



Summary of NCE and SEE Performance and Clinical Experience

September 1, 2016, through August 31, 2017

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Introduction

This report presents a summary of information on individual performance on the National Certification Examination (NCE) and the Self-Evaluation Examination (SEE) over the time frame of the NBCRNA's fiscal year 2017 (FY 2017), September 1, 2016, through August 31, 2017.

Performance on the NCE is summarized first, with pass/fail outcomes presented according to several demographic variables: gender, age, clinical background, and type of graduate degree. Trend data summarizing pass rates over the past five years are also provided in the last column of each table for each demographic as well. Readers will note that there was no change to the NCE passing standard in FY 2017; the last time the passing standard was raised was January 1, 2014.

NCE pass rate summaries are followed by an analysis of candidates' responses on a satisfaction survey administered at the end of the NCE. The survey requested information pertaining to candidates' satisfaction with their registration and test experience. Next, descriptive statistics (e.g., mean, standard deviation) are provided for the number of cases performed in various clinical areas by students of nurse anesthesia educational programs who graduated in FY 2017.

Finally, information about scaled scores for the SEE is presented in the last part of the report, summarizing performance by gender, age, clinical background, type of graduate degree, and year in program. Trend data summarizing the past five years in each demographic sub-group are also provided in the final column of each table.

Please note that the following changes have been included in this FY 2017 annual report:

- The **Post Master's Certificate** was included in the **Other Masters** category.
- **MS Nurse Anesthesia/Anesthesiology** was reported in the **MS Nurse Anesthesia** category, not in the **Other Masters** as in the past.
- Individuals who matriculated into anesthesia programs **on or after January 1, 2015** (approximately 28% of all first-time NCE takers), were required to meet a revised classification framework based on the Council on Accreditation (COA) Standards. This classification framework is different than the one used by students who matriculated prior to January 1, 2015.

Candidate Performance on the NCE

The information in **Table 1** addresses the performance of candidates on the NCE during the fiscal year reporting period. Pass rates appear separately for first-time candidates versus repeat candidates, based on the passing standard that took effect on January 1, 2014. The pass rate for the 2,464 first-time candidates is 82.6%. The pass rate is lower for repeat examinees, consistent with the previous year's data.

The FY 2017 pass rate (82.6%) is slightly lower than the cumulative first-time pass rate (85.6%) averaged over the previous five fiscal years as shown in the final column of **Table 1** (FY 2012–FY 2017 represents September 1, 2012–August 31, 2017, N = 14,954). First-time examinee pass rates for the NCE, by year since 2008, can be found in **Table A1** in Appendix A of this report.

Table 1. Pass/Fail Summary for NCE Candidates, FY 2017

First-Time Candidates	Frequency	Percent	5-year Trend %
Pass	2,035	82.6%	85.6%
Fail	429	17.4%	14.4%
Total	2,464	100.0%	100.0%
Repeat Candidates	Frequency	Percent	5-year Trend %
Pass	394	61.0%	62.5%
Fail	252	39.0%	37.5%
Total	646	100.0%	100.0%

The NCE total scores and domain-level information for first-time candidates can be found in **Table A2** of the Appendix A.

Table 2 shows the distribution of test length and pass/fail status. Only *first-time* candidates are included in Table 2. Of the candidates who passed, the majority (55.8%) were administered 70 items (not including the 30 unscored pretest items). Only 4.8% of NCE candidates failed the test in 70 items. Approximately 19.1% of the candidates took the maximum test length of 140 items.

Table 2. Pass/Fail Summary by Test Length for First-Time NCE Candidates, FY 2017

	Frequency	Percent	5-year Trend %
Pass in 70 items	1,376	55.8%	58.5%
Pass in 71 to 139 items	385	15.6%	15.3%
Pass in 140 items	274	11.1%	11.8%
Fail in 70 items	117	4.8%	3.8%
Fail in 71 to 139 items	114	4.6%	3.8%
Fail in 140 items	198	8.0%	6.8%
Total	2,464	100.0%	100.0%

Demographic Characteristics of NCE Candidate Population, FY 2017

The next several tables present pass rates on the NCE grouped by gender, age, clinical background, and degree earned. Only *first-time* candidates are included in these tables. **Table 3** indicates that 58.5% of the NCE candidates were female and 41.5% were male. The pass rates between males and females were very similar, and this observation is consistent with the five-year trend (final column of Table 3).

Table 3. Gender of NCE Candidates, FY 2017

Gender	Pass		Fail		Total		5-year Trend Pass %
	N	Percent	N	Percent	N	Percent	
Female	1,178	81.8%	263	18.2%	1,441	58.5%	84.9%
Male	857	83.8%	166	16.2%	1023	41.5%	86.8%
Total	2,035	82.6%	429	17.4%	2,464	100.0%	85.6%

Table 4 presents the pass rate by age group. The pass rate decreased as examinee age increased, both for the FY 2017 sample and the five-year trend analysis. Younger students tend to perform better on the NCE. The average age of the FY 2017 *first-time* NCE candidates was 31.9 years.

Table 4. Age of NCE Candidates, FY 2017

Age	Pass		Fail		Total		5-year Trend Pass %
	N	Percent	N	Percent	N	Percent	
Under 30	822	88.1%	111	11.9%	933	37.9%	91.0%
30-35	904	83.1%	184	16.9%	1,088	44.2%	85.6%
36-39	159	72.3%	61	27.7%	220	8.9%	79.8%
40 or above	150	67.3%	73	32.7%	223	9.1%	72.9%
Total	2,035	82.6%	429	17.4%	2464	100.0%	85.6%

Table 5 displays pass rates for candidates' clinical background. Over one-third of the candidates reported their clinical background as ICU/CCU (34.7%). Pass rate comparisons between different clinical settings (Table 5) should be made with caution, because some subgroups for the FY 2017 data feature small sample sizes. Also, the clinical background categories tend not to be mutually exclusive. While examinees report their clinical background as discrete categories, actual experience may be more diverse and complex (e.g., SICU in some facilities may include CVICU patients, and many other permutations can exist).

When comparing pass rates across clinical background subgroups, readers are advised to refer to the 5-year trend column of Table 5. The pass rates in this column are more reliable for comparisons because they are based on a much larger sample. For instance, over the past five years, first-time NCE examinees with PICU, MICU, and NEURO ICU clinical backgrounds respectively have demonstrated the highest rates of success on the NCE.

Table 5. Clinical Background of NCE Candidates, FY 2017

Clinical Background	Pass		Fail		Total		5-year Trend Pass %
	N	Percent	N	Percent	N	Percent	
CCU	214	82.6%	45	17.4%	259	10.5%	86.2%
ER	153	83.2%	31	16.9%	184	7.5%	83.7%
ICU/CCU	697	81.5%	158	18.5%	855	34.7%	84.9%
MICU	285	85.1%	50	14.9%	335	13.6%	87.6%
NEURO ICU	102	84.3%	19	15.7%	121	4.9%	87.4%
NICU	31	77.5%	9	22.5%	40	1.6%	80.2%
OR	12	75.0%	4	25.0%	16	0.7%	80.7%
PACU	15	79.0%	4	21.1%	19	0.8%	81.5%
PICU	82	89.1%	10	10.9%	92	3.7%	87.9%
SICU	263	81.7%	59	18.3%	322	13.1%	87.0%
Trauma ICU	117	80.7%	28	19.3%	145	5.9%	84.8%
Other	64	84.2%	12	15.8%	76	3.1%	84.5%
Total	2,035	82.6%	429	17.4%	2,464	100.0%	85.6%

Table 6 displays distribution of pass rates by degree attained. Of 2,464 first-time NCE takers in FY 2017, 29.4% (n=724) were from program that awarded a Master of Science in Nursing degree, 43.4% (1,069) graduated from programs awarding a Master of Science in Nurse Anesthesia degree, 7.1% (n=176) were from other master's programs, and 20.1% (n=495) were from programs that awarded a doctoral degree. Pass rate comparisons between different degrees (Table 6) should be made with caution because some demographic subgroups feature small sample sizes.

When comparing pass rates across clinical background subgroups, readers are advised to refer to the five-year trend column of Table 6. For instance, over the past five years, first-time NCE examinees coming out of MSN programs appear to exhibit the highest rates of success on the NCE.

Table 6. Types of Graduate Degrees Reported by NCE Candidates, FY 2017

Degree Upon Completion	Pass		Fail		5-year Trend Pass %
	N	Percent	N	Percent	
MS Nursing	630	87.0%	94	13.0%	87.3%
MS Nurse Anesthesia	841	83.4%	228	21.3%	84.2%
Other Masters	150	85.2%	26	14.8%	86.2%
Doctoral Degree	414	83.6%	81	16.4%	83.3%
Total	2,035	82.6%	429	17.4%	85.6%

Descriptive Information on Number of Clinical Experiences, FY 2017

The tables in this section report data collected about the number of anesthesia cases performed in clinical areas, as submitted by program directors to the NBCRNA for individuals completing nurse anesthesia programs in the reporting period. *This data reflects records of clinical experiences submitted for individuals with a graduation date in the fiscal year reporting period, and not the sample of NCE candidates during this time frame.* As a result, sample sizes presented in this section will not equal the number of first-time NCE candidates as reported in Tables 1 through 6.

As noted, individuals who matriculated into anesthesia programs on or after January 1, 2015, were required to meet a revised classification framework based on the Council on Accreditation (COA) Standards (See Appendix B for Academic and Clinical Experience Requirements). For clarity, these two groups of students are reported separately in Tables 7a through 17a for students who matriculated before January 1, 2015 (n=1,765), and in Tables 7b through 17b, for students who matriculated on and after January 1, 2015 (n=693), respectively. Clinical experiences are aligned in the table pairs, but not every “Table a” has a corresponding “Table b”.

The columns are the same in **Tables 7 through 17**, presenting the following information:

- The first column contains the clinical area in which cases were performed.
- The *N* column represents the number of records submitted in the reporting period.
- The *Number of Cases Required* column indicates the minimum number of cases that must be completed by an applicant for the applicant to be deemed eligible to take the NCE. If a minimum number of cases is not required, a “0” is entered in this column. Please refer to Appendix B for required number of cases in each clinical area.
- The *Mean* column indicates the average number of cases reported on the FY 2017 records.
- The *Standard Deviation* column describes the dispersion in the number of cases reported on the FY 2017 records.
- The *Median* column indicates the median number of cases (50th percentile) reported on the records in the reporting period. Half the records contained values higher than this number, and half contained a value below this number.
- The *Minimum* column indicates the smallest number of cases reported on the FY 2017 records.

Table 7a. Sections I, II and III: Clinical Experience (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Total Number of Cases	1,765	550	854.4	156.6	833	559
Total Hours of Anesthesia	1,765	0	1,688.9	372.0	1,628	877
Total Clinical Hours	1,765	0	2,660.8	427.2	2,634	1,228

Table 7b. Sections I, II and III: Clinical Experience (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Total Number of Cases	693	600	901.2	154.4	884	616
Total Hours of Anesthesia	693	0	1,676.9	305.6	1,645	992
Total Clinical Hours	693	0	2,610.1	582.7	2,583	1,499

Table 8a. Section IV: Patient Physical Status (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Class I	1,765	0	95.5	53.0	85	6
Class II	1,765	0	367.2	98.0	352	104
Class III & IV	1,765	100	398.8	118.0	386	109
Class V	1,765	0	3.3	4.1	2	0

Table 8b. Section IV: Patient Physical Status (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Class I	693	0	84.6	36.1	80	11
Class II	693	0	394.0	97.9	386	175
Class III-VI Total	693	200	426.6	109.8	415	211
Class III	693	50	345.6	91.3	331	178
Class IV	693	10	77.5	34.8	72	10
Class V	693	0	3.0	3.3	2	0
Class VI	693	0	0.5	0.9	0	0

Table 9a. Section V: Special Cases (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Geriatric, 65+ years	1,765	50	232.8	74.2	223	73
Pediatric, 2-12 years	1,765	25	71.9	36.8	64	25
Pediatric, under 2 years	1,765	10	22.4	12.4	19	10
Neonatal, under 4 weeks	1,765	0	1.7	2.3	1	0
Trauma/Emergency	1,765	30	56.6	25.8	50	30
Ambulatory/Outpatient	1,765	100	424.8	175.1	414	100
Obstetrical Mgmt Total	1,765	30	68.8	36.1	58	30
Obstetr Mgmt Cesarean	1,765	10	31.6	16.2	28	10
Obstetr Mgmt Analgesia	1,765	10	38.8	26.0	32	10

Table 9b. Section V: Special Cases (Students matriculated post-January 1, 2015)

Area	N	Number of		Standard		
		Cases Required	Mean	Deviation	Median	Minimum
Geriatric, 65+ years	693	100	256.2	74.1	244	112
Pediatric, 2-12 years	693	30	77.3	35.7	69	30
Pediatric, under 2 years	693	10	23.6	12.4	20	10
Neonatal, under 4 weeks	693	0	1.6	2.1	1	0
Trauma/Emergency	693	30	56.8	22.3	51	30
Obstetrical Management	693	30	76.2	40.3	66	30
Cesarean delivery	693	10	39.0	21.6	35	10
Analgesia for labor	693	10	38.0	27.1	30	10
Pain Management Encounters	693	15	52.0	51.4	38	15

Table 10. Section VI: Position Categories (Students matriculated before January 1, 2015)*

Area	N	Number of Cases		Standard		
		Required	Mean	Deviation	Median	Minimum
Prone	1,765	20	52.7	27.8	47	20
Lithotomy	1,765	25	85.6	32.1	82	25
Lateral	1,765	5	87.6	51.8	74	9
Sitting	1,765	5	25.9	22.9	19	5

*After January 1, 2015, clinical experience by position is no longer tracked.

Table 11a. Section VII: Anatomical Categories (Students matriculated before January 1, 2015)

Area	N	Number of		Standard		
		Cases Required	Mean	Deviation	Median	Minimum
Intra-abdominal	1,765	75	181.3	59.6	170	75
Extrathoracic	1,765	15	34.8	81.8	30	15
Extremities	1,765	50	170.0	62.8	160	50
Perineal	1,765	15	100.0	48.9	90	15
Head, Extracranial	1,765	15	68.5	35.9	61	15
Head, Intracranial	1,765	5	14.7	8.7	13	5
Head, Oropharyngeal	1,765	20	95.6	52.4	85	20
Intrathoracic	1,765	15	36.7	15.3	33	15
Heart	1,765	5	19.6	11.0	17	5
Heart, Intrathoracic with CPB	1,765	0	12.4	8.5	11	0
Heart, Intrathoracic w/o CPB	1,765	0	4.4	5.7	3	0
Lung	1,765	5	10.7	5.4	9	5
Intrathoracic, Other	1,765	0	2.8	4.8	0	0
Neck	1,765	5	23.4	10.9	22	5
Neuroskeletal	1,765	20	44.4	25.7	39	20
Vascular	1,765	10	37.6	17.4	35	10
Other	1,765	0	8.9	26.0	0	0

Table 11b. Section VII: Anatomical Categories (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Intra-abdominal	693	75	186.7	64.8	171	85
Intracranial Total	693	5	13.7	7.8	12	5
Intracranial Open	693	3	10.5	6.2	9	3
Intracranial Closed	693	0	3.2	4.2	2	0
Oropharyngeal	693	20	86.8	45	78	20
Intrathoracic Total	693	15	37.9	15.9	34	15
Heart	693	5	21.3	11.5	18	5
Open Heart Total	693	5	17.7	10.1	16	5
Open Heart with CPB	693	0	14.8	8.7	13	0
Open Heart without CPB	693	0	3	4.2	2	0
Closed Heart	693	0	3.5	4.7	1	0
Lung	693	5	11.5	6.2	10	5
Other	693	0	5.1	6	4	0
Neck	693	5	22.6	9.9	21	5
Neuroskeletal	693	20	48.4	23	43	20
Vascular	693	10	38	18	35	10

Table 12. Section VIII: Pharmacological Agents (Students matriculated before January 1, 2015)*

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Inhalation Agents	1,765	200	574.1	116.8	569	200
Intravenous Induction Agents	1,765	200	696.3	180.5	678	200
Intravenous Agents, Muscle Relaxants	1,765	200	442.6	109.0	429	200
Intravenous Agents, Opioids	1,765	200	750.2	321.8	688	200

*After January 1, 2015, clinical experience by pharmacological agent is no longer tracked.

Table 13a. Section IX: Methods of Anesthesia (Students matriculated before January 1, 2015)

Area	N	Number of		Standard	Median	Minimum	
		Cases	Required				Mean
General Anesthesia	1,765	350		606.6	121.8	595	352
Intravenous Induction	1,765	200		517.7	129.6	508	200
Inhalation Induction	1,765	10		87.6	47.0	80	11
Mask Management	1,765	25		64.0	77.3	41	25
LMA	1,765	25		108.4	49.1	100	25
Tracheal Intubation/Oral	1,765	200		380.1	81.3	372	203
Tracheal Intubation/Nasal	1,765	0		18.7	16.1	15	0
Total Intravenous Anesthesia	1,765	10		58.7	58.2	38	10
Emergence from Anesthesia	1,765	200		571.9	141.4	556	217
Monitored Anesthesia Care	1,765	25		154.1	90.0	136	25
Regional/Management	1,765	30		107.3	66.6	91	30
Administration	1,765	25		113.3	68.1	97	25
Spinal	1,765	1		43.3	29.1	36	1
Epidural	1,765	1		36.9	27.2	30	1
Peripheral	1,765	1		33.1	37.2	22	1
Methods Regional Admin Peripheral Upper	1,765	0		12.4	16.3	7	0
Methods Regional Admin Peripheral Lower	1,765	0		14.5	22.2	8	0
Methods Regional Admin Peripheral Other	1,765	0		2.0	5.6	0	0

Table 13b. Section IX: Methods of Anesthesia (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
General Anesthesia	693	400	635	132.9	612	400
Inhalation Induction	693	25	91.8	57.6	80	25
Mask Management	693	25	55.7	46.7	42	25
Supraglottic Airway Devices (total of a & b)	693	35	126.5	57.8	118	36
a. Laryngeal mask	693	-	123	55.2	116	36
b. Other	693	-	3.4	12.9	0	0
Tracheal Intubation (total of a & b)	693	250	412.2	95.6	395	250
a. Oral	693	-	396.9	90.8	380	223
b. Nasal	693	-	15.2	11.9	12	0
Alternative Tracheal Intub/Endo (total of a & b)	693	25	84.4	57.2	75	30
a. Endoscopic techniques, total	693	5	15.1	16.8	9	5
1. Actual Placement	693	-	10.2	14.6	5	0
2. Simulated Placement	693	-	4.9	10.6	3	0
3. Airway Assessment	693	-	7.8	36.2	5	0
b. Other techniques	693	5	46.2	29.2	41	5
Emergence from Anesthesia	693	300	607.4	142.8	590	318
Regional Techniques	693					
Actual Administration (total of a, b, c,& d)	693	35	126.6	70.2	110	36
a. Spinal (total of 1 & 2)	693	10	47.2	27	43	10
1. Spinal Anesthesia	693	-	43.9	25.8	40	2
2. Spinal Pain Management	693	-	3.3	7.2	1	0
b. Epidural (total of 1 & 2)	693	10	35.9	23	30	10
1. Epidural Anesthesia	693	-	13.2	16.5	7	0
2. Epidural Pain Management	693	-	22.6	20.6	18	0
c. Peripheral (total of 1, 2, 3 & 4)	693	10	39.4	49.9	23	10
1. Anesthesia Upper	693	-	3.7	7.6	0	0
2. Anesthesia Lower	693	-	9.6	16.5	6	0
3. Pain Management Upper	693	-	6.4	12.5	2	0
4. Pain Management Lower	693	-	10.2	23.5	2	0
d. Other	693					
1. Anesthesia	693	-	2.2	5.9	0	0
2. Pain Management	693	-	3.7	12.8	0	0
Management (total of 1 & 2)	693	35	105.3	55.5	93	35
1. Anesthesia	693	-	70.2	41.8	65	0
2. Pain Management	693	-	35	35.1	26	0
Moderate/deep sedation	693	25	125.7	78.2	111	25

Table 14a. Section X: Arterial Technique (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Arterial Puncture/Catheter Insertion	1,765	25	55.8	25.0	50	25
Intraarterial Blood Pressure Monitoring	1,765	30	79.9	29.1	75	25

Table 14b. Section X: Arterial Technique (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Arterial Puncture/Catheter Insertion	693	25	52.9	21.3	49	25
Intraarterial Blood Pressure Monitoring	693	30	78.8	28.5	75	30

Table 15a. Section XI: Central Venous Pressure Catheter (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	1,765	5	14.0	10.1	11	5
Monitoring	1,765	15	25.7	11.0	22	15
Central Venous Pressure Catheter, Actual, Total	1,765	-	11.1	10.4	9	0
Central Venous Pressure Catheter, Actual PICC	1,765	-	0.8	2.6	0	0
Central Venous Pressure Catheter, Actual Non-PICC	1,765	-	10.9	10.7	68	0
Central Venous Pressure Catheter, Simulated	1,765	-	2.9	3.8	2	0

Table 15b. Section XI: Central Venous Pressure Catheter (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement—Non-PICC (total of a & b)	693	10	14.7	6.2	12	10
a. Non-PICC, Actual	693	-	9.3	8.1	9	0
b. Non-PICC, Simulated	693	-	5.4	4.7	4	0
Placement—PICC (total of a & b)						
a. PICC, Actual	693	-	0.3	1.1	0	0
b. PICC, Simulated	693	-	1.1	2.8	0	0
Monitoring	693	15	26.2	11.1	23	15

Table 16a. Section XII: Pulmonary Artery Catheter (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	1,765	0	5.8	7.2	3	0
Monitoring	1,765	0	12.5	8.4	12	0

Table 16b. Section XII: Pulmonary Artery Catheter (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	693	0	4.4	5.6	2	0
Monitoring	693	0	12.2	8.9	11	0

Table 17a. Section XIII: Other (Students matriculated before January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Intravenous Catheter Placement	1,765	100	209.8	117.2	171	100
Mechanical Ventilation	1,765	200	490.1	114.2	488	200
Pain Management	1,765	0	30.3	51.9	13	0
Alternative Airway	1,765	10	59.0	38.9	53	11
Alt Airway Mgmt: Fiberoptic Total	1,765	5	19.1	24.8	13	5
Alt Airway Mgmt: Fiberoptic Actual	1,765	-	8.0	16.6	5	0
Alt Airway Mgmt: Fiberoptic Simulated	1,765	-	2.4	6.5	0	0
Alt Airway Mgmt: Fiberoptic Assessmt	1,765	-	9.0	14.6	7	0
Other Ultrasound	1,765	-	9.4	23.6	0	0
Other Ultrasound Regional	1,765	-	14.9	24.4	5	0
Other Ultrasound Vascular	1,765	-	8.2	12.1	3	0
Other Techniques	1,765	5	39.5	26.3	36	5

Table 17b. Section XIII: Other (Students matriculated post-January 1, 2015)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Ultrasound (US)-Guided Techniques (total of a & b)	693	-	30.0	37.4	18	0
a. Regional	693	-	22.6	33.5	11	0
b. Vascular	693	-	7.4	10.2	4	0
Intravenous Catheter Placement	693	100	186.0	103.8	150	100
Advanced Noninvasive Hemodynamic Monitoring	693	0	-	-	-	-

Exit Survey Results

Candidates provide important ongoing sources of evaluative information about the examination process. This information serves as essential input for the continuous quality improvement initiatives of the NBCRNA. Candidates are asked to complete a post-examination survey regarding their testing experience. The post-examination survey addressed the following four areas:

- Six statements related to pre-examination activities such as registration and scheduling, locating the testing center, and interaction with test center staff;
- Nine statements related to aspects of the examination experience such as readability, fairness of test questions, and use of testing software;
- Six statements related to examinee perception of the alternative question formats; and
- Three statements related to exam preparation.

Most of the questions employ a Likert-type rating scale, by which respondents indicate their level of agreement with the survey statements. For the purposes of this report, the Likert response categories, *Strongly Agree* and *Agree*, are combined into a single *Agree* category, and *Strongly Disagree* and *Disagree* are combined into *Disagree*. The survey questions and format were developed by the NBCRNA and representatives from Pearson VUE, Inc. Completion of the survey is not required as part of the examination process and is not part of the three-hour time limit. Respondents do not always answer all the questions, as reflected by the unequal sample size across the sections of the survey.

Responses were analyzed based on a sample of NCE test takers who were administered the exit survey during the period of September 1, 2016, through August 31, 2017 (FY17). After each test administration, the test taker can contact the NBCRNA office to address any problems or concerns related to the NCE.

The first seven statements pertain to pre-examination scheduling and registration activities. The responses to the first statement, not included in the table below, indicate that nearly all (96.9%) of the NCE candidates scheduled their examination on the Internet. Responses to the other six survey questions are summarized in **Table 18**.

**Table 18. Responses to Survey Questions: Scheduling and Registration
(N=1,543 with about 0.5% omitted responses to some questions)**

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
I was able to schedule an acceptable test date.	1,435	93.0%	105	6.8%
I was able to schedule an acceptable test center location.	1,473	95.5%	61	4.0%
The Exam Reservation process was easy to use.	1,518	98.4%	15	1.0%
The test center was easy to locate.	1,509	97.8%	26	1.7%
The test center staff was helpful and knowledgeable.	1,529	99.1%	5	0.3%
The testing center Registration/Check-In Process was handled in a professional and efficient manner.	1,522	98.6%	12	0.8%

The next nine statements relate to mid-administration topics such as the fairness of test questions and readability of the examination. **Table 19** summarizes the responses to these survey questions. Overall (98.3% agreement), the FY 2017 NCE examinees were satisfied with their testing experience.

Table 19. Responses to Survey Questions: Examination and Testing Experience (N=1,576 with about 1.0% omitted responses to some questions)

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
I thought the examination questions were fair.	1,357	86.1%	205	13.0%
The graphs, figures, and diagrams in the questions were easy to read.	1,452	92.1%	104	6.6%
The graphs, figures, and diagrams in the questions fit onto the screen.	1,313	83.3%	236	15.0%
I was able to 'scroll' the test window in order to view an entire graph or figure in a question.	1,532	97.2%	15	1.0%
The areas of the content outline were fairly represented.	1,362	86.4%	200	12.7%
My testing environment was clean, quiet, and comfortable.	1,514	98.1%	22	1.4%
I encountered no technical problems with the test administration software.	1,504	97.5%	31	2.0%
The test administration software was user-friendly.	1,524	98.8%	11	0.7%
Overall, I was satisfied with my testing experience.	1,516	98.3%	17	1.1%

Since August 2009, the NBCRNA has administered alternative question formats on the NCE in addition to traditional multiple-choice items. These question formats include multiple correct response (MCR, where the examinee is asked to select an indicated number of correct responses), short answer/calculation (SA, where the examinee types in short, numerical responses), drag and drop (used for matching or ordering questions), and hotspot (where an examinee points and clicks on the correct region of an image). Of all 3,110 takers of NCE in FY 2017, about half (N = 1,576) of them provided feedback on these question formats. **Table 20** summarizes the responses to six survey questions related to the MCR, SA, drag and drop, and hotspot question formats.

Table 20. Responses to Survey Questions: Alternative Question Formats (N=1,576 with about 1.0% omitted responses to different questions)

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
The questions in the Multiple Correct Response format were fair.	1,423	90.3%	135	8.6%
The questions in the Short Answer/Calculation format were fair.	1,500	95.2%	61	3.9%
The questions in the Drag and Drop format were fair.	1,479	93.8%	80	5.1%
The questions in the Hotspot format were fair.	1,441	91.4%	118	7.5%
I understood how to respond to the questions in the alternative formats.	1,520	96.4%	41	2.6%
I needed help figuring out how to respond to the questions in the alternative formats.	544	34.5%	1,014	64.3%

Responses to the last three items on the exit survey, addressing methods that candidates used to prepare for the examination, are summarized in **Table 21**. Of the NCE examinees testing in FY 2017, 59.8% stated that the SEE helped them. Of 1,567 who responded to the question regarding preparation for this examination, all attended a review course. Finally, 85.1% reported that their nurse anesthesia educational program featured computerized testing.

**Table 21. Responses to Survey Questions: Preparation for the NCE
(N=1,576 with about 0.5%-1.0% omitted responses to different questions)**

Survey Question	Response	Count	Percent
Taking the SEE helped prepare me to take the certification examination.	Agree	942	59.8%
	Disagree	482	30.6%
If you took a review course in preparation for this examination, please indicate below which review course you took.	Valley Anesthesia	714	45.3%
	Core Concepts	121	7.7%
	Howard Review	3	0.2%
	R&R Board Review	0	0.0%
	PACES	121	7.7%
	CRNA Secrets	2	0.1%
	Review Course at AANA Annual Meeting	0	0.0%
	NARC4U	0	0.0%
	APEX Anesthesia Review	438	27.8%
	Other commercial	45	2.9%
	Course Organized by My Program	123	7.8%
Please indicate below if your nurse anesthesia educational program featured any academic tests using computer based testing.	Did Not Take	0	0.0%
	Yes	1,341	85.1%
	No	225	14.3%

Demographic Characteristics of the SEE Candidate Population, FY 2017

The following tables summarize performance on the SEE according to demographic variables, including gender, age, clinical background, and degree. Within each demographic, the scores are presented by year in the program. Also, the column in the extreme-right of each table displays the five-year trend average (FY 2012–FY 2017, or September 1, 2012–August 31, 2017, N = 16,695) for each demographic subgroup. In addition, summaries of SEE total scores and domain-level information can be found in **Table A3** of Appendix A.

Table 22 summarizes SEE scores by gender: 41.5% of SEE examinees were male, and 58.5% were female. The mean total score for Year-2 examinees (402.9) was higher than the mean total score for Year-1 examinees (393.0). The mean SEE score for the Year-3-and-above students was highest at 410.3.

The five-year trend information (last column) shows a similar pattern. Average scores for Year-2 and Year-3-and-above students are very similar, and consistently higher than Year-1 students. Also, males consistently attained slightly higher scores on the SEE than females.

Table 22. SEE Candidate Performance by Gender and Program Year, FY 2017

Program Year	Gender	Count	Mean	Standard Deviation	5-Year Trend Mean
Year 1	Female	176	386.6	37.8	385.8
	Male	162	400.1	43.0	400.4
	Total	338	393.0	40.9	392.0
Year 2	Female	1,061	398.5	42.0	395.6
	Male	740	409.1	43.3	405.1
	Total	1,801	402.9	42.9	399.3
Year 3 and above	Female	1,011	406.4	43.1	399.0
	Male	695	416.0	43.8	410.1
	Total	1,706	410.3	43.6	403.2
Total	Female	2,248	401.1	42.6	395.9
	Male	1,597	411.2	43.8	406.3
	Total	3,845	405.3	43.3	400.0

Table 23 summarizes SEE scores by age group. The average age of Year-1 SEE examinees was 31.6 years. The average age of Year-2 SEE examinees was 31.2 years. The average age of Year-3 SEE examinees was 32.0 years. The mean age of all SEE examinees during the period was 31.6 years, on average similar to the sample of first-time NCE examinees (31.9 years). The largest age group was composed of examinees under the age of 30 (43.1%). Examinees between the ages of 30 and 35 comprised a slightly smaller subgroup (38.7%). In FY 2017, examinees under 30 years of age scored higher on the SEE than examinees in other age groups. The same result was found in the five-year trending sample.

Table 23. SEE Candidate Performance by Age and Program Year, FY 2017

Program Year	Age	Count	Mean	Standard Deviation	5-Year Trend Mean
Year 1	Under 30	138	397.6	37.9	391.4
	30-35	140	392.6	40.7	394.7
	36-39	32	386.5	44.8	393.8
	40 and over	28	380.2	49.3	381.0
	Total	338	393.0	40.9	392.0
Year 2	Under 30	836	407.4	43.3	402.6
	30-35	668	402.1	41.9	399.5
	36-39	170	392.2	38.0	391.4
	40 and over	127	391.7	46.6	391.0
	Total	1,801	402.9	42.9	399.3
Year 3 and above	Under 30	685	416.7	43.5	407.5
	30-35	680	410.9	42.1	403.3
	36-39	176	400.5	44.8	398.6
	40 and over	165	391.4	42.1	393.4
	Total	1,706	410.3	43.6	403.2
Total	Under 30	1,659	410.4	43.4	402.8
	30-35	1,488	405.2	42.3	400.4
	36-39	378	395.6	42.0	394.4
	40 and over	320	390.5	44.6	391.3
	Total	3,845	405.3	43.3	400.0

Table 24 displays summaries of SEE scores by clinical background. Overall, the most commonly identified clinical setting was ICU/CCU (36.2%).

When comparing pass rates across clinical background subgroups, readers are advised to refer to the five-year trend columns of Table 24. The averages in these columns are more reliable because they are based on much larger sample sizes.

Table 24. SEE Candidate Performance by Clinical Background and Program Year, FY 2017

	Clinical Background	Count	Mean	Std Dev	5-Yr Mean	Program Year	Clinical Background	Count	Mean	Std Dev	5-Yr Mean
Year 1	CCU	44	394.6	39.3	394.2	Year 3 & above	CCU	163	412.0	43.2	405.1
	ER	40	388.8	57.4	395.2		ER	143	410.9	46.5	406.5
	ICU/CCU	140	392.4	38.4	390.5		ICU/CCU	631	410.0	43.7	404.3
	MICU	30	394.2	33.4	391.8		MICU	193	412.8	42.6	403.9
	NEURO ICU	7	404.7	48.4	389.0		NEURO ICU	87	408.3	40.0	400.6
	NICU	5	386.8	32.8	359.1		NICU	27	398.9	37.5	395.8
	OR	4	360.8	62.8	381.5		OR	11	406.6	38.4	401.1
	PACU	4	392.5	39.6	380.9		PACU	16	414.1	33.3	405.7
	PICU	14	398.3	29.8	401.0		PICU	56	410.3	39.8	398.7
	SICU	32	394.5	41.0	395.0		SICU	220	411.2	46.1	401.7
	Trauma ICU	14	402.9	43.0	391.1		Trauma ICU	96	400.5	43.5	402.5
	Other	4	386.8	18.6	394.0		Other	63	419.2	45.7	403.1
	Total	338	393.0	40.9	392.0	Total	1,706	410.3	43.6	403.2	
Year 2	CCU	228	406.3	43.0	401.5	Total	CCU	435	407.3	42.9	401.7
	ER	161	393.4	41.4	397.6		ER	344	400.2	46.4	400.1
	ICU/CCU	619	399.3	43.4	397.5		ICU/CCU	1,390	403.4	43.5	399.1
	MICU	256	408.4	40.6	403.7		MICU	479	409.3	41.2	402.7
	NEURO ICU	111	399.2	39.9	400.3		NEURO ICU	205	403.2	40.3	399.3
	NICU	30	393.2	42.8	390.1		NICU	62	395.2	39.4	390.3
	OR	6	395.2	36.2	397.7		OR	21	394.6	44.3	398.8
	PACU	11	381.2	30.5	395.7		PACU	31	399.6	35.6	398.7
	PICU	47	410.6	45.6	400.0		PICU	117	409.0	41.1	399.6
	SICU	221	410.2	44.8	401.5		SICU	473	409.6	45.3	401.0
	Trauma ICU	70	402.2	41.6	395.2		Trauma ICU	180	401.4	42.5	397.5
	Other	41	416.9	40.5	399.3		Other	108	417.2	43.2	400.0
	Total	1,801	402.9	42.9	399.3	Total	3,845	405.3	43.3	400.0	

Table 25 displays summaries of SEE scores by degree to be attained. As is noted, starting in FY 2017, “Post-Master’s Certificate” is no longer reported as a separate category; instead, it is reported together with Other Masters degrees. Due to a transcript category change, MS Nurse Anesthesia/Anesthesiology is reported in the MS Nurse Anesthesia category, not in the Other Masters as in the past. Although MSN is still a popular degree, a smaller percentage of SEE candidates were enrolled in MSN programs in FY 2017 (28.2%) than in FY 2016 (32.6%). The number of SEE examinees in doctoral programs (N = 915, 23.8%) represents an increase over the previous fiscal year (N = 544, 18.4%). Score comparisons among groups in this table should be made with caution because of the small sample size of some subgroups.

Table 25. SEE Candidate Performance by Graduate Degree and Program Year, FY 2017

Program Year	Degree Upon Completion	Count	Mean	Standard Deviation	5-Year Trend Mean
Year 1	MS Nurse Anesthesia	197	397.2	37.6	398.1
	MS Nursing Major	85	399.0	37.1	389.9
	Other Masters	55	367.9	48.7	391.4
	Doctoral	1	436.0	-	373.8
	Total	338	393.0	40.9	392.0
Year 2	MS Nurse Anesthesia	710	401.0	42.1	398.3
	MS Nursing Major	602	409.2	43.0	403.6
	Other Masters	223	411.9	44.8	399.0
	Doctoral	266	385.8	37.4	380.7
	Total	1,801	402.9	42.9	399.3
Year 3 and above	MS Nurse Anesthesia	530	404.7	44.3	402.3
	MS Nursing Major	399	422.1	45.5	407.3
	Other Masters	129	413.7	37.5	400.6
	Doctoral	648	407.0	41.7	398.9
	Total	1,706	410.3	43.6	403.2
Total	MS Nurse Anesthesia	1,437	401.9	42.4	399.6
	MS Nursing Major	1,086	413.1	44.1	403.2
	Other Masters	407	406.5	45.7	398.1
	Doctoral	915	400.8	41.6	392.2
	Total	3,845	405.3	43.3	400.0

When comparing pass rates across clinical background subgroups, readers are advised to refer to the five-year trend columns of Table 25. The averages in these columns are more reliable because they are based on much larger sample sizes.

Appendix A - Additional NCE and SEE Performance Data

Table A1. NCE Pass Rate Trends—First-Time Candidates 2008 through August 31, 2017

Reporting Period	Percent Passing
2008* (Graduates 2007 – 2008)	89.9
2009 (Graduates after 2008)	87.7
2010	88.9
2011	89.1
FY 2012	88.5
FY 2013	88.4
FY 2014**	87.8
FY 2015	85.0
FY 2016	84.5
FY 2017	82.6

*Passing standard increased in August 2008

**Passing standard increased in January 2014

Table A2. Descriptive Statistics for NCE Scores and Domain-Level Information—First-Time Candidates FY 2017

	Mean	Standard Deviation
Total Score	491.8	44.8
Basic Science	498.4	61.0
Equipment, Instrumentation and Technology	501.0	73.0
Basic Principles of Anesthesia	498.6	58.1
Advanced Principles of Anesthesia	488.8	55.9

Table A3. Descriptive Statistics for SEE Scores and Domain-Level Information, FY 2017

	1st Year in Program		2nd Year in Program		3rd Year in Program		All	
	Avg	SD	Avg	SD	Avg	SD	Avg	SD
Total	393.0	40.9	402.9	42.9	410.3	43.6	405.3	43.3
Basic Science	398.8	44.8	397.6	46.9	404.7	49.2	400.8	47.9
Equipment, Instrumentation and Technology	398.6	46.4	403.9	48.2	409.8	47.6	406.0	47.9
Basic Principles of Anesthesia	396.4	48.8	407.2	49.3	413.5	49.6	409.0	49.7
Advanced Principles of Anesthesia	382.4	47.6	406.5	49.3	416.8	49.4	409.0	50.1