

Anesthesiologist assistants (AAs) are highly skilled health professionals who work under the direction of licensed anesthesiologists to implement anesthesia care plans. AAs work exclusively within the anesthesia care team environment as described by the American Society of Anesthesiologists (ASA).

All AAs possess a premedical background, a baccalaureate degree, and have graduated from an accredited AA program. This comprehensive didactic and clinical training fulfills the requirements for awarding AAs a Masters degree in Anesthesiology. All AA programs have required this educational training and provided this certification since 1987. AAs are trained extensively in the delivery and maintenance of quality anesthesia care as well as advanced patient monitoring techniques. The goal of AA education is to guide the transformation of qualified student applicants into competent health care practitioners who aspire to practice as a member of the Anesthesia Care Team. Anesthesiologist assistants and certified registered nurse anesthetists are both defined as “non-physician anesthetists” within the Centers for Medicare & Medicaid Services section of the Code of Federal Regulations.

What does the ASA Care Team Statement say about AAs?

According to the ASA statement on the Anesthesia Care Team, anesthesia care personally performed or medically directed by an anesthesiologist constitutes the practice of medicine. Certain aspects of anesthesia care may be delegated to other properly trained and credentialed professionals. These professionals comprise the Anesthesia Care Team.

The Care Team statement (last amended on October 21, 2009) says, “Such delegation should be specifically defined by the anesthesiologist and should also be consistent with state law or regulations and medical staff policy. Although selected tasks of overall anesthesia care may be delegated to qualified members of the Anesthesia Care Team, overall responsibility for the Anesthesia Care Team and the patient’s safety rests with the anesthesiologist.”

The ASA Anesthesia Care Team statement may be read in its entirety at:
<http://www.asahq.org/for-members/standards-guidelines-and-statements.aspx> (Adobe file entitled “Anesthesia Care Team, The (2009))

What is the scope of AA clinical practice?

The scope of AA clinical practice is generally the same as that of nurse anesthetists on the Anesthesia Care Team. Specifically, the local scope of practice of AAs is usually defined by:

1. the medically directing anesthesiologist,
2. the hospital credentialing body,
3. the state’s board of medicine,
4. any applicable state statute or regulation.

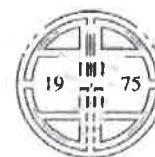
States may also require a practice agreement between the sponsoring anesthesiologist and

the AAs who are medically directed.

The ASA statement on the Recommended Scope of Practice of Nurse Anesthetists and Anesthesiologist Assistants may be found at:

<http://www.asahq.org/for-members/advocacy/federal-legislative-and-regulatory-activities/position-papers/recommended-scope-of-practice-of-nurse-anesthetists-and-anesthesiologist-assistants.aspx>

Comparison of the Education & Practice of Anesthesiologist Assistants (AAs) and Certified Registered Nurse Anesthetists (CRNAs)



Anesthesiologist Assistant (AA)	Nurse Anesthetist (CRNA)
Job Description	
<p>The anesthesiologist assistant (AA) is a skilled person qualified by advanced academic and clinical education to provide anesthetic care under the direction of a qualified anesthesiologist. The anesthesiologist who is responsible for the AA is available to prescribe and direct particular therapeutic interventions in the operating room and intensive care setting.¹</p>	<p>"...CRNAs provide anesthesia in collaboration with surgeons, anesthesiologists, dentists, podiatrists, and other qualified healthcare professionals. When anesthesia is administered by a nurse anesthetist, it is recognized as the practice of nursing; when administered by an anesthesiologist, it is recognized as the practice of medicine. Regardless of whether their educational background is in nursing or medicine, all anesthesia professionals give anesthesia the same way..."²</p>
Practice Patterns	
<p>Survey data is not available. The impression is that AAs tend to work in urban and suburban settings, and quite often in tertiary care hospitals.</p>	<p>In 2004 survey, 79.2% of NAs practice in urban and suburban settings, 34.5% practice in hospitals, 44.9% in a physician group, 2.9% in a CRNA only group, 4.6% for Federal service, and 6.2% under independent contractor locum tenens agreements, etc.³</p> <p>In a 2005 survey, 60.8% of NAs worked in an anesthesiology group and 88% in an ACT dominant model. Many NAs practice within a restricted scope and cannot perform procedures w/o anesthesiologist present (induction, regionals, etc.).⁴ In the same survey, it was found that 78.6% of NAs hold a full time position, 21.1% are part time and the rest are</p>

¹ *Standards & Guidelines for the Accreditation of Educational Programs in Anesthesiologist Assistant*; Commission on Accreditation of Allied Health Education Programs (CAAHEP), 2004.

² American Association of Nurse Anesthetists – Certified Registered Nurse Anesthetist at a Glance. Available at: http://www.aana.com/aboutaana.aspx?ucNavMenu_TSMMenuTargetID=179&ucNavMenu_TSMMenuTargetType=4&ucNavMenu_TSMMenuID=6&id=265; Accessed on: 28 May 2008.

³ McShane and Fagerlund CRNA, "A report on the Council on Certification of Nurse Anesthetists 2001 professional practice analysis", *AANA Journal*, v.72, No.1, 2004, pp. 31 – 52.

⁴ Alves CRNA, "A study of occupational stress, scope of practice, and collaboration in nurse anesthetists practicing in anesthesia team settings", *AANA Journal*, v. 73, No.6, 2005, pp. 443 – 452.

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	unemployed. ⁴
Number of Practitioners	
Survey data is not available. There are approximately 700 AAs practicing in 17 states plus the District of Columbia ⁵ .	There are approximately 37,000 NAs and NA students practicing in all 50 states plus the District of Columbia. ²
Approximately 97% of AAs have graduate (MS, MMSC.) degrees and 5% have baccalaureate (BS Health Science) degrees.	In the 2005 survey of NA practice, 19.4% possess a diploma or certificate, 3.8% possess an associate degree, 26.2% possess a baccalaureate, 50.3% possess a master degree and 0.3% possess a doctorate degree. ⁴

Educational Program Demographics

Number of Programs	
There are 5 accredited AA educational programs. ^{6,7}	There are 108 accredited NA educational programs as of 12/1/06, and 8 new programs have been accredited since 1/1/06. ^{8,9}
Number of States	
Educational programs are located in 4 states. ⁶	Educational programs are located in 35 states. ¹⁰
Average Class Size	
Class sizes vary with a range from 15 to 45 with an average of 29. ¹¹	Class sizes vary with a range from 5 to 122 and an average of 19. ¹²

⁵ Kentucky Legislative Research Commission. A Study of Anesthesiologist Assistants (2007). Available at: <http://www.anesthetist.org/images/stories/Kentucky%20LRC%20-%20AAs.pdf>; Accessed 28 May 2008

⁶ Commission for the Accreditation of Allied Health Education Programs – Accredited Programs. Available at: http://www.caahep.org/Find_An_Accredited_Program.aspx; Accessed 28 May 2008.

⁷ A sixth program in Tampa, Florida (Nova Southeastern University) has applied for initial CAAHEP accreditation as of 21 April 2008

⁸ Gerbasi CRNA, "Program Directors Update", *Newsletter Council on Accreditation*, Issue Forty-Seven, December 2006.

⁹ American Association of Nurse Anesthetists – Certified Registered Nurse Anesthetists (CRNAs) At a Glance. Available at:

http://www.aana.com/aboutaana.aspx?ucNavMenu_TSMMenuTargetID=179&ucNavMenu_TSMMenuTargetType=4&ucNavMenu_TSMMenuID=6&id=265; Accessed 28 May 2008

¹⁰ American Association of Nurse Anesthetists – Accredited Programs. Available at: www.aana.com/accreditedprograms; Accessed 23 February 2007.

¹¹ Compiled from AA program websites. Available at: www.nova.edu/anesthesia; www.southuniversity.edu/campus/AnesthesiologistAssistant; www.anesthesiaprogram.com; www.emoryaaprogram.org; http://www.med.umkc.edu/msa/our_program.html

¹² Lupien AE, Rosenkoetter MM. Nurse Anesthetists as University Faculty. *AANA Journal*. 2006;74.5:367.

Average Length of Educational Program	
Programs vary in length with a range of 24 to 28 months and an average of 25.8 months. ¹¹	Programs vary in length with a range from 24 to 36 months ¹³ and an average of 27.6 months. ¹²
Sponsoring Institutions	
50% are housed within a college/university, and 50% within a hospital and university. ¹¹	36% are housed within a college/ university, 24% within a hospital, 15% within a hospital and university, 7% within an anesthesiologist group, 5% within a government facility and 13% other. ¹⁴
Degrees Offered	
In 1987, the Commission on Accreditation of Allied Health Educational Programs (CAAHEP) mandated that all programs award a master degree. ¹⁵	In 1998, the Council on Accreditation of Nurse Anesthesia Educational Programs (CoA) mandated that all programs award a master degree. ¹⁶
25% of the programs award a Master of Science degree, 25% award a Master of Health Science, and 50% award a Master of Medical Science. ¹¹	According to an article published in 1999, 39% of the programs award a degree in Nursing, 38% in Allied Health, 5% in Biology, 1% in Education, 0.4% in Administration and 16% in Other. ¹⁷
	According to an article published in 2001, the last bachelor of science in nursing NA program closed in 1988, but the last certificate program closed in 1992. ¹⁸
Graduates per Year	
Survey data is not available. There will be approximately 109 graduates in 2008 and 136 graduates in 2009 ¹¹ .	The number of graduates has grown from 948 in 1999 to 1,946 in 2006. ⁸

¹³ Horton BJ. Monitoring Nurse Anesthesia Programs. *AANA Journal*. 2002;70.3;178.

¹⁴ Myers SJ, Martin-Sheridan D. The Perceived Influence of Financial Risk Factors on the Viability of Nurse Anesthesia Educational Programs.

¹⁵ Commission on Accreditation of Allied Health Education Programs – Standards & Guidelines; 2004.

¹⁶ Council on Accreditation of Nurse Anesthesia Educational Programs – Standards for Accreditation for Nurse Anesthesia Educational Programs; 2006.

¹⁷ Ouellette SM, Courts N, Lincoln PJ. The Application Process for Nurse Anesthesia Programs : Is There Room for Improvement ?; *AANA Journal*. 1999;67.2;122

¹⁸ Mastropietro, CRNA, PhD, Horton, CRNA, DNSc, Ouellette, CRNA, Med, FAAN, Faut-Callahan, CRNA, DNSc, FAAN, "Education News: The National Commission on Nurse Anesthesia Education 10 Years Later – Part 1: The Commission Years (1989-1994)," *AANA Journal*, October 2001/Vol. 69, No. 5, pp. 379-385.

Program Funding

<p>100% of program funding ultimately is generated by student tuition.</p>	<p>University assumes cost of program as hospitals relinquished control of hospital based NA programs including cost of education.¹⁹</p> <p>Medicare pass-through of nurse anesthesia education cost applies only at hospital based programs and does not include those sponsored by educational institutions (universities, etc.).²⁰</p> <p>Medicare regulations do not address how payments should be made for anesthesia services provided by SNAs in nonacademic educational programs.²¹</p> <p>CRNAs and SNAs may provide anesthesia related services, e.g., art lines, etc but Medicare does not pay for these services.¹⁸</p> <p>In 1999, 37% of programs reported hospital and university financial support, 18% had grant monies, 32% identified other sources, 31% tuition and/or hospital fees.²²</p>
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Program Accreditation

Accrediting Agencies

<p>Commission on Accreditation of Allied Health Educational Programs (CAAHEP).¹⁵</p> <p>CAAHEP is the largest programmatic accreditor in the health sciences field. In collaboration with its Committees on Accreditation, CAAHEP reviews and accredits nearly 2000 educational programs in nineteen (19) health science occupations. CAAHEP is recognized by the</p>	<p>Council on Accreditation of Nurse Anesthesia Educational Programs (COA).¹⁶</p> <p>COA is recognized by U.S. Department of Education and Council on Higher Education Accreditation (CHEA), COA is fiscally autonomous under the corporate structure of AANA.²⁴</p>
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¹⁹ Horton CRNA, "Accreditation of regionalized and comprehensive nurse anesthesia programs", *Journal of AANA*, v. 61, No.1, 1993, pp. 25-31.

²⁰ Cromwell Ph.D, Rosenbach Ph.D, et.al, "CRNA manpower forecasts: 1990 – 2010", *Medical Care*, v.29, No. 7, 1991, pp. 628 – 644.

²¹ Beutler CRNA, "Federal legislative and regulatory impact of funding of nurse anesthesia educational programs: Medicare reimbursement for nurse anesthesia education", **Report of the National Commission on Nurse Anesthesia Education**, *Journal AANA*, v.39, No.2, 1991, pp 180-182.

²² Ouellette CRNA, "Nurse anesthesia education: A different challenge", *Journal of AANA*, v. 67, No. 1, 1999, 21 – 31.

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Council for Higher Education Accreditation (CHEA). ²³	
Accreditation Sponsors	
The American Academy of Anesthesiologist Assistants (AAAA) and the American Society of Anesthesiologists (ASA). ¹⁵	The American Association of Nurse Anesthetists (AANA). ¹⁶
Sponsoring Institution Requirements	
<p>"A sponsoring institution must be a post-secondary academic institution accredited by an institutional accrediting agency that is recognized by USDE and must be authorized under applicable law or other acceptable authority to provide a post-secondary program, which awards a minimum of a master's degree at the completion of the program. The AA program must be supported by an anesthesiology department of a medical school that is accredited by the Liaison Committee on Medical Education or its equivalent. The anesthesiology department must have the educational resources internally or through educational affiliates that would qualify it to meet the criteria of the Accreditation Council for Graduate Medical Education (ACGME), or its equivalent for sponsorship of an anesthesiology residency program."²⁵</p>	<p>The conducting institution demonstrates that resources are sufficient to provide ongoing commitment and support of the nurse anesthesia program.²⁶</p> <p>There are three categories of COA accreditation:¹⁶</p> <ul style="list-style-type: none"> • Type 1--Regional Academic Program (college or University offering didactic coursework) • Type 2--Clinical Residency Program a program offering clinical experience with minimal didactic work • Type 3--Comprehensive Program a program offering both didactic and clinical experience <p>AANA Keeps data on all NA educational programs.²⁷</p>
Accreditation Documents and Guidelines	
<u><i>Standards & Guidelines for the Accreditation of Educational Programs in Anesthesiologist Assistant.</i></u>	<u><i>Standards of Accreditation of Nurse Anesthesia Educational Programs.</i></u>

²⁴ Council on Accreditation, "Council on Accreditation of Nurse Anesthesia Programs", *AANA Journal*, v.67, No. 6, 1999, pp. 543 – 551.

²³ Commission for the Accreditation of Allied Health Education Programs – Accredited Programs. Available at: www.caahep.org; Accessed 28 May 2008.

²⁵ *Standards & Guidelines for the Accreditation of Educational Programs in Anesthesiologist Assistant*; Commission on Accreditation of Allied Health Education Programs (CAAHEP), 2004. Available at: www.caahep.org/documents/ForProgramDirectors/AA_Standards.pdf. p.2.

²⁶ Council on Accreditation of Nurse Anesthesia Educational Programs – Standards for Accreditation for Nurse Anesthesia Educational Programs; 2006

²⁷ Fagerlund CRNA, "An economic analysis of the investment in nurse anesthesia education", *Journal of AANA*, v.66, No.2, 1998, pp.153 – 160.

Program Re-Accreditation Time Interval	
Every five years with yearly reports due including faculty, employer and student survey evaluation of the program. ¹	Previously every six years but increased to 10 years in 1999, with annual reports due from program directors and faculty and student survey evaluations required every 5 years. ²⁸

Admissions Criteria

Degree and Applicant Interview Requirements	
Baccalaureate trained student, premedical requisite coursework. ²⁹	Baccalaureate trained student, registration as a professional nurse. ²⁶
All programs require interviews and all programs require essays. ²⁹	In a survey published in 1995, 97% of the programs required interviews and 68% required essays. ³⁰
Prerequisite Coursework	
English, biology, chemistry, organic chemistry, biochemistry, physics, calculus, statistics, anatomy and physiology. ²⁵	Organic chemistry, biochemistry, inorganic chemistry, anatomy and physiology, physics, pathophysiology, statistics, research, computer science and college algebra. ³¹
Standardized Exams	
Graduate Record Exam (GRE) or Medical College Admissions Test (MCAT). ²	Graduate Record Exam (GRE) and/or the Miller Analogies Test (MAT). ³²
Mean GPA of Admissions Class	
Emory University: 3.31 ³³ ; Case Western Reserve University: 3.37 (from 2001 to 2005). ³⁴	3.0 with a range of 2.50 to 3.90. ³⁵

²⁸ Horton, CRNA, DNSc, "Education News: Monitoring Nurse Anesthesia Educational Programs," *AANA Journal*, June 2002/Vol. 70, No. 3, pp. 177-179.

²⁹ Compiled from AA program websites. Available at: www.nova.edu/anesthesia; http://www.med.umkc.edu/msa/our_program.html; www.southuniversity.edu/campus/AnesthesiologistAssistant; www.anesthesiaprogram.com; www.emoryaaprogram.org

³⁰ Haritos RN, Shumway, RN, Austin CRNA, Ellis CRNA, "Nurse anesthesia admissions qualifications", *Journal of AANA*, v.63, No.3, 1995, pp. 244 – 248.

³¹ Ouellette SM, Courts N, Lincoln PJ. The Application Process for Nurse Anesthesia Programs : Is There Room for Improvement ? *AANA Journal*. 1999;67.2;123.

³² The Temple University School of Nurse Anesthesia. Available at: www.ocis.temple.edu/gradbulletin/chp/nursing_anesthesia_msn.htm#1. Accessed on 22 March 2007.

³³ Emory University Anesthesiologist Assistant Program – Matriculant Statistics. Available at: <http://www.emoryaaprogram.org/GeneralTrack/admissionregs.htm>; Accessed on: 5 March 2007.

³⁴ Case Western Reserve University Master of Science in Anesthesia Program. Available at: www.anesthesiaprogram.com/admissions.htm. Accessed 22 March 2007.

³⁵ Ouellette SM, Courts N, Lincoln PJ. The Application Process for Nurse Anesthesia Programs : Is There Room for Improvement ? *AANA Journal*. 1999;67.2;122.

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Required Clinical Experience	
<p>One year preferred but not required.³⁶</p>	<p>One year minimum experience in critical care setting.³⁷</p> <p>In a survey published in 1995, NA program directors ranked the overall importance of the following criteria with regard to admissions characteristics: 1) GPA, 2) interview, 3) science GP, 4) critical care experience (years), 5) standardized tests, and 6) critical care background.²⁸</p> <p>A large survey of ~150 advanced practice nurse (APN) programs (including NA) published in 2003 examined "Preadmission Characteristics of APN Students." That survey determined "Personal skills" (ethical and critical thinker) to be the most important characteristic and "Clinical Experience" (setting with physician-RN interaction and interdisciplinary staffed settings) to be the least important.³⁸</p> <p>The Crosby, et al article highlights APN evidence that prior clinical experience is not an indicator of a successful practitioner: "Some [APN] programs admit students without prior nursing experience... Faculty at Columbia... are creating clinical experiences within their masters program to accommodate for this dichotomy." The consensus qualities "may be enhanced by, but are not exclusively based upon, prior professional clinical experience. Perhaps the demonstration of the specific characteristics of most importance, rather than set time or experience criteria, can serve as a guide for admissions decisions... Some respondents noted that <i>many of these attributes [professional and clinical skills] are expected to develop as</i></p>

³⁶ Compiled from AA program websites. Available at: www.nova.edu/anesthesia; www.southuniversity.edu/campus/AnesthesiologistAssistant; www.anesthesiaprogram.com; www.emoryaaprogram.org. http://www.med.umkc.edu/msa/our_program.html

³⁷ Council on Accreditation of Nurse Anesthesia Educational Programs – Standards for Accreditation for Nurse Anesthesia Educational Programs; 2006.

³⁸ Crosby, Dunn, Jozwiak-Shields, MacIsaac, RNs, Fallacaro, CRNA, DNS, "Preadmission Characteristics of Advanced Practice Nursing Students," Journal of the American Academy of Nurse Practitioners, Vol. 15, Issue 9, September 2003, pp. 424-431.

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	<p><u>part of the graduate educational process...These abilities improve with practice and education; thus, they are not necessarily preadmission expectations, but outcomes expected upon completion of the program. Clinical experiences that are part of the curriculum should allow opportunity for the development of those key characteristics.</u>"³⁵ [Emphasis added]</p>
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Faculty Demographics

Requirements for Program Directors	
<p>The program director(s) must hold a graduate degree in education, administration, medicine, or the medical basic sciences and have the requisite knowledge and skills to administer the classroom/academic aspects of the program. The program director(s) must hold an administrative title and have the requisite knowledge and skills to administer the operation of the overall program.³⁹</p>	<p>A CRNA with an appropriate graduate degree who by position, responsibility, and authority is actively involved in the organization and administration of the entire program of nurse anesthesia. The graduate degree must be from an institution of higher education accredited by a nationally recognized accrediting agency.³³</p>
Degrees and Appointments	
<p>Doctorate: 75%; Master: 25% with faculty appointments typically from medical schools. 40 [^]</p>	<p>A 2006 article states, "Only 16% of programs reported doctorally prepared program directors and asst directors."⁴¹ Faculty appointments are typically from nursing schools.</p> <p>"Of 73 programs: 49% have at least 1 FT doctorally prepared faculty member 34% have no doctoral or doctoral-enrolled faculty."⁴¹</p> <p>"Doctorally prepared FT faculty (25%) was only slightly higher than the 22%...in 1991."⁴¹</p> <p>It has been estimated that 50% of doctorally prepared CRNAs will retire in less than 10 years. Doctoral degrees include PhD, EdD,</p>

³⁹ Commission on Accreditation of Allied Health Education Programs – Standards & Guidelines; 2004:4.

⁴⁰ Compiled from AA program websites. Available at: www.nova.edu/anesthesia; http://www.med.umkc.edu/msa/our_program.html; www.southuniversity.edu/campus/AnesthesiologistAssistant; www.anesthesiaprogram.com; www.emoryaaprogram.org

[^] One Program Director is in dissertation phase of PhD degree.

⁴¹ Lupien, CRNA, PhD, Rosenkoetter, RN, PhD, FAAN, "Nurse Anesthetists as University Faculty," *AANA Journal*, October 2006/Vol. 74, No. 5, pp. 366-372.

Time Commitment for Program Directors and Faculty

Program Director: Administrative/Didactic: 70% (40-100%), Clinical: 30% (0-60%).⁴⁰

There is no survey data available. Anecdotal data suggests that faculty time commitment varies from 25% to 75% of total time.

Program Director (mean FTE):

- 30% of time classroom teaching, range 2-75%
- 37% program administration, range 5-95%
- 10% clinical teaching
- 2% classroom teaching of non-NA students
- 4% conducting research
- 6% guiding student research
- 5% service to university
- 4% service to profession
- 4% clinical practice w/o NA student⁴¹

Assistant Director (mean FTE):

- 32% classroom teaching, range 0-95%
- 18% program administration, range 0-75%
- 25% clinical teaching
- 3% classroom teaching non-NA students
- 2% conducting research
- 3% guiding student research
- 3% service to university
- 4% service to profession
- 9% clinical practice w/o NA student⁴¹

In a quote from the same 2006 article, "[There exists an] ongoing shortage of qualified faculty...potential explanations for a decreasing number of doctorally prepared faculty include retirement and the return of faculty to practices outside education."⁴¹ Faculty turnover is higher than outside of nursing.

Physician Involvement

At least one program director [medical director] must be a licensed anesthesiologist certified by the American Board of Anesthesiology, or its

In a quote from a 2004 article published in the UK, "...on an organizational level there is no anesthesiologist input into the development of

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equivalent, and have a faculty appointment in the sponsor's academic anesthesiology department. ⁴²	CRNA training within academic institutions. ⁴³

Matriculant Demographics

Gender Data	
There is no survey data available.	Male: 42%; Female: 58% ⁴⁴
Cross-Section of Incoming Degrees	
There is no survey data available. Anecdotal data suggests that the majority of baccalaureate degrees are in the hard sciences.	In an article published in 1999, 87% of NA program matriculants possessed a BSN although 58% of NA programs accepted baccalaureate degrees in other areas with the most common outside degree in the hard sciences. ¹⁹

Program of Study—Didactic Curriculum

Program Models	
All programs use an integrated model in which students spend concurrent time in the classroom and in the operating room learning clinical practice. ⁴⁰	<ul style="list-style-type: none"> ● Two Phase Model: Phase I Didactic- no clinical responsibility, Phase II – clinical responsibility.⁴⁵ ● Integrated or Concurrent Model: students simultaneously spend time in classroom and clinical areas for entire program.⁴⁵ ● “Military” Two-Phase Model: <ul style="list-style-type: none"> ○ University-based didactic portion (Phase I) usually granting a degree and, clinical portion (Phase II) conducted a regional sites.⁴⁵
Core Courses	
<ul style="list-style-type: none"> ● Anatomy ● Biochemistry ● Physiology 	<ul style="list-style-type: none"> ● Anatomy ● Physiology ● Pathophysiology

⁴² Commission on Accreditation of Allied Health Education Programs – Standards & Guidelines; 2004:4.

⁴³ Kane M, Smith AF. An American Tale – Professional Conflicts in Anaesthesia in the United States: Implications for the United Kingdom. *Anaesthesia*; 2004:59:797.

⁴⁴ American Association of Nurse Anesthetists. Certified Registered Nurse Anesthetists (CRNAs) At a Glance. Available at:

http://www.aana.com/aboutaana.aspx?ucNavMenu_TSMenuTargetID=179&ucNavMenu_TSMenuTargetType=4&ucNavMenu_TSMenuID=6&id=265; Accessed on 28 May 2008

⁴⁵ Carroll-Perez CRNA, “A study comparing characteristics of nurse anesthesia programs with the success rate on the certification examination”, *Journal AANA*, v.64, No. 1, 1996, pp. 76-80.

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<ul style="list-style-type: none"> ○ Concentration on cardiovascular, respiratory, renal, nervous and neuromuscular systems ● Pharmacology ● Microbiology ● Pathology ● Immunology ● Medical biophysics ● Anesthesia delivery systems ● Medical instrumentation ● Clinical decision making ● Clinical correlation conferences ● Patient assessment and anesthetic evaluation ● Clinical practice of anesthesia and patient monitoring⁴⁶ 	<ul style="list-style-type: none"> ● Chemistry & Biochemistry ● Physics ● Pharmacology ● Anesthesia Principles ● Professional Aspects of Nurse Anesthesia Practice ● Clinical Correlation Conference⁴⁷ <p>Nursing theory courses are becoming mandatory in NA programs. Traditional medical theory model is being questioned. Nursing theory distinguishes nursing from medicine by directing nursing actions and controlling the clinical environment. Neuman Systems Theory as applied to NA programs have three key concepts: stress, homeostasis, and patient perceptions or total person approach. Therefore the nurse assesses, manages, and evaluates the patient acting to impede states of disorder.⁴⁸</p>
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Evaluation Methods and Outcomes Assessment

<p>SAAAs can be taught by graduate AAs, anesthesiologists, CAIII anesthesia residents and CRNAs⁴⁶.</p>	<p>CRNAs and anesthesiologists are the only anesthesia care providers who can teach SNAs.⁴⁹</p> <p>Research studies have not identified a uniform skills and knowledge set inherent in the 1st year clinical experience.⁵⁰</p>
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Program of Study—Clinical Curriculum

<p>Clinical Affiliations</p>	
<p>Survey data is not available at this time.</p>	<p>From 1982-87 NA programs had trouble gaining clinical sites due to lessening support from anesthesiologists.⁵¹</p> <p>Approved national clinical sites numbered 1,200</p>

⁴⁶ Commission on Accreditation of Allied Health Education Programs – Standards & Guidelines; 2004:6

⁴⁷ Council on Accreditation of Nurse Anesthesia Educational Programs – Standards for Accreditation for Nurse Anesthesia Educational Programs; 2006.

⁴⁸ Martin CRNA, "Applying nursing theory to the practice of nurse anesthesia", *Journal of AANA*, v.64, No.4, 1996, pp. 369 – 372.

⁴⁹ Hand and Thompson CRNA, "Are we really mentoring our students?", *AANA Journal*, v.71, No. 2, 2003, pp. 105 - 108.

⁵⁰ Elnitsky RN, "Essential skills and knowledge of applicants", *AANA Journal*, v.67, No.3, 1999, pp. 273 – 278.

⁵¹ Horton CRNA, "Accreditation of regionalized and comprehensive nurse anesthesia programs", *Journal of AANA*, v. 61, No.1, 1993, pp. 25-31.



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	in '05. ⁵² National clinical sites climbed to over 1,500 by 12/1/06. ⁵³
Direct Patient Care Hours and Case Numbers	
SAA's average approximately 2,200 hours of direct participation in anesthesia care and the Case Western Reserve program averages approximately 850 cases completed by graduates. ⁴⁰	In an article published in 1998, SNAs participated in 450 cases with an average of 1,000 hrs of hands on clinical experience. ⁵⁴ In 2006, COA revised the minimum number of cases standard to 550. ⁴⁷
Specialty Cases/Rotations	
Pediatrics, Obstetrics, Neuro, Cardio-thoracic, Trauma, Ambulatory, Intensive Care, Vascular, General. ⁴⁰	COA lists the following as "Special Cases" standards: Geriatric (65+), Pediatric (neonates, 4 weeks to 2 years, 2 to 12 years), Trauma/Emergency, Ambulatory/Outpatient, Obstetrical Management (C-section, analgesia for delivery). ⁴⁷ In an article published in 2002, 65 (78%) of all NA educational programs included pain management as a non-operating room clinical experience. ⁵⁵
Specialty Techniques	
The following lists specialty techniques taught to AA students with respect to percentage of conformity by educational programs nationally: <ul style="list-style-type: none"> • Arterial puncture 100% • Arterial catheters 100% • Central venous catheters 100% • Pulmonary artery catheters 100% • Regional anesthesia (technical aspects) <ul style="list-style-type: none"> ○ Subarachnoid 50% 	An article published in 2002 listed the following specialty techniques taught to NA students with respect to percentage of conformity by educational programs nationally: <ul style="list-style-type: none"> • Arterial puncture 100% • Arterial catheters 100% • Central venous catheters 83% • Pulmonary artery catheters 81% • Regional anesthesia (technical aspects)

⁵² Seibert CRNA, "Area health education centers and health education training centers: A well kept secret", *AANA Journal*, v.73, No. 5, 2005, pp. 345 – 349.

⁵³ Gerbasi CRNA, "Program Directors Update", *Newsletter Council on Accreditation*, Issue Forty-Seven, December 2006.

⁵⁴ Gunn CRNA, "Setting the record straight on nurse anesthesia education and medical anesthesiology education", *CRNA, The Clinical Forum for Nurse Anesthetists*, v.9, No. 4, 1998, pp. 163-171.

⁵⁵ Horton, CRNA, DNSc, "Education News: Monitoring Nurse Anesthesia Educational Programs," *AANA Journal*, June 2002/Vol. 70, No. 3, pp. 177-179.

AA	NA
<ul style="list-style-type: none"> ○ Epidural 50% ○ Peripheral nerve 50%⁵⁶ 	<ul style="list-style-type: none"> ○ Subarachnoid 100% ○ Epidural 99% ○ Peripheral nerve 87%⁵⁴
Clinical Supervision	
<p>In a quote from <i>Standards & Guidelines for the Accreditation of Educational Programs in Anesthesiologist Assistant</i>, "All direct patient care activities by students during any clinical education experience must be supervised by a licensed anesthesiologist. When students are assigned or undertake any patient care duty, a licensed anesthesiologist or duly certified anesthetist must be physically present as the anesthesia provider of record."⁵⁷</p>	<p>In an article published in 1998, it was estimated that first-year NA students spend an average of 2 hours per day as the sole anesthesia provider in the room. Second-year students spend an average of 4 hrs per day as sole anesthesia provider. The supervising CRNA is immediately available should the student need assistance. It was estimated that the supervising CRNA can be doing additional work for the department 50% of the time a first-year student is the sole anesthesia provider in the room and about 88% of the time a second-year student is the sole provider in the operating room.⁵⁸</p> <p>The following is a quote from an article published in 1991, "...in reality, during the last 6-9 months of training, NA students function as staff anesthetists...During their second year of their educational program, nurse anesthesia students provide direct patient care in the operating room and other settings."⁵⁹ Second year students were equivalent to one half of a FTE nurse anesthetist.⁵⁸</p>

Program of Study—Clinical Didactic Curriculum

Clinical Conferences	
Required by CAAHEP. ⁶⁰	Required by COA. ⁴⁶
Quality Assurance Conferences	
Clinical quality assurance conferences are	Not required by COA. ⁴⁶

⁵⁶ Compiled from AA program websites. Available at: www.nova.edu/anesthesia;

http://www.med.umkc.edu/msa/our_program.html; www.southuniversity.edu/campus/AnesthesiologistAssistant;
www.anesthesiaprogram.com; www.emoryaaprogram.org

⁵⁷ *Standards & Guidelines for the Accreditation of Educational Programs in Anesthesiologist Assistant*; Commission on Accreditation of Allied Health Education Programs (CAAHEP), 2004, p. 7.

⁵⁸ Fagerlund CRNA, "An economic analysis of the investment in nurse anesthesia education", *Journal of AANA*, v.66, No.2, 1998, pp.153 – 160.

⁵⁹ Cromwell Ph.D, Rosenbach Ph.D, et.al, "CRNA manpower forecasts: 1990 – 2010", *Medical Care*, v.29, No. 7, 1991, pp. 628 – 644.

⁶⁰ *Standards & Guidelines for the Accreditation of Educational Programs in Anesthesiologist Assistant*; Commission on Accreditation of Allied Health Education Programs (CAAHEP), 2004, p. 6.

AA	NA
required. ⁵⁶	
Journal Club	
Literature review conferences are required. ⁵⁶	Not required. ⁴⁶
Anesthesia Simulator Education	
All existing programs offer this type of education although it is not required by CAAHEP. ⁵⁶	Survey data is not available. Not required by COA. ⁴⁶

Certification Requirements

Certifying Organizations	
National Commission on the Certification of Anesthesiologist Assistants (NCCAA) consisting of 12 members: <ul style="list-style-type: none"> • 8 board certified anesthesiologists • 4 certified anesthesiologist assistants.⁶¹ The National Board of Medical Examiners (NBME) consults and contracts with NCCAA for the examinations and certification processes. ⁶¹	Council on Certification of Nurse Anesthetists (CCNA) consisting of 11 members: <ul style="list-style-type: none"> • 6 CRNAs • 2 anesthesiologists • 1 hospital administrator • 1 currently enrolled SNA • 1 public member CCNA exists autonomously under corporate structure of AANA. ⁶²
Sponsoring Organizations	
American Academy of Anesthesiologist Assistants (AAAA) & American Society of Anesthesiologists (ASA). ⁶³	American Association of Nurse Anesthetists (AANA). ⁴⁶
Examination Requirements	
Entry level Certification Exam: Required. Continued Demonstration of Qualifications Exam: Required every 6 years. ⁶¹	Entry level Certification Exam: Required. Continued Demonstration of Qualifications Exam: Not required. ⁶⁴
Examination Content Grid	
The following is a list of examination content topics with respect to percentage representation within each exam: ⁶⁵	The following is a list of examination content topics with respect to percentage representation within each exam: ⁶⁶

⁶¹ National Commission on Certification of Anesthesiologist Assistants. Available at: <http://aa-nccaa.org/certification.htm>. Accessed on 5 March 2007.

⁶² Carroll-Perez CRNA, "A study comparing characteristics of nurse anesthesia programs with the success rate on the certification examination", *Journal AANA*, v.64, No. 1, 1996, pp. 76-80.

⁶³ Commission on Accreditation of Allied Health Education Programs – Standards & Guidelines; 2004:1

⁶⁴ The Council for Certification of Nurse Anesthetists 2007 *Candidate Handbook*. Available at: www.aana.com/uploadedFiles/Credentialing/Certification/CCNA_Resources/2007ccnacandidatehandbook.pdf. Accessed on 28 May 2008.

AA

NA

<ul style="list-style-type: none"> • Airway 8% • Cardiovascular 10% • Hematology & Coagulation 3% • Instrumentation & Monitoring 5% • Metabolism & Endocrine 5% • Miscellaneous 6% • Neuroanesthesia 5% • Neuromuscular 5% • Obstetrics & Perinatology 5% • Pediatrics & Neonatology 5% • Pharmacology 8% • Physics 5% • Principles of Anesthesia 10% • Regional Anesthesia & Pain 5% • Renal Physiology 5% • Respiratory 10% 	<ul style="list-style-type: none"> • Basic Science 30% • Instrumentation & Monitoring 5% • Basic Principles of Anesthesia 30% • Advanced Principles of Anes. 31% • Professional Issues 4%
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Professional Practice Surveys and Analyses Dictating Exam Content

NCCAA's *Survey of Practicing Anesthesiologist Assistants and Their Physician Sponsors* was last conducted in 1997.⁶¹

CCNA last performed a *Professional Practice Analysis (PPA)* in 2002.⁶⁴

There currently is no time limit on when new practice surveys should occur.

Content validation studies for certification exam should occur every 3 to 5 years.⁶⁴

CME/CE Requirements

NCCAA requires that 40 Continuing Medical Education (CME) units be completed and registered every 2 years to maintain certification.⁶¹

CCNA requires that 40 Continuing Education (CE) credits be completed and registered every 2 years for recertification.⁶⁷

NCCAA will accept CME credit for programs approved for continuing medical education credit by the:

Acceptable CE units include those with prior approval from the American Association of Nurse Anesthetists (AANA) or the following activities with non-prior approval:

- American Medical Association (AMA)
- American Association of Physician Assistants (AAPA)
- Accreditation Council for Continuing

- Programs that have received approval or accreditation for CE credit from another recognized professional organization, with the exception of life support courses

⁶⁵ National Commission on Certification of Anesthesiologist Assistant – Certification Process. Available at: <http://aa-nccaa.org/certification.htm>; Accessed on 28 May 2008.

⁶⁶ McShane and Fagerlund CRNA, "A report on the Council on Certification of Nurse Anesthetists 2001 professional practice analysis", *AANA Journal*, v.72, No.1, 2004, pp. 31 – 52.

⁶⁷ The Council for Certification of Nurse Anesthetists 2006 *Criteria for Recertification*. Available at: www.aana.com/uploadedFiles/Credentialing/Recertification/Recertification_Requirements/060626_recertbk.pdf, p. 6. Accessed on 26 March 2007.

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Medical Education (ACCME) ⁶¹	<ul style="list-style-type: none"> • College or university courses • Publication of an original paper • New clinical anesthesia experiences • Research.⁶⁸
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Practice Details

Supervision Standards and Ratios	
<p>Anesthesia Care Team mode is 100% utilized.</p> <p>ASA approved concept of ACT on 10/26/82.⁶⁹</p> <p>Maximum supervision ratio for CMS reimbursement is 1:4.</p>	<p>When employed in the Anesthesia Care Team mode, a Kaiser Study in 1995 stated that the anesthesiologist to CRNA ratio of 1:4 most cost effective.⁷⁰</p>
Scope of Practice	
<p>AAs practice under <i>medical direction</i>.</p>	<p>In 1983, Medicare defined <i>medical direction</i> as an anesthesiologist overseeing up to 4 patients and <i>medical supervision</i> where they were involved in the care of more than four patients. Patients in excess of 4 were billed in Part A. In 1987, the Omnibus Budget Reconciliation Act cut payments for Pts #3 and #4. In 1989, CRNAs cut bill directly. In 1993, Congress capped payment per procedure to 120% of solo anesthesiologist's fee (apparently in response to over billing by NAs since '89) and if a case was shared by both, the fee was split, financially NAs became redundant.⁷¹</p>

⁶⁸ The 2007 Continuing Education Program of the AANA. Available at:

www.aana.com/uploadedFiles/Professional_Development/Continuing_Education/CE_Program_Book/CE%20Program%20Book2007.pdf. Accessed on 26 March 2007.

⁶⁹ Bacon and Lema MD, "Anaesthetic team and the role of nurses – North American perspective", *Best Practice and Research Clinical Anaesthesiology*, v.16, No.3, 2002, pp. 401-408.

⁷⁰ Cromwell, "Barriers to achieving a cost-effective workforce mix: Lessons from anesthesiology", *Journal of Health Politics, Policy, and Law*, V.24, No.6, 1999, pp. 1331 – 1361.

⁷¹ Kane and Smith MD, "An American tale- professional conflicts in anaesthesia in the United States: implications for the United Kingdom", *Anaesthesia*, v.59, 2004, pp.793 – 802.