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## Electronic nose for detecting chronic lung allograft dysfunction in lung transplant recipients

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### Introduction

Chronic lung allograft dysfunction (CLAD) negatively affects long-term survival of lung transplant recipients (LTR). Early diagnosis of CLAD could allow early intervention to halt progression. Electronic nose (eNose) technology could play an important role in early diagnosis of CLAD. We aimed to assess the feasibility and reliability of exhaled breath analysis using an eNose to detect CLAD in LTR.

### Methods

In this cross-sectional study, exhaled breath of stable LTR and LTR with CLAD was collected using an eNose (SpiroNose). CLAD diagnosis was made according to the ISHLT criteria. Statistical analyses were conducted using partial least square discriminant analysis and receiver operating characteristics (AUC) analysis to assess differences in breathprint between LTR with and without CLAD.

### Results

A total of 91 LTR that received bilateral lung transplantation (LTx) were included during outpatient follow-up; 47% were male, median age was 59 (range 35-73) years, median time after LTx was 3.6 (0.1-18.8) years. The SpiroNose reliably discriminated between stable LTR (n=68) and CLAD (n=23), with an AUC of 0.87 (CI 0.80-0.95, Figure 1).

### Conclusion

Stable LTR and CLAD differ in breathprint. Exhaled breath analysis using an eNose is a promising tool for early detection of CLAD. Further research should validate these results, and indicate whether longitudinal eNose measurements can predict development and progression of CLAD.

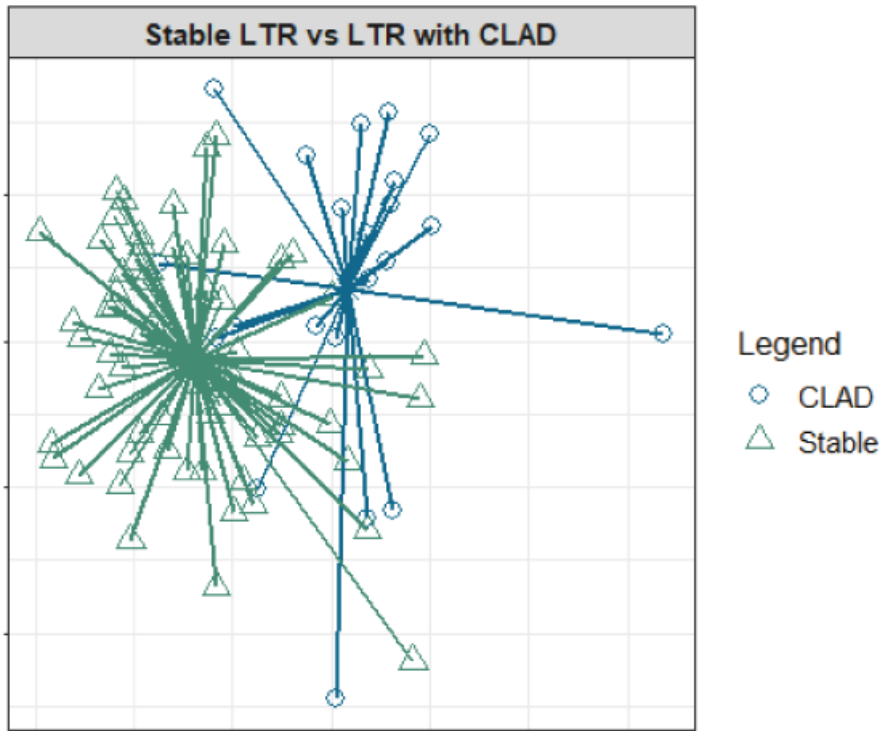


Figure 1: Discrimination between stable LTR (n=68) and LTR with CLAD (n=23) using the SpiroNose.

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