The VAST (Vencor Admission Screening Tool) Program: Helping Make Better Referral Decisions

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One of the many challenges facing hospitals today is their ability to identify the appropriate care setting for medically complex patients who require extended periods of clinical care. These patients receive a high level of care in what is typically one of the hospital’s highest-cost areas—the intensive care unit (ICU). Even though referral decisions can significantly affect the clinical and economic outcomes for patients, clinicians have traditionally had little information on which to base their referral decisions.

One of the nation’s largest long-term healthcare providers—Vencor, Inc.—is now offering a new technology-based service that creates a more objective justification for, and reduces the uncertainty associated with, referral decisions. And because determination of an appropriate care setting is as vital to the economic viability of a facility as it is to the health status of patients, this new service is being widely accepted by hospital administrators and clinicians.

The Vencor Admission Screening Tool (VAST) program is a combination of software tool and consultation service that is offered free of charge to referral hospitals. Case managers use the software tool in the referral hospital to assess a patient, that is, they collect and enter clinical, administrative, and demographic data on an individual patient, and the software produces a selection of reports that contain clinical outcome and utilization predictions for the patient. Case managers then use the reports to confer with clinicians on the relevance of the predicted outcomes to their referral decisions. The information on the reports, in coordination with consultation from the case managers, adds to clinicians’ understanding of their patients’ risks of mortality, extended length of stay, and costs of care. As managed care becomes more the norm across the country, providers who use this type of information to support their referral decisions will succeed in delivering the best possible outcomes at the best cost.

Vencor’s long-term acute care (LTAC) hospitals offer post-acute services to intensive-care-level patients who require extended hospital stays. The LTAC
hospitals essentially function as intensive care hospitals, thus providing a critical service because today’s acute care ICUs are not intended to provide care for extended-stay patients. Because LTAC hospitals receive patients primarily through referrals, case managers are responsible for working with referral hospital clinicians to assist in identifying patients who would benefit from the specialized respiratory, wound-care, and rehabilitative services offered. These patients are usually those experiencing multisystem failures, with extended lengths of stay in an acute care ICU.

The Referral Process Before the VAST Program

Before VAST, an acute care hospital clinician would typically notify a case manager by phone, fax, or pager when ready to refer a patient to the LTAC setting. Case managers had a very hectic and unpredictable workday. They generally lived in their cars, going from hospital to hospital trying to gain an audience with referral clinicians to discuss which patients were ready for transfer. Their day usually started with an early-morning voice-mail check that directed their travels for the day. Throughout the day, they responded to phone, fax, and paged requests from various hospitals to conduct referral assessments on patients who were being considered for transfer. On any given day, they did not know the number of potential referral patients in their market in general or in any one hospital; their market could cover a considerable number of hospitals in several states. It was not unusual for a case manager to drive a significant distance to a referral hospital, only to find out that the hospital was not currently caring for any potential referral patients. Case managers rarely had the information or tools to help them plan their day. And they simply did not have time to build the relationships with clinicians that would have enabled them to become part of the care team and participate in patient transfer decisions. Because the majority of these case managers were registered nurses and respiratory therapists, they had skills and capabilities (specifically in the ICU setting) that were significantly underused by clinicians at referral hospitals.

Referrals were typically made after a patient had been in the acute care hospital ICU for several weeks or even months. The long length of stay was likely to be a result of chronic ventilator dependence, nutritional depletion, or development of major decubitus ulcers. These patients often had a tracheotomy; in some cases, they had received surgical interventions during their ICU stay. In addition, the long ICU length of stay usually resulted in the referring hospital incurring a substantial loss on Medicare-insured patients, as well as other patients who were insured by fixed reimbursement. Because case managers assessed referrals in reaction to a phone call or fax that came in after the extended ICU length of stay, they were usually not involved early enough in patients’ care program to identify those who would have benefited from long-term acute care earlier in their ICU stay. Early delivery of the specialized ventilator and rehab care at an LTAC hospital gives patients a better chance of being successfully weaned and can reduce the need for extensive wound care.
Years of experience have shown that patients are often transferred after the referral hospital’s treatment has become cost-ineffective and, worse than that, after the patient’s health status has passed the optimal point for receipt of the LTAC hospital’s intensive treatment programs. On average, patients have historically been transferred after twenty-one days of stay in the referral hospital ICU. The skills and experience of the clinical case managers could be used earlier in the process to the benefit of patients’ health outcome as well as the referring hospital’s bottom line.

Development of VAST

To improve this situation and achieve better outcomes for patients and acute care hospitals, Vencor engaged APACHE Medical Systems, Inc., to design an assessment tool to be used by their case managers. The VAST software application is that tool. It incorporates APACHE’s methodologies and current referral hospital economic data to produce a clinically and financially integrated set of outcome expectations for an ICU patient.

The VAST application is installed on portable, laptop computers that case managers can carry to referral hospitals. It is a Microsoft Windows–based software program that allows case managers to assess patients who have been ventilated and in the ICU for seven and/or fourteen days. It was first developed as a prototype in 1996, following completion of a large clinical outcomes study of ventilated patients, and is now in use by Vencor nationally. The equations used in the VAST program to calculate the APACHE III (which measures severity of illness), acute physiology score (APS), and expected mortality values are the same as those used in APACHE’s decision-support systems and used to support clinical research projects. This information is used to objectively assess the patient’s severity of illness. Two additional equations that predict additional ICU length of stay on ICU day seven and/or fourteen were developed specifically for the VAST application. These equations allow the tool to provide an expected length of stay for patients if they remain in the acute care hospital.

To date, over eighty case managers have been certified to collect data, produce reports, and interpret predictions using VAST. Their training has included strict data-collection methodologies to ensure the validity and reliability of predictions generated by the software. While reviewing a patient’s chart, case managers enter approximately twenty data elements into four data-entry screens. Data elements are clinically, demographically, and financially oriented. For example, case managers look for the following data:

- Patient date of birth
- Patient sex
- Hospital admit date
- ICU admit date
- ICU admit diagnosis
- Vent status
Except for one or two data elements, this is the same data set that case managers have historically recorded when conducting a referral assessment. The entire data-collection process takes approximately ten to fifteen minutes, and reports can be generated immediately.

The VAST program produces several types of reports to assist referral hospital clinicians in referral decision making. Other reports for system administration and evaluation purposes are available for case manager use only. The main report is the Consultation Report. It shows the patient's APACHE score, APS, predicted mortality, and expected length of stay in the ICU. In addition, it provides a prediction of cost and reimbursement based on Medicare DRG prospective payment dollars and specific hospital and ICU cost information. Case managers can elect to print all reports or any single report, depending on the referral hospital's specifications. Physicians and administrators at referral hospitals have been open to receiving these reports because of their reliance on a proven predictive methodology.

**The Referral Process After the VAST Program**

VAST reports provide a focal point for caregiver discussion about the appropriate care setting for a patient. Clinicians receive an objective measure of the patient’s severity of illness (the APACHE score), a predicted mortality for the patient, and an estimated length of stay in the ICU. Unusually long length-of-stay predictions are evaluated against the APACHE score and the predicted mortality to facilitate determination of whether or not the patient is a good candidate for transfer. If the patient is a good candidate, then referral assessments can be completed sooner rather than later, increasing the possibility of a successful ventilator wean after transfer to the long-term acute care hospital. Because VAST assessments occur at day seven and/or day fourteen of a patient's stay in the ICU, case managers are gaining access to patients significantly earlier in their ICU stay.

The VAST software uses the predicted ICU length of stay and Medicare cost data specific to a particular hospital to estimate the hospital's total cost of care for that patient. It also uses current Medicare reimbursement data to estimate the hospital's likely DRG-based reimbursement for that patient. This information is consolidated into a Financial Summary Report, which provides text-based and graphic information on the economics of the patient's care. Physicians and other hospital utilization review coordinators are using this information in coordination with the clinical information on the Consultation Report to determine the appropriateness of transfer for assessed patients.
The VAST program has facilitated an improved working relationship between case managers and caregivers at the referral hospitals. It enables the case managers to provide and interpret valuable clinical and economic information, and it facilitates open communication concerning the appropriate care setting for potential referral patients. In many locations, referral hospital clinicians fax a list of patients who are eligible for a VAST assessment to the case manager on a daily basis. The information on these lists allows the case managers to proactively plan their day and visit the referring facilities that are currently caring for potential referral patients. Thus case managers are integrated into a patient’s care team early enough to have an impact on the timeliness of referral decisions.

When case managers conduct VAST assessments, they are accomplishing five goals: (1) they are given an opportunity to assess the patient’s health status and to provide clinical information to the care team; (2) they are building relationships that will enable them to become part of the care team; (3) they are providing financial information to unit-based physicians and clinicians who are often unaware of the financial implications of their activities; (4) they can use the data collected during VAST assessments to provide objective information back to the referral hospital on their collective outcomes for specific types of patients; and (5) they are creating a log of potential referral patients. This log can be used to provide structure and increase the efficiency of their workday. It also allows them to proactively manage their referral volume.

Summary and Prognosis

The VAST application has been introduced in each of Vencor’s six geographic regions, and the majority of regions have already seen benefits directly related to VAST use. Specifically, the benefits realized to date include, but are not limited to, the following:

- Vencor case managers indicate that the VAST application is easy to use and, as a result, is being used routinely.
- Requests for additional training and hardware are continually being made as the word spreads about the VAST program’s effectiveness.
- Case managers believe that the use of VAST improves their credibility and allows them to use their clinical judgment increasingly to assist in treatment and transfer decisions.
- Case managers can be proactive rather than reactive players in the referral process as a result of requests for VAST assessments by acute care providers early in the patient’s hospital stay.
- VAST gets the attention of key referral hospital decision makers. It has had a positive impact on physicians’ perceptions of the LTAC hospitals; nurses and respiratory therapists report that they have access to integrated clinical and financial information that they have not consistently seen before.
• Physician confidence and comfort with the VAST reports are opening doors for case managers to make presentations and conduct in-services at medical staff meetings that traditionally were closed to Vencor participation.
• Because VAST assessments occur at day seven and/or day fourteen, Vencor is gaining earlier access to potential patients, increasing the chance for successful outcomes for the patients.
• Vencor has gained a powerful marketing tool for differentiation in this increasingly competitive market of post-acute care.

In order to solidify the use of VAST, more area case managers will be trained and the VAST software will be upgraded. In addition to the certification workshop for front-line users, a train-the-trainer program is being developed that will transfer the knowledge on APACHE methodology and VAST technology to Vencor, and facilitate ongoing user certification.

VAST Version 2.0 is planned for release in the fall of 1998. An important feature of the new version is that it will allow case managers to assess all ICU patient types, not just ventilated patients. Version 2.0 will include several ease-of-use enhancements and a new clinical outcomes report. The cost tables used to estimate a hospital's cost of care for a particular patient will be updated to reflect the most recent Medicare cost data, and reimbursement calculations will be updated to reflect fiscal year 1999 changes.

Case managers have used the APACHE III critical care system since the late 1980s to provide a measure of severity of illness for patients admitted to Vencor. This team is already committed to future development of tools for decision support. Future versions of VAST may integrate the assessment information with admission and internal clinical care systems; it may be applied in other post-acute care settings like sub-acute, home health, and skilled nursing care. Additionally, the team is considering VAST enhancements that will provide financial data on non-Medicare-insured patients. Projects are already under way to develop methodologies for predicting clinical and financial outcomes for patients in the long-term care setting. These methodologies can be used to provide valuable information to providers, as well as managed care companies and other payors.

VAST has already proven to be one of the most exciting of Vencor's support tools for making referral decisions. It enhances tried-and-true clinical judgment with objective, valid prognostic information. It improves internal operations while providing valuable information to referral hospital clinicians and integrating clinical information with financial information—a first step in helping clinicians' understand the links between the severity of illness and the economics of care. The VAST program is a decision-support tool that pushes the referral process into the next century of decision making, and the resulting program synergy positions Vencor to continue to lead the industry in long-term acute care.
The VAST (Vencor Admission Screening Tool) Program

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