EENA-Everdrone project

Lifesaving medical deliveries by drone

PROJECT DESCRIPTION &
CALL FOR APPLICATIONS

An invitation to build knowledge and drive change in Emergency Medical Services.

eena
EUROPEAN EMERGENCY NUMBER ASSOCIATION

EVERDRONE

EENA-Everdrone project: Lifesaving medical deliveries by drone

An invitation to build knowledge and drive change in Emergency Medical Services

EENA-Everdrone project: Lifesaving medical deliveries by drone. An invitation to build knowledge and drive change in EMS.

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1 | INTRODUCTION

Drones are increasingly becoming a part of the emergency response and public safety industry all around the world. The typical use case is to capture images and thermal data for better situational awareness and decision support. However, more advanced operations are just around the corner, driven by new technology and more autonomous drone systems.

Operations conducted by Croatian Mountain Rescue Service[1], Chula Vista Police Department[2] and others are currently pushing the envelope for how drones are utilised within emergency response and public safety. EENA has also previously explored the benefits of drone technology for first responder teams across various pilot sites through a partnership with DJI[3] and has published a Drone Efficacy Study with DJI and Black Channel, to assess the added value of drones for the current standard practice used for search and rescue missions.[4]

To explore this promising novel technology, EENA and Everdrone are now launching a project to better understand the possibility of using drones for emergency medical deliveries in Europe and beyond. With support from the Swedish medical university Karolinska Institutet, the project will comprise information gathering through interviews conducted with relevant end-user organisations.

Professionals from organisations providing emergency medical services are invited to take part in the project and contribute to driving change for the safety of citizens.

EENA and Everdrone are launching a project to better understand the possibility of using drones for emergency medical deliveries. Professionals from organisations providing emergency medical services are invited to join the project.

[1] https://eena.org/knowledge-hub/press-releases/drones-case-study-airspace/
[2] https://www.chulavistaca.gov/departments/police-department/programs/uas-drone-program
[3] https://eena.org/wp-content/uploads/2016_11_07_EENA_DJI_Pilot_Project_Report_FINAL.pdf
[4] https://eena.org/wp-content/uploads/2018_09_18_EENA_DJI2Report19.pdf

2 l EMERGENCY DELIVERY OF AED BY AUTONOMOUS DRONE

The concept of using drones for emergency medical deliveries may prove valuable in a number of life-critical situations. Transportation of low-weight autoinjectors carrying epinephrine for anaphylactic shock, nasal dispensers with naloxone for opioid overdoses, and single-use glucagon for hypoglycaemia are such examples. However, one use case in particular has gained world-wide interest in the past years; the possibility of transporting an Automated External Defibrillator (AED) to the site of an out of hospital cardiac arrest (OHCA).

OHCA affects some 275,000 individuals in Europe each year and 30-day survival rates are generally low: around 10%. Despite tens of thousands of AEDs sold, the survival rate has not changed significantly: still, 90% of all people suffering from OHCA die.[5]

It has been well proven that the time to treatment with cardio-pulmonary resuscitation (CPR) and defibrillation is the most important factor to improve survival rates. For each minute that passes from the time of collapse without treatment, the chance of survival decreases by 7-10%.[6] Research shows that if CPR and early defibrillation are initiated within the first minutes, up to 50-70% of all patients may survive.[7,8] The circumstances described above inevitably leads to the conclusion that traditional emergency medical services (EMS) are not able to reach this group of patients quickly enough – especially not in residential homes or in suburban and rural areas.[9]

The method of dispatching AED equipped drones to decrease the time from collapse to first shock with a defibrillator has great potential. Research with theoretical models conducted by the Karolinska Institutet, has shown that drones could have a lower response time than traditional EMS in 93% of rural OHCA cases with a mean timesaving of 19 minutes.[10] These models have further been supported by real-world test flights where drones have been dispatched in non-emergency situations to historical OHCA locations.[11] Furthermore, a first of its kind clinical feasibility study turning the concept into reality has also been carried out in Sweden during the summer of 2020 (See section 4). The results from this study are to be published in early 2021.

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[7] Valenzuela TD, Roe DJ, Nichol G, Clark LL, Spaite DW, Hardman RG. Outcomes of rapid defibrillation by security officers after cardiac arrest in casinos. N Engl J Med. 2000;343(17):1206-9.

[8] Ringh M, Jonsson M, Nordberg P, Fredman D, Hasselqvist-Ax I, Håkansson F, et al. Survival after Public Access Defibrillation in Stockholm, Sweden--A striking success. Resuscitation. 2015;91:1-7.

[9] Hansen SM, Hansen CM, Folke F, Rajan S, Kragholm K, Ejlskov L, et al. Bystander Defibrillation for Out-of-Hospital Cardiac Arrest in Public vs Residential Locations. JAMA Cardiol. 2017;2(5):507-14.

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[11] Claesson A, Bäckman A, Ringh M, Svensson L, Nordberg P, Djärv T, Hollenberg J. Time to Delivery of an Automated External Defibrillator Using a Drone for Simulated Out-of-Hospital Cardiac Arrests vs Emergency Medical Services. JAMA. 2017 Jun 13;317(22):2332-2334.

3 I EENA-EVERDONE PROJECT

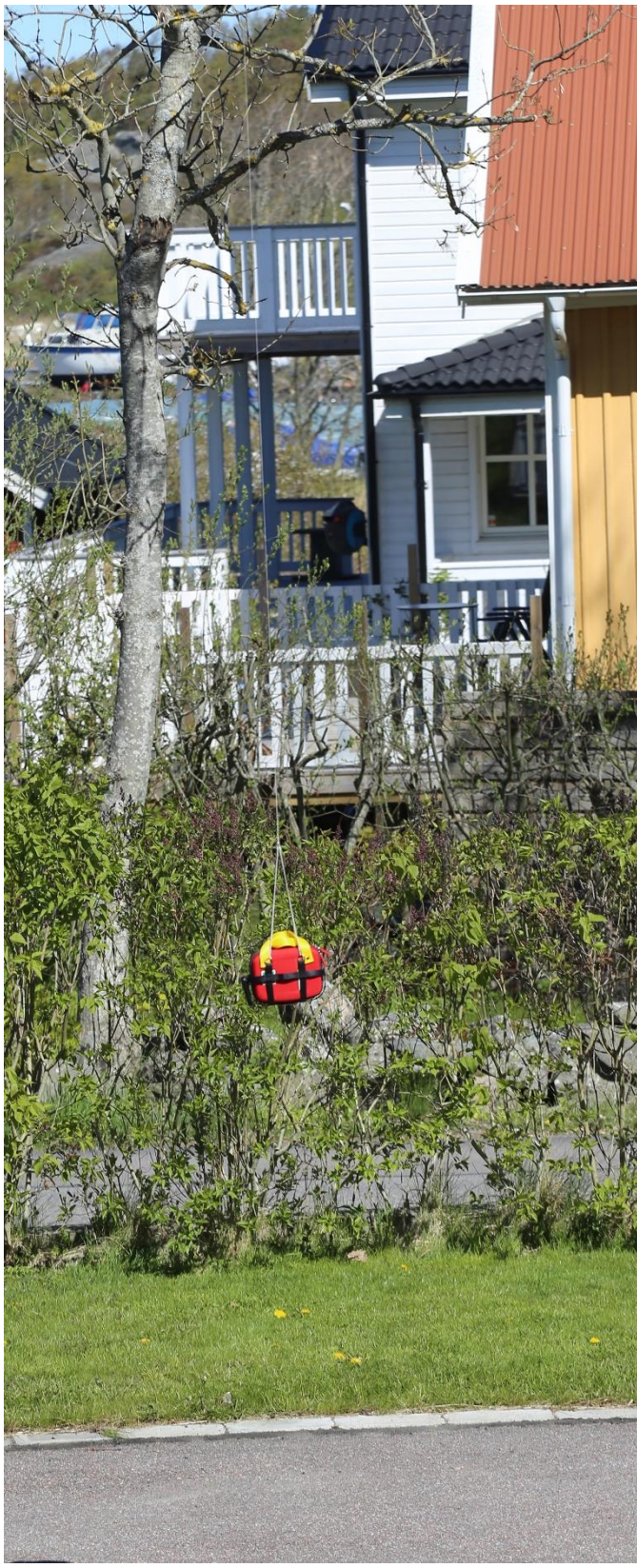
PROJECT OBJECTIVES

With the ambition of accelerating drone use within EMS where this improves citizens' safety, EENA and Everdrone have partnered for a new project. The project will involve a series of exploratory interviews with management and innovation professionals in organisations providing emergency medical services, primarily Public Safety Answering Points and first responder organisations.

The interviews aim to explore opportunities and challenges of using drones to deliver AEDs and other medical equipment in emergency situations in different countries.

In conclusion, the main objectives are:

1. To do an initial validation of the implementation of AED drone delivery services in Europe and beyond.
2. To carry out a mapping of adjacent use cases for emergency drone systems, such as other types of delivery scenarios, and other time-critical drones operations in general.



PROJECT OUTPUTS

Final report

The final report will gather the conclusions of the EENA - Everdrone interviews as well as the most recent progress from the Swedish operations. (See section 4.)

Webinar

The final report will be complemented by a webinar to present the findings to the public safety community.

CALL FOR APPLICATIONS

Professionals from organisations providing emergency medical services, in particular Public Safety Answering Points (PSAPs) and first responder organisations, are invited to take part in the project to help drive change for the safety of citizens. Applications are open for professionals from any such organisation, based in any country, with an interest in exploring opportunities with drone-assisted medical deliveries.

Participants should ideally be in a PSAP management or innovation management position, but other professionals with a thorough knowledge of these areas will also be considered. Participants are not required to have any prior knowledge about drones or drone deliveries, but a keen interest in the field is expected.

Each participant will take part in an informal exploratory interview with the purpose of understanding local requirements and circumstances. The interviews will be conducted remotely from January through to March 2021. The interview will typically last between 60 and 90 minutes and the questions (in English) will be provided beforehand to participants. The interviews may be used to propose opportunities for real-world pilot project expansion in the future.

During an interview, examples of some of the questions to be covered include:

- Current handling and experiences of suspected Out of Hospital Cardiac Arrest (OHCA) in your region?
- For research purposes: what historical dispatch and medical data is available within your current organisation related to OHCA and other priority 1 emergencies?
- What mission statements and KPIs apply to your organisation with regards to response time?
- What is the current mindset and prior experience within your organisation regarding the use of drones in emergency response?

The final report will be prepared by EENA and Everdrone. Participants will have the opportunity to provide comments on the sections which detail their interviews. An introductory webinar for participants will be held at the end of January 2021 to answer any questions and present the framework for the interviews.

Application form: *https://bit.ly/395EgxN*

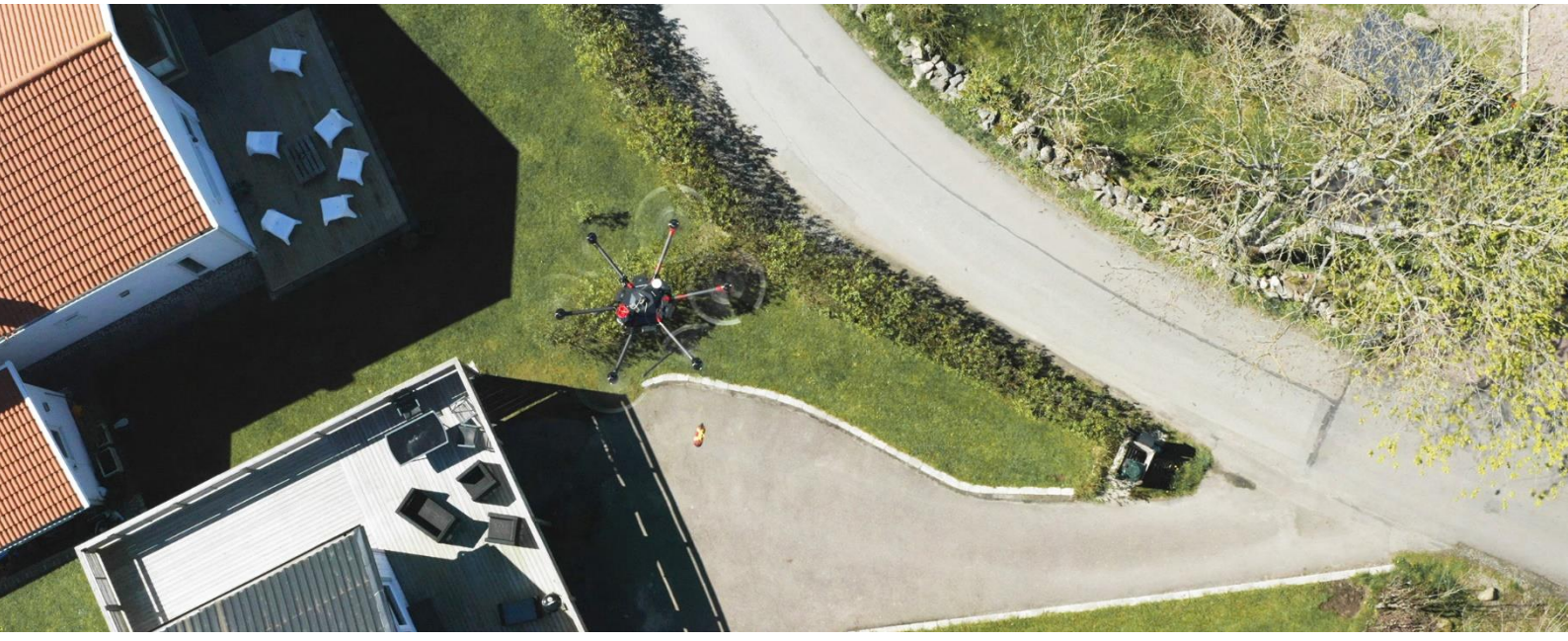
Deadline: 22 December. Successful candidates will be contacted by 15 January.

If you would like more information on the project, please do not hesitate to contact:

Alfonso Zamarro, Drones Manager, EENA: *az@eena.org*

PROJECT TIMELINE

Deadlines	Actions
23 November 2020	Call for applications launched
22 December 2020	Deadline call for applications
15 January 2021	All successful applicants contacted
End January 2021 (exact date TBC)	Kick-off webinar for participants
January – March 2021	Interviews carried out
October 2021	Final paper published
October 2021	Webinar on findings held



PROJECT PARTNERS

EENA

EENA, the European Emergency Number Association, is a non-governmental organisation with the mission to contribute to improving the safety and security of people. How can citizens get the best help possible if they find themselves in an emergency? This is the question we continuously try to answer.

Today, the EENA community includes 1500+ emergency services representatives from over 80 countries world-wide, 100+ solution providers, 100+ researchers. EENA is proud to be a platform for everyone involved in the public safety community and to provide a space for collaboration and learning.

Contact: Alfonso Zamarro, Drones Manager: az@eena.org

Everdrone AB

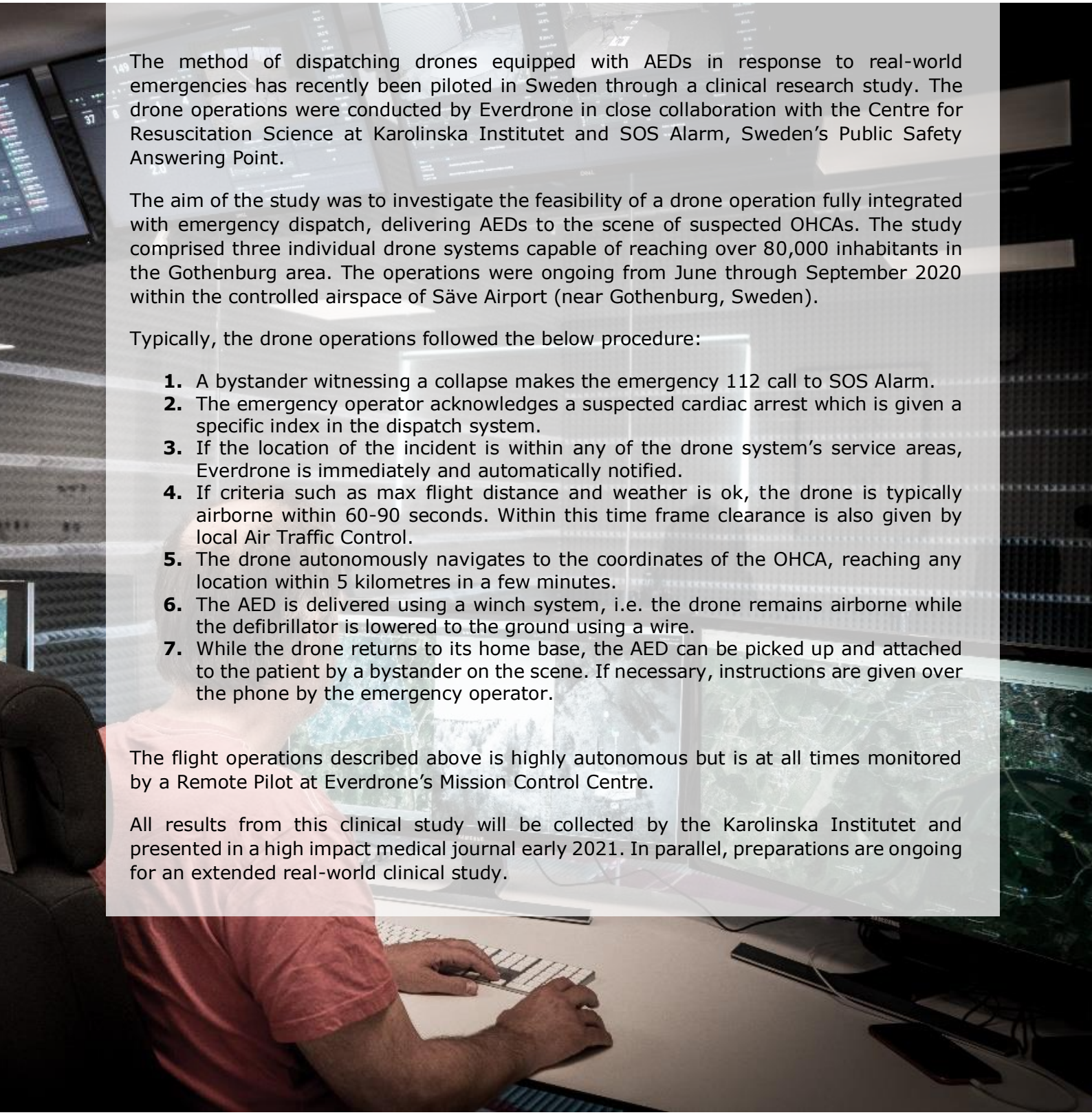
Everdrone is a global leader in autonomous drone technology and provider of integrated drone services. The company focuses on civil applications for commercial drones, with a string focus on healthcare and emergency response. Everdrone also actively works with regulatory issues associated with drones, specialising in urban operations. The company holds a unique permit for drone operations in urban areas conducted beyond visual line of sight from the pilot.

Contact: Mats Sällström, CEO: mats@everdrone.com

Centre for Resuscitation Science at Karolinska Institutet

Karolinska Institutet is one of the world's leading medical universities and is Sweden's single largest centre of medical academic research. The centre for resuscitation science at Karolinska Institutet has scientifically evaluated the use of AED-equipped drones since 2014. Andreas Claesson, Associate Professor at the Centre for Resuscitation Science at Karolinska Institutet, and Chairman of the Swedish Resuscitation Council, will hold an advisory role in the project.

4 l REAL-WORLD CLINICAL STUDY IN SWEDEN



The method of dispatching drones equipped with AEDs in response to real-world emergencies has recently been piloted in Sweden through a clinical research study. The drone operations were conducted by Everdrone in close collaboration with the Centre for Resuscitation Science at Karolinska Institutet and SOS Alarm, Sweden's Public Safety Answering Point.

The aim of the study was to investigate the feasibility of a drone operation fully integrated with emergency dispatch, delivering AEDs to the scene of suspected OHCAs. The study comprised three individual drone systems capable of reaching over 80,000 inhabitants in the Gothenburg area. The operations were ongoing from June through September 2020 within the controlled airspace of Säve Airport (near Gothenburg, Sweden).

Typically, the drone operations followed the below procedure:

1. A bystander witnessing a collapse makes the emergency 112 call to SOS Alarm.
2. The emergency operator acknowledges a suspected cardiac arrest which is given a specific index in the dispatch system.
3. If the location of the incident is within any of the drone system's service areas, Everdrone is immediately and automatically notified.
4. If criteria such as max flight distance and weather is ok, the drone is typically airborne within 60-90 seconds. Within this time frame clearance is also given by local Air Traffic Control.
5. The drone autonomously navigates to the coordinates of the OHCA, reaching any location within 5 kilometres in a few minutes.
6. The AED is delivered using a winch system, i.e. the drone remains airborne while the defibrillator is lowered to the ground using a wire.
7. While the drone returns to its home base, the AED can be picked up and attached to the patient by a bystander on the scene. If necessary, instructions are given over the phone by the emergency operator.

The flight operations described above is highly autonomous but is at all times monitored by a Remote Pilot at Everdrone's Mission Control Centre.

All results from this clinical study will be collected by the Karolinska Institutet and presented in a high impact medical journal early 2021. In parallel, preparations are ongoing for an extended real-world clinical study.

Apply now for the EENA-Everdrone project:

APPLICATION FORM

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