

# New Face Shields Protect Health Care Workers from COVID-19

---

 [brighamhealthhub.org/covid-19/new-face-shields-protect-health-care-workers-from-covid-19](https://brighamhealthhub.org/covid-19/new-face-shields-protect-health-care-workers-from-covid-19)

April 22, 2020

Many health systems are strained by shortages of personal protective equipment (PPE) during the COVID-19 outbreak. To address this problem, a team of Brigham and Women's Hospital clinicians collaborated with academic and industry partners to design and develop a new 3D-printed face shield. The shield protects clinicians on the frontlines who care for COVID-19 patients.

To create the [BWH/PanFab Mk1.0 face shield](#), the Brigham clinicians worked with BoroBot, a 3D printing workshop, and the Greater Boston Pandemic Fabrication Team (Pan-Fab). BoroBot was founded by Chelsea B. Hodnett, a human resources business partner at the Brigham, and her husband Richard Oakley, research communications manager at Dana-Farber Cancer Institute.

Dermatologists [Nicole R. LeBoeuf, MD, MPH](#), and [Sherry Yu, MD](#), led the Brigham team and worked with BoroBot and Pan-Fab to modify the open source "Prusa" face shield made by Prusa Research.



Clinical leads Drs. LeBoeuf and Yu wearing BWH/PanFab Mk1.0 face shield face shields.

## Face Shield Features Keep Frontline Clinicians Safe

---

The innovative 3D-printed face shield offers a number of advantages over traditional shields. Most standard face shields are intended to be single use, but the new Mk1.0 masks can be sterilized and used again by following the [reuse recommendations](#) from the Center for Disease Control and Prevention's (CDC).

The new 3D-printed face shields also provide:

- Ear-to-ear protection
- A longer plastic shield to limit exposure to airborne particles
- An extended top lip that protects from spray from above
- Fog resistance

“From a logistics standpoint, our new face shield also gave the Brigham an alternative to the standard face shields that we were ordering, which decreased the demand on our already stressed supply chains,” says Dr. Yu, who leads the PPE innovation and conservation efforts in the logistics section of Brigham's Incident Command Center.

## Emotional and Psychological Benefits in the COVID-19 Setting

---

“We took feedback from health care workers who are risking their lives in the Brigham emergency department (ED) to build a unique face shield that's as safe as possible,” says Dr. LeBoeuf, who has been working to address the hospital's unmet clinical needs since the COVID-19 crisis began. “Even the new face shields that are being scaled up for federal distribution don't appear to protect from the top like our design.”

In addition to helping providers feel physically safe, the masks also offer emotional and psychological benefits. “We feel fully protected in these new shields,” says [Edward W. Boyer, MD, PhD](#), director of Research in the Brigham's ED. “The fact that we can reuse them is a tremendous value to clinicians who are working directly with COVID patients.”



Greg Crosby, MD, an anesthesiologist at the Brigham, using a new 3-D printed face shield on the front lines. (Photo courtesy of Jim Rathmell, MD)

## The Brigham Tests Face Shield in the Emergency Department

---

To test the new face shield in a clinical setting, Drs. LeBoeuf and Yu connected with [Phil Anderson, MD](#), a Brigham ED physician and Dr. Boyer. They agreed to test and validate the face shields through a pilot study in the Brigham ED.

To help ensure the face shield met the FDA's standards, the team recruited [Arash Mostaghimi, MD, MPA, MPH](#), director of the Brigham's Inpatient Dermatology service. Dr. Mostaghimi leads clinical trials at the Brigham and quickly authored a clinical protocol. Within hours, the hospital's institutional review board (IRB) approved the trial. A day later, about 60 physicians, nurses and first responders provided care to COVID-positive patients with brand new face shields and reported back to the team.

Brigham clinicians who wore the Mk1.0 face shields reported feeling better protected from splash and spray. They felt safer and more confident working during the COVID crisis. They were also encouraged to know that a team was actively looking for solutions to keep them safe. Inspired by the positive feedback, production was ramped up.

## Thousands of Frontline Workers to Get Mk1.0 Face Shields

---

As of mid-April, 450 face shields have been deployed to the Brigham's ED and operating rooms. They're also being used by intubation and code teams. Several hundred Mk1.0 face shields were sent to the ED at the Brigham and Women's Faulkner Hospital.

The Brigham-led team is further increasing production and plans to make several thousand more shields in the coming weeks. They will distribute shields to the front lines and other high-risk areas at the Brigham.

“We have been making these face shields for the Brigham, DFCI and other Boston hospitals, along with our local community first responders and nursing homes,” says Hodnett. “We’ve made and distributed more than 1,000 face shields to the community. My husband and I, along with a dedicated group of volunteers, have been assembling these shields and getting them out. We’ve had huge support from our community and being a non-profit, we’ve been able to use donations to buy all of the supplies we have used.”

The team is now researching ways these shields can be best sterilized and decontaminated. “These face shields seem to remain sturdy and intact after 10 sterilizations using an ionized hydrogen peroxide,” says Dr. LeBoeuf. “Our hope is that they can be used indefinitely, making them non-disposable.”

The BWH/PanFab Mk1.0 face shield design has been made public on [Pan-Fab's website](#). Anyone with 3D printing capacity can quickly go into production. Several Boston hospitals have reached out with interest in producing the new face shield themselves.

“Everyone is so focused on bringing as many good solutions to the table as fast as possible,” says Dr. Yu. “The creative energy people are directing toward this crisis isn’t usually possible when we have other distractions. Right now, our sole focus and purpose is making sure that our frontline healthcare workers are protected and healthy.”

## Recent Local Media Coverage:

---

Subscribe for more from Brigham Health.

---