

Gąska Izabela, Sygit Katarzyna, Cipora Elżbieta, Zukow Walery, Karwat Irena Dorota. Monitoring of nosocomial infections as an element of prevention. Journal of Education, Health and Sport. 2017;7(10):261-269. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.1241145> <http://ojs.ukw.edu.pl/index.php/johs/article/view/5465> <https://pbn.nauka.gov.pl/sedno-webapp/works/864422>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part B item 1223 (26.01.2017).

1223 Journal of Education, Health and Sport eISSN 2391-8306 7

© The Authors 2017;

This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland

Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non Commercial License

(<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

This is an open access article licensed under the terms of the Creative Commons Attribution Non Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 10.10.2017. Revised: 27.10.2017. Accepted: 30.10.2017.

## Monitoring of nosocomial infections as an element of prevention

Izabela Gąska<sup>1</sup>, Katarzyna Sygit<sup>2</sup>, Elżbieta Cipora<sup>1</sup>,  
Walery Zukow<sup>3</sup>, Irena Dorota Karwat<sup>1</sup>

<sup>1</sup>Department of Nursing, Medical Institute, Jan Grodek State Vocational Academy in Sanok, Sanok, Poland

<sup>2</sup>Department of Health Promotion, Department of Physical Culture and Health Promotion, University of Szczecin, Szczecin, Poland

<sup>3</sup>Department of Spatial Management and Tourism, Faculty of Earth Sciences, Nicolaus Copernicus University in Torun, Torun, Poland

### Abstract

**Introduction.** Hospital infections are one of the most serious threats to the hospitalised patient and their monitoring is recognised as one of the most important criteria of care quality for modern hospitals.

**The aim of the work** was to present the problem of nosocomial infections and desired behaviours and activities in the field of infection prophylaxis.

**Material and method.** The analysis of the current scientific literature was carried out with particular attention to the prevention of infections in treatment wards and the need to monitor the patient's condition and the environment in the case of an infection.

**Results.** The lack of developed and implemented programmes for the control of nosocomial infections is a fundamental element that increases the risk of nosocomial infections. This disrupts the proper functioning of the hospital and causes additional health problems for the patient and the ward staff. In addition, the hospital suffers losses instead of savings, which is a priority aim in the current funding system.

**Conclusions.** The basis for eliminating or minimising the incidence of nosocomial infections is a well-developed and implemented programme of hospital infection control based on the education of medical personnel in the field of infection prevention. Constant, comprehensive assessment of the procedures used and the standards of conduct, epidemiological data as well as microbiological data can ensure quick identification and elimination of the threat.

**Key words:** nosocomial infections; control; standards; prevention; education.

## **Introduction**

Nosocomial infections are one of the most serious threats to the hospitalized patient. They remain in close connection primarily with invasive diagnostic and therapeutic techniques on the one hand, and on the other from the biological determinants of a person hospitalized. Hospital infection control is standard on the quality of care and patient safety is the basis for both patients and staff. Control of hospital infections is considered in the modern hospital sector as the most important criterion of the quality of work.

The hospital is a complex ecosystem, which are key elements of people, micro-organisms and the environment. They are in dynamic relationship to enable transmission of pathogenic microorganisms. Understanding connecting with the issues requires knowledge of epidemiology, infectious diseases, microbiology and management.

Hospital infections are not only a medical problem but above all financial and legal. The uncontrolled increase in cases of hospital-acquired infections cause losses in terms of: - human health as the highest value; - the cost of maintenance of plant health; - social costs (occupational disability, loss of the full capabilities of social roles); - economic costs: increase in the number of people using disability benefits and compensation.

In hospitals, which many years ago introduced infection control programs reduced the number of internal company infections. Developed hospital infection control programs must be constantly analyzed and verified. Continuously and comprehensively applied to be assessed procedures and standards of conduct epidemiological and microbiological data to be able to quickly identify and eliminate the threat.

Benefits of a properly functioning program of prevention of nosocomial infections are notable for the patient, personnel and health care facility. They allow savings on hospital management, which is a priority in the current system of health care financing.

## **The objective of the work**

We present the problem of nosocomial infections and desired behavior and activities within their prevention. An analysis of the current scientific literature, with particular attention to preventing infections in surgical wards and the need to monitor the patient's condition and the environment in case of infection.

## **Results**

According to the definition recognized in the Act of 5 December 2008. the prevention and combating of infections and infectious diseases in humans (Journal. 2008 No. 234 U. pos. 1570) dated December 30, 2008 [1], the hospital infection is meant an infection that occurred in connection with the provision of health were a disease :

- It does not remain at the moment of the provision of health services in the incubation period;
- occurred after the award health benefits in the period not longer than the longest incubation period [2].

Nosocomial infections are defined as an infection that did not exist or were in the incubation period, the patient was taken to the hospital and took place during the hospital stay. It may, therefore, appear both during hospitalization and after discharge of the patient in the incubation period of the disease. By convention has been adopted that infections occurring after 48 hours after admission to the hospital nosocomial infections are [3,4,5,6].

In recent years, the epidemiological situation of patients, both in Poland and in the world is more and more difficult due to the increasing threat of new and re-emerging infections and infectious diseases, against which there are no effective drugs or vaccines.

The currently available medical literature there are no data on the registered clinical forms of hospital infections in Poland. To obtain a reliable and comprehensive picture of the socio-economic impact of nosocomial infections is necessary to conduct comprehensive research in this field. First of all, it is necessary to know the current, actual epidemiological situation in Poland. There are discrepancies in the system for collecting and recording data on hospital infections, which is why it is advisable to standardize the rules of registration of hospital infections using engagement Societies: Polish Society of Hospital Infections and the Epidemiology Polish Nurses Association and with the help of regional consultants in the field of epidemiology. This would allow to collect reliable data and determine what is the initial situation regarding the number of nosocomial infections. It is important to realize medical personnel as important and it is necessary to record (reporting unit for infection control) of all clinical manifestations of infection in order to increase the detection of nosocomial infections. Currently, many hospitals rate of nosocomial infections, are at 0.5% - 2%. According to world literature hospitals should register from 5% to 10% of infections. This situation indicates accurate recording of infections and undercutting data [7]. Currently, many hospitals rate of nosocomial infections, are at 0.5% - 2%. According to world literature hospitals should register from 5% to 10% of infections. This situation indicates accurate recording of infections and undercutting data [7]. Currently, many hospitals rate of nosocomial infections, are at 0.5% - 2%. According to world literature hospitals should register from 5% to 10% of infections. This situation indicates accurate recording of infections and undercutting data [7].

The most common clinical form of hospital-acquired infections are urinary tract infections, respiratory then, sepsis, local infection, and surgical wound infections [8].

The causes of hospital infections are many and they are both on the patient, medical staff, and may also be a consequence of the improper conduct of both parties. The first and important factor in the favorable development of nosocomial infection is the predisposition of the patient - severe condition and mental natural defenses [4,5,6].

With the development of antibiotic increasing antibiotic resistance of microorganisms. Discovering new antibiotics with a broad spectrum of action and unduly their use leads to the formation of a hospital environment of new strains that are highly resistant to multiple antibiotics. Another factor that negatively affects the health of the patient is unduly prolonged hospitalization, which increases the risk of acquiring a hospital infection. Similar results can cause non-aseptic conditions with the medical procedures, which have been shown to break the continuity of tissues and the use of aggressive and invasive diagnostic, monitoring and treatment [8,9,10].

Particular attention should be paid to poor planning surgical procedures (procedures days of "dirty" before "clean"), too many staff in the operating room, not keeping a safe distance in a sterile operating table and the tables of surgical instruments, improper securing syringes with medication prepared to administration. It not without significance is also too long storage in inappropriate conditions pierced vials of medication. Improper behavior of medical personnel, such as entering the operating room or in private hospital clothes and shoes unchanged, driving into the operating wheelchair or bed hospital ward illness and medical staff. The main and very common mistake is rare or improper cleaning and disinfection,

Another aspect that is important for the development of nosocomial infections is improper cleaning of the operating room and hospital wards. Observe the "share" washed surfaces (area clean and dirty sterile), apply disposable mops. Committed the most errors is to use dirty night for cleaning, improper brush, use detergents designed for use in the household and performing surface disinfection using the wrong equipment and disinfectants [4,14,15].

Increased risk of developing infections occur as a result of inadequate preparation of material and equipment for sterilization, ie. Repeated use of paper or non-woven packing

packages, too strict alignment equipment, or too big a package, inappropriate fulfillment of the autoclave chamber. The next stage of the defective chain is inadequate sterilization resulting from the use of outdated or autoclave sterilizers tools used for cooking under pressure and lack of quality control of the sterilization process, and inappropriate storage of sterilized equipment [10,13,16].

Faulty architecture of hospitals causes an intersection between clean and dirty, lack of proper storage and disposal of hospital waste, lack of locks for the personnel of patients, equipment, lack of air conditioning in the operating room or defective functioning air conditioning, poor location central sterilization as compared to the operating or wrong location elevators. The location of the recovery room or intensive care unit within the operating theater is another factor favoring the spread of nosocomial infections. As evidenced by studies conducted in intensive care units, there is the highest risk of nosocomial infections compared to other hospital departments. Approximately 40% -50% of patients, those branches are present during treatment of different kinds of nosocomial infections [4,14,17].

Other causes of nosocomial infections are:

- ✓ insufficient equipment in hospitals disposable equipment, inadequate cleaning services agents and disinfectants;
- ✓ filled with troops;
- ✓ or transfer of patients to specialist hospitals, branches of the high consumption of antibiotics, strains of which are resistant to antibiotics;
- ✓ accepting patients with branches or hospitals, with frequent nosocomial infections;
- ✓ the insufficient number and quality of staff training;
- ✓ low level of awareness of hygiene and sanitary medical staff and a lack of proper hygiene habits;
- ✓ lack of involvement of staff in activities aimed at improving the quality of medical services [5,6,12,18];

## **Discussion**

An essential element in the prevention and combating of hospital infections is well designed and implemented hospital infection control program, which is based on education of medical personnel in the field of knowledge of the prevention of nosocomial infections. This is a problem more and more often perceived. It is very difficult to change wrong habits, habits, routine without proper training shaping correct attitudes and behavior. Guidelines for prophylactic changing, there are new publications, reports, which can be the basis for updating the knowledge and skills of medical personnel.

Numerous studies indicate a reduction in the number of bloodstream infections associated with establishing central and peripheral cannulas was conducted through educational programs for hospital staff [11,19,20]. Other studies concerning hand washing, which is the most important independent factor preventing hospital infections, also indicate that a properly executed program helped reduce the number of infections. According to the recommendation of the World Health Organization (WHO) should be implemented to monitor the consumption of preparations for disinfecting hands in terms of infections transmitted by hands and strive to achieve a minimum average consumption of hand sanitizer per 1,000 person-days. According to the multimodule strategy to improve hand hygiene WHO average minimum consumption of hand sanitizer a safety hospitalization should be 20 liters per 1000 man-days [21]. Hand washing is a simple, effective method and most economical method for preventing and reducing the transmission of nosocomial infections. This indicates a need for the implementation of the training routine, as an essential element to prevent infection [1,4]. All members of the medical staff regardless of the type of actions they take on the ward, they should be cut short and uncovered varnish nails. It has been proven that the

long nails affect the spread of nosocomial infections and nail hinders a proper hand hygiene [22]. effective method and most economical method for preventing and reducing the transmission of nosocomial infections. This indicates a need for the implementation of the training routine, as an essential element to prevent infection [1,4]. All members of the medical staff regardless of the type of actions they take on the ward, they should be cut short and uncovered varnish nails. It has been proven that the long nails affect the spread of nosocomial infections and nail hinders a proper hand hygiene [22]. effective method and most economical method for preventing and reducing the transmission of nosocomial infections. This indicates a need for the implementation of the training routine, as an essential element to prevent infection [1,4]. All members of the medical staff regardless of the type of actions they take on the ward, they should be cut short and uncovered varnish nails. It has been proven that the long nails affect the spread of nosocomial infections and nail hinders a proper hand hygiene [22]. They should be cut short and uncovered varnish nails. It has been proven that the long nails affect the spread of nosocomial infections and nail hinders a proper hand hygiene [22]. They should be cut short and uncovered varnish nails. It has been proven that the long nails affect the spread of nosocomial infections and nail hinders a proper hand hygiene [22].

The first and most important factor is infection disease forcing the patient to the hospital. It is extremely important to reduce the patient's exposure to the germs to a minimum. Recommends the patient to the hospital in the shortest possible time before surgery (if it is not sudden adoption) and list the home as soon as possible after treatment can not threatening his health and life. During the hospitalization must also remember the separation of patients waiting for treatment of patients after surgery. Patients who may be a source of pathogens or septic patients should be placed in solitary confinement or isolation of area use. In the first place, they should be planned treatments "pure" surgically, secondly treatments "dirty" or septic.

Observe personal protection to all activities performed in a patient, especially when it comes into contact with body fluids of the patient. Any sharp objects (scalpels, needles) to dispose of special disposable rigid containers, which after filling should be completely burned. Applying the principles of occupational health and safety is a proven element in reducing the risk of nosocomial infections [14,15,24]. It should be the aseptic technique in performing such treatments, such as inhalation, suction secretions from the airways, and any punctures injection and the change of dressings. Follow the manufacturer's recommendations and follow specific rules for disinfection of skin, mucous membranes, surgical instruments, surfaces and spaces. Follow the recommended concentrations,

Laundry should be in keeping with the laundry washing machines, chemical-thermal disinfection. Hospital waste belongs to the group of hazardous waste and are subject to special disposal. They should be segregated according to the accepted division of the degree of contamination and removed with a branch on a regular basis and quickly. Development of instructions for the whole hospital to standardize methods for the collection and disposal of waste is the most reasonable and improves workflow and reduces the risk of irregularities that favor the occurrence of nosocomial infections [7,15,25].

Avoid routine use of antibiotics. The aim of the antibiotic policy is primarily their rational use, which prevents the formation of resistance. It is essential to the functioning of the therapeutic team at the hospital, who would collaborate closely with the team responsible for the supervision of nosocomial infections. Such teams should conduct research into the evaluation of hospital bacterial flora, determine the list of antibiotics authorized for use in the hospital and determine the types of antibiotics used for therapeutic and prophylactic. Furthermore, they should record the expenses on the purchase of antibiotics analyze the interdependence of these expenses with a decrease or an increase in the number of hospital-acquired infections, decide on any changes of antibiotics and educate personnel in the

prevention of treatment of infections. In these teams is also necessary presence microbiologist. An essential element of the procedure is to monitor resistance, which allows you to update treatment recommendations. Carried out as described above policy antibiotic contributed to reduce costs and improve treatment facilities, which complied with the recommendations [7,12,26].

The prevention of infections is an important element of the proper handling of tools and medical equipment. Particular attention should be paid to the disinfection of endoscopes, anesthetic hoses, whose inner parts can remain not washed. For such devices use low-temperature sterilization, in which optics, optical fibers are not damaged and will be guaranteed safety for both the patient and staff, and ensure that the equipment has been sterilized. Each package should contain the chemical control test, which states the effectiveness of the sterilization carried out. Each sterilization cycle should be controlled by the test chemical and periodically by means of a biological assay [10,12,13]. It is very important to document the correct sterilization process both in the central sterilization, as well as the organizational unit due to the problem of patient claims for damages. In hospitals, where used automatic car washes - disinfectors and the whole process takes place in a closed system, significantly decreased the number of exposures of medical staff due to lack of contact with the tools that were used for surgery [8,14]. Be careful to use the correct packaging issued opinions positively by the National Institute of Hygiene and observe proper transport using "clean" routes. Sterile equipment from the central sterilization should be transported directly to the operating theater magazine "sterile" lifts solely for that purpose. The sterile material should be stored in air-conditioned rooms at a constant temperature and humidity. Such magazines should be located in a zone sterile. In the microbiological testing surface cleanliness, the equipment stored in this manner is "clean", which is crucial to preventing the spread of nosocomial infections [4,10,13,18].

Registration of nosocomial infections should be based on medical and nursing report and based on the continuous observation of the occurrence of pre-defined previously nosocomial infections. The main issue is to identify a factor, epidemiological confirmation of the diagnosis and to determine the source of infection. Registration type active is much more effective but requires the development of such a system, which plays a major role for the specialist epidemiologist. Nosocomial infections and a well-equipped microbiological laboratory. Microbiological Laboratory is an important link in the diagnosis, treatment and control of nosocomial infections. Laboratory diagnostics is to identify the microorganism and the determination of susceptibility of the pathogen in the case of bacteria and fungi [27,28,29]. Monitoring infection in practice should be carried out through constant bacteriological control patients - ie. Of the possible contamination of the gates and possible infection. It should be conducted clinical and laboratory monitoring general condition of the patient with a particular focus on the urinary tract and respiratory daily care of stitches, output tubing, surgical and traumatic wounds. Insight into developed so daily summary gives a real picture of the state of the ward on any given day and you get a current assessment. Active monitoring of invasive procedures, which may constitute a potential source of hospital-acquired infections permits the rapid assessment and detect any possible development of infections [8,12]. possible contamination of the gates and possible infection. It should be conducted clinical and laboratory monitoring general condition of the patient with a particular focus on the urinary tract and respiratory daily care of stitches, output tubing, surgical and traumatic wounds. Insight into developed so daily summary gives a real picture of the state of the ward on any given day and you get a current assessment. Active monitoring of invasive procedures, which may constitute a potential source of hospital-acquired infections permits the rapid assessment and detect any possible development of infections [8,12]. possible contamination of the gates and possible infection. It should be conducted clinical and

laboratory monitoring general condition of the patient with a particular focus on the urinary tract and respiratory daily care of stitches, output tubing, surgical and traumatic wounds. Insight into developed so daily summary gives a real picture of the state of the ward on any given day and you get a current assessment. Active monitoring of invasive procedures, which may constitute a potential source of hospital-acquired infections permits the rapid assessment and detect any possible development of infections [8,12]. surgical and traumatic wounds. Insight into developed so daily summary gives a real picture of the state of the ward on any given day and you get a current assessment. Active monitoring of invasive procedures, which may constitute a potential source of hospital-acquired infections permits the rapid assessment and detect any possible development of infections [8,12]. surgical and traumatic wounds. Insight into developed so daily summary gives a real picture of the state of the ward on any given day and you get a current assessment. Active monitoring of invasive procedures, which may constitute a potential source of hospital-acquired infections permits the rapid assessment and detect any possible development of infections [8,12].

### **Conclusions**

1. Monitoring of potential nosocomial infections is a standard for quality of care to the sick and the basis of its safety. Important indicators of quality of care is an objective evaluation of the epidemiological status measured by the number and type of hospital-acquired infections.
2. In every hospital should be set up the team. Infection Control Hospital, which has a duty to provide a safe environment sanitary-epidemiological department, through the following actions: setting goals hospital program of infection control, development of standards and rules of conduct for activities in the hospital, training for medical personnel and cleaning, supervision of health personnel and patients, conducting surveillance of antibiotic use and supervision of the use of disinfectants.
3. The prerequisite for proper infection control, to eliminate them or reduce a high level of knowledge of the medical staff of hospital infections - epidemiology, clinical manifestations and consequences of infection.
4. Reducing the number of hospital-acquired infections, the automatic reduction in treatment costs by reducing unjustified and unnecessary costs and, above all, a reduction in mortality among hospitalized and the number of disabled after treatment. It should seek to increase investment and measures aimed at prevention.

## References

1. Ustawa z dnia 5 grudnia 2008 r. o zapobieganiu oraz zwalczaniu zakażeń i chorób zakaźnych u ludzi (Dz. U. 2008 Nr 234 poz. 1570) z dnia 30 grudnia 2008 r.
2. Sierocka A., Cianciara M.: Monitorowanie zakażeń szpitalnych. *Probl Hig Epidemiol* 2010; 91 (2): 323-328.
3. Bzdęga J., Magdzik W., Narusiewicz-Lesiuk D., Zieliński A. (red.): *Leksykon epidemiologiczny*. Alfa-Medica Press, Bielsko Biała 2008.
4. Ciuruś M.J.: *Pielęgniarstwo operacyjne*. Makmed, Lublin 2007.
5. Denys A.: *Zakażenia szpitalne w wybranych oddziałach*. Wolters Kluwer Polska. Kraków 2013.
6. Dulny G., Lejbrandt E.: *Higiena w placówkach opieki medycznej*. Wyd. Verlag Dashofer Sp. z o. o., Warszawa 2002.
7. Nosowska K.: *Podstawy sterylizacji i dezynfekcji w zwalczaniu zakażeń szpitalnych*. Wyd. Czelej, Lublin 1999.
8. Dzierżanowska D. (red.): *Zakażenia szpitalne*. Alfa – Medica Press, Bielsko Biała 2008.
9. Denys A.: *Zakażenia szpitalne*. *Stand Med.* 2004.
10. Magdzik W., Narusiewicz-Lesiuk D., Zieliński A.: *Choroby zakaźne i pasożytnicze – epidemiologia i praktyka*. Alfa-Medica Press, Bielsko Biała 2007.
11. Ciuruś M., Borowiak E.: *Bezpieczeństwo i higiena pacjenta w szpitalu i na sali operacyjnej*. *Zakażenia* 2011; 3: 113-117.
12. Heczko P. (red.): *Mikrobiologia. Podręcznik dla pielęgniarek, położnych i ratowników medycznych*. Wyd. PZWL, Warszawa 2006.
13. Jędrzychowski W.: *Podstawy epidemiologii. Metody badań oraz materiały ćwiczeniowe*. Wyd. Uniwersytetu Jagiellońskiego, Kraków 2002.
14. Fleischer M., Bober-Gheek B.: *Podstawy pielęgniarstwa epidemiologicznego*. Urban & Partner, Warszawa 2006.
15. Jabłoński L., Karwat I.D. (red.): *Podstawy epidemiologii ogólnej, epidemiologia chorób zakaźnych*. Wyd. Czelej, Lublin 2002.
16. Krzywiecka H., *Dezynfekcja, sterylizacja – elementy higieny szpitalnej*. *Medycyna* 2000, 1995; 51/52 (VI): 39-42.
17. Heczko P., Wójcichowska-Mach J. (red.): *Zakażenie szpitalne. Podręcznik dla zespołów kontroli zakażeń*. PZWL, Warszawa 2009.
18. Szymańska-Pomorska G., Pytel A., Smolińska B.: *Zakażenia szpitalne, jako problem epidemiologiczny współczesnego szpitala. Dekontaminacja oraz zasady przechowywania sprzętu medycznego*. *Pielęgniarstwo i Zdrowie Publiczne* 2017; 7(2) :149-152.
19. Hryniewicz W., Ozorkowski T.: *Szpitalna lista antybiotyków*. Wyd. Narodowy Program Ochrony Antybiotyków, Warszawa, 2011.
20. Warren D.K., Zack J.E., Mayfield J.L. i wsp.: *The Effect of an Education Program on the Incidence of Central Venous Catheter – Associated Bloodstream Infection In a Medical ICU*. *Chest*, 2004.
21. *Wytyczne WHO dotyczące higieny rąk w opiece zdrowotnej – podsumowanie*. World Health Organization 2009.
22. Ostrogórska P., Gniadek A.: *Kompetencje pielęgniarek i położnych z zakresu nadzoru nad zakażeniami szpitalnymi występującymi na oddziałach intensywnej terapii noworodka*. *Pielęgniarstwo i Zdrowie Publiczne* 2015; 5, 2, 189-198.
23. Bober B. (red.): *Prewencja i kontrola zakażeń*. Elsevier Urban & Partner, Wrocław 2012.
24. Grzesiowski P., Kowalski M., Lejbrandt E., Malucz M., Pawlelko R., Sobania M. (red.): *Zasady utrzymania czystości w zakładach opieki zdrowotnej. Część I PSPE*, Warszawa 2008.



25. Jedliński D., Sobania M.: Higiena szpitalna. Higiena powierzchni szpitalnych. PSPE, Kraków 2003.
26. Profilaktyka i Zwalczanie Zakażeń Szpitalnych – Mat. konf. V Ogólnopolskie Sympozjum Kierowniczej Kadry Medycznej, Warszawa 2000.
27. Przondo-Mordarska A., Smutnicka D., Burdynowski K.: Czy w polskich szpitalach prawidłowo rozpoznaje się zakażenia?. Zakażenia 2008, 3: 79-83.
28. Rozporządzenie Ministra Zdrowia z dnia 21.12.2004 r. w sprawie kwalifikacji członków zespołu kontroli zakażeń zakładowych (Dz. U. nr 285 poz. 2869).
29. Sierocka A., Cianciara M.: Monitorowanie zakażeń szpitalnych jako element procesu zarządzania ryzykiem. Zakażenia 2011, 1: 81-89.