

DEPARTMENT OF DEFENSE -  
CONGRESSIONALLY DIRECTED  
MEDICAL RESEARCH  
PROGRAMS

**Contact Us (/contact) | Site Map (/sitemap)**

 (https://www.facebook.com

/TheCDMRP) 

(http://twitter.com/CDMRP) 

(https://www.youtube.com

/user/CDMRP) 

(/rss/funding\_opportunities.xml)



(/default)

## Transforming Healthcare through Innovative and Impactful Research

Home (/default) / Search Awards

# Search Awards

[Back to Search Results](#) | [Modify Search](#) | [New Search](#)

### **Development of a Suitcase-Sized Portable Digital Stereoscopic Ophthalmic Microscope with Surgical Telepresence/Telemedicine Capability**

**Principal Investigator:** MALTESE, MATTHEW

**Institution Receiving Award:** CHILDREN'S HOSPITAL, PHILADELPHIA

**Program:** VRP

**Proposal Number:** VR170103

**Award Number:** W81XWH-18-2-0063

**Funding Mechanism:** Technology/Therapeutic Development Award

**Partnering Awards:**

**Award Amount:** \$1,440,988.68

[View Technical Abstract](#)

PUBLIC ABSTRACT

What are the objectives and rationale for the application?

Due to the steady increase in eye injury in combat casualties over the past five decades, there is a growing necessity for deployed military eye surgeons to provide patient care in extraordinary battlefield circumstances. Surgical microscopes are key tools for treating warfighters, yet, such microscopes are too heavy and fragile for battlefield settings. We are developing a ruggedized Portable Digital Surgical Microscope (PDSM) that weighs less than 3 pounds (under 30 pounds with its protective case and base) to allow these surgeons to hand-carry a microscope to the field and provide sight-saving care.

What is the ultimate applicability and potential impact of the PDSM?

Ultimately, we envision that an eye surgeon can hand-carry their magnification system to any surgery they perform, much in the same way a medical doctor carries a stethoscope. We seek this goal for both military and civilian surgeons. The impact of this is lowering the cost and physical barriers to patient care, thereby spreading sight-saving surgery to patients everywhere.

What types of patients will it help, and how will it help them?

Eye injuries in warfighters has increased from less than 1% of combat casualties in the 1850s to 13% in modern times. Warfighters who sustain ocular polytrauma injuries must wait for transport to a facility that has a surgical microscope. If the wait time is beyond the therapeutic window of care, this could lead to loss of sight. In addition, there are approximately 2.2 million blind children globally, with three-fourths of these children living in developing countries. The incidence of childhood blindness in countries of low and very low income is 6 to 10 times that of high income countries. This disparity is driven primarily by pediatric cataracts, congenital glaucoma, and trauma, all of which require eye surgery under magnification. The limiting factor which prevents pediatric eye surgery in low income countries is lack of access to a surgical microscope. Because our PDSM is portable and rugged, it can help both children and soldiers.

What are the potential clinical applications, benefits, and risks?

The human eye is very delicate and small, and thus surgeons require magnification. The benefits of our system are that by making a portable and rugged microscope, we can spread sight-saving medical care to more patients. The risks of not successfully developing the PDSM are that people will go blind in low-income countries, battlefields, and in other austere medical settings.

What is the projected timeline it may take to achieve the expected patient-related outcome?

We expect to begin our project April 1, 2017, and we will have Food and Drug Administration approval to use the device by January 2020.

What are the likely contributions of the proposed research project to advancing the field of vision dysfunction?

As eye surgery spreads to places where such surgery is not available, the field of vision dysfunction treatment will expand to all populations.

Briefly describe how the proposed project will benefit military Service members, Veterans, and other individuals living with visual dysfunction.

By democratizing sight-saving care, military Service members, Veterans, and other individuals living with visual dysfunction will have greater likelihood of improved visual function.

[Back to Search Results](#)

Note: Documents in Portable Document Format (PDF) require Adobe Acrobat Reader to view, [download Adobe Acrobat Reader \(http://get.adobe.com/reader/\)](http://get.adobe.com/reader/).

## CDMRP

[Privacy Notice \(/privacynotice\)](/privacynotice) · [External Links/Product Disclaimers \(/disclaimer\)](/disclaimer) ·

[Research Programs \(/researchprograms\)](/researchprograms) · [Funding Opportunities \(/funding/default\)](/funding/default) ·

[Consumer Involvement \(/cwg/default\)](/cwg/default) · [Search Awards \(/search.aspx\)](/search.aspx) · [About Us \(/aboutus\)](/aboutus)

CDMRP © 2015



1077 Patchel Street  
Fort Detrick, MD 21702-5024



(301) 619-7071



[cdmrpwebmaster@cdmrp.org \(mailto:cdmrpwebmaster@cdmrp.org\)](mailto:cdmrpwebmaster@cdmrp.org)

### About Us

The CDMRP originated in 1992 via a Congressional appropriation to foster novel approaches to biomedical research in response to the expressed needs of its stakeholders-the American public, the military, and Congress.



<https://www.facebook.com/TheCDMRP>



<http://twitter.com/CDMRP>



<https://www.youtube.com/user/CDMRP>



[\(/rss/funding\\_opportunities.xml\)](/rss/funding_opportunities.xml)