

Telemedicine in Pediatric Oncohematology: Success, Barriers and Prospects

EV Zavaleva and Anna A Ivanova*

Dmitry Rogachev National Medical Research Center of Pediatric Hematology, Oncology and Immunology, Moscow, Russia

***Corresponding Author:** Anna A Ivanova, Professor, Deputy of General Director Dmitry Rogachev National Medical Research Centre of Pediatric Hematology, Oncology and Immunology, Ministry of Health, Russia.

Received: March 01, 2021; **Published:** March 31, 2021

Abstract

Background: Oncohematology service is a multidisciplinary field of medicine that includes several very important components each of which separately has a significant influence on this type of Medicaid quality in general. Nowadays, telemedicine becomes a necessary technological tool in cases where time and location are critical factors both for providing medical care and for education of medical specialists.

Methods: Personal computers (for the patient and a specialist doctor), web cameras, software (including a web interface) for video-conferencing and an Internet channel (Software over VOIP protocol), special medical software (DICOM viewer, medical information system etc.), digital signature.

Results: Between July 2019 and January 2021, 709 video-conference sessions and 10,251 off-line consultations were held between Dmitry Rogachev National Medical Research Center of Pediatric Hematology, Oncology and Immunology and Hospitals that are situated in 80 regions of the Russian Federation. More than 8,000 patients 0 - 17 y.o. with various types of cancer and severe hematological pathologies were discussed. Besides 94 trainings were organized by high quality specialists in which for about 350 medical professionals took part from all over the country.

Conclusion: Despite of still existed difficulties of telemedicine using, it serves as a great support to patients, oncologists and other medical specialists and, of course, has and will have a tremendous future.

Keywords: *Pediatric Oncohematology; Telecare; Technological Tool; Video-Conferencing; Tele-Education; Hospitalization Costs*

Dmitry Rogachev National Research Center of Pediatric Hematology, Oncology and Immunology (the Center) is the most advanced center in Russian Federation in the field of pediatric hematology, oncology and immunology with clinical, scientific and educational expertise. The main Centers' goal is to provide the best Medicaid for children, adolescents and young adults with cancer, non-malignant serious hematological disorders and immune deficiencies. Over 2,000 new patients are admitted, more than 200 hematopoietic stem cell transplantations and 2,000 surgeries are performed per year.

The Center also provides educational resources including residency and postdoctoral programs as well as disseminating current knowledge to the Russian pediatric hematology/oncology professional community with more than 100 clinical centers throughout the country.

Telemedicine and tele-education are wildly spread in the Center, making possible to provide highly qualified medical care to sick children located in hospitals with limited pediatric oncohematology specialists or experience. Having a broad range of applications, we can confidently say, that nowadays telemedicine is not just “a new promising technological tool” but, as already shown by world multiply studies, an integral part of modern healthcare, which has a strong positive clinical, educational and economic effects [1-3].

At the same time, it should be noted, that Telemedicine does not replace and is not an alternative to the in-person visit, but rather adds to it, expanding the possibilities for a specialist to be at the very center of medical activity and bring personal skills to the bedside of the sick child [3].

The main telepractice profiles in the Center are the following:

- Oncology/Hematology;
- Immunology;
- Surgery/Oncology;
- Pathomorphology;
- Reference MRI, CT, PET;
- Cellular technologies.

In most cases, to make a diagnosis, determine the treatment and, if necessary, the additional patient examination, specialists need to make reference of imaging methods and histological material (or other specimens) research, which can be extremely time-consuming. As practice demonstrates, for one patient, radiologists need about 45 minutes to 1,5 hour or more, and for pathologists the duration of biopsy material research can take up to 3 - 15 days. It should be noted that every third histological reference and every tenth reference of imaging research methods is associated with a change in the guiding clinical diagnosis.

In some extraordinary cases, our colleges - leading specialists from Europe (Italy, Great Britain, Norway, Germany), the USA (Boston, New York), and Japan (Tokyo) are involved in the process of diagnosis and treatment of cancer patients.

In this turn provider complies with all federal, regional and local laws and regulations regarding patient privacy and confidentiality and, of course, follows licensure requirements [4-6]. Even in emergency situations getting the informed consent requirement from parents/legal representatives has been never waived. The transmission of medical images is organized via secure, encrypted means of communication. The presenters have the ability to gather, securely store and securely transmit all required data (medical images, laboratory studies, photos, consents, etc).

The request of regional physicians serves as a signal to Center’s specialists to monitor the condition of patients with combined pathology after/during chemotherapy or another type of therapy (for example, radiation, surgery), as well as to consult patients who are resistant to standard program therapy and/or are in critical status. Most of these patients are located in hospitals with limited oncohematology experience or possibilities.

It’s known that Oncohematology service is a multidisciplinary field of medicine that includes several very important components such as legal regulations, material and technical base, staff, patient routing, laboratory service, CT and MRI-survice, surgical oncology care, blood transfusions, infection control, nutritional service, intensive care unit, radiology department, pathology service, out-patient department, informatization, medication supply, rehabilitation and palliative care. Each of these indicators has a significant influence on

the general quality of specialized Medicaid. All these possibilities in complex are mostly underserved and can be carried out only on the base of Federal Centers, located in the cities, but not in towns or nonurban areas [7-9].

Only thanks to telemedicine patients can access specialists who are not available in their communities. With the help of this technological tool clinicians may provide both multidisciplinary and interprofessional care that has a key point in oncohematological practice.

All these measures allow the reduction in time both in diagnosis and starting/correcting therapy for several weeks to several days or even hours which has strongly important meaning, especially in urgent or emergency cases. Telecare overcomes the barriers of time, distance, lack of specialists, including hospice providers [3,9].

Between July 2019 and January 2021, 709 video-conference sessions and 10,251 off-line consultations were held between the Center and Hospitals that are situated in 80 regions of the Russian Federation (Figure 1 and 2). More than 8,000 patients 0 - 17 y.o. with various types of cancer and severe hematological pathologies were discussed.

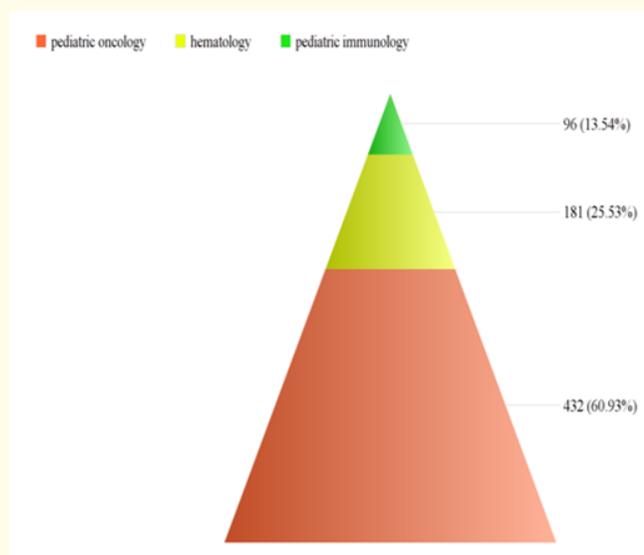


Figure 1: Video conference sessions.

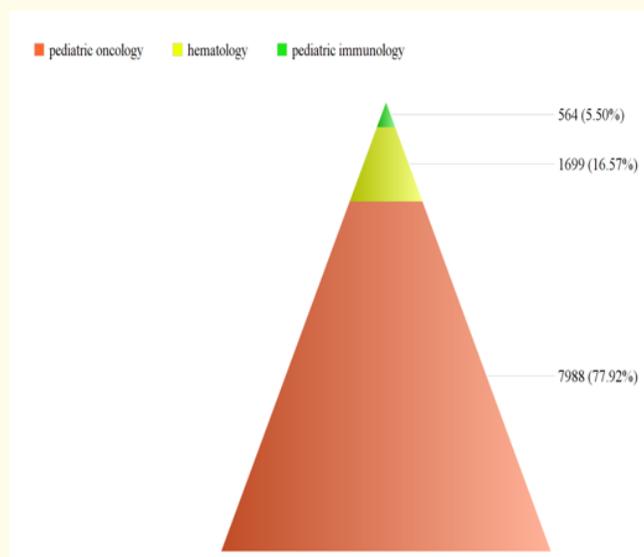


Figure 2: Off-line consultations.

Interesting data were obtained after analyzing the situation related to the number of patients who started or continued therapy at their place of residence after getting a consultation in a similar format. According to the presented results (Figure 3), the majority part of them (90%) turned out to be such. This has major success with an absolute economic effect that reduces the need for hospitalization to federal centers.

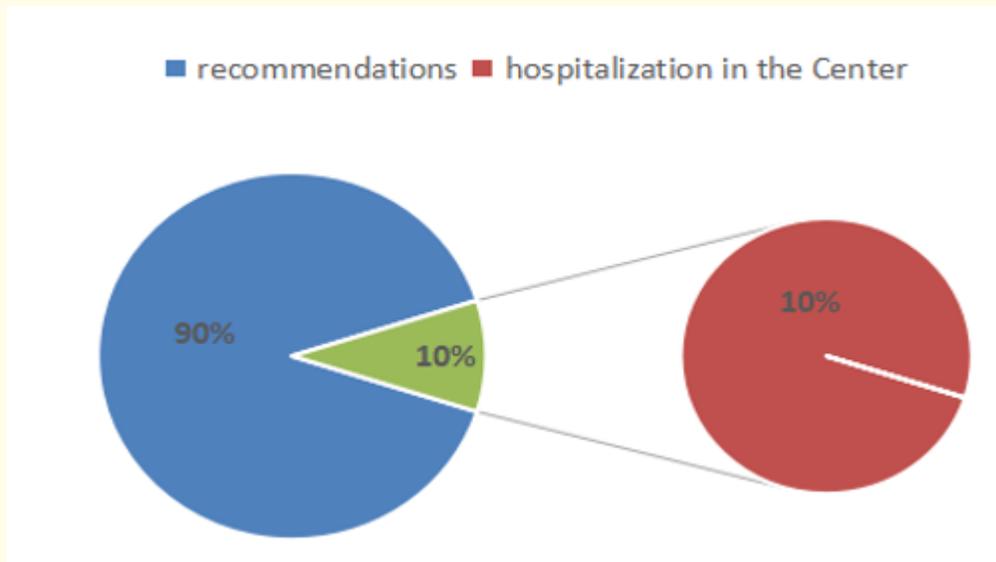


Figure 3: Decisions based on the results of a telemedicine.

Over the last years Telemedicine is widely used for educational purposes [7,8]. Annually, via the Telemedicine complex the staff and teachers of the Center organize scientific and educational seminars in various formats: round table discussions, “question-answer”, analysis of extraordinary clinical cases, broadcasts of conferences using “live” surgery possibilities.

Thus, between July 2019 and January 2021, 94 trainings were organized by Center’s specialists in which more than 350 medical professionals from different parts of Russia took active part (Figure 4).

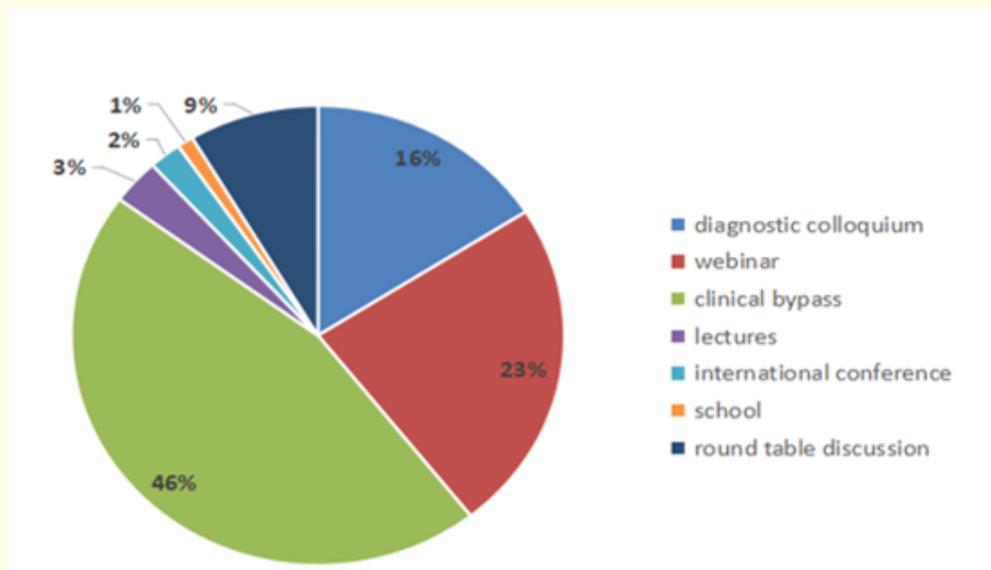


Figure 3: Decisions based on the results of a telemedicine.

Despite the high level activity of the Center’s experts and regional physicians in the Telemedicine tool, we still and quite often face some barriers that seriously interfere this kind of work.

Conventionally all the barriers can be divided into 3 main groups: technical, organizational and content-based (Figure 5).

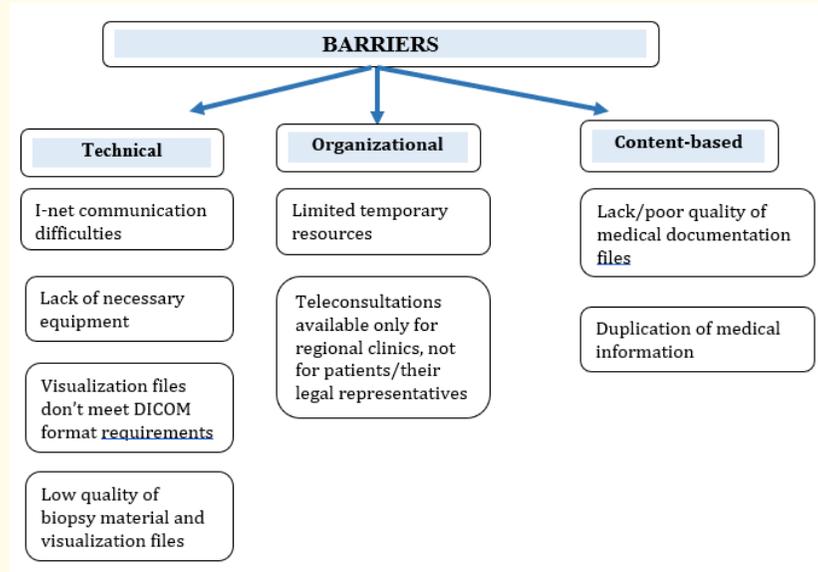


Figure 3: Decisions based on the results of a telemedicine.

Among the most common problems we can name the lack of an up-to-date status of the patient, a violation of radiological research methodology, inaccuracy in diagnostic conclusions, duplication of information. Moreover, teleconsultations are not available only for the patients or their parents/legal representatives as specialists can’t discuss changes in chemotherapy or supporting care therapy or the necessity of special research methods without the attending physician.

If there’s a lack of data about the patient, an objective or subjective violation of the integrity, volume, and adequacy of the initial data, the expert refuses to hold telemedicine procedure and as usual, offers an alternative form of organization (logistics) of the necessary medical service.

In conclusion, a few words about the Telecare prospects. The organization of telecommunication center in the form of a cluster will allow the most efficient and economical use of the intellectual potential and expensive medical equipment of the hospitals. Despite the existing, but potentially solvable, difficulties, the use of Telemedicine becomes a standard in pediatric oncohematology [10]. It is a tool, that optimizes the logistics of medical care and strongly reduces the clinics’ financial costs.

This also requires the development of a certain document flow (charter, regulations, working schedule, etc.), an assessment of hospitals’ technical opportunities, staff training and recruiting, financing, development of criteria effectiveness indications for videoconferencing (including the lack of specialists, atypical cases, relapses, geographical distance, etc.).

All these measures will unite geographically disparate, but functionally interconnected clinics that combine therapy, diagnostic, research and educational opportunities to provide specialized, including high-tech, medical care to the population using telecommunica-

tions innovations, which, in turn, will promote the delivery of quality medical services, ensure continuity in the work of medical and preventive institutions at various levels (regional and federal) and create prospects for the formation of a unified information space in the field of "Oncohematology".

Conclusion

Despite of still existed difficulties of telemedicine using, it servers as a great support to patients, oncologists and other medical specialists and, of course, has and will have a tremendous future.

Bibliography

1. Watson DS. "Telemedicine". *Medical Journal of Australia* 151.2 (1989): 62-66.
2. Mooney J. "A survey on electronic communication in pediatric clinics". *Telemedicine Journal and e-Health* 18.6 (2012): 454-458.
3. Bryan L Burke., *et al.* "Telemedicine: Pediatric Applications". *Pediatrics* 136.1 (2015): 293-308.
4. Federal Law of 21 November 2011 No. 323-Φ3. "On Fundamentals of Health Protection of Citizens in the Russian Federation" (2011).
5. Federal Law of 29 July 2017 No. 242-Φ3 «On Amendments to Certain Legislative Acts of the Russian Federation on the Application of Information Technologies in the Sphere of Health Protection» (2017).
6. Ministry of Health Order of 30 November 2017 No. 965n. "On Approval of the Procedure for Organizing and Providing Medical Care Using Telemedicine Technologies" (2017)
7. Qaddoumi I., *et al.* "Impact of telemedicine on pediatric neuro-oncology in a developing country: the Jordanian-Canadian experience". *Pediatr Blood Cancer* 48.1 (2007): 39-43.
8. S. Joseph Sirintrapun, MD, FASCP, FCAP, Ana Maria Lopez, MD, MPH, FACP. Telemedicine in Cancer Care. 2018 ASCO EDUCATIONAL BOOK. P (2018): 540-545.
9. Meaghann S Weaver., *et al.* "Homestead together: Pediatric palliative care telehealth support for rural children with cancer during home-based end-of-life care". *Pediatrics and Blood Cancer* (2021): 1-9.
10. N Graf., *et al.* "Telemedicine in pediatric oncology". *Klinische Padiatrie* 214.1 (2002): 8-19.

Volume 10 Issue 4 April 2021

©All rights reserved by EV Zavaleva and Anna A Ivanova.