Critical care transport includes the interfacility transport of patients who require critical care commensurate with the level of care provided by a physician or registered nurse. The paramedic level of care is most common in the prehospital setting, but a registered nurse is the primary caregiver in more than 95% of critical care transport missions. The necessity for interfacility transport is increasing for a multitude of reasons, including the development of regional intensive care unit (ICU) facilities and the availability of specialized surgical procedures and time-sensitive interventions.
The triage decision regarding the transport of an acutely ill patient requires consideration of multiple factors. Typically, the practitioner may decide which transport agency will complete the transport, evaluate the patient’s needs during transport, determine a mode of transport, and specify when the transport should occur. Experience of the authors (SS, WS, AR), however, indicates that patient-related factors such as predictability and complexity, or transport factors such as adverse weather or road conditions, are not consistently addressed in the triage decision. No universally accepted, clear guidelines for making an informed triage decision are available.

The purpose of this article is to describe the early development of a new tool for determining necessary level of care during transport. It is inspired by the American Association of Critical-Care Nurses (AACN) Synergy Model for Patient Care and based on the proposition that transport level of care must be determined by the needs of the patient, including resiliency, vulnerability, stability, complexity, resource availability, participation in care, participation in decision making, and predictability. Nurses’ characteristics are also a component of the triage decision. The descriptions here are the initial developmental steps and are theoretical at this time. Matching the patient’s needs with the appropriate providers could reduce the risk of poor outcomes for patients.

Background

A primary indicator for interfacility transfer can be a specific diagnosis such as ST-segment elevation myocardial infarction. Owing to the time-sensitive nature of moving a patient with ST-segment elevation myocardial infarction to a facility capable of performing percutaneous coronary intervention, many facilities without that capability have developed well-rehearsed algorithms to make the transfer process to a previously determined facility that does offer percutaneous coronary intervention go quickly and smoothly. Most transfers, however, do not fall into such a category, and the referring provider must negotiate a transfer with a provider from 1 or more potential receiving facilities.

The burden of responsibility for determining the mode and time of transfer is generally placed upon the referring provider, with or without input from the receiving facility. He or she must weigh factors such as the patient’s condition, knowledge of local transport capabilities, weather, travel time, and geography, among others. Air transport is often chosen over ground transport because the competencies of the flight personnel are often perceived to be higher than those of ground teams. It is a common misconception that the level of care provided by different transport agencies is equal given the same mode of transport, yet there is evidence that specialty retrieval teams from the receiving facility have reduced the occurrence of adverse events such as prolonged hypotension and hypoxia and decreased time to definitive treatment. Education and skill levels vary widely from one agency to another. The referring provider must consider multiple factors and a significant amount of data, some of which he or she may not be aware of or have access to. The known and, more importantly, the unknown factors could have a substantial impact on the

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patient and the transfer for which the referring provider takes responsibility. No widely accepted tool exists to assist practitioners in an appropriate selection of transport level of care. One aspect critical to triage is the use of a tool to make the process more than an arbitrary decision of the provider.10,12

Numerous attempts have been made to create and apply triage tools to the process of planning critical care transport. Werman et al13 reported on the use of an original triage tool to determine mode of transport to tertiary care for cardiac patients. Those researchers examined the influence of using ground transport time and 3 physiological markers in the determination of air versus ground transport of cardiac patients. Results of that study indicate that the level of care provided on each mode of transport is equivalent but the level of care provided is not indicated. Another triage tool, The Transport Risk Assessment in Pediatrics (TRAP score) was evaluated by Kandil et al14 for use in determining the destination unit of transported pediatric patients. However, the tool was not used to determine mode of transport or level of care required for the transport. Another triage tool was used to guide international repatriation requests.15 This tool looked at age, geographical location, and infrastructure to determine the urgency of these requests. Although these tools worked well in the contexts in which they were developed, none of them attempt to address patients’ characteristics, as described in the AACN Synergy Model for Patient Care, nor do any of the models address the knowledge, skills, and experience of the transport nursing staff.

Two other tools, the Therapeutic Intervention Scoring System and the Modified Early Warning System, yielded poor prognostic performance and did not differentiate for interfacility level of care required to transport the patient safely.16 The Risk Score for Transport Persons17 showed some discriminatory power for predicting instability during transport, but made little association between the scoring system and a differentiation in transport personnel. Van Lieshout et al,18 however, in a survey of intensivists, found that the level of interfacility personnel was the most important factor in determining “transportability.” They reported that by optimizing the level of care, even the most critically ill patient could be transported safely.

Patients would benefit if decisions about the transport level of care were based on the patients’ needs.

The AACN Synergy Model for Patient Care

It would be beneficial to the patient to base decisions about the transport level of care on a model that focuses on the needs of the patient. The AACN Synergy Model for Patient Care, developed by a group representing the AACN, is a patient-centered model that is focused on the needs of the patient, the competencies of the nurse, and the synergy created when those needs and competencies match.5 The original purpose of the model was to provide a theoretical framework for certified practice. It seeks to define nursing beyond a set of tasks and instead defines nursing through higher-level characteristics and competencies. The levels of patient characteristics and nurse competencies occur on a continuum and may vary with time. The Synergy Model for Patient Care has been used in a variety of circumstances and for a variety of purposes. Examples of recent uses include staff development,19 building a nursing productivity measure,20 and care of patients with acute coronary syndromes.21

The 8 characteristics of patients in the model include resiliency, vulnerability, stability, complexity, resource availability, participation in care, participation in decision making, and predictability. A patient is evaluated on each of the 8 characteristics according to their capacity in that category, and assigned a numeric value: either 1 (very low), 3 (moderate), or 5 (high). For example, a patient evaluated for resiliency, or the ability to return to baseline level of functioning after an illness or injury, is rated a level 1 if the patient had a very low level of resiliency, a 3 for moderate resiliency, and 5 for a high level of resiliency. Each characteristic is evaluated similarly.

The 8 characteristics of nurses in the model include clinical judgment, advocacy and moral agency, caring practices, collaboration, systems thinking, response to diversity, facilitation of learning, and clinical inquiry. Similar to the evaluation of a given patient, a nurse may be evaluated by using the characteristics of a nurse on a similar scale of 1 to 5 based on strength in an area from competent (1) to expert (5). According to the AACN, “Synergy results when the needs and characteristics of a patient, clinical unit, or system are matched with a nurse’s competencies.”5 Historically, the Synergy Model for Patient Care has been used in a wide variety of settings from inpatient care to the military.22,23

The final component of the AACN Synergy Model for Patient Care is outcomes. There are 3 levels of outcomes. The first set of outcomes is derived from the patient and
includes function, satisfaction, comfort, and other patient-centered foci. Nurse-derived outcomes include presence or absence of complications, the extent to which care or treatment objectives were attained, and physiological changes. System-derived outcomes are recidivism and cost/resource utilization.5

Adaptation of Synergy Model to Critical Care Transport

The individual making the triage decision in the interfacility critical care transport process carries the responsibility of ensuring that the most appropriate transport mode, time, and level of care are provided. An inappropriate decision in any of the 3 areas can have serious implications for the patient and the health care system, which could include an inappropriate destination unit for the patient, deterioration in the patient’s condition, patient/caregiver mismatch, or even a patient’s death. The predominant system places the full responsibility of this decision on the referring provider, who has no universally accepted tool to guide this judgment.

A provider from the referring facility initiates an interfacility transfer by communicating a transfer request to an admitting clerk at a potential receiving facility. Generally, a clerk then follows facility-specific processes for finding an accepting provider. A conversation takes place between the referring and receiving provider, and once the transfer is accepted and a bed is assigned, the referring facility staff is notified of the bed assignment and given a phone number to call nursing report. In most cases, staff from the referring unit makes transport arrangements with a local transport agency. Typically, a call-taker at the transport agency completes a transport-specific form (Table 1), and the closest team available is dispatched to complete the transport. Triage in critical care transport is almost universally based on various devices and interventions such as invasive catheters and medications. Provider involvement in the transfer process varies widely depending on the setting, although the referring provider generally writes a medical order for transport. The purpose of developing this tool is to challenge the present triage process, and rather, focus on the needs of the patient and the clinical competencies of the transport staff selected.

The AACN Synergy Model for Patient Care provides a well-established theoretical basis on which to develop a new triage tool, the Transport Triage Tool (Table 2).

Table 1 Example of brief transport form

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Patient name</th>
<th>Date of birth</th>
<th>Referring facility</th>
<th>Bed</th>
<th>Referring physician</th>
<th>Referring phone number</th>
<th>Receiving facility</th>
<th>Accepting physician</th>
<th>Bed assignment</th>
<th>Diagnosis</th>
<th>IV, oxygen, monitor?</th>
<th>Infusions?</th>
</tr>
</thead>
</table>

Table 2 shows the linkage between the AACN Synergy Model for Patient Care and the Transport Triage Tool. Use of the tool is expected to determine appropriate level of transport staff and thus improve patients’ outcomes through assignment of appropriate staff, while increasing efficiency of scarce transport resources. Trained transport personnel are infrequently involved in the transport triage decision. Tertiary referral facilities, however, which use their own retrieval teams, may use these specialized teams in the triage decision. At these facilities, each transfer request can be evaluated by using a tool designed specifically for the purpose of evaluating the patient’s characteristics and needs and aligning transport level of care and mode of transport to best meet those needs.

Operationalizing the association between patient characteristics and level of care is still theoretical at this point and will be the subject of future research. If each category is equal in importance, the user could take any measure of central tendency (ie, mean, mode, or median) and use this as the basis for selecting the appropriate level of care. It is likely, however, that some factors may be deemed more important than others and as such may be weighted more heavily. Future research will focus on providing empirical data to support an appropriate decision. At the present stage of development, numerous permutations are being examined to determine those values that most accurately determine an appropriate
<table>
<thead>
<tr>
<th>Patient characteristic</th>
<th>AACN definition</th>
<th>Triage tool adaptation</th>
<th>Triage tool example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resiliency</td>
<td>The capacity to return to a restorative level of functioning using compensatory/coping mechanisms; the ability to bounce back quickly after an insult</td>
<td>Minimally resilient; unable to mount a response; minimal reserves</td>
<td>Multiple comorbid conditions (CRF, uncontrolled IDDM, with sepsis); chronic debilitating illness (NYHA class 3 HF); single event beyond individual's ability to respond (LV rupture)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderately resilient; able to mount a moderate response; able to mount some compensatory response</td>
<td>Chronic illness with decreasing ability to independently respond as evidenced by repeated hospitalizations and/or ED visits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Highly resilient; able to mount and maintain a response; strong reserves</td>
<td>Acute isolated illness or injury without confounding comorbid conditions</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>Susceptibility to actual or potential stressors that may adversely affect patients' outcomes</td>
<td>Highly vulnerable; susceptible; unprotected; fragile</td>
<td>Physiologically dependent on technology or continuous intravenous medications (infusions or frequent boluses) to maintain homeostasis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderately vulnerable; somewhat susceptible; somewhat protected</td>
<td>Requires technology or pharmaceuticals for improved condition, but could tolerate significant interruptions without threat to health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimally vulnerable; safe; not fragile</td>
<td>No technological or chemical requirements to maintain homeostasis</td>
</tr>
<tr>
<td>Stability</td>
<td>The ability to maintain a steady-state equilibrium</td>
<td>Minimally stable; labile; unresponsive to therapies; high risk of death</td>
<td>Requires frequent medication or ventilator titrations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderately stable; able to maintain steady state for limited time; some responsiveness to therapies</td>
<td>Condition is changeable but would not be adversely affected by no interventions for intervals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Highly stable; responsive to therapies; low risk of death</td>
<td>Unlikely to need therapeutic intervention to maintain homeostasis during transport</td>
</tr>
<tr>
<td>Complexity</td>
<td>The intricate entanglement of 2 or more systems (eg, body, family, therapies)</td>
<td>Highly complex; intricate; vague; atypical presentation; multiple interacting technologies, therapies, and comorbid conditions</td>
<td>MODS; mechanical ventilation secondary to failure of nonrespiratory systems; AKI secondary to sepsis secondary to pneumonia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderately complex; moderately involved patient dynamics</td>
<td>One or 2 body systems or therapeutic modalities that have low to moderate interaction; status post ICH on vent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimally complex; routine; clear cut; typical presentation</td>
<td>Single system, process, or therapeutic modality</td>
</tr>
<tr>
<td>Resource availability</td>
<td>Extent of resources (eg, technical, fiscal, personal, psychological, and social) the patient, family, and community bring to the situation</td>
<td>Few resources; needed resources to survive/thrive not available at present location</td>
<td>Needed resource, expertise, or therapeutic modality inaccessible at present location such as interventional cath lab, immediate life-sustaining surgery; leaking thoracic aneurysm with no thoracic surgery immediately available</td>
</tr>
<tr>
<td>Rating</td>
<td>Triage tool adaptation</td>
<td>AACN definition</td>
<td>Nurse characteristic</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------</td>
<td>-----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>1</td>
<td>Advanced practice nurse–led; synthesizes multiple sources of data; anticipates problems; multidisciplinary collaboration to optimize final disposition</td>
<td>Clinical reasoning, which includes clinical decision making, critical thinking, and a global grasp of the situation, coupled with nursing skills acquired through a process of integrating formal and informal experiential knowledge and evidence-based guidelines</td>
<td>Clinical judgment</td>
</tr>
<tr>
<td>3</td>
<td>Registered nurse–led; collects complex data; recognizes trends; recognizes limitations and seeks appropriate resources to improve patients’ outcomes</td>
<td>The ongoing process of questioning and evaluating practice and providing informed practice; creating practice changes through research utilization and experiential learning</td>
<td>Clinical inquiry</td>
</tr>
<tr>
<td>5</td>
<td>Paramedic-led; collects basic level data, uses protocols to complete goal of transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Advanced practice nurse–led; improves, deviates from, and individualizes practice and guidelines to meet the present and anticipated needs of the patient/family; reviews current literature and research and incorporates into practice</td>
<td>Nursing activities that create a compassionate, supportive, and therapeutic environment for patients and staff, with the aim of promoting comfort and healing and preventing unnecessary suffering; includes, but is not limited to vigilance, engagement, and responsiveness of caregivers, including family and health care personnel</td>
<td>Caring practices</td>
</tr>
<tr>
<td>3</td>
<td>Registered nurse–led; questions current policies and practice; looks for alternatives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Paramedic-led; strict adherence to protocols; EBP used only to the extent of current protocols</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Advanced practice nurse–led; anticipates needs of patient and patient’s family both during and after transport; promotes safety through avoidance of hazards</td>
<td>Working with others (eg, patients, families, health care providers) in a way that promotes/encourages each person’s contributions toward achieving optimal/realistic patient/family goals; involves intra- and interdisciplinary work with colleagues and community</td>
<td>Collaboration</td>
</tr>
<tr>
<td>3</td>
<td>Registered nurse–led; tailors caring practices to individual patient’s needs; anticipates needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Paramedic-led; bases care on standards and protocols; no anticipation of future needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Advanced practice nurse–led; seeks opportunities to teach and be taught; recruits diverse resources when necessary to optimize patient care; Communication at a collegial level with providers from both referring and receiving facilities</td>
<td>Body of knowledge and tools that allow the nurse to manage whatever environmental and system resources exist for the patient/family and staff, within or across health care and non–health care systems</td>
<td>Systems thinking</td>
</tr>
</tbody>
</table>

Continued
level of care. Once an appropriate level of care is determined, an appropriate mode and time can be determined through a combination of resource availability, decision trees, and geographic factors.

Nursing Implications

The Synergy Model for Patient Care underscores the necessity for the nursing skill set in the care of and decision making about critically ill patients. Through the
adaptation of this model to the interfacility transport triage decision, the nursing continuity of care is extended from the sending critical care area to the receiving critical care area. Nurses have a place in the collaborative care process as part of the team ensuring holistic, safe care for critical care patients in the unstructured environments of transport.25 Specifically, most states require that at least 1 crew member of a critical care practitioner.
Exemplar Cases

The Synergy Model provides us with a unique mechanism of evaluating the needs of a patient during transport. Likewise, our adaptation using the Transport Triage Tool provides us with a similar mechanism for objectively quantifying the level of care provided by a transport agency. Once completed, an unbiased assessment of the patient’s needs exists parallel to an unprejudiced appraisal of available resources. The final step is interpreting the needs of the patient and appropriately selecting a level of care capable of meeting those identified needs. The following exemplars provide insight into this process.

Exemplar 1

A 48-year-old man came to the emergency department at a community hospital with a 3-day history of progressive weakness and shortness of breath. He had a history significant for mild chronic obstructive pulmonary disease, coronary artery disease with 2 coronary stents placed 6 months ago, and hypertension. Cardiac enzyme levels were normal; the level of brain natriuretic protein was elevated, indicating fluid overload and heart failure; and electrocardiography showed an old inferior wall myocardial infarction, age indeterminate. Uncompensated heart failure was diagnosed and treated with diuretics, and the patient was admitted to the ICU. His hospital course was complicated by development of frequent intermittent ventricular tachycardia and hypotension, now requiring vasopressor support and intravenous amiodarone. An echocardiogram showed a nearly akinetic left ventricle with an ejection fraction of 10%. No evidence of renal compromise was apparent (ie, serum creatinine levels were normal), but he had decreasing urine production. The treating provider elected to transfer the patient to a tertiary facility for further evaluation and management and for possible evaluation for heart transplant.

The treating provider called the transfer line at the tertiary facility, 81 miles away. A 4-way conversation followed between the treating provider, the cardiology fellow, the hospital transfer coordinator, and the nurse practitioner from the transport team of the receiving facility. The patient was accepted for transfer, the hospital transfer agent assigned a cardiac ICU bed, and the nurse practitioner on the transport team completed the transport triage evaluation. The triage evaluation was based on the adaptation of AACN Synergy Model for Patient Care into the Transport Triage Tool, and evaluated the patient’s needs on 8 separate characteristics. His current support included 2 peripheral intravenous catheter sites, a vasopressor being actively titrated, an anti-arrhythmic infusion at a continuous rate, and oxygen at 4 L/min via nasal cannula. He had no invasive monitoring, no central venous access, and no cardiac assist devices such as an intra-aortic balloon pump or ventricular assist device. Current vital signs were blood pressure 88/50 mm Hg (mean arterial pressure, 62 mm Hg), heart rate 104 beats per minute, respiratory rate 26/min, and an oxygen saturation of 93% on 4 L/min. He was somewhat anxious, requiring benzodiazepines on an as-needed basis. The completed triage evaluation for this patient is shown in Table 3.

This patient’s transport triage evaluation finds 6 categories of level 1, 1 category of level 3, and 1 category of level 5 (see Table 2 for definitions of levels). Additionally, the patient is getting worse despite reasonable care at a community level ICU. Based on these findings, this patient’s level of care during transport should be at the provider level, based on the nurse characteristics of clinical judgment, systems thinking, and collaboration. An advanced practice nurse will match the patient’s needs in these areas with the prescriptive authority and clinical judgment present at this level of nursing practice. The patient will now be more vulnerable because of the stressors of the transport environment of care. This patient has safety needs during transport that can best be monitored and responded to by the advanced practice nurse.

Factors such as predictability and complexity of the case, or transport factors such as weather or road conditions, are not consistently addressed in decisions about interfacility transport.
the benzodiazapines. This level of complexity cannot be handled effectively under a protocol-based system and requires the presence of a prescriptive provider.

Exemplar 2

A 68-year-old woman came to the emergency department at a community hospital with a 1-week history of dark, tarry stools, and abdominal pain. She was weak and dyspneic on exertion. Her history was significant for osteoarthritis for which she takes anti-inflammatory drugs, and chronic rate-controlled atrial fibrillation, for which she takes warfarin. She had a hemoglobin level of 7 g/dL, a hematocrit of 22%, and a platelet count of 175 000/μL. Her international normalized ratio was supertherapeutic at 4.5, which was treated with vitamin K in the emergency department. She was mildly orthostatic, but otherwise hemodynamically stable. She was admitted to the telemetry unit for blood administration, anticoagulant regulation, and cardiac monitoring.

After initial stabilization of the patient’s condition by infusion of 2 units of packed red blood cells, endoscopy revealed a bleeding duodenal erosion that could not be successfully cauterized. During the procedure, the patient vomited and aspirated. She quickly desaturated and required intubation. She returned to the ICU hemodynamically stable, requiring no vasopressor support, on ventilator settings of assist/control with tidal volume of 480 mL, respiratory rate 16/min, fraction of inspired oxygen 60%, and a positive end-expiratory pressure of 5 cm H2O. Following surgery, the family requested a transfer of the patient to a “better” hospital. The tertiary facility of their choice was 50 miles away.

The referring provider contacted the intensivist at the requested facility, and the 4-way conference proceeded with the critical care transport department of the receiving facility using the Transport Triage Tool. At this time, the patient had started treatment with antibiotics, and no blood products were currently infusing. Vital signs were blood pressure 135/84 mm Hg, heart rate 84/min, respiratory rate 16/min on the ventilator, and 96% oxygen saturation on 60% inspired oxygen.

Table 3 Exemplar 1 of a completed transport triage tool

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Level assigned</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resiliency</td>
<td>1</td>
<td>Cardiac status has no reserves left, as evidenced by ejection fraction of 10%, intermittent ventricular tachycardia. Also has numerous chronic comorbid conditions.</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>1</td>
<td>This patient is highly vulnerable. Interruption in intravenous vasopressor support or antiarrhythmic would place in serious jeopardy. Fluid status is tenuous because of low ejection fraction.</td>
</tr>
<tr>
<td>Stability</td>
<td>1</td>
<td>Very unstable and unresponsive to therapies as evidenced by worsening condition despite standard therapy.</td>
</tr>
<tr>
<td>Complexity</td>
<td>1</td>
<td>Several systems currently involved, with potential for further system involvement owing to hypotension.</td>
</tr>
<tr>
<td>Resource availability</td>
<td>1</td>
<td>Current available resources at the referring facility are unable to meet the patient’s needs. Although it is unclear at this stage whether the resources at the tertiary facility, such as a transplant evaluation, will change the course of the disease, it is clear that current resources are exhausted.</td>
</tr>
<tr>
<td>Participation in care</td>
<td>3</td>
<td>The patient’s ability to participate in care is significantly affected by the effects of the NYHA class 3 heart failure, but family members are present and participate in care where possible.</td>
</tr>
<tr>
<td>Participation in decision making</td>
<td>5</td>
<td>The patient is fully alert and actively participates in decision making.</td>
</tr>
<tr>
<td>Predictability</td>
<td>1</td>
<td>This patient has a low level of predictability owing to the hemodynamic instability and intermittent ventricular tachycardia despite intravenous administration of an antiarrhythmic agent.</td>
</tr>
</tbody>
</table>

* Key: 1, The characteristic is present in low amounts, or not present at all; 3, the characteristic is present in moderate amounts, or to a moderate degree; 5, the characteristic is strong, or present to a great degree.
She had 2 large-bore peripheral intravenous catheters but no arterial catheter. The results of her triage evaluation are shown in Table 4.

The results of this triage tool revealed 5 categories of level 3, 2 categories of level 5, and 1 category of level 1 (see Table 2 for definitions of levels). She has the most level 3 categories. Her only level 1 category is participation in care, which one could argue has a lower level of priority during transport than other categories. These results indicate that the registered nurse is the most appropriate level of provider in this case. No immediate needs that should be addressed before transport but are currently unmet are identified, and there is no reasonable expectation of deterioration during transport that requires assessment and prescriptive intervention. The nurse characteristics most indicative here are advocacy, caring practices, and clinical judgment (see Table 2 for descriptions of these characteristics). The nurse has the capacity to protect this intubated and sedated patient, monitor and recognize deteriorations in condition, and use standardized protocols to maintain the patient’s sedation.

Discussion

Both of these exemplars demonstrate that determination of the appropriate level of care during transport is a multifactorial decision that must be centered on the needs of the patient at this time. At this stage, no attempt has been made to link the patient’s care needs with a particular means of transport such as a ground ambulance or a helicopter. That secondary decision is based on a different set of variables, which are beyond the scope of this article, but will be the focus of future research. The exemplars demonstrate that level of care is a primary concern that must be determined first regardless of the mechanism of travel.

Many details still need to be addressed before this Transport Triage Tool is ready for introduction into practice. This article seeks only to explore and introduce the possibility of using the AACN Synergy Model for Patient Care and a Transport Triage Tool based on this model. A forthcoming study will explore further development and weighting of specific variables and characteristics of patients in the triage process. Some aspects still to be determined include the following:

### Table 4 Exemplar 2 of a completed transport triage tool

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Level assigneda</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resiliency</td>
<td>3</td>
<td>An aspiration resulted in brief hypoxia, but oxygenation was quickly restored with intubation and positive pressure ventilation.</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>3</td>
<td>She now has an artificial airway and sedation making her more vulnerable.</td>
</tr>
<tr>
<td>Stability</td>
<td>3</td>
<td>Hemodynamic status is currently satisfactory, but the cause of her original instability was unable to be corrected, and she continues to bleed.</td>
</tr>
<tr>
<td>Complexity</td>
<td>3</td>
<td>She has 2 systems involved in separate problems. Each problem is limited to its respective system.</td>
</tr>
<tr>
<td>Resource availability</td>
<td>5</td>
<td>Since receiving packed red blood cells, she has good hemodynamics. The bleeding has not been fixed, however, and this resource (blood) continues to be lost. The referring facility has the resources to treat the current problem, so she is not in increasing danger.</td>
</tr>
<tr>
<td>Participation in care</td>
<td>1</td>
<td>She is currently intubated and sedated, thus unable to provide any care for herself. Family members are supportive but are also unable to provide care.</td>
</tr>
<tr>
<td>Participation in decision making</td>
<td>3</td>
<td>The patient cannot participate in decision making, but the family has stepped in and made treatment requests on her behalf (transfer).</td>
</tr>
<tr>
<td>Predictability</td>
<td>5</td>
<td>This patient’s transport trajectory is fairly predictable. The bleeding source has been found, although not repaired, and packed red blood cell infusion provided sufficient stabilization. Her current respiratory status is stable with no reasonably expected complications.</td>
</tr>
</tbody>
</table>

a Key: 1, The characteristic is present in low amounts, or not present at all; 3, the characteristic is present in moderate amounts, or to a moderate degree; 5, the characteristic is strong, or present to a great degree.
• How many level 1 categories are required to make a
   level 1 transport triage decision?
• Does it make a difference which characteristics are
   level 1?
• Weighting of the characteristics will need to be
   considered, as shown in Exemplar 2.
• Time to complete the Transport Triage Tool

We are in the process of establishing validity by using
a predictive model and examining interrater and intrarater
reliability through a retrospective study approved by the
institutional review board. We will continue to examine
clinical relevance with our expert providers, and the many
benefits of involving nurses with validated nursing instru-
ments in the decision-making process. A further step
needed is the development of measurable outcomes
linked to the Transport Triage Tool. For example, clinical
outcomes might include the number of adverse patient
events, complications of interventions initiated by the
transport team, and satisfaction of patients, their fami-
lies, and facilities (friends, community).

An additional variable is the time sensitivity of a deci-
sion in the triage process. What characteristics warrant
immediate transport, and which characteristics can wait?
Which characteristics, if any, indicate that the patient
should be transported by a lower level of care in the
interests of the time-sensitive nature of the diagnosis or
treatment if that is the only transport agency immediately
available? Many questions remain unanswered, but the
development of a sound framework based on a strong
theoretical basis will guide the triage process and increase
the quality and safety of care for patients requiring inter-
facility transport.

Conclusion

Interfacility transport of patients has taken place for
many years, and although its use continues to grow, the
rationale for determining appropriate transport staffing
remains poorly understood and underdeveloped. Growth
in interfacility transport will continue as changes in the
delivery of health care lead to the development of region-
alized health systems that consolidate specialized centers
of care to academic medical centers in urban locations.
The predominant current approach is not designed to
determine an appropriate level of care during transport.
Referring providers must make a judgment with only
experience and intuition as a guide. The transport triage
process lacks any theoretical framework and is inconsistent
in terms of providing patients with relative assurance of
safe and reliable care during interfacility transport.

The authors propose that a new triage tool based on
the AACN Synergy Model for Patient Care provides a
theoretical framework and guidance in the provision of
interfacility nursing care. This tool is developed with the
potential to differentiate the level of nursing care required
during this time of instability and change for the patient.
Results of use should improve outcomes for both patients
and nurses. CCN

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