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The Emergency Severity Index (ESI) Triage Algorithm

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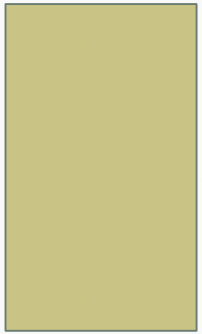


Learning Objectives

- Recognize clinical presentations requiring immediate life-saving interventions
- Predict resources needed for a variety of common complaints
- Describe and understand the role of triage in the emergency department
- Identify and describe clinical presentations of each Emergency Severity Index (ESI) level

Triage in the Emergency Department

- Triage is the initial assessment of patient's severity of injury or illness; is performed in a short period of time
- Prioritizes treatment and evaluation among patients based on medical stability
- Identifies patients that require life-saving interventions
- Level is assigned to the patient
  - This **level** acts as an indicator for how long a patient can safely wait before provider evaluation and treatment

Triage in the Emergency Department

- Triage can occur in two different situations:
  - After patient enters ED and signs in
  - After patient arrives via ambulance
- When patients arrive via ambulance, triage and assessment may be assisted by paramedics/EMTs
  - **Nurses must perform their own assessment of the patient to determine severity and needs!**

Importance of Triage

- Available resources in the ED may become limited because patient volumes cannot be precisely predicted
  - Limited resources leads to risks for patient safety and deterioration
- Patients cannot all be treated immediately and simultaneously
- Structured triage provides a method for rapidly identifying life-threatening conditions and allocating resources appropriately

Importance of Triage

As EDs become increasingly crowded, accurate triage is even more critical

- Undertriage puts patients at risk for deterioration while waiting
- Overtriage may encumber scarce resources and may delay care for patients who require immediate attention

Accurate, quick triage is imperative for successful ED operations

Legal Implications in Triage: EMTALA

EMTALA - Emergency Medical Treatment and Labor Act

- Enacted by Congress in 1986
- Ensures public access to emergency services without regard to patients' ability to pay
- Requires a medical screening examination (MSE) be provided to any patient who comes to the ED requesting an examination

Legal Implications in Triage: EMTALA

EMTALA, continued.

- ED staff ***cannot*** refuse to provide care for complaints that appear non-urgent
- Providing patients with alternatives to seeking care (urgent care, etc.) when wait times are long, instead of providing an MSE, is prohibited
- The MSE cannot be delayed in order to inquire about and/or collect insurance and payment information

What happens during Triage?

Triage nurse obtains the following:

- Chief complaint
- Brief medical history
- Vital signs
- Allergies
- Medications
- Age and gender

Emergency Severity Index

- Developed by two U.S. ED physicians in 1998
  - Richard Wuerz and David Eitel
- Wuerz and Eitel created this triage instrument to facilitate prioritization of patients based on urgency of treatment and conditions
  - First principal triage question was "**Who should be seen first?**"
- Wuerz and Eital soon realized there are often multiple patients of the same urgency
  - Changed principal triage question to "**How long can each patient safely wait?**"

Emergency Severity Index (ESI)

- Commonly referred to as “ESI”
- Triage algorithm for assessing severity of a patient’s condition upon arrival to ED
- Common triage method in EDs across the U.S.
- Intended for use by nurses who have triage experience, or who have attended a comprehensive triage program
- Also assesses resource needs
  - Seeks to get the patient to the right resources at the right time (ortho area, quick care, cardiac monitoring, etc.)

Emergency Severity Index (ESI)

Five-Level Triage Algorithm

1. Immediate life-saving intervention required
2. High-risk situation/emergent
3. Urgent/stable, requiring several resources
4. Less urgent/stable, requiring only one resource
5. Non-urgent/stable, not requiring resources

Four Decision Points to Guide Triage

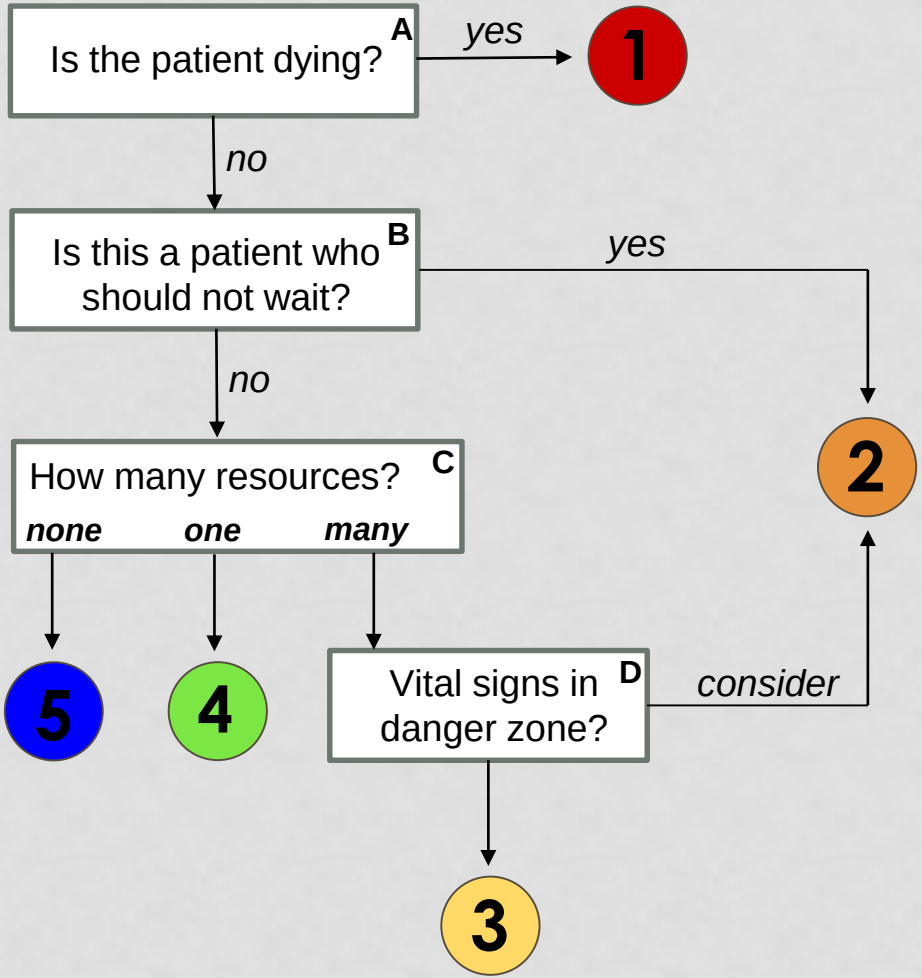
A. Does this patient require immediate life-saving intervention?
   - If yes, assign level 1

B. Is this a patient who should not wait?
   - If the patient should not wait, assign level 2

C. How many resources will this patient need?

D. What are the patient's vital signs?

The answers to questions C & D are evaluated together to determine if patient is a level 3, 4, or 5.



Conceptual Algorithm of Emergency Severity Index

Decision points A through D

Four Decision Points to Guide Triage

- Triage nurse proceeds through decision points A through D of the conceptual algorithm in order
  - Must rule out patient being a level 1 before proceeding to determining if patient may be a level 2
  - After ruling out both of these possibilities, proceeds to determining if patient is a level 3, 4, or 5

ESI Level 1 Overview

- Requires **immediate** life-saving interventions
- Requires **immediate** physician involvement
- Patient's level of consciousness must be considered
- Patient may be currently dying or deteriorating
- Airway, breathing, or circulation is compromised

ESI Level 1

- May not always arrive to ED via ambulance, but always presents with an unstable condition
- Most will be admitted to the ICU, while some will expire in the ED
- Some patients *may* be able to be discharged from the ED after being assigned a level 1, such as those with hypoglycemia, seizures, alcohol intoxication, or anaphylaxis
- ESI level 1 make up 1–3% of ED visits

ESI Level 1

- ESI uses the AVPU (Alert, Verbal, Pain, Unresponsive) scale when assessing level of consciousness (LOC)
- Goal is to identify those individuals who have had a sudden change in LOC
- Patients who are unresponsive, or are responsive to pain only (score P or U on the AVPU scale), meet the criteria for ESI level 1

ESI Level 1

Life-saving interventions are aimed at securing an airway, maintaining breathing, supporting circulation, or addressing major changes in consciousness

- Examples:
  - Intubation
  - Defibrillation
  - Control of major bleeding
  - Open thoracotomy
  - Compressions
  - Surgical airway
  - External pacing
  - Administration of emergency medications

ESI Level 1

Signs and symptoms indicative of level 1 patients:

- Unprotected airway
- Pulseless
- Absence of spontaneous breathing
- Severe respiratory distress
- Acute mental changes
- Need for immediate medication to maintain hemodynamic stability (including volume or blood replacement)

ESI Level 1

Examples of level 1:

- Cardiac arrest
- Respiratory arrest
- Overdose with respiratory rate less than 6
- Unresponsive trauma patient
- Chest pain with diaphoresis, respiratory distress, or hemodynamic instability
- Respiratory distress with agonal or gasping respirations; oxygen saturation <90%
- Patients who are unresponsive, and those who are responsive to pain only

ESI Level 2 Overview

- Patient is considered "emergent"
  - High risk for deterioration
  - Needs time-sensitive treatment
- Make up about 20–30% of ED visits
- In patients assigned level 2, the nurse has determined that it would not be safe for the patient to remain in the waiting room
- Level 2 criteria are the most often misinterpreted criteria
- Major differentiating factor between levels 1 and 2
  - Level 1 requires immediate resuscitation
  - Level 2 should have their placement rapidly facilitated

ESI Level 2

Questions to help determine if patient meets level 2 criteria:

- Is this a **high-risk situation**?
- Is the patient confused, lethargic, or disoriented?
- Is the patient in severe pain or distress?

- Answering YES to any of these questions indicates the patient is probably a level 2

- With experience, answering these questions will become easier and more intuitive

Ask yourself: "Would I give my last bed to this patient?"

- ➢ If yes, they are probably a level 2

Identifying High-Risk Situations

- A critical component of the triage process, regardless of the triage system used
- ESI uses the nurse's expertise and experience to identify high-risk patients
- Inexperienced nurses are more likely to not be able to identify high-risk situations because they have not yet incorporated symptom clustering and clinical portraits from prior clinical situations into their nursing practice

Identifying High-Risk Situations

- In identifying many high-risk situations, the nurse must consider the patient's age, past medical history (PMH), and current medications, along with the patient's chief complaint, in order to appropriately triage the patient
  - For example, if an 85-year-old frail man presents with severe abdominal pain, he is at a much greater risk for increased morbidity and mortality than a previously healthy 25-year-old who presents with the same complaint

Identifying High-Risk Situations

- Vitals signs or a detailed physical assessment may not always be necessary in identifying a high-risk situation
  - For example, a patient who is allergic to dairy products presents to the ER complaining of throat tightness and angioedema after eating at a restaurant. This patient can be triaged as a level 2 before vital signs are obtained, as he or she is at high risk for anaphylaxis and rapid deterioration
  - A patient presents to the ED complaining of "the worst headache of my life" following heavy lifting. The nurse should recognize this clinical picture as worrisome for a brain hemorrhage and assign this patient as an ESI level 2

New Onset Confusion, Lethargy, Disorientation

- Altered mental status (AMS) is a common chief complaint in the ED
- Can be caused by multiple conditions, including stroke, brain pathology, metabolic or electrolyte imbalances, or toxicological conditions
- If the patient's medical history is not known and they present to the ED confused, lethargic, or disoriented, it should be presumed that this condition is new and the patient should be assigned as level 2
- Chronic dementia or confusion alone do not meet the criteria for level 2 unless accompanied by other level 2 criteria symptoms

Pain

- Pain or severe distress may result in patient being "up-triaged" from an ESI level 3 to 2.
  - "Up-triage" – increasing acuity of patient
- Patients who present with pain at a 7/10 should be *considered* for meeting level 2 criteria, but they may not need to be assigned ESI level 2 after further assessment
  - For example, a patient who presents with a broken finger complaining of pain 10/10 would most likely *not* meet the criteria for ESI level 2 unless other factors or injuries are present
- If pain is alleviated by nursing interventions (ice application, repositioning, etc.), the patient should not be up-triaged
- It is up to the nurse to determine if the pain rating and clinical condition together warrant a level 2 ESI rating

Severe Distress

- Severe distress can be either physiological or psychological
- It may be best to have these patients placed in the treatment area quickly in order to address the issue in a timely manner

Some examples include:

- A patient who is distraught following a sexual assault
- Combative patients
- Victims of domestic violence
- Behavioral outbursts at triage
- Patients experiencing an acute grief reaction

ESI Level 2

Examples of level 2:

- Active chest pain with previous cardiac history of myocardial infarction
- Cancer patient with a fever
- Suicidal or homicidal patient
- Flank pain with a rating of 10/10
- Sudden onset palpitations with a heart rate of 160
- Hematemesis accompanied by tachycardia

ESI Level 2

Examples of level 2:

- Sudden loss of vision
- Severe headache, stiff neck, rash, fever
- Patient complaining of severe headache following strenuous activity
- Sudden onset slurred speech
- Stab wound to groin with controlled bleeding
- Possible diabetic ketoacidosis or sepsis

Differentiating Level 1 vs. Level 2

Level 1	Level 2
• Requires life-saving intervention • Patient has experienced rapid deterioration • Patient will die without further action • Requires physician evaluation immediately	• High-risk situation • Patient has new onset of confusion, lethargy, or disorientation (without compromised airway) • Patient has severe pain or distress

Is This a Life-Saving Intervention?

- One of the ways to detect a level 1 patient is to identify a life-saving intervention that they require immediately

Examples of Life-Saving Interventions	Examples of Other Interventions
• Bag-mask ventilation • Massive blood transfusion for hemorrhage • TPA for acute ischemic stroke • D50 (IV dextrose) for hypoglycemia with altered mental status • Airway management (intubation, oral airway, etc.)	• IV antibiotics • Oxygen via nasal cannula • C-Collar placement • Tylenol for high fever • Narcotic pain medication • Lab tests • EKG

ESI Levels 3, 4, and 5

- After determining that a patient does NOT meet criteria for ESI level 1 or 2, the triage nurse can move on to deciding if the patient meets criteria for level 3, 4, or 5.

ESI Levels 3, 4, and 5

- Differentiated based on number of resources patient is expected to need
- Estimation of resources only occurs after patient is determined not to meet level 1 or 2 criteria
- When determining resources, the nurse should **not** take into consideration which physician, nurse practitioner, or physician assistant is on duty in the ED that shift

Level 3: two or more resources
Level 4: one resource
Level 5: no resources

What Counts as a Resource?

Examples of Resources	Examples of Non-Resources
Labs (blood, urine, etc.) IV fluids Laceration repair Foley catheter EKG X-ray Ultrasound IV fluids IV, IM, and nebulized medications	History and physical Pelvic exam IV insertion without labs PO medications Prescription refills Simple wound care Tetanus vaccine Crutches, splints, slings Glucose check

ESI Level 3 Overview

- Patients require in-depth evaluation but are stable in the short-term
- Predicted to require at least two resources in order for physician to reach a disposition (admission, discharge, transfer)
- Make up 30–40% of ED visits

ESI Level 3

- Examples of ESI level 3 presentations/complaints
  - Abdominal pain
  - Headache
  - Vomiting
  - Young otherwise healthy adult with generalized fatigue, chest pain with coughing, productive cough

ESI Level 2 vs. Level 3

- Differentiating between level 2 and 3 requires experience and expertise
- Lack of risk factors may support a level 3 designation
  - Ex: A 20-year-old with a fever and heart rate of 112 would be a level 3, but an elderly patient undergoing chemotherapy with the same vital signs would be a level 2
- Severe distress with certain chief complaints could bump a patient up to an acuity of level 2
  - Ex: A patient in significant distress complaining of abdominal pain is more likely to meet level 2 criteria than a patient in significant distress complaining of foot pain

ESI Levels 4 and 5 Overview

- Clinically stable
- Can wait several hours to be seen by a provider
- Are appropriate for a “fast-track” area if the emergency department is equipped with one
- Make up 20–35% of ED visits
  - Proportions may be higher in communities with poor primary care access

ESI Levels 4 and 5

- ESI level 4 – clinically stable and requires one resource
- ESI level 5 – clinically stable and requires no resources
- May vary between different emergency departments and what resources/protocols they have in place

ESI Levels 4 and 5

Level 4 Presentations and Resources	Level 5 Resources
• Sore throat (strep swab) • Ankle injury (x-ray) • Laceration (sutures) • Back pain (x-ray *OR* IM meds)	• Medication refill • Pediatric patient with poison ivy • Suture removal

Dangers of Over-Triaging

"Over-triaging" – assigning patients more acute ESI level than is truly appropriate

- Ex: designating a patient with a mild fever and no risk factors as an ESI level 2 based on heart rate of 102, which is a normal heart rate to accompany a fever – patient should be assigned ESI level 3

- Assigning excessive patients to level 2 ESI will prevent beds from being available to true ESI 1evel 1 and 2s

Dangers of Under-Triaging

"Under-triaging" - assigning patients a less acute ESI level than is truly appropriate

- Ex: assigning a patient with a mild fever who is undergoing chemotherapy with a heart rate of 102 as an ESI level 3; this patient has significant risk factors and should be assigned ESI level 2

- Under-triaging patients may lead to patients receiving delayed medical treatment and waiting in the lobby for unnecessarily longer times with high risk of deterioration

Triage Protocols

- Emergency departments commonly have protocols put in place for the triage nurse to activate
  - These allow the patient to have labs, EKGs, x-rays, etc. performed prior to physician evaluation
  - Shortens ED visit duration and identifies abnormalities quicker

Triage Protocols & Common Complaints

- Stroke symptoms
- Chest pain
- Abdominal pain
- Broken bones
- Shortness of breath

Stroke Symptoms

- EDs often have “stroke alerts” that notify the entire department this patient requires time-sensitive care for a possible stroke
- Triage nurse initiates patient being transported to CT scanner within 20 minutes of arrival
- Common stroke symptoms:
  - Facial droop
  - Numbness on one side of the body
  - Difficulty talking or understanding speech

Stroke Symptoms

- Stroke symptoms should be assigned an acuity of ESI level 2 *unless* the patient has limited responsiveness or cannot protect their airway – **then assign level 1**

Chest Pain

- One of the most common complaints at the ED
- May be difficult to differentiate severity and acuity
- Chest pain should be given an ESI level of *at least* a 3
- Protocol initiated for EKG within 10 minutes of arrival

Chest Pain

- Considerations when triaging:
  - Is the patient diaphoretic and in acute distress?
    - *probably level 2*
  - Is the patient ambulatory with unlabored breathing and no acute distress
    - *probably level 3*
  - Does the patient have a cardiac history (previous heart attack, known blood clot, etc.)
    - *probably level 2*
  - Does the EKG show an acute STEMI?
    - *probably level 1*

Abdominal Pain

- Will almost always utilize two or more resources (level 3)
  - Labs, urinalysis, and often CT scan and medications
- Warning signs – may warrant upgrade to level 2
  - Hypotension
  - Pallor
  - Diaphoresis
  - Fever
  - "Ripping" description of pain
    - May indicate a abdominal aortic aneurysm

Broken Bones

- Patients often come to the ED for an X-ray to see if a bone is broken after a minor injury
  - Most of the time, ESI level 4 (one resource)
- If patient arrives with visible deformity, they may require conscious sedation and IM/IV pain medication
  - Should be an ESI level 3 (at least two resources)

Broken Bones

- If the patient's chief complaint is a possible broken bone, the triage nurse must ask further questions to determine mechanism of injury
  - This patient may be a **trauma** (severe car crash, fall from several feet, etc.)
    - **High-risk situation –** patient should be at least an ESI level 2

Shortness of Breath

- Shortness of breath will almost always be at least an ESI level 3 (will require labs, x-ray, possibly medications)
- Things to consider:
  - Work of breathing (labored, unlabored)
  - Use of accessory muscles
  - Oxygenation
- If SpO_2 is compromised, apply oxygen immediately
  - ➢ patient should be at least ESI level 2

Other High-Risk Situations

- Should be given ESI level 2
  - Testicular torsion
  - Urinary retention
  - Diabetic ketoacidosis (DKA) or hyperglycemic hyperosmolar non-ketotic syndrome (HHNS)

Pediatric Considerations

- Different vital sign parameters
- An accurate weight should be obtained upon arrival
- Speak with the child directly, not just the caregiver
- Warning signs in pediatric patients may be more subtle than in adults
- Observe if patient is acting in an age-appropriate manner
  - Ex: A 3-year-old who is crying loudly and pushing the nurse away during vital signs can be reassuring because the child is acting in an age-appropriate manner

A General Approach to Pediatric Triage

- "Pediatric assessment triangle"
  - Appearance – interactiveness, muscle tone/strength, consolability
  - Work of breathing – use of accessory muscles, tripoding, apnea
  - Circulation – pallor, mottling, cyanosis
- "ABCDE"
  - Airway, breathing, circulation, disability, exposure
- Pertinent history, vital signs, presence of fever, pain level
  - Obtaining a blood pressure may not be a critical factor in assigning acuity of a pediatric patient

Pediatric "Danger Zone" Vital Signs

	Heart Rate	Respirations	Temperature
Under 3 months	Over 180	Over 50	Over 100.4°F
3 months to 3 years	Over 160	Over 40	Over 102.2°F
3 to 8 years	Over 140	Over 30	Over 102.2°F
Over 8 years	Over 100	Over 20	Over 102.2°F

- Vital signs should be interpreted relative to patient's behavior
  - If a patient is screaming, the heart rate will be higher

➢ SpO_2 should always be above 92%!

Pediatric "Danger Zone" Vital Signs

Neonates (28 days and younger) with a fever:

- Should be assigned an ESI level of at least 2
- Will undergo a sepsis evaluation

High-Risk Situations for Pediatrics

- Should be ESI level 2
  - Seizures
  - Sepsis
  - Suspected child abuse
  - Burns
  - Head trauma
  - DKA
  - Ingestions and overdoses
  - Neonate with fever

Examples

30-year-old female complaining of chest discomfort. No reported medical history.

Vitals: BP 130/83, HR 90, RR 18, SpO_2 94%, T 97.8

- What resources do we expect this patient to need?
  - EKG, blood work, chest X-ray
- Can this patient wait safely in the waiting room until a bed is available?
  - Yes, patient is stable. Assign ESI level 3
- What would make you consider assigning this patient a level 2?
  - Elevated heart rate, especially above 120, decreased oxygen saturation, previous cardiac history

Examples

50-year-old male complaining of pain during urination. History of hypertension.

Vitals: BP 145/89, HR 83, RR 16, SpO_2 99%, T 98.5

- What resources do we expect this patient to need?
  - Urinalysis
- Can this patient wait safely in the waiting room until a bed is available?
  - Yes, patient is stable. Assign ESI level 4
- What might make you consider assigning a level 3?
  - Fever or recent ED visit for kidney stones

Examples

2-year-old female brought in by mother who states the patient has not had a wet diaper in 14 hours. Patient stares at nurse blankly and does not respond to the nurse blowing bubbles.

Vitals: HR 165, RR 25, SpO_2 96%, T 102.5

- What resources do we expect this patient to need?
  - Blood work, urinalysis, possibly IV antibiotics
- Can this patient wait safely in the waiting room until a bed is available?
  - No, patient is exhibiting warning signs of advanced infection and dehydration. Assign ESI level 2

Examples

42-year-old male complaining of chest pain at 9/10, unrelieved by aspirin. History of stable angina. Patient is current smoker.

Vitals: BP 171/94, HR 99, RR 16, SpO_2 97%, T 98.2

- What resources do we expect this patient to need?
  - EKG, chest x-ray, blood work
- Can this patient wait safely in the waiting room until a bed is available?
  - No, patient has risk factors for a cardiac event and vitals are outside of normal parameters. Assign ESI level 2
- What might make you consider upgrading this patient to a level 1?
  - EKG revealing acute ST-elevated myocardial infarction

Examples

72-year-old male walks into ED and states since waking up this morning, he cannot feel the right side of his face and his right arm. History of hypertension.

Vitals: BP 198/105, HR 87, RR 18, SpO_2 100%, T 97.2

- What resources do we expect this patient to need?
  - CT scan, lab work, EKG
- Can this patient wait safely in the waiting room until a bed is available?
  - No, this patient is showing signs of an acute stroke. Assign level 2 and initiate stroke protocols

Examples

A mother brings in her 4-year-old daughter after a bee sting; she's concerned because her grandmother was allergic to bees. The patient hides behind her mother and requires coaxing to obtain vitals.

Vitals: HR 119, RR 26, SpO_2 99%, T 98.9

- What resources do we expect this patient to need?
  - Likely no resources
- Can this patient wait safely in the waiting room until a bed is available?
  - Yes, this patient is stable and showing no signs of an allergic reaction or respiratory compromise. Assign ESI level 5

Examples

20-year-old male is brought to ED by a friend after he took 8 sleeping pills. Patient states that his girlfriend recently broke up with him. No medical history.

Vitals: BP 119/70, HR 101, RR 16, SpO_2 94%, T 98.6

- What resources do we expect this patient to need?
  - Blood work, drug screen, and possible IV medications
- Can this patient wait safely in the waiting room until a bed is available?
  - No, this patient is experiencing a psychiatric emergency, displaying suicidal behavior. Assign ESI level 2
- What would make you consider upgrading this patient to a level 1?
  - Patient loses consciousness and can no longer protect his airway

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