МЕДИЦИНСКЕ НАУКЕ / MEDICAL SCIENCES
ПРИКАЗ МОНОГРАФИЈЕ / MONOGRAPH REVIEW

ПРОЦЕНА РИЗИКА У КАРДИОХИРУРГИЈИ

RISK ASSESSMENT IN CARDIAC SURGERY

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The monograph represents an overview of risk assessment tools and algorithms currently used in modern cardiac surgery practice. Risk assessment models are particularly beneficial for the purpose of data transformation into clear and understandable form. This is especially true in the field of medical science, where the presentation of risk to the patient provides the basis for informed consent. Achieving these objectives involves access to relevant facts and usage of existing knowledge and experience in analyzing and recognizing relationships between different phenomena. This process can be significantly aggravated by insufficient, unreliable or unavailable data. Additionally, the analysis may be incomplete or inaccurate, just in the case of improper analysis strategy selection.

The author of the monograph has provided a concise and critical review of the preoperative, operative and postoperative risk factors that may influence the final outcome of the surgery. Each phase of the treatment might have different underlying mechanism and impact on the surgical outcome. Outcome prediction in cardiac surgery, just like in any other type of surgery, largely depends on preoperative risk factors. These factors reflect the severity of the patient condition. In addition, to some degree, the outcome of cardiac interventions depends on factors that are related to the operation – any time possible contingencies that may affect the outcome of surgery (bleeding, rupture of the aorta, anastomotic dehiscence, acute ventricular failure, etc.). Postoperative course and postoperative management of the patient could also determine the final success of the specific operation.

Applications of risk prediction models, beyond patient-specific risk assessment, are also covered in details in this monograph. The importance of these models can be established from the various aspects of the health-care process (patients, doctors, hospitals and authorities). Besides patient's informed consent, a family has to be informed about the risk that specific surgical treatment carries. Impact on improving health care system is reflected through the establishment of guidelines for the treatment of certain diseases and conditions that are based on the categorization of patients in relation to the degree of risk. Realistic risk prediction could provide adequate hospital resource allocation and management, for example, the number of beds in intensive care unit.

Especially appealing is the concept of reimbursement according to the severity of patient's status – pay for performance.

Dr. Velicki explained in details the statistical background of the most current risk assessment models in contemporary cardiac surgery practice. Application of statistical modeling in medicine refers to the establishment of relationships that exist between risk factors and outcomes of an intervention. In this sense, the model can be viewed as a *black box* making a connection between a number of independent predictors (risk factors for a specific outcome) and the outcome itself. Inside the *black box*, a mathematical mechanism that establishes the relationship between risk factors and outcomes is defined. The influence of other factors not designated as risk factors is expressed through the constant of the model. When the impact of each risk factor in a particular population is defined, it becomes possible to determine the likelihood of a particular outcome given the specific combination of risk factors. The most commonly used models for risk assessment in contemporary cardiac surgery, including EuroSCORE, STS score, Veterans Affairs Administration and Parsonnet scores, are based on binary logistic regression. Although models based on logistic regression are the most common ones, biostatisticians propose alternatives to this approach including models based on Bayesian statistics, additive models, models based on cluster analysis combined with clinical assessment, classification and regression trees, an approach based on the analysis of components aiming at reducing the number of predictors and causal logistic regression.

The monograph also explains the basis of models and techniques used for the individual assessment of surgical success or success of specific therapeutic strategies. A detailed overview of CuSUM charts, learning curves and other methods are presented in the book.

In conclusion, the author emphasized the importance of risk prediction in every-day clinical practice, especially in cardiac surgery. For this reason, healthcare workers are strongly advised to become familiar with analytical techniques used for monitoring and evaluation of the outcome, success, and quality of health services.

Монографија пружа детаљан приказ савремених модела за процену и стратификацију ризика у модерној кардиохируршкој пракси. Образлаже се њихов значај, како са аспекта болесника и његове породице, тако и са аспекта адекватне алокације ресурса, организовања медицинске службе као и унапређења свеукупног здравственог система. Детаљно су приказане статистичке методе које се користе у моделима за процену ризика као и начин креирања сопственог модела. Систематично су приказани најзначајнији преоперативни, оперативни и постоперативни фактори ризика који, у већој или мањој мери, могу утицати на коначни исход кардиохируршке операције. Аутор, такође, анализира и разматра резултате других група које су се бавиле проценом ризика у кардиохирургији, упоређујући успех установе у којој ради са еминентним светским центрима. У закључку је наглашен значај континуираног праћења и евалуације резултата рада путем модела за процену ризика чиме се пружа основ за унапређење квалитета рада појединца, установе и свеопштег здравственог система.