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*“The ethics of excellence are grounded in action — what you actually do ....”*

*— Price Pritchett*

## Grounded in Excellence: The Certified Transport Registered Nurse (CTRN)

When traveling by ground is the best or only way to get a critically ill or injured patient to the definitive care they need, having advanced caregivers on board who are well-versed in the transport environment promotes optimal outcomes. It can even mean the difference between life and death. Nurses who earn the Certified Transport Registered Nurse (CTRN®) certification from the Board of Certification for Emergency Nursing (BCEN®) possess the critical care ground transport specialty knowledge, skills and experience necessary to deliver and sustain essential care—every second, and every mile, of the way. *For more than 20 years, the CTRN has set the standard for ground transport nursing excellence.*

### Expert Care Starts at Scene or Referring Facility

Ground transport nurses are primary members of highly trained critical care teams who offer enhanced services with a scope of practice beyond advanced life support (ALS).<sup>1</sup> Responding *on scene*, transport nurses rapidly assess, stabilize, and initiate life-sustaining and life-saving interventions in a wide variety of prehospital environments. Their education and skills give them the flexibility to “scoop and run” or “treat and then run.”<sup>2</sup>

Even more frequently, critical care ground transport nurses are called to take the lead during *interfacility transfers*. In these situations, they must maintain the complex treatments of patients with complex needs while moving them across the highways to a higher level or specialty care facility—ready and able at any moment to escalate the level of care.

*Consider this scenario:* An EMS ground ambulance crew delivers a 48-year-old male with a serious heart attack involving complete blockage of a major artery to the local community hospital where initial treatment—a cardiac catheterization with stent placement—is given. Although the blockages are opened, the heart muscle has suffered significant damage. The patient’s condition deteriorates to ventricular arrest.

He is resuscitated at the bedside and put on a special type of heart and lung bypass known as extracorporeal membrane oxygenation (ECMO). This both resumes blood and oxygen flow and stabilizes him for transfer to a facility that has the capacity to perform the open heart surgery his physicians deem necessary to save his life.

At this point, the patient is receiving blood pressure support, sedation, and pain management, as well as maintenance fluids, anticoagulants, and blood products, for a total of 10 drips and 10 pumps. In addition, he is also connected to a cardiac monitor with monitoring for blood pressure, heart rate and rhythm, arterial blood pressures, and oxygen saturation, plus a carbon dioxide monitor and the ECMO ventilator device consisting of a pump and an oxygenator. Once transport by a critical care ground transport specialty team gets underway, each of these therapies and pieces of equipment must be maintained, monitored and potentially rapidly adjusted.

Whether working a scene or a facility transfer, it is crucial that nurses caring for patients in out-of-hospital environments stay current on critical care clinical and technological advances *and also* possess a mastery of the real and consequential impacts and risks that moving by ground means for their patient’s condition. Transport nursing practice depends on “independent judgment, analytical thinking, decision-making and prioritization.”<sup>3</sup>

### Nurses Preferred for Critical Transitions

In the dynamic, challenging and space-limited transport environment, ground transport team configurations must maximize both scope of practice and knowledge, skills and abilities. A typical team consists of a critical care transport RN, a critical care paramedic, and an emergency medical technician (EMT) driver. When needed, a perfusionist may also be on board to help monitor and manage the patient and all the equipment.

Transport RNs combine “an educational foundation with clinical experience and the flexibility to operate at an expanded scope of practice. Relative to paramedics and respiratory therapists, nurses offer more extensive clinical assessment skills, pharmacology experiences, radiology and laboratory data interpretation ability, and critical care for complex disease processes,” plus they have (institution-specific) ability to perform advanced procedural skills.<sup>4</sup> Further, “[b]ecause of this expanded skill set and clinical experience, the RN is the typical team leader for specialty care transport,” with nurses preferred as team leader even over physicians because of their “heightened familiarity of the logistics and operations of transport medicine.”<sup>4</sup>

## More Interfacility Transfers Mean Greater Need for Ground Transport Expertise

In addition to a wide range of cardiac scenarios and ECMO scenarios, including those seen with COVID-19 patients, critical care transport scenarios also span high-risk obstetric (OB) patients, patients suffering from complex neurological conditions, and pediatric patients requiring care at specialized centers. As a result, the need for CTRN-certified nurses has never been greater.

The major factors driving the increase in interfacility transfers and the need for expert transport teams<sup>5</sup> are:

- **Specialization** accelerated by medical advances
- **Closures** of OB and other specialty units, and even entire facilities, particularly in rural communities
- **Regionalization** due to closures and pooling of specialty resources in select locations

Other factors include the rise of freestanding emergency departments (EDs), an aging baby boomer generation, and changes in reimbursement.<sup>5</sup> The surge in ground transports during the COVID-19 pandemic underscored the need for and value of ground transport expertise.

All of these factors piggyback on aspects of the landmark Emergency Medical Treatment and Active Labor Act (EMTALA), a 1986 federal law that governs the transfer of patients between hospitals. Among the requirements for transferring *unstable* patients to a higher level facility is the mandate that those type of transfers are made with *qualified personnel* and appropriate medical equipment in order to minimize risks to the patient.

### When Going by Ground Makes Sense

Whether for interfacility transport or emergency scene response, going by ground may be the preferred mode for a variety of practical and medically appropriate reasons, including:

- Timeliness that rivals air travel in certain scenarios
- Ability to accommodate an extended medical team and more/larger equipment (due to bigger cabin space and less weight restrictions)
- Ability to accommodate a patient's family member
- Capability to travel over long distances
- Overall capacity and capabilities to support a wider range of patient needs

Ground also serves as the backup mode when weather or other conditions prohibit flying. Ground transport is also required on both ends of fixed-wing transports in order to get patients to and from the airport. In less developed countries, ground transport is very common.<sup>4</sup> When compared to air transport, ground transport is typically more cost-effective, reliable and safe overall.

### Why Moving a Patient Is Risky Business

While research on *interfacility* transfers (IFTs)—moving between hospitals—is still limited, the risks associated with moving a patient from one location *within* a hospital to another, called *intra*hospital transfers (IHTs), are well known and well documented.<sup>6-11</sup>

Inside hospitals, patients are moved for temporary reasons, such as for diagnostic imaging, and more permanently, such as from the ED to a critical care unit. Such moves—even for stable, non-serious patients—present significant risks. For critically ill patients, whose conditions are often unstable and who are typically hooked up to multiple pieces of apparatus and equipment, intrahospital transfers are “associated with increased incidence of life-threatening complications, morbidity and mortality.”<sup>9</sup>

The potential complications and adverse events that moving a patient may precipitate<sup>9-11</sup> include:

- Pulmonary and airway-related complications (especially if the patient is on a ventilator)
- Cardiovascular complications (from blood pressure and heart rhythm alterations to cardiac arrest)
- Exacerbation of existing injury (especially brain, spine and orthopedic)
- Interruption of therapies in place (such as medications and infusions)
- Nosocomial infection
- Endocrine imbalances or abnormalities
- Problems that occur due to equipment or monitoring failures (equipment dislodged, interruption of therapy/care)

Beyond patient-related factors, and separate from facility- and equipment-specific factors, there are also multiple *staff-related factors* that contribute to adverse events during transport,<sup>9-11</sup> including:

- Lack of supervision
- Insufficient preparation of patient for transport
- Inexperienced staff & insufficiently educated and trained staff
- Unfamiliarity with/failure to inspect equipment
- Interruption of therapy or equipment dislodgement
- Inadequate resuscitation

To be clear, these are the documented risks that persist for transport *inside* hospitals, despite the presence of countless resources and personnel. For *interfacility* transfers, no such safety net exists.

### Specially Trained Teams Can Make a Difference

Following years of documented mishaps, accidents and worse, detailed intrahospital transport rules, protocols, checklists and documentation now exist worldwide and require *entire teams* of advanced and well-prepared personnel to accompany patients being moved within a facility. Still, risks persist. Even with guidelines in place, one prospective audit of IHTs found “[o]verall, 44% of transfers resulted in incident occurrence, many of which were preventable....”<sup>8</sup>

Having the right team in place can make a big difference. Stearley's intrahospital study found “patients moved by a specially trained transport team had a 15.5% overall complication rate” versus national complication rates as high as 75%.<sup>6</sup> When you add the variables and vagaries of *interfacility* transfers, the need for experts is clear.

## A Call to Action: National Certification Matters

Today's critical care ambulances are a combination of an emergency department and an ICU on wheels. When the doors of their vehicle—often called a mobile intensive care unit (MICU)—close, ground transport nurses step into a very autonomous environment. While they operate under physician's orders, they also run off of standing protocols and their own clinical judgment when immediate action is required. Following every safety protocol<sup>12</sup> and navigating the potential clinical impacts of conditions endemic to the uniquely challenging ground transport environment—including noise, vibration, acceleration, turns, abrupt stops, and temperature and humidity variations—are part and parcel of every trip.

Although transport medicine draws and borrows from many medical specialty areas, as a 2018 review article points out, “it is much more than the sum of its parts.”<sup>13</sup> As the authors explain: “[t]here are important, unique aspects of transport medicine that make it impossible to assume that someone competent in an ICU setting will be equally competent in the environment of transport...” Competencies, they add, “in the peculiarities of transport ... are critical.”<sup>13</sup>

National board certification—distinct from completing technical courses—validates a nurse's mastery of the entire critical care ground transport body of knowledge. Nurses who hold the CTRN have demonstrated they have the know-how to manage the care of critically ill adult and pediatric patients, and are well prepared to continually assess changes in patients' conditions and appropriately intervene when necessary to maintain optimum health *while* managing and minimizing the impacts and risks of the ground transport environment.<sup>14</sup>

## CTRN's History: Ground Transport as a Distinct Nursing Specialty & Key Milestones

Recognition of ground transport as a discrete specialty came a decade after the 1993 introduction of BCEN's flight nursing credential, the Certified Flight Registered Nurse (CFRN), as the role of RNs in critical care ground transport programs increased. BCEN joined with the Air & Surface Transport Nurses Association (ASTNA) to collaborate on the initial development of the CTRN. In 2004, the two organizations funded a flight and ground transport nursing role delineation study (RDS) that identified distinct practice requirements meriting a separate certification for ground transport nurses.

BCEN offered the first CTRN exam on March 31, 2006. In February 2009, the CTRN certification program was deemed Magnet®-accepted. In August 2023, the CTRN certification program earned national accreditation after a sufficient number of nurses held the credential.

## Advocacy for Transport Nursing Excellence

In the still relatively young field of transport medicine, which has grown rapidly in recent decades, ASTNA and the Commission on Accreditation of Medical Transport Systems (CAMTS) are longtime steadfast advocates for transport nursing and specialty certification. ASTNA's *Position Statement on Transport Nurse Certification* encourages nurses to “demonstrate their commitment to the profession and validate their nursing expertise by becoming certified in their specialty.”<sup>15</sup> In their 2016 *Air Medical Journal* article “Education and Certification for Patient Transport,” CAMTS leaders emphasized that standardized certifications help ensure the health, safety and welfare of transport patients and “are a reflection of who we are as professionals.”<sup>16</sup> Today, CAMTS medical transport accreditation standards require transport nurses to hold a transport-specific national credential.<sup>17</sup>

Also championing for safe, effective, evidence-based ground transport care are the Association of Air Medical Services and the Association of Critical Care Transport.<sup>18</sup> The American Academy of Pediatrics (AAP) joined with the American College of Emergency Physicians and the Emergency Nurses Association and emergency medical services organizations to elevate emergency pediatric care and transport.<sup>19-21</sup> In fact, AAP recommends every pediatric transport team have at least two patient care providers, with at least one being an RN.<sup>4</sup>

## Today's CTRN: Indispensable Expertise for Patients on the Move

From the start of 2020 through early 2026, the number of CTRNs nearly tripled to over 675 certified nurses, reflecting rising demand for nurses skilled in critical care ground transport. Original research conducted in 2022 highlighted the clinical and operational value of CTRN certification,<sup>22</sup> and a 2023 specialty spotlight in the *American Journal of Nursing* showcased the unique expertise nurses bring to high-acuity patient transport.<sup>23</sup> These notable developments illuminate the CTRN as a recognized mark of professional excellence.

As the medical value of ground transport care and the patient care and safety contributions of expert ground transport nurses gain even greater awareness, BCEN's proud dedication to critical care ground transport nurses and the CTRN remains grounded in excellence.

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