An Overview of the ESI Version 4 Algorithm
requires immediate life-saving intervention?  

A  

yes  

1  

no  

high risk situation? or confused/lethargic/disoriented? or severe pain/distress?  

B  

yes  

2  

no  

how many different resources are needed?  

C  

none  

one  

many  

5  

4  

D  

danger zone vitals?  

<3 m  

3 m-3 y  

3-8 y  

>8 y  

HR  

RR  

SaO2<9  

<50  

<60  

<70  

<80  

<90  

<100  

<110  

<120  

<130  

<140  

<150  

<160  

<170  

<180  

<190  

<200  

<210  

<220  

<230  

<240  

<250  

<260  

<270  

<280  

<290  

<300  

<310  

<320  

<330  

<340  

<350  

<360  

<370  

<380  

<390  

<400  

<410  

<420  

<430  

<440  

<450  

<460  

<470  

<480  

<490  

<500  

<510  

<520  

<530  

<540  

<550  

<560  

<570  

<580  

<590  

<600  

<610  

<620  

<630  

<640  

<650  

<660  

<670  

<680  

<690  

<700  

<710  

<720  

<730  

<740  

<750  

<760  

<770  

<780  

<790  

<800  

<810  

<820  

<830  

<840  

<850  

<860  

<870  

<880  

<890  

<900  

<910  

<920  

<930  

<940  

<950  

<960  

<970  

<980  

<990  

<1000  

no  

3  

consider
Emergency Severity Index (ESI)

- **Acuity assessment**
  - Airway, breathing, circulation
  - Potential for life, organ or limb threat
  - How soon the patient needs to be seen

- **Expected resource assessment**
  - Number of resources, as estimated by the triage nurse, that a patient is expected to consume in order for a disposition decision to be reached
ESI

• Five explicitly defined categories
  • Mutually exclusive
  • Allows for rapid sorting

• Differs from a complete assessment
  • Gathering sufficient information to assign an ESI level
  • Quick sorting
ESI

- Requirements to maintain the validity and reliability of the instrument
  - Experienced emergency department nurse at triage
  - Education of each RN prior to implementation
patient dying? A

shouldn’t wait? B

how many resources? C

vital signs D

1

2

3

4

5

none

one

many

c consider

yes

no

yes

no

no
Is this patient dying? [A]

- Yes → 1
- No
Does this patient need immediate life-saving intervention?

- yes
- no
Decision Point A

*Is this patient dying?*

- Does this patient require immediate life-saving intervention?

<table>
<thead>
<tr>
<th>Airway</th>
<th>Breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstructed or partially obstructed</td>
<td>Apneic</td>
</tr>
<tr>
<td>Unable to protect their own airway</td>
<td>Intubated prehospital</td>
</tr>
<tr>
<td></td>
<td>Severe respiratory distress</td>
</tr>
<tr>
<td></td>
<td>SpO2 less than 90%</td>
</tr>
</tbody>
</table>
**Decision Point A**

*Is this patient dying?*

- Does this patient require immediate life-saving intervention?

<table>
<thead>
<tr>
<th>Circulation</th>
<th>Pulseless or concerned about rate, rhythm or quality?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs</td>
<td>Hemodynamic interventions</td>
</tr>
<tr>
<td></td>
<td>Immediate IV medications</td>
</tr>
<tr>
<td></td>
<td>to correct hemodynamic instability</td>
</tr>
</tbody>
</table>
Decision Point A

• Does this patient have an acute mental status change that requires immediate life saving intervention?

Examples
  – Hypoglycemia needs glucose
  – Heroin OD needs Narcan
  – Subarachnoid bleed needs airway protection

• Is this patient a “P” or “U” on the AVPU scale
  
  A = Alert
  V = Verbal stimuli to elicit a response
  P = Painful stimulus required for response
  U = Unresponsive
ESI Level 1

• Patient is physiologically unstable
• Requires immediate aggressive life-saving interventions
  • MD evaluation
  • Nursing care
  • Team response
• Most patients will be hospitalized
ESI Level 1 Examples - v4

- Cardiac or respiratory arrest
- Overdose with a respiratory rate of 8
- Severe respiratory distress with agonal or gasping respirations
- Acute SOB with $\text{SpO}_2 < 90\%$
- Anaphylactic shock
ESI Level 1 Examples - v4

- Critically injured trauma patient
  - GSW to abdomen with a BP 88/palp
- Chest pain, pale, diaphoretic
- CC dizziness, recent LOC, HR=40
- Chest palpitations, HR 180+
- Unresponsive with strong odor of alcohol
- Severe stroke needs airway protection
Aggressive Life-saving Interventions

Will this intervention save this person’s life?

- Airway and Breathing
  - Intubation
  - Surgical airway
  - CPAP, BiPAP
  - Bag Valve Mask Ventilation

- Defibrillation

- External Pacing

- Chest needle decompression

- Hemodynamics
  - Significant IV fluid resuscitation
  - Blood administration
  - IV medications – vasopressors

- Control of major bleeding
Interventions: *Not* Life Saving

- Diagnostic Tests
  - ECG
  - Lab studies
- Oxygen
- Monitor
- IV access

- Medications
  - ASA
  - Nitroglycerine
  - Pain medications
  - Antibiotics
  - Heparin
Shouldn’t wait?

- **no**
- **no**
- yes

2
High risk situation?  

B  

or  

Confused/lethargic/disoriented?  

or  

Severe pain/distress?

- Yes
- No
Decision Point B

*Is this a high risk situation?*

- Determination is based on a brief patient interview, gross observations, “sixth sense”
- Do not require a full set of vital signs
- Unsafe for the patient to wait
  - Suggestive of a condition that could easily deteriorate
  - Symptoms of a condition that’s treatment is time sensitive
  - Potential major life or organ threat
Examples of “High Risk”

- Episode of chest pain, denies other symptoms, known cardiac history
- R/O PE
- Newborn with a fever
- Rule out ectopic pregnancy
- Neutropenia with a fever
- Suicidal/homicidal
- Needlestick in a healthcare worker
Decision Point B

*Is the patient confused, lethargic or disoriented?*

- Is there an **acute** change in level of consciousness?
- Is this a situation where the brain is structurally or chemically compromised?
Examples

• New onset of confusion in an elderly patient

• 30 year old with a known brain tumor whose wife reports that he is confused

• Adolescent found confused and disoriented
Decision Point B

*Is this patient in severe pain or distress?*

- **Is this patient currently in pain?**
  - Pain is subjective
  - *It is whatever the patient says it is!*
  - How can we quantify it?
  - Research based
  - Documented on all ED patients
Pain Scale

0-10 Numeric Pain Intensity Scale

0 1 2 3 4 5 6 7 8 9 10

No Pain 1 2 3 4 Moderate Pain 5 6 7 8 9 10 Worst Possible Pain

Pain Scale

Wong-Baker FACES Pain Rating Scale

<table>
<thead>
<tr>
<th>Alternate Coding</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hurt</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Hurts Little Bit</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Hurts Little More</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Hurts Even More</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Hurts Whole Lot</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Hurts Worst</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>

Decision Point B

Is this patient in severe pain or distress?

Is this patient currently in pain?
  • Pain intensity rating
  • Chief complaint
  • PMH, medications
  • VS, Physical assessment findings

Assign ESI Level 2 if and only if:
  – Self reported 7/10 or greater
  – AND
    • RN cannot intervene AND they require immediate intervention
    • Do you want to give your last bed to this patient???
ESI Level 2 Pain Examples

- Kidney stone
- Burn victim
- Oncology patients
- Possible dislocated shoulder
- ? Compartment syndrome
Decision Point B

*Is this patient in distress?*

Physiological or Psychological

Sexual assault victim
Combative patient
Homicidal/suicidal patient
Bipolar patient who is manic
Acute grief reaction
Known alcoholic with minor head trauma
Examples of ESI Level 2

- Patient with severe flank pain, vomiting with a hx of renal colic
- Patient with burns to both arms
- Patient with a dislocated shoulder, pain rated as a 10+, diaphoretic, tearful
- Psychiatric patient who is screaming obscenities
ESI Level 2

• With ESI v3 25-35% of patients
• 50-60% are hospitalized
• Many require ICU or telemetry beds
Decision Point C

How many resources?

• Determined by the experienced ED RN at triage
• Based on the standard of care
• Independent of type of hospital, location, physician on duty, acuity of the department
How many different resources are needed?

- None: 5
- One: 4
- 2 or more: Vital Signs (3)
**Resources:** Count number of *different types* of resources, not individual tests or x-rays (ex: CBC, electrolytes, and coags equal one resource; CBC plus chest x-ray equals two resources.)

<table>
<thead>
<tr>
<th>Resources</th>
<th>Not Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labs (blood, urine)</td>
<td>History &amp; physical (including pelvic)</td>
</tr>
<tr>
<td>ECG, x-ray</td>
<td>Point-of-care testing</td>
</tr>
<tr>
<td>CT, MRI, ultrasound, angiography</td>
<td>Saline or heplock</td>
</tr>
<tr>
<td>IV fluids (hydration)</td>
<td></td>
</tr>
<tr>
<td>IV or IM or nebulized medications</td>
<td>PO medications</td>
</tr>
<tr>
<td></td>
<td>Tetanus immunization</td>
</tr>
<tr>
<td></td>
<td>Prescription refills</td>
</tr>
<tr>
<td>Specialty consultation</td>
<td>Phone call to PCP</td>
</tr>
<tr>
<td>Simple procedure = 1</td>
<td>Simple wound care</td>
</tr>
<tr>
<td>(lac repair, foley cath)</td>
<td>(dressings, recheck)</td>
</tr>
<tr>
<td>Complex procedure = 2</td>
<td>Crutches, splints, slings</td>
</tr>
<tr>
<td>(conscious sedation)</td>
<td></td>
</tr>
</tbody>
</table>
ESI Level 5

• No resources
• Examples
  – Healthy 10 year old with “poison ivy”
  – Healthy 52 year old who ran out of his blood pressure medicine yesterday
  – 22 year old, involved in a car accident 2 days ago, wants to be checked. Nothing hurts.
  – 46 year old with a cold
ESI Level 4

- Stable, can safely wait hours to be seen
- Care by mid-level providers in fast track or express care setting
- Requires a physical exam and one resource
ESI Level 4

• Examples
  – Healthy 19 year old with a sore throat and fever
  – Healthy 29 year old with a UTI, denies vaginal discharge
  – Healthy 43 year old with a stubbed toe
    – “I think I broke it!”
  – Healthy 12 year old with a minor thumb laceration
ESI Level 3

- 30-40% of patients seen in the ED
- Require in-depth evaluation
- Long length of stay
- Before assigning a patient to ESI Level 3 the nurse must consider the patient's vital signs
Decision Point D
What are the patient’s vital signs?

- **consider** the vital signs
  - Are they outside the acceptable parameters for age?
  - If unacceptable, **consider up-triage to ESI Level 2**

<table>
<thead>
<tr>
<th>Danger Zone Vitals?</th>
<th>&lt; 3m</th>
<th>3m-3y</th>
<th>3-8y</th>
<th>&gt; 8y</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>&gt; 180</td>
<td>&gt; 160</td>
<td>&gt; 140</td>
<td>&gt; 100</td>
</tr>
<tr>
<td>RR</td>
<td>&gt; 50</td>
<td>&gt; 40</td>
<td>&gt; 30</td>
<td>&gt; 20</td>
</tr>
<tr>
<td>SaO₂ &lt; 92%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
Pediatric Fever Criteria

- 1 to 28 days of age: assign at least ESI 2 if temp >38.0 C (100.4F)
- 1-3 months of age: consider assigning ESI 2 if temp >38.0 C (100.4F)
- 3 months to 3 yrs of age: consider assigning ESI 3 if: temp >39.0 C (102.2 F), or incomplete immunizations, or no obvious source of fever
Frequently Asked Questions
Do I have to upgrade a patient’s triage level if the pain rating is 7/10 or greater?
ESI Level 3, 4, or 5 Examples

- **ESI Level 3**
  - Fracture ankle
  - Abdominal pain
  - Most migraines

- **ESI Level 4**
  - Sprained ankle, toe
  - Abscess

- **ESI Level 5**
  - Toothache
Do I have to upgrade the patient’s triage level if their heart rate is 104?
If my patient is always confused are they automatically assigned ESI Level 2?
Does ESI identify time to reassessment for each triage level?
What do I do with ambulance patients? Does their triage score change if I don’t want them in the waiting room?
ESI Triage Algorithm, v4

1. requires immediate life-saving intervention? yes → 1
   no →

2. high risk situation? yes → 2
   or
   confused/lethargic/disoriented? yes →
   or
   severe pain/distress? no →
   no →

3. how many different resources are needed? none →
   one →
   many →
   consider danger zone vitals?
   yes →
   no →

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**Notes:**

A. Immediate life-saving intervention required: airway, medications, or other hemodynamic interventions, or any of the following clinical conditions: intubated, apneic, pulseless, severe respiratory distress, \( \text{SpO}_2 < 90 \), acute mental status changes, or unresponsive.

Unresponsiveness is defined as a patient that is either:

1. nonverbal and not following commands (acutely); or  
2. requires noxious stimulus (P) or unresponsive (U) on AVPU scale.

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

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

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

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| -Complex procedure = 2  
  (conscious sedation) | -Crutches, splints, slings |

D. **Danger Zone Vital Signs**

Consider uptriage to ESI 2 if any vital sign criterion is exceeded.

**Pediatric Fever Considerations**

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

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

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

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