medical

industrial

consumer

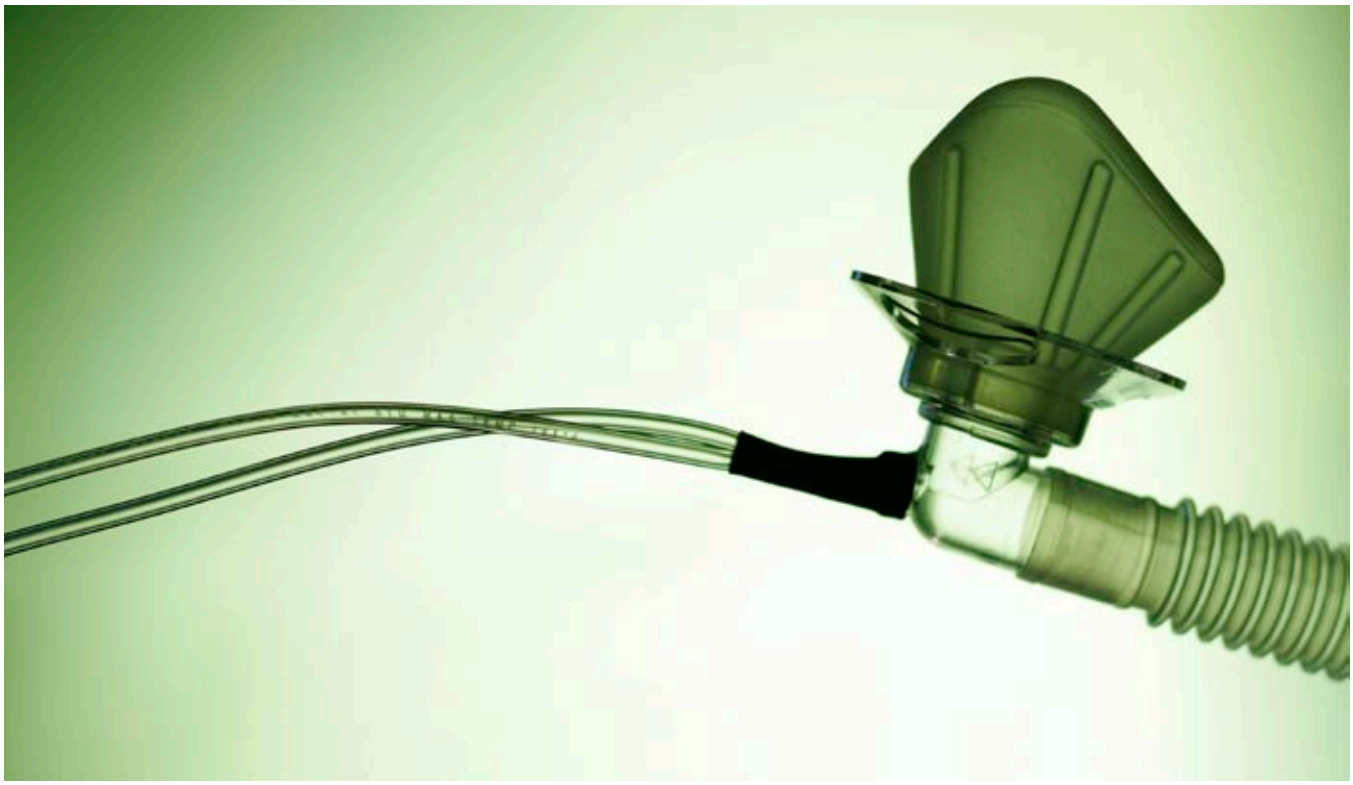
QUANTITATIVE RESPIRATORY FLOW METER

An inexpensive, disposable respiratory flow meter increases access to advanced sleep diagnostic metrics.

The Reason:
A brainstorming session with researchers from the John Hopkins University (JHU) School of Medicine revealed that respiratory monitoring technologies used for sleep diagnostics were only semi-quantitative and unable to capture the nuances of sleep disordered breathing. The JHU research team believed that detection of these flow subtleties would enable future treatment modalities targeted at specific disorders and conditions.

The Challenges:
As part of a joint venture with JHU, Key Tech developed a laboratory-grade system providing quantitative flow data of comparable quality to the current gold-standard (pneumotachograph) without the cost or physical bulk which made that system impractical for standard sleep studies. The flow meter system can be used by laboratory technicians with minimal background and training. As such, the device needed to be easy to install and operate without requiring user cleaning or calibration. Future applications in ambulatory (at-home) diagnosis will require further refinement to improve the ease of use of the system.

The Work:
Within two weeks of the initial brainstorming, Key Tech fabricated a prototype system that proved the technical feasibility of the measurement technique and met all of the doctors' requirements. Only a few months later, Key Tech had sufficiently refined the design for use as a research tool at the sleep lab at JHU. The doctors found the system to be vastly superior to their old techniques, gathering improved data and opening up research possibilities. The new prototypes were significantly smaller and lighter than comparable



pneumotachograph devices, providing a system that could be worn during sleep without disturbing the patient. Low airflow resistance and minimum dead air space enabled accurate measurements to be made without disrupting the patient's normal breathing patterns. The Key Tech system is now the de facto standard at JHU's research facilities in Baltimore as well as participating sleep laboratories in Germany and Australia.

While doctors continue validating the technology in the lab at JHU, Key Tech is starting the process of converting the prototype device into a market ready product. With the help of an NIH grant approved in 2008, Key Tech is now refining the design based on feedback from the early research and a forwarding looking plan for applications in the sleep lab and the at-home setting.

The Value:
By enabling sleep laboratories to obtain quantitative respiratory data with a system that is smaller, lighter, and cheaper than comparable technologies on the market, the Key Tech respiratory flow meter has opened a door to the future of sleep medicine. As laboratories around the world recognize the potential of this technology and develop new diagnostics and treatments based around the improved measurements, Key Tech is developing a market-ready product to fill this critical need as the emerging market matures. Further, as the business of diagnosing sleep disordered breathing moves from the sleep lab to the home setting, Key Tech's current work, funded by the NIH, will provide a high quality system ready for launch into that emerging market.