

FUNCTIONALITY OF SPECIAL EQUIPMENT MADE FOR SURGEONS

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Abstract: *This article presents results of study on functional analysis equipment for surgeons to identify special requirements imposed by carriers, to identify topographical areas liable to various applications, analysis the character of applications affecting special equipment.*

Keywords: *functional analysis, equipment for surgeons, special equipment.*

1 INTRODUCTION

Functionality of equipment that doctors use directly affects the quality of services offered by them. Compliance functionality requirements, especially in the surgeons work involving applications of different nature more complex than the work of other medical specialties, would help ensure favorable microclimate, safety and protection of their health. Controversial discussions about the need for special equipment assigned to certain stereotypes with reference to the cut, design and technological solution, color raises again the problem of special equipment for surgeons.

2 SCOPE OF THE SURGEONS

Scope of the surgeons concerns surgery representing the medical specialty that treats diseases or injuries by operative manual and instrumental interventions.

Sized surgery has specializations shown in Figure 1, each of which is characterized by risk factors, conditions and specific manipulations required to be considered in the aesthetics and technological design of special clothing equipment.

Functionality of surgical activity involves special equipment among other elements and specialized skills required is determined by goals scored by:

- development and application of surgical techniques of choice;
- identify optimal solutions for the diagnosis and surgical treatment;
- development of specific instrumentation capable of reproducing closely surgical gestures used in laparoscopic surgery;
- identify effective ways of surgery handling;
- standardization of surgical techniques operative time;
- comparative analysis of different surgical techniques;
- remote evaluation of results;
- remote survival assess;
- evaluation of immune response;
- strengthening joint work of specialists in various medical and scientific specializations;
- selection of surgical methods to reduce hospitalization time for patients;
- deepening of the most innovative aspects of surgery;
- facilitate exchange of information, views and experience among surgeons throughout the world;
- development of transplant experience;
- promoting effective surgical technologies;
- development of mixed surgical centers;
- implementation of computer technologies in surgical technology.

3 REQUIREMENTS FOR EQUIPMENT FOR SURGEONS

1. Requirements for equipment for surgeons

Equipment requirements for surgeons depend on the type of equipment and are divided into:

- multiple use equipment
- equipment for single use;
- combined equipment.

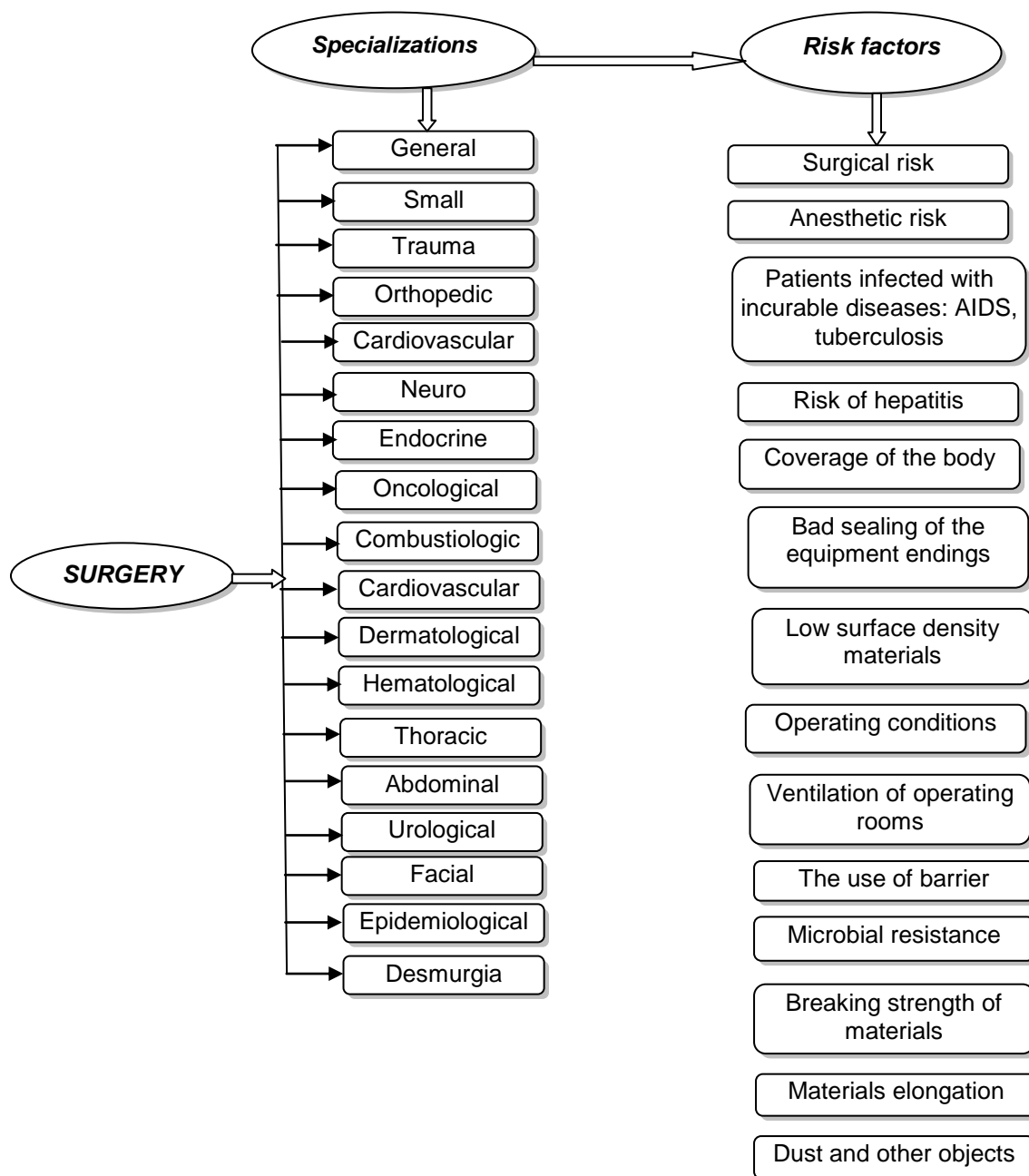


Figure 1: Surgical specializations and risk factors

In order to maintain control of safety of life of patients and medical staff European standard EN 13795 [4] governing requirements to be met given the fact that largest exposure to infection have open wounds, both formed during the surgical act and those formed under other conditions. According to it, the requirements of high priority concerns:

- dry microbial impermeability;
- wet microbial impermeability;
- microbial purity;

- impermeability to liquids;
- impermeability to dust and fibers from all sources [1-3].

Although these requirements are priority safety standards as outlined in the standard there are many other requirements that are just as important as those mentioned but not covered in this standard. These can be exemplified as follows:

- physiological comfort;
- sensory comfort;
- thermo comfort;
- the operating environment conditions: temperature, humidity;
- the material properties: mass, impermeability to liquids, surface density, air permeability, drapery, rigidity, heat resistance, conductivity, electrostatic charge;
- structural characteristics of the products: cut, size, contour lines of decorations;
- aesthetic characteristics: shape, color;
- technological characteristics of products: type of joints used, strengthening elements, etc..

Thus the design of special equipment for surgeons will be analyzed thoroughly addressed specialization, risk factors, assessment during static and dynamic surgical activity, topographical areas subject to various applications, character of applications, etc.

4 CONSTRUCTIVE-FUNCTIONAL APPROACH TO SOLVING SPECIAL EQUIPMENT

Constructive-functional approach solving special equipment for surgeons in this study is systematic and aims to obtain special equipment that would consider factors to influence priority in providing their multifunctionality (Figure 2):

- surgical field;
- risk factors;
- environmental conditions;
- operating conditions;
- ergonomic features of surgeons;
- properties of the materials dedicated for equipment manufacture;
- topography areas subject to applications;
- applications character;
- variations of applications character.

5 ANALYSIS FUNCTIONS OF THE EQUIPMENT FOR SURGEONS

Meeting requirements submitted to special equipment needs to identify their functions (table 1).

Table 1: Functions of special equipment destined surgeons

Group of functions						
Usual					Aesthetic-informational	
Protective	Funcțional	Ergonomic	Reliability	Economic	Aesthetic	Informational
Microbial protection	Ensure carrying out surgery	Anthropometric compliance: <ul style="list-style-type: none"> • in static • dynamic. 	Stabile shape	Minimal cost	Compliance with the image and aesthetic requirements of the medical institution	Information about product
Protection of action of infectious diseases agents	Product compliance with predestination surgical field	Psychophysiological compliance: <ul style="list-style-type: none"> • the perception; • tactile; • convenience of using small elements and parts system, 	Strength of materials		Aesthetic concept compliance with the surgeons activity	Information about carriers preferences

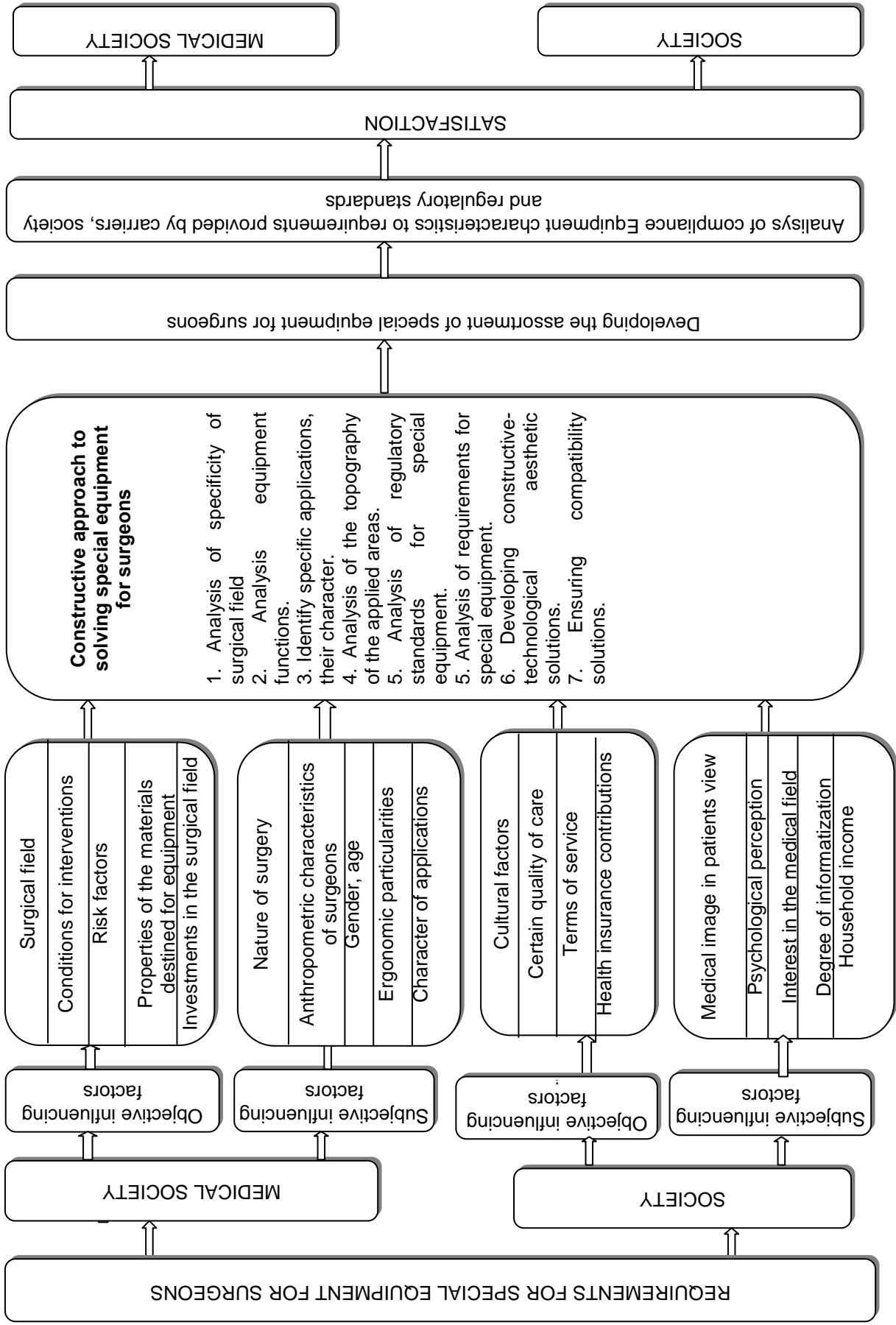


Figure 2: Functional approach to solving construction equipment for surgeons

Table 1: Functions of special equipment destined surgeons

Group of functions						
Usual					Aesthetic-informational	
Protective	Funcțional	Ergonomic	Reliability	Economic	Aesthetic	Informational
Protection from influence of the clinical environment	Ensure joints seal	Physiologic-hygiene compliance: • comfort of thermal conductivity; • hemodynamic maintenance; • ensuring under clothes microclimate.	Joints resistance		Quality of manufacture and finishing products with their aesthetic implications	
Protection from hospital resistant microflora action	Ensure the barrier properties of materials and joints	Providing easy dressing			Conformity of the products with fashion trends	
Mechanical protection	Ensuring multifunctionality					

6 TOPOGRAPHIC ANALYSIS OF SPECIAL EQUIPMENT DESTINED SURGEONS

Special equipment for surgeons includes (Figure 3):

- clothing with general predestination;
- specialized clothing;
- products for local use;
- limited use products.

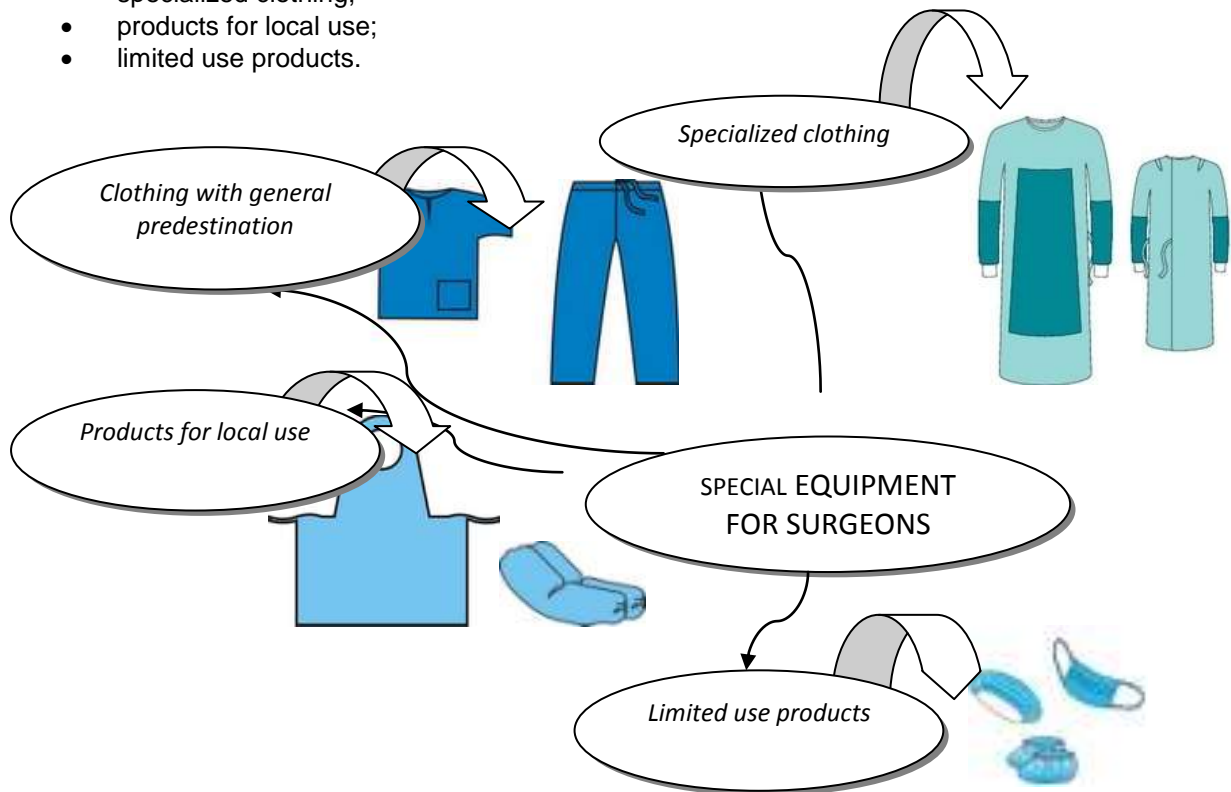


Figure 3: Special equipment components for surgeons

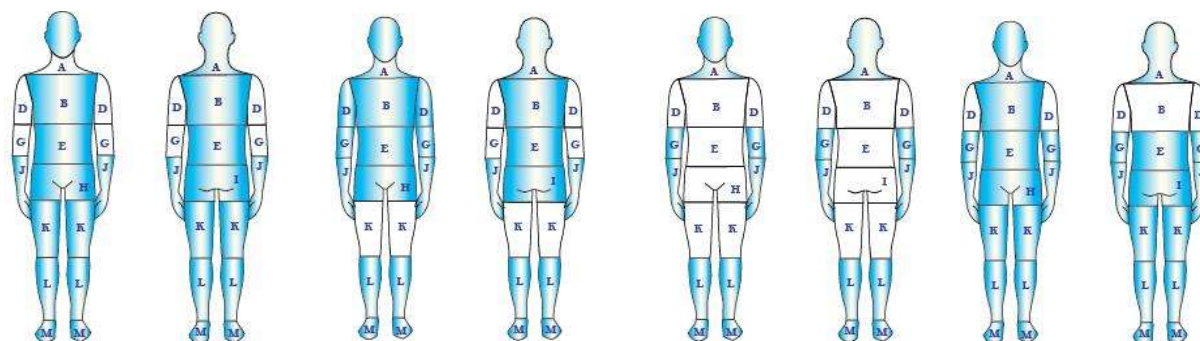


Figure 4: Topographic analysis of special equipment destined surgeons

7 CONCLUSIONS

- The functionality of the equipment that use doctors influence largely the quality of services provided by them.
- When deciding on aesthetics, design and technology of special equipment for surgeons is important to consider the surgical field, risk factors, environmental conditions, operating conditions, ergonomic features of surgeons, properties of the materials dedicated for equipment manufacture, topography areas subject to applications, applications character, variations of applications character.
- Sizing equipment components in clothing for general use, specialized clothing, products for local use, limited use products must clearly identify the product functions to ensure compliance of their solutions.
- Safety and functionality of equipment are the main functions and objectives when deciding on aesthetics, design and technology.

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