Effects of Art on Surgical Patients:
A Systematic Review and Meta-analysis
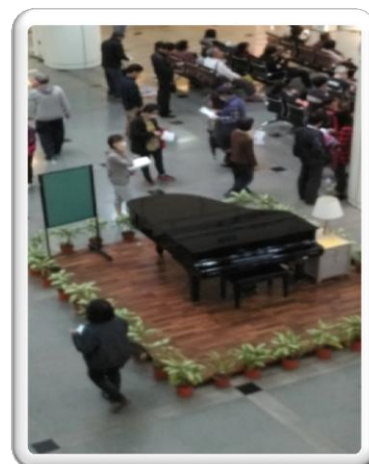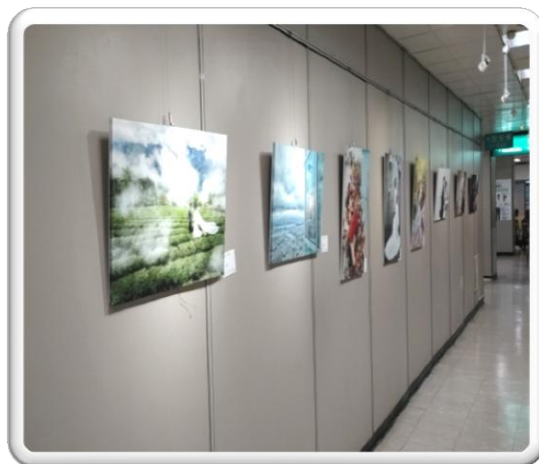
Vetter D, Barth J, Uyulmaz S, Uyulmaz S, Vonlanthen R, Belli G, Montorsi M, Bismuth H, Witt CM, Clavien PA.
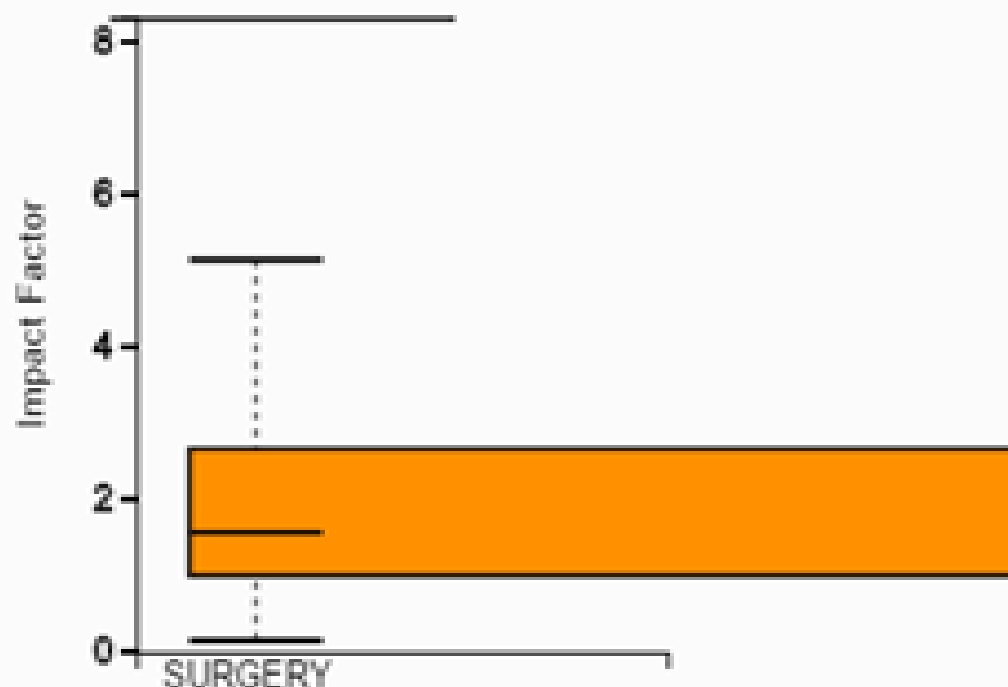
Present by 陳秀鉛
2016.04.12

藝術在萬芳

藝術讓病人安適的效果如何呢？

Category Box Plot

ANNALS OF SURGERY, IF: 8.327

Category Box Plot

The category box plot depicts the distribution of Impact Factors for all journals in the category. The horizontal line that forms the top of the box is the 75th percentile (Q_1). The horizontal line that forms the bottom is the 25th percentile (Q_3). The horizontal line that intersects the box is the median Impact Factor for the category.

Horizontal lines above and below the box, called whiskers, represent maximum and minimum values.

The top whisker is the smaller of the following two values:
the maximum Impact Factor (IF)
Q_1 IF + 3.5(Q_1 IF - Q_3 IF)

The bottom whisker is the larger of the following two values:
the minimum Impact Factor (IF)
Q_1 IF - 3.5(Q_1 IF - Q_3 IF)

Box Plots are provided for the current JCR year for each of the categories in which the journal is indexed.

Introduction

■ Surgery not only has an important physical impact on patients, but the loss of control, waiting periods for surgery, postoperative pain, and gradual recovery, as well as thoughts on temporary or lasting disability cause significant psychological stress.

■ Stress responses
  - compromise patients' ability to cooperate
  - lead to sleep disruption
  - delay gastric emptying with a risk of broncho-aspiration
  - increase the metabolism and oxygen consumption
  - probability of thromboembolic events
  - impair wound healing

■ Anxiety and pain-reducing therapies have been shown to reduce perioperative morbidity and mortality in surgical patients.

■ Physical environment of the health care setting may improve the healing process and patients' feeling of well being.

藝術的定義

- 廣義：
  - 凡是含有技術與思慮的活動及其製作，皆謂之藝術
- 狹義：
  - 凡含有審美的價值的活動及其活動的產物，而能表現出創作者的思想及情感，並予接觸者產生共感者，謂之藝術

- 包括文學、繪畫、音樂、舞蹈、雕塑、建築、戲劇與電影

取自*維科百基*

Critical Appraisal
[系統性文獻回顧 Systematic Review]

步驟 1：研究探討的問題為何？
the effect of art including ambient features such as music, interior design including visual art, and architectural features on health outcomes in surgical patients.

研究族群／問題 (Problems)	surgical adult patients
介入措施 (Intervention)	art (including ambient features such as music, interior design including visual art, and architectural features)
比較 (Comparison)	
結果 (Outcomes)	measuring health outcomes: pain, anxiety, blood pressure, and heart rate

步驟 2：系統性文獻回顧的品質如何？ (FAITH)

Find-良好的文獻搜尋至少應包括二個主要的資料庫，並且加上文獻引用檢索(參考文獻中相 關研究、Web of Science, Scopus 或 Google Scholar)、試驗登錄資料等。文獻搜尋應不只限於英文，並且應同時使用 MeSH 字串及一般檢索詞彙(text words)。
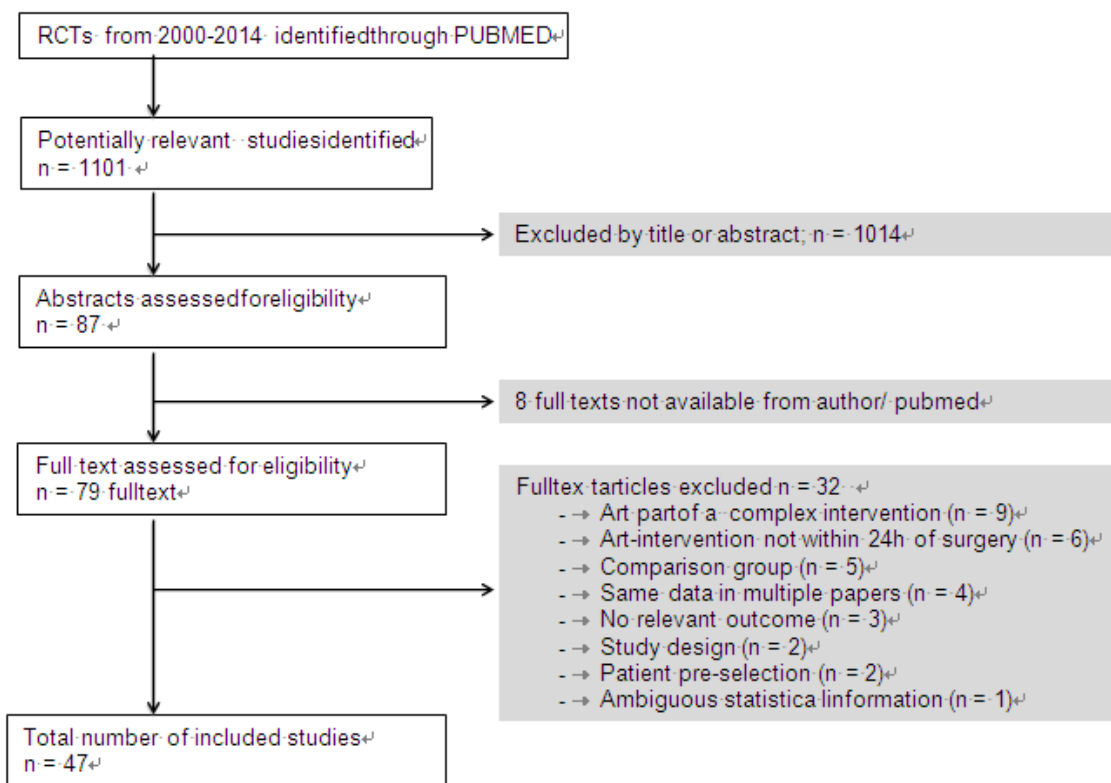
Systematic Review and Meta-analysis

Literature Search

Our literature search aimed at controlled clinical studies investigating the role of art in surgical patients. We used PubMed and combined keywords, with text words related to surgical interventions, controlled trials, and any kind of art. The performed systematic search in PubMed from January 2000 to October 2014 resulted in 1101 references, which were stored in the reference database software EndNote X7 (Thomson Reuters, Philadelphia, PA). For the present meta-analysis, all references related to the search terms were considered for inclusion. We further hand-searched promising journals such as "Journal Health&Place" and the "Nordic Journal of Music Therapy," both of which were negative for articles of interest. In the journal "Journal of Music Therapy," we found 2 additional hits that were later excluded after full-text screening. One further reference on natural lighting in surgical patients[13] was found while screening review articles.

評讀結果： □是　□否　不清楚

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Find-在文章的方法(Methods)章節，可以找到詳細搜尋策略的說明，包括使用的名詞，結果(Results)章節中可以找到本篇系統性文獻回顧評估的摘要及全文文獻數目、文獻納入與排除的數量及原因。資料可能會以圖表或PRISMA的流程圖呈現

Supplemental Digital Content 1: PRISMA flow diagram of systematic review

RCTs from 2000-2014 identifiedthrough PUBMED

↓

Potentially relevant studiesidentified
n = 1101

→ Excluded by title or abstract; n = 1014

↓

Abstracts assessedforeligibility
n = 87

→ 8 full texts not available from author/ pubmed

↓

Full text assessed for eligibility
n = 79 fulltext

→ Fulltex tarticles excluded n = 32
- → Art partof a complex intervention (n = 9)
- → Art-intervention not within 24h of surgery (n = 6)
- → Comparison group (n = 5)
- → Same data in multiple papers (n = 4)
- → No relevant outcome (n = 3)
- → Study design (n = 2)
- → Patient pre-selection (n = 2)
- → Ambiguous statistica linformation (n = 1)

↓

Total number of included studies
n = 47

評讀結果：☐ 是 ☐ 否 不清楚

A－文獻是否經過嚴格評讀 (Appraisal)？

應根據不同臨床問題的文章類型，選擇適合的評讀工具，並說明每篇研究的品質 (如針對治療型的臨床問題，選用隨機分配、盲法、及完整追蹤的研究類型)

Study Selection

Following the Preferred Reporting Items of Systematic reviews and Meta-Analyses (PRISMA) guidelines (PRISMA Statement, http://www.prisma-statement.org), of 1101 references, titles and abstracts were identified and screened for inclusion by 4 independent coders (S.U., Sr.U., D.V., and J.B.) in Endnote version X7 with a structured manual (the manual is available on request from the corresponding author). For training purposes and interrater agreement evaluation, a random sample of 5% of all references was independently rated by all coders. The percentage of agreement for the reasons of exclusion was larger than 75%, and all raters identified the same studies for a full-text screening. During the screening, raters were able to mark references as unclear. In such cases, a definite decision was taken by consensus with a senior researcher (J.B. and D.V.). Of the 1101 screened references, 87 were of interest to us. Seventy-nine of those references were available in the full text. Each full text was screened independently for inclusion by 2 of the 4 authors (S.U., Sr.U., D.V., and J.B.) following the inclusion criteria presented above, and data were collected in Excel version 14.3.9 (Microsoft Corporation, Redmond, WA). Discrepancies were checked by a fifth coworker (I.M.), corrected, and, if

unclear, a consensus was found with a senior researcher. One study was totally[14] and 4 were partially[15–18] excluded for certain endpoints due to ambiguous statistical information. One study about the effect of sunlight on patient outcome was not included in the meta-analysis. We finally included 47 studies on perioperative music interventions in the meta-analysis (Supplemental Digital Content 1, http://link-s.lww.com/SLA/A861).[15–61]

Moderators of Treatment Effects

We extracted potential moderators for treatment effects for stratified meta-analyses. The study quality was assessed with the following three criteria: (1) blinding (adequate blinding of outcome assessors vs not/unclear); (2) intention-to-treat analysis (used vs not/unclear); and (3) randomization (adequate generation of sequence and adequate allocation of patients vs not/unclear). Clinical moderators as proxies for the extent of the surgery were as follows: (1) the type of anesthesia (local and regional vs general anesthesia); and (2) inpatient vs outpatient surgical treatment. The moderator of self-selected vs preselected music (by study personnel) was used to look at the importance of personalized music.

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評讀結果： □是　□否　□不清楚

I - 是否只納入 (included) 具良好效度的文章？

僅進行文獻判讀是不足夠，系統性文獻回顧只納入至少要有一項研究結果是極小偏誤的試驗。

(Supplemental Digital Content 2, http://links.lww.com/SLA/A861).

Suppl. Table 1: Characteristics of the 47 studies included in the meta-analysis

Study First author Publication year Country	Sample Sample size (N analyzed) Age: M; c, ex Type of elective surgery	Intervention & Setting (1) Self-selected (2) Selected from a selection by exp. (3) Selected by exp.	Dose of intervention (1) Total number (2) Duration in min (3) Timepoint	Outcome measures (1) Pain (2) Anxiety (3) Physiological parameters (4) Laboratory parameters	Methodological quality (1) Blinding (2) Intention to treat (3) Randomization
Allen 2001 USA	N=40 Age: c=74 ex=77 Ophthalmic	(1)	(1) 1 (2) N.r. (3) pre-, intra- and postoperative	(1) – (2) N.r. (3) sBP and HR (4) –	(1) → – (2) → – (3) → +
Angioli 2014 Italy	N=356 Age: c=55 ex=57 Hysteroscopy	(2)	(1) 1 (2) N.r. (3) intraoperative	(1) VAS (2) STAI (3) sBP and HR (4) –	(1) → – (2) → – (3) → +
Arai 2008 Japan	N=32 Age: c=66 ex=60 Inguinal herniarepair	(3)	(1) 1 (2) N.r. (3) pre- and intraoperative	(1) – (2) – (3) sBP and HR (4) Salivaryamylase	(1) → – (2) → – (3) → +
Bae 2014 South Korea	N=80 Age: c=39 ex=39 Orthopedic	(2)	(1) 1 (2) N.r. (3) intraoperative	(1) – (2) VAS (3) sBP (4) –	(1) + (2) – (3) +
Cooke 2005 Australia	N=180 Age: c=56 ex=53 Orthopaedic surgery, cystoscopy and biopsy	(2)	(1) 1 (2) 30 (3) preoperative	(1) – (2) STAI (3) – (4) –	(1) → N.r. (2) → N.r. (3) → +
Dabu-Bondoc 2010 USA	N=60 Age: c=41 ex=42 Laparoscopy, breast surgery, orthopedic procedure, plastic surgery	(2)	(1) 1 (2) N.r. (3) pre- and intraoperative	(1) VAS and analgesic amount (2) – (3) sBP and HR (4) –	(1) → + (2) N.r. (3) → +
Good 2005 USA	N=167 Age: c=n.r ex=N.r. Open abdominal surgery	(2)	(1) 1 (2) 60 (3) postoperative	(1) VAS (2) VAS (3) – (4) –	(1) → + (2) → N.r. (3) → +

(待續...)

評讀結果：☐是　☐否　☐ 不清楚

T – 作者是否以表格和圖表「總結」 (total up) 試驗結果？

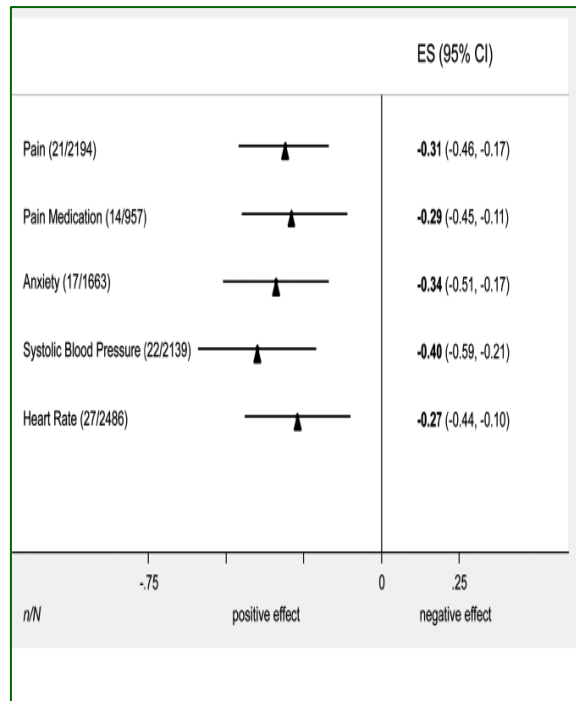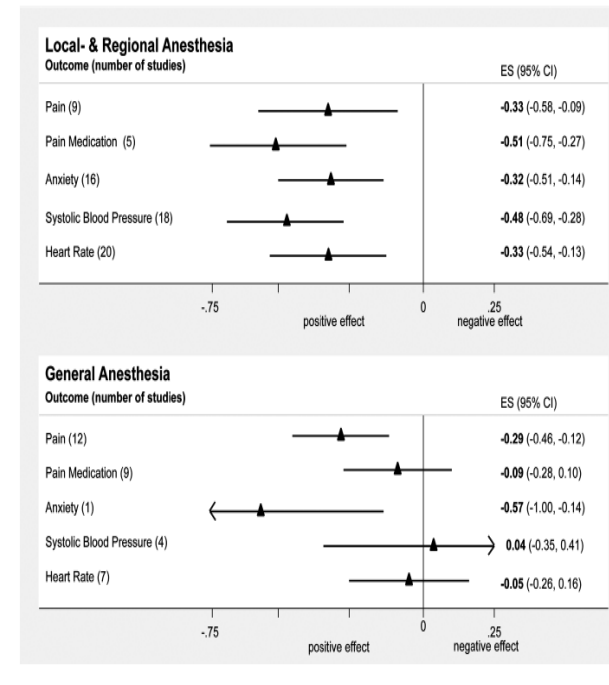應該用至少 1 個摘要表格呈現所納入的試驗結果。若結果相近，可針對結果進行統合分析(meta-analysis)，並以「森林圖」(forest plot)呈現研究結果，最好再加上異質性分析

FIGURE 1. Perioperative music has a positive effect on pain, anxiety, and physiological parameters. This figure summarizes the findings of the meta-analysis on perioperative music on pain, anxiety, and physiological parameters after surgery. Music was effective to reduce pain and consequently decreased the demand for pain medication. The effect of music on anxiety was similar. Further, systolic blood pressure and heart rate were reduced in patients receiving a music intervention.

FIGURE 2. Perioperative music for patients with general anesthesia has a lower effect on pain medication require-ment and physiological parameters. This figure summarizes the findings of the meta-analysis on perioperative music on pain, anxiety, and physiological parameters after surgery in patients receiving a surgical intervention in local or regional anesthesia, compared to patients receiving general anesthesia. Perioperative music reduced pain, pain medication, anxiety, and blood pressure and heart rate in patients with local and regional anesthesia. The positive effect of music was lost for pain medication, sys-tolic blood pressure, and heart rate in patients with general anesthesia.

評讀結果： □ 是　□ 否　□ 不清楚

H – 試驗的結果是否相近 – 異質性 (Heterogeneity)？

在理想情況下，各個試驗的結果應相近或具同質性，若具有異質性，作者應評估差異是否顯著(卡方檢定)。根據每篇個別研究中不同的**PICO**及研究方法，探討造成異質性的原因。

Overall Effectiveness of Perioperative Music on Pain, Anxiety, and Physiological Parameters

Music was effective to reduce pain after surgery (ES = −0.31, 95% confidence interval (CI) −0.46 to −0.17, $I^2 = 62.7\%$), and consequently pain medication was lower in patients who were exposed to music (ES = −0.28, 95% CI −0.45 to −0.11, $I^2 = 38.2\%$) (Fig. 1). Additional data for all analyses are available from the authors. The effect of music on anxiety was similar (ES = −0.34, 95% CI −0.51 to −0.17, $I^2 = 63.9\%$). Systolic blood pressure was reduced in patients receiving a music intervention (ES = −0.40, 95% CI −0.59 to −0.21, $I^2 = 76.8\%$), and also heart rate (ES = −0.27, 95% CI −0.44 to −0.1, $I^2 = 75.6\%$) (Fig. 1).

Analysis

Between-group effect sizes (ES) were calculated from the difference of posttreatment means of the intervention group and the control group, and dividing this difference by the pooled SD (Cohen's d). In case of missing information in the publication, we estimated ES according to established procedures.[62] An ES of 0.20 indicates a small effect, 0.50 a medium effect, and 0.80 a large effect between groups.[63]

All statistical analyses were done with STATA 12 by the command *metan* and *metareg*.[64] The reported summary statistics were calculated as random-effects models based on the assumption of heterogeneity between studies. Pooling was done according to the DerSimonian and Laird method,[65] using inverse variance of the primary studies as implemented in the command metan in STATA (StataCorp LP, College Station, TX).

Heterogeneity between the studies was assessed by examining forest plots of studies and through I^2 statistics. The I^2 value, ranging from 0% to 100%, indicates the magnitude of between-study heterogeneity. I^2 values of <25% indicate low, 25% to <50% moderate, and 50% to 75% high heterogeneity.[66] The presence of a publication bias was examined using funnel plots and the Egger regression test.[6]

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評讀結果： □是　□否　□ 不清楚

Results

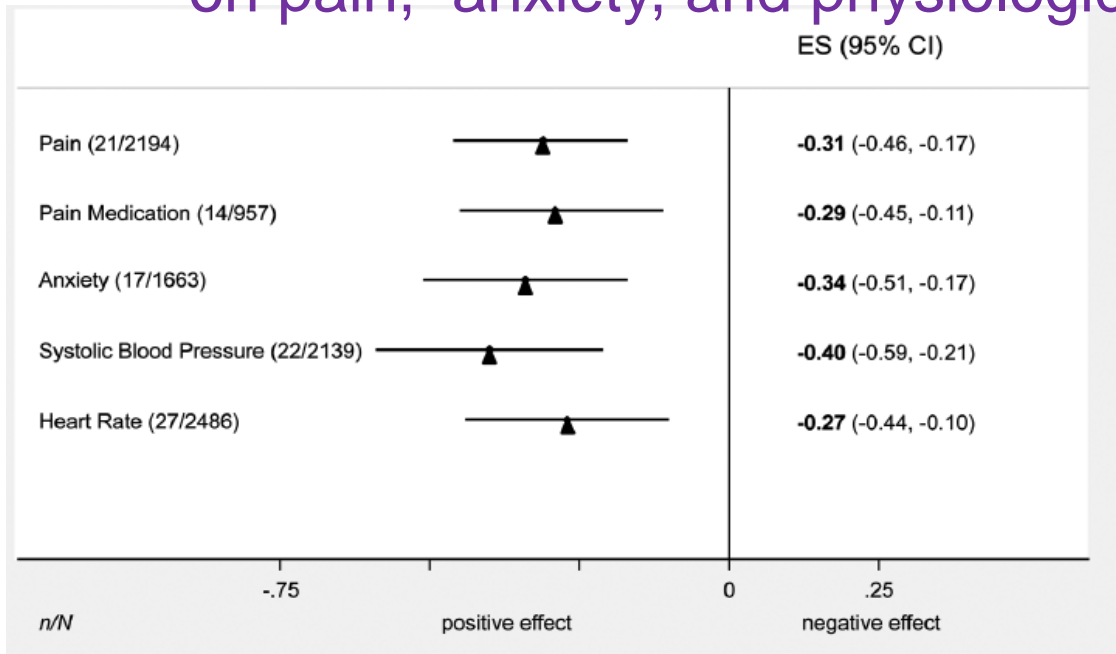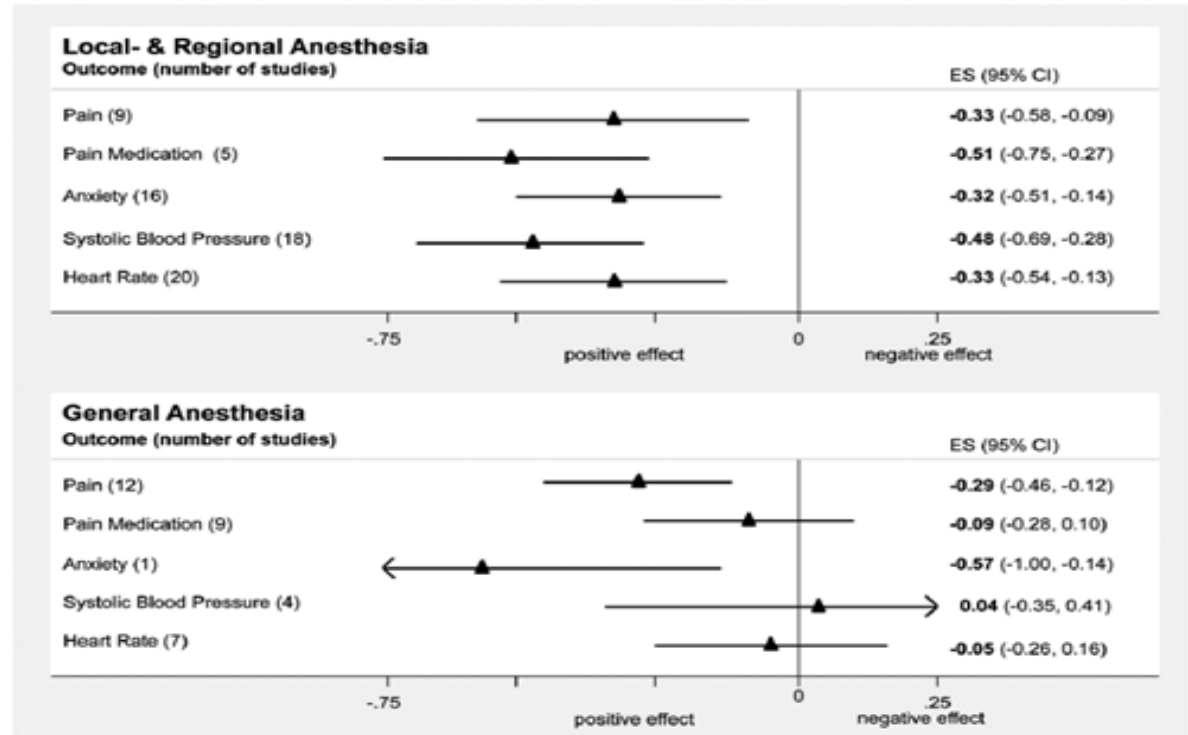## Perioperative music has a positive effect on pain, anxiety, and physiological parameters

FIGURE 1. Perioperative music has a positive effect on pain, anxiety, and physiological parameters. This figure summarizes the findings of the meta-analysis on perioperative music on pain, anxiety, and physiological parameters after surgery. Music was effective to reduce pain and consequently decreased the demand for pain medication. The effect of music on anxiety was similar. Further, systolic blood pressure and heart rate were reduced in patients receiving a music intervention.

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Results

Perioperative music in local or regional anesthesia, compared general anesthesia

FIGURE 2. Perioperative music for patients with general anesthesia has a lower effect on pain medication requirement and physiological parameters. This figure summarizes the findings of the meta-analysis on perioperative music on pain, anxiety, and physiological parameters after surgery in patients receiving a surgical intervention in local or regional anesthesia, compared to patients receiving general anesthesia. Perioperative music reduced pain, pain medication, anxiety, and blood pressure and heart rate in patients with local and regional anesthesia. The positive effect of music was lost for pain medication, systolic blood pressure, and heart rate in patients with general anesthesia.

Perioperative music reduced pain, pain medication, anxiety, and blood pressure and heart rate in patients with local and regional anesthesia.
The positive effect of music was lost for pain medication, systolic blood pressure, and heart rate in patients with general anesthesia

Results

Music self-selected vs experimenterselected

With self-selected music

Outcome (number of studies)	ES (95% CI)
Pain (12)	-0.35 (-0.52, -0.17)
Pain Medication (7)	-0.34 (-0.65, -0.03)
Anxiety (12)	-0.47 (-0.61, -0.33)
Systolic Blood Pressure (15)	-0.38 (-0.60, -0.15)
Heart Rate (16)	-0.26 (-0.43, -0.09)

With pre-selected music

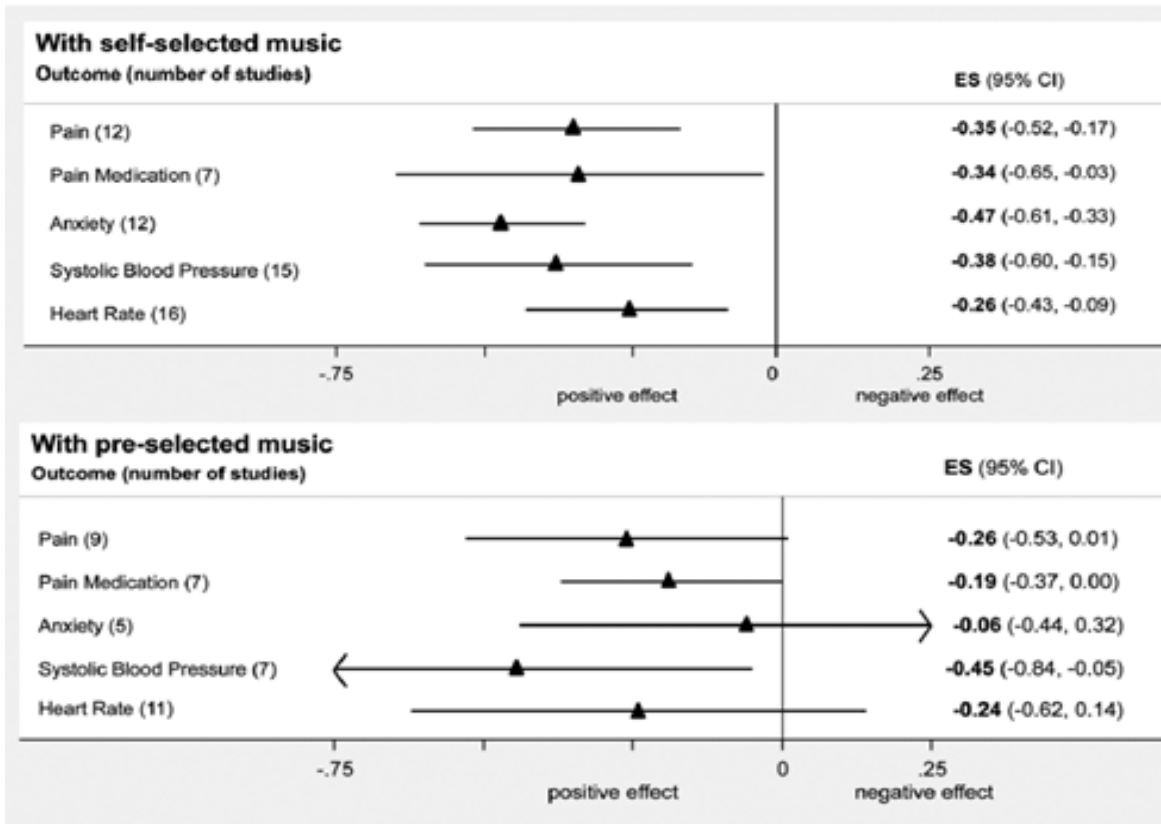| Outcome (number of studies)	ES (95% CI)
Pain (9)	-0.26 (-0.53, 0.01)
Pain Medication (7)	-0.19 (-0.37, 0.00)
Anxiety (5)	-0.06 (-0.44, 0.32)
Systolic Blood Pressure (7)	-0.45 (-0.84, -0.05)
Heart Rate (11)	-0.24 (-0.62, 0.14)

FIGURE 3. Personalized perioperative music increases the positive effect of music on pain, anxiety, and physiological parameters. This figure summarizes the findings of the meta-analysis on perioperative music on pain, anxiety, and physiological parameters after surgery in patients receiving a surgical intervention, depending on whether the music was self-selected or experimenter-selected. Self-selected music significantly reduced pain, pain medication, anxiety, and systolic blood pressure and heart rate. The positive effect of preselected music was limited to reducing the blood pressure.

Self-selected music significantly reduced pain, pain medication, anxiety, and systolic blood pressure and heart rate. The positive effect of preselected music was limited to reducing the blood pressure.

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"Patient room" and "Viewing room" designed by Gottfried Honegger at the University Hospital Zurich, Switzerland.

The patients rated the room color with increasing satisfaction over their hospitalization, and no patient stated that they would have preferred a white room.

FIGURE 5. Hepatobiliary Center, Paul Brousse Hospital, Paris, France. The architects focused on opening the building to direct sunlight. Further, the building itself was curved to avoid long straight corridor perspectives onto the patient rooms.

The vision of the architect was primarily ''to diminish the anguish of patients and their families facing serious liver diseases, and waiting for major surgery or liver transplantation

醫院設計
的可能性

Conclusion

- Art has an effect on patients' health seems obvious, however, that this knowledge is not yet widely implemented in daily clinical practice.

- Based on our findings, we recommend personalized perioperative music for routine surgical care.

- Regarding visual art, evidence is still weak, although the effects are likely to be important with possible intervention at relatively low cost.

- Visual art could be individualized to patients' preferences by using digitalized picture frames, or offering a rotating selection of art to hang on the walls.

- There is some evidence for a positive effect of architectural hospital design with maximized sunlight and spacious layout.

- Further, research looking at associated costs and effects is warranted.

Discussion

音樂是否可以納入術後病人照護，變成臨床常規?

🟩 同意: 18
🟨 懷疑: 17
🟥 不同意: 0

InstaMag Journal Club[66]@Wanfang Hospital 2016/04/12