Improving Safety in Subspecialty Respiratory Clinics

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Background

Respiratory medicine comprises a diverse range of subspecialty clinics, including interstitial lung disease (ILD), bronchiectasis, pulmonary hypertension, tuberculosis, pleural disease, and lung cancer[1]. Each domain is supported by extensive and evolving national and international guidelines[2]. While these frameworks aim to standardise care and improve outcomes, their complexity presents practical challenges, particularly for trainees rotating through multiple subspecialties within limited timeframes. Rotational training is a fundamental component and respiratory trainees are expected to develop competence across multiple subspecialty clinics. time-pressured outpatient consultations, this can lead to increased cognitive load, defined as the mental effort required to process and apply information. High cognitive load has been associated with impaired decision-making, omission of key clinical elements, and reduced efficiency.

In our regional respiratory training programme, trainees frequently reported difficulty locating relevant guideline criteria during consultations, uncertainty in structuring clinical assessments, and reduced confidence when attending subspecialty clinics. These challenges raise concerns regarding variability in care and the potential for missed safety elements. Visual cognitive aids have been successfully used in other high-pressure clinical environments

to support decision-making and reduce errors. However, their application in outpatient subspecialty clinics remains limited. We therefore conducted a trainee-led quality improvement project aimed at reducing cognitive load, improving confidence, and standardising clinical assessments through the development and implementation of concise visual cognitive aids.

Methods

This quality improvement project was conducted across multiple respiratory departments within a regional training deanery in the United Kingdom and targeted respiratory trainees attending subspecialty outpatient clinics. A baseline survey was distributed to trainees to assess different domains: confidence in attending subspecialty clinics, ability to locate and use relevant guideline criteria, and confidence in covering key components of the clinical history. Responses were collected using structured questions alongside optional free-text feedback. Following baseline assessment, a series of concise, one-page visual cognitive aids ("posters") were developed across a broad range of respiratory subspecialties. These included asthma, chronic obstructive pulmonary disease (COPD), bronchiectasis, chronic cough, Aspergillus-related disease, interstitial lung disease, pulmonary hypertension, pleural effusion, pneumothorax, pulmonary vasculitis, sarcoidosis, tuberculosis, and genetic considerations in spontaneous pneumothorax. Each poster was designed to provide a structured framework for clinical assessment, including key history components, relevant investigations, diagnostic criteria, and important safety considerations. Content was aligned with national guidelines and local practice and was reviewed by consultant specialists in each

subspecialty to ensure accuracy and clinical relevance. The posters were disseminated electronically via a shared drive, allowing flexible access before, during, and after clinic sessions. No formal teaching session was mandated, reflecting a real-world implementation model.

A post-intervention survey was subsequently distributed to evaluate changes in confidence, patterns of use, and perceived usefulness. Quantitative data were analysed descriptively, and qualitative responses were reviewed to identify recurring themes.

Results

A total of 19 trainees completed the baseline survey. Respondents represented a range of training levels, with the majority at ST4–ST6 level. At baseline, only 10.5% of trainees reported feeling very confident attending subspecialty clinics, while 57.9% reported being only somewhat confident and 31.6% not confident. None reported being extremely confident. Confidence in structured clinical assessment was similarly limited, with 47.4% reporting they were "not so confident" and 5.3% "not at all confident" in covering key history components without missing important details. Accessing and applying guideline criteria was identified as a major challenge. A majority of trainees (57.9%) reported finding it difficult to locate and use relevant guidelines during clinical encounters, while none reported this as "very easy." Following implementation of the visual cognitive aids, 13 trainees completed the post-intervention survey. Participants included a mix of training levels, with representation from ST4 to ST7 and one consultant. Confidence improved substantially after the intervention. A

total of 76.9% of respondents reported a significant improvement in confidence when attending subspecialty clinics, with a further 15.4% reporting slight improvement. Only 7.7% reported no change, and no respondents reported a decline in confidence.

The posters were used across multiple clinical and educational contexts. Approximately 46.2% of trainees reported using them before clinic sessions, and an equal proportion used them during consultations. More than half (53.8%) used them when preparing or reviewing referrals, while 61.5% reported using them for teaching or self-directed learning. Qualitative feedback highlighted several consistent themes. Trainees described the posters as "well structured," "concise," and "practical," emphasising their role in providing a clear framework for clinical assessment. Many reported that the materials improved clarity, reinforced key principles, and supported safety-netting during consultations. The use of bullet points and structured layouts was particularly valued, allowing rapid access to essential information in time-pressured settings. Suggestions for improvement included expanding coverage to additional topics such as obstructive sleep apnoea and pulmonary function test interpretation, incorporating direct links to guidelines, and providing brief explanations for investigation choices.

Discussion

This quality improvement project demonstrates that simple, structured visual cognitive aids can significantly improve trainee confidence and support safer, more standardised clinical practice in respiratory subspecialty clinics. The baseline findings highlight the cognitive

challenges faced by trainees in navigating complex guideline-based care. Despite the availability of comprehensive national guidance, trainees frequently reported difficulty accessing and applying this information in real time. This disconnect between knowledge and application is a recognised issue in clinical education and reflects the limitations of relying solely on traditional guideline formats in busy clinical environments. The intervention addressed this challenge by translating extensive guideline content into concise, accessible formats tailored to clinical use. By reducing extraneous cognitive load and providing structured frameworks for assessment, the posters enabled trainees to focus on key clinical tasks, including history-taking, decision-making, and safety-netting.

The marked improvement in self-reported confidence following the intervention is notable. Confidence plays a critical role in clinical performance, influencing decision-making, communication, and efficiency. While subjective, the consistency of improvement across respondents and the absence of negative responses suggest that the intervention was both acceptable and effective.

This project has several strengths. The inclusion of multiple departments across a regional deanery enhances the generalisability of the findings and reflects real-world variation in subspecialty practice. The versatility of the posters is another key strength. Their use across multiple contexts—including pre-clinic preparation, real-time consultation support, referral decision-making, and teaching demonstrates their adaptability and broad utility. This flexibility likely contributed to their sustained use and perceived value. Qualitative feedback

further supports the impact of the intervention, with recurring themes of improved structure, clarity, and practicality. Importantly, trainees highlighted the role of the posters in supporting safety-netting, suggesting a potential impact on patient safety beyond confidence alone. However, several limitations should be considered. The study relied on self-reported measures of confidence rather than objective assessments of clinical performance or patient outcomes. The sample size was relatively small. Future work could focus on evaluating objective outcomes, such as documentation quality, adherence to guidelines, and clinical decision accuracy. Integration of cognitive aids into digital platforms, including mobile applications or electronic health records, may further enhance accessibility and sustainability. Expanding the range of topics and incorporating direct guideline links may also improve utility.

Conclusion

This trainee-led quality improvement initiative demonstrates that concise visual cognitive aids can reduce perceived cognitive burden, improve confidence, and support safer, more structured clinical practice in respiratory subspecialty clinics. As a low-cost and scalable intervention, this model offers a practical solution to the challenges of guideline complexity in modern healthcare and has the potential for wider adoption across specialties.

References

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