

## Editorial

# Is bronchoscopy essential for pulmonary infections in patients with haematological malignancies?

Assessing a patient who has a haematological malignancy, fever and pulmonary infiltrates is frequently a heart-sink consultation for a respiratory physician. These patients are mostly very unwell, with atypical radiological findings, are receiving medications with potential pulmonary toxicity, as well as multiple preventive and empiric antibiotics. The physician weighs up the decision whether to perform a bronchoscopy or not. As often happens, the request will occur at a time when a herculean effort is required to organise an urgent bronchoscopy in the face of other priorities: bronchoscopy lists filled with patients with suspected cancer, a weekend or other scheduled low-activity period, and in 2020, the challenge of staff safety in the context of a pandemic. The patient looks to you for advice: is this procedure truly needed? These desperately ill patients are willing to undergo whatever is required if it improves the chance of survival. The referring physicians are understandably impatient, the investigation is time critical. The hospital managers are clear, resources must be used wisely. The hapless respiratory physician is centre stage. If only they knew what to do! This was the rationale to invite a debate on the benefits of bronchoscopy in patients with haematological malignancies who present with fever and pulmonary infiltrates. The pro side has been argued by an infectious diseases team, and the con side by respiratory physicians with a special interest in bronchoscopy [1, 2].

Our debate provides some justification for the clinical indecision: the evidence is not strong, and largely based on single-centre trials of an

observational design. Bronchoscopy appears to yield a microbiological diagnosis in up to 75% of patients, if performed within the first 24 h of symptoms, using advanced microbiological techniques [3].

There is less agreement about the risk of bronchoscopy. While the pro side claims that there is no increased risk of complications of bronchoscopy in patients with haematological malignancy, the con side argue that the risks are considerable, particularly in patients who have acute respiratory failure or who require intensive care support. The difference is largely explained by the different patient cohorts. It is a salient reminder that this patient group has a very high risk of short-term mortality, with no evidence that bronchoscopy has a positive impact. A futile investigation at the end of life is something many physicians would strive to avoid.

There are two major alternative strategies to invasive diagnostic testing: noninvasive diagnostic techniques and empiric therapy. The pro debate reminds us that some diagnoses can only be achieved with bronchoscopy or induced sputum. The con debate provided evidence that noninvasive testing was either superior or non-inferior to a strategy that includes bronchoscopy in a group of patients who were in respiratory failure [4]. This would certainly be mediated by the timing of antimicrobial therapy in comparison to the bronchoscopy.

Empiric therapy has some attractions: we believe that early antibiotics reduce mortality in pneumonia [5]. It would be unwise to withhold treatment while arranging for a diagnostic test to be performed in

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**A pro/con debate in this issue of *Breathe* outlines the evidence on utility and safety of bronchoscopy in patients with haematological malignancy, with concurrence that the microbiological yield is best when performed within 24 h** <https://bit.ly/35MKy1Y>



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these high-risk patients. Once therapy is instituted, clinical progress can be monitored, and treatment altered in a stepwise algorithm to cover usual pathogens. However, the broad empiric therapy used in neutropenic patients is likely to reduce the diagnostic yield of culture-based investigations.

In addition to the burden on the patient, urgent bronchoscopy requires resources. Few health facilities have unlimited access to bronchoscopy and arranging a procedure within 24 h would usually result in a delay for another patient, or additional costs to provide an extended service. The cost-effectiveness of this approach has not been evaluated, nor is there an analysis of the opportunity costs: the indirect effects of our choice of procedure on delivery of health services as a whole.

While we may be dissuaded from spending our resources on these vulnerable patients, we, as physicians, need to advocate not only for the patient in front of us, but for the one in the bed beside them and the patient in the future who is yet to be born. The most compelling argument in favour of bronchoscopy rests on the conjecture

that targeted therapy, if this is indeed achieved by bronchoscopy, may prevent the development of drug-resistant bacteria. Unfortunately, the evidence that the microbiological diagnosis leads to a change in management is based on very limited evidence so confidence in this assertion should be low.

The debate is not over, as the evidence is neither complete nor compelling. However, on certain aspects both sides agree: the best microbiological yield is within 24 h of presentation, and the least complications are incurred in patients who are not in respiratory failure. It would be important to believe that the patient is likely to benefit from the investigation, not solely that a microbiological diagnosis would be achieved. We should take into account an evaluation of the best use of resources, both facility and personnel, and a recognition that we are also ultimately responsible for antibiotic stewardship to protect our future patients. Thus, as physicians we balance the competing paradigms of action *versus* inaction, empiric *versus* precision medicine, individual *versus* community benefit for each and every patient.

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### Affiliations

#### Zinta Harrington<sup>1,2</sup>

<sup>1</sup>South West Sydney Clinical School, University of New South Wales, Sydney, Australia. <sup>2</sup>Dept of Respiratory and Sleep Medicine, Liverpool Hospital, Sydney, Australia.

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### Conflict of interest

Z. Harrington has nothing to disclose.

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