

# Intra-articular corticosteroid injections with the reciprocating procedure device reduced procedural pain and duration more than the conventional syringe

Bankhurst AD, Nunez SE, Draeger HT, *et al.* A randomized controlled trial of the reciprocating procedure device for intraarticular injection of corticosteroid. *J Rheumatol* 2007;**34**:187–92.

Clinical impact ratings GP/FP/Primary care ★★★★★☆ Rheumatology ★★★★★☆ IM/Ambulatory care ★★★★★☆

**Q** In patients receiving intra-articular corticosteroid injections (IACSI), is the reciprocating procedure device (RPD) more effective than the conventional syringe?

## METHODS

**Design:** randomised controlled trial (RCT).

**Allocation:** {concealed\*}†.

**Blinding:** blinded {data analysts and data safety and monitoring committee}†.\*

**Follow up period:** 2 weeks.

**Setting:** {rheumatology clinic in the University of New Mexico Health Sciences Centre, Albuquerque, New Mexico, USA}†.

**Patients:** 104 patients (mean age 52 y, 82% women) who had a swollen, painful large (hip, knee) or intermediate sized joint (shoulder, ankle, wrist); rheumatoid arthritis, idiopathic monarthritis, osteoarthritis, reactive arthritis, systemic lupus erythematosus, or acute gout; and required IACSI for usual medical care. Patients who had infection, trauma, or received corticosteroid injections for  $\geq 6$  months were excluded.

**Intervention:** IACSI (methylprednisolone acetate, 40 mg/ml; 2 or 1.5 ml for large or intermediate joints, respectively) delivered by the RPD (n = 52, 76 joints) or conventional syringe (n = 52, 78 joints). In both groups, the core syringe was a 10 ml Luer-Lok™ Becton Dickinson syringe (New Jersey, USA). The RPD consisted of a reciprocating mechanism attached to the syringe.

**Outcomes:** included procedural pain on a 10 cm visual analogue scale (VAS) (0 = no pain, 10 = worst pain), patients with moderate to severe pain (VAS  $\geq 5$  during needle induction), procedural duration, and physician satisfaction on a 10 cm visual analogue satisfaction scale (0 = most dissatisfied, 10 = most satisfied).

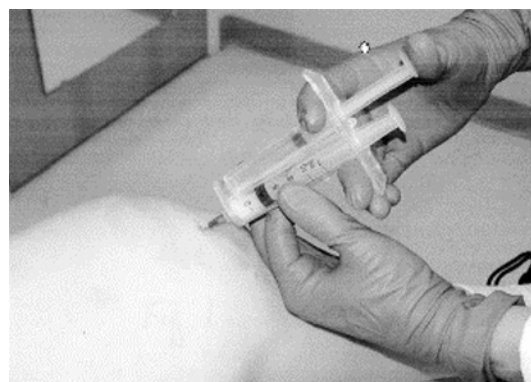
**Patient follow up:** 100%.

\*See glossary.  
†Information provided by author.

Intra-articular corticosteroid injections of large or intermediate sized joints using the reciprocating procedure device (RPD) v conventional syringe (CS)\*

Outcomes at 2 weeks	RPD	CS	Difference in means (95% CI)
Procedural pain score (VAS)†	2.40	4.73	-2.33 (-3.24 to -1.42)
Procedural duration (min)	1.28	1.86	-0.58 (-0.95 to -0.21)
Physician satisfaction score (VASS)†	9.12	5.59	3.53 (3.24 to 3.82)

\*VAS = visual analogue scale; VASS = visual analogue satisfaction scale. CI defined in glossary. †VAS and VASS based on 10 cm scales; 0 = no pain or most dissatisfied, 10 = worst pain or most satisfied.



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## Commentary

A coin flip RCT with 21 investigators and 104 patients with 5 manifestations of 6 different diseases can be instructive. The trial by Bankhurst *et al* focused on the single but highly relevant question regarding optimal intra-articular injection techniques. In this study, coin flipping randomisation seemed to work well.

IACSI are an essential option for many patients with inflammatory or degenerative rheumatic diseases, and they are therefore integral to the treatment repertoires of most orthopaedic surgeons, rheumatologists, and primary care physicians. Lack of experience is the main reason for underuse of intra-articular injections by physicians.<sup>1</sup> Accuracy of needle placement and the assurance of an aseptic technique are essential if satisfactory and safe outcomes are to be achieved.<sup>2</sup> However, perhaps the greatest hurdle in optimising performance is the replacement of the syringe followed by the transition from aspiration to injection. The RPD offers a novel one-hand technique that can reduce both pain and the inaccuracy of needle positioning.

The availability of different syringe sizes would be useful since large effusions (often  $\geq 50$  ml) need to be dealt with. Despite some possible drawbacks in the application of the RPD, the device nonetheless represents a novel and effective alternative to the more established delivery systems that are used for IACSI.

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1 Jolly M, Curran JJ. *J Clin Rheumatol* 2003;**9**:187–92.

2 Courtney P, Doherty M. *BestPract Res Clin Rheumatol* 2005;**19**:345–69.

## MAIN RESULTS

The RPD group had less procedural pain, shorter procedural duration, and greater physician satisfaction than the syringe group (table). The RPD group had fewer procedures in which patients had moderate to severe pain than the syringe group (17% v 55%,  $p < 0.01$ ).

## CONCLUSION

Intra-articular corticosteroid injections with the reciprocating procedure device reduced procedural pain and duration and improved physician satisfaction more than the conventional syringe.

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