

Purpose To quantify the correlation between lobar contrast agent distribution on DECT and SPECTPS.

Materials and Methods Institutional review board approval was obtained for this retrospective study. Between May 2018 and February 2020, 152 patients (89 male, 63 female, 64.5 ± 8.6 years, forced expiratory volume in 1 s (FEV_1) $31.5 \pm 12.3\%$ (predicted)) were eligible for inclusion. DECT data was reconstructed using prototype artificial intelligence software (eXamine, Siemens Healthineers, Forchheim, Germany) and recorded in a blinded fashion. Contrast agent lobar distribution on DECT and SPECTPS images were calculated by dividing contrast agent distribution in individual lobes by the total amount in both lungs. Effective radiation dose, adverse reactions, need for manual corrections and processing time were calculated. Bland-Altman analysis (limits of agreement, LoA) and Pearson correlation were used for intermodality comparison using Prism8.

Results There is strong agreement between lobar perfusion values acquired using DECT compared to SPECTPS ($r = 0.86$, $p < 0.01$). Bland Altman Analysis gave a bias of 0.044; LoA = -11.667, 11.75% ($p = x$). 123 DECT studies (81%) did not require manual correction, taking $1\text{ m}53 \pm 3\text{ s}$ to process. 19% of DECT studied required manual correction ($8\text{ m}48 \pm 56\text{ s}$).

Conclusion DECT pulmonary angiography accurately quantifies lobar perfusion, and streamlines the LVR patient selection paradigm. Software efficiency improvements are necessary for the implementation of DECT angiography into mainstream clinical practice.

S21 RECEIVER TRIAL INTERIM ANALYSIS: REDUCTION IN COPD ADMISSIONS WITH DIGITALLY SUPPORTED SELF-MANAGEMENT

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Background The Remote-management of COPD: Evaluating Implementation of Digital Innovations to Enable Routine Care (RECEIVER, NCT04240353) observational cohort trial

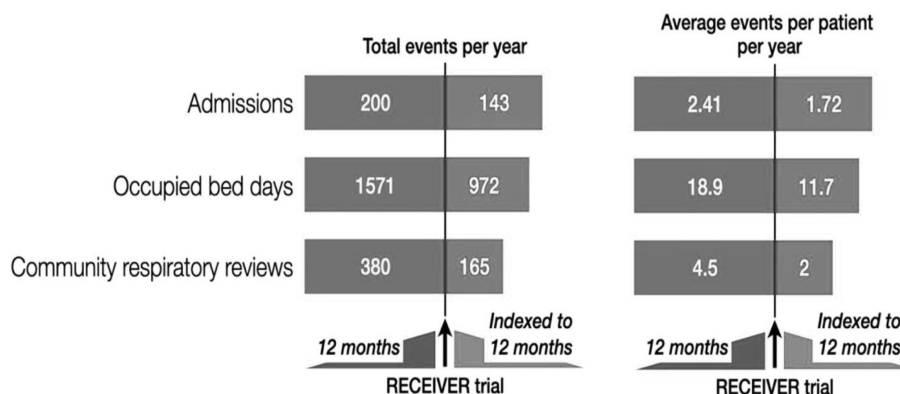
commenced September 2019. Clinician-patient co-designed progressive web application captures patient-reported outcomes (PROs), Fitbit and home NIV data, and provides self-management resources including asynchronous messaging. Cloud-based clinician dashboard integrates these with clinical summary and event data. Inclusion criteria are diagnosis of COPD with recent severe exacerbation and/or chronic hypercapnia, and daily access to smartphone, tablet or computer. Primary endpoint is patient use of the application. Secondary endpoints include impact on clinical outcomes and deriving AI-based risk predictive models.

Methods We performed a planned interim effectiveness analysis of recruitment, patient-app utilisation and clinical outcomes at week 40, reflecting a minimum of 3 months follow up per patient.

Results 283 patients were screened with 83 patients (average age 65 years) enrolled in RECEIVER by March 2020. Recruitment was paused then due to COVID-19 pandemic. 25/83 patients had home NIV or CPAP. Of the 143 excluded patients, 41 had no access to technology (average age 71 yrs), 42 had not had a recent exacerbation (average age 67 yrs) and 23 declined to participate (average age 67 yrs).

An average of 4.6/patient/week daily PROs were completed, with usage sustained through to week 40. Improvement in patient outcomes versus their preceding year, with reduction in annualised admissions, occupied bed days and community reviews is noted (figure 1). Improved event ratios are maintained in subgroup analyses of home NIV patients, and if follow up is censored at UK COVID-19 lockdown.

Conclusion Interim analyses of the RECEIVER trial are encouraging, with sustained patient use of the application, and associated positive impact on patient outcomes. Older age of patients lacking access to digital technology is notable. To support post COVID-19 NHS recovery we have scaled-up the digital self-management service, offering this to all COPD patients in NHS GG&C. RECEIVER trial dataset will be combined with large NHS GG&C SafeHaven historical cohort and the scale-up patient data for machine-learning analyses. We aim to train, validate and operationalise prediction models for 12-month mortality, 3-month re-admission and 72-hour exacerbation risk.



Abstract S21 Figure 1 Interim analysis of RECEIVER trial outcome data
Reduction in total and average per patient indexed annualised admissions, occupied bed days and community respiratory reviews following RECEIVER trial enrolment