ESI™

EMERGENCY SEVERITY INDEX

EMERGENCY SEVERITY INDEX HANDBOOK FIFTH EDITION

VERSION 5

ENA®

EMERGENCY NURSES ASSOCIATION

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Dedication

To those who pioneered and developed the Emergency Severity Index:
Richard Wurez, David Eitel, Nicki Gilboy, Paula Tanabe,
Debbie Travers, Alexander Rosenau, and a host of others.

PREFACE

The Emergency Severity Index® (ESI®) is a tool for use in emergency department (ED) triage. The ESI 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 acuity with consideration of resource needs for stable, low-risk patients.

Emergency physicians Richard Wurez and David Eitel developed the original ESI concept in 1998 and brought together other emergency professionals interested in triage with 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 further refined based on feedback from the seven sites. Research over the last 20 years has established the reliability, validity, and ease of use of the ESI.

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. The group completed the first edition of *The Emergency Severity Index (ESI) Implementation Handbook* in 2002 (published by the Emergency Nurses Association [ENA]). The group then formed the ESI Triage Research Team, LLC and worked with the Agency for Healthcare Research and Quality, which published the second edition in 2005. The 2012 edition was significantly updated, including presentation of ESI Version 4, and there was the addition of a pediatric chapter. The fourth edition of the handbook was created in 2020 by the new owner of the ESI as of 2019, ENA.

The current handbook has been reorganized and simplified to better explain each decision point within the algorithm. While the algorithm is fundamentally unchanged, elimination of two questions used in decision point B will help users more accurately identify ESI level-2 patients.

With ED crowding, triage nurses have tended to misapply the algorithm by assigning an acuity based on the ED's current capacity and bed availability rather than the patient's physiologic status. Given the current situation, there are ESI 2 patients who will have to wait and will not get an ED bed immediately. These patients *should not wait*, and removing this language supports the triage nurse in assessing the patient's true acuity, instead of considering ED bed and staff capacity in that decision.

The basic techniques of inspection, auscultation, and palpation are reinforced as the quickest way to assess physiologic stability. Patient appearance, work of breathing, quality of pulses, and skin color/temperature/moisture may be all that is needed to identify a patient in need of immediate lifesaving intervention. Care should not be delayed by obtaining a full set of vital signs from the patient whose decompensation is readily apparent. However, greater emphasis has been placed on recognition of abnormal vital signs for patients initially assigned less urgent acuity levels as a means to identify underlying pathophysiology and increased risk of decompensation.

Content has also been incorporated based on evolving evidence of how racism and other forms of bias and stigma lead to inaccurate triage decisions. Some of the practice and competency cases in the fourth edition of the handbook reinforced bias that leads to poor decision-making and did not reflect best practice decisions related to abnormal vital signs, particularly regarding sepsis and anxiety.

This handbook is intended only as a guide to using the ESI system for categorizing patients at triage in ED settings. Nurses who participate in an ESI educational program are expected to be experienced triage nurses and/or to have attended a separate, comprehensive triage educational program. This handbook does not provide a comprehensive triage educational program. This handbook is best used in conjunction with a comprehensive triage educational program in addition to education on institution-specific triage policies and protocols.

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Introduction to the Emergency Severity Index

CHAPTER 1

In 2018, there were more than 143 million visits to emergency departments (EDs) in the United States (U.S. Department of Health and Human Services, 2021). Identification of patient acuity based on ED presentation is a crucial piece of effective and safe emergency department care. Accurate triage reduces patient morbidity and mortality. The purpose of triage is to rapidly sort patients presenting for emergency department care, prioritizing those who are in more immediate need of care. This chapter presents evidence for the utility of the Emergency Severity Index (ESI), a standardized 5-level triage tool.

Standardization of Triage Acuity in the U.S.

Crowding in emergency departments has been a serious problem for many years, often resulting in long wait times for patients. The use of a standardized triage system with clear application and evaluative processes is key to safe patient care. Triage standardization also provides the capability to support clinical care through research activities, ED surveillance, and benchmarking capabilities (Barthell et al., 2004; Gilboy et al., 1999; Handler et al., 2004).

The American College of Emergency Physicians (ACEP) and the Emergency Nurses Association (ENA) recognized the need for triage standardization in 2003. A policy statement supporting standardization (2010), most recently updated in 2017, states, "Based on expert consensus of currently available evidence, ACEP and ENA support the adoption of a scientifically validated triage scale such as the Emergency Severity Index (ESI)" (ACEP, 2017, p.1). Following the initial adoption of this policy statement, the number of EDs using 3-level triage systems decreased, and the number of EDs using the ESI triage system increased significantly (McHugh et al., 2012). Currently, 94% of U.S. EDs use ESI (Worth et al., 2019).

Other triage scales in use (e.g., the Australasian Triage Scale [ATS], the Canadian Triage and Acuity Scale [CTAS], and the Manchester Triage System [MTS]) utilize the triage decision 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 those algorithms. This represents a major difference between ESI, ATS, CTAS, and MTS. *The ESI does not define expected time intervals to physician evaluation.*

Description of the Emergency Severity Index

The ESI is a 5-level triage acuity scale developed by ED physicians Richard Wuerz and David Eitel in the U.S. (Gilboy et al., 1999; Wuerz et al., 2000). The ESI was developed around a new conceptual model of ED triage as a proxy measure of physiologic stability and risk for deterioration. For patients determined to be stable, prediction of resources necessary to move the patient to a final disposition (admission, discharge, or transfer) is used to further differentiate patient acuity. The ESI retains the traditional foundation of initially evaluating patient urgency and then seeks to maximize patient streaming: getting the right patient to the right resources at the right place and the right time.

Research on the Emergency Severity Index

The ESI has been studied and evaluated in the United States, across other countries and languages, and across age groups demonstrating reliability and validity (Aeimchanbanjong & Pandee, 2017; Baumann & Strout, 2007; Blomaard et al., 2020; Chmielewski & Moretz, 2022; Durani et al., 2009; Ebrahimi et al., 2020; Platts-Mills et al., 2010; Takaoka et al., 2021; Travers et al., 2009).

While research data support the use of ESI, education is needed to ensure appropriate application and implementation of the index. Studies on the application of ESI demonstrate 59% accuracy in assigning acuity (Jordi et al., 2015; Mistry et al., 2018). Given the low accuracy rate, learning how to properly apply the algorithm is key to accurately assigning acuity levels.

Benefits of Using the ESI

ESI is the most used triage scale in the United States, and its adoption internationally is growing (Mistry et al., 2018, Hinson et al., 2019). ED clinicians, managers, and researchers at those sites have identified several benefits of ESI triage over conventional 3-level scales. One benefit of using a 5-level acuity scale is the rapid identification of patients who need immediate interventions and treatment. The focus of 5-level acuity scales is on identification of unstable and high-risk patient situations and quick sorting of patients in the setting of constrained resources.

ESI triage is a summative clinical judgment that assists in the rapid sorting into five groups. The five groups reflect clinically meaningful differences in physiological and psychological stability based on the assessment of vital signs and projected resource needs. Use of the ESI for this rapid sorting can lead to improved flow of patients through the ED, with highest acuity patients being identified and treated first. Assessing the department's patient acuity burden based on ESI can inform staffing needs. While patient throughput and flow is outside the scope of ESI, some departments utilize it to safely assign patients to treatment areas outside the main department.

Nurses using the ESI have reported the tool facilitates communication of patient acuity more effectively than the former 3-level triage scales (Wuerz et al., 2001). For example, the triage nurse can tell the charge nurse, "I need a bed for a level-1 patient," and through this common language, the charge nurse understands that the patient is unstable without a detailed explanation of the patient's condition by the triage nurse. Understanding patient acuity in the ED waiting room may provide department and hospital stakeholders with the ability to make decisions regarding additional organizational resources to facilitate ED throughput.

Summary

ESI has been shown to be a uniquely effective triage tool. Evidence demonstrates its reliability and validity. Evidence also suggests the need for high quality education in its use in order to triage accurately. ESI provides benefits such as rapid identification of patients needing immediate treatment, improved patient flow, information concerning staffing needs, and improved communication.

References

Aeimchanbanjong, K., & Pandee, U. (2017). Validation of different pediatric triage systems in the emergency department. *World Journal of Emergency Medicine, 8*(3), 223–227. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5496831/

American College of Emergency Physicians. (2003, 2010, 2017). *Triage scale standardization* [Policy statement]. https://www.acep.org/globalassets/new-pdfs/policy-statements/triage.scale.standardization.pdf

Barthell, E. N., Coonan, K., Finnell, J., Pollock, D., & Cochrane, D. (2004). Disparate systems, disparate data: Integration, interfaces and standards in emergency medicine information technology. *Academic Emergency Medicine, 11*(11), 1142–1148. https://doi.org/10.1197/j.aem.2004.08.008

Baumann, M. R., & Strout, T. D. (2007). Triage of geriatric patients in the emergency department: Validity and survival with the Emergency Severity Index. *Annals of Emergency Medicine, 49*(2), 234–240. https://doi.org/10.1016/j.annemergmed.2006.04.011

Blomaard, L. C., Speksnijder, C., Lucke, J. A., Gelder, J., Anten, S., Schuit, S. C. E., Steyerberg, E. W., Gussekloo, J., Groot, B., & Mooijaart, S. P. (2020). Geriatric screening, triage urgency, and 30-day mortality in older emergency department patients. *Journal of the American Geriatrics Society*, *68*(8), 1755–1762. https://doi.org/10.1111/jgs.16427

Chmielewski, N., & Moretz, J. (2022). ESI triage distribution in U.S. emergency departments. *Advanced Emergency Nursing Journal, 44*(1), 46–53. https://doi.org/10.1097/TME.0000000000000390

Durani, Y., Brecher, D., Walmsley, D., Attia, M. W., & Loiselle, J. M. L. (2009). The Emergency Severity Index version 4: Reliability in pediatric patients. *Pediatric Emergency Care, 25*(11), 751–753. https://doi.org/10.1097/PEC.0b013e3181b0a0c6

Ebrahimi, M., Mirhaghi, A., Najafi, Z., Shafaee, H., & Hamechizfahm Roudi, M. (2020). Are pediatric triage systems reliable in the emergency department? *Emergency Medicine International*, Article ID 9825730. https://doi.org/10.1155/2020/9825730

Emergency Nurses Association. (2017). *Triage scale standardization* [Joint policy statement with ACEP]. https://enau.ena.org/Users/LearningActivity/LearningActivityDetail.aspx?LearningActivityID=mC38oXqUbT4%2b4Btw8c%2fM8g%3d%3d

Gilboy, N., Travers, D. A., & Wuerz, R. C. (1999). Re-evaluating triage in the new millennium: A comprehensive look at the need for standardization and quality. *Journal of Emergency Nursing, 25*(6), 468–473. https://doi.org/10.1016/s0099-1767(99)70007-3

Handler, J. A., Adams, J. G., Feied, C. F., Gillam, M., Vozenilekv J., Barthell, E., & Davidson, S. J. (2004). Emergency medicine information technology consensus conference: Executive summary. *Academic Emergency Medicine*, *11*(11), 1112–1113. https://doi.org/10.1197/j.aem.2004.08.005

Hinson, J. S., Martinez, D. A., Cabral, S., George, K., Whalen, M., Hansoti, B., & Levin, S. (2019). Triage performance in emergency medicine: A systematic review. *Annals of Emergency Medicine*, *74*(1), 140–152. https://doi.org/10.1016/j.annemergmed.2018.09.022

Jordi, K., Grossmann, F., Gaddis, G. M., Cignacco, E., Denhaerynck, K., Schwendimann, R., & Nickel, C. H. (2015). Nurses' accuracy and self-perceived ability using the emergency severity index triage tool: A cross-sectional study in four Swiss hospitals. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, *23*(1), Article 62. https://doi.org/10.1186/s13049-015-0142-y

McHugh, M., Tanabe, P., McClelland, M., & Khare, R. K. (2012). More patients are triaged using the Emergency Severity Index than any other triage acuity system in the United States. *Academic Emergency Medicine*, *19*(1), 106–109. https://doi.org/10.1111/j.1553-2712.2011.01240.x

Mistry, B., Balhara, K. S., Hinson, J. S., Anton, X., Othman, I. Y., E'nouz, M. A., Avila, N. A., Henry, S., Levin, S., & De Ramirez, S. S. (2018). Nursing perceptions of the emergency severity index as a triage tool in the United Arab Emirates: A qualitative analysis. *Journal of Emergency Nursing*, *44*(4), 360–367. https://doi.org/10.1016/j.jen.2017.10.012

Platts-Mills, T. F., Travers, D., Biese, K., McCall, B., Kizer, S., LaMantia, M., Busby-Whitehead, J., & Cairns, C. B. (2010). Accuracy of the Emergency Severity Triage instrument for identifying elder emergency department patients receiving an immediate life-saving intervention. *Academic Emergency Medicine*, *17*(3), 238–243. https://doi.org/10.1111/j.1553-2712.2010.00670.x

Takaoka, K., Ooya, K., Ono, M., & Kakeda, T. (2021). Utility of the emergency severity index by accuracy of Interrater agreement by expert triage nurses in a simulated scenario in Japan: A randomized controlled trial. *Journal of Emergency Nursing*, *47*(4), 669–674. https://doi.org/10.1016/j.jen.2021.03.009

Travers, D. A., Waller, A. E., Katznelson, J., & Agan, R. (2009). Reliability and validity of the Emergency Severity Index for pediatric triage. *Academic Emergency Medicine*, *16*(9), 843–849. https://doi.org/10.1111/j.1553-2712.2009.00494.x

U.S. Department of Health and Human Services. (2021, March 1). *Trends in the utilization of emergency department services, 2009–2018*. [Report to Congress]. https://www.aspe.hhs.gov/sites/default/files/migrated_legacy_files//199046/ED-report-to-Congress.pdf?_ga=2.183792290.549132656.1672499253-624883666.1672499253

Worth, M., Davis, L. L., Wallace, D. C., Bartlet, R., & Travers, D. (2019). Are emergency departments in the United States following recommendations by the Emergency Severity Index to promote quality triage and reliability? *Journal of Emergency Nursing*, *45*(6), 677–684. https://doi.org/10.1016/j.jen.2019.05.006

Wuerz, R., Milne, L. W., Eitel, D. R., Travers, D., & Gilboy, N. (2000). Reliability and validity of a new five-level triage instrument. *Academic Emergency Medicine*, *7*(3), 236–242. https://doi.org/10.1111/j.1553-2712.2000.tb01066.x

Wuerz, R., Travers, D., Gilboy, N., Eitel, D. R., Rosenau, A., & Yazhari, R. (2001). Implementation and refinement of the Emergency Severity Index. *Academic Emergency Medicine*, *8*(2), 170–176. https://doi.org/10.1111/j.1553-2712.2001.tb01283.x

CHAPTER 2

Overview of the ESI Algorithm

Algorithms are frequently used in emergency care. Emergency clinicians are familiar with algorithms to guide and prioritize care from courses such as Advanced Cardiovascular Life Support and Pediatric Advanced Life Support. These courses present a step-by-step approach to clinical decision-making that can be applied to practice. The ESI algorithm follows the same principles.

This chapter presents an overview of how to assign a triage acuity level using the ESI algorithm and concludes with some common errors in application of the algorithm. Subsequent chapters elaborate on each decision point, explaining key concepts and population-specific information in more detail. Numerous examples are included in each chapter to clarify the specific points of ESI.

Conceptual Overview

The algorithm consists of four decision points. The decision points must be performed in order, but higher acuity patients will only require one or two decision points to assign an acuity level. Figure 2-1 is a simple conceptual overview depicting the decision steps as A, B, C, and D, with corresponding questions and resulting ESI acuity levels of 1 to 5.

The ESI is intended for use by nurses with both emergency nursing and triage experience. The first decision the triage nurse makes is regarding stability. If a patient does not meet high risk instability 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).

Acuity judgements are initially based on assessment of physiological or psychological stability and the need for immediate lifesaving intervention. Decision point A is the only one needed for ESI level-1 patients, who are defined as in need of immediate lifesaving intervention. Decision point B is used to determine whether the patient is likely to deteriorate and/or require more immediate care based on symptom presentation and patient risk factors. These patients are assigned an ESI level of 2. Both of these decisions may require a full set of vital signs and a focused assessment prior to reaching such a determination.

Decision point C is used only after level 1 and 2 are excluded and patients are determined to be physiologically stable with low risk for deterioration. This step requires the anticipation of resources needed during a typical ED course for patients with similar presentations. Resources are listed in the full algorithm and further elaborated on in Chapter 5. ESI levels 3, 4, and 5 are based on how many resources the nurse anticipates will be used to reach a disposition decision.

Decision point D incorporates vital signs to identify more subtle high-risk presentations or an immediate need for lifesaving interventions and to reassess the acuity decision, potentially resulting in assignment of a higher acuity level as appropriate.

To summarize, there are four conceptual decision points used in the ESI algorithm to determine an acuity level:

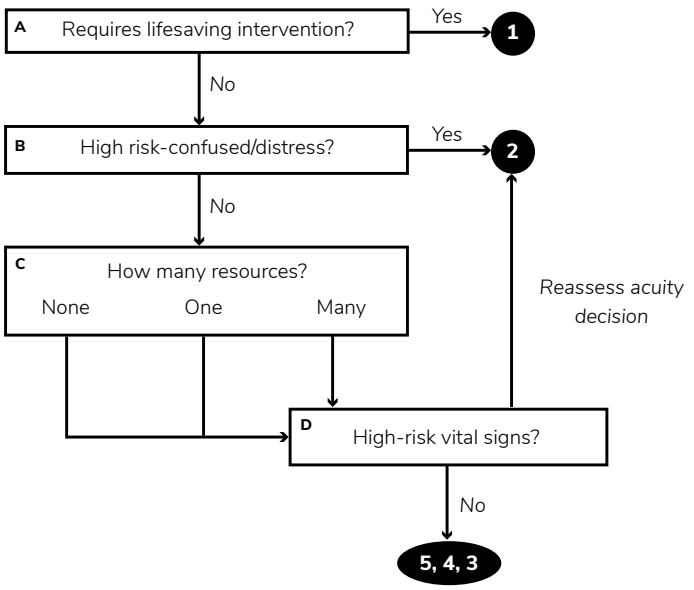
A. Is this patient unstable and in nseed of immediate lifesaving intervention?

B. Is this a high-risk situation?

C. How many resources will this patient need?

D. Do the patient's vital signs warrant a reassessment of the acuity level?

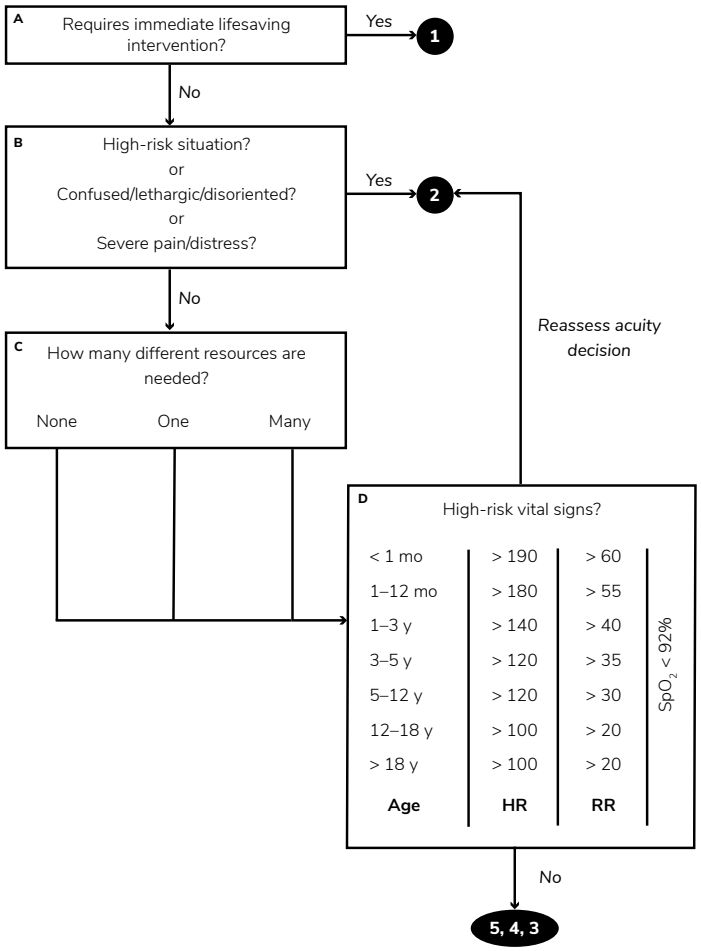
Figure 2-1. Emergency Severity Index Conceptual Algorithm



Detailed Algorithm

Figure 2-2 depicts the full algorithm with elaboration on the criteria for each decision point. (A similar representation is presented in Appendix B, "ESI Triage Algorithm, v5".) The algorithm assumes the user has sufficient clinical knowledge to identify physiologic instability, determine risk of deterioration, and anticipate resource needs. This knowledge is based on emergency care experience and familiarity with the course typical of patient ED presentations. Comprehensive educational programs can be used to partially fill this gap for inexperienced clinicians but does not replace knowledge gained through clinical experience.

Figure 2-2. ESI Triage Algorithm, Version 5



A. Immediate life-saving intervention required: Airway or respiratory support, emergency medications, hemodynamic interventions such as fluid resuscitation or blood products

Clinical presentations requiring lifesaving interventions include the following: intubated, unresponsive, pulselessness, apneic, severe respiratory distress, profound hypotension or hypoglycemia.

Unresponsiveness is defined as a patient who either:

1. Is nonverbal and not following commands (acutely)
OR
2. Requires noxious stimulus (P or U on AVPU scale)

B. High-risk situation: May become unstable, have high risk for deterioration, or exhibit newly altered mental status. Severe pain or distress is determined by patient report, corroborated with clinical observation.

C. Resources: Count the number of different types of resources, not the individual tests or radiographs.
(*For example, complete blood count, electrolytes, and coagulant studies equal one resource because they are all laboratory tests, while complete blood count plus chest radiograph equals two resources because one is a laboratory test and one is imaging*).

ESI Resources	Not ESI Resources
• Labs (blood, urine)	• History and physical exam (Including pelvic)
• Electrocardiogram, radiographs	• Point-of-care testing
• Computed tomography, magnetic resonance imaging, ultrasound, angiography	• Saline or heparin lock
• Intravenous fluids (hydration)	• Oral medications
• Intravenous, intramuscular, or nebulized medications	• Tetanus immunization
• Specialty consultation	• Prescription refills
• Simple procedure = 1 (laceration repair, urinary catheter)	• Phone call to primary care physician
• Complex procedure = 2 (procedural sedation)	• Simple wound care (dressings, recheck)
	• Crutches, splints, slings

D. High-risk vital signs: Reassess to determine whether the patient warrants a higher acuity level if a patient has one or more vital signs outside the normal parameters for the patient.

Pediatric Fever Considerations

1-28 days of age: Assign at least ESI 2 if T > 38° C (100.4 ° F)

1-3 months: Consider assigning ESI 2 if T > 38 ° C (100.4 ° F)

3 months and older: Consider assigning ESI 2 or 3 if:

1. T > 39°C (102.2°F) or < 36°C (96.8°F), or

2. Incomplete immunizations,
OR
3. No obvious source of fever

The Purpose of Acuity Levels

ESI is a triage acuity algorithm that is valid for evaluating patient acuity and resource needs as determined by a trained triage nurse *upon the patient's presentation to the emergency department*. The ESI tool was developed to categorize patients by acuity and direct stable patients to resources upon presentation. It is a process to differentiate between those who are at risk of decompensation and those who are more stable. The validity and reliability of the tool have been tested in the triage environment, and it was not developed to be a means of updating or communicating a change in patient condition after the provider has seen the patient.

Changing Triage Acuity

The initial ESI acuity level represents a summative clinical judgment on the patient's physiologic or psychological stability. Prior to a provider evaluation, a patient change in condition can be reflected in an amended ESI level. What is critical to this process is *documentation* of the change in condition, the *reason for the change* in ESI level, and the *resultant action* by the nurse.

A dangerous but not uncommon practice is for colleagues to question the assigned acuity level or pressure the triage nurse to downgrade the patient based on the environmental conditions (crowding, boarding, staffing) (Wolf et al., 2018). The ESI level assigned by the nurse should reflect the patient's current risk, not the environmental conditions of the ED. Nor should the ESI level be used to manipulate metrics such as door-to-ECG or door-to-CT times.

Bias and Stigma

The process of clinical decision-making is by its nature subjective, although there are objective ways to measure efficacy and accuracy. The correct application of the ESI algorithm relies on the emergency nurse to objectively assess each patient. Racial, age, and gender bias can impede accuracy in triage decision-making by causing nurses to ignore critical cues. Hinson et al. (2018), noted that high-risk presentations often went unrecognized across their general population, while López et al. (2010), Schrader and Lewis (2013), Puumala et al. (2016), and Zook et al. (2016), all noted undertriage in minority populations of all ages. Vigil et al. (2015) reported that Black patients in the Veterans Administration system were assigned less urgent ESI scores than white patients, and this effect was more pronounced for Black male patients than Black female patients. A similar outcome was found for Hispanic male patients. Grossmann et al. (2014) found significant undertriage in geriatric populations, and Arslanian-Engoren (2004) described inaccurate triage decisions made by emergency nurses about women presenting with chest pain.

Patients presenting to the ED who have a past or current history of behavioral health issues or substance use are particularly susceptible to the effects of bias and stigma (Helmke., 2021). Patients who are described as "difficult" are perceived similarly (Mamede et al., 2017). It is critically important for the nurse to self-reflect, identify implicit and explicit bias, and use that knowledge to mitigate barriers to accurate assessment in triage. Experience does not always translate to expertise: more-experienced nurses tend to undertriage and less experienced nurses to overtriage (Levis-Elmelech et al., 2022).

Summary

The Emergency Severity Index is meant for use by nurses with both emergency nursing and triage experience. When a patient presents to the ED, the nurse follows decision points A through D to objectively assess them and assign an appropriate ESI acuity level.

References

Arslanian-Engoren, C. (2004). Do emergency nurses' triage decisions predict differences in admission or discharge diagnoses for acute coronary syndromes? *Journal of Cardiovascular Nursing, 19*(4), 280–286. https://doi.org/10.1097/00005082-200407000-00008

Grossmann, F. F., Zumbrunn, T., Ciprian, S., Stephan, F. P., Woy, N., Bingisser, R., & Nickel, C. H. (2014). Undertriage in older emergency department patients — tilting against windmills? *PLOS ONE*, *9*(8), Article e106203. https://doi.org/10.1371/journal.pone.0106203

Helmke, N. (2021). Risk of cognitive bias associated with the treatment of urinary tract infection in patients with psychiatric disorders. *Journal of the Academy of Consultation-Liaison Psychiatry*, *62*(5), 555–556. https://doi.org/10.1016/j.jaclp.2021.03.004

Hinson, J. S., Martinez, D. A., Schmitz, P. S. K., Toerper, M., Radu, D., Scheulen, J., Stewart de Ramirez, S. A., & Levin, S. (2018). Accuracy of emergency department triage using the Emergency Severity Index and independent predictors of under-triage and over-triage in Brazil: a retrospective cohort analysis. *International Journal of Emergency Medicine*, *11*(1), 3. https://doi.org/10.1186/s12245-017-0161-8

Levis-Elmelech, T., Schwartz, D., & Bitan, Y. (2022). The effect of emergency department nurse experience on triage decision making. *Human Factors in Healthcare*, *2*, Article 100015. https://doi.org/10.1016/j.hfh.2022.100015

López, L., Wilper, A. P., Cervantes, M. C., Betancourt, J. R., & Green, A. R. (2010). Racial and sex differences in emergency department triage assessment and test ordering for chest pain, 1997–2006. *Academic Emergency Medicine*, *17*(8), 801–808. https://doi.org/10.1111/j.1553-2712.2010.00823.x

Mamede, S., Van Gog, T., Schuit, S. C., Van den Berge, K., Van Daele, P. L., Bueving, H., Van der Zee, T., Van den Broek, W. W., Van Saase, J. L., & Schmidt, H. G. (2017). Why patients' disruptive behaviours impair diagnostic reasoning: A randomised experiment. *BMJ Quality & Safety*, *26*(1), 13–18. https://doi.org/10.1136/bmjqs-2015-005065

Puumala, S. E., Burgess, K. M., Kharbanda, A. B., Zook, H. G., Castille, D. M., Pickner, W. J., & Payne, N. R. (2016). The role of bias by emergency department providers in care for American Indian children. *Medical Care*, *54*(6), 562–569. https://doi.org/10.1097/MLR.0000000000000533

Schrader, C. D., & Lewis, L. M. (2013). Racial disparity in emergency department triage. *The Journal of Emergency Medicine*, *44*(2), 511–518. https://doi.org/10.1016/j.jemermed.2012.05.010

Vigil, J. M., Alcock, J., Coulombe, P., McPherson, L., Parshall, M., Murata, A., & Brislen, H. (2015). Ethnic disparities in emergency severity index scores among U.S. Veteran's Affairs emergency department patients. *PLOS ONE*, *10*(5), Article e0126792. https://doi.org/10.1371/journal.pone.0126792

Wolf, L. A., Delao, A. M., Perhats, C., Moon, M. D., & Zavotsky, K. E. (2018). Triaging the emergency department, not the patient: United States emergency nurses' experience of the triage process. *Journal of Emergency Nursing*, *44*(3), 258–266. https://doi.org/10.1016/j.jen.2017.06.010

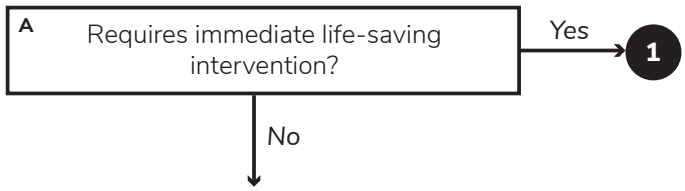
Zook, H. G., Kharbanda, A. B., Flood, A., Harmon, B., Puumala, S. E., & Payne, N. R. (2016). Racial differences in pediatric emergency department triage scores. *The Journal of Emergency Medicine*, *50*(5), 720–727. https://doi.org/10.1016/j.jemermed.2015.02.056

Decision Point A: Lifesaving Intervention Required?

CHAPTER 3

At decision point A of the ESI algorithm, the determination needs to be made whether the patient requires immediate lifesaving interventions (Figure 3-1). Signs of instability requiring immediate, lifesaving intervention include unresponsiveness, active seizure, occluded airway, ineffective gas exchange, and ineffective/decreased perfusion (Giri et al., 2022; Siquera Moura et al., 2022). When these signs are present, the patient is assigned an ESI level of 1.

Figure 3-1. Decision Point A: Is Lifesaving Intervention Required?



Examples of ESI Level-1 Criteria

Examples of ESI level-1 criteria include the following:

- Ineffective airway clearance
- Ineffective respiratory pattern
- Impaired gas exchange
- Ineffective tissue perfusion
- Obtunded/unresponsive patient
- SpO_2 < 90% that is not the patient's norm, with other signs of respiratory compromise
- Anaphylaxis
- Hypotension with signs of hypoperfusion (e.g., Chest pain with signs of hypoperfusion and systolic blood pressure of 80 mm Hg)
- Hypoglycemia
- Severe bradycardia or tachycardia
- Flaccid infant
- Cardiac and/or pulmonary arrest (or appears to be imminent)
- Penetrating trauma of head, neck, abdomen, chest requiring a lifesaving intervention

Level-1 Considerations

Level-1 considerations include method of arrival at the ED and the relationship between disposition and initial acuity level. In order to help explain the level-1 decision further, Table 3-1 provides a list of lifesaving interventions.

Table 3-1. Examples of Lifesaving Interventions

Intervention Type	Lifesaving Interventions
Airway/breathing	Assisted ventilation Intubation Surgical airway Emergent non-invasive positive pressure ventilation
Electrical Therapy	Defibrillation Emergent cardioversion External pacing
Procedures	Chest needle decompression Pericardiocentesis Open thoracotomy
Hemodynamics	Significant intravenous fluid resuscitation Blood administration Control of external hemorrhage
Medications	Adenosine Atropine Dextrose Dopamine Epinephrine (including IM for anaphylaxis) Naloxone

Note that diagnostics are **not** interventions. For example, a CT scan for a stroke or use of the catheterization lab for hemodynamically stable patients are diagnostics but not interventions.

THE PROBLEM OF GEOGRAPHY

An ESI level-1 patient is not always brought to the emergency department by ambulance but may be dropped at the front door. Infants and children, because they are "portable," may be brought to the ED by car and carried into the emergency department. The triage nurse should not consider the method of arrival as a barrier to assigning the appropriate ESI level.

DISPOSITION DOES NOT EQUAL INITIAL ACUITY

There are certain ESI level-1 patients who may be discharged from the ED if they have a reversible cause for the change in level of consciousness or vital functions, such as with hypoglycemia, alcohol intoxication, drug or other substance overdose, or anaphylaxis. The likelihood of discharge does not have an impact on assigning ESI 1.

Summary

The patient who meets criteria for an ESI level-1 designation shows signs of deterioration; intervention must be rapid and appropriate.

References

Giri, S., Watts, M., LeVine, S., & Tshering, U. (2022). Characteristics and outcomes of patients triaged as critically ill in the emergency department of a tertiary care hospital in Bhutan. *International Journal of Emergency Medicine*, *15*(1), Article 64. https://doi.org/10.1186/s12245-022-00468-8

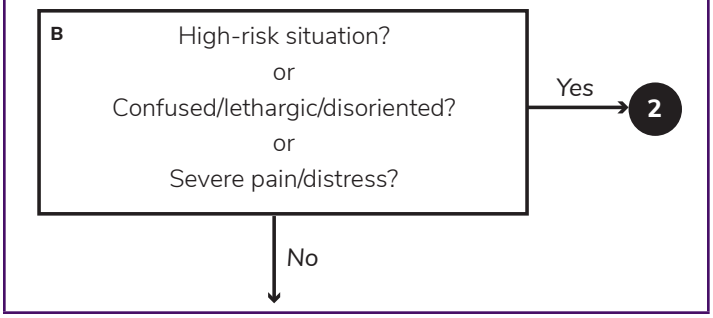
Siquera Moura, B. R., Oliveira, G. N., Medeiros, G., de Souza Vieira, A., & de Souza Nogueira, L. (2022). Rapid triage performed by nurses: Signs and symptoms associated with identifying critically ill patients in the emergency department. *International Journal of Nursing Practice*, *28*(1), Article e13001. https://doi.org/10.1111/ijn.13001

Decision Point B: High-Risk Presentation?

CHAPTER 4

If it is determined that the patient does not meet ESI level-1 criteria, the nurse moves to decision point B (Figure 4-1). At decision point B, the nurse assesses whether this patient is high-risk or likely to deteriorate. If the situation is high-risk or the patient is at elevated risk for physical or psychological deterioration, the patient is triaged as ESI level 2. Research findings suggest that nurse accuracy at decision point B is about 43% (Ivanov et al., 2021). Proper use of the ESI is especially useful for the older adult population. Studies demonstrate that individuals 65 years of age and older are at an increased risk of inaccurate triage acuity assignment, or under-triage, increasing their risk of adverse patient outcomes (Blomaard et al., 2020). It is crucial for the nurse to understand the criteria to prevent patients being under-triaged.

Figure 4-1. Decision Point B: High-Risk Presentation



The following questions are used to determine whether the patient meets the Level-2 high-risk criteria:

- Is the situation high-risk?
- Is the patient likely to deteriorate?
- Does the patient have an acute change in mental status?
- Is the patient in severe pain or distress (physiological or psychological)?

Is This a High-Risk Situation?

The patient who is high-risk can be identified through patient interview, assessment, and collection of confirmatory data. A high-risk patient is one whose condition could easily deteriorate or who presents with symptoms suggestive of a condition requiring time-sensitive treatment. This is a patient who has a potential threat to life, limb, sight, or organ. Vital sign assessment can be critically important to correctly identifying these high-risk patients. Specifically, abnormal respiratory rate and high pulse rate have been found to be independent predictors of adverse events or deterioration (Chaboyer et al., 2008). Similarly, there is a large body of research showing that other indicators such as heart rate, blood pressure, respiratory rate, oxygen saturation, level of consciousness, temperature, age, and cardiac complaints are also associated with, or predictors of, deterioration in patients (Considine et al., 2012, Goldhill & McNarry, 2004; Hillman et al., 2002).

Unrecognized or unmanaged abnormalities of these vital signs (i.e., Glasgow Coma Scale [GCS] score, blood pressure, heart rate, respiratory rate, and oxygen saturation) is significantly associated with higher mortality rates (Buist et al., 2004), highlighting the importance of monitoring a wide range of vital signs to identify deterioration in the patient's health status.

NOTE Geriatric Considerations. Geriatric patients may not produce immune or compensatory responses due to age or medications used to manage chronic conditions (Martin et al., 2010; Melady & Perry, 2018). Consider vital signs in the context of medications before assigning an ESI level. (For more information see the ENA course "Geriatric Emergency Nursing Education (GENE) Level I 2.0")

Examples of high-risk situations include the following:

- Active chest pain, suspicious for acute coronary syndrome but does not require an immediate lifesaving intervention.
- Signs of a stroke but does not meet level-1 criteria.
- A possible ectopic pregnancy, hemodynamically stable.
- A patient on chemotherapy, and therefore immunocompromised, with a fever.
- Transplant recipient presenting with a fever or other indication of infection.
- Actively suicidal or homicidal patient
- A needle stick in a health care worker (time sensitive to postexposure prophylaxis treatment)
- Sexual assault survivor
- Increasing respiratory effort
- Postpartum hemorrhage

Is the Patient Experiencing New Onset Confusion, Lethargy, or Disorientation?

At decision point B of the ESI algorithm, the presence of confusion, lethargy, or disorientation refers to a new onset or an altered mental status (AMS). In broad terms, AMS indicates a change in the level of consciousness and/or orientation from a patient's baseline mental status. However, other clinical signs, such as confusion, somnolence, agitation, or belligerence, are commonly referred to as AMS (Smith & Masterson, 2023). Approximately 5–10% of ED visits are for AMS (Smith & Han, 2019), with up to 40% of ED visits in the geriatric population (Smith & Han, 2019).

AMS is a high-risk complaint and may be caused by a variety of serious medical conditions including hypoxia, hypoglycemia, or hyponatremia, underperfusion due to occlusion or vascular collapse, increased intracranial pressure, or toxicological conditions. If the patient's history is unknown, and the patient presents as confused, lethargic, or disoriented, the nurse should assume this condition is new and assign an ESI level 2.

Is the Patient Experiencing Severe Pain or Distress?

Pain is the most common presenting symptom, with up to 78% of ED visits involving pain (Cordell et al., 2002) and 11.75% involving abdominal pain specifically (Hooker et al., 2019). 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. This is an often-misinterpreted criterion of ESI. Because pain may or may not be proportional to actual tissue damage (Schiavenato & Craig, 2010), not all patients with a pain score greater than 7 should be triaged as ESI level 2, and every patient who presents with severe pain should be thoroughly assessed.

If the pain is a result of an orthopedic injury, for example, assuming no neurovascular compromise, the nurse can implement comfort measures at triage including ice, elevation, and analgesics (if standing orders are in place) to reduce the pain. The nurse should accept the patient's pain rating is 10/10 and address the pain at triage. However, this patient can wait to be seen, and the resources needed to reach a disposition should be determined. Patients experiencing severe pain or distress as a result of a systemic disruption, for example, renal colic, cancer, or sickle cell crisis, should be triaged as ESI level 2, and placement should be facilitated as quickly as possible.

Distress

Psychological distress can be described as *emotional suffering*, a negative psychological reaction to threats to personal life goals and can affect up to 47% of ED patients who present for medical care (Faessler et al., 2016). In consideration of assigning an ESI level 2, the nurse must assess for severe distress, which can be physiological or psychological. Examples of patient behavior or experiences reflecting or resulting in severe psychological distress include the following:

- Distraught after experiencing a sexual assault
- Behavioral outbursts at triage
- Combativeness
- Survivor of sexual violence
- Survivor of domestic violence
- Acute grief reaction
- Suicidal ideation, plan, or attempt
- Prenatal loss

The following sections provides a nonexhaustive list of examples of other presenting symptoms and red flags that would warrant an ESI level-2 assignment.

Neurological Concerns

Almost 3% of all ED visits are for headaches, with about 31% of those patients requiring neuroimaging (American College of Emergency Physician's Clinical Policies Subcommittee (Writing Committee) on Acute Headache et al., 2019). Most concerning is the "thunderclap headache" (a severe, rapid-onset headache), which is often associated with subarachnoid hemorrhage (Edlow, 2018) and warrants immediate evaluation. Any headache accompanied by neck pain or nuchal rigidity falls into this category. Other presentations of concern that warrant an ESI 2 designation include headache plus fever, vomiting, lower back pain, altered mental status, and/or signs and symptoms of stroke, including gross deficits such as aphasia, apraxia, agnosia, or dysarthria (Zweifler, 2017).

Patients presenting post-ictal are triaged as ESI level 2 (altered mental status). Patients with a known seizure history who are alert and oriented after having a seizure prior to ED presentation can be triaged according to their physiological presentation and expected resource needs.

NOTE Pediatric Considerations. Neurological concerns include the following:

- Pediatric patients presenting as alert and appropriate after a febrile seizure can be triaged based on their physiological assessment and anticipated resource needs.
- A subtle change in a pediatric patient's mental status can be suggestive of a change in hemodynamics and should be immediately investigated as high risk.

Ocular Concerns

Ocular emergencies represent a small but significant number of cases presenting to the ED. They include pathologies that involve sudden threats to the visual system that left untreated can lead to permanent visual loss or severe threats to visual function (Khare et al., 2008). U.S. Bureau of Labor Statistics data shows that approximately 16,000 U.S. workers in private industry sustained work-related eye injuries in 2020, about a third of which were treated in EDs. The Alphabetic Triage score for Ophthalmology (ATSO) score (D'Oria et al., 2020) may be useful in stratifying risk; the elements of the score that predict urgency include the presence of altered vision; sudden diplopia, anisocoria, or exophthalmos; red eye; distress/pain (specifically intolerable pain); eye trauma; and "floaters and flashers," with more symptoms in constellation predicting a more emergent problem and serve as a good guideline for the triage nurse.

Other common ophthalmic concerns, especially in pediatric patients, can include red eyes, traumatic injury, eye pain with headache, and visual loss (Henríquez-Recine et al., 2020; Noval et al., 2020). The most frequent diagnoses in the pediatric population are conjunctivitis, corneal erosion, and allergic conjunctivitis (Henríquez-Recine et al., 2020; Noval et al., 2020); few of these merit an ESI level-2 designation.

Ear, Nose, and Throat Concerns

Airway emergencies may affect adults and children, upper (croup, epiglottitis, neck abscess, bleeding tonsil) and lower (foreign body aspiration, lower bleeding) airways, as well as natural and artificially created airways (e.g., tracheostomy) (Klein, 2019; Sokolovs & Tan, 2020). Patients who are unable to manage their own secretions and/or exhibit respiratory stridor are extremely high-risk patients and should be assigned an ESI level of 2. Airway emergencies are *clinical* diagnoses and care should be initiated rapidly.

Several etiologies of epistaxis represent high-risk situations. Examples include brisk bleeding secondary to posterior nosebleed or when experienced by a patient with known thrombocytopenia, clotting dyscrasias, and use of warfarin or other anti-coagulants (Krulewitz & Fix, 2019; Hamlett et al., 2021). In these situations, patients are assigned an ESI level of 2.

NOTE Pediatric Considerations. Esophageal button battery ingestion has a high risk of complication, especially in children less than 6 years of age and involving batteries greater than 20 mm in diameter (Mubarak et al., 2021). This presentation is extremely time sensitive.

Respiratory Concerns

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. Signs of distress can include tachypnea, tachycardia, tripoding, speaking in short, 2-to-3-word sentences; audible stridor; wheezing; or congestion. Patients with mild to moderate distress should be further evaluated for respiratory rate and pulse oximetry to determine whether they should be categorized as ESI level 2. Patients in severe respiratory distress who require immediate lifesaving intervention, such as intubation, meet level-1 criteria.

NOTE Pediatric Considerations. Grunting, belly breathing, and retractions suggest respiratory distress. In the pediatric patient, the arc of decline can be precipitous.

Cardiovascular

Cardiovascular complaints may include presentations such as chest pain, difficulty breathing, hypoperfusion, weakness, dizziness, and bleeding. Undertriage of these patients can result in poor patient outcomes (Tsai et al., 2016). Chest pain specifically accounts for 5–10% of US emergency department visits (Sakamoto et al., 2016), yet the presentation of acute coronary syndromes (ACS) is not always symptom specific, and it is sometimes difficult to determine the risk of ACS during the triage assessment. Patients with cardiac events may present with fatigue, nausea, vomiting, and/or weakness, rather than the more "classic" chest pain. There are gender and sex differences in assessment and identification (Gao et al., 2019) that the triage nurse should be aware of, paying close attention to female patients.

Patients with chest pain who are physiologically unstable and require immediate interventions such as intubation or hemodynamic support should be triaged as ESI level 1.

An ECG within 10 minutes for patients with concerns of chest pain may also be helpful in determining acuity. If the ECG is abnormal, patients would be assigned level 2.

NOTE A recent Covid-19 infection increases cardiac risk (Boukhris et al., 2020) regardless of age, sex, or menopausal status.

Abdominal and Gastrointestinal Concerns

Abdominal pain is a common presentation to the ED (Kamin et al., 2003) and presents a triage challenge—causes of abdominal pain can be emergent or benign (Medford-Davis et al., 2016). A major cause of diagnostic errors involving abdominal pain is associated with inadequate history-taking, so a good history and assessment of current pain rating, location, onset, accompanying symptoms and current vital signs are important elements in determining the presence or absence of a high-risk situation. Abdominal pain can be caused by a vascular, genitourinary, infectious, or cardiac issue, rather than have a gastrointestinal etiology.

The literature suggests that up to 31% of patients presenting with abdominal pain are undertriaged, with patients over the age of 80 undertriaged the most (52.1%) (Oh & Kim, 2021). The most frequently missed diagnoses include acute gallbladder pathology, urinary system infections, diverticulitis, small bowel obstruction, appendicitis, cancer, and ectopic pregnancy. Older patients are more likely to experience bowel obstructions, gastrointestinal bleeds, mesenteric ischemia, and other abdominal complications associated with significantly higher morbidity and mortality than other patients. In addition, pregnancy-capable patients who present with abdominal pain may be having pregnancy complications or be in labor.

Several important assessment questions can help the triage nurse determine whether or not the patient meets high-risk criteria. Such questions include the following:

- Is the patient pregnant or postpartum?
- Does the patient show signs of sepsis?
- Does the patient show signs of hypoperfusion?
- Was there blunt or penetrating trauma to the abdomen?
- Is the patient's pain refractory to analgesia, constant, and /or maximal on onset?

Differentiation between ESI 2 and ESI 3 in the context of abdominal pain may depend on vital signs, patient age, and previous history.

- **Pediatric considerations:** In younger children, pneumonia can present as abdominal pain. Button battery or earth magnet ingestion are time sensitive presentations, with high morbidity (Mubarak et al., 2021).
- **Geriatric considerations:** Elderly patients with abdominal pain are likely to need hospitalization (Lee & Kim, 2019).
- **Obstetric/gynecological concerns:** Abdominal pain with vaginal bleeding can suggest ectopic pregnancy or other emergent pregnancy complications.

Obstetrical and Gynecological Concerns

Pregnancy or postpartum status are important data elements that can influence understanding of patient risk; patients may or may not disclose this information. The maternal death rate in the United States is approximately 23.8 per 100,000 live births, (55.3 per 100,000 deaths in Black women) (Hoyert, 2022), with an increase during the COVID-19 pandemic to 25.5 maternal deaths/100,000 live births (Thoma & Declercq, 2022). Assessing for current or recent COVID-19 infection is important to assessing risk.

Critical determinants of acuity include blood pressure; bleeding; and abdominal, head, or chest pain. The pregnant or postpartum patient with a SBP of < 90 or > 150 should be designated an ESI 2 even in the absence of other symptoms (Hauspurg & Jeyabalan, 2022; Prejbisz et al., 2019). Approximately 60% of patients with new, delayed-onset postpartum preeclampsia have no antecedent diagnosis of a hypertensive disorder of pregnancy (Al-Safi et al, 2011). Pregnant patients with chest pain and/or shortness of breath, abdominal pain, or headache (Sperling et al., 2015) should be triaged as ESI 2 and rapidly assessed by ED and/or OB providers.

Pregnant patients who present with heavy vaginal bleeding and abnormal vitals with suspicion of infection should be categorized at ESI level 2. (Heavy vaginal bleeding generally means soaking through a pad an hour, plum-sized clots, bright red bleeding that does not slow down, or bleeding that has increased after a decrease.)

Postpartum patients presenting with heavy vaginal bleeding should also be assigned ESI level 2 and seen by a provider immediately (Borovac-Pinheiro et al., 2018). Any pregnancy-capable patient, whether pregnant or postpartum, who presents with significant hemodynamic instability and who needs immediate lifesaving interventions should be triaged as ESI level 1.

Genitourinary

Pain in the male or female genitourinary tract should be investigated with respect to history, onset, pain level, and discharge. Testicular or scrotal pain should be immediately evaluated for testicular torsion (Laher et al., 2020), a time-sensitive clinical situation capable of producing permanent organ loss. Similarly, unilateral lower quadrant pain in patients with ovaries should be evaluated for ovarian torsion and ectopic pregnancy (Bridwell et al., 2022; Rey-Bellet Gasser et al., 2016).

Males with testicular torsion may complain of severe pain, are easily recognized, and require rapid evaluation and surgical intervention in addition to rapid pain control. The patient with symptoms of a UTI who is elderly (Liang, 2017) or who also complains of back pain, chills, and rigors may have urosepsis and should also be assigned to ESI 2. Patients presenting with severe flank pain receive a level-2 designation (Gelber & Singh, 2021).

Trauma

Injury results from mechanical or kinetic energy transfer and is caused by acceleration forces, deceleration forces, or both. Victims of motor vehicle and motorcycle crashes, falls, and gunshot and stab wounds are examples of blunt and penetrating trauma, which should be assessed carefully for the potential for serious injury. Especially at nontrauma centers, it is critical to rapidly identify patients who may need higher levels of care (Wolf, 2009). In many emergency departments, trauma patients can arrive by private vehicle, so a careful assessment of both injuries and mechanism is warranted to correctly identify the high-risk patient.

Mechanisms of injury that warrant an ESI 2 designation include falls of 20 feet (6 meters) or more, ejection from a vehicle, or removal from a vehicle with mechanical extrication tools, and sexual assault. Injuries that warrant an ESI level of 2 may include penetrating trauma of the head, neck, chest, and abdomen without signs of hemodynamic instability.

Specifically, advanced age is a known risk factor for poor outcomes among trauma patients, and the severity of injury in older adults often exceeds what would normally be expected from the mechanism (Jacobs et al., 2003). Occult hypoperfusion with normal vital signs is associated with age greater than 55, and so a careful assessment should be made in the older patient (Hatton et al., 2020).

Patients with high-risk orthopedic injuries include those presenting with any extremity injury with compromised neurovascular function, symptoms of compartment syndrome, or partial or complete amputations. Patients with possible fractures of the pelvis, femur, or dislocations should be carefully evaluated and vital signs considered. These injuries can be associated with significant blood loss and neurovascular compromise.

Ingestions

Toxic ingestion is a high-risk presentation which needs to be rapidly evaluated. The drug or substance that was taken and the amount may be unknown. Patients who present with alterations in mental status, difficulty breathing, changes in breathing pattern, or changes in heart rate and/or rhythm without an obvious cause should be evaluated as a possible toxic ingestion (Chandran & Krishna, 2019).

Transplant

Transplant recipient patients have a high ED utilization rate even after transplant surgery (Lovasik et al., 2018; Unterman et al., 2009). Solid organ transplant recipients often present with fever and infectious processes and have a high hospitalization rate (McElroy et al., 2015; Unterman et al., 2009). Patients presenting with a fever or other indication of infection or rejection should be designated ESI level 2 due to their immunocompromised status. Patients who are on a transplant list are also usually considered high-risk.

Mental and Behavioral Health

Emergency department visits for mental/behavioral health concerns in the U.S. comprise more than 12% of all visits (Moore et al., 2017). Patients who present with specific mental health concerns are at high risk if they are a danger either to themselves, others, or the environment. A focused assessment of the patient's potential for self- or other-directed harm is critical to establishing an ESI designation. Patients who are suicidal, homicidal, psychotic, or violent should be assigned an ESI level of 2 (Sands et al., 2014).

Summary

ESI level-2 patients remain a high priority, and placement and treatment should be initiated rapidly. ESI level-2 patients have the potential to be very ill and at high risk for decompensation. Usually, rather than move to the next patient, the triage nurse determines that the charge nurse or staff in the patient care area should be immediately alerted that they have an ESI level-2 patient.

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 they triage each patient. Missing a high-risk situation may result in an extended waiting period, increasing the chance of morbidity and mortality.

References

Al-Safi, Z., Imudia, A. N., Filetti, L. C., Hobson, D. T., Bahado-Singh, R. O., & Awonuga, A. O. (2011). Delayed postpartum preeclampsia and eclampsia: Demographics, clinical course, and complications. *Obstetrics & Gynecology*, *118*(5), 1102–1107. https://doi.org/10.1097/aog.0b013e318231934c

American College of Emergency Physician's Clinical Policies Subcommittee (Writing Committee) on Acute Headache, Godwin, S. A., Cherkas, D. S., Panagos, P. D., Shih, R. D., Byyny, R., & Wolf, S. J. (2019). Clinical policy: Critical issues in the evaluation and management of adult patients presenting to the emergency department with acute headache. *Annals of Emergency Medicine*, *74*(4), e41–e74. https://doi.org/10.1016/j.annemergmed.2019.07.009

Blomaard, L. C., Speksnijder, C., Lucke, J. A., de Gelder, J., Anten, S., Schuit, S. C. E., Steyerberg, E. W., Gussekloo, J., de Groot, B., & Mooijaart, S. P. (2020). Geriatric screening, triage urgency, and 30-day mortality in older emergency department patients. *Journal of the American Geriatrics Society*, *68*(8), 1755–1762. https://doi.org/10.1111/jgs.16427

Borovac-Pinheiro, A., Pacagnella, R. C., Cecatti, J. G., Miller, S., El Ayadi, A. M., Souza, J. P., Durocher, J., Blumenthal, P. D., & Winikoff, B. (2018). Postpartum hemorrhage: New insights for definition and diagnosis. *American Journal of Obstetrics and Gynecology*, *219*(2), 162–168. https://doi.org/10.1016/j.ajog.2018.04.013

Boukhris, M., Hillani, A., Moroni, F., Annabi, M. S., Addad, F., Ribeiro, M. H., Mansour, S., Zhao, X., Ybarra, L. F., Abbate, A., Vilca, L. M., & Azzalini, L. (2020). Cardiovascular implications of the COVID-19 pandemic: A global perspective. *The Canadian Journal of Cardiology*, *36*(7), 1068–1080. https://doi.org/10.1016/j.cjca.2020.05.018

Bridwell, R. E., Koyfman, A., & Long, B. (2022). High risk and low prevalence diseases: Ovarian torsion. *The American Journal of Emergency Medicine*, *6*, 145–150. https://doi.org/10.1016/j.ajem.2022.03.046

Buist, M., Bernard, S., Nguyen, T. V., Moore, G., & Anderson, J. (2004). Association between clinically abnormal observations and subsequent in-hospital mortality: a prospective study. *Resuscitation*, *62*(2), 137–141. https://doi.org/10.1016/j.resuscitation.2004.03.005

Chaboyer, W., Thalib, L., Foster, M., Ball, C., & Richards, B. (2008). Predictors of adverse events in patients after discharge from the intensive care unit. *American Journal of Critical Care*, *17*(3), 255–263. https://doi.org/10.4037/ajcc2008.17.3.255

Chandran, J., & Krishna, B. (2019). Initial management of poisoned patient. *Indian Journal of Critical Care Medicine, 23*(Suppl 4), S234–S240. https://doi.org/10.5005/jp-journals-10071-23307

Considine, J., Lucas, E., & Wunderlich, B. (2012). The uptake of an early warning system in an Australian emergency department: a pilot study. *Critical Care and Resuscitation*, *14*(2), 135–141.

Cordell, W. H., Keene, K. K., Giles, B. K., Jones, J. B., Jones, J. H., & Brizendine, E. J. (2002). The high prevalence of pain in emergency medical care. *The American Journal of Emergency Medicine*, *20*(3), 165–169. https://doi.org/10.1053/ajem.2002.32643

D'Oria, F., Bordinone, M. A., Rizzo, T., Puzo, P., Favale, R. A., Guerriero, S., & Alessio, G. (2020). Validation of a new system for triage of ophthalmic emergencies: the alphabetical triage score for ophthalmology (ATSO). *International Ophthalmology*, *40*(9), 2291–2296. https://doi.org/10.1007/s10792-020-01413-5

Edlow J. A. (2018). Managing patients with nontraumatic, severe, rapid onset headache. *Annals of Emergency Medicine*, *71*(3), 400–408. https://doi.org/10.1016/j.annemergmed.2017.04.044

Faessler, L., Perrig-Chiello, P., Mueller, B., & Schuetz, P. (2016). Psychological distress in medical patients seeking ED care for somatic reasons: results of a systematic literature review. *Emergency Medicine Journal*, *33*(8), 581–587. https://doi.org/10.1136/emermed-2014-204426

Gao, Z., Chen, Z., Sun, A., & Deng, X. (2019). Gender differences in cardiovascular disease. *Medicine in Novel Technology and Devices*, *4*, Article 100025. https://doi.org/10.1016/j.medntd.2019.100025

Gelber, J., & Singh, A. (2021). Management of acute urinary retention in the emergency department. *Emergency Medicine Practice*, *23*(3), 1–28. https://www.ebmedicine.net/topics/genitourinary/urinary-retention

Goldhill, D. R., & McNarry, A. F. (2004). Physiological abnormalities in early warning scores are related to mortality in adult inpatients. *British Journal of Anaesthesia*, *92*(6), 882–884. https://doi.org/10.1093/bja/aeh113

Hamlett, K. E. L., Yaneza, M. M. C., & Grimmond, N. (2021). Epistaxis. *Surgery*, *39*(9), 577–590. https://doi.org/10.1016/j.mpsur.2021.08.002

Hatton, G. E., McNutt, M. K., Cotton, B. A., Hudson, J. A., Wade, C. E., & Kao, L. S. (2020). Age-dependent association of occult hypoperfusion and outcomes in trauma. *Journal of the American College of Surgeons*, *230*(4), 417–425. https://doi.org/10.1016/j.jamcollsurg.2019.12.011

Hauspurg, A., & Jeyabalan, A. (2022). Postpartum preeclampsia or eclampsia: defining its place and management among the hypertensive disorders of pregnancy. *American Journal of Obstetrics and Gynecology*, *226*(2 Suppl.), S1211–S1221. https://doi.org/10.1016/j.ajog.2020.10.027

Henríquez-Recine, M. A., Noval, S., Zafra, B., De Manuel, S., & Contreras, I. (2020). Ocular emergencies in children: Demographics, origin, symptoms, and most frequent diagnoses. *Journal of Ophthalmology*, Article 6820454. https://doi.org/10.1155/2020/6820454

Hillman, K. M., Bristow, P. J., Chey, T., Daffurn, K., Jacques, T., Norman, S. L., Bishop, G. F., & Simmons, G. (2002). Duration of life-threatening antecedents prior to intensive care admission. *Intensive Care Medicine*, *28*(11), 1629–1634. https://doi.org/10.1007/s00134-002-1496-y

Hooker, E. A., Mallow, P. J., & Oglesby, M. M. (2019). Characteristics and trends of emergency department visits in the United States (2010–2014). *The Journal of Emergency Medicine*, *56*(3), 344–351. https://doi.org/10.1016/j.jemermed.2018.12.025

Hoyert, D. L. (2022). *Maternal mortality rates in the United States, 2020.* https://doi.org/10.15620/cdc:113967

Ivanov, O., Wolf, L., Brecher, D., Lewis, E., Masek, K., Montgomery, K., Andrieiev, Y., McLaughlin, M., Liu, S., Dunne, R., Klauer, K., & Reilly, C. (2021). Improving ED Emergency Severity Index acuity assignment using machine learning and clinical natural language processing. *Journal of Emergency Nursing*, *47*(2), 265–278.e7. https://doi.org/10.1016/j.jen.2020.11.001

Jacobs, D. G., Plaisier, B. R., Barie, P. S., Hammond, J. S., Holevar, M. R., Sinclair, K. E., Scalea, T. M., Wahl, W., & EAST Practice Management Guidelines Work Group (2003). Practice management guidelines for geriatric trauma: The EAST Practice Management Guidelines Work Group. *The Journal of Trauma*, *54*(2), 391–416. https://doi.org/10.1097/01.TA.0000042015.54022.BE

Kamin, R. A., Nowicki, T. A., Courtney, D. S., & Powers, R. D. (2003). Pearls and pitfalls in the emergency department evaluation of abdominal pain. *Emergency Medicine Clinics*, *21*(1), 61–72. https://doi.org/10.1016/s0733-8627(02)00080-9

Khare, G. D., Symons, R. C., & Do, D. V. (2008). Common ophthalmic emergencies. *International Journal of Clinical Practice*, *62*(11), 1776–1784. https://doi.org/10.1111/j.1742-1241.2008.01855.x

Klein, M. R. (2019). Infections of the oropharynx. *Emergency Medicine Clinics of North America*, *37*(1), 69–80. https://doi.org/10.1016/j.emc.2018.09.002

Krulewitz, N. A., & Fix, M. L. (2019). Epistaxis. *Emergency Medicine Clinics of North America*, *37*(1), 29–39. https://doi.org/10.1016/j.emc.2018.09.005

Laher, A., Ragavan, S., Mehta, P., & Adam, A. (2020). Testicular torsion in the emergency room: A review of detection and management strategies. *Open Access Emergency Medicine*, *12*, 237–246. https://doi.org/10.2147/oaem.s236767

Lee, H. K., & Kim, J. I. (2019). Analysis of nursing records for elderly patients with abdominal pain in the emergency medical center. *Journal of Muscle and Joint Health*, *26*(1), 27–34. https://doi.org/10.5953/JMJH.2019.26.1.27

Liang, S. Y. (2016). Sepsis and other infectious disease emergencies in the elderly. *Emergency Medicine Clinics*, *34*(3), 501–522. https://doi.org/10.1016/j.emc.2016.04.005

Lovasik, B. P., Zhang, R., Hockenberry, J. M., Schrager, J. D., Pastan, S. O., Adams, A. B., Mohan, S., Larsen, C. P., & Patzer, R. E. (2018). Emergency department use among kidney transplant recipients in the United States. *American Journal of Transplantation*, *18*(4), 868–880. https://doi.org/10.1111/ajt.14578

Martin, J. T., Alkhoury, F., O'Connor, J. A., Kyriakides, T. C., & Bonadies, J. A. (2010). "Normal" vital signs belie occult hypoperfusion in geriatric trauma patients. *The American Surgeon*, *76*(1), 65–69. https://doi.org/10.1177/000313481007600113

Melady, D., & Perry, A. (2018). Ten best practices for the older patient in the emergency department. *Clinics in Geriatric Medicine*, *34*(3), 313–326. https://doi.org/10.1016/j.cger.2018.04.001

McElroy, L. M., Schmidt, K. A., Richards, C. T., Lapin, B., Abecassis, M. M., Holl, J. L., Adams, J., & Ladner, D. P. (2015). Early postoperative emergency department care of abdominal transplant recipients. *Transplantation*, *99*(8), 1652–1657. https://doi.org/10.1097/tp.0000000000000781

Medford-Davis, L., Park, E., Shlamovitz, G., Suliburk, J., Meyer, A. N., & Singh, H. (2016). Diagnostic errors related to acute abdominal pain in the emergency department. *Emergency Medicine Journal*, *33*(4), 253–259. https://doi.org/10.1136/emermed-2015-204754

Moore, B. J., Stocks, C., Owens, P. L. (2017). *Trends in emergency department visits, 2006–2014* (HCUP Statistical Brief #22). Agency for Healthcare Research and Quality. https://www.hcup-us.ahrq.gov/reports/statbriefs/sb227-Emergency-Department-Visit-Trends.pdf

Mubarak, A., Benninga, M. A., Broekaert, I., Dolinsek, J., Homan, M., Mas, E., Miele, E., Pienar, C., Thapar, N., Thomson, M., Tzivinikos, C., & de Ridder, L. (2021). Diagnosis, management, and prevention of button battery ingestion in childhood: A European Society for Paediatric Gastroenterology Hepatology and Nutrition position paper. *Journal of Pediatric Gastroenterology and Nutrition*, *73*(1), 129–136. https://doi.org/10.1097/MPG.0000000000003048

Noval, S., Zafra, B., De Manuel, S., & Contreras, I. (2020). Ocular emergencies in children: Demographics, origin, symptoms, and most frequent diagnoses. *Journal of Ophthalmology*, Article 6820454. https://doi.org/10.1155/2020/6820454

Oh, B. Y., & Kim, K. (2021). Factors associated with the undertriage of patients with abdominal pain in an emergency room. *International Emergency Nursing*, *54*, Article 100933. https://doi.org/10.1016/j.ienj.2020.100933

Prejbisz, A., Dobrowolski, P., Kosiński, P., Bomba-Opoń, D., Adamczak, M., Bekiesińska-Figatowska, M., Kądziela, J., Konopka, A., Kostka-Jeziorny, K., Kurnatowska, I., Leszczyńska-Gorzelak, B., Litwin, M., Olszanecka, A., Orczykowski, M., Poniedziałek-Czajkowska, E., Sobieszczańska-Małek, M., Stolarz-Skrzypek, K., Szczepaniak-Chicheł, L., Szyndler, A., Wolf, J., ... Januszewicz, A. *Arterial Hypertension*, *23*(3), 117–182. https://doi.org/10.5603/AH.a2019.0011

Rey-Bellet Gasser, C., Gehri, M., Joseph, J. M., & Pauchard, J. Y. (2016). Is it ovarian torsion? A systematic literature review and evaluation of prediction signs. *Pediatric Emergency Care*, *32*(4), 256–261. https://doi.org/10.1097/PEC.0000000000000621

Sakamoto, J. T., Liu, N., Koh, Z. X., Fung, N. X., Heldeweg, M. L., Ng, J. C., & Ong, M. E. (2016). Comparing HEART, TIMI, and GRACE scores for prediction of 30-day major adverse cardiac events in high acuity chest pain patients in the emergency department. *International Journal of Cardiology*, *221*, 759–764. https://doi.org/10.1016/j.ijcard.2016.07.147

Sands, N., Elsom, S., Berk, M., Hosking, J., Prematunga, R., & Gerdtz, M. (2014). Investigating the predictive validity of an emergency department mental health triage tool. *Nursing & Health Sciences*, *16*(1), 11–18. https://doi.org/10.1111/nhs.12095

Schiavenato, M., & Craig, K. D. (2010). Pain assessment as a social transaction: Beyond the "gold standard." *The Clinical Journal of Pain*, *26*(8), 667–676. https://doi.org/10.1097/ajp.0b013e3181e72507

Smith, A., & Han, J. (2019). Altered mental status in the emergency department. *Seminars in Neurology*, *39*(1), 5–19. https://doi.org/10.1055/s-0038-1677035

Smith, A., & Masterson, M. (2023). The approach to altered mental status. *Physician Assistant Clinics*, *8*(1), 139-150. https://doi.org/10.1016/j.cpha.2022.08.009

Sokolovs, D., & Tan, K. W. (2020). Ear, nose and throat emergencies. *Anaesthesia & Intensive Care Medicine*, *21*(4), 200–204. https://doi.org/10.1016/j.mpaic.2020.01.010

Sperling, J. D., Dahlke, J. D., Huber, W. J., & Sibai, B. M. (2015). The role of headache in the classification and management of hypertensive disorders in pregnancy. *Obstetrics and Gynecology*, *126*(2), 297–302. https://doi.org/10.1097/AOG.0000000000000966

Thoma, M. E., & Declercq, E. R. (2022). All-cause maternal mortality in the U.S. before, versus, and during the COVID-19 pandemic. *JAMA Network Open*, *5*(6), Article e2219133. https://doi.org/10.1001/jamanetworkopen.2022.19133

Tsai, I. T., Sun, C. K., Chang, C. S., Lee, K. H., Liang, C. Y., & Hsu, C. W. (2016). Characteristics and outcomes of patients with emergency department revisits within 72 hours and subsequent admission to the intensive care unit. *Tzu Chi Medical Journal*, *28*(4), 151–156. https://doi.org/10.1016/j.tcmj.2016.07.002

Unterman, S., Zimmerman, M., Tyo, C., Sterk, E., Gehm, L., Edison, M., Benedetti, E., & Orsay, E. (2009). A descriptive analysis of 1251 solid organ transplant visits to the emergency department. *The Western Journal of Emergency Medicine*, *10*(1), 48–54. https://escholarship.org/uc/item/0fc16496

U.S. Bureau of Labor Statistics. (2020). *Injuries, illnesses, and fatalities*. https://www.bls.gov/iif/nonfatal-injuries-and-illnesses-tables.htm

Wolf, L. (2009). When trauma walks into triage. *Journal of Emergency Nursing*, *35*(4), 389–391. https://doi.org/10.1016/j.jen.2009.03.006

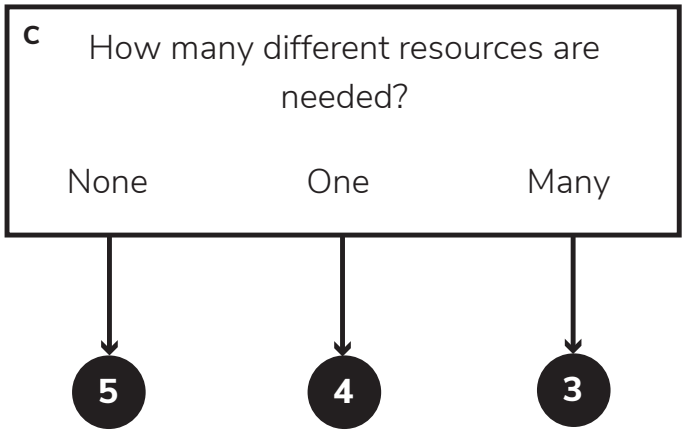
Zweifler, R. M. (2017). Initial assessment and triage of the stroke patient. *Progress in Cardiovascular Diseases*, *59*(6), 527–533. https://doi.org/10.1016/j.pcad.2017.04.004

Decision Point C: How Many Resources?

CHAPTER 5

Once an ESI 1 or 2 designation has been ruled out, the presumed stability of the patient enables the nurse to move to the next decision point (Figure 5-1). Patients who require two or more resources are assigned level 3, those who require one resource are assigned level 4, and those who require no resources are assigned level 5. The ESI triage acuity tool uses an approach that includes the nurse's judgement about who should be seen first (ESI level 1 and 2) as well as resource prediction for less acute patients (ESI levels 3–5). Resource prediction requires the nurse to determine how many resources are likely to be used in order for the provider to reach a disposition decision, which could include discharge home, admission to an observation unit, transfer to another institution or others (Tanabe et al., 2004). To determine resource needs the nurse must have familiarity with general ED standards of care. This decision point may also require the nurse to draw from past experiences in caring for similar patients. Resource determination is independent of type of hospital (teaching versus nonteaching) and location of the hospital (urban versus rural). A patient presenting for care should require the same general resources in one ED as in any other ED.

Figure 5-1 Resource Prediction



Common Questions

There are some common questions about what is considered an ESI resource. One question often asked concerns the number of blood or urine tests and radiographs that constitute a resource. In the ESI triage method, the ED nurse should count the number of different types of resources needed to determine the patient's disposition, not the number of individual tests. Illustrative examples follow:

- A complete blood count and electrolyte panel comprise one resource (lab test).
- A complete blood count and chest radiograph are two resources (lab test, radiograph).
- A complete blood count and a urinalysis are both lab tests and together count as only one resource.
- A chest radiograph and abdominal radiograph are one resource (radiograph).
- Cervical-spine films and a computed tomography scan of the head are two resources (radiograph and computed tomography scan).

Table 5-1 provides further examples of what constitutes a resource and what does not. In order to understand what counts as a resource, it is important to realize that resources are defined by presentational acuity. The purpose of resource prediction in ESI is to sort patients into distinct groups and help get the right patient to the right area of the ED.

Summary

ESI is an approach to ED triage that includes prediction of the number of resources needed to make a patient disposition. Consideration of resources is included in the triage level assignment for ESI levels 3, 4, and 5, while ESI level 1 and 2 decisions are based only on patient acuity. Examples of ESI level 3, 4, and 5 patients are presented 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 5-1 Predicted ESI Resources	
Resources	**Not Resources**
Labs (blood, urine) Electrocardiogram, radiographs Computed tomography, magnetic resonance imaging, ultrasound, angiography	History and physical exam (including pelvic) Point-of-care testing
Intravenous fluids (hydration)	Saline or heparin lock
Intravenous, intramuscular, or nebulized medications	Oral medications Tetanus immunization Prescription refills
Specialty consultation	Phone call to primary care physician
Simple procedure = 1 (laceration repair, urinary catheter) Complex procedure = 2 (procedural sedation	Simple wound care (dressings, recheck)) Crutches, splints, slings

Table 5-2 Patient Presentations and Predicting Resources			
ESI Level	**Patient Presentation**	**Interventions**	**Resources**
5	Healthy 3-year-old patient with right ear pain, up to date on immunizations. Vital signs WNL.	Needs an exam and prescription	None
5	A 42-year-old patient who lost their rescue inhaler and needs a new prescription, Patient is asymptomatic and vital signs WNL.	Needs an exam and prescription	None
4	Healthy 19-year-old patient with a sore throat. Vital signs WNL	Needs an exam, culture(s)*, prescriptions	One *
4	Healthy 29-year-old assigned female at birth with dysuria. Vitals signs WNL	Needs an exam, urine, urine culture, maybe urine pregnancy, and prescriptions	One **
3	A 22-year-old assigned male at birth with right lower quadrant abdominal pain since early this morning, Vital signs WNL	Needs an exam, lab studies, Intravenous fluid, abdominal computed tomography scan, and perhaps surgical consult	Two or more
3	A 45-year-old patient with left lower leg pain and swelling, started 2 days ago after a 12-hour car trip. Vital signs WNL	Needs exam, lab, lower extremity non-invasive vascular studies	Two or more

* Follow the institution's policy on what constitutes a resource. For example, there may be a department where 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 three tests count as one resource (labs)

Wuerz, R., Milne, L. W., Eitel, D. R., Travers, D., & Gilboy, N. (2000). Reliability and validity of a new five-level triage instrument. *Academic Emergency Medicine*, 7(3), 236–242 https://doi.org/10.1111/j.1553-2712.2000.tb01066.x

References

Tanabe, P., Gimbel, R., Yarnold, P. R., & Adams, J. G. (2004). The Emergency Severity Index (version 3) 5-level triage system scores predict ED resource consumption. *Journal of Emergency Nursing*, *30*(1), 22–29. https://doi.org/10.1016/j.jen.2003.11.004

Wuerz, R., Milne, L. W., Eitel, D. R., Travers, D., & Gilboy, N. (2000). Reliability and validity of a new five-level triage instrument. *Academic Emergency Medicine*, *7*(3), 236–242. https://doi.org/10.1111/j.1553-2712.2000.tb01066.x

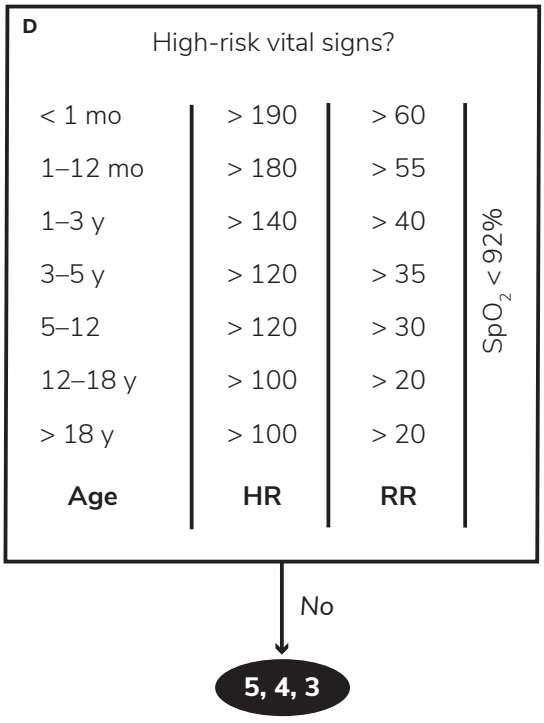
Decision Point D: High Risk Vital Signs?

CHAPTER 6

To reach this point in the algorithm, the nurse has already determined that the patient does not meet ESI level-1 or level-2 criteria. For patients not meeting ESI level-1 or 2- criteria, a complete set of vital signs needs to be obtained to identify the "well-appearing ill." This is important for the recognition of patients who may appear stable but whose vital signs indicate signs of instability. An Iranian study (Nejad et al., 2016) reported that of 551 cases who were up-triaged from ESI level 3 to 2, 88.7% had an increased respiratory rate and 97.8% had an increased respiratory or heart rate, suggesting that vital signs for ESI level 3 patients are important in identifying those who should be assigned a higher acuity.

Obtain a full set of vital signs to assist in determining patient acuity. This is decision point D in the algorithm (Figure 6-1). When vital signs are not obtained, the patient is at risk for being undertriaged, especially when presenting with symptoms indicating a lower acuity. The nurse's ability to recognize abnormal vital signs and appropriately act on them is crucial to patient outcomes (Cioffi et al., 2006).

Figure 6-1. High-Risk Vital Signs



Patients who are immediately recognized and categorized as an ESI level 1 or 2 do not need vitals taken if it is going to delay initiation of care. If the patient appears unstable or presents with symptoms that necessitate immediate treatment, the patient is directly transported to the treatment room, and the treatment begins immediately. For these patients, the resuscitation team is responsible for obtaining and monitoring vital signs at the bedside. This would include patients who have clinical appearances that indicate high risk or need for immediate cardiovascular or respiratory intervention. These patients may appear pale, diaphoretic, or cyanotic. The nurse can obtain vital signs if it may assist in confirming the triage acuity level. Some patients may not be identified as ESI level 1 or 2 until vital signs are taken. An awake, alert elderly patient who presents with dizziness might be found to have a life-threatening condition when a heart rate of 32 beats/minute or 180 beats/minute is discovered during vital sign measurement. In this case, the patient is unstable and should be assigned ESI level 1 no matter how "good" the patient appears.

Vital signs explicitly included in the ESI algorithm include heart rate, respiratory rate, and oxygen saturation (for patients with potential respiratory compromise). An important note is that vital signs must be contextualized in light of the patient's history, medications, and presentation. Medications that affect tachycardic compensation for hypotension, such as beta blockers, need to be accounted for. Medications that blunt a robust immune response, such as corticosteroids, must also be noted. Patients may present with medication-mediated "normal" vital signs, yet still be quite ill.

Pediatric Vital Signs

The ED nurse must be familiar with normal vital sign ranges for pediatric patients. A full set of vital signs should be attempted in triage. The well-appearing, potentially dehydrated or septic patients may experience a delay in care if high risk vital signs are not recognized. An infant less than 28 days old with a fever is considered high risk and is assigned to at least ESI level 2. The patient presenting with a fever, non-petechial rash, and incomplete immunizations should prompt the triage nurse to consider isolation. 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 may be appropriate. For example, a 10-month-old who is up-to-date on immunizations, who presents with fever and pulling on his ear, could be assigned to ESI level 5.

Table 6-1 lists the normal vital sign ranges for each pediatric age group.

Table 6-1 Normal Vital Signs for Pediatric Patients by Age Groups

Age	Heart Rate (beats/min)	Respiratory Rate (breaths/min)	Systolic Blood Pressure (mm Hg)
Term neonate to <1 month	90–190	35–60	67–84
Infant, 1–12 months	90–180	30–55	72–104
Toddler, 1–3 years	80–140	22–40	86–104
Preschooler, 3–5 years	65–120	18–35	89–112
School age, 5–12 years	70–120	16–30	90–115
Adolescent, 12–18 years	60–100	12–20	100–130

Data from American Heart Association. (2020). Part 4: Systematic approach to the seriously ill or injured child. *Pediatric advanced life support provider manual*; Ernst, G. (2020). Pediatric trauma. In J. E. Tintinalli, O. J. Ma, D. M. Yealy, G. D. Meckler, J. S. Stapczynski, D. M. Cline, & S. H. Thomas (Eds.), *Tintinalli's emergency medicine: A comprehensive study guide* (9th ed., pp. 689–697). McGraw Hill; Lucia, D., & Glenn, J. (2017). Pediatric emergencies. In C. K. Stone & R. L. Humphries (Eds.), *Current diagnosis and treatment: Emergency medicine* (8th ed., pp. 964–1016). McGraw Hill.

Pediatric Temperatures

Temperature greater than 38°C (100.4°F) in an infant younger than 90 days old is a red flag and the patient should be considered high risk and assigned at least ESI level 2. A temperature less than 36°C (96.8°F) in a child of any age is hypothermic and concerning for sepsis (Balamuth et al., 2017). Table 6-2 provides a quick summary of these pediatric temperature red flags.

Table 6-2. Pediatric Temperature Red Flags

Age	Temperature
< 90 days	> 38°C (100.4°F) or < 36°C (96.8°F)
> 3 months old	> 38.5 °C (101.3°F) or < 36°C (96.8°F)

Temperature guidelines adapted from from Depinet, H., Macias, C. G., Balamuth, F., Lane, R. D., Luria, J., Melendez, E., Myers, S. R., Patel, B., Richardson, T., Zaniletti, I., Paul, R., & American Academy of Pediatrics Pediatric Septic Shock Collaborative (PSSC) Investigators (2022). Pediatric Septic Shock Collaborative improves emergency department sepsis care in children. *Pediatrics*, 149(3), Article e2020007369. https://doi.org/10.1542/peds.2020-007369; Eisenberg, M. A., & Balamuth, F. (2021). Pediatric sepsis screening in U.S. hospitals. *Pediatric Research*, 91, 351–358. https://doi.org/10.1038/s41390-021-01708-y

Case Examples

The following cases are examples of the need for vital signs on every patient are they are an important part in assigning an appropriate triage acuity level.

Example One

A 28-year-old patient presents with generalized abdominal pain. Her last menstrual period is reported as 8 weeks ago. Vital signs are as follows: T 36.7°C (98°F), HR 120 beats/minute, RR 22 breaths/minute, and BP 92/50mm Hg.

This patient meets the criteria for being uptriaged from level 3 to level 2 based on her vital signs. Her increased heart rate, respiratory rate, and decreased blood pressure make her high risk. This presentation could indicate internal bleeding from a ruptured ectopic pregnancy.

Example Two

A 15-month-old presents with their caregiver, who states the child has had decreased appetite, a low-grade temperature, and numerous liquid stools. The toddler is sitting quietly on the mother's lap. They have no past medical history, no known drug allergies, and are not on any medications. Vital signs are as follows: T 38°C (100.4° F), HR 158 beats/minute, RR 42 breaths/minute, BP 86/50 mm Hg. Capillary refill is 3 seconds

Prior to vital sign assessment, this patient meets the criteria for ESI level 3. Based on vital sign assessment, the nurse should triage them to an ESI level 2. This patient is tachypneic and tachycardic for their age.

Example Three

A 57-year-old presents with cough for multiple days. The patient tells you that they had a temperature of 101°F (38.3°C) last night. Vital signs are as follows: T 38.5°C (101.4°F), RR 26 breaths/minute, HR 100 beats/minute, and SpO_2 90%.

At the beginning of the triage assessment, this patient presents as though they could have pneumonia or viral illness. Their low oxygen saturation and increased respiratory rate are a concern. After assessing vital signs, the nurse should uptriage the patient to an ESI level 2.

Example Four

A 34-year-old patient assigned female at birth presents with generalized abdominal pain, vomiting, and constipation. She has a history of laminectomy and currently takes no medications. She states her LMP was within the last 28 days. Vital signs are as follows: T 36.5°C (97.8°F), HR 102 beats/minute, RR 16 breaths/minute, BP 132/80 mm Hg, and SpO_2 99%.

This patient will need a minimum of two or more resources: labs, intravenous fluids, perhaps intravenous 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 other vital signs are within expected limits. In this case, the decision should be to assign the patient to ESI level 3.

Example Five

A 72-year-old patient presents to the ED with oxygen via nasal cannula for her advanced chronic obstructive pulmonary disease. 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, takes daily inhaled steroids, uses albuterol as needed, and takes an aspirin daily. Vital signs include the following: T 37.5°C (99.6°F), HR 105 beats/minute, RR 24 breaths/minute, BP 138/80 mm Hg, and SpO_2 91% (on 2 L nasal cannula per norm, states her SpO_2 is 90 to 91% at home). She denies respiratory distress.

This patient will require two or more resources: labs and intravenous 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 chronic obstructive pulmonary disease. However, because the patient takes a steroid for her COPD, it is possible she will not mount a robust immune response, so her vital signs should be considered in the context of both immunosuppression and the possibility of sepsis. These vital signs are not surprising given the patient's history, so the temptation is to attribute them to her respiratory disease. However, given the infected bite, it is critical to consider that as a cause of her elevated heart rate and respiratory rate and uptriage the patient to an ESI 2.

Summary

Vital signs can reveal many things about the patient's condition, including the potential risk for deterioration. They also provide a baseline for trending of vital signs while the patient is in the ED. The information in this chapter provides a foundation for understanding the role of vital signs in the ESI acuity system. 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 high-risk vital signs are exceeded, it is recommended that the triage nurse reassess the patient and uptriage the patient from level 3 to level 2 if the vital signs remain out of range.*

References

American Heart Association. (2020). Part 4: Systematic approach to the seriously ill or injured child. *Pediatric advanced life support: Provider manua*l.

Balamuth, F., Alpern, E. R., Abbadessa, M. K., Hayes, K., Schast, A., Lavelle, J., Fitzgerald, J. C., Weiss, S. L., & Zorc, J. J. (2017). Improving recognition of pediatric severe sepsis in the emergency department: Contributions of a vital sign–based electronic alert and bedside clinician identification. *Annals of Emergency Medicine*, *70*(6), 759–768.E2. https://doi.org/10.1016/j.annemergmed.2017.03.019

Cioffi, J., Salter, C., Wilkes, L., Vonu-Boriceanu, O., & Scott, J. (2006). Clinicians' responses to abnormal vital signs in an emergency department. *Australian Critical Care*, *19*(2), 66–72. https://doi.org/10.1016/s1036-7314(06)80011-1

Eisenberg, M. A., & Balamuth, F. (2021). Pediatric sepsis screening in U.S. hospitals. *Pediatric Research*, *91*, 351–358. https://doi.org/10.1038/s41390-021-01708-y

Ernst, G. (2020). Pediatric trauma. In J. E. Tintinalli, O. J. Ma, D. M. Yealy, G. D. Meckler, J. S. Stapczynski, D. M. Cline, & S. H. Thomas (Eds.), *Tintinalli's emergency medicine: A comprehensive study guide* (9th ed., pp. 689–697). McGraw Hill.

Lucia, D., & Glenn, J. (2017). Pediatric emergencies. In C. K. Stone & R. L. Humphries (Eds.), *Current diagnosis and treatment: Emergency medicine* (8th ed., pp. 964–1016). McGraw Hill.

Nejad, H. H., Banaie, M., Davarani, S. H. S., & Khazaeipour, Z. (2016). Evaluation of the significance of vital signs in the up-triage of patients visiting emergency department from Emergency Severity Index level 3 to 2. *Acta Medica Iranica*, *54*(6), 366–369. https://acta.tums.ac.ir/index.php/acta/article/view/5276

APPENDIX A

Frequently Asked Questions

If and when is it appropriate for a nurse to change an ESI level?

The purpose of ESI is to identify patients at risk of decompensation, assign acuity, and predict resources at the initial encounter. Therefore, once initial data are collected and a clinical judgment is rendered in the form of an ESI assignment, that ESI level should not be changed, ***unless*** the patient condition changes before they are placed from the waiting area. The only change that should be made is to increase acuity, because now this may be the highest priority patient. When this occurs, an appropriate note should be made in the medical record reflecting the patient's change in condition and change in ESI level.

Can the ESI level be changed after the patient has seen a physician or advanced practice provider?

The purpose of ESI is to identify patients at risk of decompensation, assign acuity, and predict resources at the initial encounter. The ESI assignment is the result of a clinical judgement of the patient's condition at the initial presentation. It is only used to predict decompensation risk and resource allotment. ESI is not intended as an ongoing measurement of patient acuity. Therefore, it is not appropriate to change the ESI once a patient has been seen by a physician or advanced practice provider.

Can physicians and APPs triage and assign ESI levels?

Triage is generally a nursing function. Physicians, physician assistants, and advanced practice RNs, if they are appropriately trained in the use of ESI, can assess patients at the initial encounter and assign an ESI level. It is not appropriate for a physician or advanced practice provider to assign a second ESI after the patient has been triaged by a nurse.

Can a preliminary ESI level be assigned prior to assessment?

The assignment of an ESI level is the result of a clinical decision-making process that requires a history of present illness, brief focused assessment, and vital signs. Assigning an ESI level without an assessment may result in significant undertriage. Unless the patient is in extremis, an assessment including a full set of vital signs should be made before assigning an ESI level.

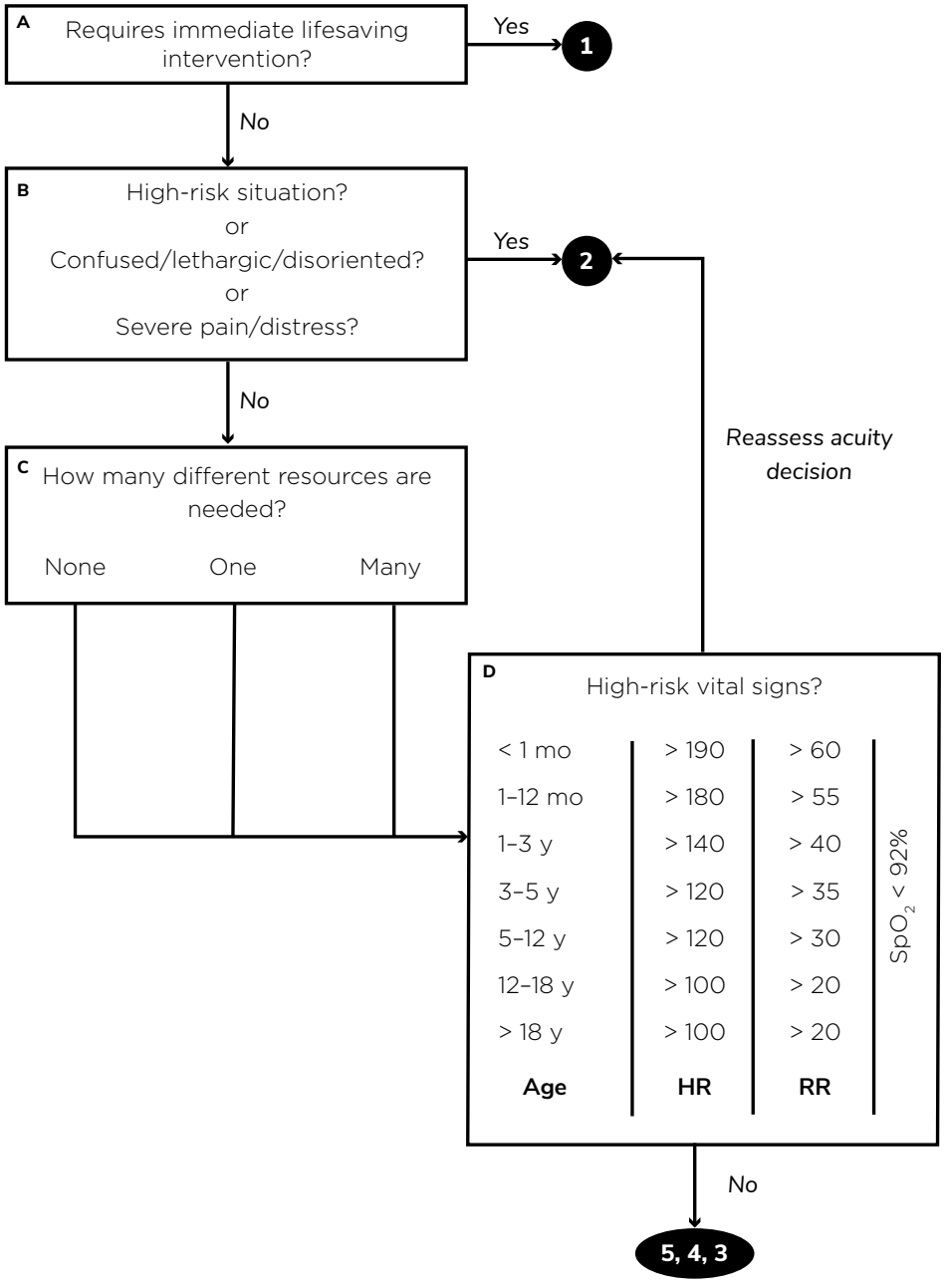
Can ESI levels be used for other purposes such as average acuity tracking, staffing, or billing?

The purpose of ESI is to sort patients at the initial encounter. ESI identifies patients at risk of decompensation, assigns acuity, and predicts resources at the initial encounter. This is the only purpose of the ESI system, and it should not be used to calculate billing. ESI levels are ordinal data, not interval data, and so cannot be meaningfully averaged. In tracking acuity in each department, distribution by percentage should be used.

APPENDIX B

ESI Triage Algorithm, v5

ESI Triage Algorithm, V5



A. Immediate life-saving intervention required: Airway or respiratory support, emergency medications, hemodynamic interventions such as fluid resuscitation or blood products

Clinical presentations requiring lifesaving interventions include the following: intubated, unresponsive, pulselessness, apneic, severe respiratory distress, profound hypotension or hypoglycemia.

Unresponsiveness is defined as a patient who either:

1. Is nonverbal and not following commands (acutely)
OR
2. Requires noxious stimulus (P or U on AVPU scale)

B. High-risk situation: May become unstable, have high risk for deterioration, or exhibit newly altered mental status. Severe pain or distress is determined by patient report, corroborated with clinical observation.

C. Resources: Count the number of different types of resources, not the individual tests or radiographs. (For example, complete blood count, electrolytes, and coagulant studies equal one resource because they are all laboratory tests, while complete blood count plus chest radiograph equals two resources because one is a laboratory test and one is imaging).

ESI Resources	Not ESI Resources
• Labs (blood, urine) • Electrocardiogram, radiographs • Computed tomography, magnetic resonance imaging, ultrasound, angiography • Intravenous fluids (hydration) • Intravenous, intramuscular, or nebulized medications • Specialty consultation • Simple procedure = 1 (laceration repair, urinary catheter) • Complex procedure = 2 (procedural sedation)	• History and physical exam (Including pelvic) • Point-of-care testing • Saline or heparin lock • Oral medications • Tetanus immunization • Prescription refills • Phone call to primary care physician • Simple wound care (dressings, recheck) • Crutches, splints, slings

D. High-risk vital signs: Reassess to determine whether the patient warrants a higher acuity level if a patient has one or more vital signs outside the normal parameters for the patient.

Pediatric Fever Considerations

1-28 days of age: Assign at least ESI 2 if T > 38° C (100.4 ° F)

1-3 months: Consider assigning ESI 2 if T > 38 ° C (100.4 ° F)

3 months and older: Consider assigning ESI 2 or 3 if:

1. T > 39°C (102.2°F) or < 36°C (96.8°F),
OR
2. Incomplete immunizations, or
3. No obvious source of fever

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