All India Institute of Medical Sciences Triage Protocol (ATP): ATP of a Busy Emergency Department

Emergency department (ED), the specialty of undifferentiated resuscitation and care, caters all patients irrespective of their age, gender, social status, or disease condition. In doing so, the demand almost always outstrips the supply. To handle this demand-supply mismatch, ED triage is one of the measures. It is a carefully structured process in which patients are categorized to subsequent groups according to the severity of their presenting condition.[1]

Variety of triage systems are applied in different hospitals to best suit the given resource availability, economic situation, and patient capacity of each ED.[2] The more popular variants of the triage system with good reported reliability rates are Emergency Severity Index (ESI), Canadian Triage and Acuity Scale (CTAS), Manchester Triage System (MTS), and Australasian Triage Scale (ATS).[3] These are five-level triage systems with decreasing order of severity.

ESI used in EDs of USA, categorizes treatment priority on the basis of disease severity and the expected resource needs. The triage algorithm consists of four decision points.[4] CTAS widely used in EDs of Canada, has an extensive list of presenting clinical symptoms (i.e., the Canadian ED Information Systems complaint list) to determine the triage level.[5] MTS is used in EDs in Europe, has a different approach. The patient's presenting complaints are allocated to 1 of the 53 flowchart diagrams, followed by the use of key discriminators to determine the priority.[6] The ATS has been used in Australian EDs which has five categories defined by a time limit within first contact with emergency medicine (EM) physician should be done.[7]

India, with the second largest population of world, is one of the countries with highest burden of emergencies.[8] However, the history of EM in India is just few years old.[9] Currently, there is no evidence-based ED triage system available in the country. Here, we at, All India Institute of Medical Sciences (AIIMS), New Delhi, one of the premier medical institutes in the country; has been using an innovative ED triage protocol since 2010. Yearly, we receive approximately 1.5 lakh patients in our ED (trauma and nontrauma patients). Before 2010, patients in our ED were managed without any formal triage. It was difficult to use any of these internationally accepted five-tier complex algorithm-based triage systems because of huge daily burden of patients, limited trained emergency physicians, unavailability of trained personnel for triage, and hospital support staffs those who facilitate patient flow are mostly uneducated. Even some of the acceptable triage systems create confusion for untrained hospital staffs due to different numbers, colors, and severity. Hence, we developed in-hospital AIIMS Triage Protocol (ATP) from the color pattern-based simple triage and rapid treatment protocol used in disaster situations.[10] In a pilot study at AIIMS, we found that this protocol can reduce overtriage and undertriage rates.[11]

We are going to discuss the ATP in terms of its evolution, components, relevance to the community, adoption in different parts of country, comparison with international systems, and future prospects.

Patients in the ED triage area are triaged into traffic-color coded "Red," "Yellow," and "Green" categories, by a triage nurse in the triage area. Patients who need immediate care are categorized as "Red;" defined by the presence of any altered physiological parameters, any time-sensitive conditions or conditions with increased urgency [Details in Supplementary Material]. Yellow-triaged patients are those who have no "Red" criteria but have semi-urgent conditions needing admission for monitoring, evaluation, and treatment. Green-triaged patients are given minor treatment and discharged.

For harmonization of initial triage decision with care delivery, our ED is divided into respective Red, Yellow, and Green areas. This color concept is so easy that support staffs such as hospital attendants and patients' relatives do not find difficult to comprehend the severity and timeliness of condition. From triage area, color-coded floor-signages for specific zones are there to shift the patients easily. All "Red" and "Yellow" triaged patients are tagged with respective color bands for easy identification. In the respective areas, all necessary equipment, medication, and workforce are available round the clock. Telephonic consultations to different specialties and laboratory investigations including imaging are always done with a mention of triage category to fast-track "Red" patient's care. Emergency physicians may sometimes do retriage to decongest the zones.

Comparing ATP with other international triage systems, we found that ESI – 1 and 2; CTAS – I, II, and III; MTS – 1 and 2; and ATS – 1, 2, and 3 partially matches with "Red" category. ATP "yellow" cadre is somewhat similar to ESI – 3 and 4; CTAS – IV; MTS – 3; and ATS – 4. ATP "Green" category matches with MTS – 4 and category – 5 of all systems [Tables 1 and 2].

Table 1: Comparison of three-tier All India Institute of Medical Science Triage Protocol with Internationally available five-tier triage systems, i.e., Emergency Severity Index, Canadian Triage and Acuity Scale, Manchester Triage System, and Australasian Triage Scale - Detailed comparison

ATP	ESI	Description
Red	1	Requires immediate life-saving interventions
Red	2	High-risk situation or confused/lethargic/disoriented or severe pain/distress or danger-zone vitals
Yellow	3	Needing "many" resources but nondanger zone vital signs
Yellow	4	Needing only one resource
Green	5	No resource needed
ATP	**CTAS**	**Description**
Red	I	Resuscitation
Red	II	Emergent
Red	III	Urgent
Yellow	IV	Less urgent
Green	V	Nonurgent
ATP	**MTS**	**Description**
Red	1	Immediate
Red	2	Very urgent
Yellow	3	Urgent
Green	4	Standard
Green	5	Nonurgent
ATP	**ATS**	**Description**
Red	1	Immediately life-threatening
Red	2	Imminent life-threatening or time-critical condition
Red	3	Potentially life-threatening or situational urgency
Yellow	4	Potentially serious
Green	5	Less urgent

Color coding in ATP column denotes color codes of All India Institute of Medical Sciences Triage Protocol. Color codes in the rest two columns denote the color codes being used by respective triage protocols. ATP: All India Institute of Medical Science Triage Protocol, ESI: Emergency Severity Index, CTAS: Canadian Triage and Acuity Scale, MTS: Manchester Triage System, ATS: Australasian Triage Scale

Table 2: Comparison of three-tier All India Institute of Medical Science Triage Protocol with Internationally available five-tier triage systems, i.e., Emergency Severity Index, Canadian Triage and Acuity Scale, Manchester Triage System and Australasian Triage Scale

ATP category	ESI category	CTAS category	MTS category	ATS category
Red	1, 2	I, II, III	1, 2	1, 2, 3
Yellow	3, 4	IV	3	4
Green	5	V	4, 5	5

ATP: All India Institute of Medical Science Triage Protocol, ESI: Emergency Severity Index, CTAS: Canadian Triage and Acuity Scale, MTS: Manchester Triage System, ATS: Australasian Triage Scale

Some centers in India, like AIIMS Bhubaneswar, CMC Vellore, and GTB Delhi, have adopted and modified ATP for their ED. Even the Directorate of Health Services in state of Kerala has adopted similar protocol for use in medical colleges and community hospitals like district hospitals and community health centers.[12]

Now, we are conducting a prospective study for validation of ATP in AIIMS ED with a sample size of 10,000 and utilization of it in predicting mortality at 24 h, at 7 days and proportion of intensive care unit admission.

Although well-reliable, internationally available triage systems are applicable to Western countries, the applicability of these in ED with high volume of patients but with less trained-personnel is a concern. We propose that ATP can be used in these locations and act as an energy for the ED patient management (hence compared to ATP – adenosine triphosphate, energy currency of cellular metabolism).

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