

QUALITY MANAGEMENT IN HOSPITALS AND ITS ROLE IN INFECTIONS PROVISION

Wiktor Adamus

Jagiellonian University, Kraków, Poland

E-mail: wiktor.adamus@uj.edu.pl

ABSTRACT

The paper undertakes the issue of quality management in health facilities in Poland and presents its role in prevention against infections, on the example of the Independent Public Health Care Team in Brzesko. The study aims to identify priorities for the numerical minimization of hospital infections and to develop the best model system for infection control. These priorities have been determined on the basis of interviews with the Hospital Infection Control Team i.e. microbiologists, pharmacists, and overview of the existing legislation in this regard. Decision makers, interviewed in terms of the Analytic Hierarchy Process, pointed to the determinants of hospital infections, which in their opinion had a decisive impact on reducing the number of infections in the hospital and allowed for the quantitative expression of these priorities. The paper presents an analysis of quality management in health care and assesses hospital infection control system. Based on the interviews results numerical priorities were calculated to minimize hospital infection, having a decisive impact on the quality of medical services, patient safety, their families and staff. Moreover, four alternative models of decision-making, with objective to minimize hospital infections have been developed. The best model assumes that in order to minimise the hospital infections the hospital treatment systems should mainly focus on the following criteria: introduction of a quality management system ISO 9001: 2000 accreditation, compliance procedures to ensure protection against hospital infections, microbial diagnostics, hospital antibiotic policy, improvement of the Group and Infection Control Committee hospital staff training in the principles and methods of prevention of hospital infection control, adherence to the principles of disinfection and sterilization of hospital.

Keywords: quality, management, hospital infections, control

1. Introduction

Quality improvement in health care is a relatively new and constantly developing field. The Council of Europe advises member states to create where it is possible: policies and structures supporting the development and implementation of quality management systems, supervision systems and quality improvement systems at all levels. The World Health Organization (WHO) acknowledges as its most important objective the right of each individual to the access to the best doctors, the best health care and high quality health services. Currently, hospital infections have become a global problem. They decide about the patient's safety during hospitalization and are inseparably bound with the quality of performed procedures. They are becoming more and more important in hospital management. However, the problem of controlling hospital infections

has been associated with ensuring the quality of medical services from only a few years. Despite huge improvements in treating patients, on average one out of ten hospital patients becomes infected during hospitalization. The ability to determine the quantitative expression of these priorities is extremely important in the minimization of hospital infections. The aim of this paper is to determine the most efficient numerical priorities in order to minimize the hospital infections and develop the best model of infection control system.

2. Quality management in health care

The quality category was introduced to medicine by Hippocrates. His principle “**primum non nocere**” provides proof of concern for the quality of health services which until today is respected by the representatives of medical professions.

Quality - is a degree to which each service rendered to a patient is provided in accordance with the current degree of medical certainty which increases the probability of achieving the desired effect in terms of care and reduces the probability of undesirable results (**Joint Commission On Accreditation of Healthcare Organizations-JCAHO**).

2.1. Principles of quality management in hospitals

According to the ISO 8402 norm, quality management is related to “activities connected with management which decide about the quality policy, goals and responsibility and their fulfilment as part of the quality system by means of quality planning, quality control, ensuring quality and improving quality”.

For hospitals quality means fulfilling the client’s expectations and is inextricably related to quality policy. The basis of the quality management systems is formed by **eight quality management principles**, namely: orientation towards the client, leadership, commitment of people, a process-based approach to management, constant improvement, making decisions on the basis of facts and mutually beneficial relationships with suppliers.

2.2. Quality control as an important management tool

Quality control (**QC**) – a set of functions and activities aimed at ensuring established quality standards. Quality control must be constantly improved in order to ensure its efficiency.

3. Hospital infections control system

Hospital infections constitute the main cause of many contemporary infectious diseases. They pose threats not only to the patients, but also to the hospital staff.

In 2001 as a result of changes in the infections and infectious diseases act the concept of hospital infections has been introduced to the Polish legal system. According to the current definition, a hospital infection is understood as each infection related to the patient's stay in a hospital, which is clinically diagnosed and laboratory tested, and which occurs as a result of hospitalization and manifests itself during hospital stay or after discharging the patient from the hospital.

3.1 Main causes of hospital infections

A hospital is a complex ecosystem composed of such tightly and dynamically related elements as people, micro-organisms and the environment.

3.2. Types of hospital infections

Typical hospital infections may be divided into: endogenous and exogenous ones.

4. Minimization of hospital diseases by means of the AHP method and the choice of the best hospital infections control system model

4.1. Specifying the criteria and sub-criteria of minimizing hospital infections and their priorities

The study has been conducted by means of the AHP method and makes use of the computer programme called *Super Decisions*. The research has aimed to determine those control factors of hospital infections on which emphasis needs to be placed on in order to minimize hospital infections. On the basis of a review of literature and interviews with experts the criteria and sub-criteria related to the minimization of hospital infections were specified and an AHP model of a decision problem was constructed (Fig. 1).

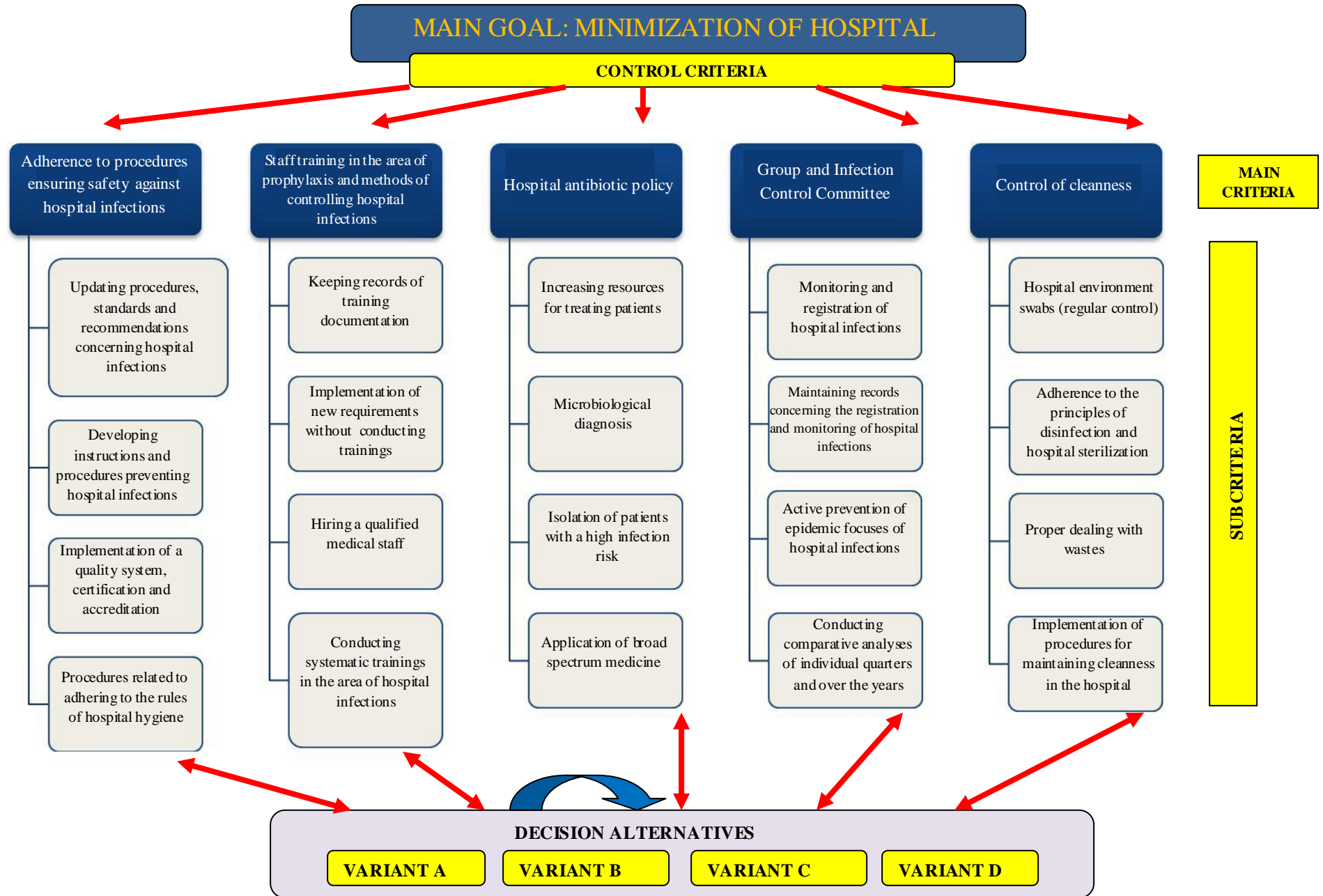


Fig. 1 AHP Model of minimization of hospital infections
 Source: Own work on the basis of experts' opinions

The next step was the measurement of intangible criteria by comparing them in pairs, each element with one another in relation to the aim (Fig. 1). Opinions expressed verbally by experts have been presented numerically by means of Saaty's fundamental scale of comparisons. For this purpose 24 interviews with experts were carried out. After performing the analysis of main criteria an analysis of sub-criteria was conducted and their priorities in the realization of the main criteria and the main goal. The calculated priority values for each of the sub-criteria constitute **local priorities**, that is priorities which express the contribution of each of the decision elements in achieving the goal on a directly higher level. In order to determine the decision alternatives in regards to the minimization of hospital infections it is necessary to determine the values of global priorities. **Global priorities** indicate the contribution of each sub-criteria in achieving the main goal. Four decision alternatives have been established – variants of the hospital infection control system model. The selection of the best variant forms the basis for the application of the hospital infection control system model.

4.2 Hospital infection control system models

On the basis of achieved priority values for four decision variants A, B, C, D, related to the hospital infection control system one model was chosen. The best model was chosen on the basis of a comparison of the importance of each of the established variants in relation to all the sub-criteria. Basing on the calculations conducted in the programme Super Decisions it turned out that the best hospital infection control system model was **variant D**, which achieved the priority of the highest value - **0,43** (Fig. 2).

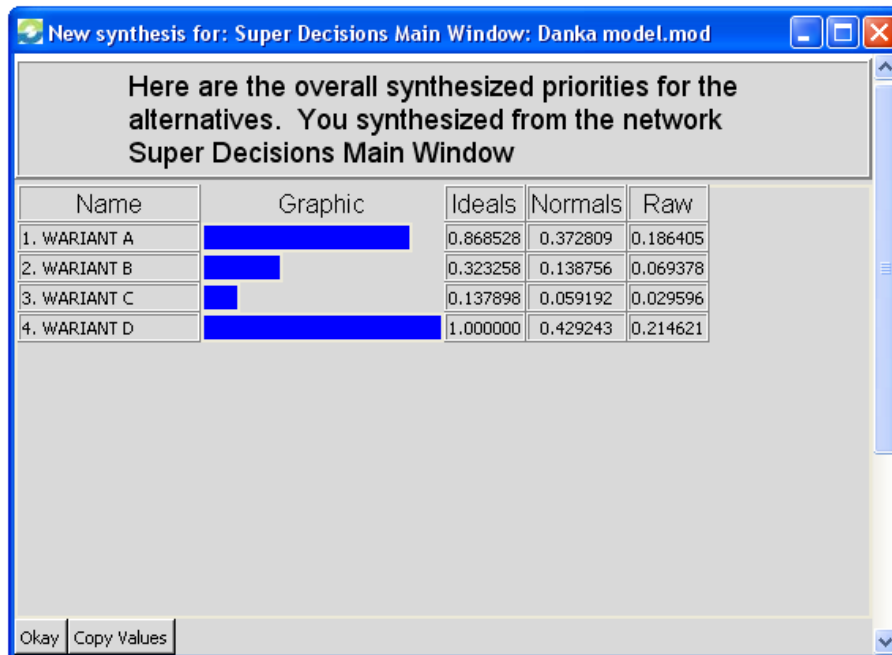


Figure 2. Priority values for models A, B, C, D.
Source: Developed with the programme *Super Decisions*

This model assumes that the most important factors in minimizing hospital infections are:

- implementation of the ISO: 2000 quality management system and accreditation,,
- compliance with the procedures ensuring protection against hospital infections,
- microbiological diagnosis,
- hospital antibiotic policy,
- Hospital Infection Control Group and Committee,
- staff training in the area of prophylaxis and methods of controlling hospital infections,
- abiding by the rules of disinfection and hospital sterilization.

All of the abovementioned elements of the hospital infection control system model constitute an inseparable whole and the lack of whichever of them will disturb its functioning and will not yield the minimization of infections. Built a modern system for hospital infection control (Fig. 3) improving the epidemiological situation in the hospital, shortening the patient's stay, reduce the cost of treatment, complications and appropriate management of antibiotics. When comparing model D with the hospital infection control system model used in the Independent Public Health Care Team in Brzesko it may be noticed that the hospital has chosen an appropriate direction in order to minimize infections.

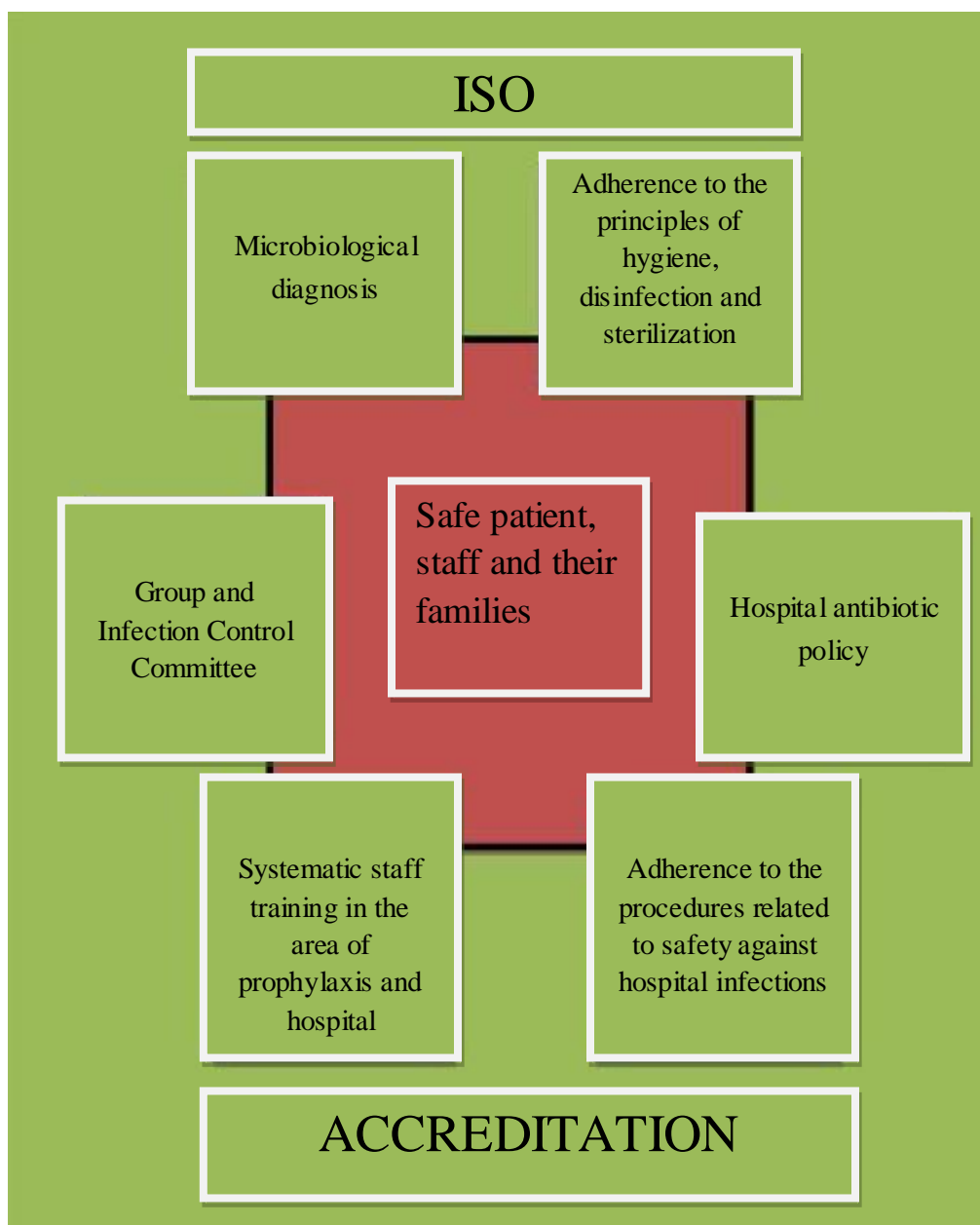


Figure 3. A hospital infection control system model for Hospital in Brzesko - Source: Own work

Conclusion

1. Use the first time in the study hospital AHP method to solve the problem of minimizing hospital infections, has proved very helpful in the evaluation and construction of the system of infection control.
2. Hospital infections pose together for a growing number of complications, mortality, and increased compensation costs of hospitalized patients. Only a properly functioning system for hospital infection control can reduce this negative impact.
3. Constructed system for infection control priority criteria identified in the process of minimizing of hospital infections, having a decisive impact on the quality of medical services, patient safety, their families and staff.
4. In order to reduce the number of hospital infections it is advisable to the implementation a test of the model system for hospital infection control at hospitals.

REFERENCES

- Adamus,W.(a) (2009). A new method of job evaluation. http://www.isahp.org/2009.Proceedings/Final_Papers/106_Adamus_REV_FIN.pdf, 20.09.2009.
- Blumenthal, A. L. (1977). *The Process of Cognition*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
- Erev, I., Cohen, B.(1990). Verbal versus numerical probabilities: Efficiency, biased, and the preference paradox. *Organizational Behavior and Human Decision Processes*, 5:1-18.
- Larichev, O. I. (1984). *Psychological validation of decision methods*. *Journal of Applied Systems Analysis*, No 11, 37-46.
- Miller, H. A. (1956). The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information, *Vol. 63, No. 2*, 81-97.
- Moshkovich, H.M., Mechitov, A. L., Olson D.L. (2005). *Verbal Decision Analysis* [in:] *Multiple Criteria Decision Analysis: State of the Art Surveys*, edited by J. Figueria, S. Greco, M. Ehrgott, Springer, 609-637.
- Saaty, T. L. (2006). *Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process*, Vol. VI of the AHP Series, Pittsburgh: RSW Publications.