

Anesthesia Update: Separating Fact from Fear

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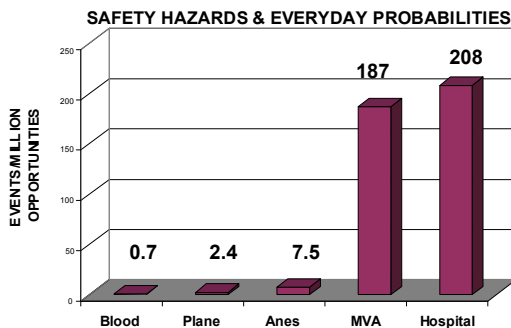
INTRODUCTION:

This talk will briefly review the process of anesthesia care, current anesthesia practice, and how these might relate to post-polio syndrome (PPS) patients having surgery. The goal is to make clear that proper preop planning allows post-polio patients to have surgery and anesthesia with a minimum of risk. Indeed, the risk of anesthesia is much, much less than the risk of death from an error while hospitalized. It also emphasizes that it is not necessary for post-polio patients to keep up with drugs and practices in anesthesia. Anesthesia, like every medical specialty, is rapidly changing, as legions of dedicated researchers and clinicians work to make what we do more effective and safer. It is extremely difficult for anesthesiologists to keep up with all the new drugs and practices; patients can not possibly keep up.

This talk will NOT address pain management, except pain immediately postop. Research has—and is still—finding numerous, complex mechanisms that cause pain, and pain treatment is becoming more and more complicated. Continuing research on pain mechanisms will probably lead to better therapies for PPS patients with pain problems.

THE RISK OF ANESTHESIA:

What is the risk for anyone having anesthesia, and how does this compare it to other risks in our daily lives? The government's Agency for Healthcare Research and Quality looked at this in 2002.



AHRQ data, 2002

(Source: www.webmm.ahrq.gov/dykarchivecase.aspx?dykID=1)

DEFINITIONS:

- **BLOOD:** Getting HIV from transfusion of a single unit of blood
- **PLANE:** Annual number of passenger deaths/number US commercial flights, 1992-2002
- **ANES:** 2002 estimate of mortality from anesthesia
- **MVA:** Deaths/number registered drivers
- **HOSPITAL:** Estimate preventable deaths hospitalized patients/number of hospitalizations

It should be clear where the real risk is: just being in the hospital! The risk of dying from anesthesia is much, much smaller. The focus for worry should move from anesthesia to being hospitalized. Fortunately, a nation-wide effort to improve hospital safety is developing, but safety still varies markedly by individual hospital.

ANESTHESIA RISKS FOR PPS PATIENTS:

What do we know about how PPS patients do during anesthesia? Very little! Medical knowledge like this can be measured by looking at the number and type of medical journal publications over time, something easily done on the National Library of Medicine's PubMed data base. (This lists all articles in standard medical journals over time.) Searching for "post-polio syndrome AND anesthesia," 11 articles were found. The first was in 1990. Ten more articles were published in the next 12 years,. Not all were significant/focused only on PPS. There were 3 case reports, 3 letters-to-the-editor on the cases, 1 was a theoretical article with no cases, 1 article was on dental issues, 1 mentioned PPS as part of a larger study of a new drug and 1 was on indications for modafinil (Provigil), not about anesthesia. This is a very small amount of information, really only 8 articles.

Contrast this meager number of articles with those on PPS itself: 946 articles were published since 1990, when the first article on anesthesia was published! So researchers were focused on the bigger problem of what is PPS and what should therapy be. Additionally, few hospitals have many PPS patients coming for surgery, so a significant study of anesthesia complications would be very difficult.

Fortunately, we *will* get some real data in the next few years. The Mayo Clinic has had an electronic medical record since 1980, and it is often used to study anesthesia complications. So, I convinced my anesthesia friends there to study this. The question is, *“How many and what type of anesthesia complications occur in PPS patients having anesthesia and how does that compare to other patients with a neuromuscular disease and also how do they compare to normal patients?”*

Data gathering is finished and they are half-way thorough data analysis. They gave me permission to give you some early, preliminary results, as of March 6, 2009. The study covers 1986-2008 and includes all PPS patients having surgery (excludes sedation cases and patients less than 18 yo) . There are 779 patients, a very generous sample size, which will make their results very powerful. Data analysis is complete on the first 300/779 patients. No anesthesia complications occurred. It will take other 6-plus months to finish the data analysis, write this up and get it published, so we won't get the final results for awhile. But, I think this is a most hopeful study, and it supports my clinical impression that if a good preop evaluation is done and if surgical, anesthesia and hospital care are competent, PPS patients can have surgery without problems.

PPS patients have asked numerous questions about anesthesia since 1996, when I gave the first talk on this. Many questions have been about normal things that can happen, for example a drop in blood pressure after a spinal anesthetic was placed. This is due to the effect of the spinal anesthetic on nerves controlling blood vessels and is actually not a complication. Well-trained anesthesiologists look for these “complications” and treat them appropriately and promptly. And, some of the most significant “anesthesia complication” questions were actually about complications from surgery and had nothing to do with anesthesia. We have to use great care about what we call “anesthesia complications.”

THE PROCESS OF ANESTHESIA CARE:

Because each patient's anesthesia needs differ, and differ over time as new problems show up, this talk will focus less on specific anesthesia techniques and drugs and discuss how you can hopefully communicate with anesthesiologists about your problems. This is an area of confusion, so the usual process is reviewed here.

Most PPS patients will have surgery in a hospital or an out-patient surgery facility attached to a hospital. (PPS patients should not have anesthesia in physicians' offices, for safety reasons, and that situation will not be discussed.) The anesthesia process is essentially the same, but varies by elective and emergency surgery.

A. FOR ELECTIVE SURGERY:

- (1) The surgeon and you decide on surgery. You should state your special problems for anesthesia (sleep apnea or whatever). If you have a request for a particular anesthesiologist, tell the surgeon.
- (2) Surgeon's office calls the hospital's scheduling office and schedules time, date and the operation. The special medical problems related to anesthesia should be stated to the scheduling secretary. If there is an anesthesia request, the office secretary should give the information to the scheduling office. (Many hospitals do this process on the web now.)
- (3) Anesthesia preop evaluation varies in different institutions. Many hospitals now run a daily clinic for upcoming surgery patients. This is at the hospital; blood work, EKG and chest X-ray can be done at the same time. You receive an appointment, usually from the preop clinic's scheduling office. These clinics are often staffed by specially trained nurses, who follow protocols. Anesthesia residents are also used. An anesthesiologist is always available to the nurse/resident, who would call him/her for complicated patients. The anesthesiologist might suggest special tests or even come to the clinic to examine you. The data on each patient is recorded and reviewed at the end of the day to see if anything is missing. These

forms are passed along to the scheduled anesthesiologist, usually the night before. If there is no preop clinic, trained nurses will usually call before surgery to check on your medical history and medications. The answers to those questions are given to an anesthesiologist.

Often, you don't physically see the anesthesiologist until the day of surgery. If your problems are very difficult, for example you need assisted ventilation, appointments can be made well ahead of time for the Anesthesia Preop Clinic or to see an anesthesiologist. The surgeon's office would facilitate that. Patients with these difficult problems should get evaluations by your pulmonary and post-polio physicians before that preop clinic visit, and you should come with all those records (a pulmonary function test, at least!), so the anesthesiologist has maximum information about you. Be sure you are well-organized and precise when you speak with them ("I've had polio and need or have ---whatever."); they are usually extremely busy and pressed for time.

(4) Hospital operating rooms are chaotic and always in flux, due to emergencies incoming at all hours and also problems possibly occurring in the scheduled operations. As a result, anesthesia staffing is always in flux. The department should do their best to get you your desired staff, but there are times when it just isn't possible. In that case, all the preop information is passed along to the new physician, who should have all the needed information on you.

(5) After surgery, you should get a visit from an anesthesia person, usually a specially-trained nurse or an anesthesia resident. They should ask about your anesthesia experience and if you note any possible complications on this first postop day. Be frank in your responses. They need to know what YOU experienced. This information is typically put into a data base so the department can see how they are doing and compare themselves to national figures.

B. FOR EMERGENCY SURGERY: In a true emergency such as a car accident, there is little choice of hospital or anesthesiologist. The Emergency Room physician will assess you and decide how urgent surgery is. There may be time for your own physician to get involved. The anesthesiologist will talk with you, often in the OR.

You can help by having a MedicAlert bracelet or some other way to identify your health problems and needs. Because of the wide recognition of the MedicAlert program, that is probably the best to use. Also, your companions/spouse should be aware of your needs. Simple wallet cards can provide them with the needed information. This could save your life! It's also helpful to know which are the best hospitals in your geographic area and discuss this with your companions/spouse.

TYPES OF ANESTHESIA:

"What kind of anesthesia is best?" is the question I'm asked most often. The answer is it depends: It depends on your own health problems, including the ones from age-related diseases as well as from polio. It also depends on your wishes and your past experience with anesthesia. It depends on the operation that's planned: Some operations require certain types of anesthesia. It also depends on your surgeon: Some surgeons, for example, just can't operate under local anesthesia. Your anesthesiologist may be particularly skilled in a certain technique, so it can also depend on them.

This calls for discussion as each individual patient comes for each particular operation and at that point in time. After evaluating all these "depends" we can come up with an "Anesthesia Plan." All anesthesia plans should include something for pain relief in the postop period.

There are 3 types of anesthesia:

General anesthesia: You are completely asleep. You receive intravenous drugs and also gases to breathe, by way of a mask or breathing tube.

Regional anesthesia: Only the part of the body being operated on is anesthetized, using local anesthesia injected at the site of surgery, near a major nerve(s) to that area or around or near the spinal cord. The most common types are spinal anesthesia (local anesthesia is given into the fluid around the spinal cord)

and epidural anesthesia (local anesthesia is given in the space just before the spinal cord's covering, usually through a small catheter). Regional anesthesia is increasingly popular because pain is actually prevented.

Monitored Anesthesia Care (MAC) The surgeon injects local anesthesia at the surgical site; an anesthesiologist sedates, monitors and makes sure you are comfortable and safe.

Many operations need a certain kind of anesthesia. Common operations and the usual anesthetics are as follow:

Cholecystectomy (removal of the gall bladder, usually done laparoscopically, using a telescope-like instrument inserted into the abdomen through small incisions): Needs general anesthesia because the abdomen is very distended during the operation.

Cataract removal: MAC. The ophthalmologist/anesthesiologist does a nerve block behind the eyeball, anesthesiologist gives sedation so you hold still and are comfortable.

Carpal tunnel release: MAC, usually. Usually done with local injection by the surgeon at the wrist, with sedation added. Can be done with various nerve blocks of arm or general anesthesia.

Orthopedic operations: General/regional, depending on the operation and the surgeon.

Rectal surgery (hemorrhoidectomy, anal fistula): Regional anesthesia has many benefits and is indicated. Sedation can be added.

Urologic surgery (resect the prostate, kidney stone): Simple trans-urethral resection of prostate (TURP) is best done with regional for numerous reasons. Radical prostatectomy calls for general anesthesia because the operation is more extensive and longer. Kidney stone removals are usually done with general anesthesia due to the severe pain.

It is not unusual to combine types of anesthesia: to add sedation to regional cases (to improve patient comfort while lying on the hard OR table), or to do a regional technique and then put the patient to sleep; the regional will be in place at the end of the case to give long-term postop pain relief. Mixed techniques gets the benefits of each.

These recommendations may change in the future. Surgical techniques are changing very rapidly and will lead to less invasive surgery. You may have read about robotic surgery, currently used in prostatic, neurosurgical, cardiac and gynecology operations. You might also have learned about endoscopic surgery. There are some simple ones already, such as laparoscopic cholecystectomy. Soon, we'll have major operations on the GI tract done via an endoscope passed through the mouth—and they'll remove your stomach! Or, they will go through the rectum and remove your colon!

We can also note how anesthesia is advancing. People have very different responses to many drugs, and this can be predicted now, for some drugs, based on genetic studies. In the near future, we will be able to predict ahead of surgery, how you would respond to certain anesthesia drugs, based on your genetic profile. So, we could tailor an anesthetic to each individual patient. I hope you get the sense of how dynamic the practice of medicine is and how rapidly it's changing.

ANESTHESIA SPECIFICS FOR PPS:

In the absence of any significant published information, the following is based on my clinical experience and ideas developed after extensive study of polio and PPS. As more information becomes available, these will change. These are the recommendations on the PPHI web site (www.post-polio.org/ipn/anes.html). I reviewed them and added an additional one, #9, and a comment.

ANESTHESIA ISSUES FOR POST-POLIO PATIENTS:

1. Post-polio patients are nearly always very sensitive to sedative meds, and emergence can be prolonged. This is probably due to central neuronal changes, especially in the Reticular Activating System, from the original disease.

2. Non-depolarizing muscle relaxants cause a greater degree of block for a longer period of time in post-polio patients. The current recommendation is to start with half the usual dose of whatever you're using, adding more as needed. This is because the poliovirus actually lived at the neuromuscular junctions during the original disease, and there are extensive anatomic changes there, even in seemingly normal muscles, which make for greater sensitivity to relaxants. Also, many patients have a significant decrease in total muscle mass. Neuromuscular monitoring intraop helps prevent overdose of muscle relaxants. Overdose has been a frequent problem.

3. Succinylcholine often causes severe, generalized muscle pain postop. It's useful if this can be avoided, if possible.

4. Postop pain is often a significant issue. The anatomic changes from the original disease can affect pain pathways due to "spill-over" of the inflammatory response. Spinal cord "wind-up" of pain signals seems to occur. Proactive, multi-modal post-op pain control (local anesthesia at the incision plus PCA, etc.) helps.

5. The autonomic nervous system is often dysfunctional, again due to anatomic changes from the original disease (the inflammation and scarring in the anterior horn "spills over" to the intermediolateral column, where sympathetic nerves travel). This can cause gastro-esophageal reflux, tachyarrhythmias and, sometimes, difficulty maintaining BP when anesthetics are given.

6. Patients who use ventilators often have worsening of ventilatory function postop, and some patients who did not need ventilation have had to go onto a ventilator (including long-term use) postop. It's useful to get at least a VC preop, and full pulmonary function studies may be helpful. One group that should all have preop PFTs is those who were in iron lungs. The marker for real difficulty is thought to be a VC <1.0 liter. Such a patient needs good pulmonary preparation preop and a plan for postop ventilatory support. Another ventilation risk is obstructive sleep apnea in the postop period. Many post-polios are turning out to have significant sleep apnea due to new weakness in their upper airway muscles as they age.

*COMMENT: Postop respiratory failure in these patients can be difficult to manage. The patient's pulmonary physician could help by doing a preop evaluation and being involved in postop ventilatory management. This situation might call for the resources of an ICU in a major medical center.

7. Laryngeal and swallowing problems due to muscle weakness are being recognized more often. Many patients have at least one paralyzed cord, and several cases of bilateral cord paralysis have occurred postop, after intubation or upper extremity blocks. ENT evaluation of the upper airway in suspicious patients would be useful.

8. Positioning can be difficult due to body asymmetry. Affected limbs are osteopenic and can be easily fractured during positioning for surgery. There seems to be greater risk for peripheral nerve damage (includes brachial plexus) during long cases, probably because nerves are not normal and also because peripheral nerves may be unprotected by the usual muscle mass or tendons.

***9. NEW IDEAS/THOUGHTS:**

Spinals: Recent studies demonstrating the presence of cytokines in the CNS of PPS patients lead me to be less enthusiastic about using spinal/epidural anesthesia. There is no data on this situation, and there are so many benefits to this regional anesthesia, and they might be suitable in some situations. Lidocaine would not be a suitable drug choice for PPS patients.

Regional anesthesia: Should the peripheral nerves of PPS patients be exposed to local anesthetics, especially for long periods postop? There is no data, but many PPS patients have atrophied peripheral nerves. Perhaps smaller doses of local anesthetics and avoiding continuous postop infusions would be safer.

Above-the-clavicle blocks(supraclavicular and interscalene): These have a high risk for diaphragmatic paralysis and should probably not be used in PPS patients, unless the patient can tolerate a 30% decrease in pulmonary function.

SUMMARY:

PPS patients can have anesthesia and surgery safely, with careful preparation. Anesthesia and surgery is a process that involves anesthesia, surgery and hospital care. For an optimal outcome, ALL must be at high levels of performance and achievement! You, the patient, must work to be sure you get these. Remember, few surgeries are truly urgent and you usually have time to get data from the web, the state's hospital licensing department, the state's medical board and other resources. You should also research the operation and its consequences, to be sure you can deal with them. Don't rush into anything until you're satisfied you'll get the best. You deserve it.

HELPFUL RESOURCES:

ON ANESTHESIA:

1. Post-Polio Health International: www.post-polio.org/jpn/anes.html
2. "Post polio Syndrome and Anesthesia" by David A. Lambert, MD; Elenis Giannouli, MD; & Brian J. Schmidt, MD, The University of Manitoba, Winnipeg, Canada, in the September 2005 issue of *Anesthesiology* (Vol. 103, No. 3, pp 638-644). This article reviews polio, post polio syndrome and anesthetic considerations for this patient population.
3. To learn more about anesthesia: The American Society of Anesthesiologists' (ASA) patient education web site: www.asahq.org/patientEducation.htm. Covers many topics.

ON HOSPITALS:

1. To check out a hospital, start with the Joint Commissions (JCAHO) web site: www.jointcommission.org and click on the Quality Check mark.
2. Check the hospital's web site; many show their surgical results.

ON PHYSICIANS:

1. Check your surgeon and anesthesiologist in the state's medical licensing board web site.