Advancing Diabetes Research as Part of a $3.6M Training Grant from the National Library of Medicine

The U.Va. Medical Informatics/Systems Engineering Training Program (MINDSET) prepares researchers to use systems engineering methods to improve health care.

As a MINDSET mentor and faculty member in the U.Va. Department of Systems and Information Engineering, Stephen Patek, along with his research group, is developing an “artificial pancreas.” In collaboration with the U.Va. School of Medicine, the group is examining how to combine continuous blood glucose monitors with insulin pumps to create a closed-loop automated system.
People with Type 1 diabetes have lost the normal functions of their pancreas and, therefore, face a control problem: maintaining blood glucose concentration through external insulin delivery while avoiding hypoglycemia that can result from over-insulinization.

Using the discipline and tools of systems engineering, Stephen Patek and his research team are addressing the problem by coupling continuous blood glucose monitors with insulin pumps to develop a safety-supervised, closed-loop automated system that functions as an “artificial pancreas.”

The project, supported in part by grants from the National Library of Medicine and the Juvenile Diabetes Research Foundation, is advancing diabetes research with the help of trainees in the U.Va. Medical Informatics/Systems Engineering Training Program (MINDSET).