446

Telephonic Triage for Medical Emergencies: From discreet classification systems to the continuum of "Urgency Levels"

Lazzati E., Urteaga I., Pattin D.

Objective:
Ensure the continuous improvement of the quality of our telephonic triage expert system through self-learning tools.

Methods:
IHSA is a company aimed at providing medical prehospital services in emergencies and non-emergencies to a portfolio of 1.500.000 affiliates over 1.000 km2.

The process begins when a caller asks for assistance to the health center. The operator decides what resource is the most appropriate for the incident described. However, he may misqualify the event and cause an excess or shortage of resources. Overqualification occurs when the resource is faster or more complex than what is actually needed; on the other hand under qualification takes place when the resource is too simple or slow to satisfy the demand.

While over qualification is due to an inadequate use of the budget, under qualification usually puts the patient's life or condition at risk.

In the past, this kind of decision was in the hands of highly qualified operators supported by doctors that worked within the dispatch center and dealt with the doubtful cases.

IHSA has developed an expert system based on a decision tree that guides the questioning process and advices on the kind of resource that should be sent.

In turn, the doctors who render the services also assess the severity of the incidents after examining the patients and inform what resource they consider should have been chosen, providing their feedback to the database.

The study of the differences between the resources that were sent and those that were actually needed serves to build the metrics that are used to evaluate the triage process and becomes the bases and guidelines for all continuous improvement plans.

The information stored after an appropriate filtering process has therefore helped to develop a knowledge base based on AI techniques that serves to optimize the performance of the expert system considering the evidence that has been collected.

The self-learning process has made it necessary to follow an objective criteria so as to order the different paths in the decision tree and decide on the relative urgency of the incidents.

This order enables the system to work with any resource-type scheme, no matter if it has 3, 4 or 5 classification levels since it is possible to assess the relative urgency of each path on a continuous scale.

Results:
This expert system has made it possible to diminish the subjectivity inherent to human operations and to store all signs and symptoms described by the callers, therefore enlarging the system database.
Its main objective consists in distinguishing the cases that require faster and more complex resources (VPP o target) in order to reduce the scope of complex resources while keeping the service level unaffected (sensitivity) as seen in the "Target" Model (www.ihsatest.com.ar).

Until now the following results have been obtained:
a)   The Sensitivity (Metric of the ratio between the complex services committed and that actually needed) has gone from 65% to 85% in three years and is still climbing.
b)   The deaths statistically related to triage errors are between one and two orders of magnitude bellow the same figure for other systems using traditional triage tools. (Human based)
c)   The tools for prioritizing calls in any kind of situation have been developed and tested in a real operation

Conclusions:
a)   The expert triage system has clear and distinct advantages over the traditional human based decision process.
b)   The self-learning procedures have raised the metrics beyond the historic values.
c)   The continuous improvement methodology is favoured by the systemic approach.

It will be necessary to improve the triage tool in order to overcome some limitations of the decision tree structure.