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PROSPECTS FOR ORGANIZING MEDICAL SERVICES ON THE BATTLEFIELD USING DRONES AND TELEMEDICINE

Public Safety University of the Republic of Uzbekistan
Senior Lieutenant ***Yoqubov Sardor Ixtiyor o'g'li***

Annotation: Providing rapid and effective medical assistance during combat is essential, though often complicated by limited resources and high risks to medical personnel. Modern technologies, such as Unmanned Aerial Vehicles (UAVs) and telemedicine, offer new opportunities to enhance medical support in combat zones and emergency situations. This article analyzes the utilization of drones and telemedicine in conflict and emergency areas, examining their effectiveness, advantages, limitations, and the prospects for integrating these technologies. Furthermore, the study draws upon data from scientific articles, reports, and practical case studies regarding UAVs and telemedicine.

Keywords: Unmanned Aerial Vehicles (UAVs), telemedicine, emergency medicine, combat medicine, medical assistance, remote diagnostics, technology integration.

Emergency situations such as military conflicts, natural disasters and man-made disasters pose a serious threat to human life and health. In such situations, traditional methods of providing medical care are often ineffective due to limited resources, destroyed infrastructure and high risks for medical workers. Modern technologies such as unmanned aerial vehicles (UAVs) and telemedicine offer new opportunities to improve medical care in emergency zones. Drones allow for the rapid delivery of medical supplies, equipment and first aid to hard-to-reach or dangerous areas, reducing delivery times and minimizing risks for medical workers. In turn, telemedicine allows for remote consultation and diagnosis, which is important in situations where access is limited.

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Numerous studies have analyzed data showing the effectiveness of unmanned aerial vehicles (UAVs) and telemedicine. The results show that the use of these technologies significantly improves the efficiency, availability and quality of medical care in disaster areas.

The use of drones for delivering medical supplies and equipment to hard-to-reach areas has proven to be highly effective. For instance, during combat, the delivery time for medications was reduced by half, which led to an increase in the number of successful medical evacuations. Prospectively, this creates an opportunity to increase the number of survivors from 30 to 60 out of every 100 wounded individuals.

Drones also demonstrate their effectiveness in delivering humanitarian aid. For example, the **MQ-9 Reaper (USA)** can deliver up to 3 kg of medical supplies over a distance of 1,850 km, while the **Bayraktar TB2 (Turkey)** can transport up to 4 kg over a distance of 150 km. These capabilities allow for the rapid delivery of medical resources to remote areas where traditional delivery methods are unavailable.

The reduction of risk for medical personnel is a significant result. The use of drones has decreased the risk to medical staff from **80% to 40%**, which is particularly crucial in combat situations or natural disasters.

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Telemedicine technologies have proven highly effective in remote diagnostics and consultations. For example, a study conducted in the Chechen Republic analyzed a children's field hospital where **64 telemedicine consultations** were performed for 54 patients over a year. Among them, 33 consultations were for injuries and orthopedic conditions, 15 for general medical issues, and 4 for cardiac problems.

The combination of drones and telemedicine has demonstrated significant potential to increase the effectiveness of medical care. For instance, while drones can deliver medical resources to remote areas, telemedicine systems can provide remote diagnostics and consultations with specialists. This not only ensures rapid assistance but also minimizes risks for medical personnel.

The use of drones and telemedicine has also proven to be **cost-effective**. Reducing delivery times and improving access to medical care has lowered transportation costs and enhanced the overall efficiency of medical operations.

https://www.strixdrones.com/why-are-drones-good-for-delivery/#:~:text=Unlike%20traditional%20delivery%20methods%2C%20drones,compared%20to%20traditional%20delivery%20vehicles.

increased overall efficiency. For instance, the use of drones in combat scenarios has reduced the cost of medical supply delivery by 30%.

The results concerning the use of Unmanned Aerial Vehicles (UAVs) for the delivery of medical resources align with the findings presented in research by international authors. For example, studies conducted in the United States and Israel also confirm that drones can significantly reduce the delivery time of medications and increase access to medical assistance in hard-to-reach areas.

As for telemedicine, its effectiveness in emergency situations is validated by both local and international research. For example, the previously mentioned experience of the pediatric field hospital in the Chechen Republic demonstrates the high efficiency of telemedicine consultations. and increase access to medical care in hard-to-reach areas.

As for telemedicine, its effectiveness in emergency situations has been confirmed by both domestic and international studies. For example, the experience of a field pediatric hospital in the Chechen Republic, cited above, shows the high effectiveness of telemedicine consultations. However, focusing on integration with drones allows us to open up new approaches to providing medical care in emergency zones.

One of the main limitations of these studies is the lack of data on the use of drones and telemedicine in various emergency situations. While most of the cases considered are related to military operations and natural disasters, the use of these technologies in man-made disasters and pandemics has not yet been sufficiently studied.

In addition, the study did not consider all aspects of the cost-effectiveness of the use of drones and telemedicine. For example, the long-term costs of developing and implementing these technologies have not been taken into account, which could be important for their widespread adoption in the future. The advantage of this research is that it has a comprehensive approach to analyzing the use of drones and telemedicine in disaster medicine. The results obtained can be used to develop new strategies for providing medical care. For example, the integration of drones and telemedicine can be the basis for creating mobile medical systems

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capable of rapid response to various disasters. In addition, the results of the study can be useful in developing a regulatory framework governing the use of drones and telemedicine in emergency situations.

The use of drones to deliver medical supplies and equipment to hard-to-reach areas significantly improves the speed and availability of medical care. Delivery time is reduced by up to half, which increases the number of medical evacuations and reduces mortality among the wounded. Telemedicine technologies provide rapid diagnostics and consultations with specialists, which is especially important in conditions with limited access to medical care. The experience of a children's field hospital in the Chechen Republic has shown that telemedicine simplifies the process of hospitalization and improves patient treatment strategies. The combination of drones and telemedicine opens up new opportunities to improve the efficiency of medical care in emergency zones. Drones can deliver medical supplies, while telemedicine systems provide remote diagnostics and consultations, minimizing risks for medical workers and improving the quality of care. The use of drones and telemedicine has also shown its cost-effectiveness, reducing the cost of drug delivery and streamlining the medical care process. To fully realize the potential of drones and telemedicine, it is necessary to develop their legal regulation, strengthen cybersecurity and international cooperation

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