Analgesic interventions that are not recommended for pain management in patients undergoing elective caesarean section under neuraxial anaesthesia.

Intervention	Reason for not recommending
Pre-operative	
Gabapentin	Inconsistent evidence and concerns for adverse effects
Intrathecal dexmedetomidine	Inconsistent evidence and concerns for adverse effects
Intrathecal naloxone	Lack of evidence
Intra-operative after delivery	
Intravenous midazolam, magnesium, dexmedetomidine	Lack of evidence
Intravenous esketamine	Inconsistent evidence and concerns for adverse effects
Liposomal bupivacaine	Inconsistent evidence
Dexmedetomidine as nerve block adjuvant	Limited evidence
Dexamethasone as nerve block adjuvant	Limited evidence
Intraperitoneal local anaesthetic	Lack of evidence
Postoperative	
Epidural esketamine	Lack of evidence
Thoracic epidural/patient-controlled epidural analgesia/programmed intermitted epidural bolus	Lack of evidence
Lidocaine patch	Limited evidence
Transcutaneous electrical acupoint stimulation	Lack of evidence
Auricular acupressure	Limited evidence
NSS-2 BRIDGE device	Lack of evidence
Surgical technique	
Re-approximation of the rectus sheath	Lack of evidence

Overall PROSPECT recommendations table

Overall recommendations for procedure-specific pain management in patients undergoing elective caesarean section under neuraxial anaesthesia	
Pre-operative	• Oral paracetamol • Intrathecal long-acting opioid (i.e. morphine 50–100 µg or diamorphine up to 300 µg) • Epidural morphine 2–3 mg or diamorphine up to 2–3 mg may be used as an alternative when an epidural catheter is used in the primary anaesthetic technique
Intra-operative (after delivery)	• Intravenous paracetamol (if not administered pre-operatively) • Non-steroidal anti-inflammatory drugs • Intravenous dexamethasone 8–10 mg • If intrathecal morphine is not used, local anaesthetic wound infiltration (single injection) or continuous wound infusion and/or regional analgesia techniques (fascial plane blocks such as transversus abdominis, transversalis fascia, quadratus lumborum, erector spinae plane or ilio-inguinal/iliohypogastric)
Postoperative	• Oral or intravenous paracetamol • Oral or intravenous non-steroidal anti-inflammatory drugs • Oral opioid for rescue or when other recommended strategies are not possible (e.g. regional anaesthesia contraindicated) • Transcutaneous electrical nerve stimulation can be used as an analgesic adjunct
Surgical technique	• Joel-Cohen incision • Non-closure of peritoneum • Abdominal binders

PROSPECT publication

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Pain management after elective caesarean section under neuraxial anaesthesia: an updated systematic review and procedure-specific postoperative pain management (PROSPECT) recommendations.

Anaesthesia 2026. https://doi.org/10.1111/anae.70141

PROSPECT recommendations for elective caesarean section under neuraxial anaesthesia – Infographic