Medical Need: Portable way to induce hypercapnia to assess cerebrovascular injury using Cerebrovascular Reactivity (CVR)

Design Need: Automated device that can simplify hypercapnia administration and increase portability

Solution:

- CO₂ sensor measures EtCO₂
- Controller runs algorithm
- Valve directs air flow
- System can perform Hypercapnia Challenge

Approach:

Expired air consists of roughly 5% CO₂. By capturing and administering it, we can control patient’s CO₂ intake to:

- **Increase** patient EtCO₂ 10 ± 2 mmHg from baseline
- **Maintain** hypercapnia for 30 ± 5 seconds
- **Return** to baseline levels of EtCO₂

Results and Impacts:

The device will make it easier for users to administer hypercapnia

Advanced Hypercapnia System for Ambulatory Assessment of Cerebrovascular Reactivity (CVR)

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