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**Question:** Should vapocoolants before vaccine injections vs placebo be used for reducing vaccine injection pain in adults?

**Settings:** travel clinic

**Bibliography:** Mawhorter 2004

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Vapocoolant be applied before vaccine injections	Placebo	Relative (95% CI)	Absolute		
Pain (Acute) <sup>1</sup> (measured with: validated tool (McGill Present Pain Intensity of 0-5); Better indicated by lower values)												
1	randomised trials	serious <sup>2,3</sup>	no serious inconsistency	no serious indirectness	serious <sup>4</sup>	none	93	92	-	SMD 0.78 lower (1.08 to 0.48 lower) <sup>5</sup>	⊕⊕○○ LOW	CRITICAL
Pain (Recovery) <sup>1</sup> (measured with: validated tool (McGill Present Pain Intensity 0-5); Better indicated by lower values)												
1	randomised trials	serious <sup>2,3</sup>	no serious inconsistency	no serious indirectness	serious <sup>4</sup>	none	93	92	-	SMD .10 lower (0.39 lower to 0.19 higher) <sup>5</sup>	⊕⊕○○ LOW	CRITICAL
Safety <sup>1</sup> (measured with: validated tool (Likert scale describing discomfort with administration 1-5) ; Better indicated by lower values)												
1	randomised trials	serious <sup>2</sup>	no serious inconsistency	no serious indirectness	serious <sup>6</sup>	none	93	92	-	SMD 0.15 lower (0.44 lower to 0.14 higher)	⊕⊕○○ LOW	IMPORTANT
Preference <sup>1</sup> (measured with: validated tool (likert scale 1-5); Better indicated by higher values)												
1	randomised trials	serious <sup>2</sup>	no serious inconsistency	no serious indirectness	serious <sup>4</sup>	none	93	92	-	SMD 0.15 higher (0.14 lower to 0.44 higher)	⊕⊕○○ LOW	IMPORTANT
Fear, Distress, Procedure Outcomes, Vaccine Compliance, Memory, Satisfaction (assessed with: no data were identified for these important outcomes)												
0	No evidence					none	-	-	-	-		IMPORTANT

	available							0%		-		
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<sup>1</sup> Intervention (vapocoolant) administered with a cotton ball

<sup>2</sup> Immunizer not blinded

<sup>3</sup> Insufficient information regarding vaccines given (e.g., type, route), intervention administration details (e.g., duration of application) and limb being vaccinated relative to limb being treated with intervention (e.g., arm treated with intervention injected first)

<sup>4</sup> Sample size was below the recommended optimum information size (OIS) of 400 for an effect size of 0.2

<sup>5</sup> In a recent systematic review of venipuncture pain (Hogan 2014), effectiveness was demonstrated for vapocoolant vs. no treatment control only (not compared to placebo). Moreover, discomfort from application offset the benefit.

<sup>6</sup> Confidence interval crosses the line of nonsignificance and sample size was below the recommended optimum information size (OIS) of 400 for an effect size of 0.2