

Assessing the Predictors of Patient Satisfaction Undergoing a Regional Anaesthesia Procedure: A Prospective Observational StudySunil Kumar Tiwari¹, Shivam Sinha², Sagar Patankar³^{1,3}Third Year Post Graduate Resident, L.N. Medical College & J.K. Hospital, Bhopal, MP, India²First Year Post Graduate Resident Department of Anaesthesiology, L.N. Medical College & J.K. Hospital, Bhopal, MP, India

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Abstract:

Background: Patient satisfaction has become an increasingly important outcome measure in perioperative medicine because it reflects not only technical success but also the quality of communication, comfort, expectation management, and postoperative recovery. Regional anaesthesia is widely used for orthopaedic, obstetric, lower abdominal, urological, and extremity procedures because it offers effective anaesthesia, opioid-sparing analgesia, earlier mobilization in selected settings, and reduced exposure to airway instrumentation. However, the mere completion of a successful block does not guarantee a favorable patient experience. Dissatisfaction may arise from anxiety before the block, pain during needle insertion, inadequate explanation of expected sensory changes, block failure, prolonged limb numbness, nausea, shivering, delayed onset, or poorly controlled postoperative pain.

Aim: Previous studies have shown that patient satisfaction with regional anaesthesia is generally high, yet dissatisfaction persists in a clinically meaningful minority and appears to be strongly associated with communication quality, adequacy of sedation, procedural comfort, and postoperative symptoms. The present study aimed to assess the predictors of patient satisfaction among adults undergoing surgery under regional anaesthesia in a prospective observational design.

Materials and Methods: This prospective observational study was conducted in the Department of Anaesthesiology LPMC & JK Hospital Bhopal over 18 months. A total of 220 adult patients undergoing elective surgery under spinal, epidural, combined spinal-epidural, or peripheral nerve block techniques were enrolled by consecutive sampling. Preoperative variables included age, sex, educational status, prior exposure to anaesthesia, baseline anxiety, and adequacy of pre-procedural counselling. Intraoperative variables included type of regional anaesthesia, number of attempts, pain during block placement, need for supplemental sedation, adequacy of block, haemodynamic adverse events, nausea or vomiting, and conversion to general anaesthesia. Postoperative variables included pain scores, time to first analgesic request, motor discomfort related to prolonged numbness, and willingness to undergo the same technique again. Satisfaction was measured 24 hours after surgery using a structured 5-point Likert scale and dichotomized for predictor analysis into satisfied and not fully satisfied groups. The study framework and variable selection were informed by prior literature showing the importance of communication, block success, procedural discomfort, and postoperative symptom burden in shaping satisfaction with regional anaesthesia.

Result: The mean age of participants was 41.8 ± 13.7 years, and 126 patients (57.3%) were male. Overall, 184 patients (83.6%) were satisfied, including 102 (46.4%) who were very satisfied and 82 (37.3%) who were satisfied, while 36 patients (16.4%) were neutral or dissatisfied. Higher satisfaction was significantly associated with adequate preoperative counselling, previous positive anaesthesia experience, single-attempt block placement, absence of pain during needle insertion, successful block without supplementation, use of light sedation when indicated, low postoperative pain scores, absence of postoperative nausea or vomiting, and absence of distress related to prolonged motor block. In multivariable logistic regression, adequate counselling, successful surgical anaesthesia with the initial block, low postoperative pain score, and absence of procedural pain emerged as the strongest independent predictors of satisfaction. These findings are consistent with published evidence identifying communication quality, information adequacy, perioperative pain control, and block success as major determinants of patient-reported satisfaction.

Conclusion: Patient satisfaction following regional anaesthesia is multidimensional and depends on more than pharmacologic block success alone. The present study demonstrates that modifiable care processes, especially comprehensive counselling, atraumatic block performance, effective postoperative analgesia, and prevention of unpleasant sensory or motor experiences, are the principal determinants of a positive patient experience. Anaesthesiologists can improve satisfaction by setting realistic expectations, minimizing puncture discomfort, optimizing block reliability, identifying anxiety early, and maintaining structured postoperative follow-up. Because patient-reported experience increasingly serves as a quality indicator, perioperative teams should

incorporate satisfaction-focused pathways into routine regional anaesthesia practice. Existing studies similarly emphasize that communication, expectation management, and postoperative comfort are central to acceptance of regional techniques and willingness to choose them again in future procedures.

Keywords: Regional Anaesthesia; Patient Satisfaction; Predictors; Prospective Observational Study; Perioperative Care.

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Introduction

Regional anaesthesia occupies a central role in modern perioperative care because it can provide dense surgical anaesthesia, effective postoperative analgesia, reduced systemic opioid exposure, and faster recovery for many common operations. It is now used across a broad spectrum of surgeries involving the lower abdomen, perineum, lower limb, upper extremity, and obstetric practice. Contemporary pain guidelines support the broader use of regional and local techniques as an important component of multimodal perioperative pain management, particularly when the goal is to reduce postoperative pain and opioid requirements. Yet, from the patient's perspective, the success of a regional anaesthesia procedure is not defined solely by a functioning block. The patient experience includes the preoperative explanation, emotional response to being awake, discomfort during positioning and needle insertion, confidence in the anaesthesiologist, management of anxiety, intraoperative comfort, and the quality of recovery after surgery.

Patient satisfaction is therefore a complex patient-reported experience measure rather than a simple technical endpoint. A block that is clinically effective may still be remembered negatively if the patient felt frightened, inadequately informed, or distressed by prolonged numbness and immobility. Conversely, even when minor discomfort or transient symptoms occur, satisfaction may remain high if communication is clear, trust is established, and expectations are met. Earlier studies have highlighted that the advantages most appreciated by patients include staying awake when desired, early interaction with relatives, and freedom from immediate postoperative pain, whereas the common sources of dissatisfaction include needle pain, fear of awareness during surgery, inadequate block effect, and discomfort from prolonged sensory or motor block.

The literature suggests that several domains influence patient satisfaction under regional anaesthesia. Preoperative variables include demographic profile, educational level, prior anaesthesia exposure, baseline anxiety, and patient preference for being awake versus sedated. Process-related variables include the quality of information provided, shared decision-making, number of

puncture attempts, type of block, and the use of sedation or adjuvant medication. Outcome-related variables include adequacy of surgical anaesthesia, rescue analgesic requirement, conversion to general anaesthesia, postoperative nausea and vomiting, pain after regression of the block, and the patient's interpretation of delayed return of motor or sensory function. Published observational studies have repeatedly emphasized communication quality, information adequacy, and procedural comfort as important predictors of satisfaction, while dissatisfaction is commonly linked to block failure, untreated pain, and unpleasant postoperative sensory experiences.

Despite this growing body of evidence, patient satisfaction with regional anaesthesia remains under-evaluated in many hospitals, especially in routine clinical settings in low- and middle-income environments where service pressure may limit structured counselling and follow-up. In addition, much of the published evidence comes from specific surgeries or single block types, making it difficult to generalize the predictors of satisfaction to broader perioperative practice. A prospective observational approach is useful because it allows the evaluation of naturally occurring clinical factors without altering standard care. Such studies can identify modifiable predictors and thereby help departments improve the patient experience while maintaining the established analgesic and recovery benefits of regional techniques.

The present study was therefore designed as a prospective observational study to assess patient satisfaction among adults undergoing surgery under regional anaesthesia and to identify the perioperative factors that predict a favorable or unfavorable experience. The study specifically examined whether counselling quality, previous anaesthesia exposure, procedural pain, block success, sedation requirement, adverse intraoperative events, and postoperative pain outcomes are associated with patient satisfaction at 24 hours after surgery.

Materials & Method

This prospective observational study was carried out in the Department of Anaesthesiology LNMC & JK Hospital Bhopal after approval from the Institutional Ethics Committee and after obtaining written

informed consent from all participants. The study period was 18 months. Adult patients aged 18 to 70 years, of either sex, posted for elective surgery under regional anaesthesia were screened for eligibility. The regional techniques included subarachnoid block, epidural block, combined spinal-epidural anaesthesia, and peripheral nerve blocks for upper or lower limb surgery. Patients with cognitive impairment, inability to communicate effectively, psychiatric illness precluding questionnaire response, emergency surgery, failed follow-up, or refusal to participate were excluded.

A sample size of 220 was considered feasible for prospective enrolment and adequate for evaluating satisfaction patterns and common predictors in the local setting. Consecutive eligible patients were recruited until the target was achieved. Baseline data recorded preoperatively included age, sex, body mass index, residence, educational status, ASA physical status, prior exposure to surgery or anaesthesia, previous regional anaesthesia experience, and whether that prior experience had been positive or negative. Anxiety before the procedure was graded on a simple three-level clinical scale as mild, moderate, or severe. The adequacy of counselling was assessed immediately before surgery based on whether the patient reported receiving an understandable explanation regarding the procedure, expected sensations, benefits, possible need for supplementation, and likely postoperative numbness.

All regional anaesthesia procedures were performed in the operation theatre or designated block area under standard monitoring. The type of block and drug dose were selected by the attending anaesthesiologist according to the surgical requirement and routine department protocol. Intraoperative observations included the regional technique used, number of skin punctures, pain during block placement, use of local infiltration at puncture site, use of supplemental sedation, adequacy of block for surgery, need for rescue analgesia, requirement of block supplementation, conversion to general anaesthesia, occurrence of

hypotension, bradycardia, shivering, nausea, vomiting, and patient-reported intraoperative comfort. Light sedation was administered when clinically indicated and according to patient preference, a practice supported by prior evidence suggesting that appropriate sedation may improve acceptance of regional anaesthesia when matched to patient expectations.

Block success was defined as completion of surgery under the planned regional technique without conversion to general anaesthesia and without major rescue intervention. Postoperatively, all patients were followed for 24 hours. Pain intensity was assessed using a 0 to 10 numeric rating scale at 2, 6, and 24 hours. Time to first rescue analgesia, postoperative nausea or vomiting, urinary retention where relevant, headache where relevant, and distress caused by persistent numbness or motor weakness were recorded. At 24 hours, patient satisfaction was assessed by a structured questionnaire using a 5-point Likert scale: very satisfied, satisfied, neutral, dissatisfied, and very dissatisfied. Patients were also asked whether they would choose the same regional technique again.

For analytical purposes, satisfaction was described in full categories and also dichotomized into satisfied (very satisfied/satisfied) and not fully satisfied (neutral/dissatisfied/very dissatisfied). The principal predictors examined were adequacy of counselling, preoperative anxiety, previous anaesthesia exposure, previous positive regional anaesthesia experience, number of attempts, pain during block placement, use of sedation, block success, postoperative pain, nausea or vomiting, and discomfort due to prolonged numbness. The choice of these predictors was guided by published studies showing the importance of information provision, symptom burden, and technical success in determining regional anaesthesia satisfaction outcomes.

Observation Tables

Table 1: Baseline Characteristics of Study Participants (N = 220)

Variable	Number	Percentage
Age 18-30 years	58	26.4
Age 31-50 years	102	46.4
Age >50 years	60	27.2
Male	126	57.3
Female	94	42.7
ASA I	132	60.0
ASA II	74	33.6
ASA III	14	6.4
Previous anaesthesia exposure	96	43.6
Previous positive regional anaesthesia experience	52	23.6
Adequate preoperative counselling	168	76.4
Moderate to severe preoperative anxiety	72	32.7

Table 2: Peri-Procedural Observations During Regional Anaesthesia

Variable	Number	Percentage
Spinal anaesthesia	124	56.4
Epidural/CSE	38	17.3
Peripheral nerve block	58	26.3
Single-attempt successful placement	162	73.6
More than one attempt	58	26.4
Pain during block placement	64	29.1
Supplemental sedation used	88	40.0
Successful block for surgery	198	90.0
Rescue supplementation required	28	12.7
Conversion to general anaesthesia	10	4.5
Hypotension/bradycardia	34	15.5
Intraoperative nausea/vomiting	18	8.2

Table 3: Postoperative Recovery Profile

Variable	Number	Percentage
Numeric pain score <4 at 24 hours	176	80.0
Numeric pain score $\geq$ 4 at 24 hours	44	20.0
First analgesic request after 6 hours	148	67.3
Postoperative nausea/vomiting	22	10.0
Distress due to prolonged numbness/motor block	30	13.6
Willing to undergo same technique again	186	84.5

Table 4: Association of selected predictors with satisfaction

Predictor	Satisfied n=184	Not fully satisfied n=36	P value
Adequate counselling present	154	14	<0.001
Previous positive RA experience	48	4	0.041
Single-attempt block	146	16	<0.001
No pain during block placement	146	10	<0.001
Successful block without conversion	176	22	<0.001
Sedation used when requested	80	8	0.118
24-hour pain score <4	160	16	<0.001
No postoperative nausea/vomiting	170	28	0.022
No distress from prolonged numbness	168	22	<0.001

Result

Two hundred and twenty patients were included in the final analysis. The largest age group was 31 to 50 years, accounting for 46.4% of the study population, and males constituted 57.3%. Most participants belonged to ASA physical status I or II. Adequate preoperative counselling was reported by 76.4% of patients, while nearly one-third had moderate to severe anxiety before the procedure. A prior positive regional anaesthesia experience was present in 23.6%.

Spinal anaesthesia was the most commonly performed technique, followed by peripheral nerve blocks and epidural or combined spinal-epidural procedures. A single-attempt successful block placement was achieved in 73.6% of patients, whereas 29.1% reported pain during block placement. Supplemental sedation was used in 40.0% of cases. Successful completion of surgery under the intended regional anaesthesia occurred in 90.0%, while 4.5% required conversion to general anaesthesia.

Overall satisfaction was high. Of the 220 patients, 102 (46.4%) were very satisfied, 82 (37.3%) were satisfied, 20 (9.1%) were neutral, 12 (5.5%) were dissatisfied, and 4 (1.8%) were very dissatisfied. Thus, 184 patients (83.6%) were categorized as satisfied. At 24 hours, 80.0% had pain scores below 4, and 84.5% stated that they would choose the same technique again.

Univariate association analysis demonstrated that adequate counselling, previous positive regional anaesthesia experience, single-attempt procedure, absence of procedural pain, successful block, low postoperative pain, absence of nausea or vomiting, and absence of distress related to prolonged numbness were significantly associated with higher satisfaction. Sedation use alone was not statistically significant, suggesting that sedation contributes positively only when aligned with patient comfort and expectation rather than as an isolated intervention. This pattern agrees with earlier published findings that communication, information, procedural comfort, and symptom

control influence satisfaction more strongly than demographic factors alone.

On multivariable logistic regression, four variables retained independent significance: adequate preoperative counselling, block success without conversion, absence of pain during block placement, and 24-hour pain score below 4. These findings indicate that patient satisfaction after regional anaesthesia is determined mainly by modifiable perioperative care factors rather than fixed patient characteristics. The overall results support the concept that technical proficiency and structured communication should be considered equally important quality targets in regional anaesthesia services.

Statistical Analysis

Data were entered in Microsoft Excel and analyzed using SPSS version 26.0. Continuous variables were summarized as mean $\pm$ standard deviation or median with interquartile range depending on distribution, and categorical variables were expressed as frequency and percentage. Association between categorical predictors and satisfaction group was tested using the chi-square test or Fisher exact test where appropriate. Independent sample t-test or Mann-Whitney U test was applied for continuous variables. Variables with p value less than 0.10 on univariate analysis were entered into a multivariable logistic regression model to identify independent predictors of satisfaction. Adjusted odds ratios with 95% confidence intervals were calculated, and p value less than 0.05 was considered statistically significant. This analytic strategy is consistent with prior observational studies that examined determinants of patient satisfaction after regional anaesthesia using regression-based approaches.

Discussion

Patient satisfaction is increasingly recognized as a core outcome in regional anaesthesia because it reflects not only technical success but also communication, comfort, anxiety control, and postoperative recovery. In the present study, overall satisfaction was high, with 83.6% of patients reporting that they were satisfied, and 84.5% stating that they would choose the same technique again, which supports the view that regional anaesthesia is generally acceptable when performed well. This pattern is broadly consistent with earlier work by Gori et al., who found that patient attitudes toward regional anaesthesia were mostly favorable or indifferent, and that patients valued the lived experience of the technique as much as the anaesthetic outcome itself. At the same time, the existence of a clearly dissatisfied subgroup in our study shows that satisfaction is not guaranteed by successful block placement alone, a point also

emphasized in later observational and review studies.

One of the strongest findings in our study was the central role of preoperative counselling. Patients who reported adequate counselling were significantly more likely to be satisfied, and counselling remained an independent predictor in multivariable analysis. This aligns closely with the study by Droog et al., which found that dissatisfaction after regional anaesthesia was often related to insufficient information, block failure, and discomfort from prolonged postoperative numbness, leading the authors to recommend stronger preoperative counselling. Likewise, the earlier work by Gori et al. showed that patient acceptance improved when individuals understood the procedure better and when their prior doubts were addressed through experience and explanation. Our findings therefore reinforce a consistent message across decades of literature: the quality of information given before the block is a modifiable determinant of patient experience.

Procedural comfort also emerged as an important contributor to satisfaction in our cohort. Pain during block placement was strongly associated with lower satisfaction, and absence of procedural pain remained independently significant. This is similar to the findings of Gori et al., where needle puncture was the most common complaint and the strongest negative factor in regression analysis. In contrast, some studies have suggested that procedural pain may be less influential than communication quality, especially when patients are well prepared for the sensation and understand its temporary nature. Our results sit between these viewpoints: pain during block placement mattered substantially, but its effect appeared intertwined with counselling, because patients who were adequately informed may have tolerated transient discomfort better than those who were not.

Block success was another major driver of satisfaction in the present study. Successful completion of surgery under the intended regional technique without conversion to general anaesthesia was strongly associated with satisfaction, and failure or supplementation reduced patient approval. This is in line with Droog et al., who specifically reported that inadequate anaesthesia before surgery was a major cause of dissatisfaction after regional plexus anaesthesia. It also matches the broader literature summarized by Barnett et al. and Wu et al., both of whom highlighted that technical reliability and symptom control are repeatedly associated with positive patient-reported outcomes in anaesthesia studies. In practical terms, our findings show that satisfaction is influenced not just by whether anaesthesia is regional, but by whether it performs reliably enough to prevent intra-procedural distress and the need for rescue interventions.

Postoperative pain control was another independent predictor in our study, with lower 24-hour pain scores significantly linked to higher satisfaction. This is strongly supported by pain-management guidance, including the postoperative pain clinical practice guideline by Chou et al. and the more recent ASA perioperative pain guidance, both of which emphasize multimodal and regional techniques as central components of effective pain management. The importance of postoperative pain also appears in satisfaction studies outside regional anaesthesia, where delayed pain after discharge is often one of the main reasons patients downgrade their experience. Our findings therefore suggest that the benefit of regional anaesthesia is perceived by patients as extending beyond the operating room and into the recovery period, making postoperative analgesic planning essential for satisfaction.

Residual sensory or motor effects were another notable concern in our study. Distress related to prolonged numbness or motor block was associated with lower satisfaction, and patients without such distress were more likely to report a positive experience. This closely mirrors the conclusions of Droog et al., who identified discomfort from a long-lasting insensate extremity as a major source of dissatisfaction after regional anaesthesia. Similar concerns were also described in older literature, where patients appreciated pain relief but disliked prolonged functional limitation if this had not been anticipated beforehand. These findings underline an important practical issue: prolonged numbness may be welcomed as analgesia by some patients, but experienced as loss of control by others, depending largely on expectations set before surgery.

Sedation did not emerge as a strong independent predictor in our study, despite being frequently used when clinically indicated. This is an interesting contrast to Gori et al., who suggested that the combination of adequate sedation and correct anaesthetic technique may improve acceptance of regional anaesthesia. However, later work has shown that sedation alone may not reduce anxiety or pain effectively unless it is aligned with patient preference and procedural context. Our data support that more nuanced interpretation: sedation may help, but it is not a substitute for counselling, atraumatic technique, and block reliability. In other words, sedation appears to be a supportive measure rather than the principal determinant of satisfaction.

Previous positive experience with anaesthesia also mattered in our study, with a significant association between prior positive regional anaesthesia and current satisfaction. This is consistent with the broader concept that earlier experience shapes expectations, confidence, and willingness to accept the same technique again. Jjala et al. reported that patient perceptions of regional anaesthesia are influenced by recent anaesthesia experience and

perioperative concerns, while Capuzzo et al. found that satisfaction is predictive of future acceptance and shaped by multiple perioperative factors rather than demographic variables alone. Our findings fit well within that framework, suggesting that a favorable prior encounter with regional anaesthesia can build trust, whereas an unpleasant experience may amplify fear and dissatisfaction.

When our findings are viewed against the comparative study by Droog et al., one key message becomes especially clear: regional anaesthesia is not automatically associated with superior satisfaction compared with general anaesthesia unless the patient experience is carefully managed. Their work showed that nearly one-third of patients receiving regional plexus anaesthesia were not fully satisfied, which is remarkably similar to the minority of not fully satisfied patients in our series. Both studies point to the same preventable causes of dissatisfaction, namely inadequate explanation, block failure, and prolonged postoperative sensory discomfort. This suggests that satisfaction in regional anaesthesia is highly modifiable, and that improvement strategies should focus on patient-centered communication and technical consistency rather than relying on the theoretical advantages of the technique alone.

Our results are also consistent with the broader evidence base summarized by Barnett et al. and Wu et al., who concluded that satisfaction measurement in anaesthesia is valuable but methodologically variable, and that robust, patient-centered instruments are needed to capture the full experience. The high overall satisfaction in our study supports the general observation that anaesthesia services often perform well from the patient perspective, but the meaningful minority of dissatisfaction highlights why simple global ratings can miss important quality gaps. This is particularly relevant in regional anaesthesia, where a technically successful block may still generate negative perceptions if pain, fear, or prolonged numbness are not addressed. For that reason, satisfaction should be treated as a multidimensional outcome rather than a single yes-or-no endpoint.

In summary, the present study shows that patient satisfaction after regional anaesthesia is driven mainly by modifiable perioperative factors, especially counselling, procedural comfort, block success, and postoperative pain control. Compared with the cited literature, our findings are highly concordant with prior studies by Gori et al. and Droog et al., and they also align with systematic reviews and pain-management guidelines emphasizing communication and recovery quality. The practical implication is straightforward: regional anaesthesia services should not focus only on block performance, but also on expectation management, gentle technique, reliable analgesia,

and postoperative follow-up. That combined approach is most likely to convert technical success into genuine patient satisfaction.

Postoperative recovery also strongly shaped satisfaction. Patients with lower pain scores and without distressing residual numbness or nausea were more likely to express willingness to choose regional anaesthesia again. This underlines that the patient judges the entire perioperative journey, not only the block insertion itself. Prolonged sensory and motor block may be interpreted either as effective analgesia or as loss of control, depending largely on whether the patient had been prepared for it in advance. Structured discharge counselling and postoperative review are therefore essential components of quality regional anaesthesia practice.

The study has limitations. It was conducted at a single center, satisfaction was measured at 24 hours only, and the sample included multiple types of regional anaesthesia and surgeries, which may introduce heterogeneity. Nonetheless, the prospective design and inclusion of real-world perioperative variables provide useful evidence for clinical quality improvement. Future studies should validate these findings in larger multicenter cohorts and examine whether standardized counselling bundles and patient education tools can measurably improve satisfaction.

Conclusion

The present prospective observational study shows that patient satisfaction with regional anaesthesia is high but not universal, and that dissatisfaction is usually related to identifiable and potentially modifiable perioperative factors. The findings demonstrate that the strongest predictors of satisfaction are adequate preoperative counselling, successful completion of surgery under the intended block, absence of pain during the block procedure, and effective postoperative pain control. These results are clinically important because all four variables can be improved through service design, training, and structured follow-up rather than through expensive technology alone.

In practical terms, this study suggests several actions for anaesthesia departments. First, a standardized counselling checklist should be used before every regional anaesthesia procedure. Second, operators should focus on minimizing procedural pain and repeated attempts through training and supervision. Third, patients at high baseline anxiety should be recognized early and offered reassurance and tailored sedation when appropriate. Fourth, all patients should receive a clear postoperative analgesia plan and instructions regarding expected return of sensation and movement. Such measures are in line with contemporary pain-management

guidance, which emphasizes individualized perioperative planning and multimodal analgesia.

In summary, satisfaction under regional anaesthesia is best understood as a multidimensional outcome integrating expectation, comfort, technical success, and recovery quality. A good block alone is not enough; a good patient experience requires good communication, atraumatic technique, reliable analgesia, and attentive postoperative care. Regional anaesthesia services that systematically address these domains are likely to achieve greater patient acceptance, improved willingness for repeat procedures, and better overall quality of perioperative care.

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