CHAPTER 45.

ADVANCED ANESTHESIA SUPPORT PERSONNEL: Anesthesia Assistant, Anesthesia Technician or Anesthesia Nurse Aid

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(this is a 3 page extract of the full 7 page chapter in the printed book)

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1. INTRODUCTION

Operating surgeons need an assistant scrub nurse in sterile attire and a floor nurse outside the sterile field. Those assistants hold second devices, bring supplies, retract the tissues, and place instruments in the surgeon's hand without the surgeon looking up. Anesthesiologists, too, need helpers for parts of anesthesia care.

This book author once worked for 12 years in private practice anesthesia in South Africa, performing solo anesthesia for major surgery. It was physician anesthesia care (MD-only care). It was a *norm* for every anesthesiologist to have a fully qualified nurse (a “nursing sister” or “registered nurse”) assist them for the full day’s anesthesia work. They were termed Anesthetic Nurses, a form of anesthetic assistant. An anesthetic nurse had to be a trained and registered nurse *qualified to administer medication to the patient under the anesthesiologist's directions*. For example, the anesthesiologist may be inserting an arterial line with sterile gloves, and then the blood pressure alarm sounds indicating hypotension. The patient needs an urgent dose of a vasoactive drug. To avoid breaking sterility, the anesthesiologist requests the anesthetic nurse to inject a dose of vasoconstrictor and continues inserting the arterial line without interruption. Were there no anesthetic assistant, the anesthesiologist would break sterility, inject the drug into the patient, and then put on fresh sterile gloves to restart the arterial intervention.

The anesthetic nurse had undivided responsibilities and could only leave the operating room for brief periods with the anesthesiologist's permission. They were *invaluable assistants* facilitating fast, efficient insertion of devices, performing nerve blocks, “holding the mask” during induction of anesthesia, and fast operating room changeovers between surgical patients. They could also verify the correctness of critical steps. This system of ANESTHESIA SUPPORT PERSONNEL is highly recommended as a standard for top-level safest anesthesia care. Anesthetic nurses are a standard of care in most countries with a British medical and cultural heritage and adequately funded healthcare sectors.

2. ADVANCED ANESTHESIA SUPPORT PERSONNEL (A.S.P.)

All countries and medical cultures have a *form* of Anesthesia Support Personnel (**ASP**). The type of ASP person varies greatly between countries and within an institution.

Anesthesia support personnel are essential and can be casual momentary recruits. This book author has, in urgent moments in low resource systems, recruited random persons to hold an oxygen mask to the patient’s face and apply cricoid pressure to the patient following a hasty elementary technique description. That person was once a husband, often a surgeon, often a surgical floor nurse, occasionally a nurse called in from the postoperative care unit (PACU), or a wide-eyed medical student. At other career times, the anesthesia support person was the anesthesia trainee physician or a medical student.

South African private practice A*nesthesia Support Personnel,* for their anesthesia work, only had informal on-the-job training. They were professionally called "Anesthesia nurses." They were assigned to work with me all day and throughout the case. In addition, they managed all anesthesia equipment in the operating room, anesthesia medication inventory, and equipment cleaning between surgical cases. I could also assign them to monitor the patient and adjust the anesthesia vaporizer in a fashion I explained to them if I had to leave the operating room for a restroom visit urgently. That exit time from the operating room was rushed and lasted only 1 to 2 minutes. The Anesthesia nurse had to defer to the surgeon for immediate help if a massive crisis ever arose during my 2-minute absence and phone me to the restroom phone. Such a scenario never arose as I was judicious in choosing a stable, safe anesthesia time to hastily take a break during a long case. I did not have the option of calling upon any extra free anesthesiologist colleagues to relieve me as we all were busy with our own physician-managed solo anesthesia cases. If needed, the anesthesia nurses would also fetch anesthesia supplies and drugs from the main storeroom or pharmacy.

Being present for the majority of the cases, such anesthetic nurses would be perfect for double-checking induction drug injections and all drugs prepared before the anesthetic. That would prevent unintended drug vial and drug syringe swap errors.

During the rare advanced cardiac life support resuscitation event, anesthetic nurses were instantly available and fully skilled and competent to prepare and administer emergency drugs upon my verbal directives while I gave the patient physical cardio-respiratory support. Those registered ***qualified-nurse anesthesia technicians*** were the most valuable and ***BEST Anesthesia Support Personnel*** (ASPS) I have ever known.

In my latter career, I became an American anesthesia professor and simultaneously supervised trainees and non-physician anesthesia providers in up to four operating rooms. There, we had very different Anesthesia Support Personnel (ASP). They were called (a) *Anesthesia Technicians*, (b) *Anesthesia Technologists,* or (c) *Anesthesia Assistants*. Popularly, they were known as "ANESTHESIA TECHS." We rarely worked jointly with them during actual patient anesthesia care. There was a shortage of them, and they would each be responsible for between 2 to 6 operating rooms. Their main responsibilities were cleaning and preparing anesthesia machines and equipment between surgical patients. They cleared trash cans and restocked drug inventory in the anesthesia supply cart. As an American full-time anesthesia teacher, I supervised trainees and non-physician anesthesia providers in four operating rooms. I gave them breaks from anesthesia care for restroom visits and lunch breaks. As a supervising anesthesiology physician consultant and teacher, I took on some responsibilities of anesthesia support personnel (ASP), such as obtaining urgent equipment supplies or extra drugs from the pharmacy.

Then followed a two-year job change, during which I reverted to being a solo physician anesthesiologist at a large American university. Having no one to do little chores for me during anesthesia care had many challenging moments. I never saw the anesthesia techs at all. They only came into the operating room when I was outside, transferring patients. They rushed through their cleaning chores and set up the ventilator with clean tubing. If I needed extra drugs or some unplanned device during an anesthetic, I would phone my anesthesia tech to fetch them for me. It would disturb their tasks cleaning their other operating rooms, and a few refused to help me, telling me it was not their job to fetch medications from the pharmacy for my patients. My next remedy was to phone the anesthesia resident working in the emergency department waiting for emergency intubations. They would find some anesthesia trainee physician who was on a coffee or lunch break and who would give up their break and fetch the items I needed. I recalled the excellent anesthesia support personnel I had enjoyed in South Africa, feeling nostalgic.

In America in 1987, anesthesia technicians worked in 3 operating rooms at a time, had no after-high-school training, and learned their job skills informally "on the job."[1] By 2012, some formal training of anesthesia technicians had evolved but with great interinstitutional variation[2]. There was also great variation in their duties (scope of practice). Large institutions with large complex surgeries tended to employ most anesthesia technicians, and small rural operating facilities could employ none. The anesthesia techs mainly performed anesthesia equipment management and drug inventory in the operating room and minimally assisted the anesthesiologist with patient care. A call was made for increased employment of anesthesia techs with the normalization of giving them formal training. They were described as the "inconspicuous members" of the American anesthesia support personnel.

The American Society of Anesthesia Technologists and Technicians (**ASATT**) was established in 1989 (https://www.asatt.org/). ASATT sets education standards and designed the standards of Anesthesia Techs' scope of practice that employers should adopt. They pushed for Anesthesia Techs to move away from informal on-the-job training towards formalized training, earning an associate's degree (2 years) or bachelor's degree (3 years).

In 2022, the American Society of Anesthesiologists (ASA) strongly argued for including Anesthesia Techs in all anesthesia care teams[3]. The ASA motivated all state health boards and national healthcare institutional accrediting bodies to mandate the use of Anesthesia Techs and to adopt the ASATT scope of practice standards. At that time, there was still great variability between institutions and within institutions on the scope of practice, duties, and training requirements for Anesthesia Techs as Anesthesia Support Personnel. The curriculum includes the physics of anesthesia machines, ventilators and devices, pharmacology, basic life support, crisis management, how to assist with regional anesthesia placement, medication inventory management, and more. An Anesthesia Tech never interacts with patients unless under direction and in the presence of an anesthesiologist. They may then adjust an infusion's flow rate. The ASA states ***Anesthesia Techs*** are "*an incredible asset of our anesthesia care team*."

In Turkey, anesthesia technicians are embraced into large hospital "Code Blue" teams[4]. They are one of the 5-person emergency teams treating cardio-respiratory arrest cases. The anesthesia technicians have Basic Life Support (BLS) training. The teams, with anesthesia technician members, have been very successful.

In Saudi Arabia, the efficacy of using anesthesia technicians to check anesthesia machines and ventilators before use each day and between surgical patients was studied[5]. It was known that anesthesia machine or ventilator failure during patient care caused 76% of operating room patient deaths and serious injuries. Anesthesia technicians were effective in preventing technical failures of ventilators and anesthesia machines. The trained and certified competent anesthesia technicians were a worthy patient safety investment.

An interesting German study of trainee medical students and Anesthesia Techs found that both parties knew little about each other's skills, which limited their collaboration during team-managed crises[6]. Foremost, the anesthesia techs were reluctant to speak up because they overestimated the medical student's knowledge and skills, which created an excessively rigid hierarchy. Hierarchy is positive when it provides necessary reassurance of order and structure. Hierarchy can be negative if it is inflexibly adhered to and "speaking up" is inhibited. As advanced anesthesia support personnel, Anesthesia Techs are well integrated into German anesthesia care.

In India, using an Anesthesia Tech throughout anesthesia care in MRI suites in the care team supporting the anesthesiologist is routine[7].

3. SCOPE OF PRACTICE OF ANESTHESIA TECHs.

The DUTIES of **Anesthesia Techs** (ATs) vary immensely, but their SCOPE OF PRACTICE limits are similar worldwide. The following description is based on American data[8, 9] . The American Society of Anesthesia Technologists and Technicians (ASATT) recognizes three groups of Anesthesia Techs (**AT**s).

1) Non-certified Anesthesia Technicians. They receive informal on-the-job training and minimal didactic teaching. Their employer trains them and defines their institutional scope of practice. They are commonly part of a larger team and relieve some of the work burdens of their more trained and certified Anesthesia tech peers.
2) Certified Anesthesia Technicians (**Cer.A.T.).** The **Cer.A.T.** examination was retired in 2015, but Cer.A.T. qualified anesthesia Techs will be allowed to practice all their lives provided they obtain sufficient continuing education credits.
3) Certified Anesthesia **Technologists** (**Cer.A.T.T.)** The Cer.A.T.T. qualification and examination was instituted in 2015. They need to regularly accrue continuing education credits to remain licensed to work.

The Anesthesia Tech National Society (ASATT) respects Anesthesia Tech employers who choose to narrow the ASTT scope of practice standards but opposes any expansion of those scope of practice standards. Cer.A.T.T. workers may insert intravenous lines if proficiently trained, but older qualified Cer.A.T. workers may not.

Simply put, Anesthesia Techs are *technicians, not clinicians*. Despite similar-sounding titles, they are not Anesthesiologist Assistants. Anesthesiologist Assistants (called AAs) who are highly trained American anesthesia *providers* who work strictly under physician anesthesiologist supervision.

(Read the remainder of this chapter in the full printed book, for ideas how "*anesthesia techs*" and other anesthesia support personnel can help reduce anesthesia drug errors.)