INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Nasopharyngeal Airway for Upper Airway Obstruction (Including Sleep Apnea)

TECHNOLOGY NUMBERS: 2020-115, 2022-322

Accelerate Blue Foundry - 2025 (Life Sciences)

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Category
Medical Devices
Life Sciences
Accelerate Blue Foundry - 2025/Life Sciences

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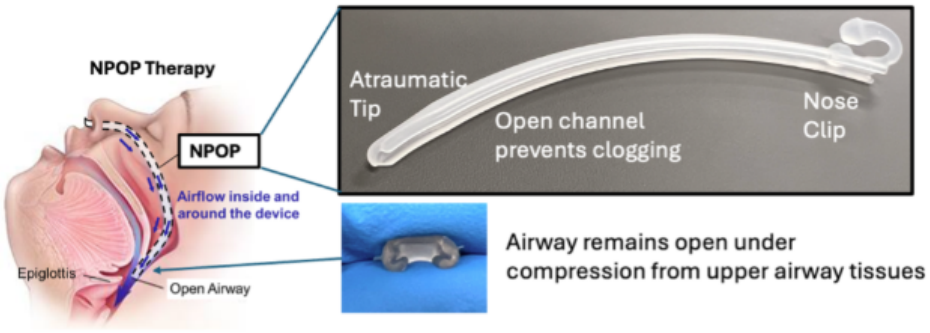
OVERVIEW

A newly designed nasopharyngeal/oropharyngeal (NPOP) airway device uses an open channel, atraumatic tip, and flexible supporting structures to provide comfortable, effective relief of upper airway obstructions—especially for patients with upper airway obstruction such as obstructive sleep apnea or pediatric hypotonia—by maximizing airflow, resisting collapse, and minimizing clogging, thereby addressing key shortcomings of current rigid or overly flexible airway devices.

DESCRIPTION

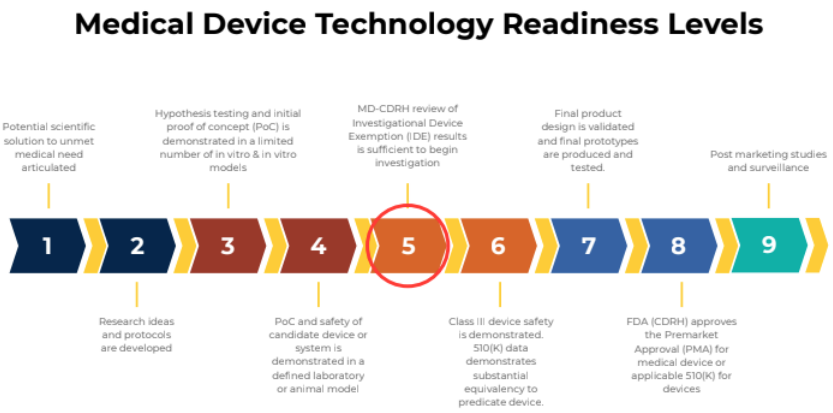
This device consists of a flexible, medical-grade silicone stent with an open channel running most or all of its length. Unlike conventional solid tubes (which can be either stiff and uncomfortable or soft and prone to collapse), this channel is open to the outside of the device, allowing air to flow along the entire length and preventing blockages from mucus. The structural supports embedded within the device keep the channels from collapsing, even under the strong pressure that occurs during airway obstruction, while the flexible material and slim profile provide improved comfort for users both awake and asleep. Additional features include a customizable shape, multiple size options, and safety mechanisms to keep the device securely and safely positioned.



VALUE PROPOSITION

- Maximizes both airway patency and wearer comfort by combining flexible, low-profile design with advanced support structures that resist collapse in multiple directions.
- Open-channel construction reduces the risk of airway blockage from mucus and allows airflow even if part of the device becomes occluded.
- Customizable sizing allows tailored fit for a variety of patients, increasing compliance and effectiveness compared to rigid or overly soft alternatives.

TECHNOLOGY READINESS LEVEL



INTELLECTUAL PROPERTY STATUS

The device is protected by three utility patent families: US20210220590A1 (granted), WO2021091998A1 (granted in EP, pending in US), and WO2023219805A1 (pending).

MARKET OPPORTUNITY

Pediatric Hypotonia Indication: Estimated 10,000-20,000 new US patients/year with hypotonic conditions, focusing on cerebral palsy, Down syndrome, and Pierre Robin sequence. These patient groups are highly targetable and have few, if any, therapeutic alternatives aside from tracheostomy. With ~1M people living in the US with these conditions and an estimated 700,000 who would be candidates for NPOP therapy, and anticipated insurance reimbursement at a similar level to CPAP, ~$1k/year, this population represents a total market size of $700M/year as the device is used long-term for treatment and replaced bi-weekly.

Adult Indication: In the US, the prevalence of OSA in adults is over 50M people. Focusing solely on the 1.3M CPAP non-compliant adults in the US whom which there are minimal/no alternative treatment options, this creates an additional $1.3B target market opportunity for the NPOP device in adults. From our primary market research, many CPAP users who are compliant with their therapy are extremely interested in NPOP therapy, representing additional market size upside.

Both pediatric and adult markets are expected to continue growing as OSA awareness and home diagnostics become more prevalent. For example, many wearables now offer sleep apnea screening features.

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- This project has conducted extensive market research through the Coulter Translational Research Partnership Program.