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Written review of the official reviewer on the thesis by Mustapayeva Aigerim on the topic: Improving of radiological diagnosis of cystic echinococcosis of the liver», submitted for the degree of Doctor of Philosophy (PhD) on the specialty. 6D110100-«Medicine»

No	Criteria	Compliance with the criteria (you have to mark one of the answer options)	Substantiation of the position of the official reviewer
1.	The subject of the dissertation (at the date of its approval) corresponds to the directions of development of science and/or government programmes	<p>1.1 Compliance with priority directions of development of science or state programs:</p> <p>1) Thesis completed as part of a project or targeted programme funded by(s) from the State budget (name and number of the project or programme)</p> <p>2) <u>Thesis performed in the framework of another state program (specify the name of the program)</u></p> <p>3) The thesis corresponds to the priority direction of science development approved by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan (indicate the direction)</p>	<p>The topic of PhD thesis corresponds to the priority directions of development of science at the date of its approval - 2016 year.</p> <p>This study was partly funded by WHO TDR grant «Research Capacity Strengthening and Knowledge Management to Improve Disease Control (Special Programme for Research and Training in Tropical Diseases)» (to A.Duisenova) and educational grant of the WHO Special Program in the field of research and training of specialists in tropical diseases (TDR/WHO) "Implementation of the scientific and educational program for the study of echinococcosis on the model of Kazakhstan".</p>



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2.	Importance for science	<u>Work contributes to science and its importance is well revealed</u>	<p>As required, the PhD student analyzed the data in the course of the study, she achieved important and significant results:</p> <ol style="list-style-type: none">1. Incidence Rates of Surgically Managed Cystic Echinococcosis in Kazakhstan, 2007–2016 (December 2019, The American journal of tropical medicine and hygiene 102(1) DOI:10.4269/ajtmh.19-0572) - This study presents data from the Kazakhstan Scientific and Practical Center for Sanitary and Epidemiological Evaluation and Monitoring on CE patients treated surgically, with a diagnosis confirmed by pathology. A total of 8443 CE cases were reported. This study showed that Cystic echinococcosis is an important public health problem in southern Kazakhstan. This study is also an example to nearby endemic countries. The surveillance for CE is very important for the prevention and control of the diseases in endemic countries as indicated in this report.2. Ultrasound-based evaluation of the prevalence of abdominal cystic echinococcosis in the Turkestan region of Kazakhstan (September 2021 Transactions of the Royal Society of Tropical Medicine and Hygiene 116(12) DOI:10.1093/trstmh/trab105) – In this study, the prevalence of abdominal CE in the Turkestan region of Kazakhstan were evaluated with the ultrasound-based examination by the author. A total of 2252 individuals were screened by ultrasound. An epidemiological and imaging characters were evaluated in this study. Very important scientific results were obtained by the author.3. Stories from the Field One Patient (and One Physician) at a Time (June 2020 The American journal of tropical medicine and hygiene 102(6):1170-1171 DOI:10.4269/ajtmh.20-0051) - This article introduced the works of Mustapayeva Aigerim.
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			<p>4. Cystic Echinococcosis of the Bone in Kazakhstan (September 2018 Case Reports in Infectious Diseases 2018(1) DOI:10.1155/2018/9682508) – The authors reviewed bone CE cases admitted to a reference oncological hospital in Kazakhstan from January 2010 to February 2017. A rare clinical form of CE, bone CE, was observed and summarized the epidemiological and radiological characteristics. The findings are very important in the clinical medicine.</p> <p>Thus, the work presented makes a significant contribution to science and its importance is well exposed.</p>
3.	The principle of independence	Self-reliance level: 1) <u>High</u> ; 2) Medium; 3) Low; 4) There is no independence.	<p>The PhD student conducted a literary review on the topic of the study, the relevance of the topic was substantiated, the goal was set and tasks were developed to achieve the goal.</p> <p>All the results presented in the thesis and scientific novelty received by the author personally.</p> <p>The Mustapayeva Aigerim independently conducted the Methodology of the Ultrasound technique with the interpretation of the results, analysis and statistical processing of the obtained results, with the statement of conclusions and the proposal of recommendations for practical health care.</p>
4.	The principle of internal unity	4.1 Rationale for the relevance of the thesis: 1) <u>Substantiated</u> ; 2) Partially substantiated; 3) Not substantiated.	<p>Cystic echinococcosis is a widely endemic helminthic disease caused by infection with metacestodes (larval stage) of the Echinococcus granulosus tapeworm. The highest prevalence of the parasite is found in parts of Eurasia, Africa, Australia, and South America. Echinococcosis is a serious medical and social problem in many countries of the world, including Kazakhstan, where large endemic foci among farm animals persist, and in a subordinate connection there is an increase tendency in the number of cases among human. Echinococcal cysts are found in the liver in approximately 70% of cases, and the lungs in approximately 25% of cases.</p>



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		<p>Diagnosis of cystic echinococcosis of the liver is difficult due to the prolonged asymptomatic course of the disease. Patients, as a rule, seek medical help late, when the parasitic cyst reaches a significant size, that is why CE is often called “parasitic cancer”. The prognosis of the disease can be extremely unfavorable when complications requiring emergency surgical intervention are diagnosed (cyst suppuration, breakthrough into the bile ducts, abdominal or pleural cavities, bronchi).</p> <p>Ultrasound is a highly informative, accessible, non-invasive method of diagnosing liver echinococcosis. In international practice, several classifications of the ultrasound pattern of echinococcal cysts are used, of which the most common are the Gharbi classification and the WHO classification (WHO-IWGE), which are not used mainly in Kazakhstan.</p> <p>The principle of internal unity is respected.</p>
	4.2 The content of the Ph Thesis reflects the thesis topic: 1) <u>Reflects</u> ; 2) Partially reflects; 3) Does not reflect.	<p>The content of the Ph Thesis fully reflects the thesis topic.</p>
	4.3. The goal and tasks correspond to the thesis topic: 1) <u>conform</u> ; 2) partially conform; 3) do not conform.	<p>The goal and tasks correspond to the Ph Thesis topic. The work includes 4 tasks, each of them is logically related to the previous and is described in detail with the presentation of clinical examples and the proposal of an algorithm of diagnosis, to solve the goal.</p>
	4.4 All sections and provisions of the dissertation are logically interrelated: 1) <u>completely interconnected</u> ; 2) relationship partly; 3) relationship exists.	<p>The Ph Thesis of Dr. Mustapayeva A. has an inner unity, all sections and positions of the thesis are logically interconnected. The results obtained and the practical recommendations are in line with the stated goal and objectives.</p>



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		<p>4.5 New solutions (principles, methods) proposed by the author are reasoned and evaluated against known solutions:</p> <p>1) <u>have critical analysis</u>;</p> <p>2) partial analysis;</p> <p>3) the analysis is not one's own opinions, but quotes from other authors.</p>	<p>New data obtained by the author are substantiated, reasoned and evaluated in comparison with known data. The critical analysis of the literature, own research has been conducted, ways of solving the studied problem have been proposed.</p>
5.	The principle of scientific novelty	<p>5.1 Are scientific results and regulations new?</p> <p>1) completely new;</p> <p>2) <u>partly new (25-75% are new)</u>;</p> <p>3) not new (less than 25% are new).</p>	<p>Scientific results and regulations are partly new.</p>
		<p>5.2 Are the conclusions of the dissertation new?</p> <p>1) completely new;</p> <p>2) <u>partly new (25-75% are new)</u>;</p> <p>3) not new (less than 25% are new).</p>	<p>The conclusions of the Ph Thesis are partly new.</p>
		<p>5.3 Technical, technological, economic or managerial solutions are new and justified:</p> <p>1) <u>completely new</u>;</p> <p>2) partly new (25-75% are new);</p> <p>3) not new (less than 25% are new).</p>	<p>The technological solutions used by the author are completely new.</p>



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6.	Validity of the main conclusions	All major findings are based on scientifically significant evidence	The reliability of the results obtained is confirmed by the large volume of the analysed material, research methods and modern statistical processing.
7.	Main provisions to be defended	<p>The following questions should be answered on a case-by-case basis:</p> <p>7.1 Is the position proven? 1) <u>Proved</u>; 2) Rather proved; 3) Rather not proven; 4) Not proven</p> <p>7.2 Is this trivial? 1) yes; 2) no</p> <p>7.3 Is it new?? 1) yes; 2) no</p> <p>7.4 Level to apply: 1) narrow; 2) medium; 3) <u>wide</u>.</p> <p>7.5 Is it proven in the article? 1) <u>yes</u>; 2) no</p>	<p>The following positions have been put forward by the author for protection:</p> <p>Retrospective analysis of the incidence of cystic echinococcosis in the Republic of Kazakhstan for 2007-2016 revealed a downward trend with consistently high rates in the Southern region with the highest level of population involvement in South Kazakhstan, Zhambyl and Almaty regions with a predominant lesion of people of working age with a significant predominance of women and localization of echinococcal cysts in the liver. According to WHO (2022) at the global level incidence of CE in Republic of Kazakhstan belongs to hyperendemic region.</p> <p>A field study of a conditionally healthy population of endemic regions using an ultrasound method revealed for the first time all stages of activity with a predominance of neglected inactive stages of echinococcal cysts.</p> <p>Ultrasound semiotics of cystic echinococcosis in endemic regions is characterized by pathognomonic ultrasound signs of echinococcal cysts depending on the stage of activity with the identification of new pathognomonic ultrasound signs.</p> <p>Ultrasound examination is a highly informative method of diagnosing cystic echinococcosis with determination of the stage of activity of echinococcal cyst and characterized by high sensitivity, specificity, accuracy, with low rates of false positive and false negative results according to morphological verification of the diagnosis.</p> <p>It is indicated in the Thesis abstract as the Dr. Aigerim has published a total of 15 scientific articles, 3 of them on the topic of the Ph Thesis which is on cystic echinococcosis and published in an international peer-reviewed scientific journals with an impact factor according to JCR data</p>



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			language.scientific and high prestigious journals (indexed in the Web of science Core Collection database, science Citation Index Expanded, CiteScore percentile index at least 50 in the Scopus database) - 3, 8 abstracts are presented at international conferences, 3 of them in English.
8.	The principle of certainty. Reliability of sources and information provided	8.1 Choice of methodology - justified or the methodology is described in sufficient detail 1) <u>yes</u> ; 2) no	A retrospective analysis and an Ultrasound screening test were performed by the PhD student. The amount of material more than corresponds to the sample calculation.
		8.2 The results of the Ph Thesis work are obtained using modern scientific methods of research and methods of processing and interpretation using computer technologies: 1) <u>yes</u> ; 2) no	Epidemiological data were analysed to obtain a statistical model and a formula for calculating the sample size. To compare the mean values of the standardised indices of cystic echinococcosis among men and women in age groups, the Student Test was used. The analysis of the cases of echinococcosis revealed by Ultrasound of the population of the endemic region depending on the sex and age of the patients, the analysis of Ultrasound signs of echinococcus cysts and focal liver formations was carried out with the help of the criterion χ^2 Pearson. Also, in order to determine the most characteristic Ultrasound signs of echinococcus cysts of the liver, the radiological characteristics of CE were studied, according to the WHO classification the criterion of χ^2 Pearson was used. The choice of methodology is therefore fully justified.
		8.3 Theoretical conclusions, models, revealed relationships and regularities proved and confirmed by experimental research (for directions of training	The main provisions and conclusions of the thesis work have been proved and confirmed by the results of the conducted studies.



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		in pedagogical sciences the results are proved on the basis of pedagogical experiment): 1) <u>yes</u> ; 2) no.	
		8.4 Important allegations confirmed by current and reliable scientific literature	Important assertions are supported by references to current and reliable scientific literature.
		8.5 Literature sources used are sufficient for literary review	In writing the Ph Thesis, a sufficient number of sources of literature were used, more than 90% of which are in English.
9	Principle of practical value	9.1 The thesis has theoretical value: 1) <u>yes</u> ; 2) no.	Thesis has a theoretical meaning.
		9.2 The thesis is of practical importance and there is a high probability of application of the obtained results in practice: 1) <u>yes</u> ; 2) no.	It is mentioned that the ultrasound classification of CEs (WHO-IWGE) has been introduced in the first time in the Republic of Kazakhstan by this study. The author highlighted the clinicians to choose differentiated management tactics depending on the stage of the disease (conservative treatment, percutaneous puncture of a cyst under the control of ultrasound or CT (PAIR), surgical treatment or observation).
		9.3 Are the practice suggestions new? 1) completely new; 2) <u>partly new (25-75% are new)</u> ; 3) not new (less than 25% are new).	Recommendations aimed at improving early diagnosis of liver CE have been developed and proposed. The practical recommendations proposed by the author are relevant and applicable in practice.



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10.	Quality of writing and design	Quality of academic writing: 1) <u>high</u> ; 2) medium; 3) lower than medium; 4) low.	<p>Ph Thesis work of Dr. Aigerim Mustapayeva is characterized by integrity and internal unity of presentation of the collected experimental material, its analysis, results and conclusions.</p> <p>The quality of academic writing is high.</p>
			<p>As a conclusion; The author studies show that:</p> <ol style="list-style-type: none">1. Retrospective analysis of the incidence of the CE in the Republic of Kazakhstan for 2007-2016 revealed a downward trend but CEs is still hyperendemic in the studied region. The surveillance, control and preventive studies are very important for the future work.2. Ultrasound based screening in the public is very important for the revealing neglected inactive stages of echinococcal cysts.3. In endemic regions, rare clinical form can be seen as demonstrated by the author studies. The physicians should be aware this kind of rare clinical forms of CEs.4. It is mentioned that the ultrasound classification of CEs (WHO-IWGE) has been introduced in the first time in the Republic of Kazakhstan by this study. The author highlighted the clinicians to choose differentiated management tactics depending on the stage of the disease (conservative treatment, percutaneous puncture of a cyst under the control of ultrasound or CT (PAIR), surgical treatment or observation).5. The author presented her studies in the international scientific meetings.6. The author published her studies in the scientific and high prestigious international journals. <p>In my opinion, a successful Ph Thesis on the subject of cystic echinococcosis was carried out by Dr. Mustapayeva Aigerim. Dr. I congratulate Dr.</p>



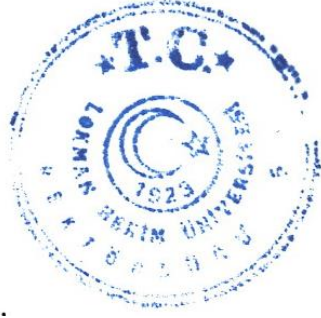
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			Aigerim and her instructors for their successful and scientific studies. I would like to thanks for the reading chance this successful and scientific study.
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Sincerely yours,



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