Total Hip Arthroplasty 2004

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.

The recommendations of the PROSPECT Working Group are graded A–D, based on the level of evidence from the studies, which is in accordance with the Oxford Centre for Evidence-Based Medicine (CEBM website accessed Dec 2003, Sackett 2000). In the context of PROSPECT, recommendations based on procedure-specific evidence are grade A, those based on transferable evidence are grade B, those based on evidence from case series are grade C, and those based on clinical practice are grade D (Click here to see the levels of evidence and grades of recommendation table). Appendix A: Levels of evidence and grades of recommendation.

Summary recommendations

In summary, the PROSPECT recommendations for pre-, intra- and postoperative interventions for the management of postoperative pain in total hip arthroplasty are as follows:

Pre-operative recommended	• Analgesic medication should be initiated in time to ensure an adequate analgesic effect in the immediate postoperative period (grade D)

Intra-operative recommended	• The anaesthetic technique should be selected on the basis of minimum impact on the co-morbid state of the patient (grade D). The chosen anaesthetic technique can be continued, or may have a continued effect, for analgesia postoperatively (see *Postoperative*) • Analgesia, other than that required for adequate anaesthesia, is recommended only if the analgesic agent requires time to have maximum effect in the early postoperative recovery period (grade D) • For long-term analgesic benefits, cemented prostheses rather than non-cemented prostheses are recommended (grade B) • Surgical drains are not recommended because they are associated with an increase in discomfort (grade A), pain scores and risk of infection (grade B)

Post-operative recommended	• *Systemic analgesia:* – **COX-2-selective inhibitors** (grade A) or **conventional NSAIDs** (grade B) (depending on patient risk factors) – in combination with strong or weak opioids, as required for pain intensity – **Strong opioids** (grade B) – in combination with non-opioid analgesia **for high-intensity pain**, preferably administered intravenously by patient-controlled analgesia (grade B) or fixed-interval injection (grade D) – **Weak opioids for moderate- or low-intensity pain** (grade A) if conventional NSAIDs or COX-2-selective inhibitors are not sufficient or are contraindicated – **Paracetamol** (grade A) – for all pain intensities in combination with conventional NSAIDs or COX-2-selective inhibitors (with or without weak opioids) • *Regional analgesia:* – **Peripheral neural block continued after surgery** (grade A) in combination with systemic analgesia as required for pain intensity (as above)

	– **Spinal LA and opioid as a 'single shot' given pre-operatively** (grade A) (continuous infusion or repeat bolus spinal is not recommended, grade D), then systemic analgesia as required for pain intensity (as above) – **Epidural analgesia continued after surgery, only in patients at high cardiopulmonary risk**, and then systemic analgesia as required for pain intensity (as above)

Overall Recommendations: Pain Management for Total Hip Arthroplasty

The PROSPECT final recommendations are based on short-term pain outcomes (e.g. pain scores and supplementary analgesic use), following total hip arthroplasty. The recommendations do not take into account rehabilitation related to long-term pain. This is because rehabilitation programmes for patients undergoing total hip arthroplasty vary greatly between countries, and there is a lack of data for the effects of different rehabilitation regimes on long-term pain outcomes. Indeed, most studies assessing postoperative pain in total hip arthroplasty do not continue beyond 48 h following surgery. It is considered that adequate postoperative pain control is a prerequisite for successful rehabilitation because it allows early mobilisation and permits a more rapid initiation of physiotherapy.

The PROSPECT final recommendations are presented in the table below and are categorised according to the different anaesthetic techniques used for total hip arthroplasty. The PROSPECT group recommends that the choice of anaesthetic technique should be primarily based on the disposition of the patient rather than the management of their postoperative pain. However, based on postoperative pain outcomes, the continuation of some form of regional analgesia following general anaesthesia is recommended over the use of general anaesthesia alone.

Following surgery, the PROSPECT recommendations for pain management encompass a step-down approach for managing high-intensity pain in the immediate postoperative period to moderate- and low-intensity pain later in the postoperative period. For this step-down approach, PROSPECT recommends opioids (strong opioids initially, followed by weak opioids) in combination with paracetamol and conventional NSAIDs or COX-2-selective inhibitors, administered as appropriate for the level of postoperative pain.

		GA alone	Peripheral neural block + GA	Spinal ± GA or IV sedation	Epidural ± GA
Pre-operative		Pre-operative analgesia is not recommended			
Intra-operative		Strong long-acting opioids to secure analgesia when the patient wakes	Femoral nerve block or posterior lumbar plexus block	Single shot spinal LA + morphine	Epidural LA + opioid Do not use clonidine
		Surgical drains and wound infiltration are not recommended			
Postop	**High-intensity pain***	Paracetamol + COX-2-selective inhibitors or conventional NSAIDs + IV strong opioid by PCA or regular injection	Continue nerve block (by continuous infusion or PCRA) + COX-2-selective inhibitors or conventional NSAIDs ± rescue strong opioids IV	Establish systemic pain management as the nerve block regresses, using COX-2-selective inhibitors or conventional NSAIDs ± rescue strong opioids IV	Establish epidural infusion as the nerve block regresses, ± PCEA, + COX-2-selective inhibitors or conventional NSAIDs ± rescue strong opioids IV
Postop	**Low- and moderate-intensity pain****	Paracetamol + COX-2-selective inhibitors or conventional NSAIDs ± rescue weak opioid			

*High-intensity pain, VAS ≥50, on a scale of 1–100 mm

**Moderate-intensity pain, VAS <50>30, on a scale of 1–100 mm

**Low-intensity pain, VAS ≤30, on a scale of 1–100 mm

IV, intravenous; LA, local anaesthetic; PCA, patient-controlled analgesia; PCEA, patient-controlled epidural analgesia; PCRA, patient-controlled regional analgesia

Evidence review process

Details of systematic literature review

Literature search

- Systematic review of the literature from 1966–May 2004 using MEDLINE and EmBASE, following the protocol of the Cochrane Collaboration
- Inclusion of randomised studies assessing analgesic interventions in total hip arthroplasty and reporting pain on a linear analogue scale
- 109 studies identified in the literature
- 55 studies included (Appendix B: THA: Included studies)
- 54 studies excluded (Appendix C: THA: Excluded references)
- The most common reason for exclusion was the lack of a defined subgroup of subjects undergoing primary total hip arthroplasty (39 studies) (Appendix D: THA: Reasons for exclusion)

Appendix

A. Levels of evidence and grades of recommendation

Study criteria	Level of evidence	Criteria for grading of recommendation	Grade of recommendation
Systematic review (with homogeneity) of randomised, controlled trials	1a	Consistent level 1 studies	A
Individual, randomised, controlled trials with statistically significant results	1b		
All or none, i.e. prior to availability of new therapy, all died, now with therapy some survive; or, prior to therapy some died, now with therapy none die	1c		
Systematic review (with homogeneity) of cohort studies	2a	Consistent level 2 or 3 studies (or extrapolations* from level 1 studies)	B
Individual cohort study (including low quality randomised controlled trial, e.g. <80% follow up)	2b		
Outcomes research	2c		
Systematic review (with homogeneity) of case-controlled studies	3a		
Individual case-controlled study	3b		
Case-series, and poor quality cohort and case-controlled studies	4	Level 4 studies (or extrapolations* from level 2 or 3 studies)	C
Expert opinion without explicit critical appraisal, or based on physiology, bench research or first principles	5	Level 5 evidence (or troublingly inconsistent or inconclusive studies of any level)	D
*Extrapolations are where data are used in a situation that has potentially clinically important differences to the original study situation. In the case of PROSPECT, extrapolation largely refers to transferable evidence.			

B. THA: Included studies

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D. THA: Reasons for exclusion

Study	**Reason for exclusion**
Alexander R 2002	No analysis of THR subgroup
Anderson SK 1991	No analysis of THR subgroup
Atanassoff PG 2000	No analysis of THR subgroup
Bachmann M 1997	No analysis of THR subgroup
Beattie WS 1997	Analgesic data reported in earlier publication (Etches RC 1995)
Boeckstyns MEH 1992	No analysis of THR subgroup
Bogoch ER 2002	No analysis of THR subgroup
Clarke PM 1997	Letter
Colwell CW Jr 1995	No analysis of THR subgroup
Daltroy LH 1998	No analysis of THR subgroup
de Miguel RC 1997	No analysis of primary THR subgroup
Drakeford MK 1991	No analysis of THR subgroup
Etches RC 1995	No analysis of THR subgroup
Flory DA 2001	No analysis of THR subgroup
Forst J 1999	No analysis of THR subgroup
Galasko CSB 1985	No analysis of primary THR subgroup

Ganapathy S 1997	No analysis of THR subgroup
Gao F 1995	No analysis of THR subgroup
Herrick IA 1996	No analysis of THR subgroup
Holmstrom B 1993	No VAS pain assessment
Hommeril J-L 1994	No analysis of THR subgroup
Johansson S 1989	No analysis of THR subgroup
Jones MJT 1990	No analysis of THR subgroup
Kampe S 1999	Not double-blinded
Kilickan L 2000	Not investigator- or patient-blinded
Klimscha W 1995	No VAS pain assessment
Kostamovaara PA 1996	No analysis of THR subgroup
McNamee DA 2001	No VAS pain assessment
Modig J 1981	No VAS pain assessment
Murdoch JAC 2002	No analysis of THR subgroup
Niemi L 1993	No analysis of primary THR subgroup
Niemi L 1994	No analysis of primary THR subgroup
Niemi L 1996	No analysis of THR subgroup
Pico L 2000	No VAS pain assessment
Porter EJB 1983	No VAS pain assessment
Prieto-A P 2002	No analysis of THR subgroup
Racle JP 1987	No VAS pain assessment

Rathmell JP 2003	No VAS pain assessment
Reay BA 1989	No analysis of THR subgroup
Reiz S 1981	Inter-group stats not done
Segstro R 1990	Abstract
Sharrock NE 1994	No VAS pain assessment
Smythe MA 1996	No analysis of primary THR subgroup
Tarradell R 1996	No analysis of THR subgroup
Tsueda K 1998	No analysis of THR subgroup
Turner G 1996	No analysis of THR subgroup
Uhrbrand B 1992	No VAS pain assessment
Van Gessel EF 1992	No VAS pain assessment
Vercauteren MP 1998	No analysis of THR subgroup
Ward M 2002	No analysis of THR subgroup
Weller R 1991	No analysis of THR subgroup
Wilder-Smith CH 1994	No analysis of THR subgroup
Wolff AP 1995	No VAS pain assessment
Zhou TJ 2001	No analysis of THR subgroup