

2022 SAMBA ANNUAL MEETING
MAY 11 - 14, 2022

Severe Postoperative Pain: Who is at Risk?

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Disclosures

- I have no financial or other interests to disclose

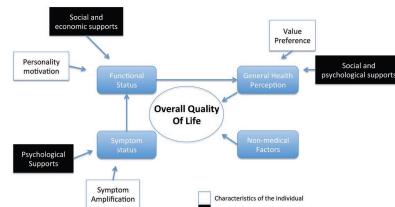
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Objectives

- After participating in this lecture, the audience will be able to:
 - Discuss the consequences of severe acute postoperative pain
 - Identify perioperative factors that can influence postoperative pain
 - Describe mechanisms that help identify patients at risk for severe postoperative pain

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Patient Outcomes



Abola et al: Anesth Analg 2018; 126(6):1874-1882.

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Severe Postoperative Pain



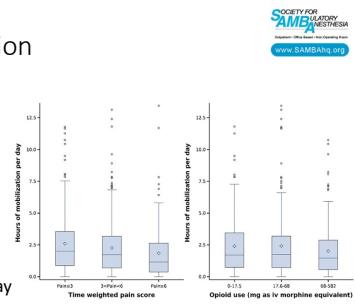
Can lead to:

- Poor mobility
- Decreased ventilation
- Chronic pain
- Chronic opioid use

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Pain and Mobilization

- 673 pts abdominal surgery
- Association -0.12 ($p=0.009$) with postop pain scores
- No association with postop opioid use
- All postop complications occurred in pts who spent <1.7 h/day sitting/standing
- Avg mobilization was 2h/day



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Assessing Risk

Timing

- Pre-operative
- Intra-operative
- Postoperative
- (>3 months postop)

Events

- Patient preparation for surgery
- Scheduled surgical injury
- Acute post-operative pain
- Chronic postop pain

Response to injury, plasticity underlying chronicification

Assess Risk Factors

- Biophysical**
 - Surgical approach
 - Sex
 - Centralization
 - Genetic variation
- Psychosocial**
 - Opioid dependence
 - Neurocognitive sensitivity
 - Emotional pain
 - Anxiety, depression
 - Pain catastrophizing
 - Somatization

Treatment

- Individual procedural risk stratification
- Minimally invasive techniques and decreased duration

Biophysical and psychosocial testing, support and treatment

Regional anesthesia
Multimodal analgesia
Minimize opioid-induced hyperalgesia

Redrawn from Hen et al: Chronic postoperative pain: Anaesthesia 2021; 76 (Suppl 1), 8-17

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Preoperative Pain Evaluation

Table 1. Predictors of Pain Testing

A. Psychological Measures	B. Pain Threshold Measures
Mental Health Inventory	Quantitative Sensory Testing
25-Item Stress Scale	Pressure Pain Threshold
Anxiety and Depression Hospital Scale	Supraspinatus Pain Scale
Self-Assessment Questionnaire for Depression	Inhibitory Control Test (Office
Posttraumatic Stress Scale	Diffuse Novice Inhibitory Control
Montgomery-Asberg Depression Rating Scale	C. Measures of Pain Outcome
Anxiety Test Inventory	Mogil's Pain Questionnaire
Hamilton Depression and Anxiety Assessment Scale	Visual Analog Scale
Endocrinological Evaluation Scale in Cancer Treatment	Numerical Pain Score
Sensitization Amplification Scale	Brad-Fast Inventory
McGill Measure of Pain Sensitivity Inventory	5-point Likert scale and 6-point Likert scale
French Personality Questionnaire	Scale of Confrontation
Multidimensional Scale of Health Control Locus	
Scale of Impact Events	
Scale of Confrontation	

Gatti. World J Surg Surg Res 2018; Vol 1 Article 1048.

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Preoperative Pain Testing?

- Quantitative sensory testing (QST)
- Preoperative psychometric evaluation

- May predict
 - 4-54% of variance in postop pain experience
 - Development of chronic post surgical pain

Werner MU et al. Anesthesiology 2010; 112(6):1494-1502.

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Psychometric Testing and Postop Pain

- 149 TKAs

TABLE 2. Correlation Between Preoperative Variables and Visual Analog Scale Pain at Followup

Psychometric Variable	1 Month	3 Months	6 Months	12 Months
State-Trait Anxiety Index	.21	.23	.16	-.04
Back Depression Inventory	.13	.22	.13	.43
McGill Pain Questionnaire—sensory	.29*	.20	.13	.08
McGill Pain Questionnaire—affective	.26	.06	.10	.13
McGill Pain Questionnaire—total score	.22	.09	.16	.11
Perceived Stress Scale	-.17	.06	.02	.06

Brander et al. Clin Orthop Rel Res 2003; 416:27-36.

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Preoperative Opioids

- Tolerance (A to C)
- Hyperalgesia (A to B)

FIGURE 1. Tolerance distinguished from hyperalgesia. Adapted from Angst MS, Clark JD. Opioid-induced hyperalgesia. A qualitative systematic review. Anesthesiology 2006;104:570-587.

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Preoperative vs Postoperative Opioids

- 57,019 chronic opioid users
- Opioid use postop days 91-365
 - Incidence of persistent opioid use
 - Average daily dose
- Weaning opioids preoperatively decreases risk of postoperative opioid use and daily dosage

Rishel et al. Anesthesiology 2021; 135:1015-1026.

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Perioperative Opioids



Larach et al: Anesthesiology 2022; 136(4): 594-608.

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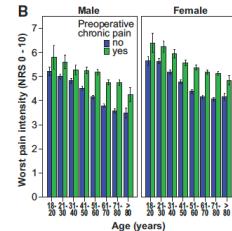
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Preoperative Chronic Pain

- 22,963 pts undergoing various surgeries
- Chronic Pain
- Age
- Gender



Gerbershagen et al: Anesthesiology 2014; 120:1237-45.

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Pain and Surgery Type

- >115,000 patients from 105 hospitals
- “worst pain” on POD1
- Outpatient procedures that had median score >=6:
 - Calcaneus ORIF, ankle fusion/reconstruction
 - Single or 2-level spinal fusion
- Some laparoscopic surgeries had pain equivalent to TKA:
 - Appendectomy
 - Extrauterine pregnancy
 - Gastric band

Gerbershagen et al: Anesthesiology 2013; 934-944.

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Early Associations

- Among patients who underwent GA (n=1416)
- Predictors of severe postoperative pain
 - Age (younger)
 - Gender (female)
 - Surgical Procedure (abdominal/orthopedic)
 - Preoperative pain severity (numerical scale)
 - Preoperative anxiety measure (Amsterdam scale [APAIS])

Kalkman et al: Pain 2003; 105:415-423.

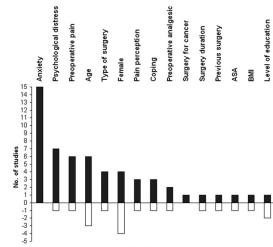
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Early Associations



- Systematic Review of Literature to assess predictors for severity of postop pain

Ip et al: Anesthesiology 2009; 111(3):657-77.

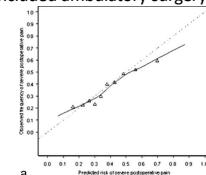
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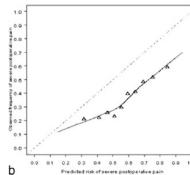
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Multifactorial Models

- Gender, age, type of surgery, incision size, preoperative pain score, anxiety score
- Included ambulatory surgery



Janssen et al: Anesth Analg 2008; 107(4):1330-9.



Janssen et al: Anesth Analg 2008; 107(4):1330-9.

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Predicting Pain Trajectory

- Postop pain trajectory groups for 7 days in 360 patients

- High pain group
 - Women
 - Younger
 - High anxiety/depression
 - Pain catastrophizing
 - NOT procedure type



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Predicting Persistent Postop Pain

- 300 pts after TKA
- Incidence of persistent pain and disability 12 months after surgery: 16%
- Predictors at 6 or 12 months:
 - Preoperative pain intensity
 - Trait (predisposition to) anxiety
 - Expected pain
- Final model:
 - Preoperative pain
 - Expected pain

Rice et al: Br J Anaes 2018; 119. <https://doi.org/10.1016/j.bja.2018.05.070>

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Summary

- Severe postop pain can lead to impaired recovery and increased risk of chronic pain
- Risk factors for increased postoperative pain are varied (biophysical and psychosocial) and multifactorial
- Correlations between anxiety, depression, preoperative pain, and postoperative pain exist, but assessing potential degree of impact is difficult and/or impractical

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