TO:
THE CHAIRMAN OF THE
SCIENTIFIC JURY,
DETERMINED BY ORDER
№ RD-493 / 16.12.2020
OF THE DIRECTOR OF NCPHA

OPINION

by Assoc. Prof. Branimir Vladimirov Spasov, MD, PhD - Executive Director of the Specialized Hospital for Active Treatment of Hematological Diseases - Sofia

Concerning:
DISSERTATION WORK FOR AWARD
OF PhD DEGREE

Field of higher education: 7. Health and sports

Professional field: 7.1. Medicine

Scientific specialty: Social medicine and health management

Author of the dissertation: Dr. Atanas Radinoff Radinoff

Dissertation topic: Organization and management of the elimination of the consequences of radiation contamination of the population as a result of a terrorist act and other radiation incidents

Scientific adviser: Prof. Plamen Stoyanov Dimitrov, MD, PhD

DEAR MR. CHAIRMAN OF THE SCIENTIFIC JURY,

I bring to your attention an opinion on the dissertation for obtaining the PhD degree by doctoral candidate Atanas Radinoff Radinoff in accordance with the requirements of the Regulations on the terms and conditions for obtaining scientific degrees and holding academic positions in NCPHA and in connection with Order RD-493 / 16.12.2020 of the Director of NCPHA - Sofia:

I. GENERAL PRESENTATION OF THE DOCTORAL CANDIDATE

Dr. Atanas Radinoff Radinoff graduated in MEDICINE at the Higher Medical Institute - Varna in 1988 and acquired successively medical specialties in internal medicine and clinical hematology in 1995 and 1998, respectively. In his career he has successively held the following academic positions in the Clinic of Hematology, Chemotherapy and Oncology at the Military Medical Academy - Sofia: assistant (1995 - 1997), senior assistant (1997 - 2000), chief assistant (since 2000). Since 10.2008 he has been the head of the department of clinical hematology at MHAT TOKUDA Hospital, and since 01.2011 he has been combining that position with the position of medical director of MHAT TOKUDA Hospital.

Since 12.2014 he has held the position of Head of the Department of Clinical Hematology at the University Hospital "St. Ivan Rilski". He has participated in over 30 interventional clinical trials, and his interests are focused mainly in the field of malignant and regenerative hematology.

II. OVERALL ASSESSMENT OF THE DISSERTATION

The topic of the dissertation of Dr. Atanas Radinoff covers a complex modern problem related to the organization and management of the elimination of the consequences of radiation contamination of the population as a result of a terrorist act. It is linked to the growing danger of terrorist attacks and nuclear accidents. On the other hand, it is particularly important that the experience gained in dealing with nuclear accidents and natural disasters to be used in wartime. So far, no common algorithm for evaluation and behavior in case of such events has been developed. The lack of such an algorithm creates conditions for improper actions in the cases of liquidation of the consequences of these accidents, as well as in the provision of emergency assistance to the affected people. The doctoral candidate has worked for many years to clarify this problem in theoretical and practical terms, as the culmination of his overall scientific and practical experience is the creation of this dissertation.

The dissertation presented by Dr. Atanas Radinoff Radinoff corresponds to the basic requirements of Art. 27 of the Regulations for Application of the Law for the Development of the Academic Staff in the Republic of Bulgaria (Promulgated SG No. 75 / 24.09.2010, amended SG No. 19 / 8.03.2011):

1. The dissertation is presented on a total of 168 pages and it contains: content (3 pages in total); exposition, structured in the following sections - I. Introduction (3 pages); II. Literature review (78 pages); III. Aim, tasks, materials and methods (3 pages); IV. Results and discussion (57 pages); V. Conclusions, recommendations, contributions and conclusion (3 pages); VI. Annexes (5 pages). In addition, the dissertation is illustrated with 38 figures, 8 tables and 2 annexes. The bibliography includes 163 printed sources, 95% of which are in Latin.

2. The dissertation work shows that the candidate has in-depth theoretical knowledge in his specialty and possesses abilities to conduct research.

2.1. *Literature review:*

The literature review covers the current state of the problem worldwide and is written on 78 pages; it shows the personal attitude of the author in a critical aspect to the topic. The problem developed by Dr. Radinoff, initially describes the history of disasters and radiation accidents in medicine, which in turn suggests the next directions in the development of this work. On the other hand, emphasis is placed on the preparation of hospitals as a major factor in the structure and behavior of the staff in radiological terrorism. Attention is paid to the role of medical physicists in these situations to assess the extent of the nuclear impact on humans. Also, attention is paid to the training of medical staff in their theoretical and

practical training for behavior in these emergency situations. The extensive experience of the USA in the algorithm and behavior is shared, as well as the means used for preparation and reaction in case of radiological incidents. They are a consequence of the experience gained since the events of September 11, 2001, when two skyscrapers in New York were hit with catastrophic consequences and a huge number of victims. The role of servicemen during these situations is emphasized, and the definition of their activity, provisions, both locally and nationally, are well presented. The author complements all this information, by presenting the organization in Belgium in the conditions of a nuclear strike. A radioactive action plan for a nuclear accident on Belgian territory, published by royal decree, has been presented. Also is presented a report of the ICRP (International Commission on Radiation Protection), which focuses on rescuing people, providing personal decontamination, shelter, iodine prophylaxis and temporary evacuation. The experience in radiation protection during and after the accident with the Fukushima nuclear reactor was described, the levels of contamination were defined and strategies for mitigating the serious psychological consequences were outlined. Attention has been drawn to the failures in encouraging the sharing of information on radiation protection actions. In the health aspect, the psychological stress and its consequences in ionizing radiation are considered. The individual response of the human response in such situations is emphasized. Attention has been paid to biomarkers for radiation exposure, as well as to the question of whether they can act as predictors for normal tissue radiosensitivity. Cancer prevention and the dose-effect relationship of the carcinogenic properties of ionizing radiation are discussed in detail. It is emphasized that ionizing radiation acts as mutagens and in high doses kills a significant part of cells, induces cell proliferation and clonal amplification.

Public health activities to mitigate radiation exposure and challenges related to communication and the risk of a nuclear accident are presented. The forms of radiological and nuclear terrorism are presented in details. The analysis of radiological terrorism is substantiated and attention is paid to possible attacks on nuclear power plants. In this regard, several scenarios from the US experience are presented.

The literature review shares the trend characteristics of terrorist acts, presented in several time intervals. The damages that occurred in the individual organs and systems of the human body, which occurred in accidents, are presented. The acute radiation syndrome, the hematopoietic, the gastrointestinal and the skin syndrome are biologically and clinically differentiated. In a critical aspect, the methods of examination in case of radiation contamination are presented, as the biological dosimetry in the triage of the injured people is of essential importance. Triage is especially important for emergency medical care. It requires categorization of patients and determines the place for their hospitalization. This is especially useful for clinicians in managing a small-scale radiological event. Subsequently, methods of treatment are considered, where cytokine therapy, transfusion of cellular components such as erythrocyte and platelet concentrates are of particular importance. In particularly severe cases, stem

cell transplantation should be considered. Attention is paid to maintenance treatment in a wide and moderate range. The cure against infections deserves attention, and the use of antimicrobial agents should continue until it becomes apparent that they are effective. Attention is paid to gastrointestinal symptoms, such as nausea, vomiting, ulcerations of the gastrointestinal tract, as well as their individual therapy.

Hematological reconstitution is represented by the fact that active bone marrow predominates in areas such as the spine, ribs, pelvis and skull. Patients may have areas of viable bone marrow, which contributes to their survival. Attention has been paid to the use of antibiotics and other antimicrobials, especially for patients with serological evidence of past infection due to exposure to ionizing radiation. Guidelines for the prevention and treatment of pregnant women, as well as in neoplasms of the thyroid gland are foreseen.

Precautions for health workers include wearing aprons, hats, masks, double gloves, shoes that guarantee their survival.

The psychological aspects of the reaction of the population depend on the preliminary preparation for mass disasters and accidents. The informational influence of the media is essential for mass psychosis. The experience of the psychological disorders among the population after the accident at the Chernobyl nuclear power plant was shared. It is essential that a person may be frightened by certain information and, due to their fear, not be adequate in taking specific precautions. Rumors, in turn, are a specific type of interpersonal communication, in the process of which the facts can be distorted. Rumors, in turn, are a specific type of interpersonal communication, in the process of which the facts can be distorted. The snowball distribution of panic can lead to complete disorganization. The change of consciousness after an accident, which can manifest itself with mental helplessness, stiffness, passivity, slowness, exclusion from the real situation, is discussed. According to ICD 10, individual vulnerability and the ability to cope play a role in overcoming the acute stress response. Post-traumatic stress disorder is included in ICD 10. The dissertation has applied in the review basic principles for providing care to the elderly and children.

2.2. *Aim, tasks, materials and methods:*

The aim of the dissertation is a logical consequence of the topic set by Dr. Radinoff. There are five tasks, which are in accordance with the set dissertation work's aim.

The methodology is formulated as interdisciplinary and determines a set of methods and tools for monitoring, document analysis, conducting structural interviews, extensive research of information sources. Subsequently, success criteria are included, a final scientific product that is identified with a management algorithm in the Department of Hematology.

Clients of the scientific product are all students, postgraduates, graduates, doctoral students and experts engaged in the provision of first aid.

2.3.Results and discussion:

This chapter is a personal work of the doctoral candidate and embodies his many years of experience in the field of clinical hematology, combined with public health policy in the field of disasters and accidents that may be caused. A questionnaire survey was presented to assess the readiness of doctors working in hospitals to provide medical assistance in case of radiation contamination of the population as a result of a terrorist act. The assessments of the knowledge of action in radiation terrorism, drug therapy and algorithms for eliminating the consequences of these disasters are also presented as graphics. In the communication between the doctors involved in helping with radiation contamination, it is especially important to feel whether they are well prepared to help the victims.

The author emphasizes the good knowledge of documents of good practice in connection with the activities in these disasters. 16 conclusions from the conducted survey are presented in a summarized form. Furthermore, the model / algorithm of organization and management of work processes in the Department of Hematology at the University Hospital "St. Ivan Rilski", led by the author of the dissertation, for first aid in sudden disorders of the hematopoietic system among large groups of people caused by radiation pollution is given in details. A way of moving for redirection patients to the Center for Radiation Affected at the Military Medical Academy has been determined. The proposal for assessment of the health condition of each injured person, the emergency aid for stabilization of his condition, determination of the degree of radioactive contamination, decontamination of the wounds, external decontamination in the absence of medical contraindications, is innovative. Skin decontamination, contaminated wounds, body openings, which include gargling of the oral cavity with 3% oxygenated water, gastric lavage and cleaning of contaminated eyes and ears are presented in details. A plan of action and assistance to the population as a result of radiation pollution in the event of a terrorist act and other incidents is presented, where psychological assistance is of essential significance.

Psychological assistance includes several phases in which it is important to identify the specifics of socio-psychological tension, coordinate all actions involving state, municipal and non-governmental organizations, media and institutions, such as health, education, home affairs, migration service and etc. Particular attention is paid to the psychological influence on children and adolescents.

2.4.Conclusions, recommendations, contributions and main conclusion:

The doctoral candidate presents 10 conclusions, which are a consequence of the set aim, as well as of the development of the dissertation work.

III. OVERALL EVALUATION OF THE DISSERTATION SUMMARY

The dissertation summary has a total volume of 66 pages. It contains a structural and meaningful description of the dissertation. Correctly reflects the presented material in the dissertation.

1. *Contributions of the dissertation*

I accept the following contributions formulated by the doctoral candidate:

i. An algorithm for the organization and mode of action of the specialists involved in first aid to the victims of nuclear accidents and disasters is presented.

ii. Recommendations for modeling and optimizing the actions of specialists involved in first aid are summarized.

iii. An algorithm for therapeutic behavior in disorders of the hematopoietic system of large groups of people due to nuclear contamination has been developed.

iv. iv. A methodology for summarizing new scientific results in an important area for social practice is proposed.

2. *Evaluation of publications related to the dissertation*

The doctoral candidate presents 5 publications related to the dissertation. Four of them are printed in current Bulgarian scientific journals, referenced and indexed in world-famous databases with scientific information, the last publication being printed in an unreferenced Bulgarian journal with scientific review.

In one of the publications Dr. Atanas Radinoff is a single author, while in the others he is a second author in three and a subsequent author in one publication.

The publications submitted by the doctoral candidate related to the dissertation exceed the set minimum national requirements for the scientific and teaching activity of the candidates for obtaining the PhD degree in the Annexes to the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Holding Academic Positions in the NCPHA

IV. CONCLUSION

In conclusion, the presented dissertation of Dr. Atanas Radinoff Radinoff, PhD candidate of self-study training in the scientific specialty "Social Medicine and Health Management" on "Organization and management of the elimination of the consequences of radiation contamination of the population as a result of a terrorist act and other radiation incidents" reflects the current state of the problem worldwide and also reflects the personal observations and ideas of the PhD candidate in a completed form with a high degree of scientific and practical value. The dissertation with the attached scientific publications meets the criteria of Article 6 of the Law on the Development of Academic Staff in the Republic of Bulgaria (SG No. 38 of 21 May 2010, last amended SG No. 68 of 2 August 2013) and the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Holding Academic Positions in the NCPHA.

Based on the above, I give a positive assessment of the dissertation and propose to the esteemed Scientific Jury to award the PhD degree in the field of higher education 7. Health and Sports; professional field 7.1. Medicine and scientific specialty "Social Medicine and Health Management" to Dr. Atanas Radinoff Radinoff.

Prepared an opinion:

11.01.2021

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Executive Director of the SHATHD - SOJSC