

Case study one: eAdvantage™ gas delivery system

Unlike other systems, eAdvantage™ is a sedation machine that delivers gas only when the patient inhales (removing the need for free flow of gas and therefore any flow rate). For the pilot, an eAdvantage™ unit was mounted on top of a mobile cart (as pictured below), allowing it to be moved and stored elsewhere when not in use.

The machine was connected to small, portable nitrous oxide cylinders on each cart (it can also be used with wall-mounted cylinders), while oxygen continued to be supplied via a medical gas pipeline system.

The team used it in conjunction with their existing reusable nasal masks and scavenging infrastructure.

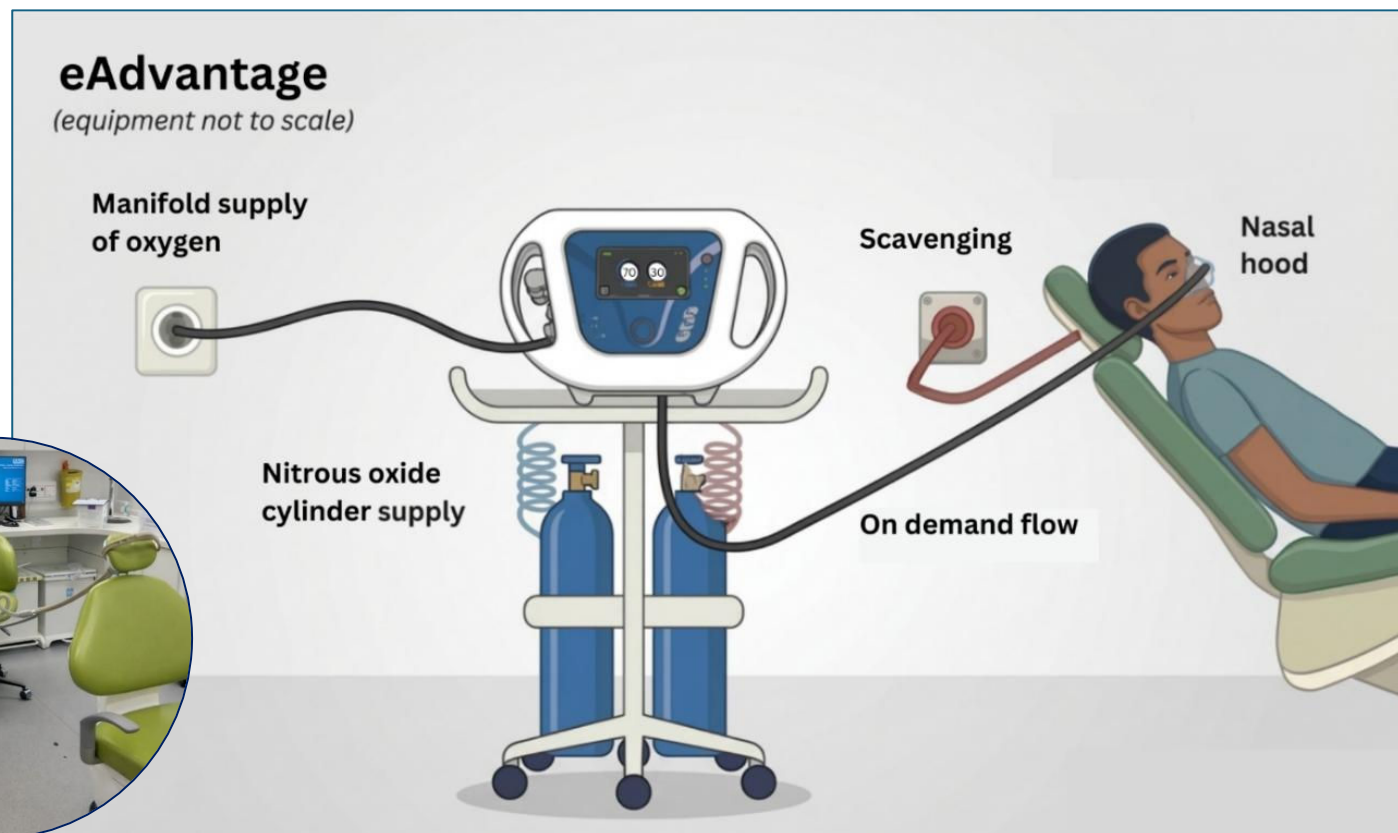


Figure one: an illustration to show the set-up of eAdvantage at the Eastman Dental Hospital, accompanied by a photo of the set-up in the room.

Note on set-up: The eAdvantage™ machine was used in the UCLH pilot with the hospital's existing Porter Brown nasal hoods. This configuration was successfully deployed in the pilot, but it is not currently a manufacturer (Porter Instruments) supported configuration. The supplier has shared an eAdvantage-dedicated tubing and nasal mask system will be available from Summer 2026.

Results

eAdvantage™ achieved a **70% reduction** in nitrous oxide use per patient.

The table compares the volumes of gas and carbon footprint of current practice and eAdvantage™:

	Current practice (n=34)	eAdvantage™ (n=34)
Volume of N ₂ O (L)	65.9 L	19.76 L
Carbon footprint from gas	35.58 kg CO ₂ e	10.67 kg CO ₂ e
Reduction compared to prior practice		70% ↓

Patient Outcomes

The team monitored patient outcomes (where the definition of successful sedation was the planned dental procedure being completed using inhalation sedation) to ensure clinical standards were maintained. The eAdvantage™ system achieved a 97% success rate, which is higher than the national average success rate of 92% for dental inhalation sedation. This could be an incidental finding rather than indicating replicable effectiveness elsewhere.

Patient Feedback

Patient feedback questionnaires were completed for 28 of the 34 eAdvantage™ cases. Of those, 22/34 patients found the nasal hood comfortable to wear, 26/34 reported that breathing the gas through their nose felt comfortable, and 26/34 said they would recommend this type of sedation to a friend.

In free-text responses, a small number of patients commented that the mask felt tight. These comments were limited in number and did not affect the overall success of sedation.

Staff Feedback

Staff feedback was collected after each patient case. eAdvantage™ users valued the system's ability to monitor breathing, along with electronic features such as self-calibration and automatic logging of volumes of gas used. However, a few staff members reported challenges in achieving a sufficiently tight mask seal for the system to operate effectively.

Other considerations

Carbon costs

As a digital device, the eAdvantage™ system uses a small amount of electricity. However, in the pilot the carbon impact from this energy use was negligible and eAdvantage™ could be used with the team's existing reusable nasal masks.

Financial costs

eAdvantage™ requires a higher upfront investment in equipment (compared to other equipment used in Dental settings) but has low ongoing costs (e.g. for the recalibration of equipment) and does not rely on single-use, repeat-purchase consumables.

The impact

The Eastman Dental Hospital has decided to adopt the eAdvantage™ system as its primary approach to nitrous oxide delivery. Seven have been procured to meet clinical demand across the site. This will deliver the greatest reduction in nitrous oxide use while maintaining high levels of clinical and patient acceptability.

It is recommended that services speak directly to the suppliers to understand costs for eAdvantage™ in more detail. This can be done by contacting sales@agilemedical.co.uk