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Title: Reducing inappropriate antibiotic use in lower respiratory tract infection (LRTI); a quality improvement study

Dr. Matthew S. 11152 Lloyd matthewlloyd@nhs.net MD ¹, Dr. Colin 11153 Murray colinmurray@nhs.net MD ¹, Ms. Arlene 11154 Shaw arlene.shaw@nhs.net ¹, Dr. Tom C. 11155 Fardon tom.fardon@nhs.net MD ¹, Dr. Robin P. 11156 Smith robinsmith@nhs.net MD ¹, Dr. Stuart 11157 Schembri sschembri@nhs.net MD ¹ and Dr. James D. 11160 Chalmers jameschalmers1@nhs.net MD ². ¹ Respiratory Unit, Ninewells Hospital, Dundee, Scotland, United Kingdom, DD1 9SY and ² Ninewells Hospital & Medical School, University of Dundee, Dundee, United Kingdom, DD1 9SY .

Body: Introduction Prolonged courses of antibiotics result in adverse events for patients and lead to antibiotic resistance. We designed an intervention study to assess the benefits and safety of a new prescribing protocol for antibiotic duration for patients with LRTIs on a respiratory ward in a Scottish teaching hospital. Methods We included all patients who received antibiotics for a LRTI identified over 1 year. In the initial phase we recorded mode and duration of antibiotic use. Outcome measures were: antibiotic related adverse effects, HDU/ITU admission, length of stay and death. The second phase followed implementation of an antibiotic protocol consisting of automatic stop dates, severity guided duration of antibiotics (duration 5 days for low risk CURB65 patients, 7 days for high severity patients) and pharmacist feedback. Antibiotic use was categorised into four therapeutic sub-groups; pneumonia (PN), acute exacerbations of COPD (AECOPD), exacerbations of asthma (ExA) and 'other' (O). Results There were 281 pre and 221 post-intervention patients included. A significant decrease in antibiotic duration (days) was seen across all patients (8.3→6.8 p<0.001) and across each individual diagnostic sub-group (p<0.001); PN (9.3→7.1), AECOPD (7.7→6.2), ExA (6.3→5.0) and O (8.5→6.6). This was associated with a significant decrease in adverse events attributable to antibiotic use when comparing pre to post-intervention groups, from 31.3%→19.0% (p<0.0001). There was no significant effect of the intervention on mortality rate (8.9%→8.1% p=0.6). Conclusion A multidisciplinary intervention can significantly reduce inappropriate antibiotic use and antibiotic associated adverse effects.