



## **NCE and SEE Annual Report Calendar Year 2021**

Summary of NCE and SEE  
Performance and Clinical Experience

January 1, 2021 – December 31, 2021

## Table of Contents

Introduction .....	1
Candidate Performance on the NCE .....	2
Demographic Characteristics of NCE Candidate Population, 2021 .....	3
Descriptive Information on Number of Clinical Experiences, 2021 .....	5
NCE Exit Survey Results.....	13
Demographic Characteristics of the SEE Candidate Population, 2021 .....	18
Appendix A - Additional NCE and SEE Performance Data.....	22

## Introduction

This report presents a summary of information on individual performance on the National Certification Examination (NCE) and the Self-Evaluation Examination (SEE) in the calendar year 2021(CY2021), January 1, 2021 through December 31, 2021. It should be noted that starting in 2019, the NBCRNA has transitioned to align its fiscal year (FY) with the calendar year (CY).

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 should note that there was no change to the NCE passing standard in 2021. 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 established in 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. Additionally, 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 2021.

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.

The pandemic brought about some changes in NCE and SEE testing since 2020. The NBCRNA has expanded testing opportunities by supplementing the traditional testing channel from Pearson VUE Professional Center (PPC) only, to include both PPCs and "third-party channel testing locations." These third-party channels are most often colleges and universities, who are not owned or operated by PearsonVUE, but are required to meet test-delivery requirements established by Pearson VUE. All third-party locations offer secure proctored testing, although without the standardization common to the Pearson owned and operated PPCs. To further accommodate candidates, the testing channel was expanded in July of 2020 to include testing for the NCE and SEE on US military bases (where testing is available), for active-duty military candidates.

## Candidate Performance on the NCE

The information in **Table 1** addresses the performance of candidates on the NCE during the CY2021 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 2,636 first-time candidates is 84.1%. The pass rate is lower for repeat examinees, consistent with the previous year's data.

The CY2021 first-time pass rate (84.1%) is slightly lower than the CY2020 pass rate (85.2%). The cumulative first-time pass rate averaged over the previous five years is 84.2% as shown in the final column of **Table 1** (Years 2017–2021 represents January 1, 2017–December 31, 2021, total N = 15,683). First-time examinee pass rates for the NCE, by year since 2008, can be found in **Table A1** in Appendix A of this report.

The total numbers of NCE candidates testing increased in 2021 (3259 in CY2021 vs. 3130 in CY2020), of which were 2,636 first-time candidates similar to that in CY 2020 (N=2,630).

**Table 1. Pass/Fail Summary for NCE Candidates, 2021**

First-Time Candidates	Frequency	Percent	5-year Trend %
Pass	2,216	84.1%	84.2%
Fail	420	15.9%	15.8%
<b>Total</b>	<b>2,636</b>	<b>100.0%</b>	<b>100.0%</b>
Repeat Candidates	Frequency	Percent	5-year Trend %
Pass	381	61.2%	61.8%
Fail	242	38.8%	38.2%
<b>Total</b>	<b>623</b>	<b>100.0%</b>	<b>100.0%</b>

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 (59.5%) were administered 70 items (not including the 30 unscored pretest items). Only 4.9% of NCE candidates failed the test in 70 items. Approximately 18.7% of the candidates took the maximum test length of 140 items.

The number of candidates getting a score determination in 70 items increased slightly in CY2021 over CY2020. In 2021, 64.4% of candidates fell into this category compared to 62.6% in CY2020. The five-year trend is 62.3%.

**Table 2. Pass/Fail Summary by Test Length for First-Time NCE Candidates, 2021**

	Frequency	Percent	5-year Trend %
Pass in 70 items	1,569	59.5%	57.9%
Pass in 71 to 139 items	359	13.6%	14.5%
Pass in 140 items	288	10.9%	11.8%
Fail in 70 items	129	4.9%	4.4%
Fail in 71 to 139 items	86	3.3%	4.0%
Fail in 140 items	205	7.8%	7.4%
<b>Total</b>	<b>2,636</b>	<b>100.0%</b>	<b>100.0%</b>

## Demographic Characteristics of NCE Candidate Population, 2021

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 59.4% of the NCE candidates were female and 40.6% were male. The pass rates for females in 2021 were slightly lower than in 2020, and males continued to show a slightly higher pass rate than females: 2021 (85.7% vs. 83.0% for male and female, respectively); 2020 (86.3% vs. 84.6%); 2019 (85.1% vs. 83.9%), consistent with the five-year trend (final column of Table 3).

The distribution of females and males in the CRNA population is relatively consistent at approximately 60% vs. 40%.

**Table 3. Gender of NCE Candidates, 2021**

Gender	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
Female	1,300	83.0%	267	17.0%	1,567	59.4%	83.4%
Male	916	85.7%	153	14.3%	1,069	40.6%	85.4%
<b>Total</b>	<b>2,216</b>	<b>84.1%</b>	<b>420</b>	<b>15.9%</b>	<b>2,636</b>	<b>100.0%</b>	<b>84.2%</b>

**Table 4** presents the pass rate by age group. The pass rate decreased as examinee age increased, both for the 2021 sample and the five-year trend analysis. Younger students tend to perform better on the NCE. The pass rate for the age groups of 40 or more improved steadily in recent years (73.6% in 2021, 72.1% in 2020 and 69.3% for recent five years). The average age of the 2021 *first-time* NCE candidates was 32.1 years.

**Table 4. Age of NCE Candidates, 2021**

Age	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
Under 30	795	89.6%	92	10.4%	887	33.6%	90.4%
30 - 35	1,038	83.3%	208	16.7%	1,246	47.3%	84.4%
36 - 39	238	77.8%	68	22.2%	306	11.6%	76.8%
40 or more	145	73.6%	52	26.4%	197	7.5%	69.3%
<b>Total</b>	<b>2,216</b>	<b>84.1%</b>	<b>420</b>	<b>15.9%</b>	<b>2,636</b>	<b>100.0%</b>	<b>84.2%</b>

**Table 5** displays pass rates for candidates' clinical background. Approximately 27.1% of the candidates reported their clinical background as ICU/CCU, continuing going down from 34.8% in 2019 and 29.6% in 2020. Pass rate comparisons between different clinical settings should be made with caution, however, because some subgroups for the 2021 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 NEURO ICU, CCU, PICU, and SICU clinical backgrounds respectively have demonstrated the highest rates of success on the NCE.

**Table 5. Clinical Background of NCE Candidates, 2021**

Clinical Background	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
CCU	219	88.0%	30	12.0%	249	9.4%	85.6%
ER	42	84.0%	8	16.0%	50	1.9%	80.0%
ICU/CCU	592	82.8%	123	17.2%	715	27.1%	83.3%
MICU	316	81.2%	73	18.8%	389	14.8%	85.9%
NEURO ICU	105	89.7%	12	10.3%	117	4.4%	84.8%
NICU	31	81.6%	7	18.4%	38	1.4%	79.8%
OR	5	55.6%	4	44.4%	9	0.3%	82.4%
PACU	31	75.6%	10	24.4%	41	1.6%	78.8%
PICU	108	87.8%	15	12.2%	123	4.7%	87.5%
SICU	528	85.4%	90	14.6%	618	23.4%	85.5%
TRAUMA ICU	166	84.7%	30	15.3%	196	7.4%	83.6%
Other	73	80.2%	18	19.8%	91	3.5%	82.6%
<b>Total</b>	<b>2,216</b>	<b>84.1%</b>	<b>420</b>	<b>15.9%</b>	<b>2,636</b>	<b>100.0%</b>	<b>84.2%</b>

**Table 6** displays distribution of pass rates by degree attained. Of 2,636 first-time NCE takers in 2021, 18.6% (n=491) were from programs that awarded a Master of Science in Nursing degree; 10.8% (n=284) graduated from programs awarding a Master of Science in Nurse Anesthesia degree; 8.5% (n=223) were from other master's programs; and 62.1% (n=1,638) were from programs that awarded a doctoral degree. The takers from doctoral degrees continued to grow and constituted over 62% of all first-time takers in 2021. This is a 12% increase from the 50.1% that doctoral candidates comprised in 2020.

When comparing pass rates across clinical background subgroups, pass rate differences across degrees should be viewed with caution because some demographic subgroups feature small sample sizes (Table 6). 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. The performance differences between graduates of Doctoral Degrees and MSN continued to decrease in 2021 as in 2020 (85.3% and 87.0% vs. 86.8% and 88.9%).

**Table 6. Types of Graduate Degrees Reported by NCE Candidates, CY 2021**

Degree Upon Completion	Pass		Fail		Total		5-year Trend
	N	Percent	N	Percent	N	Percent	Pass %
MS Nursing	427	87.0%	64	13.0%	491	18.6%	87.3%
MS Nurse Anesthesia	229	75.6%	74	24.4%	303	11.5%	80.6%
Other Masters	163	79.9%	41	20.1%	204	7.7%	83.2%
Doctoral Degree	1,397	85.3%	241	14.7%	1,638	62.1%	85.1%
<b>Total</b>	<b>2,216</b>	<b>84.1%</b>	<b>420</b>	<b>15.9%</b>	<b>2,636</b>	<b>100.0%</b>	<b>84.2%</b>

## Descriptive Information on Number of Clinical Experiences, 2021

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 2021, and not the sample of NCE candidates during this time frame.* As a result, sample sizes presented in this section (2,359) will not equal the number of first-time NCE candidates (2,636) as reported in Tables 1 through 6.

In previous years, there were different academic requirements for Doctoral and Master’s candidates, so results were reported separately. While requirements are now the same, results in this section still break out by Doctoral and Master’s candidates to allow analysis of differences as well as comparison to previous periods. For clarity, these two groups of students are reported separately in Tables 7a through 15a for Master’s students (n=864), and in Tables 7b through 15b, for Doctoral students (n=1,495), 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 2021 records.
- The *Standard Deviation* column describes the dispersion in the number of cases reported on the 2021 records.
- The *Median* column indicates the median number of cases (50<sup>th</sup> 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 2021 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	864	600	807.9	113.0	796	603
Total Hours of Anesthesia	864	0	1,606.1	311.1	1,550	225
Total Clinical Hours	864	0	2,483.6	332.4	2,426.5	2,000

**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	1,495	600	855.8	132.7	835	603
Total Hours of Anesthesia	1,495	0	1,716.2	355.9	1,653	653
Total Clinical Hours	1,495	0	2,656.9	323.5	2,628	1,898

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

<b>Area</b>	<b>N</b>	<b>Number of Cases Required</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Median</b>	<b>Minimum</b>
Class I	864	0	71.4	35.1	63	1
Class II	864	0	314.6	76.0	304	96
Class III-VI Total	864	200	420.9	91.9	416	200
Class III	864	50	341.6	75.8	335	130
Class IV	864	10	76.0	33.9	70	17
Class V	864	0	2.8	3.0	2	0
Class VI	864	0	0.5	0.8	0	0

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

<b>Area</b>	<b>N</b>	<b>Number of Cases Required</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Median</b>	<b>Minimum</b>
Class I	1,495	0	75.5	34.0	70	2
Class II	1,495	0	342.0	90.0	334	105
Class III-VI Total	1,495	200	438.4	100.6	429	205
Class III	1,495	50	356.6	85.4	347	121
Class IV	1,495	10	78.4	33.7	72	13
Class V	1,495	0	3.0	3.2	2	0
Class VI	1,495	0	0.5	0.9	0	0



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

<b>Area</b>	<b>N</b>	<b>Number of Cases Required</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Median</b>	<b>Minimum</b>
Geriatric, 65+ years	864	100	260.9	68.0	249	102
Pediatric, 2-12 years	864	30	56.1	22.4	51	30
Pediatric, under 2 years	864	10	18.0	8.3	15	10
Neonatal, under 4 weeks	864	0	1.1	1.8	0	0
Trauma/Emergency	864	30	51.9	17.7	48	30
Obstetrical Management	864	30	65.9	33.0	58	30
Cesarean delivery	864	10	31.7	15.9	29	10
Analgesia for labor	864	10	33.5	21.9	27.5	10
Pain Management Encounters	864	15	47.4	38.2	35	15

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

<b>Area</b>	<b>N</b>	<b>Number of Cases Required</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Median</b>	<b>Minimum</b>
Geriatric, 65+ years	1,495	100	261.0	69.5	254	107
Pediatric, 2-12 years	1,495	30	62.9	26.8	58	30
Pediatric, under 2 years	1,495	10	19.9	10.0	17	10
Neonatal, under 4 weeks	1,495	0	1.2	1.8	1	0
Trauma/Emergency	1,495	30	53.9	20.0	49	30
Obstetrical Management	1,495	30	67.1	32.3	58	30
Cesarean delivery	1,495	10	29.1	14.4	26	10
Analgesia for labor	1,495	10	37.5	24.7	30	10
Pain Management Encounters	1,495	15	54.2	42.9	43	15

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Intra-abdominal	864	75	173.0	53.2	165	76
Intracranial Total	864	5	14.0	7.8	12	5
Intracranial Open	864	3	10.2	5.5	9	3
Intracranial Closed	864	0	3.8	4.8	3	0
Oropharyngeal	864	20	83.0	40.7	77	20
Intrathoracic Total	864	15	44.6	19.5	41	15
Heart	864	5	29.2	15.8	26	5
Open Heart Total	864	5	14.9	7.8	13	5
Open Heart with CPB	864	0	13.1	7.3	12	0
Open Heart without CPB	864	0	1.8	2.3	1	0
Closed Heart	864	0	14.4	13.4	11	0
Lung	864	5	10.4	5.6	9	5
Other	864	0	5.0	8.6	3	0
Neck	864	5	21.4	9.6	20	5
Neuroskeletal	864	20	44.2	23.6	39	20
Vascular	864	10	36.5	17.9	34	10

**Table 10b. Section VI: Anatomical Categories (Doctoral)**

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Intra-abdominal	1,495	75	182.4	58.2	173	80
Intracranial Total	1,495	5	14.0	7.4	12	5
Intracranial Open	1,495	3	10.3	5.6	9	3
Intracranial Closed	1,495	0	3.7	4.1	2	0
Oropharyngeal	1,495	20	93.4	45.0	88	20
Intrathoracic Total	1,495	15	42.2	19.6	38	15
Heart	1,495	5	25.3	13.4	23	5
Open Heart Total	1,495	5	13.5	7.7	12	5
Open Heart with CPB	1,495	0	12.0	7.0	10	1
Open Heart without CPB	1,495	0	1.5	2.2	1	0
Closed Heart	1,495	0	11.8	9.8	10	0
Lung	1,495	5	10.4	5.7	9	5
Other	1,495	0	6.6	10.6	4	0
Neck	1,495	5	22.7	10.8	21	5
Neuroskeletal	1,495	20	44.6	24.0	40	20
Vascular	1,495	10	37.6	17.2	34	10

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
General Anesthesia	864	400	585.0	107.9	568	403
Inhalation Induction	864	25	67.7	35.0	58	25
Mask Management	864	25	50.2	42.8	37	25
Supraglottic Airway Devices (total of a & b)	864	35	111.6	50.3	101.5	35
a. Laryngeal mask	864	0	105.5	48.7	96	13
b. Other	864	0	6.1	19.7	0	0
Tracheal Intubation (total of a & b)	864	250	376.0	74.1	362	252
a. Oral	864	0	361.5	70.7	347	246
b. Nasal	864	0	14.6	12.0	12	0
Alternative Tracheal Intub/Endo (total of a & b)	864	25	78.6	54.5	67	25
a. Endoscopic techniques, total	864	5	14.6	16.8	9	5
1. Actual Placement	864	0	10.4	16.1	6	0
2. Simulated Placement	864	0	4.2	7.3	2	0
3. Airway Assessment	864	0	17.3	68.3	6	0
b. Other techniques	864	5	64.1	55.7	56	5
Emergence from Anesthesia	864	300	555.8	120.3	538.5	303
Regional Techniques	864					
Actual Administration (total of a, b, c & d)	864	35	132.2	82.3	112	39
a. Spinal (total of 1 & 2)	864	10	48.0	29.2	42	10
1. Spinal Anesthesia	864	0	44.3	27.0	38	2
2. Spinal Pain Management	864	0	3.7	8.8	1	0
b. Epidural (total of 1 & 2)	864	10	31.8	21.0	25	10
1. Epidural Anesthesia	864	0	8.5	12.9	4	0
2. Epidural Pain Management	864	0	23.3	18.6	19	0
c. Peripheral (total of 1, 2, 3 & 4)	864	10	44.8	62.9	29	10
1. Anesthesia Upper	864	0	11.4	15.4	7	0
2. Anesthesia Lower	864	0	10.2	21.6	5	0
3. Pain Management Upper	864	0	9.2	16.4	4	0
4. Pain Management Lower	864	0	14.0	34.1	6	0
d. Other	864					
1. Anesthesia	864	0	5.2	10.5	1	0
2. Pain Management	864	0	2.5	5.5	1	0
Management (total of 1 & 2)	864	35	90.1	44.7	82.5	35
1. Anesthesia	864	0	52.7	34.9	47	0
2. Pain Management	864	0	37.5	28.9	31	0
Moderate/deep sedation	864	25	121.1	70.9	107	25

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
General Anesthesia	1,495	400	604.6	105.0	591	406
Inhalation Induction	1,495	25	73.4	36.4	65	25
Mask Management	1,495	25	52.7	46.9	38	25
Supraglottic Airway Devices (total of a & b)	1,495	35	119.8	50.6	110	37
a. Laryngeal mask	1,495	0	115.7	48.7	107	26
b. Other	1,495	0	4.1	15.2	0	0
Tracheal Intubation (total of a & b)	1,495	250	393.7	73.6	384	252
a. Oral	1,495	0	375.7	75.2	368	0
b. Nasal	1,495	0	18.0	23.7	14	0
Alternative Tracheal Intub/Endo (total of a & b)	1,495	25	81.2	41.8	71	25
a. Endoscopic techniques, total	1,495	5	13.4	15.4	8	5
1. Actual Placement	1,495	0	9.6	13.5	6	0
2. Simulated Placement	1,495	0	3.9	9.1	2	0
3. Airway Assessment	1,495	0	8.2	21.8	6	0
b. Other techniques	1,495	5	67.8	40.2	60	5
Emergence from Anesthesia	1,495	300	586.7	134.1	569	300
Regional Techniques	1,495					
Actual Administration (total of a, b, c & d)	1,495	35	136.3	71.8	118	38
a. Spinal (total of 1 & 2)	1,495	10	44.3	25.7	39	10
1. Spinal Anesthesia	1,495	0	39.7	22.8	35	2
2. Spinal Pain Management	1,495	0	4.6	9.2	2	0
b. Epidural (total of 1 & 2)	1,495	10	35.2	22.8	29	10
1. Epidural Anesthesia	1,495	0	10.1	13.5	5	0
2. Epidural Pain Management	1,495	0	25.1	19.9	20	0
c. Peripheral (total of 1, 2, 3 & 4)	1,495	10	48.9	44.4	35	10
1. Anesthesia Upper	1,495	0	11.7	12.9	8	0
2. Anesthesia Lower	1,495	0	11.1	14.9	7	0
3. Pain Management Upper	1,495	0	10.1	14.4	5	0
4. Pain Management Lower	1,495	0	15.7	25.3	8	0
d. Other	1,495					
1. Anesthesia	1,495	0	2.5	7.1	0	0
2. Pain Management	1,495	0	5.4	11.0	1	0
Management (total of 1 & 2)	1,495	35	101.9	59.3	88	35
1. Anesthesia	1,495	0	52.5	38.2	45	0
2. Pain Management	1,495	0	49.4	40.0	39	0
Moderate/deep sedation	1,495	25	148.8	85.8	136	25

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Arterial Puncture/Catheter Insertion	864	25	52.0	22.2	47	25
Intraarterial Blood Pressure Monitoring	864	30	76.8	26.3	74	31

**Table 12b. Section VIII: Arterial Technique (Doctoral)**

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Arterial Puncture/Catheter Insertion	1,495	25	56.7	23.9	52	25
Intraarterial Blood Pressure Monitoring	1,495	30	80.4	25.8	77	30

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement—Non-PICC (total of a & b)	864	10	14.9	7.0	12	10
a. Non-PICC, Actual	864	0	10.1	8.8	10	0
b. Non-PICC, Simulated	864	0	4.8	4.7	3	0
Placement—PICC (total of a & b)	864	0	0.6	2.3	0	0
a. PICC, Actual	864	0	0.5	1.9	0	0
b. PICC, Simulated	864	0	0.1	0.9	0	0
Monitoring	864	15	23.1	8.9	20	15

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement—Non-PICC (total of a & b)	1,495	10	14.5	5.6	13	10
a. Non-PICC, Actual	1,495	0	9.9	7.1	10	0
b. Non-PICC, Simulated	1,495	0	4.6	3.9	4	0
Placement—PICC (total of a & b)	1,495	0	0.5	1.9	0	0
a. PICC, Actual	1,495	0	0.3	1.8	0	0
b. PICC, Simulated	1,495	0	0.1	0.7	0	0
Monitoring	1,495	15	22.6	8.6	20	15

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	864	0	4.3	5.6	2	0
Monitoring	864	0	10.2	7.0	10	0

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Placement	1,495	0	4.5	4.8	3	0
Monitoring	1,495	0	9.5	6.8	8	0

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

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Ultrasound (US)-Guided Techniques (total of a & b)	864	0	47.5	64.4	29	0
a. Regional	864	0	32.9	56.5	16	0
b. Vascular	864	0	14.6	17.2	10	0
Intravenous Catheter Placement	864	100	165.5	78.8	143	100
Advanced Noninvasive Hemodynamic Monitoring	864	0	23.2	94.4	2	0

**Table 15b. Section XI: Other (Doctoral)**

Area	N	Number of Cases Required	Mean	Standard Deviation	Median	Minimum
Ultrasound (US)-Guided Techniques (total of a & b)	1,495	0	52.7	53.6	37	0
a. Regional	1,495	0	35.6	45.6	20	0
b. Vascular	1,495	0	17.1	17.1	13	0
Intravenous Catheter Placement	1,495	100	173.6	75.1	151	100
Advanced Noninvasive Hemodynamic Monitoring	1,495	0	23.4	98.7	3	0

## NCE 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:

- Pre-examination activities such as registration and scheduling, locating the testing center, and interaction with test center staff;
- Examination experience such as readability, fairness of test questions, and use of testing software;
- Examinee perception of the alternative question formats; and
- 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*. 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.

The responses represent tests administered. If a candidate tested more than once during 2021, their responses would be counted each time they completed the survey.

The NBCRNA updated the post-exam survey questions starting with September 2021 administrations; some surveys questions were no longer given for concision. For completion of reporting, responses to questions on both old and new surveys are included, but for questions that were no longer on the revised survey, the Ns are smaller. Additionally, the N for each response differs slightly due to:

- Respondents did not always answer all the questions, as reflected by the unequal sample size across the sections of the survey.
- Prior to September 2021, the survey was split into two unique parts and randomly administered. Thus, there were small differences in the final numbers of candidates exposed to each of these two survey parts.

Responses were analyzed based on samples of NCE test takers who were administered the exit survey during the period of CY2021. After each test administration, the test taker can contact the NBCRNA office to address any problems or concerns related to the NCE.

Seven statements pertain to pre-examination scheduling and registration activities. The responses to a question concerning scheduling mode – internet or phone, not included in the table below, indicate that 93.5% of NCE candidates scheduled their examination on the Internet rather than by phone. Given the vast majority of NCE candidates scheduled their exam through internet, this survey question was eliminated since the September 2021 administration. Responses to the other six survey questions are summarized in **Table 16**.

The numbers of candidates registering satisfaction with scheduling an acceptable test date and time continued increasing from the previous year (94.5% and 93.2% for CY2021 vs. 92.7% and 91.0% for CY2020 respectively), as NBCRNA worked closely with Pearson VUE to make some centers other than

the top tier Pearson Professional Centers available to candidates and supported capacity. Overall satisfaction with scheduling and registration remains high.

**Table 16. Responses to Survey Questions: Scheduling and Registration**

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
I was able to schedule an acceptable test date.	2,046	94.5%	110	5.1%
I was able to schedule an acceptable test center location.	2,017	93.2%	136	6.3%
The exam reservation process was easy to use.	2,123	98.1%	28	1.3%
The test center was easy to locate.	2,116	97.7%	35	1.6%
The test center staff was helpful and knowledgeable*	1,090	98.7%	7	0.6%
The testing center registration/check-in process was handled in a professional and efficient manner.	2,127	98.2%	23	1.1%

\*Responses to this question were collected from January through August 2021 as this question was eliminated from the revised Survey in September.

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 (97.3% agreement), the CY2021 NCE examinees were satisfied with their testing experience. Agreement concerning the fairness of test questions increased from 85.1% in 2019, 87.1% in CY2020 to 88.8% in CY2021.

88.8% of candidates agreed that the content outline was fairly represented based responses to a question presented on the survey before September 2021. It should be noted that the content outline is rigidly adhered to for the scored items on the exam. Pretest items, however, were randomly given and may not reflect content outline specifications closely. This and two other survey questions were removed from the revised Survey administered since September 2021.



**Table 17. Responses to Survey Questions: Examination and Testing Experience**

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
I thought the examination questions were fair*	973	88.8%	123	11.2%
The questions on the test reflected the knowledge and subject matter I have been taught**	950	90.8%	96	9.2%
The graphs, figures, and diagrams in the questions were easy to read.	1,964	91.1%	160	7.4%
The graphs, figures, and diagrams in the questions fit onto the screen.	1,905	88.4%	225	10.4%
I was able to 'scroll' the test window in order to view an entire graph or figure in a question*	1,066	97.4%	15	1.4%
The areas of the content outline were fairly represented*	972	88.8%	117	10.7%
My testing environment was clean, quiet, and comfortable.	2,088	96.4%	60	2.8%
I encountered no technical problems with the test administration software.	2,099	97.0%	48	2.2%
The test administration software was user-friendly*	1,096	99.3%	5	0.5%
Overall, I was satisfied with my testing experience.	2,106	97.3%	40	1.8%

\*Responses to the questions were collected from January through August 2021 as these questions were eliminated from the revised Survey since September 2021.

\*\*This question replaced the previous fairness question and responses were collected from September through December 2021.

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). **Table 18** summarizes the responses to six survey questions related to the MCR, SA, drag and drop, and hotspot question formats. Overall candidates responded positively to questions concerning fairness of these item types, consistent with responses seen in past years. Given that alternative question types are commonly seen by NCE takers, the revised survey asks one general question about alternative items and eliminate questions about specific types for concision.

**Table 18. Responses to Survey Questions: Alternative Question Formats**

Survey Question	Agree		Disagree	
	Count	Percent	Count	Percent
The questions in the Multiple Correct Response format were fair*	1,000	91.4%	90	8.2%
The questions in the Short Answer/Calculation format were fair*	1,050	96.0%	38	3.5%
The questions in the Drag and Drop format were fair*	1,042	95.2%	48	4.4%
The questions in the Hotspot format were fair*	1,008	92.1%	76	6.9%
I understood how to respond to the questions in the alternative formats.	2,094	97.2%	35	1.6%
I needed help figuring out how to respond to the questions in the alternative formats*	426	38.9%	660	60.3%

\*Responses to the questions were collected from January through August 2021 as these five questions were eliminated from the revised Survey since September 2021.

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 tested in CY2021, over 81% (81.4% increased from 79.2% in 2020) stated that the SEE helped them in their certification examination preparation. This is a substantial and steady increase in the past several years (from under 60% in FY2017 to 67.9% in FY2018 to 77.4% in 2019). Of over 2,000 respondents who completed the question regarding preparation for the NCE in both old and revised surveys, 95.8% and 98.1%, respectively, responded they attended a review course. Finally, 94.3% reported that their nurse anesthesia educational program featured computerized testing; this number has been increasing since 2013. Given using computerized testing has become a norm, this question was no longer given in the revised survey.

**Table 19. Responses to Survey Questions: Preparation for the NCE**

Survey Question	Response	Count	Percent
Taking the SEE helped prepare me to take the certification examination.	Agree	1,755	81.4%
	Disagree	336	15.6%
Please indicate below if your nurse anesthesia educational program featured any academic tests using computer-based testing*	Yes	1,032	94.3%
	No	56	5.1%
If you took a review course in preparation for this examination, please indicate below which review course you took.	January through August 2021	1098	
	Valley Anesthesia	71	6.5%
	Core Concepts	27	2.5%
	Howard Review	-	--
	R&R Board Review	-	--
	PACES	49	4.5%
	CRNA Secrets	1	0.1%
	Review at AANA Meeting	-	--
	NARC4U	-	--
	APEX Anesthesia Review	891	81.2%
	Other commercial	2	0.2%
	Course Organized by My Program	11	1.0%
	Did Not Take	46	4.2%
If you took a review course in preparation for this examination, please indicate below which review course you took.	September through December 2021	1043	
	A. Valley Anesthesia	42	4.0%
	B. Core Concepts	11	1.1%
	C. PACES	42	4.0%
	D. APEX Anesthesia Review	917	87.9%
	E. Storm Anesthesia	-	--
	F. Other commercial	2	0.2%
	G. Course Organized by My Program	9	0.9%
	H. Did Not Take	20	1.9%

\*Responses to this question were collected from January through August 2021 as this question was eliminated from the revised Survey since September 2021.

## Demographic Characteristics of the SEE Candidate Population, 2021

The following section of this report summarizes 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 (Year 2017 through 2021, January 1, 2017–December 31, 2021, N = 22,864) 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: 40.7% of SEE examinees were male and 59.2% were female and five takers reported other. The mean total score for Year-2 examinees (410.0, n=1,951) was higher than the mean total score for Year-1 examinees (394.2, n=144). The mean SEE score for the Year-3-and-above students was highest at 426.49 (n=3,728).

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 higher scores on the SEE than females.

**Table 20. SEE Candidate Performance by Gender and Program Year, 2021**

Program Year	Gender	Count	Mean	Standard Deviation	5-year Trend Mean
Year 1	Female	86	388.1	38.3	389.3
	Male	56	404.6	38.6	406.1
	Other	2	367.0	25.5	367.0
	<b>Total</b>	<b>144</b>	<b>394.2</b>	<b>39.0</b>	<b>396.9</b>
Year 2	Female	1,152	405.0	46.4	405.1
	Male	796	417.3	46.7	415.2
	Other	3	411.3	78.4	411.3
	<b>Total</b>	<b>1,951</b>	<b>410.0</b>	<b>47.0</b>	<b>409.2</b>
Year 3 and above	Female	2,208	424.5	40.8	423.3
	Male	1,520	430.5	40.6	430.6
	<b>Total</b>	<b>3,728</b>	<b>426.9</b>	<b>40.8</b>	<b>426.2</b>
Total	Female	3,446	417.1	43.9	414.9
	Male	2,372	425.4	43.3	423.1
	Other	5	393.6	61.9	393.6
	<b>Total</b>	<b>5,823</b>	<b>420.4</b>	<b>43.9</b>	<b>418.2</b>

**Table 21** summarizes SEE scores by age group. The average age of Year-1 SEE examinees was 30.8 years. The average age of Year-2 SEE examinees was 31.4 years. The average age of Year-3 SEE examinees was 32.1 years. The mean age of all SEE examinees during the period was 31.8 years, on average similar to the sample of first-time NCE examinees (32.1 years). The largest age groups were composed of examinees under the age of 30 (38.2%) and examinees between the ages of 30 and 35 (42.5%). In 2021, the same as in previous years, except for the small number of Year 1 takers, younger examinees scored higher than older examinees within the same training year, but the differences across age groups become smaller. The same results were found in the five-year trending sample.

**Table 21. SEE Candidate Performance by Age and Program Year, 2021**

Program Year	Age	Count	Mean	Standard Deviation	5-year Trend Mean
Year 1	Under 30	68	391.1	39.6	399.9
	30 - 35	53	401.9	34.1	399.0
	36 - 39	15	374.5	40.9	384.8
	40 or above	8	406.6	50.6	385.8
	<b>Total</b>	<b>144</b>	<b>394.2</b>	<b>39.0</b>	<b>396.9</b>
Year 2	Under 30	844	414.8	47.8	413.4
	30 - 35	760	407.4	46.0	408.1
	36 - 39	212	407.0	47.3	403.9
	40 or above	135	399.6	43.9	398.1
	<b>Total</b>	<b>1,951</b>	<b>410.0</b>	<b>47.0</b>	<b>409.2</b>
Year 3 and above	Under 30	1,311	430.7	41.3	430.4
	30 - 35	1,662	426.6	40.1	426.3
	36 - 39	420	422.2	44.0	420.6
	40 or above	335	419.3	36.7	416.3
	<b>Total</b>	<b>3,728</b>	<b>426.9</b>	<b>40.8</b>	<b>426.2</b>
Total	Under 30	2,223	423.5	44.8	421.3
	30 - 35	2,475	420.2	42.9	418.6
	36 - 39	647	416.1	45.9	413.1
	40 or above	478	413.6	40.0	408.7
	<b>Total</b>	<b>5,823</b>	<b>420.4</b>	<b>43.9</b>	<b>418.2</b>

**Table 22** displays summaries of SEE scores by clinical background. Overall, the most commonly identified clinical setting was ICU/CCU (28.8%).

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, 2021**

	Clinical Background	Count	Mean	Std Dev	5-Yr Mean	Program Year	Clinical Background	Count	Mean	Std Dev	5-Yr Mean
Year 1	CCU	9	396.9	19.4	396.0	Year 3 & Above	CCU	386	429.3	38.9	429.1
	ER	7	383.4	59.9	400.7		ER	47	427.9	43.6	422.1
	ICU/CCU	38	402.4	40.5	396.7		ICU/CCU	987	425.0	40.7	425.0
	MICU	18	384.4	56.6	394.6		MICU	541	422.5	42.4	425.5
	NEURO ICU	10	389.9	43.3	399.0		NEURO ICU	183	425.7	39.9	424.7
	NICU	2	366.5	6.4	394.3		NICU	39	433.4	40.2	423.1
	OR	3	367.7	31.2	377.0		OR	30	410.6	48.0	426.7
	PACU	4	399.0	25.8	381.9		PACU	69	425.0	40.2	425.3
	PICU	3	383.0	44.5	394.0		PICU	180	423.1	41.9	424.5
	SICU	30	393.0	31.6	401.2		SICU	873	430.4	40.6	428.9
	TRAUMA ICU	18	402.4	28.1	399.9		TRAUMA ICU	253	435.8	38.1	431.0
	Other	2	392.5	2.1	394.4		Other	140	422.1	40.9	421.2
	<b>Total</b>	<b>144</b>	<b>394.2</b>	<b>39.0</b>	<b>396.9</b>		<b>Total</b>	<b>3,728</b>	<b>426.9</b>	<b>40.8</b>	<b>426.2</b>
Year 2	CCU	187	409.3	43.0	411.8	Total	CCU	582	422.3	41.2	420.7
	ER	33	406.6	48.3	405.3		ER	87	416.2	48.3	414.4
	ICU/CCU	573	409.6	48.5	407.4		ICU/CCU	1,598	418.9	44.3	416.8
	MICU	262	411.5	46.3	410.5		MICU	821	418.1	44.5	417.9
	NEURO ICU	95	408.0	45.7	411.2		NEURO ICU	288	418.7	43.0	418.3
	NICU	31	405.5	52.8	404.8		NICU	72	419.6	48.1	414.3
	OR	11	393.7	27.3	400.7		OR	44	403.4	43.8	417.5
	PACU	42	397.6	42.9	396.4		PACU	115	414.1	42.7	412.8
	PICU	77	412.7	42.7	413.1		PICU	260	419.6	42.4	418.5
	SICU	433	413.4	47.5	411.1		SICU	1,336	424.1	43.7	420.9
	TRAUMA ICU	170	405.4	47.7	410.0		TRAUMA ICU	441	422.7	44.3	420.9
	Other	37	415.8	49.6	411.3		Other	179	420.4	42.7	416.9
	<b>Total</b>	<b>1951</b>	<b>410.0</b>	<b>47.0</b>	<b>409.2</b>		<b>Total</b>	<b>5,823</b>	<b>420.4</b>	<b>43.9</b>	<b>418.2</b>

**Table 23** displays summaries of SEE scores by degree to be attained. As is noted, starting in FY2017, “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 2021 (12.7%) in comparison to 2020 (16.2%) and 2019 (20.9%). The number of SEE examinees in doctoral programs continued to increase in 2021 (N=4,053, 69.6%) over the previous years 2020 (N=2,620, 58.9%) and 2019 (N = 2,047, 44.2%). 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, 2021**

<b>Program Year</b>	<b>Degree Upon Completion</b>	<b>Count</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>5-year Trend Mean</b>
Year 1*	MS Nurse Anesthesia	51	405.1	39.1	403.3
	MS Nursing Major	15	359.7	34.5	387.1
	Other Masters	44	392.4	38.9	398.4
	Doctoral	34	395.5	32.7	394.5
	<b>Total</b>	<b>144</b>	<b>394.2</b>	<b>39.0</b>	<b>396.9</b>
Year 2	MS Nurse Anesthesia	375	418.3	45.7	410.9
	MS Nursing Major	289	423.3	49.5	416.3
	Other Masters	108	404.4	67.6	412.0
	Doctoral	1,179	404.6	43.3	401.3
	<b>Total</b>	<b>1,951</b>	<b>410.0</b>	<b>47.0</b>	<b>409.2</b>
Year 3 and above	MS Nurse Anesthesia	172	419.9	46.4	426.3
	MS Nursing Major	437	437.6	38.1	432.3
	Other Masters	279	429.6	43.3	424.7
	Doctoral	2,840	425.4	40.4	425.1
	<b>Total</b>	<b>3,728</b>	<b>426.9</b>	<b>40.8</b>	<b>426.2</b>
Total	MS Nurse Anesthesia	598	417.6	45.5	416.4
	MS Nursing Major	741	430.4	44.5	420.7
	Other Masters	431	419.5	52.0	416.8
	Doctoral	4,053	419.1	42.3	418.3
	<b>Total</b>	<b>5,823</b>	<b>420.4</b>	<b>43.9</b>	<b>418.2</b>

\*There were few students in Year 1 taking SEE in 2020 overall and by Degree program 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 December 31, 2021**

Reporting Period	Percent Passing
2008* (Graduates 2007 – 2008)	89.9
2009 (Graduates after 2008)	87.7
2010	88.9
2011	89.1
FY2012	88.5
FY2013	88.4
FY2014**	87.8
FY2015	85.0
FY2016	84.5
FY2017	82.6
FY2018	84.3
CY2019	84.4
CY2020	85.2
CY2021	84.1

\*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 2021 (January 1, 2021 – December 31, 2021)**

	Mean	Standard Deviation
Total Score	494.6	46.1
Basic Science	498.5	66.1
Equipment, Instrumentation and Technology	504.4	72.4
General Principles of Anesthesia	496.9	58.8
Anesthesia for Surgical Procedures and Special Populations	497.9	54.8

**Table A3. Descriptive Statistics for SEE Scores and Domain-Level Information, 2021 (January 1, 2021 – December 31, 2021)**

	1st Year in Program		2nd Year in Program		3rd Year in Program		All	
	Avg	SD	Avg	SD	Avg	SD	Avg	SD
Total	394.2	39.0	410.0	47.0	426.9	40.8	420.4	43.9
Basic Science	393.5	49.9	411.2	53.3	423.6	48.8	418.7	50.9
Equipment, Instrumentation and Technology	400.7	41.2	412.9	49.8	430.7	44.9	424.0	47.4
General Principles of Anesthesia	391.6	48.6	411.0	52.1	427.6	46.0	421.1	49.0
Anesthesia for Surgical Procedures and Special Populations	394.3	40.6	408.5	51.7	428.8	45.8	421.2	48.9