Effect of music on patients undergoing colonoscopy: a meta-analysis of randomized controlled trials
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CRD summary
The review concluded that music during colonoscopy improved patients' overall experience, but did not alter requirement for sedative pain medication, procedure times, patients' pain or willingness to repeat the procedure. The authors' conclusion was an accurate reflection of the results, but the small number of included studies and differences between studies made the reliability of the conclusions uncertain.

Authors' objectives
To evaluate the effects of music on patients undergoing colonoscopy.

Searching
MEDLINE via PubMed, Old MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Systematic Reviews, DARE, HealthSTAR and CINAHL databases and Journals@OVID were searched to 2006. Search terms were reported. Abstracts from meetings of Digestive Disease Week and American College of Gastroenterology National Meeting were searched for additional articles from 2001 to 2006.

Study selection
Randomised controlled trials (RCTs) that compared music versus no music for adults (aged 18 years or over) who underwent colonoscopy were eligible for inclusion. Outcomes of interest were total procedure time, dose of sedative medications, patients' pain scores, patients' experience and willingness to repeat the procedure in the future.

The type of music used in the interventions varied between studies and included classical, radio station, easy-listening or patient-directed selections. Music was played preoperatively or during procedure only. Sedation used during procedures included midazolam and meperidine. Included studies were conducted in USA, Spain, Germany, India, China, Japan and Turkey.

Two reviewers independently assessed papers for inclusion.

Assessment of study quality
Validity was assessed using Jadad criteria (maximum score 5 points). The authors did not state how many reviewers carried out the validity assessment.

Data extraction
Data were extracted for outcomes of interest and used to calculate mean differences or odds ratios (ORs) and corresponding 95% confidence intervals (CI). Where necessary, authors were contacted for clarification or additional information.

Two reviewers independently extracted data. Differences were resolved through discussion.

Methods of synthesis
Data from individual studies were combined using a random-effects model, pooled ORs, weighted mean differences (WMD) and standard mean differences (SMD) together with 95% CIs were calculated. Heterogeneity was assessed using the $I^2$ measure and $X^2$ test. Publication bias was assessed using funnel plots.

Results of the review
Eight RCTs (n=712) were included in the review. Two RCTs scored a maximum of 5 points for study validity, three RCTs scored 3 points and three RCTs scored 2 points. Sample sizes ranged from 29 to 166.
Scores for patients' overall experience were significantly improved with music (SMD -0.65, 95% CI -1.01 to -0.28, p=0.0006; four RCTs). No statistically significant differences between music and no music groups were found for patients' pain scores, doses of midazolam or meperidine, or willingness to have a repeat procedure in the future. Music was associated with a trend toward shorter procedure times, but this was not statistically significant. Evidence of statistical heterogeneity was high for all analyses ($I^2$=68% or more) apart from analysis of total procedure time ($I^2$=46%). There was no evidence of publication bias.

**Authors' conclusions**
Music played during colonoscopy improved patients' overall experience, but did not alter requirement for sedative pain medication, procedure times, patients' pain or patients' willingness to repeat the procedure in the future.

**CRD commentary**
Inclusion criteria were defined for intervention, participants, outcomes and study design. Several relevant sources were searched. It was unclear whether language limitations were applied. Potential for publication bias was assessed and no evidence was found. Appropriate methods were used to reduce reviewer error and bias for study selection and data extraction; it was unclear whether these were applied for assessment of validity. Combining studies in a meta-analysis may not have been appropriate given the differences between studies in terms of intervention, sedation and statistical heterogeneity. Reporting of study details was limited; no detail was reported for participants. Studies were conducted in various countries and methods of colonoscopy may vary between countries, which may have influenced individual results. The authors' conclusion was an accurate reflection of the results of the review, but the small number of included studies and differences between studies made it difficult to be certain of the conclusion's reliability.

**Implications of the review for practice and research**
**Practice:** The authors stated that as patients' experience was improved with the addition of music to colonoscopy it would be reasonable to offer this non-invasive modality to endoscopy laboratories.

**Research:** The authors did not state any implications for research.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.