

VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS)

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 judgements based upon the clinical circumstances and local regulations. At all times, local prescribing information for the drugs referred to must be consulted.

Pain after VATS and aims of the PROSPECT review

Video-assisted thoracoscopic surgery (VATS) is a minimally invasive procedure allowing the reduction of surgical stress and postoperative pain compared with thoracotomy. However, it is associated with significant acute and chronic postoperative pain, which negatively affects recovery ([Holbeck 2016](#); [Bendixen 2016](#)). Postoperative pain management for VATS is just as essential as it is for open surgery as it allows the reduction of postoperative complications ([Bendixen 2016](#)).

This guideline aims to provide clinicians with an evidence-based approach for pain management after pulmonary resection under VATS, to improve postoperative pain relief.

The unique PROSPECT methodology is available at <https://esraeurope.org/prospect-methodology/>.

Summary recommendations

Recommended: Pre- and intra-operative interventions	
<ul style="list-style-type: none"> • ‘Pre-operative’ refers to interventions applied before surgical incision and ‘intra-operative’ refers to interventions applied after incision and before wound closure • Analgesics should be administered at the appropriate time (pre- or intra-operatively) to provide sufficient analgesia in the early recovery period 	
Paracetamol, NSAIDs, COX-2-specific inhibitors	<p>Systemic analgesia should include paracetamol, NSAIDs or COX-2 specific inhibitors administered pre-operatively or intra-operatively and continued postoperatively.</p> <ul style="list-style-type: none"> • The benefits of these basic analgesics are well described for other procedures (Ong 2010; Martinez 2017).
IV dexmedetomidine	<p>Intraoperative administration of IV dexmedetomidine is recommended, especially when basic analgesics cannot be given.</p> <ul style="list-style-type: none"> • Several studies have documented that IV dexmedetomidine reduces pain scores and opioid demand (Lee 2016; Jannu 2020). • Dexmedetomidine also decreases the incidence of postoperative agitation and cognitive dysfunction, and postoperative nausea and vomiting (Lee 2016; Jannu 2020; Kweon 2018). Improvement in lung function, with an increase in FEV1 and vital capacity, has also been demonstrated (Lee 2016; Jannu 2020; Kweon 2018). • Patients with severe cardiac disease, conduction and/or rhythm disorders were excluded from these studies and dexmedetomidine should not be used in those patients.
Regional analgesia	<p>Regional analgesic techniques such as PVB and ESPB are recommended, using either a single shot or preferably a catheter with a continuous infusion of local anaesthetics.</p> <ul style="list-style-type: none"> • A PVB is recommended because of its efficacy on pain control and limited side effects compared to TEA. The use of a catheter instead of single-shot analgesia prolongs the analgesic effect. • An ESPB is also recommended as several studies have shown efficacy of ropivacaine ESPB versus sham block (Yao 2020; Shim 2020). Two studies have shown non-inferiority of ESPB compared with PVB (Zhao 2020; Taketa 2020). ESPB should

	<p>therefore be considered as an alternative.</p> <p>Serratus anterior plane block can be used as a second choice.</p> <ul style="list-style-type: none"> The studies retrieved considered a single injection and documented a benefit in terms of pain and opioid consumption compared to systemic basic analgesia or compared to infiltration of the incision site. <p>The block should be performed, whatever the technique, at a thoracic level adapted to the location of the port sites.</p> <p>Addition of preservative-free dexmedetomidine in perineural analgesia could be recommended. However, it remains to be demonstrated that a comparable effect could be achieved with IV administration of dexmedetomidine making it more appropriate for clinical use.</p>
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Recommended: Postoperative interventions	
<ul style="list-style-type: none"> 'Postoperative' refers to interventions applied at or after wound closure Analgesics should be administered at the appropriate time (pre- or intra-operatively) to provide sufficient analgesia in the early recovery period 	
Paracetamol, NSAIDs, COX-2-specific inhibitors	<p>Systemic analgesia should include paracetamol, NSAIDs or COX-2 specific inhibitors administered pre-operatively or intra-operatively and continued postoperatively.</p> <ul style="list-style-type: none"> The benefits of these basic analgesics are well described for other procedures (Ong 2010; Martinez 2017).
Opioid	<p>Opioids should be used as rescue analgesics postoperatively.</p>

COX, cyclooxygenase; ESPB, erector spinae plane block; FEV1, forced expiratory volume in the first second; IV, intravenous; NSAIDs, non-steroidal anti-inflammatory drugs; PVB, paravertebral block; TEA, thoracic epidural analgesia.

Interventions that are NOT recommended

Analgesic interventions that are not recommended for pain management in patients undergoing VATS.

Timing	Intervention	Reason for not recommending
Pre-operative or intra-operative	Gabapentinoids	Inconsistent evidence
	Corticosteroids	Lack of procedure-specific evidence
	MgSO ₄	Limited procedure-specific evidence
	IV lidocaine	Lack of procedure-specific evidence
	TENS	Inconsistent and limited evidence
	Wound infiltration	Limited procedure-specific evidence
	Intrapleural analgesia	Limited procedure-specific evidence
	Intercostal nerve block	Lack of procedure-specific evidence
	Thoracic epidural block	Non-inferiority of less invasive techniques with fewer side effects
Postoperative	Gabapentinoids	Inconsistent evidence
	IV lidocaine	Lack of procedure-specific evidence
	Dexmedetomidine	Lack of procedure-specific evidence
	TENS	Inconsistent and limited evidence

IV, intravenous; TENS, transcutaneous electrical nerve stimulation.

Overall PROSPECT recommendations

Overall recommendations for peri-operative pain management in patients undergoing VATS

Pre-operative and intra-operative interventions	<ul style="list-style-type: none"> • Paracetamol (Grade D) • NSAID (Grade D) / COX-2-specific inhibitor (Grade D) • Dexmedetomidine (Grade B) (excluding patients with severe cardiac disease or conduction and/or rhythm disorders) • Paravertebral block: single shot (Grade A) / continuous (Grade A) • Erector spinae plane block: single shot (Grade A) / continuous (Grade B) • Serratus anterior plane block: single shot (Grade A) / continuous (Grade D)
Postoperative interventions	<ul style="list-style-type: none"> • Paracetamol (Grade D) • NSAID (Grade D) / COX-2-specific inhibitor (Grade D) • Opioid for rescue (Grade D)

COX, cyclooxygenase; NSAID, non-steroidal anti-inflammatory drug.

PROSPECT publication

PROSPECT guidelines for video-assisted thoracoscopic surgery: a systematic review and procedure-specific postoperative pain management recommendations.

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