

# How to wash your hands: Startup aims to solve major health care problem

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The creators of the Fian Bar, from left: Michael Wu, Parham Chinikar, Marawan Gamal and Luke Kyne. Credit: Erin Howe

When Luke Kyne and his classmates Marawan Gamal, Parham Chinikar and Michael Wu learned Canada has the highest rate of health care

acquired infections (HAIs) of any developed country, they were inspired to reduce it.

Kyne is an alumnus of the University of Toronto, Gamal and Chinikar are students in the Faculty of Applied Science & Engineering, and Wu is in the master's program at the Faculty of Medicine.

The group developed a device called the Fian Bar, an interactive device that reminds users about how best to wash their hands. Kyne told writer Erin Howe of U of T's Faculty of Medicine about their startup, Fian, and the team's plan to improve [health care](#) through [handwashing](#).

## **What does Fian do?**

Our handwashing companion device, the Fian Bar, uses interactive prompts and instant feedback to increase handwashing duration and compliance. Our device is mounted next to a washroom sink and guides a person through the stages of handwashing using three different icons: water, soap and scrub. Sensors track which stage of handwashing the user is in and illuminate the appropriate icon. A timer correlated with the scrub icon encourages 15 seconds of scrubbing with soap, as mandated by the World Health Organization. If the user washes their hands insufficiently, the entire device flashes and beeps. Hand hygiene data is also uploaded to our servers, which can be viewed and analyzed in real time by hospital administrators and researchers.

## **How did you arrive at this concept? What inspired you?**

One in 10 Canadian patients are infected with an HAI every year, [causing or contributing to] nearly 10,000 deaths annually. As mechanical engineering students with specializations in biomedical

engineering, mechatronics, solid design, and manufacturing, Marawan Gamal and Parham Chinikar recognized there might be a technological solution.

After Michael Wu and I did some further research, we found approximately half of all HAIs result from improper [hand](#) hygiene. Our team was convinced improvements in this area could massively benefit a large percentage of Canadians. Our initial solution was to construct an all-in-one handwashing station, complete with automatic washing and drying. However, we wanted to minimize the intrusiveness and cost of our device, and instead imagined the Fian Bar as an inexpensive and accessible tool for guiding improved hand hygiene. Plus, previous studies have shown hand dryers tend to spread large amounts of airborne bacteria.

## **How will Fian improve the health care sector?**

Our mission is to keep [health](#) care workers and patients healthy by helping ensure proper hand hygiene practices. By focusing on hospitals, long-term care facilities and private clinics, we believe our technology can help improve handwashing in these settings. Our interactive signs also encourage improved handwashing for patients and visitors. These groups have been relatively unacknowledged in hand hygiene interventions to date and demonstrate significantly lower handwashing compliance than health care workers. Previous studies show the general public washes their hands for an average of just 4.4 seconds, versus the recommended 15-second minimum.

By comparison, dynamic speed display signs – which provide drivers with real-time speed metrics – have resulted in speed reductions of up to 9.2 km/h on average. In applying this principle to hand hygiene, we believe Fian Bars could increase handwashing duration and frequency to benefit the health care sector.

## **How far along is your concept/business?**

At this point, we've completed our prototype and are ready to validate our product in a clinical environment. We're working with Southlake Regional Health Centre to develop a study to identify changes in hand hygiene behaviour, including frequency and duration. Likewise, we're preparing to test our device in smaller-scale facilities to refine our network-based data collection services so we can expand to larger, more technologically elaborate institutions. As a member of the Faculty of Medicine's Health Innovation Hub (H2i) and MaRS Health Venture Services, we've continued to develop our business and are pursuing government funding and seed investment opportunities.

## **What makes you passionate about this project?**

Although our team originates from a diverse set of educational and cultural backgrounds, we've all got similar reasons for our enthusiasm. We've all contributed at some point to the ideation and design process, while conceptualizing novel technology is something we all enjoy. Most importantly, we're all passionate about the end results of this project. Ultimately, we want to reduce HAI-related patient deaths across Canada and around the world. If we can achieve this goal, we'll be extremely satisfied.

## **Tell me about the people at U of T who have mentored or inspired you.**

As students, we've met many highly accomplished people who've been critical to our success so far. Professor Paul Santerre, H2i co-director, has offered us valuable health care-related insights. In addition to helping us refine our business plan, H2i's lead mentor Andris Lauris has helped us prepare for pitch competitions and investor meetings. H2i's

lead legal adviser, Gabriella Chan, has assisted us in navigating the legal minefield of intellectual property claims. With years of experience developing novel hand hygiene technologies, Professor Geoff Fernie inspired us to think critically about the issue of handwashing and provided helpful feedback to enhance our solution.

## **What's next for this project?**

Once we validate our Fian Bar in a clinical environment, we want to implement this technology in as many health care facilities as possible. That way, we can help the health care system while continuing to acquire data to further enhance our service. We're planning to expand our reach to schools and food-related businesses, where proper handwashing is also critical to ensure the safety of students, teachers and the general public.

Additionally, we're looking into ways of increasing hand sanitizer compliance. Several companies have proposed solutions to encourage its use, but these are often expensive and highly intrusive, resulting in pushback from nurses and physicians.

Provided by University of Toronto

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