Variations in long-term home noninvasive ventilation practices for COPD across Europe: a clinician survey

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To the Editor:

COPD is a prevalent condition and a common cause of death globally [1, 2]. Late-stage COPD has a significant burden at the individual, societal and healthcare-system levels [3].

Long-term home noninvasive ventilation (LTH-NIV) is the main treatment for individuals with late-stage COPD who have chronic hypercapnic respiratory failure [4]. Although LTH-NIV can improve blood gases, sleep quality and health-related quality of life, and reduce hospitalisations and mortality [5–8], treatment implementation and management is complex to coordinate, and thus likely differs between and within countries.

This study explored European clinical experiences with LTH-NIV for COPD, using a physician survey to explore current clinical practices, organisational models, and barriers relating to implementation of LTH-NIV. Working from established guidelines [4], we identified research gaps and practical considerations where there was likely to be practice variation and developed an online mixed-methods survey to explore these. Data were obtained in January–February 2025. We used snowball sampling (a nonprobability sampling technique where existing participants recruit additional participants from among their acquaintances) to identify experts from across Europe with experience using LTH-NIV for COPD. For all survey questions, results are presented as percentages with the number of respondents who answered each specific item as the denominator. Some respondents did not answer every question so totals may not always sum to 100%.

38 clinicians from 11 European countries completed the survey (Italy (n=16), Spain (n=5), France (n=4), UK (n=3), Denmark and Poland (n=2 each), and Norway, Slovenia, Switzerland and Germany (n=1 each)); 31 of these were from the group of 78 who were sent the survey initially and the remainder completed the survey after it was forwarded by one of the initial group. The median annual number of patients with COPD started on LTH-NIV at each centre was 30 (interquartile range 15–50). The most common settings stated for initiation of LTH-NIV were at hospital (inpatient/outpatient; 71%) or at home (19%). Respondents most often started LTH-NIV after disease exacerbation or emergency hospitalisation (68%), or during stable disease (34%). The proportion of respondents stating that national and international guidelines were available was 26% and 87%, respectively; the most commonly mentioned were the 2019 European Respiratory Society (ERS) guidelines [4].

All respondents said that hypercapnia was required to prescribe LTH-NIV in COPD. The number of exacerbations considered by respondents before starting LTH-NIV varied between countries (⩾3 in Denmark, ⩾2 in France, Spain, the UK and some respondents from Italy, and ⩾1 in Portugal, Slovenia and other parts of Italy). Key additional considerations before starting LTH-NIV were patient motivation and treatment adherence (n=10 respondents), at-home patient support (n=9), contraindications (n=7) and clinical symptoms (n=7).

Responsibility for patient follow-up fell to physicians for 63% of respondents, and was performed by homecare providers for 18% of respondents (from Spain, Italy and France). After initiation, the mean adaptation period was 2.5±1.3 months, but could be up to 6 months. Physicians said they were very

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The organisation and implementation of long-term home noninvasive ventilation treatment for COPD patients across Europe is complex and heterogeneous. Further research and experience sharing is required to optimise and align the patient pathway. https://bit.ly/3M3r566

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involved during the adaptation period (often weekly), and then had less frequent patient interactions (approximately every 6 months). The majority of respondents (78%) said that physician follow-up visits occurred within the hospital.

Most respondents (94%) said that telemonitoring was available in their country. Where available, telemonitoring was only offered to 49% of patients with COPD starting LTH-NIV. The number of respondents who said that telemonitoring was offered to all patients with COPD starting LTH-NIV varied between countries: 100% in Denmark, Norway, Switzerland and Slovenia, 67% in the UK, 50% in France and Portugal, 40% in Spain, and 31% in Italy; telemonitoring was not available in Germany and parts of Italy.

53% of physicians stated that they were happy with the current level of support provided to patients with COPD on LTH-NIV, and 60% thought that patients were happy with the current level of support during LTH-NIV. The most commonly stated resources for improving LTH-NIV management were home assistance (30%) and telemonitoring (27%). There were several tasks that respondents thought could be delegated to external stakeholders (*e.g.* homecare providers) (figure 1). Overall, there was a significant difference (+39%; p=0.0031) in the number of tasks that were considered appropriate to delegate to external stakeholders *versus* the current state. 71% of respondents agreed that home healthcare providers could play a greater role in the management of LTH-NIV in COPD, but only 45% thought that current treatment guidelines recognised the potential contribution of these providers in their country.

The results of this exploratory, practice-oriented survey confirmed that LTH-NIV implementation varies substantially between 11 different European countries. A respondent from Slovenia described the process as "primarily a logistical challenge", reflecting the fragmented care models, logistical barriers and inconsistent resource allocation between countries [9]. While physician workload for initiating and managing LTH-NIV for patients with COPD is high, many tasks may be appropriate to delegate to homecare providers. Evidence from recent Italian models confirms that task-shifting in chronic care is feasible when supported by training, clear role definitions, and organisational support structures from their institutions [10]. Multidisciplinary collaboration and individualised care tailored to disease stage have been highlighted as the preferred approach to managing patients with COPD [11].

Telemonitoring could represent a key component of LTH-NIV management pathways. The recent ERS Clinical Practice Guideline on Telemedicine in Home Mechanical Ventilation made a conditional

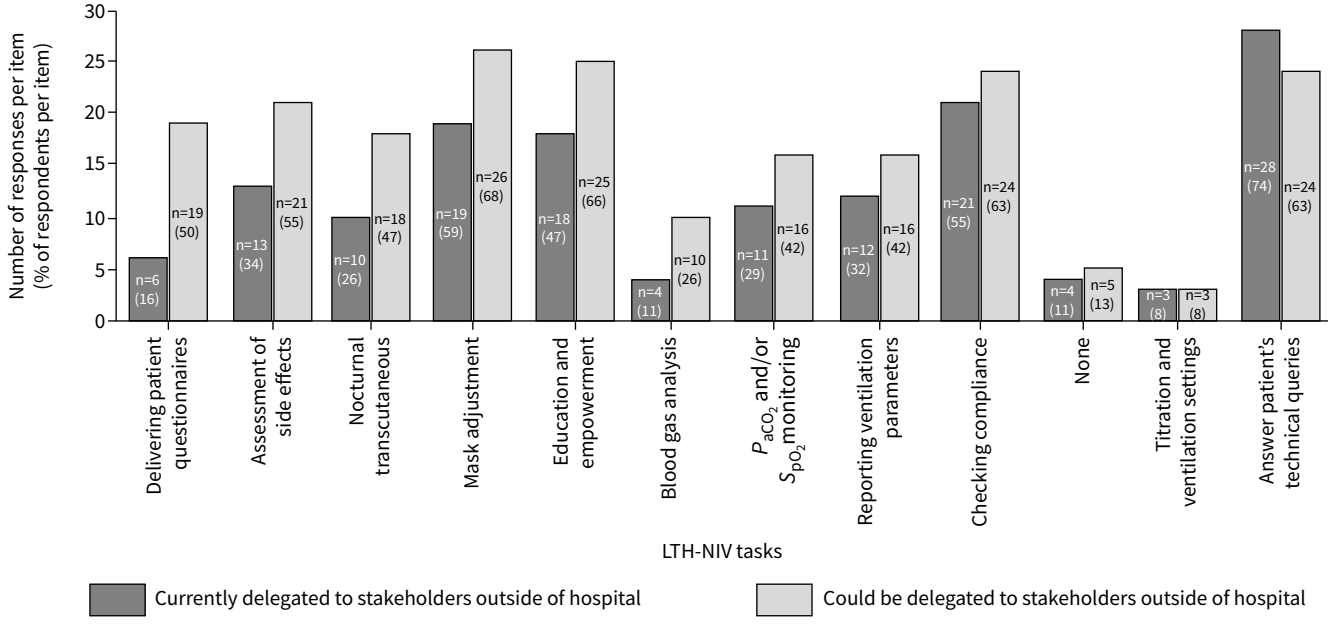

FIGURE 1 Tasks relating to long-term home noninvasive ventilation (LTH-NIV) therapy that are currently (dark bars) or could be (light bars) delegated to stakeholders outside the hospital (data from 38 respondents; tasks are ordered along the x-axis from the greatest to smallest difference between current practice and suggested practice). P_{aCO_2}: arterial carbon dioxide tension; S_{pO_2}: peripheral oxygen saturation.

recommendation for telemedicine-guided initiation of home mechanical ventilation in patients with COPD [12], and for the use of telemedicine for follow-up of home mechanical ventilation therapy. However, the certainty of evidence is low, and the feasibility of large-scale implementation depends on the organisational capacity for remote setup and monitoring within each healthcare system. In our survey, reported telemonitoring usage varied between nothing and 100%, reflecting significant disparities in telemonitoring access and integration across Europe. This may partly reflect organisational and reimbursement barriers, but limited economic evidence and conceptual differences in how telemonitoring is perceived and implemented are also likely to play a role, highlighting critical unmet needs in these areas.

Our findings are a call to action for harmonising LTH-NIV care delivery, highlighting the need for further research and access to LTH-NIV for patients with COPD in accordance with ERS guidelines [4]. Limited compliance with these guidelines over the six years since their publication probably does not reflect a lack of clinical engagement or motivation, but is likely due to structural limitations and differences in key areas like reimbursement, care pathways and local guidelines. In addition, there has been little innovation in LTH-NIV to drive change over time. In that context, advances such as telemedicine, artificial intelligence, and extended healthcare teams could play an important role in supporting a redesign of current care models to utilise newer technology and incorporate the patient perspective into care pathways. In that context, it is interesting to note that the ERS itself has now launched the IMPORTANCE project [13]. Key aims are to evaluate differences in LTH-NIV management (including the use of new technologies), how these differences affect outcomes, and how to harmonise patient management approaches. This includes a call for a variety of types of research, such as that characterised by an ongoing systematic review evaluating LTH-NIV delivery in COPD and the impact of delivery modalities on health outcomes (PROSPERO ID-CRD42025648464).

The number of physicians surveyed was relatively small and this limits the generalisability of our findings and the ability to make robust comparisons between countries. However, respondents came from several countries, allowing us to map existing care models and barriers, and highlight practice differences. The use of snowball sampling could also introduce bias into the sample and mean that participants with similar practices may have been more likely to have been included. Furthermore, although respondents came from many European countries, a large proportion of the sample (42%) came from Italy, further limiting the generalisability of our findings. Additionally, physicians might not accurately report their practices and responses could be influenced by recall bias. Responses from each physician also may not necessarily be representative of clinical practice for all physicians at that hospital, or all hospitals in a region/country. Finally, we did not gather data on differences in NIV initiation under elective/stable disease conditions *versus* emergency application of NIV, and this is something that would be useful to include in future surveys/research.

Despite limitations, our data describe a specialised clinical area, provide important insights for future research, and highlight the need for experts in the field to share their experiences so that patient pathways can be optimised and aligned across countries.

In light of the organisational variability, resource gaps, and potential for better task-shifting and telemonitoring revealed by our survey, it is worth reconsidering care models for LTH-NIV in COPD, supported by new digital tools and thoughtful policy, which could help create a sustainable path toward equitable, efficient, and patient-centred care across Europe.

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