Does intraoperative music reduce pain following abdominal wall reconstruction? A double-blind randomized controlled trial

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Dr. Rosen's Lessons

- Nobody cares, work harder
- Use your left hand
- You can't fix hernias without playing the "Chicken Fried" song

Background

Anaesthesia
Peri-operative medicine, critical care and pain
Association of Anaesthetists

Free Access

A comparison of intra-operative or postoperative exposure to music – a controlled trial of the effects on postoperative pain

U. Nilsson, N. Rawal, M. Unosson

First published: 06 June 2003 | https://doi.org/10.1046/j.1365-2044.2003.03189_4.x | Citations: 94

	IM-group (*n* = 51)	PM-group (*n* = 51)	Control (*n* = 49)	p-value
Pain, after 1 h 0–10	2.6 (1.5)	2.7 (1.6)	3.6 (1.7)	< 0.01 [a]
Morphine, after 1 h mg	1.6 (2.1)	1.2 (1.7)	2.5 (2.8)	< 0.05[b]
Pain, after 2 h 0–10	1.8 (1.1)	1.7 (1.2)	2.6 (1.6)	< 0.01[c]
Morphine, total amount mg	2.0 (2.5)	1.9 (2.8)	3.1 (3.6)	n.s.

- Ambulatory patients
- Patients not blinded

Pain, narcotics

Background

- There may be a benefit during sedation:
  - The auditory sensory system is still activated by auditory stimuli on fMRI during deep propofol sedation[1]
  - Intraoperative music has been associated with lower levels of cortisol and cytokines in studies employing locoregional anesthesia with sedation[2]

1) W.L. Gross, K.K. Lauer, X. Liu, *et al.* Propofol sedation alters perceptual and cognitive functions in healthy volunteers as revealed by functional magnetic resonance imag
Anesthesiology, 131 (2019), pp. 254-265
2) V.X. Fu, P. Oomens, D. Sneiders, et al. The effect of perioperative music on the stress response to surgery: a meta-analysis
J Surg Res, 244 (2019), pp. 444-455

Background

Meta-Analysis > Ann Surg. 2020 Dec;272(6):961-972. doi: 10.1097/SLA.0000000000003506.

The Effect of Perioperative Music on Medication Requirement and Hospital Length of Stay: A Meta-analysis

Victor X Fu [1 2], Pim Oomens [1 2], Markus Klimek [3], Michiel H J Verhofstad [1], Johannes Jeekel [2]

Affiliations + expand

PMID: 31356272 PMCID: PMC7668322 DOI: 10.1097/SLA.0000000000003506

Meta-Analysis > J Surg Res. 2019 Dec:244:444-455. doi: 10.1016/j.jss.2019.06.052. Epub 2019 Jul 18.

The Effect of Perioperative Music on the Stress Response to Surgery: A Meta-analysis

Victor X Fu [1], Pim Oomens [2], Dimitri Sneiders [3], Sjoerd A A van den Berg [4], Richard A Feelders [5], Bas P L Wijnhoven [3], Johannes Jeekel [2]

Affiliations + expand

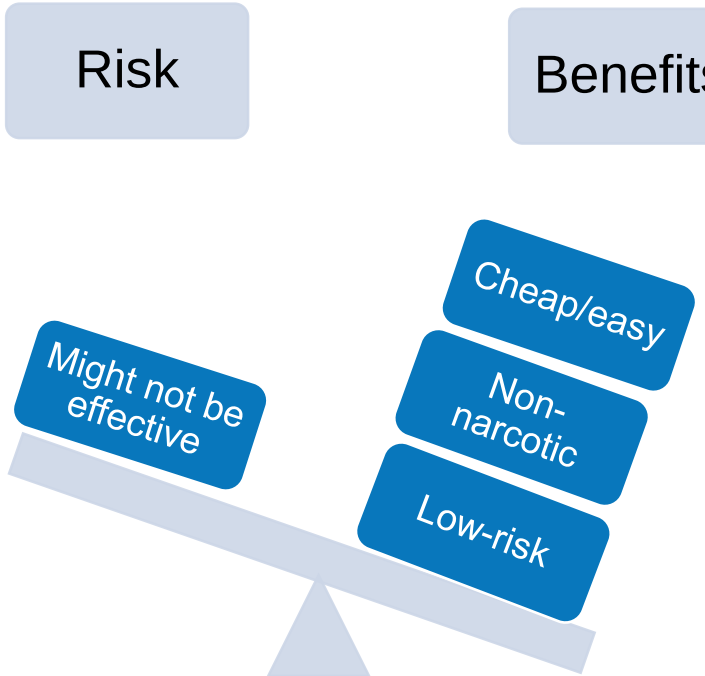
PMID: 31326711 DOI: 10.1016/j.jss.2019.06.052

Opioid medications
Sedative medications

Cortisol stress response

Background

What about music as an adjunct in abdominal wall reconstruction?



Hypothesis

- We sought to determine whether patient-selected intraoperative music would decrease early postoperative pain following AWR compared to intraoperative silence
  - Primary outcome (NRS-11) at 24+/-3 hours
    - Adjusted for chronic opioid use, hernia width, operative time, myofascial release, pre-operative anxiety disorder diagnosis, and pre-operative STAI-6 anxiety score

Secondary Outcomes

Outcome	Measurement Tool
Pain	NRS-11
Anxiety	STAI-6
Opioid use	Oral Morphine Milligram Equivalents
Sedative medications	IV sedation, MAC

- Anxiety (STAI-6) correlation with pain, complications, LOS, readmission
- Patient perception correlation with anxiety, pain, complications, LOS, readmission

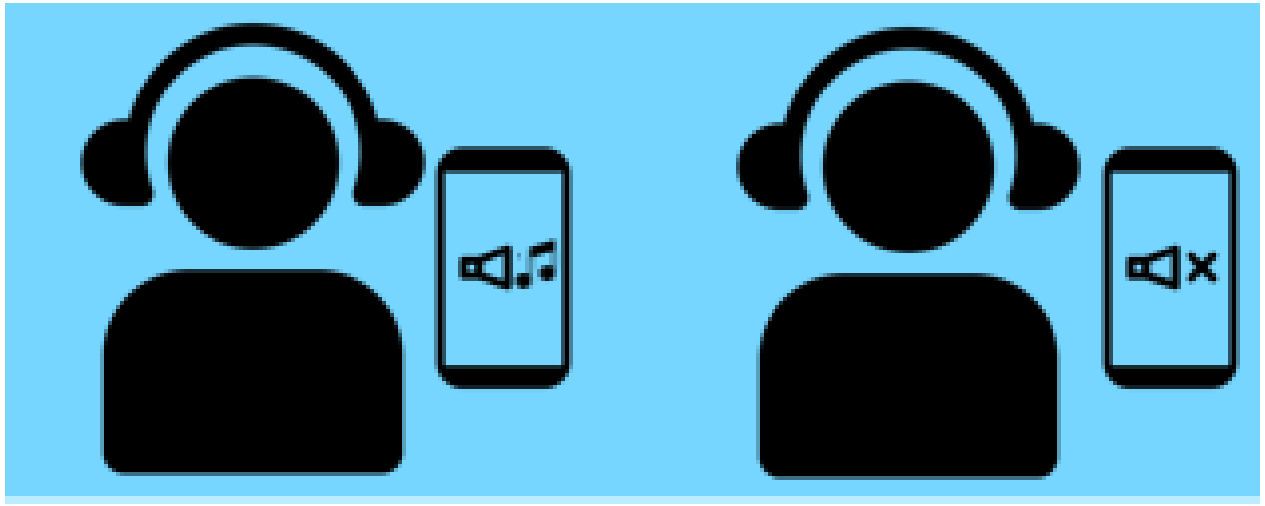
Inclusion/Exclusion Criteria

- Inclusion
  - Adults having open retromuscular VHR with mesh, with or without myofascial release for a hernia width ≤ 20 cm
    - Flank, parastomal, ventral

- Exclusion
  - Lack of English language fluency
  - Hearing impairment, +/- hearing aids
  - Neurologic condition that may preclude accurate assessment of postoperative pain and anxiety
  - Patients who will remain intubated after surgery

Randomization/Treatment

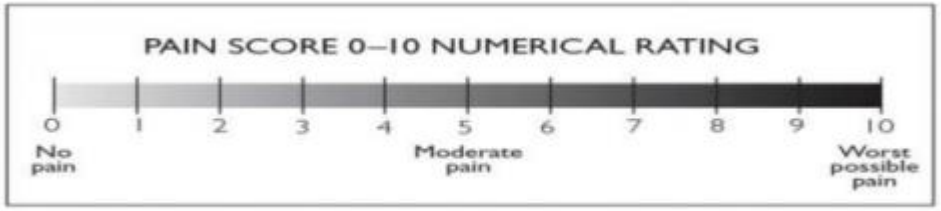
Headphones placed after intubation, removed during skin closure
Randomization and treatment by study coordinator uninvolved with surveys
Stratified by chronic opioid user vs opioid naive



- **Music**
  - Patient selected
- **Silence**
  - Noise-cancelling headphones only

Outcome Measurements

NRS-11:



STAI-6:

State Trait Anxiety Index 6-question version (STAI-6)

DIRECTIONS:

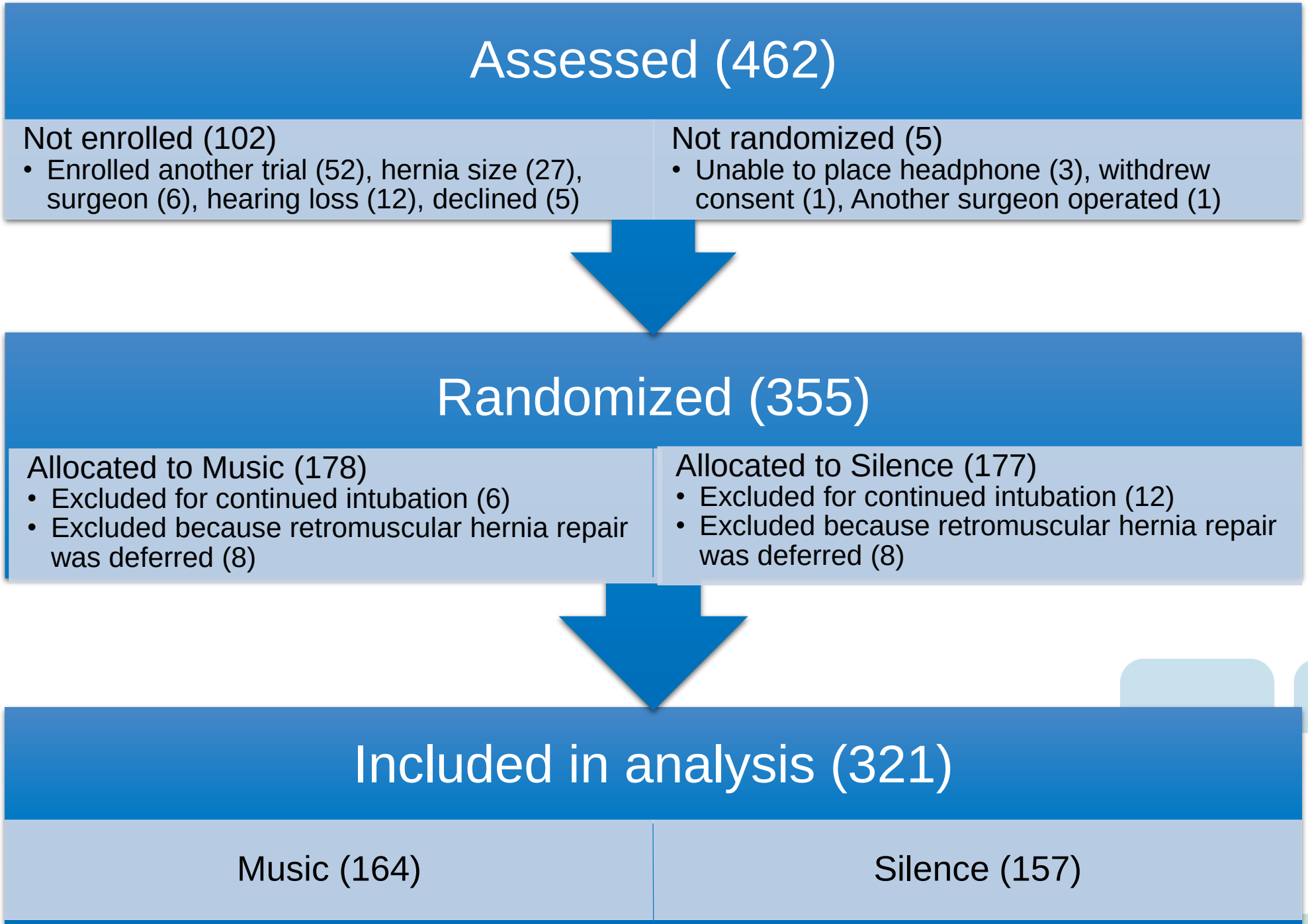
A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right now*, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I am tense	1	2	3	4
3. I feel upset	1	2	3	4
4. I am relaxed	1	2	3	4
5. I feel content	1	2	3	4
6. I am worried	1	2	3	4

Outcome Timeline

	Baseline	Intraop	24 hours	48 hours	72 hours	30-day
NRS-11	x		x	x	x	
STAI-6	x		x	x	x	
Sedative requirements		x				
MME requirements		x	x	x	x	
Allocation guess			x			
Complications (LOS, medical, SSO, SSI, SSOPI)						x

- Power Calculation–
  - 20% reduction in NRS-11 Pain score at 24 hours
  - α=0.05 β=90%
  - n=320 (160 in each arm)


Assessed (462)
Not enrolled (102)
• Enrolled another trial (52), hernia size (27), surgeon (6), hearing loss (12), declined (5)
Not randomized (5)
• Unable to place headphone (3), withdrew consent (1), Another surgeon operated (1)
Randomized (355)
Allocated to Music (178)
• Excluded for continued intubation (6)
• Excluded because retromuscular hernia repair was deferred (8)
Allocated to Silence (177)
• Excluded for continued intubation (12)
• Excluded because retromuscular hernia repair was deferred (8)
Included in analysis (321)
Music (164)
Silence (157)

Patient Demographics

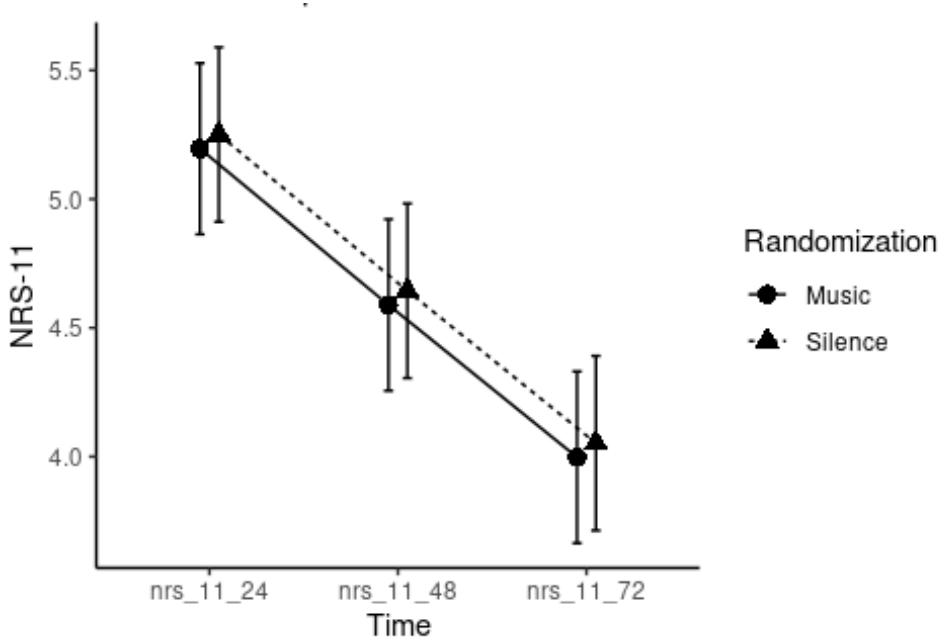
	Music (164)	Silence (157)
Age (median)	59.9 (11.4)	59.6 (12.3)
Male %	71 (43.3%)	65 (41.4%)
ASA %		
II	28 (17.1%)	19 (12.1%)
III	135 (82.3%)	133 (84.7%)
IV	1 (0.61%)	5 (3.18%)
Preoperative chronic opioid use, n (%)	27 (16.5%)	23 (14.6%)
Anxiety disorder, n (%)	49 (29.9%)	47 (29.9%)

Operative Details

	Music (164)	Silence (157)	p
Hernia Length (mean, cm)	21.4 (6.68)	22.2 (5.82)	0.22
Hernia Width (mean, cm)	14.4 (4.83)	14.7 (4.35)	0.55
Concomitant procedure, n(%)	34 (20.7%)	31 (19.7%)	0.94
Mesh Fixation, n(%)	25 (15.2%)	24 (15.3%)	1
Fascial closure, n(%)	157 (95.7%)	152 (96.8%)	0.83
OR time (mean, hours)	3.74 (1.03)	3.63 (1.01)	0.35

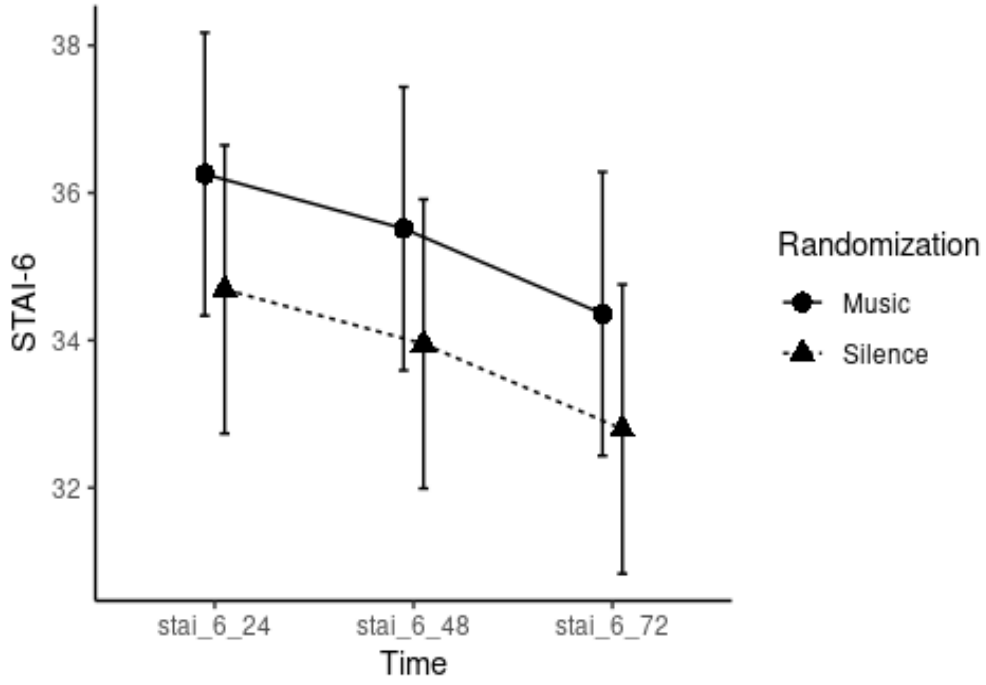
No difference in sedatives, MAC, benzodiazepine, opioids, or anesthesia guess

NRS-11



Time (hours)	24	48	72
Music	5.18 (2.62)	4.42 (2.64)	3.95 (2.54)
Silence	5.27 (2.46)	4.81 (2.47)	4.08 (2.63)
P-value	0.75	0.18	0.66

STAI-6



Time (hours)	24	48	72
Music	36.4 (15.0)	35.2 (15.0)	35.1 (15.1)
Silence	34.5 (13.7)	34.0 (14.5)	31.7 (14.3)
P-value	0.25	0.46	0.037

Opioid use

	Music (n=164)	Silence (n=157)	p
IV intraop (MME), mean	77.1 (59.2)	72.7 (26.5)	0.39
Postop 24 hours (MME), mean	202 (384)	159 (128)	0.17
Postop 48 hours (MME), mean	312 (572)	252 (213)	0.21
Postop 72 hours (MME), mean	381 (620)	438 (1537)	0.67

STAI-6 correlation with outcomes

Parameter	Model 1 (any complications)	Model 2 (re-admission)
(Intercept)	0.61 (0.33, 1.12)	0.09 (0.03, 0.25)
STAI 6 (24 hours)	1.00 (0.98, 1.01)	1.00 (0.98, 1.03)
Observations	**319**	**315**

Parameter	Model 1 (NRS-11@24 hours)	Model 2 (length of stay)
(Intercept)	2.80 (2.11, 3.49)	4.22 (3.44, 5.01)
STAI 6 (24 hours)	0.07 (0.05, 0.09)	0.04 (0.02, 0.06)
Observations	319	319

Outcomes by patient perception

	Music (n=135)	Silence (n=182)	p
Preop NRS-11, Mean (SD)	2.72 (2.43)	3.07 (2.99)	0.247
NRS-11@24 hours, Mean (SD)	4.99 (2.46)	5.39 (2.60)	0.162
Preop STAI 6, Mean (SD)	40.6 (14.5)	40.0 (13.9)	0.691
STAI6@24 hours, Mean (SD)	31.1 (11.9)	38.7 (15.3)	<0.001
Length of stay (days), Mean (SD)	5.27 (2.36)	5.84 (3.00)	0.063
Readmission, n(%)	14 (10.4%)	12 (6.74%)	0.344
Any complications, n(%):	43 (31.9%)	66 (36.3%)	0.485

Postoperative Course

	Music	Silence	p
Length of Stay (mean, d)	5.43 (2.52)	5.77 (2.96)	0.27
VTE	1 (0.62%)	3 (1.94%)	0.36
MI	1 (0.62%)	0	0.49
UTI	5 (3.09%)	5 (3.23%)	1
PNA	8 (4.94%)	5 (3.23%)	0.63
Readmission	16 (9.88%)	12 (7.74%)	0.64

Summary

- Music had no benefit on intraoperative or postoperative pain perception, anxiety or opioid requirements
- Anxiety levels affected pain scores and length of stay
- Patient belief that music played affected anxiety score

Thank you