Falls From the O.R. or Procedure Table

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Patient safety secured by constant vigilance remains a primary responsibility of every anesthesia professional. Although significant attention has been focused on patient falls occurring before and after surgery, a potentially catastrophic complication is when patients fall off an operating room or procedure table during anesthesia care. Because such events are (fortunately) uncommon, and because very little information is published in our literature, we queried 2 independent closed claims databases (the American Society of Anesthesiologists Closed Claims Project and the secure records of a private, anesthesia specialty-specific liability insurer) for information. We acquired documentation of patient events where a fall occurred during anesthesia care, noting the surrounding conditions of the provider, the patient, and the environment at the time of the event. We identified 21 claims (1.2% of cases) from the American Society of Anesthesiologists Closed Claims Project, while information from a private liability insurer identified falls in only 0.07% of cases. The percentage of these patients under general, regional, or monitored anesthesia care anesthesia was 71.5%, 19.5%, and 9.5%, respectively. To educate personnel about these uncommon events, we summarized this cohort with illustrative examples in a series of mini-case reports, noting that both inpatients and outpatients undergoing a broad array of procedures with various anesthetic techniques within and outside operating rooms may be vulnerable to patient falls. Based on detailed reports, we created 2 supplementary videos to further illuminate some of the unique mechanisms by which these events and their resulting injuries occur. When such information was available, we also noted the associated liability costs of defending and settling malpractice claims associated with these events. Our goal is to inform anesthesia and perioperative personnel about the common patient, provider, and environmental risk factors that appear to contribute to these mishaps, and suggest key strategies to mitigate the risks. (Anesth Analg 2017;XXX:00–00)

This special article seeks to enlighten anesthesia providers that both inpatients and outpatients undergoing a broad array of procedures with various anesthetic techniques within and outside the operating theater are vulnerable to the rare but potentially devastating consequences of patient falls. Although recent publications provide an excellent review of risk factors associated with patient falls in the pre- and postoperative periods, our report is unique because it focuses exclusively on falls occurring in the O.R. or procedural area during anesthesia care. We illustrate these intraoperative events with several case summaries describing patient falls while receiving a host of different modes of anesthesia. Moreover, we provide 2 supplementary videos to illustrate the mechanism and rapidity with which these events can occur. Therefore, our objective was to collate factors that appear to contribute to these intraoperative mishaps, and suggest key strategies anesthesiologists might invoke to mitigate the risks. A secondary aim was to examine the medicolegal facts from both the ASA Closed Claims database as well as those of a private anesthesiology liability insurer, and highlight some of the liability and legal costs associated with these events with the perspective of an attorney experienced in the field.

METHODS

In response to our request, the Anesthesia Closed Claims Project (CCP) database was searched for claims associated with falls from the O.R. or procedure table. A search of the current 10,546 cases in the American Society of Anesthesiologists Closed Claims Project (ASA CCP) database was truncated to include only events associated with surgical anesthesia or pain medicine, and those that occurred in the year 2000 or later. It is the standard practice
of ASA CCP data query service to restrict analyses to the year 2000 and later to reflect current standards, guidelines, equipment, and technology of modern practice. This search resulted in 1717 claims meeting our inclusion criteria. Two of the identified claims (for spine surgery leading to patient falls) were published previously and were also extracted for our analysis. The text of this material was submitted for prepublication review and approved by the ASA CCP Committee.

Similar to the review of the ASA Closed Claims database, Preferred Physicians Medical (PPM) reviewed and identified all claims or litigation involving patient falls from O.R. or procedure tables from the inception of the company in 1987. PPM is based in Overland Park, Kansas and is the only specialty-specific, anesthesia-focused medical professional liability insurer in the nation. Their database contains 13,427 adverse outcome reports and identified 121 falls. The ASA claims were examined to remove any duplicates submitted by PPM.

Recognizing the low incidence of patient fall events in the O.R., we conducted a focused literature search to collate previously published reports on this topic. We used the following search terms to query both PubMed (PubMed.gov) and GoogleScholar (scholar.google.com):

- patient falls from O.R. table
- falls from O.R. table
- patient falls off procedure tables
- patient injuries due to O.R. table

Last, 2 supplementary videos were created with the expertise of Mayo Clinic-based professional animators, using 3DS Max by Autodesk software (San Rafael, CA). These videos faithfully reproduce the patient circumstances, timeline, and sequence of events based on an analysis obtained from malpractice insurance experts as well as sworn court depositions.

Examples

Case 1—Monitored Anesthesia Care. A 77-year-old woman underwent kyphoplasty in the radiology procedure room under monitored anesthesia care. At the end of the case, the anesthesiologist stated the orderlies/technicians removed the patient’s restraints before they left the room as the anesthesiologist was standing several feet away from the patient. While the patient was in the prone position, she lifted herself up and fell off the radiology table hitting the floor. The anesthesiologist attended to the patient immediately. Her vital signs were stable, but she sustained a laceration to the back of her head. A full-body computerized tomography (CT) scan was negative. The lawsuit was settled for $30,000 indemnity insurance coverage and $21,000 for costs of investigating, including legal loss adjustment expenses (LAE).

Case 2—Regional Anesthesia. A 79-year-old man presented for elective transurethral resection of the prostate. Spinal anesthesia was planned due to his history of previous coronary artery bypass surgery, myocardial infarction, and chronic congestive heart failure with peripheral edema. The patient was brought to O.R. and standard ASA monitors were applied. After administration of 2 mg intravenous midazolam, the patient was placed in a sitting position for spinal anesthesia. The skin over his lumbar back was prepared while the nurse stood in front of and supported the patient for the subarachnoid injection. The anesthesiologist turned to mix the spinal medications, during which time the patient fell forward hitting the floor. The nurse had turned away “just for a moment to check the cystoscopy table.” The patient did not lose consciousness but stated his neck hurt. A C-collar was placed and the patient was taken to the emergency department. X-rays showed a cervical spine fracture of the anterior-inferior C2 body. CT scan of head was normal. Patient also complained of a sore thumb and hand, but there was no evidence of significant skeletal or soft tissue injury. Neurosurgical evaluation determined no immediate surgery was necessary and the patient was stabilized in a C-collar for 6 weeks. A claim was settled for $5,000 indemnity loss.

Case 3—Failed Regional Block, Conversion to General Anesthesia. A 50-year-old morbidly obese woman presented for left shoulder surgery. Following a failed interscalene block, the anesthesiologist decided to convert to general anesthesia with placement of a laryngeal mask airway. The initial administration of 200 mg of intravenous propofol proved inadequate, so the anesthesiologist turned to obtain another syringe of induction medication. While turned away from the patient for a moment, there was a loud thud noise. When the anesthesiologist spun back around, the patient was lying on the floor. Immediate medical care ensured adequate ventilation while a quick physical examination revealed no obvious skeletal injuries to the patient. However, in the weeks following the surgery, the patient complained of pain in her left elbow, left hip, and neck as well as her right shoulder. A lawsuit was settled for $70,000 and $19,500 LAE.

Case 4—Emergence From General Anesthesia. A 40-year-old woman underwent a laparoscopic salpingo-oophorectomy and enterolysis with general anesthesia. The procedure and anesthetic were uneventful. Shortly after the patient was extubated, she rolled onto her right side, fell off the operating table, and landed on her buttocks. The anesthesiologist’s recollection was that the circulating nurse was standing beside the table at the time, but her back was turned to the patient. As the patient began to fall, the nurse turned around but was unable to prevent the patient’s fall to the floor. Soon after this event, the patient was noted to be awake, cooperative, and following commands. The immediate evaluation in the O.R. showed no apparent injury and the patient had no immediate complaints of pain. She was ultimately transferred to the postanesthesia care unit awake and in stable condition. A malpractice lawsuit is still pending. LAE thus far is $20,000.

Case 5—Patient Transfer to a Gurney Without Locking the Wheels. A 68-year-old man presented for colectomy with general anesthesia. Surgery and anesthesia were completed without complication. As the patient was being moved from the O.R. table, the gurney moved and the patient fell to the floor. The wheels on the gurney were not locked. The patient...
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claimed permanent shoulder injury. The lawsuit settled for $5,000 indemnity and $89,000 LAE.

Case 6—Fatal Fall From the O.R. Table. A 61-year-old morbidly obese man suffered a major stroke and required a series of neurosurgical interventions during prolonged hospital convalescence. The patient was sedated and positioned on his side for replacement of a lumbar drain while in the O.R. At some point, the patient safety strap(s) holding the man to the surgical table failed, allowing him to roll off the table and strike his head on the floor. The area of greatest impact involved the same site as a recent craniotomy (part of his earlier treatment of the stroke). Despite all efforts, the patient died 5 weeks after this event." A lawsuit alleged that the O.R. fall caused "substantial additional injuries" to the patient. A significant, sealed out-of-court settlement was reached.

Case 7—Permanent Paralysis After Fall From the O.R. Table. A 60-year-old obese man suffered a C1-2 dislocation, quadriplegia, and permanent ventilator dependency after slipping off the cephalad end of an O.R. table while positioned in steep Trendelenburg in preparation for a robotic prostatectomy. The patient had been anesthetized and intubated and was awaiting bladder catheterization after induction of general anesthesia. He was not strapped or otherwise restrained on the O.R. table while placed in steep head-down position. Two years after the injury, the patient remains ventilated and lives in a medical-assisted living center. A malpractice lawsuit included the hospital, O.R. staff, and anesthesia personnel (Supplemental Digital Content 1, Video 1, http://links.lww.com/AA/B763).

Case 8—Fatal Fall From the O.R. Table. A 60-year-old obese man suffered a severe head injury and intracerebral bleeding after somersaulting feet-over-head off the cephalad end of the O.R. table while positioned in steep Trendelenburg position in preparation for a robotic prostatectomy. The patient had been anesthetized and intubated but was not yet prepared or draped for the procedure. He was not strapped or otherwise restrained on the O.R. table before being placed into steep Trendelenburg. Given the severe intracerebral bleeding, no surgical intervention was undertaken. The patient died 2 days later secondary to markedly elevated cerebral pressure (Supplemental Digital Content 2, Video 2, http://links.lww.com/AA/B764).

Lessons From the ASA Closed Claims Database
We identified 21 claims (1.2% of cases in the CCP database) in which a patient fell from an O.R. or procedure table. Three of these claims were categorized as pain medicine claims; the remainder of the claims were categorized as surgical anesthesia claims.

Most patients (15 of the 21 claims, 71.5%) received general anesthesia, although 4 (19%) received regional anesthesia and 2 (9.5%) received monitored anesthesia care. These patient falls were associated with the full range of operative procedures including orthopedics, simple biopsies, general surgery, endoscopy, and pain medicine procedures. Falls were equally likely for both inpatients and outpatients, and the fall events occurred in hospitals, ambulatory surgery centers, non-O.R. locations, and office-based anesthesia locations. Clearly, patient falls occur at virtually all anesthetizing locations regardless of the facility, setting, or provider.

Most falls resulted in temporary nondisabling injury. However, 2 (9.5%) of these 21 patients sustained permanent severe injury as a result of their falls. One patient with permanent disabling injury fell during trigger point injections under propofol sedation. As the anesthesiologist turned away from the patient to pick up a syringe, the patient twisted and assistants were unable to prevent the patient from falling to the floor. The patient did not lose consciousness but sustained a head injury. She had complaints of postconcussive nausea and cognitive issues, new tingling and numbness in the lower extremities, and visual field complaints, all corroborated by other physicians. She was ultimately diagnosed with a cranial nerve 7 injury. This incident was classified as a pain medicine claim as the fall occurred in association with the trigger point injections. A lawsuit was settled for $187,500.

The second severe injury resulted when an elderly woman moved on emergence after having kyphoplasty under general anesthesia. The anesthesiologist was not at the bedside when the patient fell to the floor. She sustained a severe head injury with bilateral frontal lobe contusions and a subdural hematoma. Surgery was performed to relieve the subdural hematoma; however, the patient experienced ongoing cognitive and memory impairment. Her injury was considered permanent and extremely disabling, requiring ongoing care. This claim was classified as surgical anesthesia (the fall occurred during general anesthesia to facilitate the kyphoplasty by another physician). A lawsuit was settled for $368,500.

Among the 21 patient falls since 2000, nearly half (n = 10, 48%) resulted in payment to the plaintiff. Payments (adjusted to 2015 dollar amounts) ranged from $18,000 to $925,000, with a median payment of $49,000. The dollar figures in the ASA database do not include legal fees or other costs of defense investigations.

Claims With a Private Anesthesiology Specialty-Specific Malpractice Insurer
The PPM data summarize 13,427 adverse outcome reports, with 121 total falls (0.9%). Thirty-three of these falls resulted in actual claims or litigation against anesthesia providers. Total loss payouts (indemnity) associated with all falls has been $320,000, with an additional $215,500 in LAE—cost of investigating and adjusting losses, including legal expenses. Average payouts were $9697 in indemnity and $6530 in LAE. Notably, of the 33 fall claims against anesthesia providers, only 10 specifically involved falls from O.R. or procedure tables (0.07% of all adverse reports). We were able to determine that of the 10 PPM cases involving intraoperative O.R. falls, 8 cases were against the anesthesiologist and 2 cases were against Certified Registered Nurse Anesthetists.

Legal Considerations (A US Perspective)
Patient falls from O.R. and procedure tables are universally considered preventable adverse events. As noted in the case reports, patient injuries from such falls can be catastrophic including brain damage, paralysis, and even
death. However, the laws covering negligence, civil torts, and medical malpractice are unique in each country (and to some extent even from state-to-state), so the comments here are specific to general principles applicable to most areas and territories of the United States only.

The ability to successfully defend litigation involving patient falls from O.R. tables is extremely challenging for a number of reasons. Plaintiff attorneys typically argue that preventing patient falls is a “shared responsibility” and every member of the perioperative care team has a duty to prevent these devastating and life-threatening complications. A review of PPM’s cases revealed the most common allegation against the anesthesia provider was that as part of the surgical team, they had a shared duty to ensure that patients were properly positioned and did not fall. Litigation involving patient injuries from falls also allows plaintiff attorneys to argue “res ipsa loquitur” (Latin for “the thing speaks for itself”), which is the legal doctrine that infers negligence from the very nature of the injury and allows plaintiffs to meet their burden of proof without the need for expert testimony. Under the theory of res ipsa loquitur, all those involved with the surgery are liable for the alleged negligence. In most cases, jurors simply will not accept that these types of accidents and resulting injuries occur absent someone’s negligence.

Understanding these defense challenges, plaintiff attorneys typically evaluate these cases as having significant settlement value, even when the injuries may seem insignificant. Given the uncertainty of allowing a jury to calculate the amount of damages to be awarded to a patient who is injured from an arguably preventable fall, most anesthesia providers and their professional liability carriers settle these cases rather than defend them at trial. Other legal consequences of these settlements may include the following:

- National Practitioner Data Bank reporting
- State medical licensing board investigations and sanctions including fines, published reprimands, and mandatory continuing medical education and additional training
- Centers for Medicare and Medicaid Services and third-party payer investigations and disciplinary actions
- Suspension and nonrenewal of privileges at practice facilities
- Significant negative media coverage

Causes of Patient Falls: Tables, Patients, and Provider Contributions

O.R. Tables. Over the past few decades, O.R. tables have evolved concurrent with the rapid transition to minimally invasive surgery. Most notably, the design, materials, and particularly the electronic controls of modern O.R. tables have extended the speed and range of positioning options such as steep Trendelenburg (25°) and lateral tilt (18°) (Table 1). Indeed, O.R. tables today have greater freedom and extremes of positioning specifically because surgical procedures—especially robotic and minimally invasive surgery—have driven development. Falling from the O.R. table may be just one more unintended consequence of the move to minimally invasive and robotic surgery—a complication first noted over 25 years ago. In addition, some specialized tables, such as the Jackson O.R. table, offer unique attributes in which a patient can be rotated along their long axis from supine to prone to supine “rotissiere-style” (Table 2). Although maneuvering of these unique tables through their extremes of positioning is surgically advantageous, it comes with the cost of more complex controls and required knowledge for positioning. Clearly, operator uncertainty or confusion may occur. Devastating consequences have happened—including patient falls. In contrast to the changes in O.R. table materials and controls, the physical dimensions of O.R. tables have changed little. Most notably, the width of the table surface remains 20 inches. Documents from 90 years ago highlight that O.R. tables from the 1920s had dimensions of 72 × 20 inches—the same as most standard O.R. tables used today (Tables 1 and 2).

Patient Demographics. Although O.R. table size has remained the same, the average patient has not. Since the late 19th century, improved nutrition in industrialized
countries has increased the mean height for males by approximately 3 inches. The average man in the United States is now 5-feet 10-inches tall (1.78 m), and the average woman is 5-feet 4-inches (1.62 m).

Even more dramatic is the increase in obesity rates in the US population. The average man and woman in the United States now weighs 172 pounds (78 kg) and 166 pounds (75 kg), respectively. But more alarming is that nearly 38% of adults are obese (body mass index > 30) and a disturbing 8% of adults are extremely obese (body mass index ≥ 40) (National Health and Nutrition Examination Survey, 2013–2014 data). Obesity rates are also higher among women (40.4%) compared to men (35.0%). Extremes of habitus can be reasonably considered as one of those patient attributes that increase the risk of falls, primarily because sudden and unexpected movements are difficult to stop once initiated. These movements are often associated with altered consciousness, whether related to sedation or during periods of induction or emergence from anesthesia.

In addition, obesity may result in maldistribution of weight across O.R. tables. Videos 1 and 2 illustrate the problems associated with maldistribution of weight when O.R. tables do not have their support columns in their centers. While most O.R. tables have central support columns, some do not, especially if they are designed for special purposes (eg, to accommodate fluoroscopy equipment). These tables may have exceptional moment arms. If too much weight is added to the longer of the 2 moment arms, it can result in tipping actions. Last, obesity may also reduce the margins of safety for sitting, lateral, and nonsupine positions because the width of O.R. tables have not adapted over the years for the increased size and weight of our patients.

Provider Elements. Our review of these closed claims notes that many falls appear to occur when personnel are distracted from observing patients, especially during periods when patients are either sedated or awakening from general anesthesia and potentially confused or agitated. Production pressures (eg, preparing for the next patient); diversion of attention by extraneous noises, alarms, and conversations; and failure to assure team coordination of responsibility for observing patients (ie, proactive determination of who is responsible for observing the patient) are all recurring factors that lead to adverse events. Table 3 summarizes the table, patient, and provider contributions to patient falls.

What Can Be Done to Minimize the Risk? The Role of the Anesthesiologist

Clearly, anesthesiologists share a duty to keep patients safe during surgery and related invasive procedures. Indeed, plaintiff attorneys frequently argue that a patient falling from the O.R. table is negligence that “speaks for itself,” and preventing patient falls is a shared responsibility among every member of the perioperative care team. Thus, anesthesiologists—as patient safety advocates—can help focus team attention on the 3 primary contributors identified earlier (Table 3) to minimize the risks. First, anesthesia providers should be generally familiar with the controls, operations, and the safe weight limits of all O.R. tables used in their facility or have ready access to such information and knowledgeable personnel. O.R. directors should make this information readily available to all O.R. personnel. Moreover, the upper weight limits can vary greatly depending on the type and model of table as well as its actual orientation (normal or reversed) or the anticipated need for side tilt. These elements become even more critical when specialty tables are being utilized, or even when routine surgical tables are used in nonstandard orientation or extremes of positioning are anticipated. The anesthesiologist as a safety advocate should ensure that the appropriate table is used for each operation and each patient. In addition, anesthesiologists must help ensure that each patient is secured throughout all table movements, and that the table will not exceed limits that make it vulnerable to tipping. Table tipping is an important recognized risk that puts both patients and providers in jeopardy.

Of course, these table factors are amplified when dealing with patients of extreme habitus where anesthesiologists should assume obesity increases the risk of falls. Morbid obesity, in particular, may result in maldistribution of weight across O.R. tables. Thus, the anesthesiologist should help coordinate all patient movements because sudden and unexpected transfers of obese patients may be difficult to safely stop once initiated. With the rising prevalence of morbid obesity, it is increasingly common to care for patients that require multiple assistants for safe and secure positioning. In addition, when securing obese patients for the operation, the anesthesia provider must anticipate the additional stresses that may be created when the table is later shifted or tilted during the operation. Thus, anesthesia providers may consider the practice advocated by some for the routine use of additional “posts” to safely secure the patient whenever tilting the O.R. table. Obesity also reduces the margins of safety for sitting, lateral, and nonsupine positions as the width of O.R. tables have not kept pace over the years for the increased size of the average patient. Clearly, our current patients are bigger, taller, heavier, and wider—providers must add another layer of vigilance commensurate with the expanding size of patients.

Table 3. Elements Potentially Contributing to Patient Falls During Anesthesia Care

<table>
<thead>
<tr>
<th>Patient attributes</th>
<th>Provider actions and inactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>Distraction</td>
</tr>
<tr>
<td>Age</td>
<td>Shifting attention from the patient to other unrelated O.R. tasks</td>
</tr>
<tr>
<td>Patient position other than supine, especially lateral positioning</td>
<td>Assumption that other providers are securing the patient</td>
</tr>
<tr>
<td>Sedated or altered consciousness</td>
<td>Vulnerability to production pressure</td>
</tr>
<tr>
<td>Agitation during induction or emergence from anesthesia</td>
<td>O.R. table factors</td>
</tr>
<tr>
<td>• New or unfamiliar O.R. table and controls</td>
<td>• Improper function or use of the locking mechanism of the Jackson spinal table (eg, OSI Model # 5943) or other mechanical table failures</td>
</tr>
<tr>
<td>• Improper position or of the locking mechanism of the Jackson spinal table</td>
<td>• Extremes of positioning (eg, side tilt, steep Trendelenburg position, and reverse Trendelenburg position)</td>
</tr>
<tr>
<td>• Absence or inadequate application or number of safety restraints/belt</td>
<td>• Absence or inadequate application or number of safety restraints/ belt</td>
</tr>
<tr>
<td>• Failure to lock wheels of either O.R. table or gurney</td>
<td>• Failure to lock wheels of either O.R. table or gurney</td>
</tr>
<tr>
<td>• Table tipping</td>
<td>• Table tipping</td>
</tr>
</tbody>
</table>

Abbreviation: O.R., operation room.
Last, vigilance of anesthesia providers and other O.R. staff is crucial to avoiding O.R. table falls, especially during periods of altered consciousness whether related to sedation or during periods of induction of or emergence from anesthesia. Many falls appear to occur when personnel are distracted from observing patients, especially during periods when patients are either sedated or awakening from general anesthetics and potentially confused or agitated. Production pressures (eg, preparing for the next patient); diversion of attention by extraneous noises, alarms, and conversations; and failure to assure team coordination of responsibility for observing patients (ie, proactive determination of who is responsible for observing the patient) are all potential issues that can contribute to inadequate vigilance against falls. The entire O.R. team needs to proactively discuss patient observation responsibilities for all phases of the intraoperative and near-perioperative period and consider key periods of special concern such as induction and emergence from anesthesia and periods of sedation during which patients are not yet positioned for their procedures and restrained in those positions. Anesthesiologists and other team members should understand their specific roles during these vulnerable periods. Indeed, hospitals and other health care facilities should have O.R. patient safety policies and protocols to educate all members of the perioperative care team about the prevention of patient falls.

CONCLUSIONS

A host of potential perioperative injuries are known to anesthesia providers caring for patients in the operating theater, but providers, administrators, families, and most certainly patients trust they will never be subject to injuries secondary to actually falling off an O.R. or procedure table. Although actual falls are fortunately infrequent, our collective experience suggests that anesthesia professionals must add this potential complication to the list of “never events” while caring for patients in the perioperative setting. Our anecdotal discussion of this topic suggests that for every one documented fall event that makes it way to a settled malpractice claim, there are many near misses.

Moreover, key factors are converging that may increase the risks of patient falls in modern perioperative anesthesia practice:

1. Taller, wider, and more obese patients
2. Installation of ever more sophisticated and modern O.R. tables that nonetheless remain the same width (20 inches) as those designed to fit the US population of a century ago. These tables are capable of very quickly placing patients in more extreme positions (eg, side tilt, Trendelenburg, and reverse Trendelenburg) than that which was available in earlier models of these tables
3. On-going (even increasing) distractions and production pressures that envelope anesthesia providers and nursing staff in most surgical and interventional sites today

Thus, anesthesia providers need to remain vigilant to the infrequent but potentially devastating complication of patients falling from an O.R. table. Each member of the surgical care team has responsibility to minimize or eliminate the risk of patient injuries from falls.

DISCLOSURES

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