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Original Research

The 2022 Certified Flight Registered Nurse Pulse Survey

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A B S T R A C T

Objective: The Certified Flight Registered Nurse (CFRN) credential independently validates a registered nurse's advanced knowledge, skills, and abilities in the unique specialty of flight nursing. Introduced in 1993 and celebrating its 30th anniversary in July 2023, the CFRN is held by over 5,500 registered nurses. The purpose of the 2022 CFRN pulse survey was to better understand the ways CFRN-certified registered nurses value this national flight nursing specialty credential. The CFRN survey is a companion to the 2022 Certified Transport Registered Nurse pulse survey, which focused on the Certified Transport Registered Nurse critical care ground transport nursing credential.

Methods: The Board of Certification for Emergency Nursing e-mailed individuals in its database of CFRN credential holders and asked them to respond to a 14-question online survey between October 17, 2022, and November 8, 2022. Participation in the survey was voluntary. Of the 5,275 verified CFRN holders who received the survey, 992 responded, for a response rate of 18.8%. The survey instrument included discrete field and open-ended questions. Data were deidentified for analysis, and institutional review board exemption was received. Counts and percentages were reported, and descriptive statistics were used.

Results: The highest percentage of flight nurses who responded have more than 10 years of experience in flight nursing (35.3%) and are employed by a stand-alone transport program (42.7%). Flight nurses reported they spent a mean of 70% of their work hours transporting via rotor wing aircraft, with a predominantly adult patient population. The top perceived benefits of being a CFRN-certified nurse were a sense of accomplishment and pride (90.7%) followed by flight physiology knowledge (85.4%), flight nursing clinical knowledge (83.4%), and confidence as a flight nurse (80.6%).

Conclusion: The 2022 CFRN pulse survey identified current CFRN demographics, practice environments including transport percentage by mode and patient population types, and perceived benefits of the CFRN credential. The findings suggest CFRNs are very experienced, provide care for patients across the age continuum, and perceive multiple intrinsic and extrinsic benefits of CFRN certification, all of which are essential to safe, evidence-based advanced nursing practice in the unique, complex, autonomous, and dynamic flight environment.

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Registered nurses (RNs) are core flight crewmembers and, in the United States, are most often partnered with a flight paramedic, although some flight programs partner the flight nurse with a second flight nurse, a flight physician, or a flight respiratory therapist.¹ In

addition to advanced clinical knowledge and skills in both emergency and critical care nursing, flight nursing practice requires a focus on safety in the out-of-hospital environment to include expertise in flight physiology coupled with expertise in advanced assessment and intervention skills that are dependent on analytical thinking, complex decision making, and prioritization as part of a high-functioning team.² To safely provide appropriate, timely, and evidence-based care to a critically ill or injured patient in the high-stakes, complex, autonomous, and demanding flight setting, RNs must obtain

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Figure 1. CFRN certification seal.

advanced knowledge, training, and skills that far exceed their initial education, licensure, and in-hospital experience.^{3,4}

National specialty certification is an independent process that validates an RN's advanced clinical knowledge, professionalism, skills, and abilities within a well-defined specialty area. Through the renewal process, specialty certification also provides an important framework for ensuring a nurse's specialty expertise remains current and relevant over time. Specialty certification has been linked to greater nurse career success and satisfaction and improved patient care and outcomes.^{5,6} The Certified Flight Registered Nurse (CFRN) credential (Fig. 1) offered by the Board of Certification for Emergency Nursing (BCEN) since July 1993 independently validates an RN's advanced knowledge, skills, and abilities in the flight nursing environment.

The CFRN, initially developed by BCEN in partnership with the National Flight Nurses Association, which later became the Air & Surface Transport Nurses Association (ASTNA), was introduced by BCEN 30 years ago and continues to be recommended by the ASTNA with respect to individual professional development and transport program accreditation.³ The CFRN certification program has been accredited by the Accreditation Board for Specialty Nursing Certification since 2007⁷ and has been an American Nurses Credentialing Center Magnet-accepted certification since 2009.⁸ The Commission on Accreditation of Medical Transport Systems (CAMTS) has recognized and encouraged CFRN certification since its 2nd edition accreditation standards⁹ published in 1993, the year the CFRN was introduced. A long-time and leading proponent of national certification for transport professionals, CAMTS has required specialty certification for RNs as part of its accreditation standards since 2010.¹⁰ In the CAMTS 12th edition accreditation standards, which went into effect on January 1, 2023, CAMTS exclusively requires transport-specific certification for transport nurses, with the CFRN being 1 of 3 accepted credentials listed and the only flight-specific credential.¹¹ With an annual average growth rate of 9% over the past decade, the number of CFRNs has more than doubled since 2012 (Fig. 2). Today, there are more than 5,500 CFRNs.

BCEN's 2019 transport nursing role delineation study updated the skills and knowledge essential for flight and ground transport nursing practice.¹² As a result of this most recent role delineation study, for the first time, the CFRN and Certified Transport Registered Nurse (CTRN) certification programs have separate examination content outlines, which went into effect in August 2021 and February 2022, respectively.^{13,14} The 2 certification programs now also have separate test item banks. These changes underpin the mode-specific differences between the 2 specialties, and the separate examination content

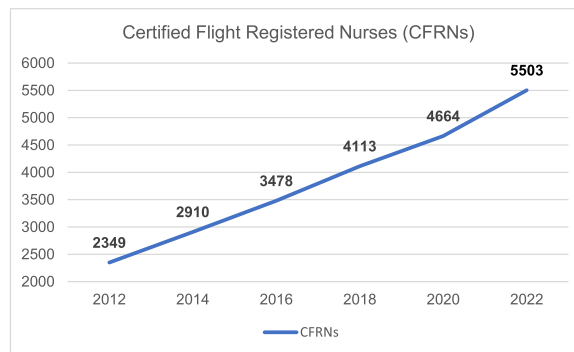


Figure 2. The number of CFRN credential holders at year end based on the BCEN CFRN database.

outlines provide a more detailed, specialty-specific road map for test takers.

In the new CFRN examination form and content outline, the former general principles of transport nursing practice domain is now general principles of *flight* transport nursing practice, and its categories (transport physiology, scene operations management, communications, safety and survival, disaster management, professional issues, and systems management) consist of content specific to flight nursing and the flight mode of transport. These changes reflect an appropriate emphasis on the crucial domains of flight physiology and scene safety. Reflecting the significant volume of high-acuity patients transported by air, the resuscitation domain, which includes principles of assessment and patient preparation, airway, mechanical ventilation, and perfusion, was given a heavier weighting and now constitutes 10% of the examination.¹³ In line with transfer patterns associated with specialty tertiary and quaternary centers,¹⁵ the number of examination items on special populations (obstetric, neonatal/pediatric, geriatric, and bariatric) was also increased.

Considering the strong growth in CFRNs over the past decade, the introduction of a stand-alone examination content outline in 2021, and the CAMTS transport-specific certification requirement for 2023, we set out to describe factors associated with holding the CFRN credential. The purpose of the 2022 CFRN pulse survey was 3-fold: 1) describe CFRN experience, practice environments, and patient populations; 2) gain fresh and additional insight into RNs' reasons for earning the CFRN; and 3) understand the perceived value and benefits of CFRN certification overall and with respect to flight nursing during the coronavirus disease 2019 (COVID-19) pandemic. The CFRN study was designed to be a companion to a similar CTRN study also conducted in 2022.¹⁶ Combined, these 2 studies are the first to describe the value of specialty certification for the unique specialty of transport nursing and provide insight into the domains of both critical care ground transport and flight nursing.

Methods

BCEN has partnered with Human Resources Research Organization (HumRRO), an Alexandria, VA-based independent nonprofit research organization with over 60 years of experience in research design and performance, since 2016. BCEN commissioned HumRRO to conduct the large-scale Value of CEN Certification Research Study in 2017 as well as a later study on CEN recertification, from which questions in the 2022 CTRN pulse survey¹⁶ were derived. Questions from the 2022 CTRN pulse survey were modified for use in this CFRN survey. The University of California Davis Institutional Review Board reviewed the survey and study design and determined it was exempt.

BCEN e-mailed individuals in its database of verified CFRN credential holders and invited them to complete a 14-question online survey between October 17, 2022, and November 8, 2022. Participation in the survey was voluntary. The survey instrument included 6 multiple-choice and 4 yes/no quantitative questions plus 4 open-ended questions to allow for free-text comments. Survey questions included career and workplace demographics, transport percentage by mode, patient population by age, year of initial CFRN certification, perceived value of CFRN certification, reason for seeking the CFRN credential, and perceived benefit of CFRN certification in treating patients during the COVID-19 pandemic. In advance of the effective date of the new (12th edition) CAMTS accreditation standards,¹¹ which, for the first time, require RNs to hold a transport-specific specialty credential, respondents were also asked if CAMTS accreditation was a factor in their decision to earn the CFRN.

We performed a descriptive analysis, reporting the number and percent, mean and standard deviation, and median and interquartile range as appropriate for all quantitative questions using Stata 17 MP (StataCorp LLC, College Station, TX). The data were deidentified and analyzed in the aggregate. Responses for open-ended questions were reported by category of response.

Results

Of the 5,275 verified CFRN holders who received the survey, 992 responded, for a response rate of 18.8%.

Certified Flight Nurse Demographics

We asked flight nurses how many years of flight-specific nursing experience they had (Table 1). The largest percentage (35.3%) reported having more than 10 years of experience in flight nursing. The next largest group (26.7%) reported having 2 to 5 years of experience. We also asked about the year flight nurses initially earned the CFRN certification (Fig. 3). With a 22% average annual increase in the number of initial CFRN certifications over the past decade, the annual number of initial CFRN certifications has increased 4-fold since 2012.

We also asked flight nurses to describe their current employer and indicate if their transport program was CAMTS accredited

Table 1
Certified Flight Registered Nurse Demographics

Flight Nursing Experience	n (%)
< 2 years	143 (14.4)
2-5 years	265 (26.7)
5-10 years	234 (23.6)
> 10 years	350 (35.3)
Total	992 (100)

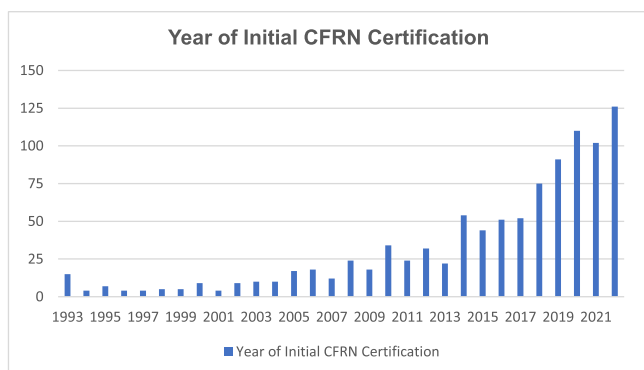


Figure 3. The self-reported year of initial CFRN certification.

Table 2
Current Employer and Transport Program Accreditation Status

Current Employer	n (%)
Children's hospital	28 (2.8)
Community hospital (< 200 beds)	78 (7.9)
Large hospital (> 200 beds)	198 (20.0)
University/academic hospital and/or university/academic trauma center	252 (25.4)
Transport program	424 (42.7)
Military	12 (1.2)
Total	992 (100)

CAMTS-Accredited Program?	n (%)
Yes	758 (76.4)
No	234 (23.6)
Total	992 (100)

CAMTS = Commission on Accreditation of Medical Transport Systems.

Table 3
Percent of Transport Time by Mode

Mode	No. of Respondents (%)	Mean (SD)	Median (IQR)
Rotor wing	915 (92.2)	69.7 (36.3)	90 (0, 100)
Fixed wing	589 (55.3)	20.8 (30.5)	5 (0, 30)
Critical care ground	636 (64.1)	18.1 (27.9)	5 (0, 20)
Other	246 (24.8)	47.6 (45.8)	32 (0, 100)

IQR = interquartile range; SD = standard deviation.

(Table 2). Of those who responded, most are employed by a stand-alone transport program (42.7%); 25.4% work for a university/academic hospital or university/academic trauma center; and 20.0% are employed by a large, nonuniversity hospital. A large majority (76.4%) work for a CAMTS-accredited transport program.

Flight nurses were asked to report the percentage of their current work spent in rotor wing, fixed wing, critical care ground, or other (eg, hospital bedside care) (Table 3). For those who responded to this question, most of their current work was spent in rotor wing transport followed by other, fixed wing, and critical care ground transport.

Flight nurses were also asked to describe their patient population by age (Table 4). For those who responded to this question, the most prevalent patient care age group was adult followed by geriatric, pediatric, and neonatal.

Value of Certification

We asked flight nurses to describe the value of CFRN certification by indicating whether the CFRN made a positive difference in 13 intrinsic and extrinsic benefits commonly associated with certification (Table 5). Nine of 10 (90.7%) reported that holding the CFRN contributed to their sense of accomplishment and pride. The next 3 highest perceived benefits of being a CFRN-certified nurse were flight physiology knowledge (85.4%), flight nursing clinical knowledge (83.4%), and confidence as a flight nurse (80.6%). More than three quarters of respondents also indicated that being CFRN certified made a positive difference in both their critical thinking in the flight environment (76.7%) and their ability to provide expert care for their patients (76.2%).

Table 4
Patient Population

Patient Population	No. of Respondents (%)	Mean (SD)	Median (IQR)
Neonatal (0-28 days)	773 (77.9)	4.0 (8.1)	1 (0, 5)
Pediatric (1 month-17 years)	964 (97.1)	15.9 (13.8)	10 (9, 20)
Adult (18-65 years)	978 (98.6)	48.9 (17.0)	50 (40, 60)
Geriatric (> 65 years)	949 (95.7)	34.8 (15.3)	35 (25, 45)

IQR = interquartile range; SD = standard deviation.

Table 5
Value of Certified Flight Registered Nurse Certification

Value of Certification Category: Intrinsic and Extrinsic Benefits	n (%)
Confidence as a flight nurse	756 (80.6)
Flight nursing clinical knowledge	782 (83.4)
Flight physiology knowledge	801 (85.4)
Scene/transport safety knowledge	647 (69.0)
Ability to anticipate and manage the challenges of the flight environment	678 (72.3)
Ability to provide expert care for your patients before, during, and after flight transports	715 (76.2)
Ability to ensure the safety of your patients before, during, and after flight transports	678 (72.3)
Ability to ensure the safety of yourself and your team before, during, and after flight transports	639 (68.1)
Ability to communicate and collaborate with your flight team and medical director	581 (61.9)
Ability to communicate and collaborate with clinical staff at sending and receiving facilities	584 (62.3)
Critical thinking in the flight environment	719 (76.7)
Self-efficacy in the flight environment	694 (74.0)
Sense of accomplishment and pride	851 (90.7)
Total	938 (100)

Nine hundred twenty-seven (93.4%) flight nurses opted to expand on their answers regarding the value of certification categories through an open-ended question. Comments on the value of CFRN certification included the following:

- Provides a foundational framework to advance, enhance, reinforce, or refresh flight nursing knowledge
- Immensely valuable to master flight physiology
- Informs and streamlines critical thinking and decision making in the air
- Instills and validates self-confidence and professional credibility with other clinicians
- Source of great pride and a top career accomplishment
- Opens doors to transition from the hospital to a flight job
- The CFRN credential, combined with employer-provided experience, education, and training, validates expertise
- Shows commitment and dedication to specialty care and the profession

Flight nurses also underscored the belief that the CFRN credentialing examination should place even more emphasis on the unique, mode-specific and crucial components of flight safety, scene safety, packaging of the patient, and operational challenges in general. Many noted that the operational aspects of the high-stakes flight environment can be more challenging than the clinical care of critically ill or injured patients.

Flight Nursing During the COVID-19 Pandemic

Although one third of flight nurses (36.6%) said having the CFRN credential did contribute to their ability to deliver the best possible

Table 6
Coronavirus Disease 2019 (COVID-19) Caregiving

Did Having the CFRN Contribute to Your Ability to Deliver the Best Possible Care for Your Patients With COVID-19?	n (%)
Yes	340 (36.6)
No	589 (63.4)
Total	929 (100)

CFRN = Certified Flight Registered Nurse.

care for their patients with COVID-19, nearly two thirds (63.4%) said it did not (Table 6).

When asked to comment on how being a CFRN benefitted them, their team, and/or their patients during the COVID-19 pandemic, 906 (91.3%) responded, and many reflected on 1 or more of the following:

- Being overall clinically and operationally solid afforded more mental bandwidth and greater ability to remain cool and collected while dealing with COVID-19
- Ability to adapt, improvise, and pivot rapidly to problem solve and overcome challenges
- Possessed essential and wide range of ventilator and respiratory management skills and strategies
- Diversified range of advanced knowledge, elevated ability, and confidence to handle higher-acuity and more complex patients during longer transports
- Boosted self-confidence, inspired confidence and comfort of patients and families, and enhanced credibility with clinical colleagues

In responding to this question, a large number of flight nurses also reported that having the CFRN credential neither helped nor hindered or that they were doing fewer transports or not flying at all during the pandemic because of the transport program or base being shut down or due to redeployment to the hospital during the pandemic.

Reason for Being CFRN Certified

In an open-ended question, we asked flight nurses to describe what prompted them to earn the CFRN credential. Many of the 928 (93.5%) responses indicated earning the CFRN was required by their employer or CAMTS or both and also cited professional (extrinsic) and personal (intrinsic) reasons.

Professional reasons included the following:

- Build more knowledge and skills
- Framework for staying current on trends and research
- Verify specialty expertise/desire to be board certified in my specialty
- Prestige/professional pride
- Keep team and patients safe
- Deliver highest standard of care

Personal reasons included the following:

- Be the best
- Know I have what it takes/build self-confidence
- Pride/sense of accomplishment/challenge self
- Passion for learning

Other common responses included the following:

- Entry ticket to flight nursing job or career
- Raise or bonus depends on it
- Set the example as an educator or leader
- Move from flight medic to flight nurse
- Current (non-CFRN) credential no longer accepted

Fifty-six percent (n = 523) of flight nurses indicated CAMTS requirements were a factor in their decision to earn the CFRN, whereas 44% said it was not (n = 408).

Discussion

As described by Frakes et al,¹ RNs are core members of critical care flight teams. Like its ground transport nursing certification cousin,

the CTRN, the CFRN is a complex and multifaceted credential, spanning transport mode-specific clinical knowledge and professional issues as well as safety, survival, disaster preparedness, scene operations management, communications, and aircraft and equipment knowledge.

In 2017, BCEN commissioned its research partner, HumRRO, to conduct a value of certification study of the Certified Emergency Nurse (CEN) credential, and the findings were subsequently published in several BCEN white papers. This large-scale study captured responses from over 8,800 certified and noncertified RNs and over 1,000 of their supervisors.¹⁷ In that study of emergency nurses, 90% said holding the CEN gave them a feeling of accomplishment and pride, and 80% said being CEN-certified made it easier to have the knowledge needed on the job. In the first-ever ground transport nursing value of certification survey, the 2022 CTRN pulse survey, CTRNs reported even higher numbers for these 2 value of certification categories.¹⁶ Perhaps not surprisingly, the 2022 CFRN Pulse Survey found that nurses holding the CFRN also felt similarly on these two points—with 90% reporting the CFRN made a positive difference in their sense of accomplishment and pride and 83% reported being CFRN-certified made a positive difference in their flight transport clinical knowledge.

In the CEN study, holding the CEN was significantly and positively correlated with nursing self-efficacy (by the nurses) and emergency nursing expertise (according to their supervisors).¹⁷ In the CTRN pulse survey, 82% indicated that CTRN certification contributed to their self-efficacy in the ground transport environment. Similarly, 74% of CFRN pulse survey respondents reported that the CFRN makes a positive difference in their self-efficacy in the flight environment.

The large-scale 2019 Emergency/Trauma/Transport Nursing Workforce Survey^{18,19} found that although 69% of nurses across all 3 specialties reported feeling prepared/competent in their specialty, 75% of transport nurses reported feeling prepared/competent—the highest percentage of the 3 specialties. Of the 645 transport nurse respondents, the CFRN was the most-held credential, with more than half (53.6%) having earned it. Transport nurse respondents also perceived fewer skill/ability gaps and training needs across nurses in the transport specialty than their trauma and emergency nursing peers perceived in their respective specialties. Furthermore, transport nurses identified decision making under pressure and critical thinking as the top 2 specific deficits in the preparedness or competency of new transport nurses. Additional transport-specific findings are described by Miller²⁰ in his call for the critical care transport industry to pay attention to this Emergency/Trauma/Transport Nursing Workforce Survey research.

A limitation of the CFRN pulse survey, which we believe to be the first study to define how flight nurses value the CFRN credential, is the moderate response rate. Although the CTRN and CFRN pulse surveys offer a foundation on which future value of transport specialty certification can expound on, more research is needed. Ideally, like the transport care specialty itself, that research will be multidisciplinary.

Previous research on transport nurse safety practices²¹ found sub-optimal compliance with available safety technologies, practices, and community-generated recommendations. The 2019 BCEN transport nursing role delineation study underscored the differences between the flight and ground modes and substantiated the significance of mode-specific knowledge, skills, and abilities. Our finding that many CFRNs feel the certification examination should place even more emphasis on safety and operations indicates an opportunity for additional research, quality improvement, and educational publications in the safety domain. Examples include “how we teach” safety, teamwork, and high reliability; the efficacy of quality improvement initiatives to increase compliance with safety topics; and a repeat of the 2009 ASTNA survey²¹ on transport nurse safety practices, perceptions, and experiences.

Conclusion

The 2022 CFRN pulse survey, reported in 2023 during the CFRN certification program's 30th anniversary year, provides the first comprehensive analysis of CFRNs' experience, practice environments, and patient population as well as RNs' reasons for earning the CFRN and the perceived value and benefits of CFRN certification. RNs earn the CFRN credential to validate their clinical and patient care excellence, prepare themselves for the flight transport environment, for a competitive hiring advantage, and to lead by example. Our findings also suggest nurses who have earned the CFRN perceive multiple intrinsic and extrinsic benefits of CFRN certification, all of which are essential to safe, evidence-based, advanced nursing practice in the unique, complex, autonomous, and dynamic flight nursing environment.

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