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Patient Safety Tip of the Week

December 3, 2019

Overlapping Surgery Back in the News

We've long been critical of overlapping surgery. It's now been over 4 years since the Boston Globe's Spotlight investigative series (Abelson 2015) ignited the controversy on double-booked surgery and led to a subsequent review by the Senate Finance Committee (Senate Finance Committee 2016). It didn't take long for everyone to agree that concurrent surgery (where critical parts of two surgeries might be taking place simultaneously) should be banned but we've been left with the debate about "overlapping" surgery.

Over subsequent years there have been multiple retrospective cohort studies purporting to demonstrate the safety of overlapping surgery and very few noting an increased risk of complications with overlapping surgery. So, the debate has largely stayed out of the media. That is, until the last few weeks. Once again, the Boston Globe Spotlight team brought renewed attention to the issue with 3 new stories.

In the first (Saltzman 2019a), it was revealed that the Massachusetts General Hospital paid a settlement of $13 million for wrongful termination to the surgeon who was dismissed from the MGH who had been critical of the practice of double-booked surgery. The settlement included offering that surgeon his old job back at the MGH (which he has declined) and naming a patient safety initiative for him.

A day later, it was revealed that a second major hospital chain agreed to a multi-million dollar settlement to resolve concerns over concurrent surgery (Saltzman 2019b). The claim was paid in part to three whistle-blowers who claimed that a urologist allowed trainees to perform surgery without proper supervision while he operated on patients in another room. And part was paid to the federal government because the hospital system had billed Medicare for operations performed by the trainees. And yet another malpractice settlement was announced recently against a surgeon who did as many as 14 operations a day, sometimes 3 at one time (Taylor 2019, Mulder 2019).

The third Boston Globe story (Saltzman 2019c) cited materials from the court file of the recently settled wrongful termination lawsuit against MGH. You'll recall that, after the first Spotlight report, the MGH responded with a fact sheet and multiple posts on its website. It noted that it had done a review of concomitant surgery cases done in calendar

year 2014 and found that the rate of complications was no higher than for cases of single (non-overlapping) surgery. The MGH did revise its policy and procedure on concomitant surgery in 2012. But the materials from the recent wrongful termination suit do appear to identify several cases in which complications happened while primary surgeons were off in different OR's. See that last Boston Globe article for details. The Globe had also reported earlier in 2019 (Saltzman 2019d) on a settlement in a malpractice made by former major league baseball pitcher, Bobby Jenks, regarding complications of spine surgery in which had had not been told his surgeon was overseeing a second simultaneous operation.

The Seattle Times has done a series of articles on overlapping surgery at Seattle's Swedish Cherry Hill Hospital. The initial article described a case in which a young woman with Ehlers-Danlos Syndrome died from post-operative complications of spine surgery (Baker 2017a). The primary problems described centered more around lack of physical presence of the primary surgeon post-operatively and failure to rescue. But subsequent articles focused on the practice of double-booked surgeries. In one article (Baker 2017b), the newspaper interviewed 13 patients who were treated in double-booked procedures and found that none recalled being told the surgeon would not be in the room for the entire procedure. The Times reported some detailed time schedules showing 4 surgeons routinely participating in overlapping in 50-70+ percent of their cases and showed that some cases had significant overlapping. Following the series of articles, the hospital CEO and a top neurosurgeon resigned, and the hospital revised its policy on overlapping surgery.

Pennsylvania Patient Safety Authority analysts queried the Pennsylvania Patient Safety Reporting System (PA-PSRS) database for events involving concurrent and overlapping surgery and procedures in hospitals and ambulatory surgical facilities that occurred during calendar year 2017 (PPSA 2019). They identified 15 events in which the narrative or recommendations indicated that the surgeon was operating in more than one room at the same time (i.e., overlapping); for example, the attending surgeon started the second case while the resident was closing the first case. Eleven of these events indicated that the overlap contributed to the reason for which the event was reported; for example, the overlap contributed to a delay in starting the next case. None of the 15 events resulted in patient harm.

In our March 12, 2019 Patient Safety Tip of the Week "Update on Overlapping Surgery" we discussed multiple large retrospective studies (Sun 2019, Ponce 2018, Hyder 2018, Goldfarb 2018, Dy 2018) that were supportive of overlapping surgery, noting that overall complication rates or mortality rates were as good or better than those from non-overlapping cases.

Since that last column on overlapping surgery, there have been several more studies published in the medical literature touting the safety of overlapping surgery. Howard and colleagues (Howard 2018) did a retrospective cohort study of patients who underwent neurosurgical procedures at Emory University Hospital over a 2 year period. A total of 2275 patients underwent neurosurgery, 42.7% were nonoverlapping and 57.3% were

overlapping. Overlapping surgery (OS) was more frequently elective. Regression analysis failed to demonstrate an association between OS and complications, As we've seen in almost all prior studies, median surgical times were significantly longer for patients in the OS cohort vs the nonoverlapping surgery cohort (in-room time, 219 vs 188 minutes; skin-to-skin time, 141 vs 113 minutes). The authors conclude their data suggest that OS can be safely performed if appropriate precautions and patient selection are followed.

Another study on 1018 neurosurgical and spine patients found no significant difference in overall or serious complications between those having overlapping surgery and those having non-overlapping surgery (Guan 2016). Another study (DiGiorgio 2018) compared before and after results when the neurosurgery service at an academic, safety-net hospital transitioned from routinely allowing one room per day (period one) to overlapping rooms (period two), with the second room being staffed by the same attending surgeon. Allowing overlapping rooms significantly reduced length of stay and complication rate and increased the rate of discharges to home in a population significantly weighted toward uninsured and Medicaid patients.

While most studies on overlapping surgery have looked at orthopedic, spine, or neurosurgical procedures, a recent study analyzed patients undergoing plastic surgery. Parikh et al. (Parikh 2019) did a retrospective cohort study of 866 consecutive patients undergoing plastic surgery procedures (35.9% overlapping, 64.1% non-overlapping) at a tertiary academic center over a 2 year period. They found no differences in complications, reoperations, readmissions, or emergency room visits between the 2 groups.

So, how do we reconcile all these studies showing that overlapping surgery seems to be safe and not associated with more complications with those isolated or anecdotal reports of complications that appear to be related to the practice? The answer is clear to us: **statistical dilution**.

We think the recent disclosures about the MGH experience hit home on a point we have made over and over. The MGH review of concomitant surgery cases done in calendar year 2014 probably really did show that the rate of complications was no higher than for cases of single (non-overlapping) surgery. Yet, the recent revelations appear to show that there were complications. Complications, particularly ones with serious patient consequences, are **not** common events. So, when anyone reports on a large series of overlapping surgery, the serious events are likely to get "buried" or "**diluted out**". In fact, the bigger the series, the less likely we are to identify cases in which the overlap contributed to an adverse outcome. Given that a randomized controlled trial is not likely to ever take place, the only real way to determine whether overlapping surgery caused or contributed to such events is to perform root cause analysis of all cases with adverse events, a time- and resource-intensive process.

There is a second problem with those retrospective reviews: even in those studies that used propensity score adjustments to minimize bias, there is likely an element of **selection bias**. There is really no way from administrative data or even chart review to

fully understand why non-overlapping surgery was chosen over overlapping surgery or vice versa. It is quite likely that surgeons may avoid overlapping surgery in patients they consider to be at more risk. Note that the subgroup analysis in the Sun study (Sun 2019) did indicate that complications may be more common with overlapping surgery in more complex cases. So, when we see a retrospective cohort study that says patients undergoing overlapping surgery do better than those with non-overlapping surgery, we are not at all surprised. If they are less at risk, they should have fewer complications. And, in our March 12, 2019 Patient Safety Tip of the Week "Update on Overlapping Surgery" we also speculated there might be an element of **publication bias** as well.

Those of us involved in patient safety have all seen instances in which overlapping surgery was a contributing factor to or root cause of an adverse event. And just because the population-based studies seem to show a relative safety of overlapping surgery, it does not mean we don't need to pay attention to the dangers. Wrong-site surgery and retained surgical items are also relatively rare events. Yet we strive to prevent all such cases of those. Why should events related to overlapping surgery be treated differently?

Our December 19, 2017 Patient Safety Tip of the Week "More on Overlapping Surgery" had our detailed comments on the following considerations for overlapping surgery:

- The "Critical Part of the Surgery"
- Timeouts
- Post-Procedure Debriefing
- The Pre-op "Huddle"
- Duration of surgery
- Other Infection Control Issues
- Definition of "Immediately Available"
- Multitasking
- The educational/training mandate
- The Ethical Issue(s)
- Who Should Be Allowed to Perform Overlapping Surgery?
- Monitoring Overlapping Surgery

We hope you'll go back to that column (and all our columns listed below) to see our arguments against the practice of overlapping surgery. However, even though we personally would not consent to undergo overlapping surgery, we are pragmatic and understand the practice is not likely to go away any time soon. Therefore, we developed our "Overlapping Surgery Checklist" to help guide you in planning for safe implementation.

AORN (Association of periOperative Registered Nurses) also recently noted 3 tips from Pat Turner, RN, BSN, MPA on patient safety actions nurses can take in relation to overlapping surgery (AORN 2019):

- **Plan ahead for room set-up duration** (coordinate timing for room set-up depending on the procedure, for example be mindful not to start the second room too early)

- **Coordinate timing with surgeons** (pre-planning for surgeries, such as during the **preoperative huddle** can be very beneficial in understanding patient nuances and surgeon scheduling that may impact the sequence and timing of surgical patients).. Amd "be in communication with surgeons during the case to plan ahead for any unexpected delays with the first patient that could impact timing for preparing the second patient for surgery."
- **Raise concerns up the chain of command** ("Advocate for your patients first and raise the red flag if you are concerned.")

See our previous columns on double-booked, concurrent, or overlapping surgery:

- November 10, 2015 "Weighing in on Double-Booked Surgery"
- November 29, 2016 "Doubling Down on Double-Booked Surgery"
- December 13, 2016 "More on Double-Booked Surgery"
- May 2017 "The Concurrent Surgery Debate Continues"
- December 19, 2017 "More on Overlapping Surgery"
- March 12, 2019 "Update on Overlapping Surgery"

And our "Overlapping Surgery Checklist"

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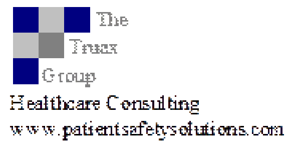

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