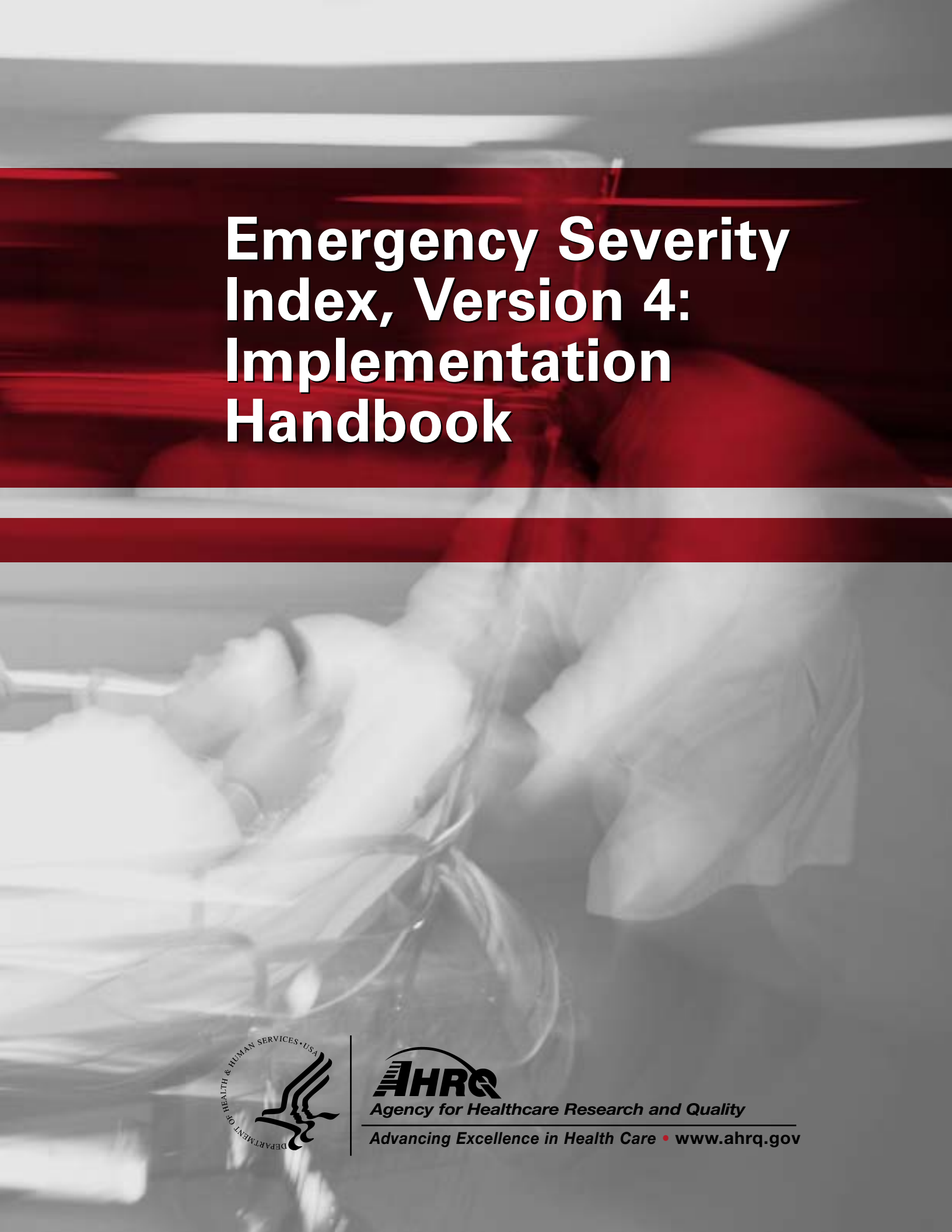

Emergency Severity Index, Version 4: Implementation Handbook

Agency for Healthcare Research and Quality

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Where To Obtain Additional Copies of the DVDs and Handbook

Additional copies of the *Emergency Severity Index, Version 4: Everything You Need To Know* DVD set (publication no. 05-0046-DVD) and spiral-bound *Implementation Handbook* (publication no. 05-0046-2), covering all the details of ESI, can be obtained by contacting the AHRQ Publications Clearinghouse at 1-800-358-9295 or by e-mail to ahrqpubs@ahrq.gov. You may request up to 3 free copies of both the DVD set and the *Implementation Handbook*. You can also view, download, and print a PDF version of the manual online at http://www.ahrq.gov/research/esi.

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Emergency Severity Index, Version 4: Implementation Handbook

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This handbook is dedicated to our leader, collaborator, and friend,

Dr. Richard Wuerz

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Note from the Director

The Agency for Healthcare Research and Quality is pleased to bring you the *Emergency Severity Index, Version 4: Implementation Handbook*. This manual covers all details of the Emergency Severity Index (ESI)—a five-level emergency department triage algorithm that provides clinically relevant stratification of patients into five groups from 1 (most urgent) to 5 (least urgent) on the basis of acuity and resource needs.

After emergency physicians Richard Wuerz and David Eitel developed the ESI in 1998 and pilot testing yielded favorable results, the ESI Triage Group was formed. Further work on the initial development of ESI was carried out under an AHRQ grant. The ESI Triage Group, which consisted of medical clinicians, managers, educators, and researchers, further refined the algorithm to what it is today.

In keeping with our mission to improve the quality, safety, efficiency, and effectiveness of health care for all Americans, one of AHRQ's areas of emphasis is training. Along with the accompanying set of two DVDs, this handbook will provide invaluable assistance to emergency department nurses, physicians, and administrators in the implementation of a comprehensive ESI educational program. These materials are based on ESI Version 4, which updates the algorithm with a particular emphasis on the expansion of ESI level 1 criteria and refinement of the pediatric fever criteria.

A well-implemented ESI program will help hospital emergency departments rapidly identify patients in need of immediate attention, better identify patients who could safely and more efficiently be seen in a fast-track or urgent care center rather than the main ED, and more accurately determine thresholds for diversion of ambulance patients from the ED.

We hope that you find this tool useful in your ongoing efforts to improve the quality of care provided by your emergency department.

Carolyn M. Clancy, M.D.
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Preface

The Emergency Severity Index (ESI) is a tool for use in emergency department (ED) triage. The ESI triage algorithm yields rapid, reproducible, and clinically relevant stratification of patients into five groups, from level 1 (most urgent) to level 5 (least urgent). The ESI provides a method for categorizing ED patients by both acuity and resource needs.

Emergency physicians Richard Wuerz and David Eitel developed the original ESI concept in 1998. After pilot testing of the ESI yielded promising results, they brought together a number of emergency professionals interested in triage and the further refinement of the algorithm. The ESI Triage Group included emergency nursing and medical clinicians, managers, educators, and researchers. The ESI was initially implemented in two university teaching hospitals in 1999, and then refined and implemented in five additional hospitals in 2000. The tool was refined further based on feedback from the seven sites. Several research studies have been conducted to evaluate the reliability, validity, and ease of use of the ESI. Since the publication of the first edition of this handbook, research has led to a further refinement in the algorithm. ESI Version 4 is presented in this handbook. The key difference between ESI Version 3 and ESI Version 4 is the expansion of ESI level 1 criteria and refinement of the pediatric fever criteria. Supporting research is presented in Chapter 2 of this handbook. Research on the ESI continues and may lead to future revisions of the tool.

A conceptual version of the algorithm is presented in Chapters 2 and 3, followed by the actual algorithm in Chapters 3 and beyond.

One of the ESI Triage Group's primary goals was to publish a handbook to assist emergency nurses and physicians with implementation of the ESI. The group agreed that this was crucial to preserving the reliability and validity of the tool. A draft of this handbook was in progress in 2000, when Dr. Wuerz died suddenly and unexpectedly. The remaining group members were committed to the value of ESI and carrying out Dr. Wuerz's vision for a scientifically sound tool that offers emergency departments a standardized approach to patient categorization at triage. The group completed the first edition of *The Emergency Severity Index (ESI) Implementation Handbook* in 2002. We once again dedicate this handbook to our leader, collaborator, and friend, Dr. Richard Wuerz.

This book is intended to be a complete resource for ESI implementation. Emergency department educators, clinicians, and managers can use this practical guide to develop and conduct an ESI educational program, implement the algorithm, and design an ongoing quality improvement program. The book includes background information on the evolution of ED triage, other triage acuity scales, how the ESI was developed, and research reports on the ESI and other triage scales. Next, we present a chapter on each aspect of the ESI in detail: an overview, identifying high-risk patients, predicting resources, and using vital signs. The book also includes chapters on ESI implementation and quality monitoring. Chapters 9 and 10 provide the reader with practice and competency cases. The algorithm and notes may be reproduced to provide to ED triage nurses. The handbook can be used alone or in conjunction with the training DVD entitled *Emergency Severity Index, Version 4: Everything You Need to Know*, also produced by the Agency for Healthcare Research and Quality (AHRQ).

The ESI represents a major change in the way triage is practiced; implementation of the ESI requires a serious commitment from education, management, and clinical staff. Successful implementation of this system is accomplished by committing significant resources during training and implementation. Like any major change, it is necessary to monitor triage staff's use of the ESI and provide ongoing feedback and clarification over time. The ESI Triage Group believes that all this hard work is worth the effort. The benefits of a successful ESI implementation are myriad: improvements in ED operations, support for research and surveillance, and a standardized metric for benchmarking.

This handbook is intended only as a guide to using the ESI system for categorizing patients at triage. Nurses who participate in an ESI educational program are expected to be experienced triage nurses, or have attended a separate, comprehensive triage educational program.

This handbook is not a comprehensive triage educational program. The ESI educational materials in this handbook are best used in conjunction with a triage educational program such as the Emergency Nurses Association's "Making the Right Decision: A Triage Curriculum.©" Triage nurses also need education in institution-specific triage policies and protocols. For example, hospitals may develop policies regarding which types of patients can be triaged to fast-track. Triage protocols may also be developed, such as giving acetaminophen for fever, or ordering ankle films for patients who meet specified criteria.

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Table of Contents

NOTE: Appendix A of this handbook includes frequently asked questions and post-test assessment questions for Chapters 3 through 8. These sections can be incorporated into an ESI training course.

Chapter 1. The Evolution of Triage

The purpose of emergency department (ED) triage is to prioritize incoming patients and to identify those patients who cannot wait to be seen. The experienced triage nurse is able to rapidly and accurately identify the small percentage of patients requiring immediate care. The triage nurse is then challenged to sort the remaining large number of patients who do not require immediate treatment and can wait for physician evaluation. The number of patients presenting to emergency departments is increasing, and this trend is not likely to change. As EDs are struggling to cope with overcrowding there is a critical need for a valid, reliable triage acuity rating system in order to sort these incoming patients more rapidly and accurately.

This chapter explores the evolution of triage in the United States and describes the dominant triage systems currently in use in EDs. A discussion follows of why the acuity ratings scales currently in place in most emergency departments are no longer adequate to meet the needs of the 21st century in light of recent trends in patient demographics, ED utilization, and other factors affecting patient flow through the ED.

Triage History

The word "triage" is derived from the French verb "trier," to "sort" or "choose." Originally the process was used by the military to sort soldiers wounded in battle for the purpose of establishing treatment priorities. Injured soldiers were sorted by severity of their injuries ranging from those that were severely injured and deemed not salvageable, to those who needed immediate care, to those that could safely wait to be treated. The overall goal of sorting was to return as many soldiers to the battlefield as quickly as possible.

Changes in the health care delivery system forced U.S. emergency departments to consider alternative ways of handling an increase in the number of incoming patients during the 1950s and early 1960s. In the late 1950s, physician practice began to change. Physicians moved away from solo practice; the days of house calls and the family doctor became nearly obsolete. Physicians formed office-based group practices that offered regular office hours with appointments. Emergency departments became the principal provider of primary medical care when doctors' offices were closed, principally during evenings and weekends. At the same time, more physicians entered specialties rather than general practice. Emergency departments started to experience a large increase in volume. The increased volume was a result of use of the ED by patients with lower acuity problems. Emergency departments recognized they needed a method to sort patients and identify those needing immediate care. This provided the impetus to put ED triage systems into place. Physicians and nurses who had used the triage process effectively in the military first introduced triage into civilian EDs. The transition of the triage process from the military to U.S. emergency departments was extremely successful.

Thompson and Dains (1982) identified the three most common types of triage systems: Traffic director, spot-check, and comprehensive triage. Traffic director is the simplest type of system. A non-clinical employee greets the patient and directs the patient to a treatment area or the waiting room based on their initial impression. By 2002, this type of system no longer worked effectively.

The second type of triage is a spot-check triage system, appropriate for a low volume emergency department where it is not cost effective to always have an RN at triage since patients do not need to wait. Instead, a registration person greets the patient and pages the triage nurse when a patient presents. The RN then determines patient acuity based on a brief triage assessment. Patient assessment is a nursing function that cannot be delegated to less qualified personnel.

Comprehensive triage, the most advanced system, has continued to evolve in the United States. It is supported by the Emergency Nurses Association (ENA) Standards of Emergency Nursing Practice:

> *The emergency nurse triages each patient and determines the priority of care based on physical, developmental and psychosocial needs as well as factors influencing access to health care and patient flow through the emergency care system.*

Triage is to be performed by an experienced ED nurse who has demonstrated competency in the triage role. The goal is to rapidly gather "sufficient" information to determine triage acuity. (ENA, 1999, p. 23).

Though it is recommended that comprehensive triage is to be completed in 2 to 5 minutes, Travers (1999) demonstrated at one tertiary center ED that this goal was only met 22 percent of the time.

Triaging pediatric and elderly patients has been found to take more time than other patients. The level of detail necessary for comprehensive triage can be difficult for the experienced nurse to complete in a short timeframe such as 2 to 5 minutes. The triage nurse is expected to obtain a complete history, take vital signs and complete department-specific screening questions. Sufficient information must be obtained to make the correct triage decision. Under-triage in the era of ED overcrowding can compromise patient safety.

Emergency nurses must question whether we have set unrealistic standards for ourselves and whether the distinction between a comprehensive triage assessment and initial assessment remains clear. A comprehensive triage system can lead to a backlog of patients waiting to be seen by the triage nurse. In an attempt to facilitate the flow of patients through high-volume emergency departments and to ensure that no patient waits to be seen by a triage nurse, two-tier or two-step triage systems have evolved. An experienced triage nurse greets the patient and decides whether the patient can safely wait for further assessment and registration or whether they should go directly to the patient care area. The decision is based on chief complaint and an "across-the-room assessment."

The introduction of triage systems into emergency departments in the 1960s, 1970s, and 1980s had a number of clear benefits for patients and for the department. Some of the benefits included:

- Each patient being greeted by an experienced triage nurse.
- A patient who cannot wait to be seen is immediately identified.
- First aid is provided.
- A registered nurse is available to meet the emotional needs of the patient and family.

Triage Acuity

Today most emergency departments in the United States use some type of triage acuity system. A triage acuity system is used to communicate to the clinical staff in the department which patient can safely wait and which patient needs to be seen immediately.

In 2001, the Emergency Nurses Association surveyed U.S. emergency departments about the type of triage acuity scale used by their department (MacLean, 2002). The survey included responses from 1,380 emergency department managers, which represent approximately 27 percent of all EDs in the United States. Sixty-nine percent of the emergency departments used a three-level scale, 12 percent used a four-level scale, 3 percent used either the Australasian or Canadian five-level scale, and 16 percent did not answer the question or used no triage acuity rating scale. More recent data reflect a trend towards five-level triage. In 2003, the National Center for Health Statistics found that 47 percent of EDs used three-level triage systems, while 20 percent used four-level and 20 percent used five-level systems (personal communication, Catharine Burt, November 1, 2004). The commonly used three-level scale includes these acuity levels: Emergent, urgent, and nonurgent (ENA, 1997). Patients are rated as emergent if they have a problem that poses an immediate life or limb threat (ENA, 2001). Patients considered urgent are those that require prompt care, but can wait up to several hours if necessary. Nonurgent patients have conditions that need attention, but time is not a critical factor.

As emergency departments and the health care system have continued to change, the value of the existing acuity rating scales have come under increasing scrutiny. This scrutiny led to research which found traditional triage models inadequate. In particular, emergency medicine and emergency nursing leaders question the reliability and validity of the three-level acuity-rating scale being used by the majority of EDs in the United States. The definitions of emergent, urgent, and nonurgent are unclear, not uniform and are often hospital dependent and nurse dependent. Wuerz, Fernandes, and Alarcon (1998) measured the interrater and intrarater agreement of three-level triage. Agreement was measured with the kappa statistic, which ranges from 0 (no agreement) to 1 (perfect agreement). Triage nurses and emergency medical technicians (EMTs) at two hospitals were asked to rate the acuity of five scripted patient scenarios using a three-level scale. Six weeks later participants were asked to again rate the same scenarios. Only 24 percent of participants rated all five cases the same in both phases. The overall kappa statistic for severity rating was 0.35, which shows poor agreement among nurses.

Rapid, accurate triage of patients is key to successful emergency department operations in the 21st century. In particular, the triage nurses' initial acuity categorization is critical. Under-categorization (undertriage) leaves the patient at risk for

deterioration while waiting. Initial over-categorization (overtriage) uses scarce resources, limiting availability of an open ED bed for another patient who may require immediate care. For these reasons, the initial triage categorization by the triage nurse must be as accurate as possible. Accurate triage categorization can only be accomplished by the use of a reliable and valid triage acuity system in which all ED nurses have been adequately trained. Initial triage categorization is not as important in small, low volume emergency departments where there is often no wait to be seen. Unfortunately, this is not the case for most EDs throughout the United States. However, an important benefit of using a valid and reliable triage system is the ability to use triage data to describe ED casemix. Therefore, using a valid and reliable triage system is also important in low-volume EDs.

Recent Trends Affecting Emergency Departments

Many opposing forces affect our ability to provide quality care and maximize patient flow through the ED. Emergency department overcrowding is a well-documented problem in the United States today; patient volumes continue to rise for many reasons and this trend is not likely to change in the near future (Adams & Biros, 2001; Derlet, Richards, & Kravitz, 2001; Taylor, 2001). The American Hospital Association (2002) reported 90 percent of hospital emergency departments perceive they are at or over operating capacity. This translates into longer waiting times to be seen and longer lengths of stay in the ED. The average waiting time to be seen by an emergency physician in 2001 was 49 minutes, which represented an increase of 11 minutes from 1997 (McCaig & Ly, 2002).

Factors contributing to the increase in ED patient volumes and waiting times include a decrease in the number of U.S. emergency departments, aging of the general population, longer lengths of ED stays, an inability to move admissions into the hospital because of a decreased number of inpatient beds due to hospital closings and downsizing, an increase in the number of uninsured patients, poor access to primary care, and a nursing shortage which often leaves open beds unable to be used due to lack of nursing staff. The impact of these issues on triage will be discussed in detail below.

The number of visits to emergency departments in the United States is continuing to grow. The *National Hospital Ambulatory Medical Care Survey: 2002 Emergency Department Summary* reports an estimated 110 million visits were made to emergency departments in 2002 (McCaig & Burt, 2004). This represents an increase of 23 percent between 1992 and 2002, with an average of 38.9 visits per 100 persons in 2004.

The highest rate of ED visits is by persons age 75 and older. This rate is approximately 61.1 visits per 100 persons (McCaig & Burt, 2004). The U.S. Census Bureau (1996) reports that the number of persons in the 65 to 74 age group and in the 75 and older category will continue to grow rapidly. In 1990 there were approximately 10 million persons in the 75 and older age group. This number is projected to grow to 23 million by 2030. One in eight Americans was 65 and older in 1994; by 2030 this ratio will change to about one in five. This age group has the highest number of emergency department visits; thus, it is expected that EDs will see a continuing increase in the number of visits by the elderly population each year.

There were approximately 39 million uninsured persons in the United States in 2001 and that number is continuing to rise (U.S. Department of Health and Human Services, 2002). Individuals may be uninsured because they lack access to a group plan or are unable to afford the cost of health insurance. The number of immigrants with health insurance is low (Velianoff, 2002). Many of these individuals are using and will continue to use emergency departments for primary care.

The actual number of emergency departments in the United States has continued to decline (McCaig & Ly, 2002). Over the 3-year period from 1997 to 2000, the number of hospital emergency departments decreased from 4,005 to 3,934. As the demand for ED services continues to increase, the number of annual visits to each emergency department has increased 14 percent on average.

At the same time, the actual number of hospital beds across the country has decreased. For example, the American Hospital Association reports that between 1994 and 1998 the number of inpatient beds nationwide dropped 8 percent (Shute & Marcus, 2001). As a result emergency departments are experiencing difficulty moving admitted patients into the hospital, at times creating gridlock. Hospitals are making changes to cope with the volume. For example, systems are being put into place to clean rooms more efficiently and physicians are being asked to make rounds and discharge

patients earlier in the day. Despite these efforts, the average emergency department length of stay for both admitted and discharged patients is increasing. Anecdotal reports of patients staying in an ED for days are no longer uncommon.

The nursing shortage is another factor that has impacted emergency department overcrowding. Most emergency departments are facing serious staffing issues and are increasingly turning to new and/or inexperienced ED nurses. The average ED RN is very experienced but is 45 years of age, working harder, and concerned about the increased volume. For many the solution is leaving for a position that is less stressful and offers more control over their own assignment. In-house nursing shortages directly affect the ED, as some open beds cannot be filled due to the unavailability of a nurse to staff the bed.

Emergency departments are in a unique and challenging position with regard to controlling patient flow in and out of the unit. As opposed to inpatient units that don't admit patients when they are full, EDs have generally been thought of as units that are always open, with a potentially limitless capacity for patients. Most emergency departments have little control over when admissions can be transferred from the ED to their assigned inpatient bed. One option for the overcrowded ED is to try to control the "front end," or the number of patients presenting for care. Some hospitals have the ability to close to ambulance traffic for a period of time, which is known as "going on diversion" or bypass. This is a strategy EDs can use when they are overcrowded and unable to safely care for any additional patients. This strategy may buy an emergency department time to deal with the patients already in the department; however, it is not a panacea for the problem of overcrowding. Due to their remote location some hospitals do not have the option to divert ambulances. Diversion is not an absolute solution, since 75 percent of patients arrive at the emergency department by means other than ambulances (McCaig & Ly, 2002).

Clearly a busy emergency department can lead to delays in care. One problem related to the increase in volume is emergency departments seeing an increased number of patients who are choosing to leave prior to a medical screening exam (Derlet, 2002). The patient may recognize that the wait to see a physician is significant and they decide to leave without being seen. While some of these patients may have less urgent conditions and suffer no ill effects by leaving the ED, others may be at risk for serious consequences by not receiving treatment. Those patients who stay may endure long waits and suffer adverse events.

In June 2002, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) released a Sentinel Event Alert (JCAHO, 2002). JCAHO identified emergency departments as the source for more than half the reported sentinel event cases of patient death or permanent disability due to delays in treatment. In 31 percent of the cases, overcrowding was identified as a contributing factor.

The causes and effects of ED overcrowding are complex and difficult to define, and researchers continue to develop metrics to measure them (Derlet, Richards & Kravitz, 2001; Weiss et al., 2004). Many models identify increasing patient acuity as a major factor in ED overcrowding, and in some studies researchers have used triage ratings to represent ED patient acuity (Derlet & Richards, 2000; Liu, Hobgood & Brice, 2003). It is even more important to move beyond defining overcrowding and examining the effects of overcrowding on patient outcomes. The triage decision is an important element to be examined. Due to the prevalence of overcrowding, many EDs are actually beginning to implement protocols that involve a physician or nurse practitioner role at triage. The benefits and cost-effectiveness of this arrangement need to be studied.

In many ways emergency departments today are facing the same major issues seen in the late 1950s and early 1960s. At that time EDs were dealing with an increase in volume. No method was in place to identify the patient who needed to be seen immediately from the one who could wait safely. Patient safety was a major concern. One solution was the introduction of basic triage principles into the emergency department. Today, EDs are once again facing the issues of overcrowding and finding that some of the triage solutions put into place in the 1950s are no longer effective. The current state of overcrowding threatens patient safety and has caused an increased focus on triage. The triage process, use of standing orders, and a physician or nurse practitioner role at triage are all important concepts that need to be examined to optimize safety of the triage process. Attention to adequate training of triage nurses is another critical element that requires attention. While all of these issues are important, the selection of a reliable and valid triage system is a fundamental decision to help begin to

address safety at triage. Current triage acuity systems are inadequate given the complex issues facing EDs. There is a need to replace the traditional triage acuity system with a research-based, valid, and reliable system. The Emergency Severity Index (ESI), which is introduced in Chapter 3, can provide EDs with a reliable, valid triage system. The ESI is a triage system that accurately identifies those patients who need to be seen immediately from those patients who can safely wait to be seen. The ESI is discussed in detail in subsequent chapters of the handbook.

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Chapter 2. Triage Acuity Systems

Standardization of Triage Acuity

Although there are more than 110 million visits to U.S. emergency departments (EDs) each year (McCaig & Burt, 2004) there are very little aggregate data about those visits on the local, regional or national level. It is difficult to answer important questions such as "Which EDs see the sickest patients?" and "How does patient acuity affect ED overcrowding?" There is growing interest in the establishment of standards for ED data in the United States to support clinical care, ED surveillance, benchmarking, and research activities (Barthell, Coonan, Finnell, Pollock, & Cochrane, 2004; Gilboy, Travers & Wuerz, 1999; Handler et al., 2004; National Center for Injury Prevention and Control [NCIPC], 1997; Zimmermann, 2001). One important ED data element is triage acuity, which has been defined by the Data Elements for Emergency Department Systems Task Force as: "Classification of patient acuity that characterizes the degree to which the patient's condition is life- or limb-threatening, and whether immediate treatment is needed to alleviate symptoms" (NCIPC, 1997, p. 94).

Unfortunately, there is great variability in ED triage acuity systems, particularly in the United States (Emergency Nurses Association [ENA], 1997). The various systems describe triage categories using different labels, and the definitions for each level are not universally agreed upon. Examples of acuity rating systems are listed in Table 2-1. Given the lack of standardization of triage acuity data in the U.S., it is not surprising that the ED has been described as a "black box" of vital public health information that is largely inaccessible in present forms (Martinez, 1995).

The Emergency Severity Index (ESI) is a promising new tool for triage acuity assessment in the ED. It has been shown to be reproducible across EDs, including urban and rural settings and academic and community hospitals (Eitel, Travers, Rosenau, Gilboy & Wuerz, 2003). If implemented widely in U.S. EDs, the ESI has the potential to become a standard for triage acuity assessment. In this chapter, we describe the types of triage systems traditionally used in EDs in the United States, and then present a review of the research on those systems. Next, a brief description of recent triage methods that have been developed in Australia, Canada and the United Kingdom is presented. The chapter concludes with a review of the research on the new ESI triage system and discusses the potential benefits of the ESI.

Triage Systems in the United States

Though many U.S. hospitals still use a three- or four-level triage system, the trend is toward the use of five-level systems. The National Center for Health Statistics plans to replace four-level triage data with five-level triage data in future national benchmarking surveys of U.S. EDs. This decision was based upon the growing evidence that five-level triage acuity data are more reliable and valid than three-level systems (personal communication, Linda McCaig, National Center for Health Statistics, October 6, 2004).

Both ENA and the American College of Emergency Physicians (ACEP) have come out in support of five-level triage systems for U.S. EDs. A joint ENA-ACEP task force was convened in 2003 to study the evidence on five-level triage systems. The task force's work is ongoing at present. The ACEP and ENA issued the following joint statement in 2003:

> *ACEP and ENA believe that quality of patient care would benefit from implementing a standardized emergency department (ED) triage scale and acuity categorization process. Based on*

Table 2-1. Examples of Triage Acuity Systems

2 levels	3 levels	4 levels	5 levels
Emergent	Emergent	Life-threatening	Resuscitation
Non-emergent	Urgent	Emergent	Emergent
	Nonurgent	Urgent	Urgent
		Nonurgent	Nonurgent
			Referred

expert consensus of currently available evidence, ACEP and ENA support the adoption of a reliable, valid five-level triage scale (ACEP, 2003; ENA, 2003).

In a paper published by the task force in 2005, both the ESI and Canadian Triage and Acuity Scale (CTAS) were recommended as valid and reliable triage systems. (Fernandes et al., 2005) In light of the growing evidence supporting five-level triage systems, it is likely that more U.S. hospitals are now using some form of five-level triage. The ENA plans to collect data about U.S. hospitals' use of the various triage systems in their upcoming ED survey (personal communication, Susan MacLean, ENA, August 23, 2004).

Research on Triage Systems in the United States

There is a growing body of research on triage acuity systems. The research has focused on two key features of acuity ratings by triage nurses: reliability and validity (Pedhazur & Schmelkin, 1991; Waltz, Strickland & Lenz, 1991). Reliability is the consistency, or agreement, among those using a rating system. There are two types of reliability that pertain to ED triage acuity ratings. First, interrater reliability is a measure of reproducibility: Will two different nurses rate the same patient with the same triage acuity level? Intrarater reliability is an indication of whether the same nurse, over time, will rate the same patient with the same acuity level. Several studies in the United States have demonstrated poor inter- and intrarater reliability of conventional three-level triage systems (Gill, Reese & Diamond, 1996; Travers, Waller, Bowling, Flowers & Tintinalli, 2002; Wuerz, Fernandes & Alarcon, 1998). In one study, 305 triage ratings were reviewed after all triage nurses attended a mandatory refresher course on the hospital's three-level triage scale (Travers et al., 2002). The original triage nurses' ratings were compared with retrospective ratings assigned by an expert panel of ED triage nurses, and there was agreement in approximately half of the cases.

Validity is the accuracy of the rating system, and assesses how well the system measures what it is intended to measure. The validity of acuity ratings is an indication of whether or not the rating, for example, of "nonurgent" is an accurate assessment of the lack of urgency of an ED patient's problem. Validity has proven difficult to assess for triage acuity, and has not been reported in research studies on conventional three-level triage in the United States. Unlike the urine culture, which is the gold standard for the correct clinical diagnosis of a urinary tract infection, there is no clear gold standard against which the validity of triage acuity ratings can be measured. However, proxy measures that have been used to evaluate five-level systems include admission rates, resource utilization and 6-month mortality.

Triage Acuity Research on Five-Level Systems Abroad

There are well-validated and reliable five-level triage systems that have become the standard in other countries. Three of those systems are described in Table 2-2.

The Australasian Triage Scale (ATS), a system developed in Australia, has been used throughout Australia and New Zealand since the early 1990s (Australasian College for Emergency Medicine, 1994, 2002; Cameron, Bradt & Ashby, 1996). The Australian Council on Healthcare Standards has adopted the ATS as a basis of ED assessment and quality of care, and triage ratings are subject to regular review. Australian EDs are expected to treat patients according to standards based on the triage category. For example, an emergency patient must be seen within 10 minutes, whereas a nonurgent patient must be seen within 2 hours.

Validity and reliability of the ATS have been evaluated in several studies. In the absence of a true gold standard for triage acuity assessment, researchers have compared the five-level scale to other severity of illness scales and outcomes (Cameron et al., 1996; Cleary, Ashby, Jelinek & Lagaida, 1994, Erwich, Bond, Phillips, & Baggoley, 1997). Triage levels correlated highly with disease- and population-specific scales including the Injury Severity Scales, trauma score, and cardiac, asthma and pediatric scales. The ATS has been shown to correlate strongly with resource consumption and outcome data, such as admission rates, ED length of stay and mortality rates. Research has also shown that the ATS has a fair to moderate degree of interrater reliability in studies in which triage nurses were asked to rate the acuity of patients described in case study format (Dilley & Standen, 1998, Jelinek & Little, 1996).

Five-level triage systems have also been implemented in the United Kingdom (U.K.) and Canada. The Manchester Triage Scale is used in the

U.K., and utilizes a presentational flow-chart based format (Manchester Triage Group, 1997). Nurses first identify the patient's chief complaint, and then choose one of 52 flow charts to conduct a structured interview and then assign a triage level from 1 (immediate care needed) to 5 (care within 4 hours). The system has been endorsed by the Accident and Emergency Nurses Association (Zimmermann, 2001). There is limited research on the Manchester system. In one study of reliability, triage nurse ratings were compared retrospectively to senior medical staff ratings; agreement was only fair to moderate (Goodacre, Gillett, Harris & Houlihan, 1999).

The Canadian Triage and Acuity Scale (CTAS) was developed by a group of Canadian emergency physicians. (Beveridge & Ducharme, 1997; Canadian Association for Emergency Physicians [CAEP], 2002). The National Emergency Nurses' Affiliation, Inc. (NENA) and the Canadian Association for Emergency Physicians (CAEP) have endorsed the CTAS as the national standard for ED triage. Canadian hospitals are required to submit data to the Canadian government, including CTAS ratings, on all ED visits. The Canadian five-level scale has also been shown to have good interrater reliability in studies in which clinicians rated the acuity of written scenarios taken from actual patient cases (Beveridge, Ducharme, Janes, Beaulieu & Walter, 1999; Manos, Petrie, Beveridge, Walter & Ducharme, 2002).

History of the Emergency Severity Index (ESI)

The Emergency Severity Index (ESI) is a five-level triage scale developed by ED physicians Richard Wuerz and David Eitel in the United States (Gilboy et al., 1999; Wuerz, Milne, Eitel, Travers & Gilboy, 2000). The two originators believed that a principal role for an emergency department triage instrument is to facilitate the prioritization of patients based on the urgency of the patients' conditions. The triage nurse determines priority by posing the question, "Who should be seen first?" Drs. Wuerz and Eitel realized, however, that when more than one top-priority patient is present simultaneously, the operating question becomes, "How long can everybody wait?" The ESI was developed around a new conceptual model of ED triage. In addition to asking which patient should be seen first, triage nurses use the ESI to also consider what resources are necessary to get the patient through to an ED disposition. The ESI retains the traditional foundation of patient urgency, and then seeks to

Table 2-2 Five-level Triage Systems

System	Countries	Levels	Patient should be seen by provider within
Australasian Triage Scale (ATS) (formerly National Triage Scale of Australia)	Australia New Zealand	1 - Resuscitation 2 - Emergency 3 - Urgent 4 - Semi-urgent 5 - Nonurgent	Level 1 - 0 minutes Level 2 - 10 minutes Level 3 - 30 minutes Level 4 - 60 minutes Level 5 - 120 minutes
Manchester	England Scotland	1 - Immediate (red) 2 - Very urgent (orange) 3 - Urgent (yellow) 4 - Standard (green) 5 - Nonurgent (blue)	Level 1 - 0 minutes Level 2 - 10 minutes Level 3 - 60 minutes Level 4 - 120 minutes Level 5 - 240 minutes
Canadian Triage and Acuity Scale (CTAS)	Canada	1 - Resuscitation 2 - Emergent 3 - Urgent 4 - Less urgent 5 - Nonurgent	Level 1 - 0 minutes Level 2 - 15 minute Level 3 - 30 minutes Level 4 - 60 minutes Level 5 - 120 minutes

(Australasian College for Emergency Medicine, 2002; Canadian Association of Emergency Physicians, 2002; Manchester Triage Group, 1997)

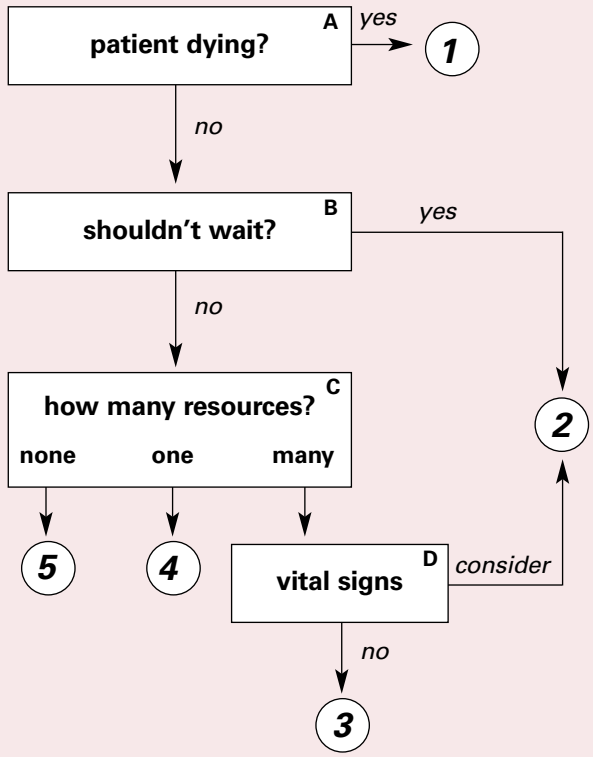
accomplish a second goal, not just patient sorting but also patient streaming: Getting the right patient to the right resources at the right place and at the right time.

Version 1 (v. 1) of the ESI was originally implemented at two university-based EDs in the spring of 1999. By the fall of 2000, the ESI was revised with input from ED clinicians to include pediatric patient triage criteria, and then version 2 (v. 2) was implemented in five additional hospitals (including non-university teaching and community settings). Based on feedback from nurses and physicians using the ESI at these sites, along with the best available scientific evidence, the ESI was further refined as version 3 (v. 3) in 2001 (Wuerz et al., 2001). Recent work has led to additional revisions to the tool, which is introduced in this edition of the ESI handbook as version 4 (v. 4) (Tanabe et al., in press).

Emergency physicians and nurses in the United States and Canada have conducted several research studies in which the reliability and validity of the ESI has been assessed. The ESI has been directly compared to conventional three-level triage and to the five-level CTAS. These studies will be described later in the chapter. Like the Australasian, Canadian and U.K. scales, ESI triage has five levels. However, it is different in both its conceptual approach and practical application. The underlying assumption of the triage scales from Australia, Canada and the U.K. is that the purpose of triage is to determine how long the patient can wait for care in the ED. Clear definitions of time to physician evaluation are an integral part of both algorithms. This represents a major difference between ESI and CTAS and the ATS. ESI does not define expected time intervals to physician evaluation.

The ESI is unique in that it also requires the triage nurse to anticipate expected resource needs (e.g., diagnostic tests and procedures), in addition to acuity, to determine a triage category for less acute patients. The ESI triage levels are outlined in Figure 2-1. The process of categorizing ED patients using the ESI will be described in detail in subsequent chapters. Briefly, acuity judgments are addressed first based on the stability of the patient's vital functions and the likelihood of an immediate life or organ threat. Then expected resource needs are addressed for stable patients based on the experienced triage nurse's prediction of the resources needed to get the patient to an emergency department disposition. Resource needs can range from none to two or more.

Figure 2-1. Emergency Severity Index Conceptual Algorithm, v. 4



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Research on the Emergency Severity Index

In a pilot study of ESI v.1 ratings for 493 triage encounters at two Boston hospitals in 1998, researchers found that the system was both valid and reliable (Wuerz et al., 2000). The patients were triaged simultaneously by the triage nurse using the traditional three-level scale and by the research nurse who used the initial version of the ESI. Then, an investigator triaged the patients again using the ESI. The investigator was blinded to the research nurses' ESI rating, and used only the written triage note to make the triage decision. Triage levels were strongly associated with resources used in the ED and with outcomes such as hospitalization. Higher acuity patients (ESI levels 1 and 2) consumed more resources and were more likely to be admitted to the hospital than low resource patients (ESI levels 4 and 5). Interrater reliability between the research nurse and the investigator was found to be good, with 77 percent exact agreements and 22 percent within one triage level.

The reliability of the ESI has been evaluated in several studies, using the kappa statistic to measure inter-rater reliability. Kappas can range from 0 (no agreement) to 1 (perfect agreement). At one of the two original ESI sites, a time series design was used to compare the reliability of triage ratings using a three-level scale, then ESI v.1 was implemented and triage ratings were re-examined (Travers et al., 2002). Reliability improved from a weighted kappa of 0.53 for the three-level system to 0.68 for the five-level ESI. In another study, researchers examined the reliability and validity of ESI v.2 during and after implementation of the system into triage practice at seven hospitals in the northeast and southeast. During the ESI triage education program, more than 200 triage nurses at the seven sites were asked to rate 40 case studies using the ESI (Eitel et al., 2003). The study results indicated substantial interrater reliability with kappas ranging from 0.70 to 0.80. Three hundred eighty-six triage decisions on actual patients were also evaluated and found to have high interrater reliability, with weighted kappas ranging from 0.69 to 0.87. In another study at a Midwestern, urban ED, researchers evaluated the reliability of the ESI v.3 for 403 actual patient triages and found a kappa of 0.89 (Tanabe, Gimbel, Yarnold, Kyriacou & Adams, 2004).

Canadian and American researchers have also directly compared the inter-rater reliability of the ESI and the CTAS in a randomized trial (Worster et al., 2004). They studied the triage assignments of ten Canadian triage nurses experienced with CTAS. The nurses were randomly assigned to initial ESI v.3 or CTAS refresher training, and then rated 200 case studies with the ESI or CTAS, respectively. Both groups had excellent inter-rater reliability, with kappas of 0.89 (ESI) and 0.91 (CTAS).

The validity of the ESI has been evaluated by examination of outcomes for several thousand patients. The studies found consistent, strong correlations of the ESI with hospitalization, ED length of stay, and mortality (Eitel et al., 2003; Tanabe, et al., 2004; Wuerz, 2001; Wuerz et al., 2001). The ESI has also been found to have moderate correlations with physician evaluation and management codes and nursing workload measures (Travers et al., 2002). The ESI has been shown to facilitate meaningful comparisons of case mix between hospitals. A stratified random sample of 200 patients was selected from each of the seven initial ESI hospitals, and case mix was compared (Eitel et al., 2003). As expected, there was a higher percentage of high acuity patients at the tertiary care centers, compared with a higher percentage of low resource patients at the community hospitals.

In a survey of nursing staff at the two original university teaching hospitals, responses to the implementation of the ESI were positive (Wuerz et al., 2001). The nurses reported that the ESI was easier to use and more useful in prioritizing patients for treatment than the former three-level systems in use at the two sites.

In the most recent study of the ESI, the validity of ESI level 2 was examined in detail (Tanabe et al., in press). In an evaluation of outcomes for 571 ESI level-2 patients at five hospitals, it was found that 20 percent of level-2 patients received immediate, life-saving interventions. The authors concluded that such patients would benefit from being classified as ESI level 1. The updated ESI v. 4 presented in later chapters of this book reflects the revisions made to the ESI based upon this recent study.

Benefits of the Emergency Severity Index

To date, the ESI has been implemented by hospitals in different regions of the country, by university and community hospitals, and by teaching and non-teaching sites. The ED clinicians, managers and researchers at those sites have identified several benefits of ESI triage over conventional three-level scales. One benefit of the ESI is the rapid identification of patients that need immediate attention. The focus of ESI triage is on quick sorting of patients in the setting of constrained resources. In part, ESI triage returns to the fundamental purpose of triage as it was originally defined in the days of Napoleon's army. ESI triage is a rapid sorting into five groups with clinically meaningful differences in projected resource needs and therefore, associated operational needs. Use of the ESI for this rapid sorting can lead to improved flow of patients through the ED. Once an ESI triage level is assigned, the patient can be directed to a more complete assessment, registration, initial treatment, or waiting based on their acuity and their presumed resource needs. For example, level-1 and 2 patients can be taken directly to the treatment area for rapid evaluation and treatment, while level-4 and 5 patients can go to registration and then be sent to the waiting room to await an available bed.

An important issue that is independent of ESI triage is the timing of the complete nursing assessment. Many believe that a complete assessment need not be done at the initial triage station, but rather can occur in the main treatment area or secondary triage area as appropriate to the needs of each patient and the current activity level of the ED (Gilboy et al., 1999). Only the assessment necessary to make an ESI assignment is required at triage in order to facilitate the initial sorting of patients. Comprehensive clinical assessments take significant time to complete and, when done at triage, can delay care and reduce satisfaction for patients with more minor emergencies. With increasing patient volumes and complexity contributing to ED overcrowding, it is time to reconsider conventional processes of care to increase efficiency and effectiveness. However, it is always important to gain sufficient information to be able to determine the correct triage category. This is especially true when waits are long to see the physician, as is frequently the case with increased volumes. Triage has become even more crucial with extended waiting room times. Assignment of an inappropriate low triage category can increase the risk of a bad outcome due to the associated long wait.

Other benefits of the ESI include discrimination of patients who do not need to be seen in the main ED, but could safely and more efficiently be seen in a fast-track or urgent care center. For example, in many hospitals, the triage policy stipulates that all ESI level 4 and 5 patients can be sent to either the medical urgent care or minor trauma areas of the ED. The triage policy also allows for some level-3 patients to be sent to urgent care (UC), such as patients needing simple migraine headache treatment. ESI level-3 patients triaged to UC and all patients sent to the acute area from UC for more serious conditions are monitored in the quality improvement program. Nurses using the ESI have reported that the tool facilitates communication of patient acuity more effectively than the former three-level triage scales used at the sites (Wuerz et al., 2001). For example, the triage nurse can tell the charge nurse, “I need a bed for a level 2 patient,” and through this common language, the charge nurse understands what is needed without a detailed explanation of the patient by the triage nurse.

The ESI has also been used as the foundation for ED policies that address specific populations. For example, the psychiatric service at one site is expected to provide consults for level 2 and 3 patients within 30 minutes and for level 4 and 5 patients within one hour of notification. At another site, the ESI has been incorporated into a policy for patients greater than 20-weeks pregnant who present to the ED. Patients rated at ESI levels 1 and 2 are treated in the ED by emergency medicine with an obstetrical consult. Those rated 3, 4, or 5 are triaged to the labor and delivery area of the hospital.

The ESI is also a useful tool for determination of thresholds for diversion of ambulance patients from the ED. The ED Diversion Policy and Guidelines at Brigham and Women's Hospital in Boston defines maximum capacity as 100 percent of RN-staffed ED beds occupied. ESI is used to determine over-capacity.

Research has shown that the ESI is a reliable, valid tool for rating triage acuity. The system has been adopted by a variety of EDs in different regions of the United States and in both academic and community settings. The participating hospitals have demonstrated the value of the ESI for improved ED operations and patient care. Wider adoption of the ESI by U.S. hospitals could lead to the establishment of a standard for triage acuity assessment, which will facilitate benchmarking, public health surveillance and research.

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Chapter 3. Introduction to the Emergency Severity Index

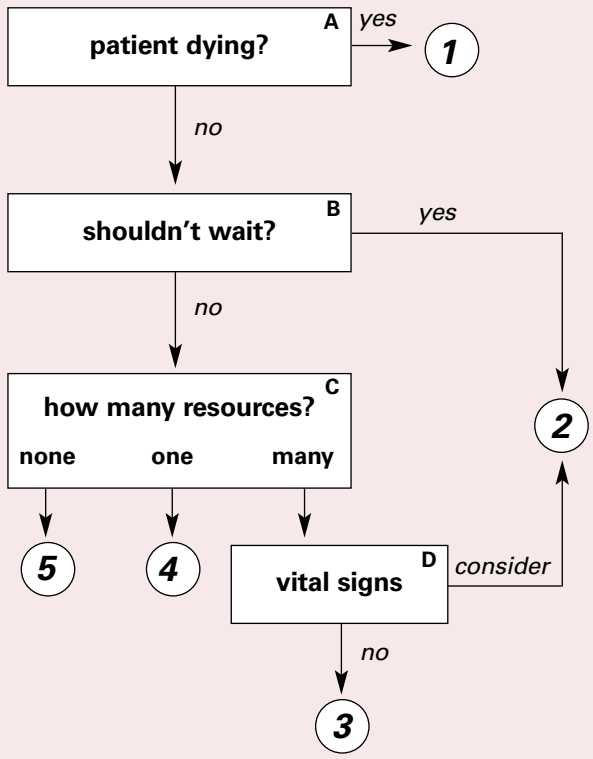
The Emergency Severity Index (ESI) is a simple to use, five-level triage instrument that categorizes emergency department patients by evaluating both patient acuity and resources. Initially the triage nurse assesses only acuity level. If a patient does not meet high acuity level criteria (ESI level 1 or 2), the triage nurse then evaluates expected resource needs to help determine a triage level (ESI level 3, 4, or 5). Inclusion of resource needs in the triage rating is a unique feature of the ESI in comparison with other triage systems. Acuity is determined by the stability of vital functions and potential for life, limb, or organ threat. The triage nurse estimates resource needs based on previous experience with patients presenting with similar injuries or complaints. Resource needs are defined as the number of resources a patient is expected to consume in order for a disposition decision to be reached. Once appropriately oriented to the algorithm, the triage nurse will be able to rapidly and accurately triage patients into one of five explicitly defined and mutually exclusive levels. The ESI provides emergency departments with a valid, reliable triage system (Eitel, Travers, Rosenau, Gilboy & Wuerz, 2003; Travers, Waller, Bowling, Flowers & Tintinalli, 2002; Wuerz, Travers, Gilboy, Eitel, Rosenau & Yazhari, 2001; Tanabe, Gimbel, Yarnold, Kyriacou, & Adams, 2004; Tanabe, Gimbel, Yarnold, & Adams, 2004).

In this chapter, we present a step-by-step description of how to triage with the ESI algorithm. Subsequent chapters explain key concepts in more detail and provide numerous examples to clarify the finer points of ESI application.

Algorithms are frequently used in emergency care. Most emergency clinicians are familiar with the algorithms used in courses such as Basic Life Support, Advanced Cardiac Life Support, and the Trauma Nursing Core Course. These courses present a step-by-step approach to clinical decision making that the clinician is able to internalize with practice. Each step of the algorithm tells the user what questions to ask or what information to gather. Based on the data or answers obtained, a decision is made and the algorithm directs the user to the next step, and ultimately to an outcome.

Triage with the ESI algorithm requires the experienced ED nurse to start at the top of the algorithm. A conceptual overview of the ESI algorithm is presented in Figure 3-1 to illustrate the major ESI decision points. The actual ESI algorithm is described in detail later in this chapter (Figure 3-1a). The algorithm uses four decision points (A, B, C, and D) to sort patients into one of the five triage levels (Figure 3-1). With practice, the triage nurse will be able to rapidly move from one ESI decision point to the next.

Figure 3-1. Emergency Severity Index Conceptual Algorithm, v. 4

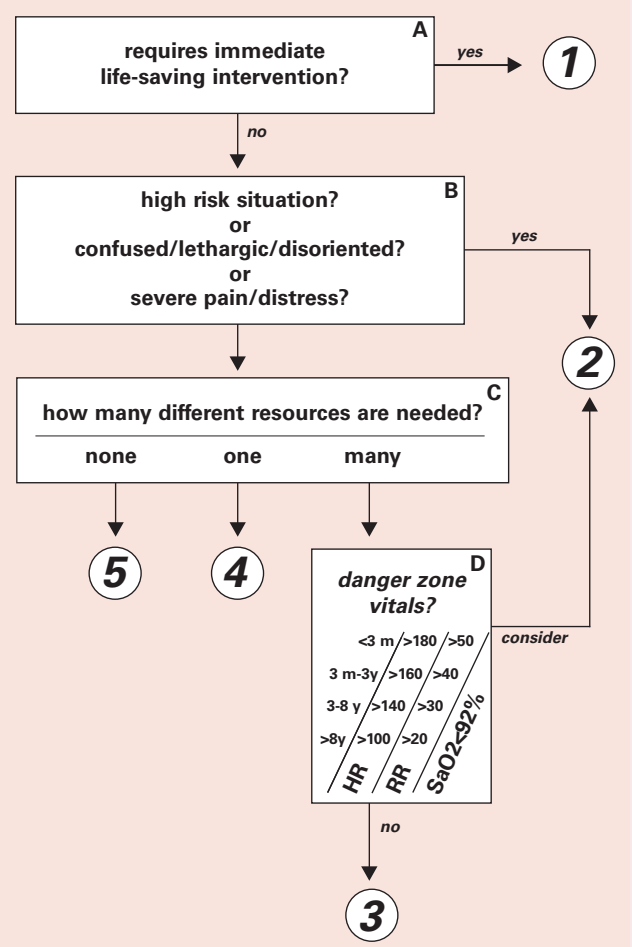


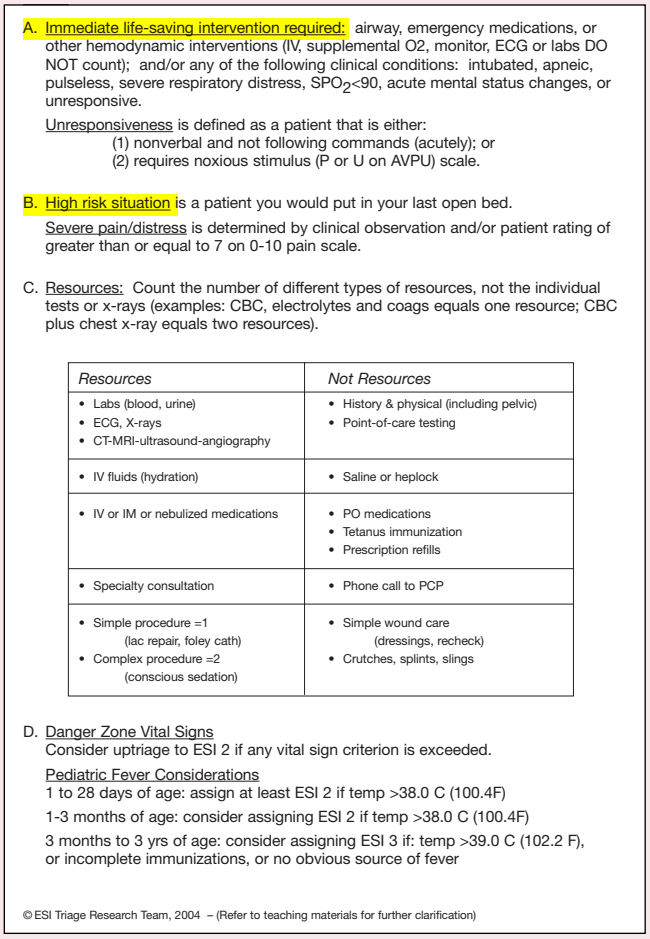
The four decision points depicted in the conceptual algorithm (Figure 3-1) are critical to accurate and reliable application of ESI. Figure 3-1 shows the four decision points reduced to four key questions:

A. Is this patient dying?

B. Is this a patient who shouldn't wait?

Figure 3-1a. ESI Triage Algorithm





A. Immediate life-saving intervention required: airway, emergency medications, or other hemodynamic interventions (IV, supplemental O2, monitor, ECG or labs DO NOT count); and/or any of the following clinical conditions: intubated, apneic, pulseless, severe respiratory distress, SPO_2<90, acute mental status changes, or unresponsive.

Unresponsiveness is defined as a patient that is either:
(1) nonverbal and not following commands (acutely); or
(2) requires noxious stimulus (P or U on AVPU) scale.

B. High risk situation is a patient you would put in your last open bed.

Severe pain/distress is determined by clinical observation and/or patient rating of greater than or equal to 7 on 0-10 pain scale.

C. Resources: Count the number of different types of resources, not the individual tests or x-rays (examples: CBC, electrolytes and coags equals one resource; CBC plus chest x-ray equals two resources).

Resources	*Not Resources*
• Labs (blood, urine) • ECG, X-rays • CT-MRI-ultrasound-angiography	• History & physical (including pelvic) • Point-of-care testing
• IV fluids (hydration)	• Saline or heplock
• IV or IM or nebulized medications	• PO medications • Tetanus immunization • Prescription refills
• Specialty consultation	• Phone call to PCP
• Simple procedure =1 (lac repair, foley cath) • Complex procedure =2 (conscious sedation)	• Simple wound care (dressings, recheck) • Crutches, splints, slings

D. Danger Zone Vital Signs
Consider uptriage to ESI 2 if any vital sign criterion is exceeded.

Pediatric Fever Considerations
1 to 28 days of age: assign at least ESI 2 if temp >38.0 C (100.4F)

1-3 months of age: consider assigning ESI 2 if temp >38.0 C (100.4F)

3 months to 3 yrs of age: consider assigning ESI 3 if: temp >39.0 C (102.2 F), or incomplete immunizations, or no obvious source of fever

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C. How many resources will this patient need?

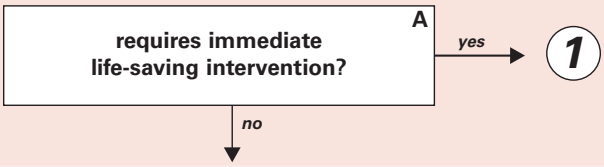
D. What are the patient's vital signs?

The answers to the questions guide the user to the correct triage level.

Decision Point A: Is the Patient Dying?

Simply stated, at decision point A (Figure 3-2) the triage nurse asks if this patient is dying. If the answer is "yes," the triage process is complete and the patient is automatically triaged as ESI level 1. A "no" answer moves the user to the next step in the algorithm, decision point B.

Figure 3-2. Decision Point A: Is the Patient Dying?



The following question is used to determine whether the patient is dying (conceptual algorithm): Does the patient require immediate life-saving intervention? The following questions are helpful in determining whether the patient meets level-1 criteria:

Table 3-1. Immediate Life-saving Interventions

	Life-saving	Not life-saving
Airway/breathing	• BVM ventilation • Intubation • Surgical airway • Emergent CPAP • Emergent BiPAP	Oxygen administration • nasal cannula • non-rebreather
Electrical Therapy	• Defibrillation • Emergent cardioversion • External pacing	Cardiac Monitor
Procedures	• Chest needle decompression • Pericardiocentesis • Open thoracotomy • Intraoseous access	Diagnostic Tests • ECG • Labs • Ultrasound • FAST (Focused abdominal scan for trauma)
Hemodynamics	• Significant IV fluid resuscitation • Blood administration • Control of major bleeding	• IV access • Saline lock for medications
Medications	• Naloxone • D50 • Dopamine • Atropine • Adenocard	• ASA • IV nitroglycerin • Antibiotics • Heparin • Pain medications • Respiratory treatments with beta agonists

- Does the patient require an immediate airway, medication, or other hemodynamic intervention?
- Does the patient meet any of the following criteria: already intubated, apneic, pulseless, severe respiratory distress, SpO2 < 90 percent, acute mental status changes, or unresponsive?

Research has demonstrated that the triage nurse is able to accurately predict the need for immediate interventions (Tanabe et al., in press). Table 3-1 lists interventions that are considered life saving and those that are not, for the purposes of ESI triage.

Interventions not considered life saving include some interventions that are diagnostic or therapeutic, but none that would "save a life." Life-saving interventions are aimed at securing an airway, maintaining breathing, or supporting circulation. Listed below are additional questions that may be helpful in determining whether the patient requires a life-saving intervention.

- Does this patient have a patent airway?
- Is the patient breathing?
- Does the patient have a pulse?
- Is the nurse concerned about the pulse rate, rhythm, and quality?
- Was this patient intubated pre-hospital because of concerns about the patient's ability to maintain a patent airway, spontaneously breathe, or maintain oxygen saturation?
- Is the nurse concerned about this patient's ability to deliver adequate oxygen to the tissues?

The ESI level-1 patient always presents to the emergency department with an unstable condition. Because the patient could die without immediate

care a team response is initiated; the physician is at the bedside, and nursing is providing intensive care. ESI level-1 patients are seen immediately because timeliness of interventions can affect morbidity and mortality.

Immediate physician involvement in the care of the patient is a key difference between ESI level-1 and 2 patients. Level-1 patients are critically ill and require immediate physician evaluation and interventions. Conversely, while level-2 patients are also very ill, the emergency nurse can initiate care through protocols without a physician at the bedside. The nurse recognizes that the patient needs interventions but is confident that the patient's clinical condition will not deteriorate. The emergency nurse can initiate intravenous access, administer supplemental oxygen, obtain an ECG, and place the patient on a cardiac monitor, all before a physician presence is needed.

When considering the need for immediate life-saving interventions, the triage nurse also carefully evaluates the patients' respiratory status and oxygen saturation (SpO2). A patient in severe respiratory distress or with an SpO2 < 90 percent may still be breathing, but is in need of immediate intervention to maintain an airway and oxygenation status. This is the patient who will require the physician in the room ordering medications such as those used for rapid sequence intubation or preparing for other interventions for airway and breathing.

Patients with chest pain must also be evaluated using the same criteria. Some patients presenting with chest pain are very stable. Although they may require a diagnostic ECG, these patients do not meet level-1 criteria. However, patients who are pale, diaphoretic, in acute respiratory distress or hemodynamically unstable will require immediate life-saving interventions and do meet level-1 criteria. Each patient with chest pain must still be evaluated within the context of the level-1 criteria to determine whether the patient requires an immediate life-saving intervention.

When determining whether the patient requires immediate life-saving intervention, the triage nurse must also assess the patient's level of consciousness. The ESI algorithm uses the AVPU (alert, verbal, pain, unresponsive) scale, (see Table 3-2). The goal for this part of the algorithm is to identify the patient who has an acute change in level of consciousness. The triage nurse needs to assess this patient for a change from baseline and the critical concern is the formerly alert patient who is now labeled a P (pain) or U (unresponsive). Unresponsiveness is assessed in the context of acute changes in neurological status, not for the patient who has known developmental delays, documented dementia, or aphasia. Any patient who is unresponsive, including the intoxicated patient unresponsive to painful stimuli meets level-1 criteria and should receive immediate evaluation. An example of an acute mental status change that would require immediate intervention would be a patient with decreased mental status who is unable to maintain an airway or has severe respiratory distress.

Table 3-2 Four Levels of the AVPU Scale

AVPU level	Level of consciousness
A	Alert. The patient is alert, awake and responds to voice. The patient is oriented to time, place and person. The triage nurse is able to obtain subjective information.
V	Verbal. The patient responds to verbal stimuli by opening their eyes when someone speaks to them. The patient is not fully oriented to time, place, or person.
P	Painful. The patient does not respond to voice, but does respond to a painful stimulus, such as a squeeze to the hand or sternal rub. A noxious stimulus is needed to elicit a response.
U	Unresponsive. The patient is nonverbal and does not respond even when a painful stimulus is applied

Emergency Nurses Association, 2000.

Previous users of ESI version 3 (v. 3) will note a major change in the ESI level-1 criteria. The key difference between ESI v. 3 and ESI version 4 (v. 4) is the identification and re-classification of some of the sickest, previously ESI level-2 patients. Patients requiring immediate life-saving intervention are now classified as ESI level 1. In the previous ESI version, a patient in severe respiratory distress who required intubation but was still breathing was categorized as ESI level 2. In the current version, this patient meets level-1 criteria. Other examples of patients now classified as ESI level 1 include a weak

and dizzy patient with a heart rate of 30 or 200. Although this change may not affect a large number of patients, it will result in the accurate categorization of the most acutely ill patients. Prior to v. 4, triage nurses were frequently confronted with two distinct levels of ESI level-2 patients; patients who required immediate evaluation and patients who could wait a brief time (10 minutes or so) without clinical deterioration. This dilemma led to a large, multi-center, prospective study that was conducted to identify characteristics of ESI level-2 patients who actually received immediate interventions (Tanabe et al., in press). Results from that multicenter study were the impetus for modifying the ESI system. This updated edition of the ESI handbook presents the changes and describes ESI v. 4.

An ESI level-1 patient is not always brought to the emergency department by ambulance. The patient with a drug overdose or acute alcohol intoxication may be dropped at the front door. Children may be brought by car and carried into the emergency department. The experienced triage nurse is able to instantly identify this critical patient. With a brief, across-the-room assessment the triage nurse recognizes the patient that is in extremis. This patient is taken immediately to the treatment area and resuscitation efforts are initiated.

Patients assessed as an ESI level 1 constitute approximately 1 percent to 3 percent of all ED patients (Eitel et al., 2003; Wuerz, Milne, Eitel, Travers & Gilboy, 2000; Wuerz et al., 2001). Upon arrival, the patient's condition requires immediate resuscitation from either the emergency physician and nurse or the trauma or code team. From ESI research we know that most ESI level-1 patients are admitted to intensive care units, while some die in the emergency department (Eitel et al., 2003; Wuerz, 2001). A few ESI level-1 patients are discharged from the ED, if they have a reversible change in level of consciousness or vital functions such as hypoglycemia, seizures, alcohol intoxication, or anaphylaxis.

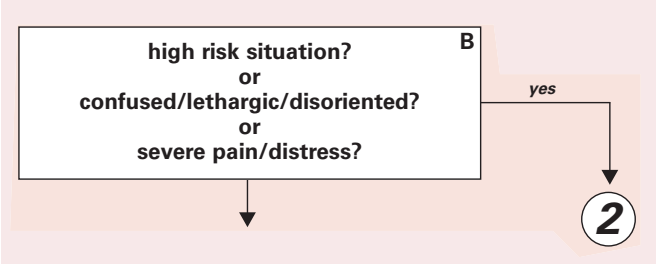
Examples of ESI level 1:

- Cardiac arrest.
- Respiratory arrest.
- Severe respiratory distress.
- SpO2 < 90.
- Critically injured trauma patient who presents unresponsive.
- Overdose with a respiratory rate of 6.
- Severe respiratory distress with agonal or gasping-type respirations.
- Severe bradycardia or tachycardia with signs of hypoperfusion.
- Hypotension with signs of hypoperfusion.
- Trauma patient who requires immediate crystalloid and colloid resuscitation.
- Chest pain, pale, diaphoretic, blood pressure 70/palp.
- Weak and dizzy, heart rate = 30.
- Anaphylactic reaction.
- Baby that is flaccid.
- Unresponsive with strong odor of ETOH.
- Hypoglycemia with a change in mental status.

Decision Point B: Should the Patient Wait?

Once the triage nurse has determined that the patient does not meet the criteria for ESI level 1, the triage nurse moves to decision point B (see Figure 3-3). At decision point B the nurse needs to decide whether this patient should wait to be seen. If the patient should not wait, the patient is triaged as ESI level 2. If the patient can wait, then the user moves to the next step in the algorithm.

Figure 3-3. Decision Point B: Should the Patient Wait?



Three broad questions are used to determine whether the patient meets level-2 criteria.

1. Is this a high-risk situation?
2. Is the patient confused, lethargic or disoriented?
3. Is the patient in severe pain or distress?

The triage nurse obtains pertinent subjective and objective information to quickly answer these questions. A brief introduction to ESI level-2 criteria is presented here, while a more detailed explanation of patients who meet ESI level-2 criteria will be presented in Chapter 4.

Is This a High-risk Situation?

Based on a brief patient interview, gross observations, and finally the "sixth sense" that comes from experience, the triage nurse identifies the patient who is high risk. Frequently the patient's age and past medical history influence the triage nurse's determination of risk. A high-risk patient is one whose condition could easily deteriorate or a patient who presents with symptoms suggestive of a condition requiring time-sensitive treatment. This is a patient who has a potential major life or organ threat. A high-risk patient does not require a detailed physical assessment or even a full set of vital signs in most cases. The patient may describe a clinical portrait that the experienced triage nurse recognizes as a high-risk situation. An example of such a portrait is the patient who states, "I never get headaches and I lifted this heavy piece of furniture and now I have the worst headache of my life." The triage nurse would triage this patient as ESI level 2 because the symptoms suggest the possibility of a subarachnoid hemorrhage.

When the patient is an ESI level 2, the triage nurse has determined that it would be unsafe for the patient to remain in the waiting room for any length of time. While ESI does not suggest specific time intervals, ESI level-2 patients remain a high priority and generally placement and treatment should be initiated within 10 minutes of arrival. It is important to remember that while the level-1 criteria have expanded with v. 4 of the algorithm, ESI level-2 patients are still considered very ill and at high risk. The need for care is immediate and an appropriate bed needs to be found. Usually, rather than move to the next patient, the triage nurse feels that this patient is so sick that the charge nurse or staff in the patient care area should be immediately alerted that they have an ESI level 2.

Examples of high-risk situations:

- Active chest pain, suspicious for coronary syndrome, but does not require an immediate life-saving intervention, stable.
- A needle stick in a health care worker.
- Signs of a stroke, but does not meet level-1 criteria.
- A rule-out ectopic pregnancy, hemodynamically stable.
- A patient on chemotherapy, and therefore immunocompromised, with a fever.
- A suicidal or homicidal patient.

Chapter 4 contains additional information on high-risk situations.

Is the Patient Confused, Lethargic, or Disoriented?

This is the second question to be asked at decision point B. Again the concern is whether the patient is demonstrating an acute change in level of consciousness. Patients with a baseline mental status of confusion do not meet level-2 criteria.

- Confused: Inappropriate response to stimuli, decrease in attention span and memory.
- Lethargic: Drowsy, sleeping more than usual, responds appropriately when stimulated.
- Disoriented: The patient is unable to answer questions correctly about time, place or person.

Examples of patients who are confused, lethargic, or disoriented:

- New onset of confusion in an elderly patient.
- The 3-month-old whose mother reports the child is sleeping all the time.
- The adolescent found confused and disoriented.

Each of these examples indicates that the brain may be either structurally or chemically compromised.

Is This Patient in Severe Pain or Distress?

The third question the triage nurse needs to answer at decision point B is whether this patient is currently in pain or distress. If the answer is "no," the triage nurse is able to move to the next step in the algorithm. If the answer is "yes," the triage nurse needs to assess the level of pain or distress. This is determined by clinical observation and/or a self-reported pain rating of 7 or higher on a scale of 0 to 10. When patients report pain ratings of 7/10 or greater, the triage nurse may triage the patient as ESI level 2, but is not required to assign a level-2 rating. Pain is one of the most common reasons for an ED visit and clearly all patients reporting pain 7/10 or greater do not need to be assigned an ESI level-2 triage rating. A patient with a sprained ankle and

pain of 8/10 is a good example of an ESI level-4 patient. It is not necessary to rate this patient as a level 2 based on pain alone.

In some patients, pain can be assessed by clinical observation: distressed facial expression, diaphoresis, body posture, and changes in vital signs. The triage nurse observes physical responses to acute pain that support the patient's rating. For example, the patient with abdominal pain who is diaphoretic, tachycardic, and has an elevated blood pressure; or the patient with severe flank pain, vomiting, pale skin, and a history of renal colic are both good examples of patients that meet ESI level-2 criteria. Chapter 4 provides additional information on ESI level 2 and pain.

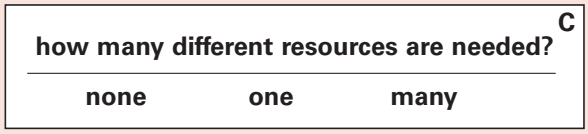
Severe distress can be physiological or psychological. Examples of distress include the sexual assault victim, the combative patient, or the bipolar patient who is currently manic.

ESI level-2 patients constitute a relatively low volume, high-risk group that comprise 20 percent to 30 percent of emergency department patients (Travers et al., 2002; Wuerz et al., 2001, Tanabe, Gimbel et al., 2004). Once an ESI level-2 patient is identified, the triage nurse needs to ensure that the patient is cared for in a timely manner. Registration can be completed by a family member or at the bedside. ESI level-2 patients need vital signs and a comprehensive nursing assessment but not necessarily at triage. Placement should not be delayed to finish obtaining vital signs. ESI research has shown that 50 to 60 percent of ESI level-2 patients are admitted from the ED (Wuerz et al., 2001).

Decision Point C: Resource Needs

If the answers to the questions at the first two decision points are "no," then the triage nurse moves to decision point C (see Figure 3-4). The triage nurse should ask, "How many different resources do you think this patient is going to consume in order for the physician to reach a disposition decision?" The disposition decision could be to send the patient home, admit to the observation unit, admit to the hospital, or even to transfer to another institution. This decision point again requires the triage nurse to draw from past experiences in caring for similar emergency department patients. ED nurses need to clearly understand that the estimate of resources has to do with standards of care and is independent of type of hospital (i.e., teaching or non-teaching) and location. A patient presenting to any emergency department should consume the same general resources in order for a disposition to be reached. Considering the patient's brief subjective and objective assessment, past medical history, allergies, medications, age, and gender, how many different resources will be used in order for the physician to reach a disposition? In other words, what is typically done for the patient who presents to the emergency department with this common complaint? The triage nurse is asked to do this based on his or her assessment of the patient and should not consider individual practice patterns, but rather the routine practice in the particular ED.

Figure 3-4. Resource Prediction



To identify resource needs the triage nurse must be familiar with emergency department standards of care. The triage nurse must be knowledgeable about the concept of "prudent and customary." One easy way to think about this concept is to ask the question "Given this patient's chief complaint or injury, what resources is the emergency physician likely to utilize?" Resources can be hospital services, tests, procedures, consults or interventions that are above and beyond the physician history and physical, or very simple emergency department interventions such as applying a bandage. Further explanations and examples are provided in Chapter 5.

A list of what is and what is not considered a resource for purposes of ESI triage classification can be found in Table 3-3. ESI level-3 patients are predicted to require two or more resources; ESI level-4 patients are predicted to require one resource; and ESI level-5 patients are predicted to require no resources (Table 3-4).

Table 3-3. ESI Resources

Resources	Not resources
Labs (blood, urine)	History & physical (including pelvic)
ECG, X-rays CT-MRI-ultrasound angiography	Point-of-care testing
IV fluids (hydration)	Saline or heplock
IV, IM or nebulized medications	PO medications Tetanus immunization Prescription refills
Specialty consultation	Phone call to PCP
Simple procedure = 1 (lac repair, Foley cath)	Simple wound care (dressings, recheck)
Complex procedure = 2 (conscious sedation)	Crutches, splints, slings

Research has shown that ESI level-3 patients make up 30 percent to 40 percent of patients seen in the emergency department (Eitel et al., 2003; Wuerz et al., 2001). They often require a more in-depth evaluation but are felt to be stable in the short term, and certainly may have a longer length of stay in the ED. ESI level 4 and ESI level 5 make up between 20 percent and 35 percent of ED volume, perhaps even more in a community with poor primary care access. Appropriately trained mid-level providers with the right skills mix could care for these patients in a fast-track or express care setting, recognizing that a high proportion of these patients have a trauma-related presenting complaint. Since their physical condition is stable, these patients could safely wait several hours to be seen.

Table 3-4. Predicting Resources

ESI Level	Patient Presentation	Interventions	Resources
5	Healthy 10-year-old child with poison ivy	Needs an exam and prescription	None
5	Healthy 52-year-old male ran out of blood pressure medication yesterday; BP 150/92	Needs an exam and prescription	None
4	Healthy 19-year-old with sore throat and fever	Needs an exam, throat culture, prescriptions	Lab (throat culture)*
4	Healthy 29-year-old female with a urinary tract infection, denies vaginal discharge	Needs an exam, urine, and urine culture, maybe urine hCG, and prescriptions	Lab (urine, urine C&S, urine hCG)**
3	A 22-year-old male with right lower quadrant abdominal pain since early this morning + nausea, no appetite	Needs an exam, lab studies, IV fluid, abdominal CT, and perhaps surgical consult	2 or more
3	A 45-year-old obese female with left lower leg pain and swelling, started 2 days ago after driving in a car for 12 hours	Needs exam, lab, lower extremity non-invasive vascular studies	2 or more

** In some regions throat cultures are not routinely performed; instead, the patient is treated based on history and physical exam. If that is the case the patient would be an ESI level 5.*

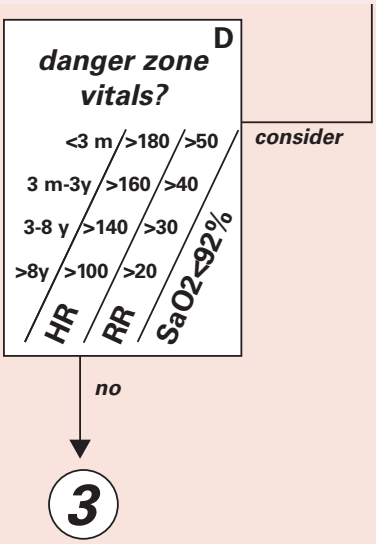
*** All 3 tests count as one resource (Lab).*

Decision Point D: The Patient's Vital Signs

Before assigning a patient to ESI level 3, the nurse needs to look at the patient's vital signs and decide whether they are outside the accepted parameters for age and are felt by the nurse to be meaningful. If the vital signs are outside accepted parameters, the triage nurse should consider upgrading the triage level to ESI level 2. However, it is the triage nurse's decision as to whether or not the patient should be upgraded to an ESI level 2 based on vital sign abnormalities. This is decision point D.

Vital sign parameters are outlined by age (see Figure 3-5). The vital signs used are pulse, respiratory rate, and oxygen saturation and, for any child under age three, body temperature. Using the vital sign criteria, the triage nurse can upgrade an adult patient who presents with a heart rate of 104, or this patient can remain ESI level 3. A 6-month-old baby with a cold and a respiratory rate of 48 could be triaged ESI level 2 or 3. Based on the patient's history and physical assessment, the nurse must ask if the vital signs are enough of a concern to say that the patient is high risk and cannot wait to be seen. Chapter 6 explains vital signs in detail and gives examples.

Figure 3-5. Danger Zone Vital Signs



Temperature is only included with children under age three. Significant fever may exclude young children from categories 4 and 5. This will help identify potentially bacteremic children and avoid sending them to a fast track setting or waiting a prolonged time. Pediatric fever guidelines will be described in detail in Chapter 6.

Does Time to Treatment Influence ESI Triage Categories?

An estimate of how long the patient can wait to be seen by a physician is an important component of most triage systems. The Australasian and Canadian Triage Systems require patients to be seen by a physician within a specific time period, based on their triage category. ESI does not mandate specific time standards in which patients must be evaluated by a physician. However, patients who meet criteria for ESI level 2 should be seen as soon as possible; it is up to the individual institution to determine a policy. Frequently, there may be confusion between institutional policy and "flow or process of patient care" and ESI triage level.

We will describe four patient scenarios in which flow and triage category may seem to conflict. Often trauma patients present to the triage nurse after sustaining a significant mechanism of injury, such as an unrestrained passenger in a high-speed motor vehicle crash. The patient may have left the crash scene in some way other than by ambulance, and then presents to triage with localized right upper quadrant pain with stable vital signs. This patient is physiologically stable, walked into the ED and does not meet ESI level-1 criteria. However, the patient is at high risk for a liver laceration and other significant trauma, so should be triaged as ESI level 2. Frequently, EDs have trauma policies and trauma response level categorization that will require rapid initiation of care. Triage and trauma response level are both important and should be recorded as two different scores. While the triage nurse recognizes this is a physiologically stable trauma patient and correctly assigns ESI level 2, she should facilitate patient placement and trauma care as outlined by the trauma policy. The patient is probably stable for another 10 minutes and does not require immediate life-saving interventions. If the same patient presented with a blood pressure of 80 palpable, they would be triaged as ESI level 1 and require immediate hemodynamic, life-saving interventions.

Another example of policies that may affect triage level is triage of the patient with stable chest pain. If the patient is physiologically stable but experiencing chest pain that is potentially an acute coronary syndrome, the patient meets ESI level-2 criteria. They do not require immediate life-saving interventions but they are a high-risk patient. Their care is time-sensitive, an ECG should be performed within 10 minutes of patient arrival. Often, EDs will have a policy related to rapid initiation of an ECG. While care of these patients should be rapidly initiated, the ECG is not a life-saving intervention, it is a diagnostic procedure. If the triage nurse were to triage all chest pain patients as ESI level 1, it would be difficult to prioritize the care for true ESI level-1 patients who require immediate life-saving interventions. But the patient with chest pain who presents to triage diaphoretic, with a blood pressure of 80 palpable would meet ESI level-1 criteria.

The third example of time-sensitive care is patients who present with signs of an acute stroke. Again, if physiologically stable, a 10 minute wait to initiate care will probably not further compromise the patient. However, the patient with signs of stroke that is unable to maintain an airway meets ESI level-1 criteria.

Finally, a somewhat different scenario is an elderly patient that fell, may have a fractured hip, arrives by private car with family, and is in pain. The patient does not really meet ESI level-2 criteria but is very uncomfortable. The triage nurse would categorize the patient as ESI level 3 and probably place the patient in an available bed before other ESI level-3 patients. Ambulance patients may also present with a similar scenario. Arriving by ambulance is not a criterion to assign a patient ESI level 1 or 2. The ESI criteria should always be used to determine triage level without regard to method of arrival.

In general, care of ESI level-2 patients should be rapidly facilitated and patients should ideally wait no longer than 10 minutes to be placed in the treatment area. It is important to remember that while ESI v. 4 has expanded level-1 criteria to include patients requiring immediate interventions that were previously ESI level 2, all level-2 patients are still potentially very ill and require rapid initiation of care and evaluation. The triage nurse has determined that it is unsafe for these patients to wait. Patients may currently be stable, but also have a condition that can easily deteriorate, and/or initiation of diagnostic treatment may be time sensitive (stable chest pain requires an ECG in 10 minutes of arrival), or the patient has a potential major life or organ threat. ESI level-2 patients are still considered to be very high risk.

In the current atmosphere of ED overcrowding, it is not uncommon for the triage nurse to be in a situation of triaging many ESI level-2 patients with no open ED beds in which to place the patients. In these situations, the triage nurse may be tempted to "undertriage." This can lead to serious, negative patient outcomes and an under-representation of the ED's overall case mix. When faced with multiple ESI level-2 patients simultaneously, the triage nurse must evaluate each patient according to the ESI algorithm. Then, the nurse can "triage" all level-2 patients to determine which patient(s) are at highest risk, in order to facilitate patient placement based on this evaluation.

Summary

In summary, the ESI is a five-level triage system that is simple to use and divides patients by acuity and resource needs. The ESI triage algorithm is based on four key decision points. The experienced ED RN will be able to rapidly and accurately triage patients using this system.

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Note: Appendix A of this handbook includes frequently asked questions and post-test assessment questions for Chapters 3 through 8. These sections can be incorporated into the ESI training course.

Chapter 4. ESI Level 2

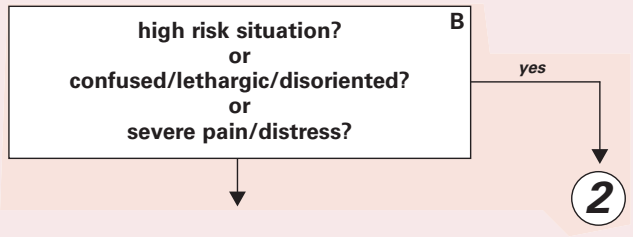
This chapter expands on the introduction to the ESI offered in Chapter 3 and discusses in further detail the decisionmaking process necessary to determine which patients meet ESI level-2 criteria. Though the ESI level-2 rating may be seen as subjective, it is based on the experienced ED nurse's sound clinical judgment. During the ESI triage educational program, a considerable amount of time should be devoted to explaining which types of patients should be categorized ESI level 2. In this chapter, we highlight common patient presentations that meet ESI level-2 criteria.

After the triage nurse has determined that the patient does not require immediate life-saving intervention, he or she must then decide whether the patient should wait. When making this decision, the triage nurse should consider the following question "Would I use my last open bed for this patient?" The following three questions listed in Figure 4-1 should be answered and are key components of ESI level-2 criteria:

1. Is this a high-risk situation?
2. Is the patient experiencing new onset confusion, lethargy, or disorientation?
3. Is the patient experiencing severe pain or distress?

The remainder of this chapter discusses the decision points of ESI level 2 in detail. Many examples are provided that are based on the potential medical diagnoses associated with patients' chief complaints and presenting symptoms. An experienced triage nurse will always assess the patient's chief complaint, presenting signs and symptoms, demographics, and medical history to attempt to identify a high-risk situation. While the purpose of nurse triage is not to make a medical diagnosis, these situations are based on the experienced triage nurse's knowledge of possible medical diagnoses that are associated with specific chief complaints. A good source of information about the signs and symptoms of various medical diagnoses is the Emergency Nursing Core Curriculum© or other emergency nursing textbooks. The following discussion provides some selected examples of high-risk situations. This discussion is not intended to be an exhaustive list. The examples are summarized in Table 4-1.

Figure 4-1. Patient Assessment



High-risk Situations

The ability to recognize a high-risk situation is a critical element of the triage decisionmaking process, regardless of the particular triage system used. ESI highlights the importance of recognizing high-risk situations and uses the triage nurse's expertise and experience to identify patients at high risk.

Little has been written about how ED triage nurses make decisions. Knowledge and experience are necessary but not sufficient. The other factor that we have found to be important is gut instinct or the sixth sense. Novice triage nurses should be taught rules of thumb which they can use until they have the confidence and experience upon which to make rapid, accurate decisions. Examples of these rules of thumb include "all women of childbearing age are pregnant until proven otherwise" or "all chest pain is cardiac until proven otherwise." Novice triage nurses are also taught symptom clustering such as the cardiac cluster of chest pain with nausea, shortness of breath, and diaphoresis. From prior clinical situations ED nurses put together what have been referred to as clinical portraits. The nurse puts into long-term memory particular patient scenarios in which they were involved in some way. For example, the patient with fever, stiff neck, and a meningococcal rash will always come to mind when a patient with a similar complaint presents to triage. The triage nurse needs to draw on all of his or her knowledge and experience with each triage encounter. High-risk situations should be easy for the experienced triage nurse to identify.

Vital signs are often not helpful in the identification of high-risk patients. The patient typically presents

Table 4-1. Examples of High-risk Situations

System	Examples/diagnosis	Signs/symptoms
Abdomen	Abdominal pain in the elderly Gastrointestinal bleeding	Severe pain, stable vital signs Tachycardia, vomiting blood or bright red blood per rectum
Cardiac	Chest pain Acute arterial occlusion History of angioplasty with chest pain Pericardial effusion Infective endocarditis	Constant or intermittent, stable vital signs Absence of distal pulse Stable vital signs Chest pain and shortness of breath History of drug abuse
General	Immunocompromised patients Oncology patients Transplant (post or on waiting list)	May or may not have fever
Genitourinary	Testicular torsion Acute renal failure	Sudden onset of testicular pain Unable to be dialyzed
Gynecological	Ectopic pregnancy Spontaneous abortion	+ pregnant, severe lower quadrant pain Bleeding and tachycardia with stable blood pressure
Mental Health	Combative, hostile, hysterical Suicidal attempt/complaint ETOH with trauma Sexual assault - any	
Neurologic	Rule out meningitis History of multiple cerebrovascular accidents Acute ischemic stroke	Headache, fever, lethargy Motor or speech deficits Motor or speech deficits
Pediatric	Vomiting, diarrhea, unable to eat Asthma attack	Sunken fontanel, poor skin turgor, lethargy Nasal flaring or use of intercostals
Respiratory	Acute epiglottitis Severe asthma Pleural effusions Spontaneous pneumothorax	Drooling Severe shortness of breath Severe shortness of breath Sudden onset of shortness of breath
Trauma	Motor vehicle crash with transient loss of consciousness Stab wound to the groin	History of head trauma Bleeding controlled, obvious stab wound

to the ED with a chief complaint, signs and symptoms, or history suggestive of a problem or condition that is serious and, unless dealt with promptly, can deteriorate rapidly. Often patient age, past medical history, and current medications influence the perceived severity of the chief complaint. For example, a frail elderly patient with severe abdominal pain is at a much higher risk of morbidity and mortality than a 20-year-old. The elderly patient with abdominal pain should be classified as ESI level 2, while the 20-year-old with stable vital signs will usually be classified as ESI level 3. It is common for the triage nurse to identify a high-risk situation which may then be confirmed by finding abnormal vital signs. For example, a patient who complains of a fever and productive cough may be found to have a respiratory rate of 32 and an oxygen saturation of 90 percent. The experienced triage nurse uses knowledge and expertise to recognize that this patient probably has pneumonia, is at risk for desaturating and is therefore high risk. Inexperienced ED nurses are not likely to have the

knowledge and expertise to consistently identify high-risk situations and make accurate triage decisions. For this reason, the inexperienced triage nurse is, in fact, a liability at triage, regardless of the particular triage system used. They have not incorporated symptom clustering, clinical portraits, or "gut instinct" into their practice; such approaches are key in identifying the high-risk patient situation. The next section will provide specific examples of high-risk situations.

Abdominal and Gastrointestinal

Abdominal pain is a frequent chief complaint in the ED. What makes it high risk? A good history and assessment of current pain rating, respiratory rate, and heart rate are important elements to consider and will help determine the presence of a high-risk situation. Pain rating is only one of many factors to consider. Tachycardia or respiratory distress that accompanies severe abdominal pain can represent shock and would place the patient at high risk. The elderly patient with severe abdominal pain presents another potentially risky situation. Often the elderly experience bowel obstructions, gastrointestinal bleeds, and other abdominal complications associated with significantly higher morbidity and mortality than younger patients. Signs and symptoms of an acute abdomen are important to assess for in all patients with abdominal pain. How long has the patient had the pain? What made the patient come to the ED today? Has the patient had severe nausea, vomiting, or diarrhea? Is the patient dehydrated? Patients with severe "ripping" abdominal pain radiating to the back should be considered to potentially have an abdominal aortic aneurysm. Patients describe the pain as severe, constant, and sudden in onset and may have a history of hypertension.

Patients with abdominal pain are often initially considered ESI level 3 at the beginning of the triage interview, and after the discovery of tachycardia or other risk factors, the triage nurse may determine that the patient is indeed high risk.

Vomiting blood or a chief complaint of blood per rectum should be seriously considered and evaluated in the context of vital signs. A 30-year-old with bright red blood per rectum, normal vital signs, and no other risk factors does not meet criteria for ESI level 2. But the elderly patient who called an ambulance because he started vomiting blood and has a heart rate of 117 and a respiratory rate of 24 is high risk and does meet ESI level-2 criteria.

Cardiovascular

Chest pain is also a very common chief complaint. The presentation of acute coronary syndromes (ACS) is not always specific, and it is sometimes difficult to determine the risk of ACS at triage. Patients who have an episode of chest or epigastric discomfort, with or without accompanying symptoms, usually will need an ECG performed rapidly to determine the presence of ACS and need to be identified as high risk-ESI level 2. It is important for the triage nurse to incorporate into his or her knowledge of women and presentational symptoms characteristic of heart disease. The 54-year-old obese female who presents to the ED with epigastric pain and fatigue is at risk of ACS and should be assigned to ESI level 2-high risk. Patients with chest pain that are physiologically unstable and require immediate intervention such as intubation or hemodynamic support should be triaged as ESI level 1. All chest pain patients do not meet level-1 or 2 criteria. For example, a 20-year-old healthy patient with chest pain, cough, and fever of 101° is at low risk for ACS and does not meet ESI level-1 or 2 criteria. Each patient must be assessed individually. Other high-risk cardiovascular situations would include the possibility of a hypertensive crisis, acute vascular arterial occlusions, and patients who present with a fever post valve replacement.

Dental, Ear, Nose, and Throat

Although less common, epiglottitis still exists and represents a potential airway threat. Patients with a peritonsilar abscess are another example of potential airway compromise and both conditions represent a high-risk situation. If a patient with either of these complaints is in immediate danger of airway compromise and requires immediate intervention, level-1 criteria are met. For patients with epistaxis, the triage nurse should obtain a blood pressure, although this is not in the ESI algorithm. Epistaxis could be caused by a posterior nosebleed due to a hypertensive crisis, nose picking by the patient on Coumadin®, or recent cocaine use. In any case, such patients should be classified as ESI level 2, as they represent a high-risk situation.

Environmental

Patients with inhalation injuries should be considered high risk for potential airway compromise. If the patient presents with significant airway distress and requires immediate intervention, they meet level-1 criteria.

Facial

Patients with trauma to the face should be evaluated for possible facial fractures. When present, facial fractures are often associated with other severe trauma and may potentially lead to airway compromise and should therefore be triaged as high risk. Facial trauma with actual airway compromise should be triaged as ESI level 1 to facilitate airway management High-risk of airway compromise should be triaged as ESI level 2.

General Medical

There are several other general medical complaints that need to be considered for possible high-risk situations. These medical complications include diabetic ketoacidosis, hyper- or hypoglycemia, sepsis, complaints of syncope or near syncope, and a variety of other electrolyte disturbances that may need to be treated immediately. Hyperkalemia in particular is a very high-risk situation that can lead to serious cardiac dysrhythmias. Hyperkalemia might be suspected in a renal dialysis patient exhibiting weakness. Finally, oncology patients with a fever who are undergoing chemotherapy are at risk for sepsis and should be identified as high risk and rapidly evaluated.

Genitourinary

Males with testicular torsion will complain of severe pain, are easily recognized, and require rapid evaluation and surgical intervention, in addition to rapid pain control. Renal dialysis patients unable to complete dialysis are another example of a high-risk genitourinary emergency, since a variety of electrolyte disturbances may be present. Females, and more commonly males, can present to the triage nurse with acute urinary retention. Males over age 65 often present with benign prostatic hypertrophy and the inability to urinate. Males and females can present postoperatively with the inability to void. These patients are in acute distress and require emergency urinary catheterization. These are examples of patients in severe distress who should be categorized as ESI level 2.

Mental Health

Many patients that present with mental health problems are at high risk if they are a danger either to themselves, others, or the environment. Patients who are suicidal, homicidal, psychotic, violent, or present an elopement risk should be considered high risk. Intoxication without signs of trauma or associated risk of aspiration does not represent a high-risk criterion. The intoxicated patient needs to be carefully assessed for signs of trauma or behavioral issues related to alcohol use or past medical history. Either could represent a high-risk situation and the patient would be categorized ESI level 2.

Neurological

Patients with severe headache associated with mental status changes, high blood pressure, lethargy, fevers, or a rash should be considered high risk. Any patient with sudden onset of speech deficits or motor weakness should also be assigned ESI level 2. Patients with these symptoms may be experiencing an acute stroke and immediate evaluation is critical. Time from onset of symptoms is a critical factor in determining treatment options, in particular fibrinolytic or other therapies. A patient with no past medical history of headaches that presents to the emergency department with the sudden onset of a headache should be identified as high risk for a subarrachnoid bleed. The patient will often describe exactly what they were doing when the headache began, typically after lifting, having a bowel movement, or after sexual intercourse.

Obstetrical and Gynecological

Females with abdominal pain or vaginal bleeding should be carefully assessed and vital signs obtained if there is no obvious life threat. Pregnancy history and last menstrual period should always be ascertained from all females of childbearing age. The triage nurse should assess for signs and symptoms of the following conditions in late pregnancy: abruptio placentae and placenta previa. In early pregnancy the triage nurse should assess for signs and symptoms of ectopic pregnancy and spontaneous abortion. All pregnant patients 14 to 20 weeks and over should be seen by a physician rapidly, according to individual institutional policy. A postpartum patient with a chief complaint of heavy vaginal bleeding should also be seen by a physician urgently. Any female patient, whether pregnant or

postpartum, who presents with significant hemodynamic instability and is in need of immediate life-saving interventions should be triaged as ESI level 1.

Ocular

Patients with trauma to the eye, sudden partial or full loss of vision, or a chemical splash to the eye are at high risk for permanent damage to the eye and should be triaged at ESI level 2. Conditions associated with some type of visual loss include central retinal artery occlusion, acute narrow-angle glaucoma, and retinal detachment. Trauma to the eye can result in a globe rupture and hyphema. Chemical splashes to the eye, particularly alkali, necessitate immediate flushing to prevent further damage to the cornea. All of these conditions require immediate evaluation and treatment to prevent further complications or deterioration. These patients meet ESI level-2 criteria. While immediate irrigation is necessary, it is not considered life-saving and thus these patients do not meet ESI level-1 criteria.

Orthopedic

Patients with signs and symptoms of compartment syndrome are at high risk for extremity loss and should be assigned ESI level 2. Other patients with high-risk orthopedic injuries include any extremity injury with compromised neurovascular function, partial or complete amputations, or trauma mechanisms identified as having a high-risk such as serious acceleration or deceleration. Patients with possible fractures of the pelvis, femur, or hip and other extremity dislocations should be carefully evaluated and vital signs considered. These fractures can be associated with significant blood loss. Again, the need for immediate life-saving intervention in hemodynamically unstable patients will meet ESI level-1 criteria.

Pediatrics

It is not uncommon for the triage nurse to be uncomfortable when making triage acuity decisions about children, especially infants. It is important to obtain an accurate history from the caregiver and evaluate the activity level of the child. The child who is inconsolable or withdrawn may be at high risk of serious illness. The following conditions are examples of high-risk situations for children:

- Seizures.
- Sepsis, severe dehydration.
- Diabetic ketoacidosis.
- Child abuse, burns.
- Head trauma.
- Vitamins/iron or other overdoses/ingestions.
- Infant less than 28 days of age with a fever of 100.4° F or 38° C, or greater.

Transplant

Patients who are status post organ transplant are usually ill and considered high risk. They can present with organ rejection, sepsis, or other complications. Patients who are on a transplant list are also usually considered high risk.

Respiratory

There are many respiratory complaints that place patients at high risk. Patients with mild-to-moderate distress should be further evaluated for respiratory rate and pulse oximetry to determine whether they should be categorized ESI level 2. Patients in severe respiratory distress that require immediate life-saving intervention such as intubation meet level-1 criteria. The high-risk patient is one who is currently ventilating and oxygenating adequately but is in respiratory distress and has the potential to rapidly deteriorate. Potential etiologies of respiratory distress may include asthma, pulmonary embolus, pleural effusion, pneumothorax, foreign body aspiration, toxic smoke inhalation, or shortness of breath associated with chest pain.

Toxicological

Most patients who present with an overdose should be rapidly evaluated and represent a high-risk situation. It is often difficult to determine which drugs were taken and the quantities actually consumed. If the patient has taken an intentional overdose, and admits to suicidal ideation, this meets criteria for a high-risk situation. A patient who is apneic on arrival or requires other immediate life-saving interventions should be categorized an ESI level 1; all other admitted overdoses should be considered ESI level 2.

Trauma

Frequently, patients who have been involved in a traumatic event are at high risk for injury, although no obvious injuries may be apparent. Any mechanism of injury associated with a high risk of injury should be categorized ESI level 2, unless they

present with unstable vital signs and require immediate intervention. These patients should be triaged as ESI level 1. Serious injury results from the transfer of mechanical or kinetic energy and is caused by acceleration forces, deceleration forces, or both. Motor vehicle and motorcycle crashes, victims of falls, and gunshot and stab wounds are examples of blunt and penetrating trauma, which should be assessed carefully for potential for serious injury. The triage nurse should obtain the following details regarding the injury: age of the patient, pre-existing conditions of the patient and environment, distance the patient fell or jumped, how fast the vehicle was moving, history of loss of consciousness, location of penetrating injury, and type of weapon. Again, the nurse will draw from his or her knowledge of biomechanics and mechanism of injury to assess the patient and decide whether they meet ESI level-2 criteria. Gunshot wounds to the head, neck, chest, or groin usually require trauma team evaluation and immediate interventions and should be triaged as ESI level 1.

Wound Management

What makes a wound high risk? Is there uncontrolled bleeding? Is there arterial bleeding? Is this a partial amputation? How was the wound sustained and does the mechanism of injury leave the patient at high risk for other traumatic complications? Most wounds do not meet the criteria for ESI level 2. A patient with a stab wound to the subcutaneous tissue of the thigh with controlled bleeding and good distal neurological function can be classified as ESI level 4. Any uncontrolled bleeding that requires immediate life-saving intervention to stabilize the patient meets level-1 criteria.

Confusion/Lethargy/ Disorientation

The second question to consider when determining whether a patient meets level-2 criteria is “Does the patient have new onset confusion, lethargy, or disorientation?” Altered mental status is another frequent chief complaint. Family members, friends, or paramedics may accompany these patients to the ED. At decision point B of the ESI algorithm, the presence of confusion, lethargy, or disorientation refers to new onset or an acute alteration in level of consciousness (LOC). Chronic dementia and confusion do not meet criteria for ESI level 2. Confusion, lethargy, or disorientation may be caused by a variety of serious medical conditions including stroke, transient ischemic attack, and other structural pathology to the brain, metabolic, and electrolyte imbalances such as hypoglycemia or hyponatremia and toxicological conditions.

This portion of the algorithm is usually very clear and leaves very little open to interpretation. If the patient's history is unknown and the patient presents to triage confused, lethargic or disoriented, the triage nurse should assume this condition is new and select ESI level 2 as the triage category. Again, if the patient has new onset confusion, lethargy or disorientation and requires an immediate life-saving intervention as previously described, the patient then meets ESI level-1 criteria.

Severe Pain/Distress

The final question to address when determining whether the patient meets level-2 criteria is “Does the patient have severe pain or distress?” The patient should be assessed for the presence of severe pain or distress. All patients who have a pain rating of 7/10 or greater should be *considered* for meeting ESI level-2 criteria.

Considered is a very important word. It is up to the discretion of the triage nurse to determine whether the clinical condition and pain rating in combination warrant a rating of ESI level 2. For example, a patient who had a heavy metal object fall on his toe may rate the pain a 10/10. Indeed, the patient may have a fracture and is experiencing severe pain. The patient probably has done nothing to try to relieve the pain prior to arrival in the ED. The correct triage level for this patient would be ESI level 4. Only one resource will be needed (an x-ray). The triage nurse should implement comfort measures at triage including ice, elevation, and analgesics (if standing orders are in place) to reduce the pain. The triage nurse should believe the patient's pain is 10/10 and address the pain at triage. However, this patient can wait to be seen and you would certainly not use your last open bed for this patient. In summary, the triage nurse assesses not only the pain intensity rating provided by the patient, but also the chief complaint, past medical history and physiologic appearance of the patient when determining a triage category. Examples of patients for whom the triage nurse could use severe pain criteria to justify an ESI level-2 rating include:

- A patient with 10/10 flank pain who is writhing at triage.

- An 80-year-old female with 7/10 generalized abdominal pain with severe nausea.
- A 30-year-old patient in acute sickle cell pain crisis.
- An oncology patient with severe pain.
- Any full- or partial-thickness burn that will require immediate pain control.

All ED patients are to be assessed for pain and asked to rate their pain using a scale such as the visual analog scale. Many triage nurses are uncomfortable with documenting a patients pain rating and then having them wait to be seen. It is important for the triage nurse to understand that the patients self reported pain rating is only one piece of the pain assessment. For example, all ED triage nurses have triaged patients who are laughing, talking on their cell phone or eating chips but report their pain is 10+. Triage nurses should assign ESI level 2 if the patient reports a pain rating of 7/10 or greater and the triage nurse's subjective and objective assessment confirms that the patient's pain requires interventions that are beyond the scope of triage. The triage nurse concludes that it would be inappropriate for this patient to wait and they would assign this patient to the last open bed.

Finally, in determining whether a patient meets ESI level-2 criteria, the triage nurse must assess for severe distress, which is defined as either physiological or psychological. In addition to pain, patients experiencing severe respiratory distress meet criteria for ESI level 2 for physiological disturbances. Examples of severe psychological distress include patients who are:

- Distraught after experiencing a sexual assault.
- Exhibiting behavioral outbursts at triage.
- Combative.
- Victims of domestic violence.
- Experiencing an acute grief reaction.

These are patients that the triage nurse usually prefers to have placed in the treatment area immediately so as to have the patient avoid the waiting room.

Summary

We have reviewed the key components and questions that need to be answered to determine whether a patient meets ESI level-2 criteria. It is critical that the triage nurse consider these questions as he or she triages each patient. “Missing” a high-risk situation may result in an extended waiting period and potentially negative patient outcomes.

Reference

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Chapter 5. Expected Resource Needs

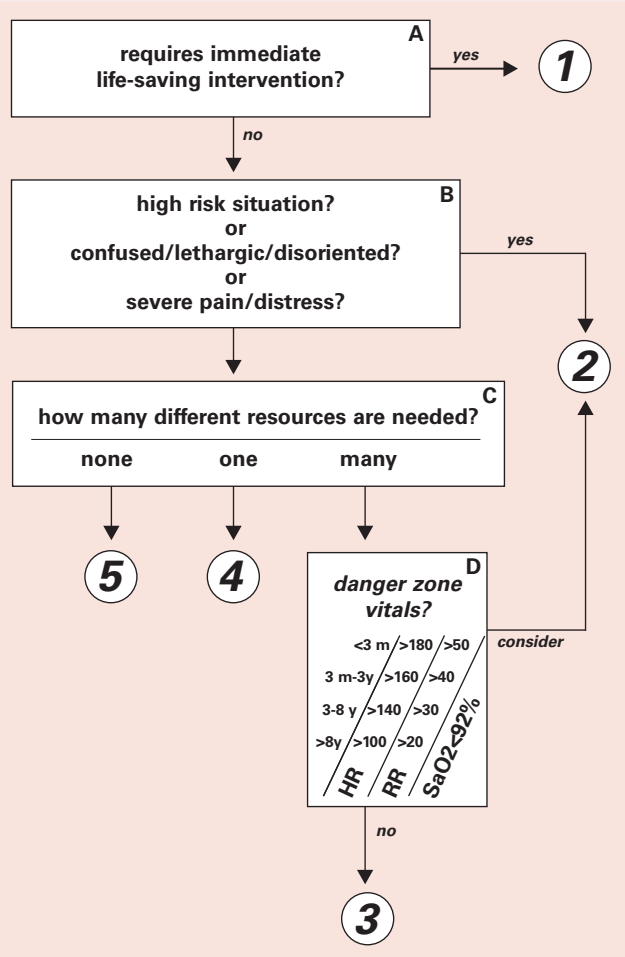
Traditionally, triage systems have been based solely upon the acuity of the patient. Such systems require the nurse to assign an acuity level by making a judgment about how long the patient can wait to be seen by a provider. The Emergency Severity Index (ESI) triage system uses a novel approach to triage level assignment by including not only judgments about who should be seen first, but also for the less acute patients, adding predictions of the resources that are likely to be used to make a disposition for the patient. This chapter includes background information on why resource predictions were included in the ESI and a description of what constitutes a resource. Also included are examples of patients rated ESI level 3 to 5 and the resources that each patient is predicted to need.

Historically, comprehensive triage has been the dominant model for triage acuity assignment in U.S. emergency departments (Emergency Nurses Association [ENA], 1997, p. 3-10; Gilboy, Travers & Wuerz, 1999). Triage systems have been based on the nurse's assessment of vital signs, subjective and objective information, past medical history, allergies, and medications to determine triage acuity.

Resource prediction is an integral part of the ESI for patients identified as ESI level 3, 4, or 5. It is important to understand that resource allocation does not have a role for patients of high acuity, e.g. ESI level 1 or 2. Resource prediction distinguishes the ESI from other triage systems that are based only on acuity. When Drs. Wuerz and Eitel created the ESI triage system, they added resource utilization to provide additional data and allow a better, more accurate triage decision. They believed that an experienced emergency department (ED) triage nurse was able to predict the nature and number of tests, therapeutic interventions, and consultations that a patient would need during his/her ED stay. This has been verified in recent studies of ESI implementation and validation, which have shown that triage nurses are able to predict ED patients' resource needs (Eitel, Travers, Rosenau, Gilboy & Wuerz, 2003; Tanabe, Gimbel, Yarnold & Adams, 2004). One study was conducted at seven EDs representing varied regions of the country, urban and rural areas, and academic and community hospitals. Nurses using the ESI were able to predict how many resources the ED patients required 70 percent of the time. That is, ESI classification by experienced triage nurses reasonably predicts at triage how many resources patients will require to reach ED disposition, but, more importantly, discriminates at presentation low versus high resource intensity patients. This differentiation by resource requirements allows for much more effective streaming of patients at ED presentation into alternative operational pathways within the ED, that is, the parallel processing of patients. Research has also established that ESI triage levels correlate with important patient outcomes, including admission and mortality rates (Eitel et al., 2003).

Again, it is important to note that resource prediction is only used for less acute patients. At decision points A and B on the ESI algorithm (Figure 5-1), the nurse decides which patients meet criteria

Figure 5-1. ESI Triage Algorithm, v. 4



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for ESI levels 1 and 2 based only on patient acuity. However, at decision point C, the nurse assigns ESI levels 3 to 5 by assessing both acuity and predicted resource needs. Thus, the triage nurse only considers resources when the answers to decision points A and B are "no."

To identify ED patients' resource needs, the triage nurse must be generally familiar with emergency department standards of care, and, specifically, what constitutes prudent and customary emergency care. An easy way to think about this concept is to ask the question, "Given this patient's chief complaint, what resources are the emergency providers likely to utilize?"

The triage nurse uses information from the brief subjective and objective triage assessment, as well as past medical history, medications, age, and gender, to determine how many different resources will be needed for the ED provider to reach a disposition. For example, a healthy teenage patient with a simple leg laceration and no prior medical history would need only one resource: Suturing. On the other hand, an older adult with multiple chronic medical problems and no history of dizziness who presents with a head laceration from a fall will clearly need multiple resources: suturing, plus blood/urine tests, ECG, and x-rays or consultations with specialists. Accurate use of ESI triage is contingent on the nurses' ability to predict resources and as such is best performed by an experienced emergency nurse. In general, we believe that no matter what triage system is used, an experienced emergency nurse is needed to safely perform triage.

Guidelines for the categorization of resources in the ESI triage system are shown in Table 5-1 (repeat of Table 3-1). ESI levels 3, 4, and 5 are differentiated by the nurse's determination of how many resources are needed to make a patient disposition. On the basis of the triage nurse's predictions, patients who are expected to consume no resources are classified as level 5, those who are likely to require one resource are level 4, and those who are expected to need two or more resources are designated as ESI level 3. Patients who need two or more resources have been shown to have higher rates of hospital admission and mortality and longer lengths of stay in the ED (Eitel et al., 2003; Tanabe et al., 2004 Reliability and validity).

Though the list of resources in Table 5-1 is not exhaustive, it provides general guidance on the types of diagnostic tests, procedures, and therapeutic

Table 5-1. Resources for the ESI Triage System

Resources	Not resources
Labs (blood, urine)	History & physical (including pelvic)
ECG, X-rays CT-MRI-ultrasound angiography	Point-of-care testing
IV fluids (hydration)	Saline or heplock
IV, IM or nebulized medications	PO medications Tetanus immunization Prescription refills
Specialty consultation	Phone call to PCP
Simple procedure = 1 (lac repair, Foley cath)	Simple wound care (dressings, recheck)
Complex procedure = 2 (conscious sedation)	Crutches, splints, slings

treatments that constitute a resource in the ESI system. Emergency nurses who use the ESI are cautioned not to become overly concerned about the definitions of individual resources. It is important to remember that ESI requires the triage nurse to merely estimate resources that the patient will need while in the ED. The most common resources are listed in Table 5-1; however a comprehensive list of every possible ED resource is neither practical nor necessary. In fact, all that is really necessary for accurate ESI rating is to predict whether the patient will need no resources, one, or two or more resources. Once a triage nurse has identified two probable resources, there is no need to continue to estimate resources. The essence of the ESI resource component is to separate more complex (resource-intensive) patients from those with simpler problems. The interventions considered as resources for the purposes of ESI triage are those that indicate a level of assessment or procedure beyond an exam or brief interventions by ED staff and/or involve personnel outside of the ED. Resources that require significant ED staff time (such as intravenous medication administration or chest tube insertion) and those that require staff or resources outside the ED (such as x-rays by the radiology staff or surgical consults) increase the patient's ED length of stay and indicate that the patient's complexity, and, therefore, triage level is higher.

There are some common questions about what is considered an ESI resource. First, there is often a question about the number of blood or urine tests and x-rays that constitute a resource. In the ESI triage method, the triage nurse should count the number of different types of resources needed to determine the patient's disposition, not the number of individual tests.

- A complete blood count (CBC) and electrolyte panel comprise one resource (lab test).
- A CBC and chest x-ray are two resources (lab test, x-ray).
- A CBC and a urinalysis are both lab tests and together count as only one resource.
- A chest x-ray and plain skull films are one resource (x-ray).
- A cervical-spine films and a computerized tomography (CT) scan of the head are two resources (x-ray and CT scan).

Another resource frequently questioned is the application of a splint, which does not count as a resource. If a splint did count, patients with sprained ankles would be triaged as ESI level 3 (x-ray and splint application). While the application of a splint can certainly be resource intensive, it is important to remember the only purpose of resource prediction is to sort patients into distinct groups and help get the right patient to the right area of the ED. In many EDs, ESI level-3 patients are not appropriate for a fast track or urgent care area. Triage scores are not a measure of total nursing workload intensity.

Another common question about ESI resources relates to the fact that eye irrigation is also considered a resource. Patients with a chemical splash usually meet ESI level-2 criteria because of the high-risk nature of the splash, so eye irrigation is not a key factor in their ESI rating. However, if the eye problem was due to dust particles in the eye, the patient would not necessarily be high risk. In this type of patient, the eye irrigation would count as a resource and the patient would meet ESI level-4 criteria. The eye exam does not count as a resource because it is considered part of the physical exam. Other common questions about resources are addressed in the Chapter 5 Frequently Asked Questions section of Appendix A.

Another frequent question posed by clinicians is related to the items listed as “not resources” in Table 5-1. The purpose of the list is to assist triage nurses with quick, accurate sorting of patients into five clinically distinct levels (Wuerz, Milne, Eitel, Travers & Gilboy, 2000). As such, items listed as not being resources include physical exams, point-of-care tests, and interventions that tend not to lead to increased length of stay in the ED or indicate a higher level of complexity. Since the standard of care is that all ED patients undergo a basic history and physical exam, an exam and even a pelvic exam does not constitute a resource for ESI classification. The beauty of the ESI is its simplicity; the true goal of the resource determination is to differentiate the more complicated patients needing two or more resources (level 3 or above) from those with simpler problems who are likely to need fewer than two resources (level 4 or 5). Emergency nurses should not try to complicate ESI by concentrating overly on resource definitions. Usually, a patient requires either no resources, one, or two or more resources.

Though resource consumption may vary by site, provider, and even individual patient, triage nurses are urged to make the ESI resource prediction by thinking about the common approaches to the most common presenting problems. Ideally, a patient presenting to any emergency department should consume the same general resources. For example, a provider seeing an 82-year-old nursing home resident who has an in-dwelling urinary catheter and a chief complaint of fever and cough will most likely order blood and urine tests and a chest x-ray. The triage nurse can accurately predict that the patient needs two or more resources and therefore classify the patient as ESI level 3.

There may be minor variations in operations at different EDs, but this will rarely affect the triage rating. For example, some departments do pregnancy tests in the ED (not a resource by ESI) and others send them to the lab (a resource by ESI). However, patients rarely have the pregnancy test as their only resource, so most of those patients tend to have two or more resources in addition to the pregnancy test. One ED practice variation that may result in different ESI levels for different sites is the evaluation of patients with an isolated complaint of sore throat. At some hospitals it is common practice to obtain throat cultures (one resource, ESI level 4), while at others it is not (no resources, ESI level 5). Another example of different site practice variation is the use of the Ottowa Ankle Rules. These are validated rules used to determine the need for an x-ray of the ankle for patients that present with ankle injuries. Institutional adoption of these rules into

practice varies. Institutions that use these rules at triage may obtain fewer x-rays when compared with institutions that do not routinely use these rules.

Temperature is an important assessment parameter for determining the number of resources for very young children. This subject will be covered in Chapter 6.

From a clinical standpoint, ESI level 4 and 5 patients can wait several hours to be seen by a provider. However, from a customer service standpoint, these patients are perhaps better served in a fast-track or urgent care setting. Mid-level practitioners with the appropriate skills mix and supervision could care for level-4 and 5 patients. The ESI provides yet another operational advantage, in that level-5 patients can sometimes be "worked in" for a quick exam and disposition by the provider, even if the department is at capacity. Often triage policies clearly state ESI level-4 or 5 patients can be triaged to an urgent care or fast-track area.

In summary, the ESI provides an innovative approach to ED triage with the inclusion of predictions about the number of resources needed to make a patient disposition. Consideration of resources is included in the triage level assignment for ESI level-3, 4, and 5 patients, while ESI level-1 and 2 decisions are based only on patient acuity. Examples of ESI level-3, 4, and 5 patients are shown in Table 5-2. Practical experience has demonstrated that resource estimation is very beneficial in helping sort the large number of patients with non-acute presentations.

Table 5-2. Examples of Resources for ESI Level 3-5

Scenario	Predicted Resources *(ESI Resources in italic)*	ESI Triage Category
Right lower quadrant pain: 22-year-old male, right lower quadrant abdominal pain since early this morning, also nausea, and no appetite.	*ESI Resources = 2 or more* Exam *Laboratory studies* *IV fluid* *Abdominal CT* *(possible) Surgery Consult*	3
Left lower leg pain: 45-year-old obese female with left lower leg pain & swelling which started 2 days ago, after driving in a car for 12 hours.	*ESI Resources = 2 or more* Exam *Laboratory studies* *Lower extremity non-invasive vascular studies* *(possible) Anticoagulant therapy*	3
Ankle injury: Healthy, 19-year-old female who twisted her ankle playing soccer. Edema at lateral malleolus, hurts to bear weight.	*ESI Resources = 1* Exam *Ankle x-ray* Ace wrap Crutch-walking instruction	4
Urinary tract infection symptoms: Healthy, 29-year-old female with UTI symptoms, appears well, afebrile, denies vaginal discharge.	*ESI Resources = 1* Exam *Urine & urine culture* *(possible) Urine hCG* Prescriptions	4
Poison ivy: Healthy 10-year-old child with 'poison ivy' on extremities.	*ESI Resources = none* Exam Prescription	5
Prescription refill: Healthy 52-year-old who ran out of blood pressure medication yesterday. BP 150/84. No acute complaints.	*ESI Resources = none* Exam Prescription	5

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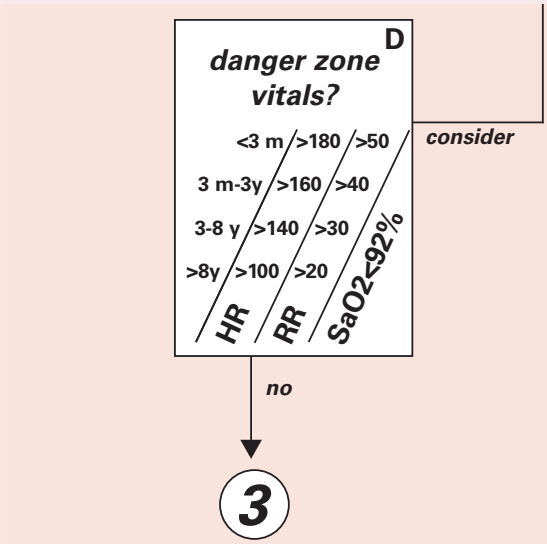
Chapter 6. The Role of Vital Signs in ESI Triage

Introduction

In this chapter, we focus on decision point D—the patient's vital signs. To reach this point in the ESI algorithm, the triage nurse has already determined that the patient does not meet ESI level-1 or 2 criteria, and that he or she will require two or more resources. Since the patient requires two or more resources, he or she meets the criteria for at least an ESI level 3. It is at this point in the algorithm that vital signs data are considered, so the triage nurse's next step is to assess the patient's heart rate, respiratory rate, and oxygen saturation, and, when appropriate (for children under age 3), temperature. If the danger zone vital sign limits are exceeded (as illustrated in decision point D, Figure 6-1), the triage nurse must strongly consider up-triaging the patient from a level 3 to a level 2.

During the ESI triage educational program, a considerable amount of time should be devoted to exploring the importance of vital signs in the decision to move a patient from ESI level 3 to an ESI level 2. It should be stressed that it is always the decision of the experienced triage nurse to determine whether the patient meets criteria for ESI level 2, based upon their past medical history, current medications, and subjective and objective assessment that includes general appearance. This decision is based on the triage nurse's clinical judgment and knowledge of normal vital sign parameters for all ages and the influence of factors such as medications, past medical history, and pain level.

Figure 6-1. Danger Zone Vital Signs



What Are Vital Signs?

Vital signs traditionally include simple measurements of physiological parameters including temperature, blood pressure, pulse, and respiratory rate as well as pulse oximetry (see Table 6-1). They frequently

Table 6-1. Standard Vital Signs

Vital Sign	Definition
Blood pressure	The pressure or tension of the blood within the systemic arteries, maintained by the contraction of the left ventricle, the resistance of the arterioles and capillaries, the elasticity of the arterial walls, as well as the viscosity and volume of the blood (Stedman, 1995).
Heart rate	A measure of the heart's beat, recorded as the number of beats per minute (Stedman, 1995).
Temperature	The degree of temperature, an indicator of the presence of disease, or health threat independent of other signs gathered from simple physical diagnosis.
Respiratory rate	Frequency of breathing, recorded as the number of breaths per minute (Stedman, 1995).
Oxygen saturation	Oxyhemoglobin saturation according to the absorption of light. It can provide early warning of pulmonary or cardiovascular deterioration (Tintinalli, Kelen & Stapczynski, 2000).
Pain	A noxious sensation transmitted by specialized nervous structures to the brain, where its perception is modified by cognition and emotion (Paris, 1989; Tintinalli et al., 2000).

prompt a health care worker to follow a particular path of action. Recently, the nursing literature has placed increased emphasis on pain. The American Pain Society adopted the phrase "Pain: the fifth vital sign" to increase healthcare workers' awareness of the importance of assessment and management of pain. Pain assessment is an important component of ESI and is actually assessed earlier in the algorithm. So, for the purpose of ESI, heart rate, respiratory rate, oxygen saturation and temperature in children under age 3 are the vital sign parameters considered in decision point D. Vital signs represent a set of objective data for use in determining general parameters of patients' health and viability. The values we obtain influence our interpretation of a patient's overall condition and, therefore, the path we take in establishing a diagnosis and treatment for the patient. However, vital signs alone do not paint a complete picture of the patient's condition. Vital signs may be affected by a variety of factors including prescription medications, herbals, and recreational drugs. For example, beta-blockers cause bradycardia and blunt the tachycardic response to shock. Hypothyroidism, common in the elderly, may lead to the finding of low temperature, even in the face of sepsis. A young adult may have an elevated body temperature due to recreational drug use.

Vital signs are variable, dynamic indicators that are an adjunct to a patient's evaluation. Vital sign measurements may also be operator dependent, and the definition of normal vital signs varies according to the reference consulted. Even under the best conditions, vital signs are not always reliable or accurate (Edmonds, Mower, Lovato & Lomeli, 2002). The patient's general appearance and clinical picture frequently prove to be of the most value. However, if in a triage nurse's judgment, knowing a patient's vital signs would help with risk analysis, then vital signs should be measured. For example, if the patient is using immunosuppressive medications or chemotherapy or is immunosuppressed by an illness such as AIDS, then the body temperature should be measured.

Are Vital Signs Necessary at Triage?

Prior to the advent of five-level triage in the United States, tradition dictated that every patient presenting to an emergency department should have a set of vital signs taken before triage level assignment. Vital signs were considered an integral component of the initial nursing assessment and were often used as a decisionmaking tool. In a traditional three-level triage system, vital signs helped determine how long a patient could wait for treatment (i.e., if no abnormal vital signs were present, in many cases, the patient could wait a longer period of time). Vital signs, therefore, in the past weighted heavily in the patient triage assessment, with variable emphasis placed on the clinical presentation.

More recently, newer triage models advocate selective use of vital signs at triage (Gilboy, Travers & Wuerz, 2000). Initial vital signs are not a mandatory component of other five-level triage systems and in general are not reported during the triage phase of a level-1 or 2 patient (i.e., those patients with the highest acuity). For example, the *Guidelines for Implementation of the Australasian Triage Scale in Emergency Departments* states that "vital signs should only be measured at triage if required to estimate urgency, or if time permits" (Australasian College for Emergency Medicine, 2000). Similarly, the Canadian Triage and Acuity Scale (CTAS) upholds the need for vital signs if, and only if, they are necessary to determine a triage level (in the cases of levels 3, 4, and 5) as time permits (Beveridge et al., 2002. The Manchester Triage Group uses specific vital sign parameters as discriminators within a presentational flow chart. The vital sign parameter is one of the factors that help the triage nurse assign an acuity level.

Vital signs may not always be the most appropriate tool to determine triage acuity. At least one study has suggested that vital signs are not always necessary in the initial assessment of the patient at triage. In 2002, Cooper, Flaherty, Lin, and Hubbell examined the use of vital signs to determine a patient's triage status. They considered age and communication ability as factors. Twenty-four different U.S. emergency departments and more than 14,000 patients participated in that study. Final results demonstrated that vital signs changed the level of triage acuity status in only eight percent of the cases. When further examining individual age groups, pediatric patients age 2 or younger showed the largest variation in triage decision with an 11.4 percent change once vital signs were collected.

Vital Signs and ESI Triage

Using ESI triage, the only absolute requirement for vital signs assessment is for patients who don't initially meet ESI level-1 or 2 criteria, but who are

predicted to need two or more resources. Assessment of vital signs at triage is optional and at the discretion of the triage nurse for patients triaged as ESI level 1, 2, 4, or 5. While the ESI system does not require vital signs assessment on all patients who present to triage, local policies may dictate a different procedure. Factors such as staffing levels, casemix, and local resources influence individual hospital policies regarding vital signs at triage and are beyond the scope of this handbook. In general when triaging a stable patient, it is never wrong to obtain a set of vital signs. ESI requires vital signs for only level-3 patients. (See Table 6-2)

The developers of the ESI and the current ESI research team believe that experienced ED nurses can use vital sign data as an adjunct to sound clinical judgment when rating patients with the ESI. There is limited evidence on vital sign abnormalities as they relate to ED acuity and that are proven to truly represent serious illness. The ESI has been revised over time to reflect changes in the available evidence and recommendations from the literature. The ESI working group initially used the systemic inflammatory response syndrome (SIRS) literature (Rangel-Frausto et al., 1995) in developing the danger zone vital sign box and accompanying footnotes. The first version of the ESI used the SIRS criteria to include a heart rate of greater than 90 (for adults) as an absolute indicator to up-triage from ESI level 3 to level 2 (Wuerz, Milne, Eitel, Traers & Gilboy, 2000). The SIRS research was based on predictors of mortality in an intensive care unit population. Based on an excess of false positives using these criteria for ED patients at the initial ESI hospitals, the heart rate cutoff was changed to 100 in ESI version 2, and nurses were instructed to consider up-triage to ESI 2 for adult patients with heart rates greater than 100 (Wuerz et al., 2001; Gilboy, Tanabe, Travers, Eitel & Wuerz, 2003). Additionally, pediatric vital signs were added to the danger zone vital signs box.

Table 6-2. ESI Vital Signs Criteria

ESI level	Complete set of vital signs at Triage (YES/NO)	Evaluation plan
1	NO	Patient requires definitive care. Vital signs are either part of the secondary survey or are done simultaneously when a multimember team responds to the patient with a life-threatening condition.
2	NO	Patient requires definitive care. Vital signs are either part of the secondary survey or are done simultaneously when a multimember team responds to the patient with a high-risk condition.
3	YES	Nurse determines patient's heart rate, respiratory rate, oxygen saturation (if pertinent), and temperature (children < age 3) to decide if uptriage is necessary.
4	NO	Patient has a single system problem requiring one of the defined resources. Vital signs are not necessary for triage level assignment but are part of the treatment area evaluation.
5	NO	Patient has a single system problem requiring none of the defined resources. Vital signs are not necessary for triage-level assignment but are part of the treatment area evaluation.
2,3,4,5 Returning to waiting room	YES	Vital sign assessment is prudent to ensure patient safety.

When using ESI as a triage system, vital signs assessment is not necessary in the triage area for patients who are immediately categorized as level 1 or 2. If the patient appears unstable or presents with a chief complaint that necessitates immediate treatment, then transport of the patient directly to the treatment area should be expedited. For these patients, the resuscitation team is responsible for obtaining and monitoring vital signs at the bedside. This would include patients that have clinical appearances that indicate high risk or need for immediate cardiovascular or respiratory intervention. These patients may appear pale, diaphoretic, or cyanotic. However, the triage nurse has the option to perform vitals in the triage area, if an open bed is not immediately available or if he or she feels that the vital signs may assist in confirming the triage acuity level. Some patients may not initially be identified as ESI level 1 until vital signs are taken. For example, an awake, alert elderly patient who complains of dizziness might be found to have a life-threatening condition when a heart rate of 32 or 180 is discovered during vital sign measurement.

As shown in the ESI algorithm in Chapter 3, if patients do not meet ESI level-1 or 2 criteria, the triage nurse comes to decision point C. The nurse then determines how many resources the patient is expected to need in the ED. If the patient is expected to need one or no resources, he or she can be assigned an ESI level of 4 or 5 and no vital sign assessment is necessary. But if the patient is expected to need two or more resources, then the nurse comes to decision point D and vital signs should be assessed. Vital signs can play a more important role in the evaluation of some patients at triage, especially those triaged as ESI level 3. The range of vital signs may provide supporting data for potential indicators of serious illness. If any of the danger zone vital signs are exceeded, it is recommended that the triage nurse consider up-triaging the patient from level 3 to level 2.

Vital signs that are explicitly included in ESI triage are heart rate, respiratory rate, and oxygen saturation (for patients with potential respiratory compromise). Temperature is specifically used in ESI triage for children under age 3 (see below). It is important to note that when considering abnormal vital signs, blood pressure is not included in the ESI algorithm. This does not mean that the triage nurse should not take a blood pressure or a temperature on older children or adults but that these vital signs are not necessarily used to assist in selecting the appropriate triage acuity level.

Vital Signs and Pediatric Fever

In this version of the ESI Handbook, version 4 (v.4) of the ESI algorithm has been updated to include more current pediatric fever criteria. As shown in Figure 6-2, note D of the ESI algorithm addresses pediatric fever considerations for ESI triage. This section incorporates recommendations from the American College of Emergency Physicians' Clinical Policy for Children Younger Than Three Years Presenting to the Emergency Department With Fever (ACEP, 2003).

The ESI Triage Research Team recommends that vital signs in patients under age 3 be assessed at triage. In particular, temperature measurement is important during triage of all children from newborn through 36 months of age, and vital sign evaluation is essential to the overall assessment of a known febrile infant under age 36 months (Baraff, 2000). This helps to differentiate ESI level-2 and 3 patients and minimize the risk that potentially bacteremic children will be sent to an express care area or otherwise experience an inappropriate wait. Remember, if a patient is in immediate danger or

Figure 6-2. Danger Zone Vital Signs

D. Danger Zone Vital Signs
Consider uptriage to ESI 2 if any vital sign criterion is exceeded.

Pediatric Fever Considerations
1 to 28 days of age: assign at least ESI 2 if temp >38.0 C (100.4F)

1-3 months of age: consider assigning ESI 2 if temp >38.0 C (100.4F)

3 months to 3 yrs of age: consider assigning ESI 3 if: temp >39.0 C (102.2 F), or incomplete immunizations, or no obvious source of fever

high risk, he or she will be assigned to either ESI level 1 or 2.

Table 6-3 provides direction for the triage nurse in using the ESI to assess the febrile child and determine the most appropriate triage level. The generally accepted definition of fever is a rectal temperature greater than 38.0° C (100.4° F) (Baraff et al., 1993; ACEP, 2003). The infant less than 28 days old with a fever should be considered high risk and assigned to at least ESI level 2. There are no clear guidelines for the infant between 28 days and 3 months of age. The ESI research team recommends triage nurses rely on local hospital guidelines. We suggest that the nurse consider assigning at least an ESI level 2 for such patients.

In v. 4 of the ESI, we have incorporated a different set of pediatric fever guidelines for children ages 3 to 36 months. These pediatric fever considerations pertain to highly febrile children, defined as those with a fever of greater than 39.0° C (102.2° F) (ACEP, 2003). When triaging a child between 3 and 36 months of age who is highly febrile, it is important for the triage nurse to assess the child's immunization status and whether there is an identifiable source for the fever. The patient with incomplete immunizations or with no identifiable source for the fever should be assigned to at least ESI level 3. If the patient has an identifiable source for the fever and his or her immunizations are up to date, then a rating of 4 or 5 is appropriate. For example, a 7-month-old who is followed by a pediatrician, has had the Haemophilus influenza type b (HIB) vaccine and presents with a fever and pulling on his ear could be assigned to an ESI level 5.

Case Examples

The following case studies are examples of how vital signs data are used in ESI triage.

- "My doctor told me I am about 6 weeks pregnant and now I think I am having a miscarriage," reports a healthy looking 28-year-old female. "I started spotting this morning and now I am cramping." No allergies, no PMH, medications: prenatal vitamins. Vital signs: T 98° F, HR 112, RR 22, BP 90/60.

This patient meets the criteria for being up-triaged from a level 3 to a level 2 based on her vital signs. Her increased heart rate, respiratory rate, and decreased blood pressure are a concern. These factors could indicate internal bleeding from a ruptured ectopic pregnancy.

- "The baby has had diarrhea since yesterday. The whole family has had that GI bug that is going around," reports the mother of a 15-month-old. She tells you the baby has had a decreased appetite, a low-grade temperature, and numerous liquid stools. The baby is sitting quietly on the mother's lap. The triage nurse notes signs of dehydration. No PMH, NKDA, no medications. Vital signs: T 100.4° F, HR 142, RR 48, BP 76/50.

This patient meets the criteria for at least ESI level 3. For resources he would require labs and IV fluid. Based on his vital signs the triage nurse can up-triage him to an ESI level 2. For a baby this age, both heart rate and respiratory rate criteria are violated.

- "I need to see a doctor for my cough. I just can't seem to shake it. Last night I didn't get much sleep because I was coughing so much, I am just so tired," reports a 57-year-old female. She tells you that she had a temperature of 101° last night and that she is coughing up this yellow stuff. Her history includes a hysterectomy 3 years ago; she takes no medications but is allergic to Penicillin. Vital signs: T 101.4°, RR 28, HR 100, SpO2 90 percent.

At the beginning of her triage assessment, this patient sounds as though she could have

Table 6-3. ESI Pediatric Temperature Criteria

Age	Temperature	ESI level
1 - 28 days	Fever over 100.4° F (38.0° C)	2
1 - 3 months	Fever over 100.4° F (38.0° C)	Consider 2
3 - 36 months	Fever over 102.2° F (39.0° C)	Consider 3 (see text)

pneumonia. She will need two or more resources but her low oxygen saturation and increased respiratory rate are a concern. After looking at her vital signs the triage nurse should up-triage the patient to an ESI level 2.

- A 34-year-old obese female presents to triage complaining of generalized abdominal pain (pain scale rating: 6/10) for 2 days. She has vomited several times and states her last bowel movement was 3 days ago. She has a history of back surgery, takes no medications, and is allergic to peanuts. Vital signs: T 97.8° F, HR 104, RR 16, BP 132/80, SpO2 99 percent.

This patient will need a minimum of two or more resources: lab, IV fluids, perhaps IV medication for nausea, and a CT scan. The triage nurse would review the patient's vital signs and consider the heart rate. The heart rate falls just outside the accepted parameter for the age of the patient but could be due to pain or exertion. In this case, the decision should be to assign the patient to ESI level 3.

- A tearful 9-year-old presents to triage with her mother. She slipped on an icy sidewalk and injured her right forearm. The forearm is obviously deformed but has good color, sensation, and movement. The mother reports she has no allergies, takes no medications, and is healthy. Vital signs: BP 100/68, HR 124, RR 32, and SpO2 99 percent.

This child is experiencing pain from her fall and is obviously upset. She will require at least two resources: x-ray and orthopedic consult, and perhaps conscious sedation. Her heart rate and respiratory rate are elevated, but the triage nurse should feel comfortable assigning this patient to ESI level 3. Her vital sign changes are likely due to pain and distress.

- A 72-year-old patient presents to the ED with her oxygen via nasal cannula for her advanced COPD. She informs the triage nurse that she has an infected cat bite on her left hand. The hand is red, tender, and swollen. The patient has no other medical problems, uses albuterol prn, and takes an aspirin daily, NKDA. Vital signs: T 99.6° F, HR 88, RR 22, BP 138/80, SpO2 91 percent. She denies respiratory distress.

This patient will require two or more resources: labs and IV antibiotics. She meets the criteria for ESI level 3. The triage nurse notices that her oxygen saturation and respiratory rate are outside the accepted parameters for the adult but this patient has advanced COPD. These vital signs are not a concern so the patient will not be up-triaged but will stay an ESI level 3.

Conclusion

The information in this chapter provides a foundation for understanding the role of vital signs in the Emergency Severity Index triage system. We addressed the special case of patients under 36 months of age. Further research is necessary to clarify the best vital sign thresholds used in emergency department triage. Further study will also examine pediatric populations presenting to the emergency department. It is our hope that future versions of the ESI will be based on additional evidence regarding the predictive value of triage vital signs for pediatric and adult patients.

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Chapter 7. Implementation of ESI Triage

Up to this point we have provided an in-depth discussion of ESI. The next step is implementation. A well-thought-out implementation plan is critical to the successful integration of the ESI into an emergency department. In a very real sense, poor implementation is worse than no implementation at all, since the ED is unlikely to realize any of the benefits of the ESI and will waste scarce resources. Change of any sort is always challenging; however, change has become constant, pervasive, and persistent in health care. Nursing management literature has a wealth of information about how to facilitate change, which Sullivan and Decker (2001, p. 249) define as "the process of making something different from what it was." It is important to keep in mind that implementation of any change takes time, careful planning, and a group of professionals dedicated to a successful change process.

In this chapter we present background information on the change process in health care organizations. The primary focus of the chapter is a step-by-step guide for successful implementation of the ESI. The implementation strategies successfully used by members of the ESI research team are also presented.

The decision to change from another triage acuity system to ESI may be based on multiple reasons. In many institutions one particular event may be the impetus for the change, such as a mis-triage or a sentinel event due to prolonged patient waiting time. The clinical or administrative staff may express concerns about patient safety. The nursing staff may find that they are, in fact, continuously re-triaging patients. In overcrowded EDs with many urgent patients waiting to be seen, nurses are forced to constantly reprioritize these patients for the scarce ED beds. The challenges associated with ED triage in the 21st century have been the subject of many journal articles and professional presentations (Gilboy, Travers, & Wuerz, 1999; SoRelle, 2002; Zimmermann, 2001). These sources have identified many potential solutions, including the ESI triage system. Changing the ED triage method, however, requires significant understanding of the planned change process.

Planned change is a process that results from a well-thought-out and conscious effort to improve something. Application of Kurt Lewin's theory of planned change is a frequently used approach to change in health care organizations (Nelson, 2002). Lewin identified three phases of change: (1) unfreezing, (2) movement, and (3) refreezing. The first step in implementing any change is to recognize that a problem exists and that there is a clear need for change. This unfreezing phase is often compared to assessment, the first step of the nursing process. During the assessment phase, data are gathered and the problem or problems are identified. Both informal and formal discussions may occur around both the problem and the need for change. In the ED this may occur at nursing and physician meetings or during informal discussions in the clinical area. In many cases one individual drives the push for change. This "champion" should take every opportunity to discuss the problem and explain why a change needs to occur.

As in the nursing process, during the movement phase the change agent or agents identify, plan, and implement suitable strategies. The last phase, refreezing, is similar to the evaluation and reassessment phase of the nursing process. At this stage, the champions of the new system need to ensure that the change has been successfully integrated into the day-to-day operations of the emergency department.

Once the decision is made to change to the ESI, a multidisciplinary implementation team needs to be identified. The implementation team becomes the change agent. Typically the team includes staff nurses, physicians and the clinical educator or clinical nurse specialist. If the department has a triage committee, the members should be included on the team. Other disciplines such as registration and information systems that will be affected by the change may also be asked to join the team. Alternatively, the core team may choose to invite representatives from these disciplines to meetings on an as-needed basis. The group should consider asking one or more of the informal nursing leaders to be staff nurse team members. This will facilitate the informal leaders' "buy-in" of the change, which will be helpful when staff begins to raise concerns about the change to ESI. The implementation team leader is a key player in the successful implementation of the ESI and needs to have the respect of the department as well as strong skills in leadership, communication, problem solving, and decision making.

It is important for the implementation team to meet regularly. Department leadership needs to arrange for staff to be available during meeting time. It is well established that without adequate planning, implementation will fail. Implementation is never a

single action but involves a well-designed comprehensive plan, a stepwise process, and a variety of strategies and interventions (Grol & Grinshaw, 1999). First, the team needs to consider all aspects of the change and identify exactly what must be accomplished and then strategies can be developed to bring about the change. For example, at Brigham and Women's Hospital in Boston, Massachusetts the team brainstormed to identify who and what would be affected by the change to ESI. The list generated by this process included:

- Information systems.
- The patient tracking system.
- The physician record.
- The nursing record.
- Triage policies and procedures.
- Triage orientation.

Visiting other emergency departments that have already implemented ESI can be very informative. Start by contacting managers, educators or clinical nurse specialists at area emergency departments to determine what triage acuity rating system they are currently using. If the answer is ESI, determine how long the system has been in place. Visiting a department that has been using ESI for at least 6 months should be most beneficial. The leadership team may share valuable information about their own implementation experience, including issues they encountered and strategies that worked well.

If team members have questions that cannot be answered by the publications, this book, or others who have implemented ESI, they can always e-mail a member of the ESI research team at ESITriageTeam@hotmail.com, and we will be happy to answer your questions.

Once the implementation team has identified an appropriate department to visit, it is important for the team to decide which members should participate in the visit. Because it is an original ESI implementation site, the Emergency Department at Brigham & Women's Hospital often hosts implementation teams from other institutions. With groups of less than four the tour guide is able to walk the group through all areas of the department and not interfere with patient care or staff activities. The group can spend time in the triage area watching the flow of patients and can see the triage process at work. With groups of five or more, these activities must be restricted.

It is important to plan these visits to make sure that all of the group's open issues are addressed. Prior to the visit make a list of questions and information the team needs. Be sure to request copies of policies and documentation forms.

The implementation team must decide what needs to be done, who will do it and what strategies will be used, as well as develop a time line. Other teams have found flow-charting helpful. A flow chart identifies the critical tasks that need to occur and links them with completion target dates. The team can regularly refer to the flow chart to see if they are meeting their target dates. Education for physicians, nurses, and support staff is one critical task the team needs to consider.

Implementing ESI demands a commitment to the education of all staff. In order for this change to be successful, ED leadership must commit the resources necessary to thoroughly prepare the ED staff to use ESI. Although the ESI algorithm looks simple, there are several key concepts that need to be well understood in order to maintain the reliability and validity of the instrument. Orientation to the ESI is not a straightforward in-service training that can occur at change of shift or during down time in the ED. The original ESI hospitals have found that successful implementation of the ESI requires that, at a minimum, every triage nurse attend a 2-hour education program. The ESI program is best conducted in a setting away from the ED that is free from the distractions of the clinical area and conducive to learning. Without this level of commitment to the necessary education, the implementation of ESI can either fail or be haphazard.

Changing to ESI takes several months of planning and timing is important. Once all the tasks associated with the change are identified and timeframes established, the group can choose a realistic implementation date. The team must consider what is happening within the hospital and within the ED and identify a time when the unit is able to support the change and the educational activities. The acuity system cannot be changed gradually. A definite start date and time must be set and shared with all staff affected by the change.

Policies and Procedures

All policies related to triage must be reviewed in light of the change to ESI. Individual hospitals must decide how the ESI will be incorporated into their ED's existing policies and procedures and many policies may need to be rewritten.

Examples of policies and procedures that need to be addressed include:

- Where are different types of patients seen within the ED? This varies by hospital, depending on the ED structure and patient flow.
- What ESI level is assigned to a needle stick injury? Such patients may have been rated as urgent in a three-level triage system but could be classified as ESI level 3 or 2 depending on local resource allocation. Perhaps, like at University of North Carolina Hospitals, employees with a needle stick are not triaged in the ED but are referred directly to a 24-hour employee needle stick service.
- If nonurgent patients have been seen in the urgent care or fast-track area, does that mean all ESI level 4 and 5 may be triaged to fast-track? Can some ESI level-3 patients also go to the fast-track?
- Where will patients be seen who are triaged ESI level 2 due to pain? For example, on a busy afternoon in what part of the ED is the patient with renal colic in severe pain seen? Are they placed in the last open bed even if it is monitored? In an ED with several different sections, do they have to go to a specific section?

The ED leadership team will ultimately make these policy decisions, but the implementation team should identify these issues and make recommendations.

The ESI research team is frequently asked if the ESI system includes criteria for time to reassessment by triage level. The ESI system does not include reassessment recommendations. This is a key difference between ESI and other five-level triage systems. The ESI triage research group has purposefully not identified reassessment times but has left that to individual departments to incorporate into their triage policy. We urge caution; in this era of ED overcrowding it is very difficult for busy triage nurses to reassess patients at set time intervals when they are busy sorting incoming patients, and falling short of the policy can become a departmental liability.

It would be unrealistic for the implementation team to assume that all staff will embrace the change to ESI. Resistance is expected. It is impossible to eliminate resistance; instead, the implementation team should put into place strategies to minimize or manage resistance. Major change can trigger a wide range of emotional responses such as enthusiasm, skepticism, stress, anxiety, and a sense of loss. The team needs to openly discuss the planned change, answer questions, and gather support.

Planning ESI Education

Some form of education about the ESI should be provided to all staff who will utilize the ESI information. The staff may include ED nurses, physicians and other providers, nursing assistants and clerical staff. While the triage nursing staff will need a full orientation to the ESI, other staff will need less education. For example, at University of North Carolina Hospitals, clerical and nursing assistant staff members received a memo describing the five ESI categories and notice of the implementation date. The physician on the implementation team may choose to handle physician education. The duration of physician orientation to ESI will depend on how familiar they are with the algorithm. At teaching hospitals, the ED residency director needs to allocate time for a member of the implementation team to provide an orientation for the residents. It is helpful to give residents copies of key articles for review.

Two to 4 hours is a realistic timeframe for the triage nurses' mandatory ESI educational program. The educator or clinical nurse specialist should set the day and time for education. Plans should include one or two make-up classes for the staff that are ill, on vacation, or pulled back into clinical duties due to staffing issues.

The ESI Trainer

The implementation team must identify a trainer for the orientation to ESI. It may not be realistic to have an educator available to teach all classes. Many groups use a train-the-trainer program, which initially trains team nurses who feel comfortable teaching and confident dealing with questions and resistors in the group.

Experienced educators have found that reading the research publications can be particularly helpful in explaining why the change to ESI is so important.

The ESI Training DVD

Another training option is to use the *Emergency Severity Index, Version 4: Everything You Need To Know* DVD, produced by the Agency for Healthcare Research and Quality (AHRQ). This product is now

free to all emergency departments and can be ordered from the AHRQ Web site at www.ahrq.gov/research/ESI. The DVD is broken into segments that can be used by the team in several ways. The intent is to enable emergency departments to implement ESI using a standardized training program rather than each department having to create their own program. The first segment addresses the benefits of using a five-level triage system, the reliability and validity of ESI and some examples of how ESI triage data can be used. The introduction to the ESI and practice cases can be reviewed individually or in a group setting. This segment is directed at nursing and physician leadership. The next segment is an introduction to the ESI algorithm. The audience is walked through each of the decision points (similar to Chapter 3) and many examples are used to clarify each triage level. The next segment provides the audience with practice cases using a classroom setting and real patient scenarios. The last segment is for those departments that implemented ESI v. 3 and need information about ESI v. 4. The DVD also includes 10 test cases that can be used as one segment of an ESI competency. The DVD also contains all slides and handouts from the cases and lectures, as well as a copy of the algorithm.

Another training option is to hire a consultant to conduct a train-the-trainer program or train all the staff. The advantage of this option is that the department does not need to spend the time and resources putting together a training program. This may also be an option for a department that does not have an available educator or staff that can effectively teach the content.

Implementation may also be an opportunity for collaboration. For example, two hospitals chose to change to ESI at the same time and decided to pool resources. They hired a consultant and offered joint educational programs. If a consultant is hired it is a good idea for future trainers to sit through a number of sessions to really learn the content, hear the types of questions that are asked and see how the trainer handles difficult participants.

The ESI Training Course

The core content for the orientation to ESI is provided in this handbook. The first edition of this manual was written with the idea that experienced educators could use the materials presented to create their own implementation program. However, many emergency departments do not have a dedicated educator, so sometimes staff with less curriculum development experience is asked to create an ESI educational program. The following section meets the needs of this group. A detailed description of a typical training course is presented along with tips from experienced ESI trainers.

Using the ESI Training DVD

The training DVD was produced to help emergency departments implement ESI. The DVD has four sections that can be used in several ways.

- **Section 1: Introduction** may help the ED leadership make the decision to implement ESI. Both physician and nursing leadership may learn more about the value of ESI data.
- **Section 2: The Emergency Severity Index** is a step-by-step review of the algorithm and can be used in several different ways depending on the department's resources. Staff members can view this section independently and then attend a group inservice. The DVD can serve as the primary educational tool with a member of the staff serving as a resource and as a facilitator answering questions. Educators may choose to develop their own educational program and use the DVD as a guide. The important point is that the DVD provides emergency departments with standardized educational materials.
- **Section 3: Practice Cases** can be used by individuals or small group to practice the application of ESI. The facilitator can stop the DVD after each patient scenario and have participants assign the ESI level. When the DVD is restarted, the participants can listen to explanations of level assignments. The facilitator can address the emergency department's specific policies and practices.
- **Section 4: Competency cases** can be done at the end of a group educational program or individually. Demonstration of competency using ESI is important. Every triage nurse should have the opportunity to demonstrate ability to accurately assign a triage level.

For departments that develop their own educational program, the cases in the DVD can be used by staff having difficulty applying ESI. The nurse can independently review the appropriate section of the DVD and practice cases.

Emergency departments that used ESI v. 3 may find the explanation of v. 4 and the practice cases

helpful. Instead of a formal class, staff may independently watch the v. 4 explanation and practice case segments of the DVD and complete the test cases.

The basic ESI training takes between 2.5 and 3 hours. Many hospitals use this opportunity to review other triage related information, such as high risk situations or policy and procedure changes. The following section provides a detailed description of a 2-hour training segment of ESI. It is advised that the trainers view the entire DVD prior to developing their own content. This will help assure reliability and validity of the ESI algorithm.

Section 1: Introduction

The purpose of the introduction is to let the staff know why the department has chosen to adopt ESI. The issues with the former triage acuity system should be briefly explained along with the advantages of ESI and how ESI will address them. The time allocated for this section will depend on what information has already been shared with staff. It is important for the trainer to focus on what ESI will do for the staff nurse and for ED administration.

A number of reasons can be cited to support a move to ESI. (See Chapter 1 for additional information.)

- Increases in local ED volume, change in admission rate.
- Changes in ED patient population.
  - More trauma patients.
  - More psychiatric patients.
- Changes within the hospital that have affected the emergency department.
  - Beds closed.
  - Unit renovations.
  - Holding patients in the ED.
  - Increased length of ED stay for admitted patients.
- Nationwide trends.
  - Increase in the number of elderly.
  - Increase in the number of patients seeking primary care in the ED.
  - Increase in the number of uninsured seeking care in an ED.
  - Nursing shortage.

At the end of the introduction trainers should discuss the issues with the current triage acuity rating system that the ED may have already identified. These may include:

- Mis-triages.
- Increasing wait time to triage or to MD exam.
- New, inexperienced staff lacking the experience and perspective to effectively triage using a highly subjective system.

While it is important to include specific examples of problems the department has experienced with the current triage system, it is also important that the trainer not let this become a "gripe" session. The facts should be presented and any comments or questions can be addressed at the end of the program.

If the staff is not convinced that a change in the triage acuity rating system is necessary they can play the Triage Game before discussing the importance of reliability and validity of triage systems.

The Triage Game. The original ESI orientation program included the Triage Game as a way to break the ice and illustrate the poor interrater reliability of the three-level triage acuity rating system. Each nurse in attendance is given a packet consisting of red, yellow, and green colored cards. The red card is labeled "emergent," the yellow "urgent," and the green "non-urgent." Three cases are read to the group and after each case participants are asked to rate the patient acuity and hold up the appropriate card. Each participant is able to see how other members of the group rated the patient. Resistance decreases as the group begins to notice that participants rate the same patient differently. The group begins to realize that with a three-level system, there is always some level of disagreement within the group.

Three cases that could be used for this game are presented below:

Case 1. A 57-year-old woman presents with epigastric pain 6/10, a smoker, her only medication is for high cholesterol. She has been tired for the last week and thinks she just needs a vacation. Her skin is cool and clammy. Is this patient emergent, urgent or non-urgent? This case may generate some interesting discussion. Chances are many of the group will triage the patient as urgent. Some more experienced staff may recognize that she is probably having a cardiac event and will label her emergent.

Case 2. A 36-year-old female presents with LLQ pain 6/10, vaginal spotting, LMP 8 weeks ago, vital signs

within normal limits. Is this patient emergent, urgent or non-urgent? Is this patient pregnant? Does she have an ectopic pregnancy? These are questions the group may ask as they try to assign a triage priority. Many participants will assign her to the urgent category, whereas a few may think she is emergent.

Case 3. A 10-day-old baby boy is brought to the ED by the parents because he feels warm and is not nursing well. Mom thinks he has the bug that her other kids are getting over. His rectal temperature is 101. Is this patient emergent, urgent or non-urgent? This baby is not non-urgent. Some nurses may say he is emergent, others will say he is urgent because his temperature is only 101 and the other kids have been sick.

After the Triage Game, it is useful to highlight the research on poor interrater and intrarater reliability of conventional three-level triage systems, which is described in Chapters 1 and 2. At this point the group is about 15 to 20 minutes into the presentation and staff should be ready to hear about ESI. Participants should have a copy of the front and back of the algorithm and the trainer can now begin the discussion.

Section 2: The ESI Algorithm

This section of the presentation explains the algorithm in detail. It is important to stress to course participants that ESI was developed by a group of emergency nurses and physicians and has been in use at a number of hospitals since April 1999. Other important background information to discuss includes the following points about ESI:

- Research based.
- Requires attendance at an educational program to ensure reliability and validity.
- Allows for rapid sorting into one of five categories.

Begin review of the algorithm with the conceptual version so that the four major decision points can be reviewed. Then begin a detailed description of the algorithm itself. The instructor should walk through each decision point slowly and not move on to the next decision point until all questions and concerns are addressed. This section will take from 40 to 65 minutes depending on the size of the group and the experience of participants. For each decision point the trainer should review the questions the triage nurse should be asking.

Decision point A: Does this patient require immediate life saving intervention? If the answer is yes, the patient is assigned to ESI level 1. It is imperative that the instructor spend time reviewing the A notes on the back of the card. The instructor should also include examples of ESI level-1 patients and the reason they fall into that triage level. Experienced ED nurses have no problems identifying this group of patients.

Decision point B: Is this a patient who shouldn't wait? The trainer needs to discuss in detail the three questions that are part of Decision Point B:

- Is this a high-risk situation?
- Is there new onset confusion, lethargy or disorientation?
- Is this patient in severe pain or distress?

Is this a high-risk situation? Define the term high risk and have the participants identify chief complaints or diagnoses that are high risk. Participants will usually mention aortic abdominal aneurysm and ectopic pregnancy but the trainer needs to encourage the staff to think about other low volume, high-risk presentations. During this discussion knowledge deficits may become evident and the instructor will need to provide additional educational materials. For example, staff nurses may disagree on the need for immediate evaluation of a patient that presents with symptoms of central retinal artery occlusion. This is a perfect opportunity to explain why this is high risk situation. A discussion of high-risk situations also provides the trainer with an opportunity to review triage red flags in the elderly and in children.

To prepare for this section of the course the instructor may want to review the Emergency Nursing Core Curriculum© and develop a list of high-risk patient situations. These situations are outlined in Chapter 4. The instructor needs to stress that a high-risk patient is safe to wait for 10 minutes while a bed is found. If the registration process takes less than 10 minutes then the patient or their family can finish this process.

Is there new onset confusion, lethargy or disorientation? This is the next question that needs to be reviewed using examples from various age groups. The definition of “acute” change in level of consciousness is important to clarify.

Is this patient in severe pain or distress? The concept of severe pain or distress elicits many opinions and questions from the audience. The instructor should

not engage in a debate about pain scales and their use at triage. The discussion should focus on the intent of this question to identify the patient in extreme pain. It may be helpful to explain that there are actually three components to severe pain:

- The patient's rating of their pain: 7/10 or higher.
- The nurse's assessment, including chief complaint, subjective and objective assessment, past medical history, and current medications.
- Can the triage nurse perform any nursing interventions that may decrease this patient's pain? (Examples—ice, elevation, positioning, quiet room, something to cover their eyes, and medications.)

If the patient rates their pain as 7/10 or greater and the triage RN feels this patient cannot wait and needs intravenous analgesia, the patient will be assigned to ESI level 2. Participants may have many questions about this concept and the trainer needs to stress that it is not just the patient's pain rating that makes them an ESI level 2.

Nurses may say they feel uncomfortable documenting a patient's high pain rating and then leaving the patient in the waiting room. It is important for the instructor to stress that the patient's rating is one piece of an assessment and that the nurse should accurately document what he/she is observing. For example: "Rates pain as 10/10, skin warm and dry, laughing with friend at triage," "Generalized abdominal pain for 3 days, constant dull ache. Rates pain as 10/10."

The instructor should describe several patients that meet ESI level-2 criteria due to pain. Examples include sickle cell crisis, a cancer patient with break-through pain, and renal colic. At the same time the instructor needs to address patients who probably will not be assigned to ESI level 2 due to pain. Examples include toothache, eye pain, most headaches and extremity injuries. This is a great opportunity to discuss nursing interventions at triage to minimize or decrease a patient's pain. This discussion may also prompt the recognition of standing orders for analgesia at triage, (i.e., ibuprofen, opthane, and so on).

The next area to address is physiological or psychological distress. Examples are often the best method of explaining this concept. Examples of physiological distress include urinary retention and priapism. These patients are in acute distress and require immediate intervention. Many psychiatric emergencies fall under psychological distress. Examples include: sexual assault, domestic violence, paranoia, and manic behavior. The suicidal/homicidal patient has already been assigned to ESI level 2 because they are high risk. These patients should be assigned to ESI level 2 even if they come in every day stating they are going to hurt themselves or someone else. This is an excellent opportunity to review your ED psychiatric policy.

After discussing the three questions under decision point B it is helpful to review all the level-2 criteria together. Once again a list of examples is helpful.

Decision point C: How many different resources will this patient consume? It is important to clarify what is and what is not a resource. Reviewing the resource table on the back of the algorithm usually generates questions and discussion. The following discussion includes examples of typical questions the trainer should be prepared to discuss.

- Course participant: Why isn't an interpreter a resource? We use them all the time.

  Trainer: It is important for the nurse using ESI not become overly focused on differentiation of what is and what is not a resource. ESI is a triage acuity rating system that evaluates how ill or injured a patient is on presentation to the emergency department. The need for an interpreter does not change that. Inclusion of everything as a resource will not allow differentiation of triage levels.

- Course participant: I don't understand why crutches aren't a resource. Fitting a patient correctly and teaching crutch walking takes time.

  Trainer: ESI assesses acuity on presentation to the emergency department, not workload issues. If crutch walking instructions counted as a resource, all patients with sprains would now be triaged as ESI Level 3; x-ray and crutch walking. This would clearly defeat the purpose of ESI.

- Course participant: A patient who needs a blood test and urine test will consume two resources.

  Trainer: This is only one resource. For example, a urinalysis and a urine culture is one resource: laboratory study. A urinalysis and two blood tests are one resource: laboratory study. A vaginal culture and a blood test are one resource: laboratory study.

- Course Participant: Why isn't a pelvic exam a resource? They take staff time.

  Trainer: As we discussed, a physical exam is not a resource. For the female patient with abdominal

pain a pelvic exam is part of that physical exam. Just like the patient with an eye complaint, a slit lamp exam is part of the physical exam for that chief complaint.

- Course participant: I don't understand why security is not a resource. We use them all the time with our psychiatric population.

  Trainer: Security is used to monitor psychiatric patients when they have been determined to be a danger to themselves, others or the environment or when they are in acute distress. Because they are high risk, these patients meet the criteria for ESI level 2 as high risk. Remember resources are only looked at after the triage nurse has determined that the patient does not meet the criteria for ESI level 1 or 2.

Once the group understands the concept of resources it is important to give multiple examples of patients who would be assigned ESI level 4 and 5. Before discussing ESI level 3, the trainer needs to review decision point D.

Decision point D: What are the patient's vital signs? It is important that participants understand that the triage nurse should consider the patients' vital signs. The triage nurse uses her judgment to determine whether the patient should be up-triaged to ESI level 2 based on abnormal vital signs. It is important to present examples of patients the triage nurse should up-triage to ESI 2, as well as examples of ESI level-3 patients that do not require up-triage based on abnormal vital signs.

At the end of this segment the participants should be quite comfortable with the type of patients that fall into each ESI level. Reviewing practice cases will reinforce use of the algorithm and answer many questions.

Section 3: ESI Practice Cases

After a thorough description of the ESI algorithm, patient scenarios are used as a group-teaching tool. Chapter 9 contains 30 cases specifically written for practice and intended to simulate an actual triage encounter. The cases encompass all age groups and the complete spectrum of acuity. In addition, these cases illustrate most of the important points in the algorithm. The instructor reads each case, and the participants are asked to use the algorithm to assign an ESI level. Each participant can be given an additional packet of colored cards labeled ESI levels 1 through 5 and asked to hold up the appropriate card as each case study is discussed. The advantage of using the cards is that participants will begin to notice a higher degree of agreement with ESI than they observed with the three-level triage system case examples.

Once everyone in the group has assigned an ESI level, the trainer can proceed with a step-by-step review of how the level was determined. The research group found it helpful to instruct nurses to always start with decision point A and work through the algorithm. If the case moves to decision point C, it is helpful to have the participants verbalize the expected resources. Many misconceptions can be cleared up with this strategy. As previously discussed, staff may initially have difficulty with what is and what is not a resource, and with determining the number of resources. This is a perfect opportunity to re-emphasize the definition of resources in the ESI triage method and answer the "what about" questions. We have found that towards the end of the practice cases the staff becomes vocal about their level of comfort with the algorithm.

Section 4: Competency Cases

One question managers and educators frequently hear is "How do you know your staff is competent to perform triage?" Chapter 10 was written with this question in mind. The chapter includes many cases for each nurse to review and assign a triage acuity rating using ESI. Each nurse should complete the competency cases individually and return them to the trainer to assess for accuracy. The ED management and educational staff of each hospital must define parameters for a passing score prior to assessing staff competency. In many institutions scoring 24 to 26 correct out of 30 is the standard. For the staff person whose score falls below the acceptable level, re-education is indicated and competency should be re-assessed at a later date with different cases. Paper case assessment of competency only addresses the staff nurse's ability to assign a triage acuity rating to paper cases. An evaluation of each triage nurse performing triage with real patients and using the ESI criteria should be performed with a triage preceptor or other designated expert.

Strategies To Assist With Implementation

Strategies that the ESI triage research group have found useful for successful ESI implementation include the following:

- Wall posters with the ESI algorithm hanging in triage and clinical areas.
- Pocket-sized laminated cards of the ESI algorithm for every nurse.
- E-mails to remind staff of the upcoming change.
- Computer help screens to explain the five ESI levels during triage data entry.
- Posters to address questions about ESI after implementation.
- Informal chart reviews conducted by the trainer, clinical nurse specialist, or ESI champions focusing on the finer points of the algorithm.

Reinforcement is key to the successful implementation of ESI. At Brigham and Women's and the York Hospitals, the implementation team chose to have the algorithm preprinted on progress notes. For 2 months the triage nurse was required to use a progress note and record the patient's chief complaint and circle the assigned ESI level. The progress note served no purpose other than to make the triage nurse look at the algorithm each time a patient was triaged.

Questions and misinterpretation of the finer points of the algorithm will always arise after implementation and will need to be addressed with re-education. After implementation of ESI at Brigham and Women's Hospital, it was noted that the staff were not consistently assigning an ESI level 1 to intoxicated and unresponsive patients. This point was emphasized on a poster in the break room to bring attention to the problem.

Implementation Day

The implementation team needs to be available around the clock to support the triage staff, answer questions, and review triage decisions. It is important that mis-triages be addressed immediately in a non-threatening manner. Making staff aware ahead of time that this will be taking place is less threatening. Reinforcing the efforts of the staff and being available will be important and help ensure ESI is appropriately integrated into the emergency department.

Post-implementation

Following implementation, it is important that triage nurses continue to be vigilant when assigning triage acuity ratings. Many nurses may complain that more patients are ESI level 2. Triage nurses should be reminded not to deviate from the original algorithm but instead understand the value of ESI as an operational tool. The staff should understand that deviations from the algorithm will threaten the reliability and predictive validity of the tool.

Staff efforts in making a smooth transition to ESI should be recognized and rewarded. This could include an article in the hospital newspaper, or a note of thanks to the staff from the ED leadership team. Successful implementation of ESI requires a dedicated team that recognizes the degree of change and effort needed to change triage systems. The team must be able to develop and carry out a specific, simple, and realistic plan. The team leader should have a clear vision, be able to clearly articulate it, be committed to the ESI implementation, and be able to energize the other members of the team and the staff. The team needs the support of the ED leadership and the resources necessary to make this planned change. For this change to be successful there must be broad-based support beginning with the most senior levels of the institution.

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Chapter 8. Evaluation and Quality Improvement

Once ESI has been implemented it is important to continue ongoing evaluation. In fact, thought should be given to evaluation prior to implementation, and plans should be made to continually evaluate the system. When evaluating the success or failure of implementation, it is important to remember why the triage process was changed. The following reasons are frequently identified as driving forces to change existing triage processes:

- Reduction in variation of assigned triage categories.
- Decreased risk of negative outcomes due to mis-triage, particularly while patients are waiting.
- The ability to obtain more accurate data to use for administrative purposes.
- The need to move from a three-category to a five-category triage system to better "sort" the increasing number of ED patients.
- A more accurate description of patient triage levels and departmental case mix (Wuerz, Milne, Eitel, Travers & Gilboy, 2000).

The ultimate goal of ESI implementation is to improve the triage process and accurately capture patient acuity to optimize the safety of patients in the waiting room by ensuring that only patients stable to wait are selected to wait. It is also important to clearly articulate to the ED staff what is not a goal of ESI triage implementation. For example, ESI triage alone cannot decrease the ED length of stay nor improve customer satisfaction with the ED visit.

The continued success of ESI triage is best accomplished by including the evaluation of triage in the overall quality improvement (QI) plan for the emergency department. The Institute of Medicine (IOM) defines quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Lohr & Schroeder, 1990, p. 707). In the past, health care organizations introduced quality assurance and quality improvement activities as part of a new management strategy called quality management (QM). QM includes the entire process of setting standards, collecting information, using interventions and tools to change identified processes, assessing outcomes, and adjusting policies (Wagner, Groenewegen, de Bakker & van der Wal, 2001). Through QM, health care leaders analyze and transform health care data into information that can be used by health care providers and policymakers to evaluate any change that has been implemented to determine whether it contributes to overall quality. More recently, these processes are referred to as process improvement.

ESI Triage Quality Indicators and Thresholds

In any quality improvement plan, it is important to select meaningful indicators to monitor. Following is a list of potential ESI quality, or process improvement, indicators:

- Accuracy of ESI triage category rating by the triage nurse.
- Rates of under and over-triage.
- Review of all negative outcomes which occurred due to a mis-triage.
- Measurement of time from patient arrival to being seen by a physician for each ESI triage category.
- Measurement of length of stay for each ESI triage category.
- Measurement of admission rates for each ESI triage category.
- Review of patients rated ESI level 4 and 5 who are admitted to the hospital.

Specific patient populations can also be analyzed as an indication of process improvement. For example, if a hospital decides to increase the number of transfer trauma patients they accept, the ED can check to see if the number of transfer trauma patients and their acuity level has increased.

While selecting indicators to review is critical, it is also important to recognize specific indicators that are not appropriate to review. For example, the actual number of resources that were used in providing care to the patient is NOT an appropriate QI indicator to monitor. Resources are incorporated in the ESI algorithm only to help the triage nurse to differentiate among the large group of patients that are not acutely ill. Monitoring of the number of resources used "on the back end" will only further increase the triage nurses' focus on counting resources, which is not the most important component of the algorithm.

In addition to selecting useful indicators, it is also important that the ED management team select a realistic threshold to meet for each indicator. All indicators do not need to have the same threshold. For example, when reviewing accuracy of triage categorization, a realistic goal must be determined. Should the triage category be correct 100 percent, 90 percent, or 80 percent of the time? Frequently a threshold of 90 percent is selected. However, the goals and circumstances of each department may be unique and should be considered when selecting each indicator and threshold. For example, the ED management team might stipulate that, when in doubt about a patient's triage rating, nurses err on the side of over-triage. While this approach might result in some patients being mis-triaged as more acute than they actually are, it is preferable to risking an adverse event because the patient was triaged to a less urgent category. In this ED, the triage accuracy threshold might be 80 percent, with a goal to keep the under-triage rate at 20 percent of the mis-triages.

Finally, it is also important to determine how many triage indicators should be monitored on an ongoing basis. It is reasonable to select one or more indicators. The number of indicators to be monitored will be determined by available staff resources and the relationship of ESI indicators to other quality indicators that are routinely monitored. It is also possible to focus on monitoring one aspect of triage for a period of time, and then switch to another indicator when improvement occurs in the previously monitored indicator. Accuracy of triage acuity level should probably be monitored on a continuous basis to evaluate new triage nurses as well as monitor for trends which may identify the need for re-education on a particular aspect of triage.

ESI Triage Data Collection

The method of collecting QI data for ESI triage indicators can be incorporated into the data collection process for other ED quality indicators or data can be collected as a separate process. The method of data collection will depend on the indicator selected, the availability of triage experts, and logistic issues such as accessibility to electronic versus paper ED records. For example, if “accuracy of triage category” is selected as a triage QI indicator, a triage expert is needed to review the triage categories. This is a critical indicator to monitor when ESI is first implemented and the actual method of review is discussed further in the examples below. If it is determined that the institution wishes to measure ED length of stay or wait times to see the physician for each ESI triage category, it is vital to have access to electronic information in order to successfully monitor this indicator. Without electronic sources, these data are cumbersome to track and manual calculations most likely result in error.

Finally, when monitoring QI indicators, it is important to determine how many charts must be reviewed for each indicator and how frequently the indicator should be reviewed (monthly, quarterly, etc.). The selection of the appropriate number of charts for each indicator will again depend on the particular indicator. If wait times for each category are reviewed, data will be most accurate when a large percentage of cases, preferably all, are reviewed.

Evaluating the accuracy of ESI triage does not require the review of each occurrence, but should reflect an appropriate number of randomly selected charts. Cases from different nurses and each shift and day of the week should be reviewed. Ten percent of all cases are often selected as an “appropriate” number of cases to review. In a busy ED, this is an unrealistic number. It is important for each institution to consider the number of review staff, background, and availability of time of those who review triage indicators.

When determining the frequency of performing triage audits, the institution should consider other departmental QI activities and try to integrate the review of triage indicators into the same process and time structure.

Sharing Results and Making Improvements

Often, 95 percent of the time and attention to QI and process improvement activities is given to the monitoring stage of the process. The “numbers” are often posted somewhere and little is done to actually improve the outcomes. The most important component of QI is sharing the data and discussing ways to improve the results. All staff should be aware of the triage QI indicators, the current overall incidence in which the threshold is met, and the actual goal. For example, if the accuracy of the triage category is being monitored and continues to be reported as 60 percent, intervention is necessary. Often education is helpful. It is also very helpful to involve the triage nurses in data collection.

Examples of ESI Triage Indicators

The emergency departments described below have implemented ESI and a QI program. They have provided examples of how they incorporate triage indicators into their QI plan.

Hospital 1

At hospital 1, the accuracy of triage nurses' ESI triage ratings is assessed on a continuous basis and reported quarterly as one indicator of the overall ED QI plan. This indicator has been monitored since ESI was implemented and continues to be the only triage indicator monitored to date. Each week, three different nurses randomly select five charts to review with the ED clinical nurse specialist (CNS). The assessment team reviews many different general documentation indicators, including the accuracy of the ESI triage category. The CNS is the designated triage expert and discusses each case with the staff nurse as she reviews the records. When there is a disagreement, cases are reported as mis-triages for the QI report. The assessment team collects and retypes all mis-triages as an educational tool and includes a discussion which explains the correct triage category and discusses why. These cases are compiled in a handout and distributed to all staff nurses monthly. The assessment team reviews sixty charts monthly. Hospital 1 has noted several distinct advantages of the triage accuracy review:

- The ED staff nurse is intimately aware of the QI indicators and has an opportunity to reflect on her own practice.
- Staff nurses have the opportunity to discuss each case with the CNS to obtain additional insight.
- All nurses benefit from the discussion when the cases are distributed as a teaching tool.

Hospital 1, like many other EDs also has excellent information technology resources that facilitate quality monitoring of clinical information. The triage acuity is entered into a large ED database. It is possible to track time to physician evaluation for each triage category. This can be a powerful administrative tool.

Hospital 2

At hospital 2, several triage indicators are reviewed on a regular basis. The ESI rating assigned by the nurse at triage and time data are recorded in the hospital's computer information system during the ED visit. The electronic information is compiled for monthly QI monitoring. Time data are reported by ESI triage level, including the following:

- Total ED length of stay.
- Time from triage to placement in the ED bed.
- Time from triage to being seen by the ED physician.
- Time from placement in the ED bed to discharge.

The time data are used for many purposes, such as monitoring for operational problems that lead to increased length of stay. The time data prove useful in addressing issues related to specific patient populations at hospital 2's ED. For example, the time data were tracked for psychiatric patients and subsequently a new policy regarding psychiatric consults was developed. The policy stipulates response times for the crisis team to see ED psychiatry patients and is based on ESI triage level. Information about the number of patients triaged to the various areas of the ED (medical urgent care, minor trauma, pediatrics, acute) is also reported by ESI triage level on a monthly basis. These data are used to make operational decisions, such as the time of day that medical urgent care and minor trauma services are offered.

The accuracy of triage nurses' ESI ratings is reviewed as part of the QI program at hospital 2. The initial review took place during the first few months after implementation of the ESI. The nurse educator reviews a random sample of ED charts on a regular basis to assess the accuracy of the triage nurses' ESI ratings. Individual nurses get feedback and the entire nursing staff hears about trends. Through this process the nursing staff identified problems with the heart rate criteria in the original version of the ESI. Based on input from the nurses, the ESI heart rate criteria were revised for ESI v. 2.

Triage ratings are also part of a QI effort at hospital 2, through a monthly peer chart review process. Each nurse selects two random ED charts per month and reviews many aspects of nurses' documentation, including the ESI triage rating. The review is forwarded to the management staff for followup with individual nurses and issues related to accurate ESI rating is communicated to the entire staff when appropriate.

Another QI effort at hospital 2 is the review of all ESI level-3 patients triaged to the medical urgent care area. The nurse manager receives a monthly report, compiled with electronic data from the

hospital computer system, of all ESI level-3 patients triaged to medical urgent care, and all ESI level-4 and 5 patients triaged to the ED. Though the department has a guideline that ESI level-4 and 5 adult patients are primarily triaged to medical urgent care or minor trauma, and ESI level-1, 2, and 3 adult patients are primarily triaged to the acute ED, the triage nurse is allowed discretion in triaging these patients. The ongoing review of the ESI level-3 patients sent to medical urgent care allows the management team to review the appropriateness of the nurses' triage decisions.

Hospital 3

At hospital 3 the manager assigns experts to review triage categories. The manager and clinical coordinators review charts identified by peers as potential mis-triages. The expert group reviews the chart and discusses it with the triage nurse. The team of experts also spot checks charts frequently. If a trend is noticed, the expert group will post the case so that all staff can learn from it.

Hospital 4

At hospital 4, the manager created a log after initiation of the ESI triage system. The triage nurse logged the patient name, triage nurse name, triage level and rationale and resources for each patient triaged. The management team reviewed each chart for triage category accuracy either while the patient was in the department or the next day. The management did this for the first 2 weeks and again in 3 months.

Hospital 5

Hospital 5's strategic plan called for the hospital to increase the number of trauma and stroke patients they would accept from outlying hospitals. Most of these patients were emergency department to emergency department transfers. Many of these patients arrived intubated and others were intubated on arrival. The staff felt that the acuity of the ED patient population was rising quickly. Nursing leadership chose to look at case mix data (the number of patients in each ESI category) for 1 year and was able to make adjustments to staffing to cover increases in patient acuity.

It is important for the emergency department nursing leadership to put a simple quality improvement plan into place. The plan needs to generate meaningful data that can be shared with the ED staff on a regular basis. Issues with individual triage nurses must be promptly identified and education provided. Larger trends must also be rapidly identified and responded to. The members of the ESI research team are repeatedly asked about QA and our suggestion is to keep it simple, relevant and meaningful.

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NOTE: Appendix A of this handbook includes frequently asked questions and post-test assessment questions for Chapters 3 through 8. These sections can be incorporated into the ESI training course.

Chapter 9. Practice Cases

The cases in this chapter are provided to give a nurse the opportunity to practice categorizing patients using ESI. Please read each case and based on the information provided assign a triage acuity rating using ESI.

1. "I just turned my back for a minute," cried the mother of a 4-year-old. The child was pulled out of the family pool by a neighbor who immediately administered mouth-to-mouth resuscitation. The child is now breathing spontaneously but continues to be unresponsive. On arrival in the emergency department (ED) vital signs (VS) were: heart rate (HR) 126, respiratory rate (RR), 28, blood pressure (BP) 80/64, SpO2 96% on a non-rebreather.
2. A 28-year-old male presents to the ED requesting to be checked. He has a severe shellfish allergy and mistakenly ate a dip that contained shrimp. He immediately felt his throat start to close so he used his EpiPen®. He tells you he feels okay. No wheezes or rash noted. VS: BP 136/84, HR 108, RR 20, SpO2 97%, temperature (T) 97° F.
3. "He was running after his brother, fell and cut his lip on the corner of the coffee table. There was blood everywhere," recalls the mother of a healthy 19-month-old. "He'll never stay still for the doctor." You notice that the baby has a 2-cm lip laceration that extends through the vermillion border. Vital signs are within normal limits for age.
4. A 44-year-old female is retching continuously into a large basin as her son wheels her into the triage area. Her son tells you that his diabetic mother has been vomiting for the past 5 hours and now it is "just this yellow stuff." "She hasn't eaten or taken her insulin," he tells you. No known drug allergies (NKDA). VS: BP 148/70, P 126, RR 24.
5. "I have this infection in my cuticle," reports a 26-year-old healthy female. "It started hurting 2 days ago and today I noticed the pus." The patient has a small paronychia on her right 2nd finger. NKDA, T 98.8° F, RR 14, HR 62, BP 108/70.
6. A 17-year-old handcuffed male walks into the ED accompanied by the police. The parents called 911 because their son was out of control: verbally and physically acting out and threatening to kill the family. He is cooperative at triage and answers your questions appropriately. He has no past medical history (PMH), allergies, and is currently taking no medications. Vital signs are within normal limits.
7. "I should have paid more attention to what I was doing," states a 37-year-old carpenter who presents to the ED with a 3-cm laceration to his right thumb. The thumb is wrapped in a clean rag. "I know I need a tetanus shot," he tells you. BP 142/76, P 88, RR 16, T 98.6° F.
8. "My mother is just not acting herself," reports the daughter of a 72-year-old female. "She is sleeping more than usual and complains that it hurts to pee." VS: T 100.8° F, HR 98, RR 22, BP 122/80. The patient responds to verbal stimuli but is disoriented to time and place.
9. EMS arrives with a 75-year-old male with a self-inflicted 6-cm laceration to his neck. Bleeding is currently controlled. With tears in his eyes, the patient tells you that his wife of 56 years died last week. Healthy, NKDA, baby ASA per day, BP 136/82, HR 74. RR 18, SpO2 96% RA.
10. "My dentist can't see me until Monday and my tooth is killing me. Can't you give me something for the pain?" a 38-year-old healthy male asks the triage nurse. He tells you the pain started yesterday and he rates his pain as 10/10. No obvious facial swelling is noted. Allergic to Penicillin. VS: T 99.8° F, HR 78, RR 16, BP 128/74.
11. "My doctor told me to come to the ED. He thinks my hand is infected," a 76-year-old female with arthritis, chronic renal failure, and diabetes tells you. She has an open area on the palm of her left hand that is red, tender, and swollen. She hands you a list of medications and reports she has no allergies. She is afebrile. VS: HR 72, RR 16, BP 102/60.
12. A 76-year-old male is brought to the ED because of severe abdominal pain. He tells you "it feels like someone is ripping me apart." The pain began about 30 minutes prior to admission and he rates the intensity as 20/10. He has hypertension for which he takes a diuretic. No allergies. The patient is sitting in a wheelchair moaning in pain. His skin is cool and

diaphoretic. VS: HR 122, BP 88/68, RR 24, SpO2 94%.

13. A 16-year-old male wearing a swimsuit walks into the ED. He explains that he dove into a pool and his face struck the bottom. You notice an abrasion on his forehead and nose as he tells you that he needs to see a doctor because of tingling in both hands.
14. "I have a fever and a sore throat. I have finals this week and I am scared this is strep," reports a 19-year-old college student. She is sitting at triage drinking bottled water. No PMH, medications: birth control pills, no allergies to medications. VS: T 100.6° F, HR 88, RR 18, BP 112/76.
15. "I think he has another ear infection," the mother of an otherwise healthy 2-year-old tells you. "He's pulling on his right ear." The child has a tympanic temperature of 100.2° F and is trying to grab your stethoscope. He has a history of frequent ear infections and is currently taking no medications. He has a normal appetite and urine output according to the mother.
16. A 76-year-old male requests to see a doctor because his toenails are hard. Upon further questioning the triage nurse ascertains that the patient is unable to cut his own toenails. He denies any breaks in the skin or signs of infection. He has a history of chronic obstructive pulmonary disease (COPD) and uses several metered dose inhalers. His vital signs are normal for his age.
17. "I am so embarrassed!" An 18-year-old tells you that she had unprotected sex last night. "My girlfriend told me to come to the hospital because there is a pill I can take to prevent pregnancy." The patient is healthy, takes no medications, and has no allergies. VS: T 97° F, HR 78, RR 16, BP 118/80.
18. Concerned parents arrive in the ED with their 4-day-old baby girl who is sleeping peacefully in the mother's arms. "I went to change her diaper," reports the father, "and I noticed a little blood on it. Is something wrong with our daughter?" The mother tells you that the baby is nursing well and weighed 7 lbs 2 oz at birth.
19. "I suddenly started bleeding and passing clots the size of oranges," reports a pale 34-year-old who is 10 days post partum. "I never did this with my other two pregnancies. Can I lie down before I pass out?" VS: BP 86/40, HR 132, RR 22, SpO2 98%.
20. A 26-year-old female is transported by EMS to the ED because she experienced the sudden onset of a severe headache that began after moving her bowels. She is 28 weeks pregnant. Her husband tells you that she is healthy, takes only prenatal vitamins, and has no allergies. On arrival in the ED the patient is moaning and does not respond to voice. EMT's tell you that she vomited about 5 minutes ago.
21. A 68-year-old female presents to the ED with her right arm in a sling. She was walking out to the mailbox and slipped on the ice. "I put my arm out to break my fall. I was lucky I didn't hit my head." Right arm with good circulation, sensation, and movement, obvious deformity noted. PMH: arthritis, medications: ibuprofen, NKDA. Vital signs within normal limits. She rates her pain as 6/10.
22. "I have this rash in my groin area," reports a 20-year-old healthy male. "I think its jock rot but I can't get rid of it." Using OTC spray, NKDA. VS: T 98° F, HR 58, RR 16, BP 112/70.
23. EMS arrives with a 17-year-old restrained driver involved in a high-speed motor vehicle crash. The patient is immobilized on a backboard and is complaining of abdominal pain. He has multiple lacerations on his left arm. Vital signs prior to arrival: BP 102/60, HR 86, RR 28, SpO2 96%.
24. "The smoke was so bad; I just couldn't breathe," reports a 26-year-old female who entered her burning apartment building to try and rescue her cat. She is hoarse and complaining of a sore throat and a cough. You notice that she is working hard at breathing. History of asthma, uses inhalers when needed, NKDA. VS: T 98° F, RR 40, HR 114, BP 108/74.
25. Paramedics arrive with a 78-year-old male whose wife heard him fall in the bathroom. He tells you he got a little dizzy when he got up to go to the bathroom. He has a history of prostate cancer and hypertension that is controlled by a diuretic. His skin is cool and moist. NKDA. VS: HR 178 and irregular, RR 24, BP 84/66.
26. A 4-year-old female is transported to the ED following a fall off the jungle gym at a

preschool. A witness reports that the child hit her head and was unconscious for a couple of minutes. On arrival you notice that the child's left arm is splinted and that she is very sleepy. VS: HR 162, RR 38.

27. A 52-year-old female requests to see a doctor for a possible urinary tract infection. She is complaining of dysuria and frequency. She denies abdominal pain or vaginal discharge. No allergies, takes vitamins, and has no significant PMH. VS: T 97.4° F, HR 78, RR 14, BP 142/70.

28. "I think I have food poisoning," reports an otherwise healthy 33-year-old female. "I have been vomiting all night and now I have diarrhea." The patient admits to abdominal cramping that she rates as 5/10. She denies fever or chills. VS: T 96.8° F, HR 96, RR 16, BP 116/74.

29. EMS arrives with a 32-year-old female who fell off a stepladder while cleaning her first floor gutters. She has an obvious open fracture of her right lower leg. She has +2 pedal pulse. Her toes are warm and she is able to wiggle them. Denies PMH, medications, or allergies. Vital signs are within normal limits for her age.

30. A 27-year-old female wants to be checked by a doctor. She has been experiencing low abdominal pain (6/10) for about 4 days. This morning she began spotting. She denies nausea, vomiting, diarrhea, or urinary symptoms. Her last menstrual period was 7 weeks ago. PMH: previous ectopic pregnancy. VS: T. 98° F, HR 66, RR 14, BP 106/68.

Chapter 9. Answers and Discussion

1. **ESI level 1: unresponsive.** This 4-year-old continues to be unresponsive. The patient will require immediate life-saving interventions to address airway, breathing, and circulation.

2. **ESI level 2: high-risk situation for allergic reaction.** The patient has used his EpiPen but still requires additional medications and close monitoring.

3. **ESI level 3: two or more resources.** A laceration through the vermillion border requires the physician to line up the edges exactly. Misalignment can be noticeable. A healthy 19-month-old will probably not cooperate. In most settings he will require conscious sedation, which counts as two resources. The toddler's vital signs are within normal limits for age, so there is no reason to up-triage to ESI level 2.

4. **ESI level 2: high risk.** A 44-year-old diabetic with continuous vomiting is at risk for diabetic ketoacidosis. The patient's vital signs are a concern as her heart rate and respiratory rate are both elevated. It is not safe for this patient to wait for an extended period of time in the waiting room.

5. **ESI level 4: one resource.** This young lady needs to have an incision and drainage of her paronychia. She will require no other resources.

6. **ESI level 2: high-risk situation.** Homicidal ideation is a clear high-risk situation. This patient needs to be placed in a safe, secure environment, even though he is calm and cooperative at triage.

7. **ESI level 4: one resource.** This patient will require a laceration repair. A tetanus booster is not a resource.

8. **ESI level 2: new onset confusion, lethargy, or disorientation.** The daughter reports that her mother has a change in level of consciousness. The reason for her change in mental status may be a urinary tract infection that has advanced to bacteremia. She has an acute change in mental status and is therefore high risk.

9. **ESI level 2: high risk.** This 75-year-old male tried to kill himself by cutting his throat. Because of the anatomy of the neck, this type of laceration has the potential to cause airway, breathing, and/or circulation problems. At the same time, he is suicidal and the ED needs to ensure that he does not leave or attempt to harm himself further.

10. **ESI level 5: no resources.** No resources should be necessary. He will require a physical exam but, without signs of an abscess or cellulites, this patient will be referred to a dentist. In the ED he may be given oral medications and prescriptions for antibiotics and/or pain medication. He is not an ESI level 2, even though he rates his pain as 10/10. Based on the triage assessment, he would not be given the last open bed.

11. **ESI level 3: two or more resources.** This patient has a complex medical history and presented with an infected hand. At a minimum she will need labs, an IV, and IV antibiotics to address her presenting complaint. Her vital signs are normal so there is no reason to up-triage her to ESI level 2.
12. **ESI level 1: requires immediate life-saving intervention.** The patient is presenting with signs of shock-hypotensive, tachycardic, with decreased peripheral perfusion. He has a history of hypertension and is presenting with signs and symptoms that could be attributed to a dissecting aortic abdominal aneurysm. He needs immediate IV access, aggressive fluid resuscitation, and perhaps blood prior to surgery.
13. **ESI level 2: high risk.** Because of the mechanism on injury and his complaints of tingling in both hands, this patient should be assigned ESI level 2. He has a cervical spine injury until proven otherwise. He is not an ESI level 1 in that he does not require immediate aggressive intervention to prevent death. At triage he needs to be appropriately immobilized.
14. **ESI level 4: one resource.** In most EDs, this patient will have a rapid strep screen sent to the lab; one resource. She is able to drink fluids and will be able to swallow pills if indicated.
15. **ESI level 5: no resources.** This child has had previous ear infections and is presenting today with the same type of symptoms. He is not ill appearing and his vital signs are within normal limits. The child requires a physical exam and should be discharged with a prescription.
16. **ESI level 5: no resources.** This elderly gentleman has such brittle toenails that he is no longer able to clip them himself. He requires only a brief exam and an outpatient referral to a podiatrist.
17. **ESI level 5: no resources.** This patient will need a bedside pregnancy test prior to receiving medication. She may be an ESI level 4, if your institution routinely sends pregnancy tests to the lab.
18. **ESI level 5: no resources.** The parents of this 4-day-old need to be reassured that a spot of blood on their baby girl's diaper is not uncommon. The baby is nursing and looks healthy.
19. **ESI level 1: requires immediate life-saving intervention.** This patient is presenting with signs and symptoms of a post-partum hemorrhage. She tells you she is going to pass out and her vital signs reflect her fluid volume deficit. The patient needs immediate IV access and aggressive fluid resuscitation.
20. **ESI level 1: requires immediate life-saving intervention.** From the history it sounds like this patient has suffered some type of head bleed. She is currently unresponsive to voice and could be showing signs of increased intracranial pressure. She may not be able to protect her own airway and may need to be emergently intubated.
21. **ESI level 3: two or more resources.** It looks like this patient has a displaced fracture and will need to have a closed reduction prior to casting or splinting. At a minimum, she needs x-rays and an orthopedic consult. Her vital signs are stable, so there is no need to up-triage her to an ESI level 2. Her pain is currently a 6/10. If she rated her pain as 9/10 and she is tearful, would you up-triage her to an ESI level 2? Probably not, given the many nursing interventions you could initiate to decrease her pain, such as ice, elevation, and appropriate immobilization.
22. **ESI level 5: no resources.** Following a physical exam, this patient will be sent home with prescriptions and appropriate discharge instructions.
23. **ESI level 2: high-risk situation.** The mechanism of injury is significant and this patient has the potential for serious injuries. He needs to be evaluated by the trauma team and should be considered high risk. If his BP was 70/palp and his HR was 128 he would be an ESI level 1; requires immediate life-saving intervention.
24. **ESI level 1: requires immediate life-saving intervention.** From the history and presentation, this patient appears to have a significant airway injury and will require immediate intubation. Her respiratory rate is 40 and she is in respiratory distress.
25. **ESI level 1: requires immediate life-saving intervention.** This elderly gentleman is not tolerating a heart rate of 178. His blood pressure is currently in the 80s and his skin is cool and moist. He requires immediate IV

access, medication administration, and possibly cardioversion.

26. **ESI level 2: high-risk situation.** This 4-year-old had a witnessed loss of consciousness and presents to the ED with a change in level of consciousness. She needs to be rapidly evaluated and closely monitored.
27. **ESI level 4: one resource.** She will need one resource-lab, which will include a urinalysis and urine culture. She most likely has a urinary tract infection that will be treated with oral medications.
28. **ESI level 3: two or more resources.** Lab studies, IV fluid, and an IV antiemetic are three of the resources that this patient will require. The patient is not high risk or in severe pain or distress.
29. **ESI level 3: two or more resources.** An obvious open fracture will necessitate this patient going to the operating room. At a minimum she will need the following resources: x-ray, lab, IV antibiotics, and IV pain medication.
30. **ESI level 3: two or more resources.** Based on her history, this patient will require two or more resources-lab and an ultrasound. She may in fact be pregnant. Ectopic pregnancy is on the differential diagnosis list, but this patient is currently hemodynamically stable and her pain is generalized across her lower abdomen.

Chapter 10. Competency Cases

This chapter can be used to assess competency. Please read each case and based on the information provided assign a triage acuity rating using ESI.

1. EMS arrives with a 76-year-old male found on the bathroom floor. The family called 911 when they heard a loud crash in the bathroom. The patient was found in his underwear and the toilet bowl was filled with maroon-colored stool. Vital signs (VS) on arrival: blood pressure (BP) 70/palp, heart rate (HR) 128, respiratory (RR) 40. His family tells you he has a history of atrial fibrillation and takes a "little blue pill to thin his blood."
2. "The pediatrician sent us to the emergency department (ED) because my son may have appendicitis," reports the mother of a healthy 7-year-old. The child is sitting quietly next to his mother holding an emesis basin. "He woke me up this morning and told me his tummy hurt. Usually he gets up and runs downstairs to watch cartoons, but not today. The poor kid vomited all over the doctor's office." VS: temperature (T) 99.6° F, HR 94, RR 20, BP 88/62.
3. A 63-year-old cachectic male is brought in from the local nursing home because his feeding tube fell out again. The patient is usually unresponsive. He has been in the nursing home since he suffered a massive stroke about 4 years ago.
4. You are trying to triage an 18-month-old whose mother brought him in for vomiting. The toddler is very active and trying to get off his mother's lap. To distract him the mother hands him a bottle of juice, which he immediately begins sucking on. The child looks well hydrated and is afebrile.
5. "I think I need a tetanus shot," a 29-year-old female tells you. "I stepped on a rusty nail this morning and I know I haven't had one for years." No past medical history (PMH), no known drug allergies (NKDA), no medications.
6. A 72-year-old female with obvious chronic obstructive pulmonary disease (COPD) and increased work of breathing is wheeled into triage. Between breaths she tells you that she "is having a hard time breathing and has had a fever since yesterday." The SpO2 monitor is alarming and displaying a saturation of 84 percent.
7. "Why the hell don't you just leave me alone?," yells a 73-year-old disheveled male who was brought to the ED by EMS. He was found sitting on the curb drinking a bottle of vodka with blood oozing from a 4-cm forehead laceration. He is oriented to person, place, and time and has a Glasgow Coma Scale (GCS) of 14.
8. EMS arrives in the ED with a 57-year-old female with multiple sclerosis. She is bedridden and her family provides care in the home. The visiting nurse sent her to the ED because her Foley catheter came out this morning. No other complaints. Vital signs are within normal range, currently on antibiotics for a UTI.
9. "How long am I going to have to wait before I see the doctor?," asks a 27-year-old female with a migraine. The patient is well known to you and your department. She rates her pain as 20/10 and tells you that she has been like this for 2 days. She vomited twice this morning. PMH: migraines, no allergies, medications include fiorocet.
10. A young male ambulates into triage and tells you that he has been shot. As he rolls up the left leg of his shorts you notice two wounds. He tells you that he heard three shots. He is alert and responding appropriately to questions. Initial VS: T 98.2° F, HR 78, RR 16, BP 118/80.
11. A 26-year-old female walks into the triage room and tells you that she needs to go into detox again. She has been clean for 18 months but started using heroin again 2 weeks ago when her boyfriend broke up with her. She had called several detox centers but was having no luck finding a bed. She denies suicidal or homicidal ideation. She is calm and cooperative.
12. EMS radios in that they are in route with a 17-year-old with a single gun shot wound to the left chest. On scene the patient was alert, oriented and had a BP of 82/palp. Two large bore IV's were immediately inserted. Two minutes prior to arrival in the ED the patient's HR was 130 and BP was 78/palp.
13. "My son needs a physical for camp," an anxious mother tells you. "I called the clinic but they can't see him for two weeks and camp starts on Monday." Her son, a healthy 9-year-old will be attending a summer day camp.

14. "Nurse, I have this pressure in my chest that started about an hour ago. I was shoveling that wet snow and I may have over done it," reports an obese 52-year-old male. He tells you his pain is 10 out of 10 and that he is nauseous and short of breath. His skin is cool and clammy. VS: BP 86/50, HR 52 and irregular.
15. This patient is the restrained driver of an SUV involved in a high-speed, multicar accident. Her only complaint is right thigh pain. She has a laceration on her left hand and an abrasion on her left knee. VS: BP 110/74, HR 72, RR 16, no medications, no allergies, no PMH.
16. "My doctor told me to come to the ED. I had a gastric bypass 3 weeks ago and have been doing fine but today I started vomiting and having this belly pain." The patient, an obese 33-year-old female rates her pain as 6/10. VS: BP 126/70, HR 76, RR 14, T 98° F.
17. "I was seen in the ED last night for my fractured wrist. The bone doctor put this cast on and told me to come back if I had any problems. As you can see my hand is really swollen and the cast is cutting into my fingers. The pain is just unbearable." Circulation, sensation, and movement are decreased.
18. A 42-year-old male presents to triage with a chief complaint of "something in his right eye." He was cutting tree limbs and thinks some sawdust went into his eye. No PMH, no allergies, no medications. On exam his right eye is reddened and tearing.
19. An 88-year-old female is brought to the ED by EMS. This morning she had an episode of slurred speech and weakness of her left arm that lasted about 45 minutes. She has a history of a previous stroke and she takes an aspirin every day. She is alert and oriented with clear speech and equal hand grasps.
20. "It hurts so much when I urinate," reports an otherwise healthy 25-year-old. She denies fever, chills, abdominal pain, or vaginal discharge. VS: T 98.2° F, HR 66, RR 14, BP 114/60.
21. "I think my son has swimmer's ear. He spends half the day in the pool with his friends so I am not surprised," the mother of a 10-year-old boy tells you. The child has no complaints except painful, itchy ears. VS: T 97° F, HR 88, RR 18, BP 100/68.
22. The medical helicopter is en route to your facility with a 16-year-old male who was downhill skiing and hit a tree. Bystanders report that he lost control and hit his head. He was intubated at the scene and remains unresponsive.
23. "I have this aching pain in my left leg," reports an obese 52-year-old female. "The whole ride home it just ached and ached." The patient tells you that she has been sitting in a car for the last two days. "We drove my daughter to college and I thought it was the heat getting to me." She denies any other complaints. VS: BP 148/90, HR 86, RR 16, T 98° F.
24. "My baby has a temperature of 101 rectally. I called the pediatrician and he told me to come here," reports the mother of a 3-week-old. The baby is alert and sucking on a pacifier. Delivered vaginally, no complications. "He's nursing fine. I just wonder if he has the bug my other kids had."
25. EMS arrives with a 45-year-old asthmatic who has had a cold for a week. She started wheezing a few days ago and then developed a cough and a fever of 103. VS: T 101.6° F, HR 92, RR 24, BP 148/86. SpO2 97%.
26. "My right breast is so sore, my nipples are cracked, and now I have a fever. Do you think I will have to stop nursing my baby?," asks a tearful 34-year-old female. She is 3 months post partum and has recently returned to work part time. VS: T 102.8° F, HR 90, RR 18, BP 108/60, pain 5/10. No PMH, taking multivitamins, allergic to penicillin.
27. A six-year-old male tells you that he was running across the playground and fell. He presents with three-centimeter laceration over his right knee. Healthy, no medications and no allergies, immunizations are up to date.
28. A 41-year-old male involved in a bicycle accident walks into the emergency department with his right arm in a sling. He tells you that he fell off his bike and landed on his right arm. He is complaining of pain in the wrist area and has a two-centimeter laceration on his chin. "My helmet saved me."
29. "I ran out of my blood pressure medicine and my doctor is on vacation. Can someone here write me a prescription?" requests a 56-year-old male with a history of hypertension. VS: BP 128/84, HR 76, RR 16, T 97° F.
30. EMS presents to the ED with an 18-year-old female with a suspected medication overdose. Her college roommates found her lethargic and

"not acting right" so they called 911. The patient has a history of depression. On exam you notice multiple superficial lacerations to both wrists. Her respiratory rate is 10 and her SpO2 on room air is 86 percent.

Chapter 10. Answers and Discussion

1. **ESI level 1: requires immediate life-saving intervention.** This 76-year-old patient is in hemorrhagic shock from his GI bleed. His blood pressure is 70, his heart rate is 128 and his respiratory rate is 40, all indicating an attempt to compensate for his blood loss. He probably takes warfarin (Coumadin®) for his atrial fibrillation. This patient needs immediate IV access and the administration of fluid, blood, and medications.
2. **ESI level 3: two or more resources.** The child's pediatrician has already examined him and referred the family to the emergency department for further evaluation. At a minimum he will need labs, an IV with fluid, and other diagnostic tests in order to reach a disposition.
3. **ESI level 4: one resource.** This patient will be sent back to the nursing home after the feeding tube is reinserted. There is no acute change in his medical condition that warrants any further evaluation. Yes, he is unresponsive but that is the patient's baseline mental status so he is not an ESI level 1.
4. **ESI level 5: no resources.** A physical exam and providing the mother with reassurance and education is what this 18-month-old will require. His activity level is appropriate and he is taking PO fluids.
5. **ESI level 5: no resources.** A tetanus immunization does not count as a resource. The patient will be seen by a physician or mid-level provider, receive a tetanus immunization, and discharge instructions. This patient will require no resources.
6. **ESI level 1: requires immediate life-saving intervention.** Immediate aggressive airway management is what this patient requires. Her saturation is very low and she appears to be tiring. The triage nurse does not need the other vital signs in order to decide that this patient needs immediate care.
7. **ESI level 2: high-risk situation.** The history of events is unclear. How did this 73-year-old gentleman get the laceration on his forehead? Did he fall? Get hit? Because of his age, presentation, and presence of alcohol he is at risk for a number of complications.
8. **ESI level 4: one resource.** The patient has been referred to the emergency department for a new Foley catheter—one resource. There are no other changes in her condition and she is already on antibiotics for a UTI so no further evaluation is needed.
9. **ESI level 3: two or more resources.** At a minimum this patient will require an IV with fluid, IV pain medication, and an antiemetic. Although she rates her pain as 20/10 she should not be assigned to ESI level 2. She has had the pain for 2 days and the triage nurse can't justify giving the last open bed to this patient. The triage nurse will need to address this patient's concerns about wait time.
10. **ESI level 2: high-risk situation.** This patient has two obvious wounds but until he is thoroughly examined in the trauma room you can't rule out the possibility that he has another GSW. The wounds on his thigh look non-life- threatening but a bullet could have nicked a blood vessel or other structure; therefore, he meets ESI level-2 criteria. His vital signs are within normal limits so he does not meet ESI level 1 criteria.
11. **ESI level 4: one resource.** This patient is seeking help finding a detoxification program that will help her. She is not a danger to her self or others. The social worker or psychiatric counselor should be consulted to assist her. Once a placement has been found she can be discharged from the emergency department and can get herself to the outpatient program. If your social worker or psychiatric counselor requires a urine toxicology or other lab work, the patient will require 2 or more resources and then meet ESI level-3 criteria.
12. **ESI level 1: requires immediate life-saving interventions.** The trauma team needs to be in the trauma room and ready to aggressively manage this 17-year-old with a single GSW to the left chest. He will require airway management, fluid resuscitation and, depending on the injury, a chest tube or rapid transport to the operating room.

13. **ESI level 5: no resources.** Because the mother could not get an appointment with a primary care physician she brought her son to the emergency department for a routine physical exam. He will be examined and discharged.
14. **ESI level 1: requires immediate life-saving intervention.** The history combined with the signs and symptoms indicate that this patient is probably having an MI. The "pressure" started after shoveling wet snow and now he is nauseous, short of breath and his skin is cool and clammy. He needs immediate IV access, the administration of medications, and external pacing pads in place.
15. **ESI level 2: high-risk situation.** Based on mechanism of injury this patient will need rapid evaluation by the trauma team.
16. **ESI level 3: two or more resources.** She will need two or more resources—laboratory tests, intravenous fluid, medication for her nausea, and probably a CT of her abdomen. This patient will be in your emergency department an extended period of time being evaluated. If her pain was 10/10 and she was tachycardic the patient would meet the ESI level-2 criteria.
17. **ESI level 2: high-risk situation.** Again, this is a high-risk situation. The recent application of a cast along with swelling of the hand and pain that is unbearable justifies an ESI level-2 acuity level. He may have compartment syndrome.
18. **ESI level 4: one resource.** The only resource this patient will require is irrigation of his eyes. A slit lamp exam is not considered a resource but is part of the physical exam.
19. **ESI level 2: high-risk situation.** The patient's history indicates that she may have had a transient ischemic attack this morning. This patient is high risk and it would not be safe for her to sit in the waiting room for an extended period of time.
20. **ESI level 4: one resource.** This patient will require one resource—lab. A urinalysis and urine culture will be sent and depending on your institution, a urine pregnancy test. One or all of these tests count as one resource.
21. **ESI level 5: no resources.** This child needs a physical exam. Even if eardrops are administered in the emergency department, this does not count as a resource. The family will be sent home with instructions and a prescription.
22. **ESI level 1: requires immediate life-saving intervention.** Prehospital intubation is one of the criteria for ESI level 1. This patient has sustained a major head injury and will require an immediate trauma team evaluation.
23. **ESI level 3: two or more resources.** At a minimum she will require labs and noninvasive vascular studies of her lower leg. She should be placed in a wheelchair with her leg elevated and instructed not to walk until the doctor has seen her.
24. **ESI level 2: high-risk situation.** Any neonate (day 1-28) with a fever over 100.4 rectally should be considered high risk regardless of how they look at triage. At this age they have limited ability to localize an infection.
25. **ESI level 3: two or more resources.** This history sounds more like pneumonia. Because the patient is not in acute respiratory distress he or she doesn't meet ESI level-2 criteria. This patient will require labs, a chest x-ray, and perhaps IV antibiotics.
26. **ESI level 3: two or more resources.** At a minimum she will require labs and IV antibiotics.
27. **ESI level 4: one resource.** The laceration will need to be sutured—one resource.
28. **ESI level 3: two or more resources.** At a minimum this patient will require an x-ray of his right arm and suturing of his chin laceration.
29. **ESI level 5: no resources.** The patient needs a prescription refill and has no other medical complaints. His blood pressure is controlled with his current medication. If at triage his blood pressure was 188/124, and he complained of a headache then he would meet the criteria for a high-risk situation and be assigned to ESI level 2. If this patient's BP was elevated and the patient had no complaints, he or she would still remain an ESI level 5. The blood pressure would be repeated and would most likely not be treated in the ED or treated with PO medications.
30. **ESI level 1: requires immediate life-saving intervention.** The patient's respiratory rate, oxygen saturation, and inability to protect her own airway indicate the need for immediate endotracheal intubation.

Appendix A. Frequently Asked Questions and Post-test Materials for Chapters 3-8

Chapter 3.

Frequently Asked Questions

1. Do I have to upgrade the adult patient's triage level if the heart rate is greater than 100?

   No, it is a factor to consider.

2. Do I have to upgrade the patient's triage level if the pain rating is 7/10 or greater?

   No, again this is one factor to consider.

3. If the patient is chronically confused, should the patient then automatically be categorized as ESI level 2?

   No, an ESI level 2 is assigned to patients with an acute change in level of consciousness.

4. When do I need to measure vital signs?

   For any patient who meets ESI level-3 criteria. Vital signs are always obtained if the triage nurse determines they may be useful.

Post-test Questions and Answers

Questions. Assign an ESI level to each of these patients.

Level	Patient
1. ____	A 62-year-old with CPR in progress.
2. ____	A 53-year-old with 30% BSA burn.
3. ____	A 22-year-old who needs a work note.
4. ____	A 12-year-old with an earache.
5. ____	A 45-year-old involved in MVC, ejected from vehicle, BP 100/60.
6. ____	An unresponsive 14-year-old. EMS tells you he and his friends "had been doing shots."

Answers

1. ESI level 1
2. ESI level 2
3. ESI level 5
4. ESI level 5
5. ESI level 2
6. ESI level 1

Chapter 4.

Frequently Asked Questions

1. Do I have to assign the ESI triage category of 2 for the 25-year-old female patient who rates her pain as 10/10 and is eating potato chips?

   No. With stable vital signs and no other factors that would meet high-risk criteria, this patient should be assigned ESI level 3. She will most likely need labs, and either x-rays, an IV, or pain medications, i.e., two or more resources. You would not use your last open bed for her.

2. Does an 80-year-old female who is chronically confused need to be triaged as ESI level 2?

   No. The new onset of confusion, lethargy, or disorientation meet criteria for ESI level 2.

3. Shouldn't the patient with active chest pain be rated an ESI level 1? After all, they should be the highest priority.

   Not all patients with chest pain meet ESI level-1 criteria. If they are unresponsive, pulseless, apneic or not breathing, or require immediate life saving intervention, they meet level-1 criteria. A chest pain patient that is pale, diaphoretic, hypotensive, or bradycardic will require immediate IV access to improve their hemodynamic status is level 1. Stable patients with active chest pain usually meet high-risk criteria and should be categorized ESI level 2; immediate placement should be facilitated.

Post-test Questions and Answers

Questions. Read each case and determine whether the patient meets the criteria for ESI level 2. Justify your decision.

1. A 40-year-old male presents to triage with vague, midsternal chest discomfort, occurring intermittently for one month. This morning, he reports a similar episode, which has now resolved. Currently complains of mild nausea, but feels pretty good. Medical history: Smoker. He is alert, with skin warm and dry, does not appear to be in any distress.

2. A 22-year-old female on college break presents to the triage desk complaining of sudden onset of feeling very sick, severe sore throat, and feels

"feverish." She is dyspneic, drooling at triage, and her skin is hot to touch.

3. A 68-year-old male brought in by his wife for sudden onset of left arm weakness, slurred speech, and difficulty walking. Symptoms began 2 hours prior to arrival. PMH: Atrial fibrillation. Meds: Lanoxin. The patient is awake, oriented, mildly short of breath. Speech is slurred; right-sided facial droop is present. Left upper-extremity weakness noted with 2/5 muscle strength.
4. A 60-year-old male complains of sudden loss of vision in the left eye that morning. Patient denies pain or discomfort. PMH: CAD, HTN. The patient is slightly anxious but no distress.
5. A 22-year-old female with 10/10 abdominal pain for two days. Denies nausea, vomiting, diarrhea, or urinary frequency. Her heart rate is 84 and she is eating ice cream.
6. A 70-year-old female with her right arm in a cast is brought to triage by her daughter. The daughter states her mother fell yesterday and fractured her arm. The patient is complaining of pain. Daughter states, "They put this cast on yesterday, but I think it's too tight." Daughter reports her mother has been very restless at home and thinks her mother is in pain. Patient has a history of Alzheimer's disease. The patient is confused, mumbling (per baseline); face flushed. She is unable to provide verbal description of her complaints. Her right upper extremity is in a short arm cast; digits appear tense, swollen and ecchymotic. Nail beds are pale; capillary refill delayed. Patient is not wearing a sling.
7. An 8-month-old presents with fever, cough, and vomiting. The baby has vomited twice this morning; no diarrhea. Mom states the baby is usually healthy but has "not been eating well lately." Doesn't own a thermometer, but knows the baby is "hot" and gave acetaminophen two hours PTA. The baby is wrapped in a blanket, eyes open, appears listless, skin hot and moist, sunken fontanel. Respirations are regular and not labored.
8. A 34-year-old male presents to triage with right lower quadrant pain, 5/10, all day. Pain is associated with loss of appetite, nausea and vomiting. PMH: None. The patient appears in moderate discomfort, skin warm and dry, guarding abdomen.
9. A 28-year-old male arrives with friends with a chief complaint of a scalp laceration. Patient states he was struck in the head with a baseball bat one hour prior to arrival. Friends state he "passed out for a couple of minutes." Patient complains of headache, neck pain, mild nausea, and emesis x 1. Patient looks pale, but is otherwise alert and oriented to person, place, and time. There is a 5-cm laceration to the scalp near his left ear with bleeding controlled.
10. A 28-year-old male presents with a chief complaint of tearing and irritation to the right eye. He is a construction worker and was drilling concrete. He states "I feel like there is something in my eye" and reports "irrigated the eye several times but it doesn't feel any better." Patient appears in no severe distress; however, he is continually rubbing his eye. Right eye appears red, irritated, with excessive tearing.
11. A 40-year-old male is brought in by his son. He is unable to ambulate due to foot pain. Patient states he fell approximately 10 feet off of a ladder and is complaining of foot and back pain. States he landed on both feet and had immediate pain. Denies LOC/neck pain. No other signs of trauma noted. The patient appears pale, slightly diaphoretic, and appears in mild distress. He rates his pain 6/10. Patient is sitting upright in a wheelchair.
12. A 12-year-old female is brought to triage by her mother who states her daughter has been weak and vomiting for three days. The child states she "feels thirsty all the time and her head hurts." Vomited once today. Denies fever, abdominal pain, or diarrhea. No significant PMH. The child is awake, lethargic, and slumped in the chair. Color is pale, skin warm and dry.
13. A 40-year-old male presents to triage with a gradual increase in shortness of breath over the past two days associated with chest pain. PMH: colon CA. He is in moderate respiratory distress, skin warm and dry.
14. A 60-year-old male presents with complaint of dark stools for one month with vague abdominal pain. PMH: None. Pulse is tachycardic at a rate of 140 and he has a blood pressure of 80 palpable. His skin is pale and diaphoretic.
15. A 25-year-old female presents to triage with a chief complaint of a moderate amount of dark

red vaginal bleeding, with 9/10 pain. The patient states she is 7 months pregnant and this is her fourth pregnancy. PMH: Denies.

Answers

1. **ESI level 2.** This patient is high-risk, due to history of angina x 1 month. The patient complained of symptoms of AMI earlier in the morning. Smoking is a significant risk factor; however, the patient presentation is concerning enough to be considered high risk. These are symptoms significant for a potential cardiac ischemic event. AMI is frequently accompanied or preceded by waxing and waning symptoms. An immediate ECG is necessary.
2. **ESI level 2.** This patient is at high risk for epiglottitis. This is a life-threatening condition characterized by edema of the vocal cords. Onset is rapid, with a high temp (usually > 101.3° F/38.5° C), lethargy, anorexia, sore throat. Patients do not have a harsh cough associated with croup, often assume the tripod position, and also have mouth drooling, an ominous sign, and may demonstrate an exhausted facial expression. Epiglottitis is more common in children, but may occur in adults; usually age 20 to 40. These patients are at high risk for airway obstruction and need rapid access of an airway (preferably in the operating room).
3. **ESI level 2.** This patient is presenting with signs of an acute stroke and requires immediate evaluation. If he meets criteria for thrombolytic therapy, he may still be in the time window of less than three hours, but every minute counts with this patient. He is a very high-priority ESI level-2 patient.
4. **ESI level 2.** High risk for central retinal artery occlusion caused by an embolus. This is one of the few true ocular emergencies and can occur in patients with risk factors of coronary artery disease, hypertension, or embolus. Without rapid intervention, irreversible loss of vision can occur in 60 to 90 minutes.
5. **ESI level 3.** Since she is able to eat ice cream, you would not give your last open bed for this patient. She will probably require at least two resources.
6. **ESI level 2.** High risk for compartment syndrome. Despite the patient being a poor historian, the triage nurse should be able to identify some of the signs of threatened compartment syndrome: Pain, pallor, pulselessness, paresthesia, and paralysis. The patient requires immediate life-saving intervention: Cutting of the cast and further evaluation for potential compartment syndrome.
7. **ESI level 2.** High risk for sepsis or severe dehydration. If the baby was alert and active with good eye contact, similar complaints, and a fever of 100.4° F (38.0° C) or greater, the ESI category would be 3. The temperature is not needed to make the assessment that the baby is high risk. The presence of lethargy and a sunken fontanel are indications of severe dehydration.
8. **Initially ESI level 3.** However, the patient could be upgraded to ESI level 2 if vital signs were abnormal, i.e., heart rate greater than 100. Signs of acute appendicitis include mild-to-severe RLQ pain with loss of appetite, nausea, vomiting, low-grade fever, muscle rigidity, and LLQ pressure that intensifies the RLQ pain. The presence of all these symptoms and tachycardia would indicate a high risk for a surgical emergency.
9. **ESI level 2.** High risk for epidural hematoma. This is a great example of the importance of understanding mechanism of injury. This man was struck with a baseball bat to the head with enough force to cause a witnessed LOC. Patients with epidural hematomas have a classic transient LOC before they rapidly deteriorate. Even though this patient looks good now and is alert and oriented at present, he must be immediately placed for further evaluation.
10. **ESI level 2.** High risk for severe alkaline burn. Concrete is an alkaline substance and continues to burn and penetrate the cornea causing severe burns. Alkaline burns are more severe than burns with acid substances and require irrigation with very large amounts of fluids.
11. **ESI level 2.** High risk for lumbar and calcaneus fractures. Again, mechanism of injury is very important to evaluate. Although he is not unresponsive or lethargic, he needs rapid evaluation and treatment.
12. **ESI level 2.** Lethargy and high risk for severe dehydration from probably diabetic ketoacidosis (DKA). It is not normal for a 12-year-old to be slumped over in a chair. Her history of being thirsty and lethargic suggest a strong suspicion for DKA. She needs rapid evaluation and rehydration.

13. **ESI level 2.** High risk for a variety of complications associated with cancer, i.e., pleural effusion, CHF, further malignancy, and pulmonary embolus. A history of cancer can help identify high-risk status.
14. **ESI level 1.** Patient is placed in ESI level 1 after consideration of heart rate, skin condition and blood pressure. Tachycardia and hypotension indicate blood loss. The patient needs immediate hemodynamic support.
15. **ESI level 1.** She is at high risk for abruptio placentae, and needs an immediate cesarean section to save the fetus. Abruption occurs when the placenta separates from its normal site of implantation. Primary causes include hypertension, trauma, illegal drug use, and short umbilical cord. Bleeding may be dark red or absent when hidden behind the placenta. Abruption is usually associated with pain of varying intensity

Chapter 5.

Frequently Asked Questions

1. Why isn't crutch-walking instruction a resource?

   Though crutch-walking instruction may consume a fair amount of the ED staff members' time, it is often provided to patients who have simple ankle sprains. These patients are typically classified as ESI level 4 (ankle x-ray = one resource). The patients are clearly less acute and less resource intensive than more complex patients like those with tibia/fibula fractures who are usually ESI level 3 (leg films, orthopedic consult, cast/splint, IV pain medications = two or more resources). A better way to reflect the ED staff's efforts for crutch-walking instruction is with a nursing resource intensity measure.

2. Why isn't a splint a resource?

   The application of simple, pre-formed splints (such as splints for ankle sprains) is not considered a resource. In contrast, the creation and application of splints by ED staff, such as thumb spica splints for thumb fractures, does constitute a resource. A helpful way to differentiate patients with extremity trauma is as follows: patients with likely fractures should be rated ESI 3 (two or more resources: x-ray, pain medications, creation and application of splints/casts), whereas patients more likely to have simple sprains can be rated as ESI level 4.

3. Why isn't a saline or heparin lock a resource?

   Generally speaking, insertion of a heparin lock doesn't consume a large amount of ED staff time. However, many patients who have heparin locks inserted also have at least two other resources (e.g., laboratory tests, intravenous medications) and are therefore classified as ESI level 3 anyway.

4. Are all conscious sedation patients ESI level 3 or higher?

   Yes, conscious sedation is considered a complex procedure (two resources) and is generally performed with patients who also have laboratory tests or x-rays, and other procedures such as fracture reduction or dilation and curettage.

5. Which of the following are considered resources: eye irrigation, nebulized medication administration, and blood transfusions?

   All three are considered resources for the purposes of ESI triage ratings. The resources tend to be used for more acute patients, require significant ED staff time, and likely lead to longer length of stay for patients.

6. Are all asthmatics ESI level 4 because they will require a nebulized medication?

   No. Stable asthmatics who only require a nebulized medications are assigned ESI level 4. However, some asthmatics are in severe respiratory distress and meet ESI level-2 criteria. Others are somewhere in between and will require intravenous steroids or an x-ray in addition to nebulized treatments and would be assigned ESI level 3. Finally, asthmatics who require only a prescription refill of their inhaler are assigned ESI level 5. They do not require any resources.

Post-test Questions and Answers

Questions. Read the following statements and provide the correct answer.

1. A magnetic resonance imaging (MRI) procedure is considered a resource in the ESI triage system. (T/F)
2. A psychiatry consult is considered a resource in the ESI triage system. (T/F)
3. Cardiac monitoring is considered a resource in the ESI triage system. (T/F)

4. How many ESI resources will this patient need? A healthy 25-year-old construction worker presents with back pain. The triage nurse predicts he will need a lumbar spine x-ray, oral pain medication administered in the ED, and a prescription to take home. (0, 1, 2 or more)
5. It is necessary to take vital signs in order to determine the number of ESI resources an adult ED patient will need. (T/F)
6. The triage nurse must have enough experience to be certain about the resources needed for each patient in order to accurately assign an ESI triage level. (T/F)
7. A 30-year-old sexually active female patient with vaginal bleeding and cramping, doesn't use birth control, and is dizzy and pale. In determining this patient's ESI triage level, does it matter if the local ED does urine pregnancy tests at the point of care versus sending a specimen to the laboratory? (Y/N) How many resources will this patient require? (0, 1, 2 or more)
8. How many ESI resources will this patient need? A healthy 40-year-old man presents to triage at 2:00 a.m. with a complaint of a toothache for two days, no fever, and no history of chronic medical conditions (0, 1, 2 or more, irrelevant)
9. How many ESI resources will this patient need? A 22-year-old female involved in a high-speed rollover MVC and thrown from the vehicle, presents intubated, no response to pain, and hypotensive. (0, 1, 2 or more, irrelevant)
10. How many ESI resources will this patient need? A 60-year-old healthy male who everted his ankle on the golf course presents with moderate swelling and pain upon palpation of the lateral malleolus. (0, 1, 2 or more, irrelevant)
11. Is it considered an ESI resource if a psychiatric patient requires a sitter or security staff member present at the bedside? (Y/N)

Answers

1. **True.** The MRI will make use of personnel outside the ED (MRI staff) and increase the patient's ED length of stay.
2. **True.** The consult involves personnel outside the ED (psychiatry team) and increases the patient's ED length of stay.
3. **False.** Monitoring is part of the routine care provided by ED staff. However, most patients who receive monitoring also need at least two other ED resources (electrocardiogram, blood tests, x-rays), and may therefore be classified as ESI level 3.
4. **One ESI resource.** The x-ray is considered a resource since it utilizes personnel outside the ED. The oral pain medication and take-home prescription are not considered resources since they are quick interventions performed by ED personnel.
5. **False.** While vital signs are helpful in up-triage of level-3 patients to level 2, they are not necessary for differentiating patients needing one, two, or more than two resources.
6. **False.** The ESI is based upon the experienced ED triage nurse's prediction, or estimation, of the number and type of resources each patient will need in the ED. The purpose of resource prediction isn't to order tests or make an accurate diagnosis, but to quickly sort patients into distinct categories using acuity and expected resources as a guide.
7. **No, it doesn't matter.** The patient will need **at least two resources,** and be classified as a level 3 whether the pregnancy test is done in the ED (not a resource) or in the laboratory (a resource). The predicted resources will include: Complete blood count, intravenous fluids, ultrasound, and possibly a gynecology consult and intravenous medications if it is determined that she is aborting a pregnancy and the cervical os is open.
8. **No resources.** This patient will likely have a brief exam (not a resource) and receive a prescription for pain medication (not a resource) by the provider, and therefore is an ESI level-5 patient.
9. **Irrelevant.** The patient is an ESI level 1 based on being intubated and unresponsive. The nurse does not need to make a determination of the number of resources in order to make the triage classification.
10. **One resource.** The patient will need an ankle x-ray (one resource), and may get an ace wrap or ankle splint (not a resource) and crutches (not a resource). Simple ankle sprains are generally classified as ESI level 4. However, if the patient was in severe pain that required pain medication by injection, or if he had a deformity that might need a cast, orthopedic consult and/or surgery, then he would need two

or more resources and be classified as an ESI level 3.

11. **Yes.** A sitter or security staff member present at the bedside is considered a resource. However, such patients are high risk, since they are suspected to be a danger to themselves or others. So, in fact, these patients should be rated ESI-2 and it is not necessary to predict the number of resources they will require in the ED.

Chapter 6.

Frequently Asked Questions

1. Why aren't vital signs required to triage ESI level-1 and 2 patients?

   Vital signs are not necessary to rate patients as life threatening (ESI level 1) or high-risk (ESI level 2). Since ESI level 1 and 2 patients are critical, they require the medical team to respond quickly. Simultaneous actions can occur and vital signs can be collected as part of the initial assessment in the main acute area of the emergency department.

2. Why aren't vital signs required for ESI level-4 and 5 patients?

   Vital signs are not necessary to rate patients as low or no resource (ESI level 4 or 5). Also, the pain, anxiety, and discomfort associated with an emergency department visit often alter a patient's vital signs. Vital signs may quickly return to normal once the initial assessment is addressed. However, a nurse may choose to assess vital signs if signs of deranged symptoms exist (e.g., changes in skin color, mentation, dizziness, sweating). If there is no physical sign indicating a need for vital signs, the patient can be taken in the main emergency department or express care room.

3. Why are vital signs done on ESI level-3 patients?

   Vital signs can aid in differentiating patients needing multiple resources as either stable (ESI level 3) or potentially unstable or high-risk (ESI level 2). On occasion, ESI level-3 patients may actually have unstable vital signs while appearing stable. Vital signs for ESI level-3 patients provide a safety check. In general, ESI level-3 patients are more complicated and many are admitted to the hospital. Since these patients are not appropriate for the fast-track area, they are sometimes asked to wait for more definitive care. These patients present a unique challenge to the triaging process and caregivers find it necessary to rely on vital signs to confirm that an appropriate ESI level has been assigned.

4. Why are temperatures always done for pediatric patients less than 36 months?

   Temperature is useful in differentiating pediatric patients that are low or no resource (ESI level 4 or 5) from those that will consume multiple resources. An abnormal temperature in the less than 3 month old may indicate bacteremia, and place the child in a high-risk category.

5. Why does the literature present conflicting information on the value of vital signs during the triage process?

   There is no definitive research on the utility of vital signs for emergency department triage. Many factors influence the accuracy of vital sign data. Vital signs are a somewhat operator-dependent component of a patient's assessment. In some cases, vital signs may be affected by many factors such as chronic drug therapy (e.g., beta-blockers). Vital signs may also be used to fulfill part of the public health obligation assumed by emergency departments. And, lastly, vital signs help segment young pediatric patients into various categories.

6. Does JCAHO require vital signs to be done during triage?

   The Joint Commission on Accreditation of Healthcare Organizations does not specifically state a standard for vital signs. The organization does assert that physiologic parameters should be assessed as determined by patient condition.

7. Should vital sign criteria be strict in the danger zone vital sign box?

   In common usage, when the danger zone vital sign criteria are exceeded, up-triage is "considered" rather than automatic. The experienced triage nurse is called upon to use good clinical judgment in rating the patient's ESI level. The nurse incorporates information about the vital signs, history, medications, and clinical presentation of the patient in that decision-making process. Research is still needed to determine the predictive value of vital signs at triage, and to determine absolute cutoffs for up-triage.

8. What if ESI level-4 or 5 patients have danger zone vital signs?

   Though it is not required to take vital signs in order to assign ESI 4 or 5 levels, many patients may have vitals assessed at triage if that is part of

the particular ED's operational process. Per the ESI triage algorithm, the triage nurse does not have to take the vital signs into account in determining that the patient meets ESI level-5 (no resources) or ESI level-4 (one resource) criteria. However, in practice, the prudent nurse will use good clinical judgment and take the vital sign information into account in rating the ESI level. If the patient requests only a prescription refill and has no acute complaints, but has a heart rate of 104 after walking up the hill to the ED, the nurse might still rate the patient as an ESI level 5. But if the patient requests a prescription refill and has a heart rate of 148 and irregular, the nurse should rate the patient as ESI level 2. The triage nurse must also consider the following dilemma: an elevated blood pressure in an ESI level-4 or 5 patient. If the patient is asymptomatic related to the blood pressure, the triage level should not change. Most likely, an elevated BP in the asymptomatic patient will not be treated in the ED. However, it may be important to refer the patient to a primary care physician for BP follow-up and long term diagnosis and treatment.

Post-test Questions and Answers

Questions. Rate the ESI level for each of the following patients.

1. 3-week-old male
   Vital signs:
   Temperature: 100.8° F (38.2° C)
   Heart rate: 160
   Respiratory rate: 48
   Oxygen saturation: 96%
   Narrative:
   Poor feeding
   Less active than usual
   Sleeping most of the day

2. 22-month-old, fever, pulling ears, immunizations up to date, history of frequent ear infections
   Vital signs:
   Temperature: 102° F (39° C)
   Heart rate: 128
   Respiratory rate: 28
   Oxygen saturation: 97%
   Narrative:
   Awoke screaming
   Pulling at ears
   Runny nose this week
   Alert, tired, flushed, falling asleep now
   Calm in mom's arms, cries with exam

3. 6-year-old with cough
   Vital signs:
   Temperature: 104.4° F (40.2° C)
   Heart rate: 140
   Respiratory rate: 30
   Oxygen saturation: 91%
   Narrative:
   Cough with fever for two days
   Chills
   Short of breath with exertion
   Green phlegm
   Sleeping a lot

4. 94-year-old male, abdominal pain
   Vital signs:
   Temperature: 98.9° F (37.2° C)
   Heart rate: 100
   Blood pressure: 130/80
   Oxygen saturation: 93%
   Narrative:
   Vomiting
   Epigastric pain
   Looks sick

5. 61-year-old female, referred with asthma
   Vital signs:
   Temperature: 99.1° F (37.3° C)
   Heart rate: 112
   Respiratory rate: 28
   Blood pressure: 157/94
   Oxygen saturation: 91%
   Peak expiratory flow rate = 200
   Narrative:
   Asthma exacerbation with dry cough
   Steroid dependent
   Multiple hospitalizations
   Never intubated

6. 9-year-old male, head trauma
   Narrative:
   Collided with another player at lacrosse game
   Loss of consciousness for "about 5 minutes" witnessed by coach
   Now awake with headache and nausea

Answers

1. **ESI level 2.** An infant less than 28 days with a temperature greater than 38.0° C (100.4° F) is considered high risk regardless of how good they look. With a child between 3 and 36 months with a fever greater than 39.0° C (102.2° F), the triage nurse should consider assigning ESI level 3, if there is no obvious source for a fever or the child has incomplete immunizations.

2. **ESI level 5.** A child under 36 months of age requires vital signs. This child has a history of frequent ear infections, is up to date on their immunizations and presents with signs of another ear infection. This child meets the criteria for ESI level 5 (exam, PO medication administration and discharge to home). Danger zone vitals not exceeded. If the child was under-immunized or there was no obvious source of infection the child would be assigned to ESI level 3.
3. **ESI level 2.** The clinical picture indicates high probability of tests that equal two or more resources (ESI level 3). Danger zone vital signs exceeded (SaO2 = 91%, Respiratory rate = 30), making the patient an ESI level 2.
4. **ESI level 2.** The clinical picture mandates ESI level 3 with expected utilization of x-ray, blood work, and specialist consultation resources. Danger zone vital signs not exceeded. If an experienced triage nurse reported this patient as looking in imminent danger of deterioration, the patient may be upgraded to an ESI level 2. A 94-year-old ill-appearing patient presenting with epigastric pain, vomiting, and probable dehydration should be considered a high-risk ESI level-2 patient. If this patient did not look toxic, an ESI level 3 might be an appropriate starting point in the decision algorithm.
5. **ESI level 2.** The clinical picture mandates ESI level 3 with expected utilization of x-ray, blood work, and specialist consultation resources. Respiratory rate and heart rate danger zone vital signs are exceeded, so patient is up-triaged to ESI level 2.
6. **ESI level 2.** This patient is assigned an ESI level 2 due to the high-risk information provided in the scenario. Vital signs are not necessary, and patient should be immediately taken to treatment area for rapid assessment.

Chapter 7.

Post-Test Questions and Answers

Questions

1. Identify the three phases of change described by Lewin.
2. The ESI algorithm is so simple; why do the nurses need two hours of education to learn to use it?
3. As the nurse manager of a low volume emergency department do I still need an implementation team?

Answers

1. Unfreezing, movement, and refreezing.
2. Yes, the algorithm looks simple but staff needs to develop a clear understanding of each of the decision points. Application to realistic cases will reinforce learning.
3. The change process is never easy. An implementation team provides input from various members of the department. They can assist in developing and carrying out the implementation plan.

Chapter 8.

Frequently Asked Questions

1. What if we don't have good electronic data monitoring systems for QI efforts?

   Although it is very helpful and will expand the number of indicators you can monitor, you do not have to have electronic data monitoring to perform ESI QI.

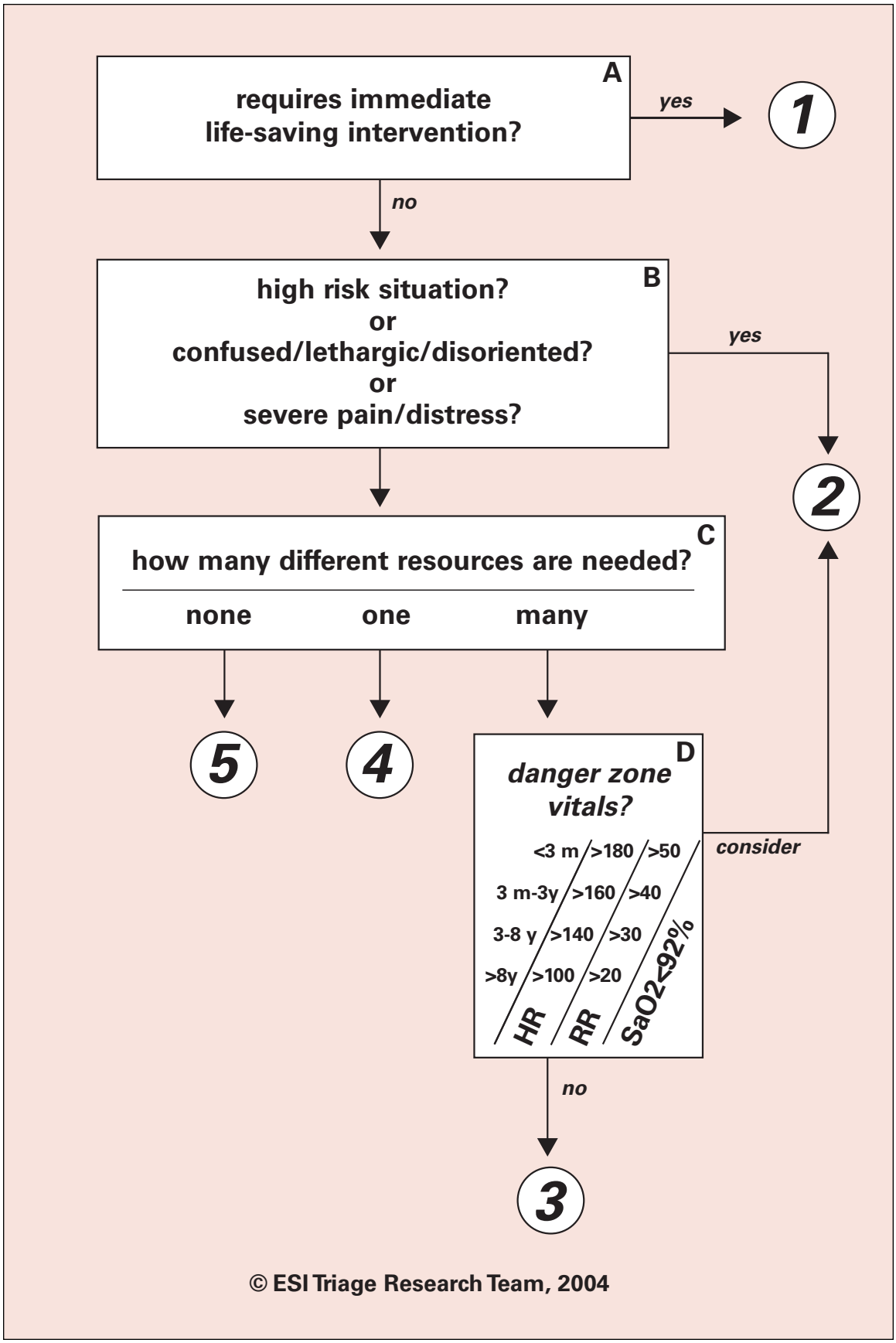
2. Can staff nurses monitor each other for the accuracy of the ESI triage acuity rating?

   No. An expert nurse in triage should determine whether the acuity ratings are correct.

3. How many indicators should we be monitoring?

   This is a decision to be made by the leadership team. Select only those indicators that have been identified as important to your ED and select only the number of indicators you have the resources to monitor.

Appendix B.
ESI Triage Algorithm, v.4



Notes:

A. Immediate life-saving intervention required: airway, emergency medications, or other hemodynamic interventions (IV, supplemental O2, monitor, ECG or labs DO NOT count); and/or any of the following clinical conditions: intubated, apneic, pulseless, severe respiratory distress, SPO_2<90, acute mental status changes, or unresponsive.

Unresponsiveness is defined as a patient that is either:
(1) nonverbal and not following commands (acutely); or
(2) requires noxious stimulus (P or U on AVPU) scale.

B. High risk situation is a patient you would put in your last open bed.

Severe pain/distress is determined by clinical observation and/or patient rating of greater than or equal to 7 on 0-10 pain scale.

C. Resources: Count the number of different types of resources, not the individual tests or x-rays (examples: CBC, electrolytes and coags equals one resource; CBC plus chest x-ray equals two resources).

Resources	*Not Resources*
• Labs (blood, urine) • ECG, X-rays • CT-MRI-ultrasound-angiography	• History & physical (including pelvic) • Point-of-care testing
• IV fluids (hydration)	• Saline or heplock
• IV or IM or nebulized medications	• PO medications • Tetanus immunization • Prescription refills
• Specialty consultation	• Phone call to PCP
• Simple procedure =1 (lac repair, foley cath) • Complex procedure =2 (conscious sedation)	• Simple wound care (dressings, recheck) • Crutches, splints, slings

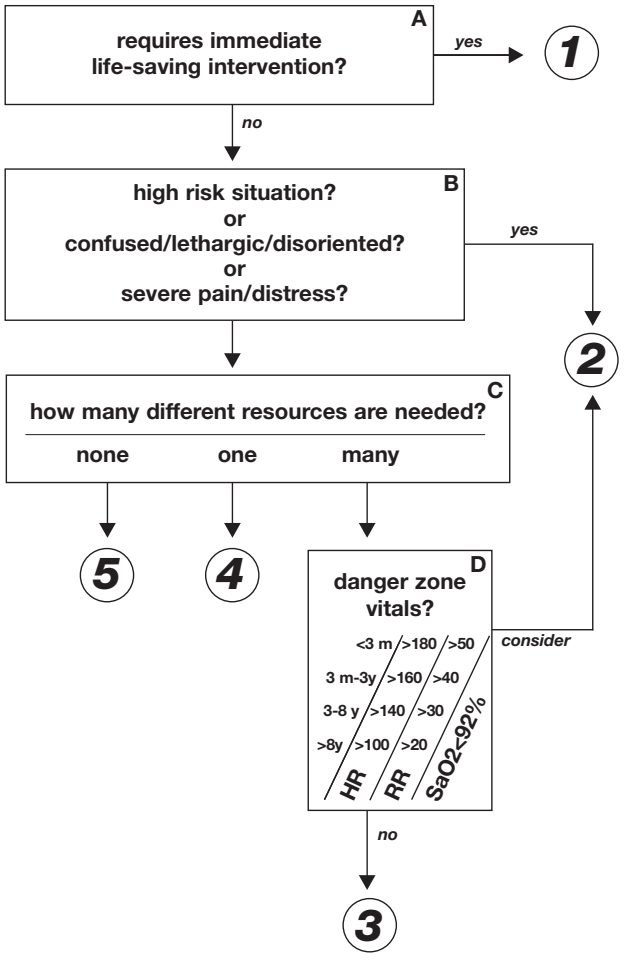
D. Danger Zone Vital Signs
Consider uptriage to ESI 2 if any vital sign criterion is exceeded.

Pediatric Fever Considerations
1 to 28 days of age: assign at least ESI 2 if temp >38.0 C (100.4F)

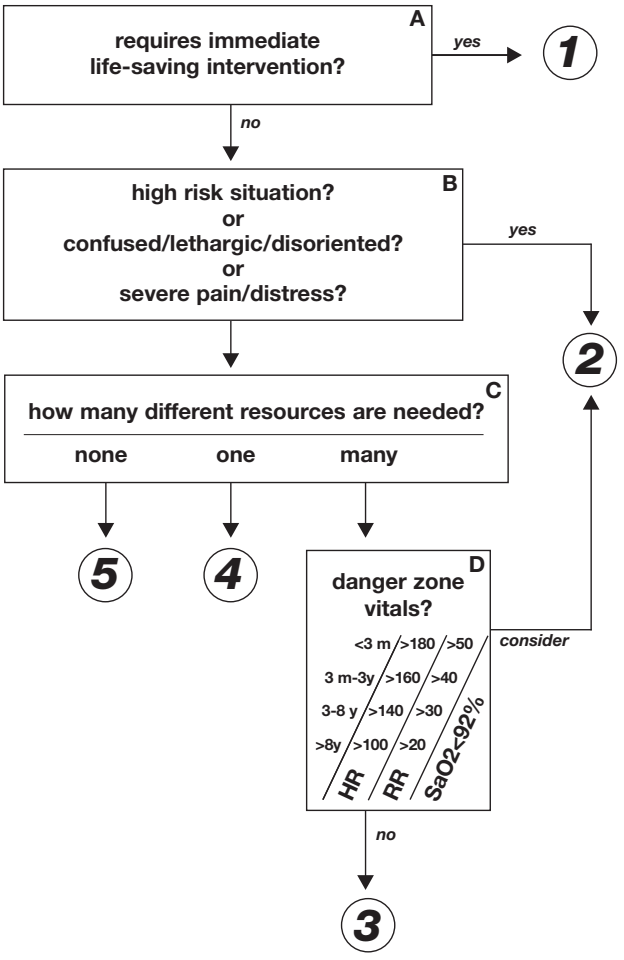
1-3 months of age: consider assigning ESI 2 if temp >38.0 C (100.4F)

3 months to 3 yrs of age: consider assigning ESI 3 if: temp >39.0 C (102.2 F), or incomplete immunizations, or no obvious source of fever

ESI Triage Algorithm, v4



ESI Triage Algorithm, v4



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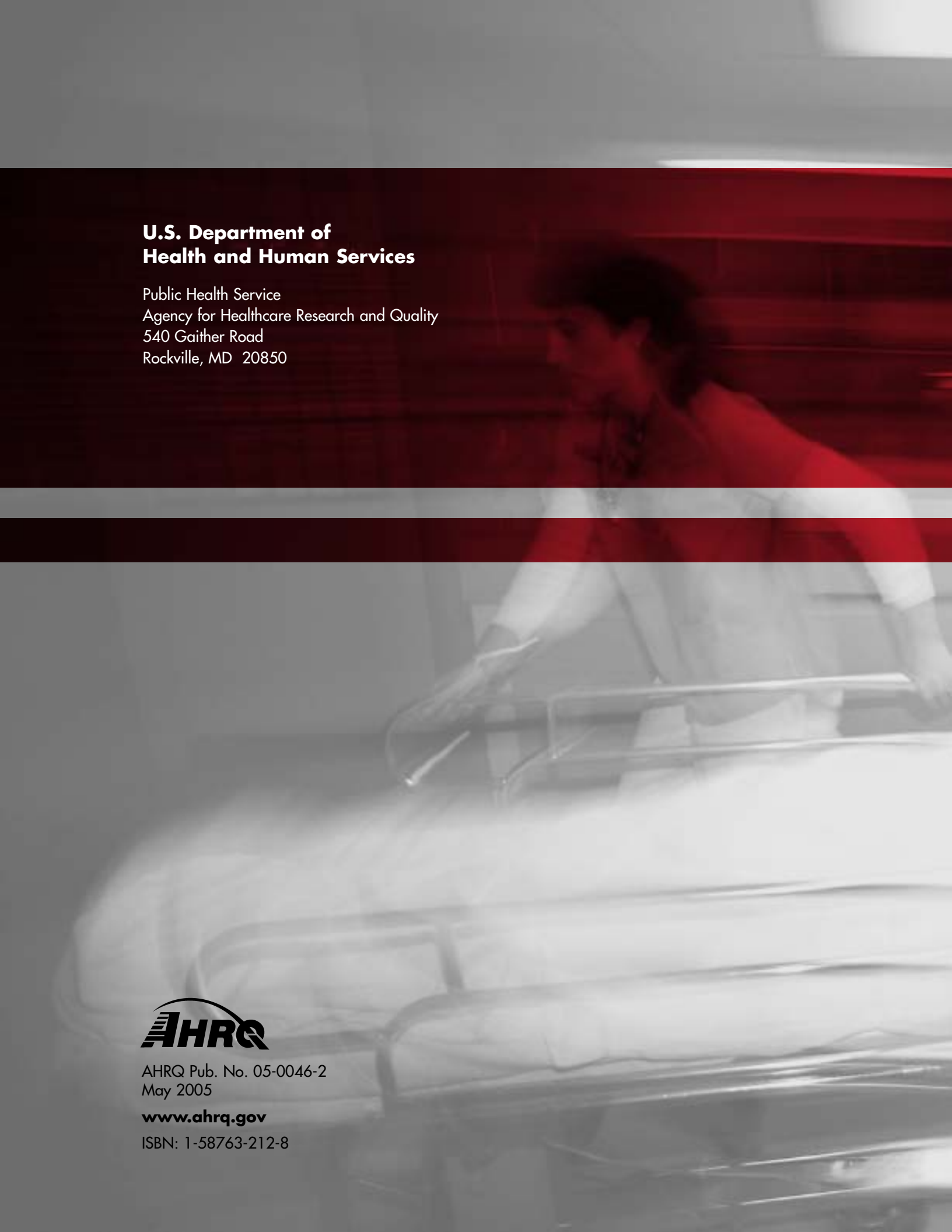

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