Supplementary Material:

Methods:

All cirrhotics admitted to hospital were screened for suitability for inclusion into the study within 72 hours of admission. Criteria for study inclusion is summarised in **Supplementary Table 1.**

Inclusion Criteria	• Clinical ± biochemical ± radiology ± histological diagnosis of cirrhosis. • Hospital admission with complication of cirrhosis including alcoholic hepatitis, sepsis, variceal haemorrhage, ascites, renal dysfunction etc. • Commencement of antimicrobial therapy. • Age 18 – 80 years.
Exclusion Criteria	• *C. difficile* infection. • HIV antibody positive • Immunosuppression (excluding low dose steroids or steroid sparing agents for autoimmune hepatitis treatment - < 20mg or equivalent of prednisolone). • Advanced disseminated hepatocellular carcinoma or invasive carcinoma. • eGFR < 30 on screening ± randomisation • End-stage/severe cardiac, pulmonary or kidney disease • Type 1 Diabetes Mellitus • Colitis or coeliac disease • Pregnancy

	• Already receiving Rifaximin or concomitant long-term antibiotics.

Supplementary Table 1: Study inclusion and exclusion criteria

Data collected included patient demographic details, aetiology of cirrhosis and concomitant medication use. Whole blood samples were obtained at all study timepoints to quantify circulating levels of bacterial DNA. Bacterial DNA extraction was performed in accordance with manufacturers' protocol using the QIAamp® DNA Blood Midi Kit (Qiagen Ltd, UK). 16S ribosomal bacterial DNA was then quantified from the purified DNA by real-time PCR using the established protocol as per *Jordan and Durso* (8). This was targeted at the V7-V9 variable region of the 16S gene.