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The Problem. A common situation observed in large urban hospitals is patients waiting hours to receive care in the emergency department (ED), not at the fault of the hospital staff, but simply due to the lack of sufficient personnel to respond to overwhelming demand for care. This problem, known as ED overcrowding, is prevalent worldwide with few solutions. As a result, patients may end up waiting 4-12 hours before receiving medical attention, each second of which can lead to decreased satisfaction and increased walkouts (resulting in large financial losses for hospitals), progression of symptoms, morbidity, and mortality. With COVID-19, this issue ED overcrowding has exacerbated with a compounded fear of contracting respiratory illnesses.

Validation: We have conducted interviews with 113 medical professionals, including clinician-administrators and physicians in emergency medicine, who have expressed interest in our product. Without fail, every single one of these emergency department physicians have voiced hospital overcrowding as a primary concern. We are pre-revenue but 13 of these contacts, without soliciting, have offered to help with product testing down the line, further demonstrating the promise they see in our device. Through these efforts, we have received an overwhelming amount of support from those on the COVID-19 front lines.

The Solution. Vita Innovations is proud to introduce VitalMask, a smart mask made out of injection molding with built-in sensors for use in the ER waiting room and other emergency situations. VitalMask monitors and records patient body temperature, respiratory rate, heart rate, and oxygenated blood levels while only requiring a few seconds to put on. The data collected from the IoT sensors is wirelessly transmitted via Bluetooth from an on-board microcontroller to a Java desktop or tablet application that visualizes and analyzes the information in real time. Furthermore, the data can be integrated into patient records and stored on a cloud-based system for further access and analysis. While the sensors eliminate the need for nurses to place electrodes and pulse oximeters onto patients, a gasket seal ensures maximum protection with comfortable fit. To prevent false alarms of concerning vital readings due to incorrect placement, we have sensors built in to ensure proper and correct fit to the face, deactivating the alarm should the mask be detected to be off the face.

Vision: Our goal with VitalMask is to change the way that the ED boarding process is completed, and how the waiting room is underutilized as an important area for data collection and monitoring. Without having to increase the number of nurses, an ED administrator can reduce the risk of a patient's condition unnoticeably worsening as they wait for care, as well as decrease the rate of walkouts due to lack of care.

Competitive Advantage: Our technology outperforms other continuously monitoring portable devices in the integration of all of the sensors. Most monitoring devices track one or two vitals, and cost hundreds of dollars. Our device tracks 4 of the 5 major vitals, costs less, and includes an algorithm that tracks whether an irregular vital is the result of a medical problem or due to patient error (ex. removal of sensors). This saves time for nurses and tackles the well documented problem of alarm fatigue. We will prove these advantages by gathering letters of intent to purchase from academic hospitals (after sending our prototype), which will allow us to partner with a strategic that has established vendor relations, and will provide us with the scale to compete on price as well.

Market Opportunity & Business Plan: Since the industry is dominated by several large players, within 10 years we aim to partner with a strategic company, as well as expand into other monitoring technologies such as an earpiece iteration that can be used for at home care. To achieve this, we will apply for FDA approval and receive letters of intent to purchase from notable academic hospitals. Our current TAM for hospitals and urgent care clinics is ~$1B, and we are looking to expand applications into the military and at home care sectors.

Our Team: We are a team of eight Cornell undergraduates coming from diverse backgrounds in science, computer science, engineering, and business. Longsha, the CEO, has previously founded and led two organizations at Cornell including an engineering medical device design team, and has experiences intersecting healthcare, engineering, and entrepreneurship. Julia Isakov, the CFO, comes with diverse financial industry & leadership experiences and Jason Chen, the CTO, is skilled in programming, design, prototyping, and entrepreneurship. As a younger team, we are uniquely suited for this work because we are able to approach the industry from an outside perspective.

Ask & Payback: Vita Innovations was launched with $3,500 of crowdfunding and, to date, has generated $16,000 in non-diluted funding from winning the Impact Challenge of the 46th Business Today International Conference, winning the eShip kickoff from Cornell eLab, and receiving grant money from the Clinton Global Initiative Social Impact Fund. New lab space has been secured at the CNY Biotech Accelerator in Syracuse, NY and we are seeking $50,000 in pre-seed funding for costs associated with developing and obtaining necessary validations to get to FDA approval for our product. Vita Innovations, a C-Corp with additional mentorship support from CNY Biotech Accelerator and LaunchNY, is open to equity or convertible debt funding.