Keeping the heart healthy, and detecting problems early, is essential for many Canadians who live with or are at risk for heart disease. According to the Heart and Stroke Foundation of Canada, cardiovascular disease accounted for 29% of all deaths in Canada in 2008—that’s more than 69,500 lives.

Electrocardiogram heart monitoring is an effective and relatively inexpensive method used to detect heart disease. But current monitor models cannot be worn continuously, meaning doctors must choose between a complete recording for a short period of time or a partial recording over a long period of time.

Enter the Heart Monitoring Vest project. Two local companies, Ocorant Inc. and Ross & Doell, approached GBC with their latest heart monitor design, hoping to fabricate a vest that could be worn comfortably and continuously for up to 30 days—generating a more accurate scorecard of heart health.

The project’s principal investigator, Marsha Jorgensen, brought her nearly two decades of fashion industry experience to the project, as well as extensive teaching and research credentials and a history of designing activewear and outerwear. The HMV project united students from GBC’s Fashion Management, Fashion Techniques and Design, Fitness and Lifestyle Management, and Bachelor of Science in Nursing Collaborative Degree programs. Signal testing was headed by Jamie McIntyre and Paul O’Brien at GBC’s Centre for Construction and Engineering Technologies. In the project’s third and final phase, students developed three new generations of vests, building on previous project phases. Students conducted many rounds of usability testing with male and female subjects, who would mimic the everyday activities of a typical wearer (such as reaching into a cupboard or laying down on a bed). Since the vest had to be worn 24/7 for 30 days, the students compared notes on factors like comfort and garment shifts, taking these issues into account when redesigning. The students also prepared the prototypes to seamlessly integrate the electronic components of the vest through signal testing.

The final three vest designs were kept unisex to decrease production costs. The final report the GBC research team delivered to the industry partner outlined the evolution of each prototype design, summarized the signal and usability testing, discussed fabrics for the vests, and provided recommendations that were outside the project scope. Thanks to these recommendations, Ocorant is in a strong position to redesign the electronics housing with the vest designs in mind, navigating the path to heart health for countless patients across the country.