

## Psychological aspects of decision-making in emergency rescue services

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### Summary:

The ability to make quick and accurate decisions in medical rescue directly influences patient survival and condition. The effectiveness of rescue operations in events involving large number of casualties depends primarily on the speed of decision-making and skillful use of available staff and equipment, i.e. the management system. Personnel qualifications are of secondary importance. Medical rescue teams act under the pressure of time, in the absence of complete information, in situations of high complexity and difficulty, often under pressure from the environment. In this publication we present the mechanisms of decision-making in medical rescue and psychological aspects of errors.

**Key words:** decisions, medical rescue.

According to classical theories, decision is a conscious choice of an action from a set of possible actions, while making a decision is a process that involves gathering and processing information regarding future actions. The more complex the decision process, the more complicated are the sequences of decision-making. Decision-making usually requires a long chain of complex cognitive processes, i.e. thinking and reasoning aided by attention, short-term memory and long-term memory. Decision-making actions lead to a choice of one or two of many possibilities. They may also lead to an alternative choice: we choose option A if conditions X are met and option B if conditions Y are present [1].

Decision-making process consists of three phases, only one of which actually involves making a choice [2]. Before that, there is a pre-decision phase, which involves defining the problem and

gathering the necessary information. Another action taken in this phase involves gathering information on the problem, particularly taking into consideration possible decision variants. The next phase of the act of making a decision, the actual process of coming to a resolution, consists of choosing one possibility from a set of those previously considered attainable. In the second phase, the importance of gathered information on the available prospects is evaluated.

Evaluation is greatly influenced by one's experience. Personality features and temper e.g. risk aversion; also play a role [3,4,5,6]. However, it is of crucial importance whether one is an expert in a given field. Experts, thanks to acquired knowledge and developed inference schemes, concentrate on relevant information and ignore insignificant ones. Post-decision processes take place in the third phase of decision-making.

Typically, doubts emerge with regard to whether the best possible option was chosen.

Despite the universality of decision-making processes we rarely consciously experience the entire process of coming to a decision. Often, a significant part of the process takes place in the subconscious or semi-conscious.

Many decisions are made under great pressure of time. Some of those decisions are automatic or controlled actions. The automatic ones do not involve consciousness, do not require a lot of attention, run in parallel and are made quickly in case of known, simple tasks. The latter involve consciousness, require a great deal of attention and precede in sequence, which means that the next action may be taken only when the previous one is finished. Controlled processes run relatively slowly because the action itself is complicated or poorly mastered. They are involved in new, difficult and risky tasks. Most actual decision-making situations are associated with risks [4].

Risky decisions may result in success or failure. A decision to perform a dangerous surgery may lead to both desirable and unwanted effects, may bring benefits or cause losses. At the moment of making a decision one has no means of predicting the outcome. These types of situations are considered risky [4, 5, 6].

The most typical error resulting from the pressure of time is excessive selectivity in collecting information necessary for full assessment of the situation. The error relates to the fact that only the information consistent with our previous attitude reaches the consciousness. Another mistake made in difficult situations under time pressure is searching for primarily negative information among all available alternatives.

The necessity of effective and quick decision-making as well as lack of awareness of the processes associated with making a choice causes us to refer to and use heuristics and patterns that are encoded and function in our brains.

Heuristics are simplified methods of making decisions in situations where the number of variants exceeds the capability to evaluate all of them, particularly when the time and information is sparse. Due to simple and compact

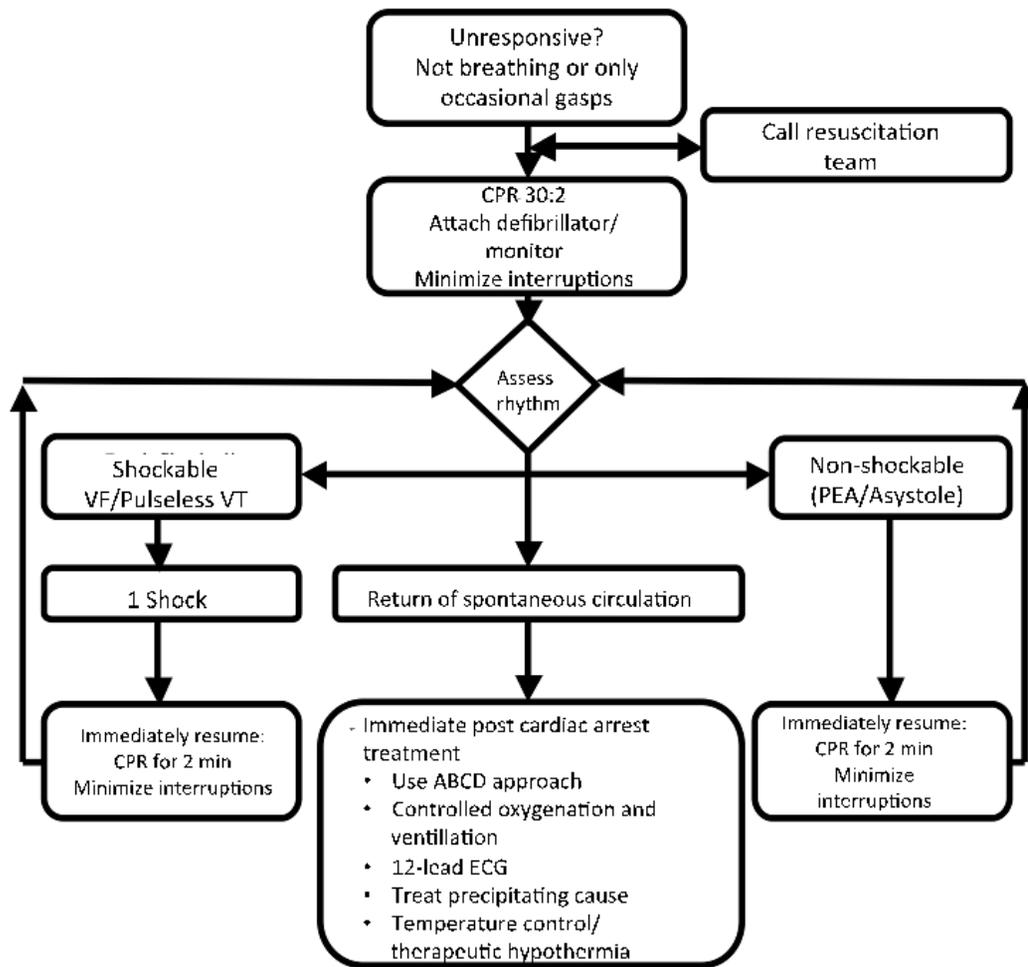
heuristics one may deal even with very complex situation in a short period of time, which would not be possible if he/she tried to encompass the entire problem in all its complexity. The following rules are examples of heuristics: „follow what is most important” or „follow what is proven to be effective”. On one hand it allows to function effectively on the basis of analogies and similar experiences, without the necessity of performing detailed analysis every time. On the other hand, it exposes us to the risk of errors. Therefore, decision-making often involves balancing on the border of schematic simplifications, time-consuming critical analysis of a situation and acceptable risk ensuing from so-called human factor [7, 8, 9, 10].

Standardization is present in many fields of science and everyday life e.g. in medical emergency rescue [10, 11]. Algorithms and norms constitute valid standards of conduct that set the limits of risk.

Failure to fulfill one of those procedures or to comply with their order leads to the eventuality of criminal or civil liability. Algorithms and standards of emergency rescue developed by experts on the basis of research and reported cases constitute a special type of schemes and heuristics. They describe the procedure, sequence of actions and expected results of those actions. In practice, algorithms allow formation of almost automatically triggered schematic sequences of actions.

Procedures and algorithms, apart from identifying the input data, i.e. the degree of merit involved in making a decision, determine the methods of their analysis and interpretation, also clearly indicate the choices that should be made in specified cases and what actions should be undertaken. Due to standardization, rescue procedures ensure the proper and optimal outcome of action necessary in life-threatening and health-threatening situations, i.e. adapted to patient's state, applied in the shortest possible time, focused on the most important aspects of securing vital functions and protection of health.

Procedures based on an „if...then” principle or their sum often constitute decisions of selective nature, excluding the alternatives and pointing to the proper choice.



**Figure 1:** Advanced life support universal algorithm according to 2010 ERC guidelines [10]

The best example of this type of decision is a decision tree describing a procedure of medical triage according to START system [12, 11]. The procedure itself, which is a sequence of selections allows for quick assessment of casualties and undertaking adequate actions.

Transparent and clear sequences of decisions allow increasing the accuracy of actions and effectiveness of the procedure. However, increasingly often simulations show that models that are effective in theory turn out to be much less dependable in practice. Research shows that so-called „human factors” should be taken into consideration in decision models.

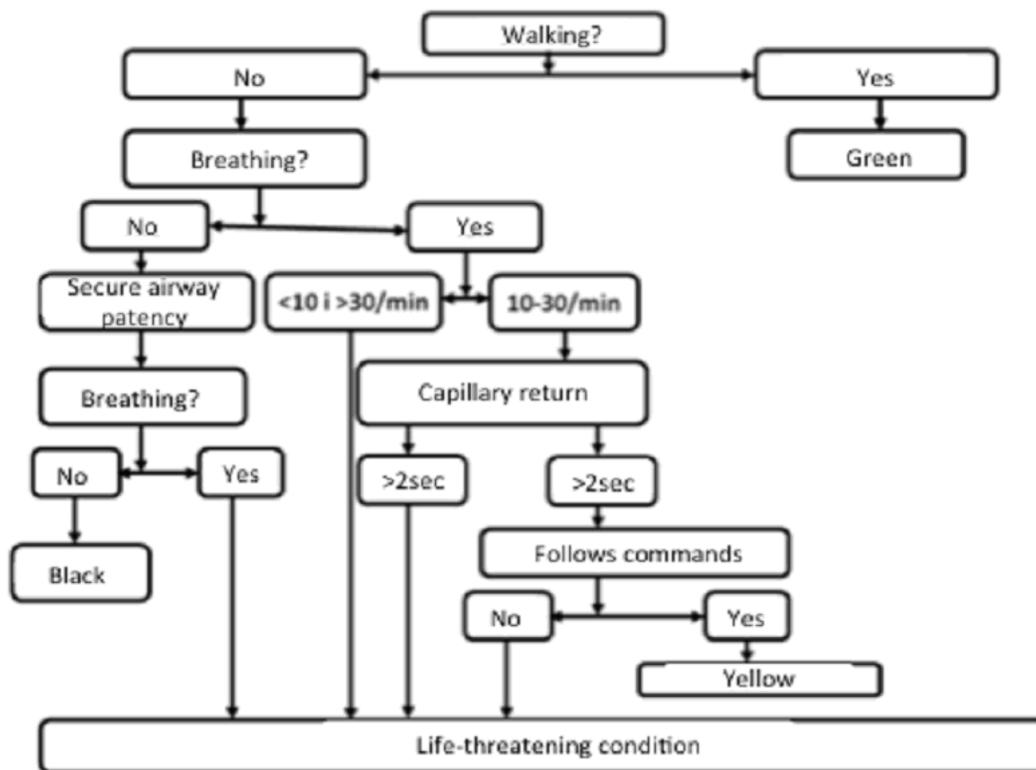
One of the main psychological factors significantly influencing the decision-making processes in emergency situations is stress and mechanisms associated with it that affect assessment,

perception, ability to relativize information, narrowing of the attention field [1, 4, 13].

Liability of the situation, lack of clarity or dynamism as well as change influences the process of evaluation, the speed of analytical processes and the actions themselves.

Personality traits, including an individual inclination toward involvement in risky situations, are also of great significance. Human factors include both cognitive factors influencing decisions on an individual level, as well as social and interpersonal ones that result from team interactions.

Predispositions, emotional and motivational aspects as well as individual expectations or susceptibility to bias are also of importance for decision outcomes.



**Figure 2:** Medical triage algorithm according to the START system

The ability to predict the after-effects and consequences of our choices is also crucial for the decision-making process. Therefore, in some sense, decision-making processes are related to estimation of probability of event occurrence as a result of our choices and actions. At the moment of making a decision regarding application of a given medical procedure or drug, the doctor or paramedic in fact simultaneously predicts the results and consequences of his/her decisions and actions, sometimes several decision sequences ahead.

When making a decision, we refer to our previous experiences and knowledge gathered from successive experiences.

Fallibility of standards and algorithms in medical procedures caused by psychosocial factors related to human nature does not predetermine inevitability of errors.

Hence, the necessity of developing critical thinking skills as a tool for understanding of operative

procedures and building the awareness of limitations, risks and sources of errors.

Adherence to procedure algorithms does not mean that we are exempt from understanding of their mechanisms and validity. Research and analyses performed up to date regarding the level of their effectiveness and correctness of their application clearly indicate the necessity to control the propriety of choices based on procedures, but also the necessity to perpetuate schemes and heuristics through increasing their availability, broadening the scope of experiences and, simultaneously, probability of event occurrence.

Observations of simulated situations indicate that causes of errors and difficulties are related not so much to the lack of sufficient medical knowledge allowing to make accurate decisions, but to inability to apply knowledge, problems dealing with one's own emotions, team interactions and experienced tension, as well as sense of pressure, but also with the necessity to lead a team, make critical decisions and take responsibility. [4, 5, 13].

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