

## **Summary Recommendations**

### **PROSPECT laparoscopic cholecystectomy update 2006 Subgroup**

For each review, a *Subgroup* of the *PROSPECT Working Group* performs an initial evaluation of the evidence and also drafts clinical practice statements and recommendations, which are then discussed by the whole *Working Group* before a final consensus is reached. The *Subgroup* may sometimes include a non-*Working Group* member, to provide additional expertise in the procedure being reviewed.

For the laparoscopic cholecystectomy update 2006 review, the *Subgroup* members were:

Mr Rory McCloy

Professor Edmund Neugebauer

Professor Stephan Schug

### **Grades of Recommendation**

Recommendations are graded according to the overall level of evidence (LoE) on which the recommendations are based, which is determined by the quality and source of evidence: (Levels of evidence and grades of recommendation in PROSPECT reviews (from 2006))

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.

## **Summary Recommendations**

Pre-, intra- and postoperative interventions have been evaluated for the management of postoperative pain following laparoscopic cholecystectomy. Unless otherwise stated, '*pre-operative*' refers to interventions applied before surgical incision, '*intra-operative*' refers to interventions applied after incision and before wound closure, '*postoperative*' refers to interventions applied at or after wound closure. The following peri-operative interventions for laparoscopic cholecystectomy have been reviewed:

<b>PRE-OPERATIVE RECOMMENDED</b>	<b>NOT RECOMMENDED</b>
<p><b>SYSTEMIC ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>Corticosteroid</b> <ul style="list-style-type: none"> <li>- dexamethasone (Grade B for analgesic effects; Grade A for anti-emetic effects)</li> </ul> </li> <li>• <b>COX-2-selective inhibitors</b> <ul style="list-style-type: none"> <li>- (Grade B)</li> </ul> </li> <li>• <b>Gabapentinoids</b> <ul style="list-style-type: none"> <li>- gabapentin (Grade B)</li> </ul> </li> </ul>	<p><b>SYSTEMIC ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>Alpha-2-adrenergic receptor agonists</b> <ul style="list-style-type: none"> <li>- clonidine (Grade D)</li> </ul> </li> <li>• <b>Conventional NSAIDs</b> <ul style="list-style-type: none"> <li>- (Grade B)</li> </ul> </li> <li>• <b>IV LA</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> <li>• <b>NMDA antagonist</b> <ul style="list-style-type: none"> <li>- dextromethorphan (Grade D)</li> <li>- ketamine (Grade D)</li> <li>- magnesium (Grade B)</li> </ul> </li> <li>• <b>Strong opioids</b> <ul style="list-style-type: none"> <li>- strong opioids (Grade B)</li> </ul> </li> <li>• <b>Weak opioids</b> <ul style="list-style-type: none"> <li>- tramadol (Grade B)</li> </ul> </li> <li>• <b>Paracetamol</b> <ul style="list-style-type: none"> <li>- (Grade B)</li> </ul> </li> </ul>
<p><b>REGIONAL ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>LA wound infiltration</b> <ul style="list-style-type: none"> <li>- long-acting LA wound infiltration (Grade A) for reducing wound pain but not shoulder pain</li> </ul> </li> <li>• <b>Epidural analgesia</b> <ul style="list-style-type: none"> <li>- in high-risk pulmonary patients (Grade D)</li> </ul> </li> </ul>	<p><b>REGIONAL ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>Paravertebral block</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> <li>• <b>Spinal LA + strong opioid</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> <li>• <b>Epidural analgesia</b> <ul style="list-style-type: none"> <li>- except in high-risk pulmonary patients (Grade D)</li> </ul> </li> </ul>
	<p><b>OTHER INTERVENTIONS</b></p> <ul style="list-style-type: none"> <li>• <b>Oral carbohydrate</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> </ul>

<b><i>INTRA-OPERATIVE RECOMMENDED</i></b>	<b><i>NOT RECOMMENDED</i></b>
<p><b><i>SYSTEMIC ANALGESIA</i></b></p> <ul style="list-style-type: none"> <li>• <b>Conventional NSAIDs</b> <ul style="list-style-type: none"> <li>- at end of surgery (Grade D)</li> </ul> </li> <li>• <b>COX-2-selective inhibitors</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> <li>• <b>Short-acting strong opioids</b> <ul style="list-style-type: none"> <li>- as part of the anaesthetic technique (Grade D)</li> </ul> </li> </ul>	<p><b><i>SYSTEMIC ANALGESIA</i></b></p> <ul style="list-style-type: none"> <li>• <b>NMDA antagonist</b> <ul style="list-style-type: none"> <li>- dextromethorphan (Grade D)</li> <li>- ketamine infusion (Grade D)</li> <li>- magnesium infusion (Grade B)</li> </ul> </li> <li>• <b>Strong opioids</b> <ul style="list-style-type: none"> <li>- longer-acting strong opioids (Grade B)</li> </ul> </li> </ul>
<p><b><i>REGIONAL ANALGESIA</i></b></p> <ul style="list-style-type: none"> <li>• <b>LA wound infiltration</b> <ul style="list-style-type: none"> <li>long-acting LA wound infiltration (Grade A) for reducing wound pain but not shoulder pain</li> </ul> </li> <li>• <b>IP LA</b> <ul style="list-style-type: none"> <li>- IP LA (Grade A) for reducing wound pain but not shoulder pain</li> </ul> </li> <li>• <b>Combined LA wound infiltration/IP LA</b> <ul style="list-style-type: none"> <li>- (Grade A; dose needs monitoring for toxicity Grade D)</li> </ul> </li> </ul>	<p><b><i>REGIONAL ANALGESIA</i></b></p> <ul style="list-style-type: none"> <li>• <b>Epinephrine as part of LA solution</b> <ul style="list-style-type: none"> <li>- (Grade B)</li> </ul> </li> <li>• <b>Intraperitoneal strong opioid</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> <li>• <b>Interpleural LA</b> <ul style="list-style-type: none"> <li>- (Grade B)</li> </ul> </li> <li>• <b>Interpleural strong opioid</b> <ul style="list-style-type: none"> <li>- (Grade B)</li> </ul> </li> </ul>
<p><b><i>ANAESTHETIC TECHNIQUES</i></b></p> <ul style="list-style-type: none"> <li>• <b>General anaesthesia</b></li> <li>• <b>Combined epidural/general anaesthesia</b> <ul style="list-style-type: none"> <li>- for high-risk pulmonary patients (Grade D)</li> </ul> </li> </ul>	<p><b><i>ANAESTHETIC TECHNIQUES</i></b></p> <ul style="list-style-type: none"> <li>• <b>Combined epidural/general anaesthesia</b> <ul style="list-style-type: none"> <li>- for routine anaesthesia (Grade D)</li> </ul> </li> </ul>
<p><b><i>OPERATIVE TECHNIQUES</i></b></p>	<p><b><i>OPERATIVE TECHNIQUES</i></b></p>

- **Low-pressure CO<sub>2</sub>**

- (Grade A)<sup>4</sup>

- **Saline lavage, followed by suction**

- (Grade A)

- **Gasless laparoscopic cholecystectomy**

- (Grade A)

- **Humidified and warmed CO<sub>2</sub> pneumoperitoneum**

- (Grade D and A, respectively)

- **N<sub>2</sub>O pneumoperitoneum**

- (Grade D)

- **Helium pneumoperitoneum**

- (Grade B)

- **Smaller total size of trocar incision**

- (Grade D)

- **Radially expanding trocars**

- (Grade D)

- **Subhepatic drain**

- (Grade D)

- **Aspiration of pneumoperitoneum gas**

- (Grade D)

<b>POSTOPERATIVE RECOMMENDED</b>	<b>NOT RECOMMENDED</b>
<p><b>SYSTEMIC ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>Conventional NSAIDs</b> <ul style="list-style-type: none"> <li>- (Grade A)</li> </ul> </li> <li>• <b>COX-2-selective inhibitors</b> <ul style="list-style-type: none"> <li>- (Grade A)</li> </ul> </li> <li>• <b>Strong opioids</b> <ul style="list-style-type: none"> <li>- for high-intensity pain in addition to other agents (Grade D)</li> </ul> </li> <li>• <b>Weak opioids</b> <ul style="list-style-type: none"> <li>- for rescue analgesia with medium-to-low-intensity pain in addition to other agents (Grade D)</li> </ul> </li> <li>• <b>Paracetamol</b> <ul style="list-style-type: none"> <li>- (Grade A)</li> </ul> </li> </ul>	<p><b>SYSTEMIC ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>NMDA antagonist</b> <ul style="list-style-type: none"> <li>- ketamine (Grade D)</li> <li>- magnesium (Grade B)</li> </ul> </li> <li>• <b>Strong opioids</b> <ul style="list-style-type: none"> <li>- for routine analgesia (Grade B)</li> </ul> </li> <li>• <b>Weak opioids</b> <ul style="list-style-type: none"> <li>- for routine analgesia (Grade B)</li> </ul> </li> </ul>
	<p><b>REGIONAL ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>PCA IP LA</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> </ul>
<p><b>EPIDURAL ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>Epidural analgesia</b> <ul style="list-style-type: none"> <li>- for high-risk pulmonary patients (Grade D)</li> </ul> </li> </ul>	<p><b>EPIDURAL ANALGESIA</b></p> <ul style="list-style-type: none"> <li>• <b>Epidural strong opioid + LA</b> <ul style="list-style-type: none"> <li>- for routine analgesia (Grade D)</li> </ul> </li> </ul>
<p><b>PATIENT MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>• <b>Early discharge</b> <ul style="list-style-type: none"> <li>- (Grade D)</li> </ul> </li> </ul>	

# Overall recommendations for postoperative pain management for laparoscopic cholecystectomy

## Pre-operative patient assessment

Pre-operative

### Routine surgery

#### Systemic analgesia

- COX-2-selective inhibitor
- Gabapentin
- Dexamethasone

#### Regional analgesia

- Long-acting local anaesthetic (LA) wound infiltration for wound pain

### High risk pulmonary patients

- Consider use of epidural analgesia/ anaesthesia in addition to other agents

Intra-operative

#### Anaesthetic technique

- General anaesthesia

#### Operative techniques

- Low-pressure CO<sub>2</sub>
- Saline lavage, followed by suction

#### Systemic analgesia

- Conventional NSAID at end of surgery
- COX-2-selective inhibitors
- Short-acting strong opioids as part of anaesthetic technique

#### Regional analgesia

- Long-acting LA wound infiltration for wound pain
- Intraperitoneal LA for wound pain
- Combined LA wound infiltration/intraperitoneal LA

#### Anaesthetic technique

- Combined epidural/general anaesthesia

Postoperative

#### Systemic analgesia

- Conventional NSAID/COX-2-selective inhibitor
- Paracetamol
- Opioid for rescue analgesia

#### Epidural analgesia

- Epidural LA + strong opioid in the early postoperative period

Early discharge (<24 h)

**Not recommended  
for Laparoscopic Cholecystectomy**

**Not recommended: Pre-operative**

*Systemic analgesia*

- Clonidine
- Conventional NSAIDs
- Dextromethorphan
- IV local anaesthetic (LA) infusion
- Ketamine bolus
- Magnesium
- Strong opioids
- Tramadol
- Paracetamol

*Regional analgesia*

- Long-acting LA wound infiltration
- Epinephrine as part of the LA solution for wound infiltration
- Bilateral paravertebral block
- Spinal LA + strong opioid
- Epidural analgesia except in high risk pulmonary patients

*Other interventions*

- Pre-operative oral carbohydrate

**Not recommended: Intra-operative**

*Systemic analgesia*

- Dextromethorphan
- Ketamine infusion
- Magnesium infusion
- Longer-acting strong opioids (instead of short-acting strong opioids as part of the anaesthetic technique)

*Regional analgesia*

- Epinephrine as part of the LA solution for wound infiltration or intraperitoneal analgesia
- Intraperitoneal strong opioid
- Interpleural LA or strong opioid

*Anaesthetic techniques*

- Combined epidural/general anaesthesia except in high risk pulmonary patients

*Operative techniques*

- Gasless laparoscopic cholecystectomy
- Humidified CO<sub>2</sub> with/without warming
- N<sub>2</sub>O pneumoperitoneum
- Helium pneumoperitoneum
- Smaller size of trocar incision
- Radially expanding trocars
- Subhepatic drain
- Aspiration of pneumoperitoneum gas

**Not recommended: Postoperative**

*Systemic analgesia*

- Ketamine infusion
- Magnesium infusion
- Strong opioids for routine analgesia
- Weak opioids for routine analgesia

*Regional analgesia*

- PCA intraperitoneal LA
- Epidural analgesia except in high risk pulmonary patients