

Annual NCE and SEE Report
Summary of NCE and SEE
Performance and Clinical Experience
September 1, 2018 - August 31, 2019

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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 2019 (FY 2019), September 1, 2018 through August 31, 2019. It should be noted that starting in 2019, the NBCRNA is in a transition to align its fiscal year with the calendar year, the performance summary of NCE and SEE based on the calendar year 2019 will be produced in Spring 2020.

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. Readers will note that there was no change to the NCE passing standard in FY 2019. The passing standard was last changed on January 1, 2014; the NBCRNA Board of Directors reviewed the results of the 2017 standard setting study and voted to retain the standard.

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 2019.

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 subgroup are also provided in the final column of each table.

Please note that the following changes have been included in this FY 2019 annual report:

- Under Descriptive Information on Number of Clinical Experiences, Position Categories and Pharmacological Agents are no longer reported as these are no longer tracked.
- Clinical experiences are reported separately for Individuals who matriculated into master's and doctoral anesthesia programs.

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 2,548 first-time candidates is 84.3%. The pass rate is lower for repeat examinees, consistent with the previous year's data.

The FY 2019 pass rate (84.3%) is the same as the FY2018 pass rate (84.3%) and is comparable to the cumulative first-time pass rate (84.1%) averaged over the previous five fiscal years as shown in the final column of **Table 1** (FY 2015–FY 2019 represents September 1, 2014–August 31, 2019, total N = 15,420). 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 2019

First-Time Candidates	Frequency	Percent	5-year Trend %
Pass	2,147	84.3%	84.1%
Fail	401	15.7%	15.9%
Total	2,548	100.0%	100.0%
Repeat Candidates	Frequency	Percent	5-year Trend %
Pass	368	59.2%	61.4%
Fail	254	40.8%	38.6%
Total	622	100.0%	100.0%

The NCE total scores and domain-level information for first-time candidates can be found in **Table A2** of 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 (60.9%) were administered 70 items (not including the 30 unscored pretest items). Only 4.7% of NCE candidates failed the test in 70 items. Approximately 19.6% 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 2019

	Frequency	Percent	5-year Trend %
Pass in 70 items	1,432	56.2%	55.6%
Pass in 71 to 139 items	381	15.0%	15.8%
Pass in 140 items	334	13.1%	12.8%
Fail in 70 items	120	4.7%	4.3%
Fail in 71 to 139 items	116	4.6%	4.2%
Fail in 140 items	165	6.5%	7.3%
Total	2,548	100.0%	100.0%

Demographic Characteristics of NCE Candidate Population, FY 2019

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 58.1% of the NCE candidates were female and 41.9% were male. The pass rates between males and females were consistent with the five-year trend (final column of Table 3), showing a smaller difference in FY2019 (83.7% vs. 85.0%) than in FY 2018 (83.2% vs. 85.9%).

Table 3. Gender of NCE Candidates, FY 2019

Gender	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
Female	1,239	83.7%	241	16.3%	1,480	58.1%	83.4%
Male	908	85.0%	160	15.0%	1,068	41.9%	85.2%
Total	2,147	84.3%	401	15.7%	2,548	100.0%	84.1%

Table 4 presents the pass rate by age group. The pass rate decreased as examinee age increased, both for the FY 2019 sample and the five-year trend analysis. Younger students tend to perform better on the NCE. The average age of the FY 2019 *first-time* NCE candidates was 32.2 years.

Table 4. Age of NCE Candidates, FY 2019

Age	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
Under 30	787	90.9%	79	9.1%	866	34.0%	90.0%
30 - 35	994	85.2%	173	14.8%	1,167	45.8%	84.5%
36 - 39	232	74.4%	80	25.6%	312	12.2%	76.8%
40 or mo	134	66.0%	69	34.0%	203	8.0%	67.9%
Total	2,147	84.3%	401	15.7%	2,548	100.0%	84.1%

Table 5 displays pass rates for candidates' clinical background. Over one-third of the candidates reported their clinical background as ICU/CCU (38.0%). Pass rate comparisons between different clinical settings (Table 5) should be made with caution, however, because some subgroups for the FY 2019 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). Finally, this data is self-reported and could subject to inaccuracies.

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, SICU and CCU clinical backgrounds respectively have demonstrated the highest rates of success on the NCE.

Table 5. Clinical Background of NCE Candidates, FY 2019

Clinical Background	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
CCU	245	86.0%	40	14.0%	285	11.2%	84.4%
ER	171	78.4%	47	21.6%	218	8.6%	80.9%
ICU/CCU	827	85.3%	142	14.7%	969	38.0%	83.7%
MICU	312	85.5%	53	14.5%	365	14.3%	87.0%
NEURO ICU	114	78.6%	31	21.4%	145	5.7%	83.7%
NICU	26	81.3%	6	18.8%	32	1.3%	77.9%
OR	11	61.1%	7	38.9%	18	0.7%	71.4%
PACU	11	78.6%	3	21.4%	14	0.5%	81.7%
PICU	81	89.0%	10	11.0%	91	3.6%	87.2%
SICU	231	84.6%	42	15.4%	273	10.7%	84.8%
Trauma ICU	81	85.3%	14	14.7%	95	3.7%	84.2%
Other	37	86.0%	6	14.0%	43	1.7%	84.5%
Total	2,147	84.3%	401	15.7%	2,548	100.0%	84.1%

Table 6 displays distribution of pass rates by degree attained. Of 2,548 first-time NCE takers in FY 2019, 20.8% (n=530) were from programs that awarded a Master of Science in Nursing degree; 33.2% (846) graduated from programs awarding a Master of Science in Nurse Anesthesia degree; 15.8% (n=403) were from other master's programs; and 30.2% (n=769) 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 5-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 2019

Degree Upon Completion	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
MS Nursing	462	87.2%	68	12.8%	530	20.8%	86.4%
MS Nurse Anesthesia	697	82.4%	149	17.6%	846	33.2%	82.4%
Other Masters	335	83.1%	68	16.9%	403	15.8%	84.0%
Doctoral Degree	653	84.9%	116	15.1%	769	30.2%	83.9%
Total	2,147	84.3%	401	15.7%	2,548	100.0%	84.1%

Descriptive Information on Number of Clinical Experiences, FY 2019

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 (2,508) will not equal the number of first-time NCE candidates (2,548) as reported in Tables 1 through 6.

As noted, students in Master’s programs and students in Doctoral programs have different academic requirements based on the Council on Accreditation (COA) Standards. For clarity, these two groups of students are reported separately in Tables 7a through 15a for Master’s students (n=1,721), and in Tables 7b through 15b, for Doctoral students (n=787), respectively. Clinical experiences are aligned in the table pairs to easily compare the degree types.

The columns are the same in Tables 7 through 15, presenting the following information:

- The first column contains the clinical area in which cases were performed.
- The *N* column represents the number of master’s or doctoral 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.
- The *Mean* column indicates the average number of cases reported on the FY 2019 records.
- The *Standard Deviation* column describes the dispersion in the number of cases reported on the FY 2019 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 2019 records.

Table 7a. Sections I, II and III: Clinical Experience (Master’s)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Total Number of Cases	1,721	600	842.3	131.4	819	604
Total Hours of Anesthesia	1,721	-	1,665.3	329.7	1,603	828
Total Clinical Hours	1,721	-	2,587.2	379.6	2,538	1,713

Table 7b. Sections I, II and III: Clinical Experience (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Total Number of Cases	787	600	901.9	146.4	877	603
Total Hours of Anesthesia	787	-	1806.9	352.6	1,764	1,076
Total Clinical Hours	787	-	2816.1	371.5	2,740	2,014

Table 8a. Section IV: Patient Physical Status (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Class I	1,721	0	81.9	37.3	76	3
Class II	1,721	0	347.9	85.1	336	129
Class III-VI Total	1,721	200	412.3	98.1	402	207
Class III	1,721	50	332.7	83.2	323	98
Class IV	1,721	10	76.0	33.8	71	10
Class V	1,721	0	3.1	3.5	2	0
Class VI	1,721	0	0.6	7.2	0	0

Table 8b. Section IV: Patient Physical Status (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Class I	787	0	87.3	40	82	3
Class II	787	0	362.3	95.8	359	125
Class III-VI Total	787	200	452.3	109.9	441	207
Class III	787	50	367.4	95.1	353	161
Class IV	787	10	81.0	37.3	73	16
Class V	787	0	3.4	3.4	2	0
Class VI	787	0	0.5	0.8	0	0

Table 9a. Section V: Special Cases (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Geriatric, 65+ years	1,721	100	249.6	68.3	238	100
Pediatric, 2-12 years	1,721	30	71.0	33.2	64	30
Pediatric, under 2 years	1,721	10	21.8	11.7	18	10
Neonatal, under 4 weeks	1,721	0	1.4	2.2	0	0
Trauma/Emergency	1,721	30	52.1	21.0	46	30
Obstetrical Management	1,721	30	68.8	33.1	59	30
Cesarean delivery	1,721	10	33.0	15.9	29	10
Analgesia for labor	1,721	10	35.6	23.2	29	10
Pain Management Encounters	1,721	15	47.8	36.8	36	15

Table 9b. Section V: Special Cases (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Geriatric, 65+ years	787	100	263.3	74.2	257	104
Pediatric, 2-12 years	787	30	71.1	32.6	63	30
Pediatric, under 2 years	787	10	22.0	12.1	18	10
Neonatal, under 4 weeks	787	0	1.5	2.3	1	0
Trauma/Emergency	787	30	56.2	22.6	50	30
Obstetrical Management	787	30	68.4	30.7	62	30
Cesarean delivery	787	10	30.7	13.8	28	10
Analgesia for labor	787	10	37.7	22.6	31	10
Pain Management Encounters	787	15	56.0	48.5	41	15

Table 10a. Section VII: Anatomical Categories (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Intra-abdominal	1,721	75	181.1	65.6	169	76
Intracranial Total	1,721	5	14.3	8.3	13	5
Intracranial Open	1,721	3	10.9	6.5	9	3
Intracranial Closed	1,721	0	3.4	4.6	2	0
Oropharyngeal	1,721	20	91.1	53.6	82	20
Intrathoracic Total	1,721	15	42.0	17.2	39	15
Heart	1,721	5	24.8	12.7	22	5
Open Heart Total	1,721	5	15.9	8.2	14	5
Open Heart with CPB	1,721	0	13.5	8.0	12	0
Open Heart without CPB	1,721	0	2.4	3.6	1	0
Closed Heart	1,721	0	8.9	9.0	6	0
Lung	1,721	5	11.3	5.7	10	5
Other	1,721	0	5.9	7.0	4	0
Neck	1,721	5	22.1	10.2	21	5
Neuroskeletal	1,721	20	44.1	18.7	40	20
Vascular	1,721	10	38.2	18.1	35	10

Table 10b. Section VII: Anatomical Categories (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Intra-abdominal	787	75	195.0	70.7	181	78
Intracranial Total	787	5	15.7	10.5	13	5
Intracranial Open	787	3	11.1	7.0	10	3
Intracranial Closed	787	0	4.6	6.6	3	0
Oropharyngeal	787	20	101.5	49.3	94	20
Intrathoracic Total	787	15	41.8	17.9	38	15
Heart	787	5	23.6	13.3	20	5
Open Heart Total	787	5	14.8	8.2	13	5
Open Heart with CPB	787	0	13.0	7.5	11	1
Open Heart without CPB	787	0	1.8	2.5	1	0
Closed Heart	787	0	8.8	8.3	7	0
Lung	787	5	10.7	5.1	9	5
Other	787	0	7.5	8.8	5	0
Neck	787	5	24.6	11.0	23	5
Neuroskeletal	787	20	48.6	29.9	41	20
Vascular	787	10	39.3	15.6	38	10

Table 11a. Section IX: Methods of Anesthesia (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
General Anesthesia	1,721	400	604.4	114.7	587	400
Inhalation Induction	1,721	25	84.4	40.5	77	25
Mask Management	1,721	25	58.3	63.2	41	25
Supraglottic Airway Devices (total of a & b)	1,721	35	115.6	50.4	106	35
a. Laryngeal mask	1,721	0	109.1	49.0	101	0
b. Other	1,721	0	5.1	20.5	0	0
Tracheal Intubation (total of a & b)	1,721	250	389.3	77.0	378	250
a. Oral	1,721	0	357.9	100.3	358	0
b. Nasal	1,721	0	16.7	15.4	13	0
Alternative Tracheal Intub/Endo (total of a & b)	1,721	25	66.3	46.8	56	25
a. Endoscopic techniques, total	1,721	5	15.9	30.3	9	5
1. Actual Placement	1,721	0	12.0	29.8	6	0
2. Simulated Placement	1,721	0	3.9	8.3	2	0
3. Airway Assessment	1,721	0	14.5	58.1	6	0
b. Other techniques	1,721	5	50.4	38.6	44	5
Emergence from Anesthesia	1,721	300	577.8	135.3	559	311
Regional Techniques	1,721					
Actual Administration (total of a, b, c & d)	1,721	35	123.0	65.9	107	35
a. Spinal (total of 1 & 2)	1,721	10	45.0	25.7	40	10
1. Spinal Anesthesia	1,721	0	40.9	23.4	36	0
2. Spinal Pain Management	1,721	0	4.1	8.2	1	0
b. Epidural (total of 1 & 2)	1,721	10	35.0	22.8	28	10
1. Epidural Anesthesia	1,721	0	10.6	14.0	6	0
2. Epidural Pain Management	1,721	0	24.4	19.8	19	0
c. Peripheral (total of 1, 2, 3 & 4)	1,721	10	37.8	45.6	25	10
1. Anesthesia Upper	1,721	0	20.1	26.3	14	0
2. Anesthesia Lower	1,721	0	10.7	13.1	7	0
3. Pain Management Upper	1,721	0	9.4	16.4	6	0
4. Pain Management Lower	1,721	0	17.6	33.8	8	0
d. Other	1,721					
1. Anesthesia	1,721	0	1.9	4.8	0	0
2. Pain Management	1,721	0	3.6	8.1	1	0
Management (total of 1 & 2)	1,721	35	92.2	51.1	80	35
1. Anesthesia	1,721	0	54.0	38.0	46	0
2. Pain Management	1,721	0	38.2	31.9	30	0
Moderate/deep sedation	1,721	25	123.9	82.1	107	25

Table 11b. Section IX: Methods of Anesthesia (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
General Anesthesia	787	400	635.9	108.3	626	419
Inhalation Induction	787	25	83.7	46.7	73	25
Mask Management	787	25	55.8	53.1	42	25
Supraglottic Airway Devices (total of a & b)	787	35	115.0	53.8	107	36
a. Laryngeal mask	787	0	108.1	55.2	101	0
b. Other	787	0	3.6	19.5	0	0
Tracheal Intubation (total of a & b)	787	250	421.8	80.6	410	250
c. Oral	787	0	378.5	120.0	383	0
a. Nasal	787	0	17.9	14.6	15	0
Alternative Tracheal Intub/Endo (total of a & b)	787	25	73.4	36.9	65	25
a. Endoscopic techniques, total	787	5	18.4	28.0	10	5
1. Actual Placement	787	0	16.0	27.2	8	0
2. Simulated Placement	787	0	2.5	3.7	1	0
3. Airway Assessment	787	0	11.2	32.1	7	0
b. Other techniques	787	5	55.0	34.7	50	5
Emergence from Anesthesia	787	300	612.7	133.8	598	313
Regional Techniques	787					
Actual Administration (total of a, b, c,& d)	787	35	134.9	69.5	116	35
a. Spinal (total of 1 & 2)	787	10	46.3	25.6	41	10
1. Spinal Anesthesia	787	0	40.9	23.8	36	1
2. Spinal Pain Management	787	0	5.4	9.0	2	0
b. Epidural (total of 1 & 2)	787	10	36.9	23.3	30	10
1. Epidural Anesthesia	787	0	12.2	14.2	8	0
2. Epidural Pain Management	787	0	24.7	20.3	19	0
c. Peripheral (total of 1, 2, 3 & 4)	787	10	45.3	41.3	32	10
1. Anesthesia Upper	787	0	23.9	25.3	16	0
2. Anesthesia Lower	787	0	12.1	12.4	8	0
3. Pain Management Upper	787	0	11.9	16.6	7	0
4. Pain Management Lower	787	0	21.4	30.2	11	0
d. Other	787					
1. Anesthesia	787	0	2.8	5.3	1	0
2. Pain Management	787	0	4.8	8.6	2	0
Management (total of 1 & 2)	787	35	104.3	73.9	85	35
1. Anesthesia	787	0	58.3	54.7	47	0
2. Pain Management	787	0	46.2	41.3	34	0
Moderate/deep sedation	787	25	153.9	97.5	133	25

Table 12a. Section X: Arterial Technique (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Arterial Puncture/Catheter Insertion	1,721	25	53.6	25.3	48	25
Intraarterial Blood Pressure Monitoring	1,721	30	76.8	27.5	72	30

Table 12b. Section X: Arterial Technique (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Arterial Puncture/Catheter Insertion	787	25	63.7	28.3	58	25
Intraarterial Blood Pressure Monitoring	787	30	90.3	29.8	86	31

Table 13a. Section XI: Central Venous Pressure Catheter (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement—Non-PICC (total of a & b)	1,721	10	15.0	7.3	12	10
a. Non-PICC, Actual	1,721	0	10.2	9.0	10	0
b. Non-PICC, Simulated	1,721	0	4.8	4.4	4	0
Placement—PICC (total of a & b)	1,721	0	0.7	2.6	0	0
a. PICC, Actual	1,721	0	0.5	2.1	0	0
b. PICC, Simulated	1,721	0	0.2	1.1	0	0
Monitoring	1,721	15	24.3	9.8	21	15

Table 13b. Section XI: Central Venous Pressure Catheter (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement—Non-PICC (total of a & b)	787	10	15.4	6.9	13	10
a. Non-PICC, Actual	787	0	12.2	8.1	11	0
b. Non-PICC, Simulated	787	0	3.2	3.6	2	0
Placement—PICC (total of a & b)	787	0	0.4	1.2	0	0
a. PICC, Actual	787	0	0.3	0.9	0	0
b. PICC, Simulated	787	0	0.1	0.6	0	0
Monitoring	787	15	24.0	10.2	21	15

Table 14a. Section XII: Pulmonary Artery Catheter (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	1,721	0	4.9	5.9	3	0
Monitoring	1,721	0	11.8	8.0	11	0

Table 14b. Section XII: Pulmonary Artery Catheter (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	787	0	6.1	5.9	5	0
Monitoring	787	0	11.2	7.6	10	0

Table 15a. Section XIII: Other (Master's)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Ultrasound (US)-Guided Techniques (total of a & b)	1,721	0	35.5	44.1	23	0
a. Regional	1,721	0	24.5	39.0	13	0
b. Vascular	1,721	0	10.7	13.3	6	0
Intravenous Catheter Placement	1,721	100	177.3	89.6	147	100
Advanced Noninvasive Hemodynamic Monitoring	1,721	0	33.0	126.1	3	0

Table 15b. Section XIII: Other (Doctoral)

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Ultrasound (US)-Guided Techniques (total of a & b)	787	0	46.1	48.8	34	0
a. Regional	787	0	28.7	39.9	16	0
b. Vascular	787	0	15.9	18.7	11	0
Intravenous Catheter Placement	787	100	205.5	104.5	174	100
Advanced Noninvasive Hemodynamic Monitoring	787	0	3.3	33.6	0	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 their personal preparation prior to examination.

Most of the questions employ a Likert-type rating scale, where respondents are asked to 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 for the NCE. 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 FY 2019. 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 (99.1%) of the NCE candidates scheduled their examination on the Internet rather than by phone. Responses to the other six survey questions are summarized in **Table 16**.

**Table 16. Responses to Survey Questions: Scheduling and Registration
(N=1,614 with about 1% omitted responses to some questions)**

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
I was able to schedule an acceptable test date.	1,379	85.4%	220	13.6%
I was able to schedule an acceptable test center location.	1,421	88.0%	177	11.0%
The exam reservation process was easy to use.	1,570	97.3%	26	1.6%
The test center was easy to locate.	1,570	97.3%	30	1.9%
The test center staff was helpful and knowledgeable.	1,589	98.5%	10	0.6%
The testing center registration/check-in process was handled in a professional and efficient manner.	1,583	97.9%	17	1.1%

The next nine statements relate to topics such as the fairness of test questions and readability of the examination. **Table 17** summarizes the responses to these survey questions. Overall (97.2% agreement), the FY 2019 NCE examinees were satisfied with their testing experience.

Table 17. Responses to Survey Questions: Examination and Testing Experience (N=1,570 – 1,614 with about 1.0% -2.0% omitted responses to some questions)

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
I thought the examination questions were fair.	1,314	83.7%	227	14.5%
The graphs, figures, and diagrams in the questions were easy to read.	1,405	89.5%	136	8.7%
The graphs, figures, and diagrams in the questions fit onto the screen.	1,205	76.8%	328	20.9%
I was able to 'scroll' the test window in order to view an entire graph or figure in a question.	1,505	95.9%	32	2.0%
The areas of the content outline were fairly represented.	1,353	86.2%	186	11.8%
My testing environment was clean, quiet, and comfortable.	1,583	98.1%	16	1.0%
I encountered no technical problems with the test administration software.	1,559	96.4%	38	2.4%
The test administration software was user-friendly.	1,585	98.2%	13	0.8%
Overall, I was satisfied with my testing experience.	1,568	97.2%	25	1.5%

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 directed to select an indicated number of correct responses), short answer/calculation (SA, where the examinee enters short numerical responses), drag and drop (used for matching or ordering of elements in question), and hotspot (where an examinee is directed to point with their computer mouse and click on the correct region of an image). Of all 3,170 takers of the NCE in FY 2019, about half (N = 1,570) provided feedback on these question formats. **Table 18** summarizes the responses to six survey questions related to the MCR, SA, drag and drop, and hotspot question formats.

Table 18. Responses to Survey Questions: Alternative Question Formats (N=1,570 with about 2.0% omitted responses to different questions)

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
The questions in the Multiple Correct Response format were fair.	1,385	88.2%	154	9.8%
The questions in the Short Answer/Calculation format were fair.	1,468	93.5%	68	4.3%
The questions in the Drag and Drop format were fair.	1,441	91.8%	98	6.2%
The questions in the Hotspot format were fair.	1,418	90.3%	123	7.8%
I understood how to respond to the questions in the alternative formats.	1,493	95.1%	47	3.0%
I needed help figuring out how to respond to the questions in the alternative formats.	584	37.2%	955	60.8%

Responses to the last three items on the exit survey, addressing methods that candidates used to prepare for their examination, are summarized in **Table 19**. Of the NCE examinees testing in FY 2019, over three-fourths (75.9%) stated that the SEE helped them in their certification examination preparation. This is a substantial and steady increase over the past two years. From under 60% in FY 2017 to 67.9% in FY 2018 reported that the SEE was helpful. Of 1,570 who completed the question regarding preparation for the NCE, 96.8% responded they attending a review course. Finally, 90.9% reported that their nurse anesthesia educational program featured computerized testing; this number has been increasing every year since 2013.

Table 19. Responses to Survey Questions: Preparation for the NCE (N=1,570 with about 1.5% omitted responses to different questions)

Survey Question	Response	Count	Percent
Taking the SEE helped prepare me to take the certification examination.	Agree	1,191	75.9%
	Disagree	324	20.6%
If you took a review course in preparation for this examination, please indicate below which review course you took.	Valley Anesthesia	190	12.1%
	Core Concepts	42	2.7%
	Howard Review	1	0.1%
	R&R Board Review	--	--
	PACES	33	2.1%
	CRNA Secrets	1	0.1%
	Review Course at AANA Annual Meeting	--	--
	NARC4U	1	0.1%
	APEX Anesthesia Review	1,217	77.5%
	Other commercial	5	0.3%
	Course Organized by My Program	13	0.8%
Did Not Take	50	3.2%	
Please indicate below if your nurse anesthesia educational program featured any academic tests using computer-based testing.	Yes	1,427	90.9%
	No	122	7.8%

Demographic Characteristics of the SEE Candidate Population, FY 2019

The following section of this report summarize performance, as indicated by overall average examination scores on the SEE, according to a variety of demographic variables, including gender, age, clinical background, and degree. The scores are presented by year in the program for each variable. Also, the last column on the right of each table displays the five-year trend average (FY 2015 through FY 2019, September 1, 2014–August 31, 2019, N = 18,706) for each demographic subgroup. Finally, summaries of SEE total scores and domain-level information can be found in **Tables A3** of Appendix A.

Table 20 summarizes SEE scores by gender: 40.8% of SEE examinees were male and 59.2% were female. The mean total score for Year-2 examinees (409.7) was higher than the mean total score for Year-1 examinees (404.8). The mean SEE score for the Year-3-and-above students was highest at 424.7.

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

Table 20. SEE Candidate Performance by Gender and Program Year, FY 2019

Program Year	Gender	Count	Mean	Standard Deviation	5-year Trend Mean
Year 1	Female	109	394.9	41.4	386.6
	Male	104	415.2	46.5	403.1
	Total	213	404.8	45.0	393.8
Year 2	Female	1,083	405.1	42.1	399.8
	Male	735	416.5	44.5	408.2
	Total	1,818	409.7	43.5	403.3
Year 3 and above	Female	1,438	421.5	40.8	409.9
	Male	972	429.4	41.5	419.7
	Total	2,410	424.7	41.3	413.8
Total	Female	2,630	413.6	42.3	403.3
	Male	1,811	423.3	43.5	412.6
	Total	4,441	417.6	43.1	407.1

Table 21 summarizes SEE scores by age group. The average age of Year-1 SEE examinees was 31.4 years. The average age of Year-2 SEE examinees was 31.3 years. The average age of Year-3 SEE examinees was 32.4 years. The mean age of all SEE examinees during the period was 31.9 years, on average similar to the sample of first-time NCE examinees (32.2 years). The largest age groups were composed of examinees under the age of 30 (39.3%) and examinees between the ages of 30 and 35 (40.1%). In

FY 2019, the same as in previous years, younger examinees scored higher than older examinees. The same results were found in the five-year trending sample.

Table 21. SEE Candidate Performance by Age and Program Year, FY 2019

Program Year	Age	Count	Mean	Standard Deviation	5-year Trend Mean
Year 1	Under 30	98	413.5	43.1	395.5
	30 - 35	79	403.0	42.6	395.0
	36 - 39	19	392.2	57.6	391.6
	40 or above	17	377.4	39.9	380.4
	Total	213	404.8	45.0	393.8
Year 2	Under 30	826	414.3	44.2	407.7
	30 - 35	664	407.1	42.6	402.2
	36 - 39	208	405.0	40.6	396.2
	40 or above	120	400.5	44.6	391.5
	Total	1,818	409.7	43.5	403.3
Year 3 and above	Under 30	823	431.9	41.5	418.4
	30 - 35	1,037	424.8	40.6	414.6
	36 - 39	326	413.5	39.0	408.0
	40 or above	224	413.7	40.7	400.3
	Total	2,410	424.7	41.3	413.8
Total	Under 30	1,747	422.5	43.8	410.6
	30 - 35	1,780	417.2	42.4	407.5
	36 - 39	553	409.6	40.6	401.5
	40 or above	361	407.6	42.9	395.0
	Total	4,441	417.6	43.1	407.1

Table 22 displays summaries of SEE scores by clinical background. Overall, the most commonly identified clinical setting was ICU/CCU (34.0%).

When comparing SEE performance across clinical background subgroups, readers are advised to refer to the five-year trend columns of Table 22. The averages in these columns are more reliable because they are based on much larger sample sizes.

Table 22. SEE Candidate Performance by Clinical Background and Program Year, FY 2019

	Clinical Background	Count	Mean	Std Dev	5-Yr Mean	Program Year	Clinical Background	Count	Mean	Std Dev	5-Yr Mean
Year 1	CCU	25	403.2	37.6	395.2	Year 3 & Above	CCU	292	429.2	42.6	418.0
	ER	4	418.0	51.0	397.6		ER	206	422.2	43.2	413.3
	ICU/CCU	48	398.5	50.3	391.8		ICU/CCU	880	425.4	40.4	414.3
	MICU	56	397.8	42.4	392.4		MICU	404	425.2	38.4	417.0
	NEURO ICU	15	422.7	47.0	392.8		NEURO ICU	143	417.4	45.7	412.7
	NICU	1	391.0	--	387.7		NICU	15	433.5	38.7	406.8
	OR	0	--	--	381.4		OR	13	426.5	48.5	407.5
	PACU	0	--	--	375.5		PACU	16	409.3	39.6	412.3
	PICU	9	399.2	31.7	400.9		PICU	81	416.1	40.3	408.0
	SICU	30	425.6	46.5	397.4		SICU	231	424.8	43.1	412.4
	Trauma ICU	24	396.9	42.4	398.7		Trauma ICU	93	426.8	39.0	410.0
	Other	1	450.0	--	386.7		Other	35	424.5	41.5	409.1
	Total	213	404.8	45.0	393.8		Total	2,409	424.7	41.2	413.9
Year 2	CCU	211	414.1	44.3	406.7	Total	CCU	528	421.9	43.8	410.4
	ER	93	405.3	47.7	400.1		ER	303	417.0	45.3	405.8
	ICU/CCU	578	407.7	43.2	401.5		ICU/CCU	1,506	417.8	42.8	406.4
	MICU	333	411.7	43.5	406.1		MICU	793	417.6	41.7	409.5
	NEURO ICU	105	413.0	41.7	404.2		NEURO ICU	263	416.0	44.1	406.9
	NICU	19	389.4	42.7	393.1		NICU	35	408.4	45.5	399.6
	OR	6	399.3	21.5	400.4		OR	19	417.9	43.2	403.1
	PACU	10	376.1	21.7	390.7		PACU	26	396.5	37.2	400.3
	PICU	71	415.9	43.4	409.5		PICU	161	415.1	41.2	408.1
	SICU	268	409.4	43.0	405.2		SICU	529	417.1	43.9	407.7
	Trauma ICU	80	413.4	41.6	400.8		Trauma ICU	197	417.7	41.5	404.8
	Other	38	410.2	40.5	402.0		Other	74	417.5	41.2	404.5
	Total	1812	409.9	43.4	403.3		Total	4,434	417.7	43.0	407.1

Table 23 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 Master’s 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, the percentage of SEE candidates enrolled in MSN programs continued to decrease in FY 2019 (22.7%) in comparison to FY 2018 (23.7%) and FY 2017 (28.3%). The number of SEE examinees in doctoral programs continued to increase in FY 2019 (N = 1,810, 40.8%) over the previous fiscal years FY 2018 (N = 1,291, 30.8%) and FY 2017 (N=915, 23.8%). Score comparisons among groups in this table should be made with caution because of the small sample size of some subgroups.

Table 23. SEE Candidate Performance by Graduate Degree and Program Year, FY 2019

Program Year	Degree Upon Completion	Count	Mean	Standard Deviation	5-year Trend Mean
Year 1	MS Nurse Anesthesia	81	419.3	49.4	400.5
	MS Nursing Major	77	392.6	43.4	386.3
	Other Masters	53	399.8	34.2	395.7
	Doctoral*	2	422.5	6.4	377.5
	Total	213	404.8	45.0	393.8
Year 2	MS Nurse Anesthesia	406	418.1	42.1	405.3
	MS Nursing Major	529	414.6	43.4	408.8
	Other Masters	351	415.3	44.9	403.2
	Doctoral	532	394.6	39.7	389.7
	Total	1,818	409.7	43.5	403.3
Year 3 and above	MS Nurse Anesthesia	519	432.9	33.0	418.7
	MS Nursing Major	297	427.9	47.6	415.4
	Other Masters	318	425.7	40.9	408.8
	Doctoral	1,276	420.3	42.2	413.1
	Total	2,410	424.7	41.3	413.8
Total	MS Nurse Anesthesia	1,006	425.8	39.0	409.8
	MS Nursing Major	903	417.1	45.8	409.2
	Other Masters	722	418.8	43.1	404.1
	Doctoral	1,810	412.8	43.1	405.7
	Total	4,441	417.6	43.1	407.1

*There were few first-year doctoral students taking SEE in FY 2019 and in past 5-year trend sample. The performance results should be viewed with caution because of very small sample size.

Appendix A - Additional NCE and SEE Performance Data

Table A1. NCE Pass Rate Trends—First-Time Candidates 2008 through August 31, 2019

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
FY 2018	84.3
FY 2019	84.3

*Passing standard increased in August 2008

**Passing standard increased in January 2014

Table A2. Descriptive Statistics for NCE Total and Domain-Level Scores—First-Time Candidates FY 2019 (September 1, 2018 – August 31, 2019)

	Mean	Standard Deviation
Total Score	493.7	46.5
Basic Science	500.5	63.0
Equipment, Instrumentation and Technology	503.7	73.0
General Principles of Anesthesia	496.9	58.1
Anesthesia for Surgical Procedures and Special Populations	493.1	57.4

Table A3. Descriptive Statistics for SEE Scores and Domain-Level Information, FY 2019 (September 1, 2018 – August 31, 2019)

	1st Year in Program		2nd Year in Program		3rd Year in Program		All	
	Avg	SD	Avg	SD	Avg	SD	Avg	SD
Total	404.8	45.0	409.7	43.5	424.7	41.3	417.6	43.1
Basic Science	407.5	51.9	407.2	50.8	418.1	48.8	413.1	50.1
Equipment, Instrumentation and Technology	405.8	49.5	413.4	48.7	429.5	45.3	421.8	47.7
General Principles of Anesthesia	404.9	50.2	410.0	47.0	424.2	46.2	417.4	47.3
Anesthesia for Surgical Procedures and Special Populations	404.9	47.1	411.5	49.0	430.3	47.5	421.4	49.1