unawareness of the bundle. It therefore became vital to target interventions to new cohorts of rotational staff and staff groups that are non-rotational. The decision was made to deliver teaching sessions as part of the foundation doctor induction. Teaching sessions were also delivered to nurses working in acute areas and to the medical consultants to embed the use of the bundle in the hospital and increase awareness amongst these permanent staff.

Through reformatting an existing bundle, targeting education and considering other members of the multi-disciplinary team we were able to improve the consistency of care for patients presenting with decompensated liver cirrhosis long term. Improving frequency of use of the decompensated cirrhosis bundle ensured consistently high levels of care for patients and improved outcomes.

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## CHANGES IN SERUM BILIRUBIN WITHIN THE FIRST FOUR DAYS OF ADMISSION DO NOT REFLECT OUTCOME IN SEVERE ALCOHOLIC HEPATITIS

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Severe alcoholic hepatitis (AH) is a dynamic process with patients presenting at different phases of disease. Change in bilirubin over 7 days has been used as an indicator of prognosis and response to corticosteroid treatment in AH. However clinical decisions are influenced by disease trajectory in the first few days of admission. We aimed to test the prognostic validity of bilirubin change within four days of admission prior to exposure to corticosteroid treatment.

Data collected from patients recruited to the STOPAH trial from three Scottish centres were analysed retrospectively. The gradient of the best fit line (m) was used to calculate change in bilirubin across the first four days (mBili4) and first seven days (mBili7) of admission for each patient. Bilirubin difference (Δ) from baseline was calculated from the average bilirubin of day three/four (ΔBili4) and day six/seven (ΔBili7) and compared to baseline bilirubin (bBili). Patients exposed to corticosteroids within these time periods were excluded from analysis. Area under the receiver operator curve (AUC) was performed for day 28 and day 90 survival.

A total of 155 patients had at least two datapoints across the four days, including a bBili and values at either day three or four. A total of 106 patients had at least three datapoints across seven days including a bBili and values at either day six or seven. bBili did not predict day 28 survival (AUC 0.53, p = 0.70), or day 90 survival (AUC 0.52, p = 0.74). mBili4 and ΔBili4 did not predict day 28 survival (AUC 0.57, p = 0.26; AUC 0.53, p = 0.69) or day 90 survival (AUC 0.46, p = 0.46; AUC 0.48, p = 0.67). mBili7 moderately predicted day 28 survival (AUC 0.67, p = 0.04) but not so ΔBili7 (AUC 0.66, p = 0.05). Neither mBili7 or ΔBili7 predicted day 90 survival (AUC 0.57, p = 0.27; AUC 0.57, p = 0.31).

Baseline bilirubin and changes in bilirubin within the first four days of admission were not predictive of day 28 and day 90 outcome. Only 7 days after admission did a change in bilirubin reflect subsequent outcome at day 28 but not at day 90. These results suggest that the trajectory of bilirubin in the first four days of admission with severe AH prior to

corticosteroid treatment are not indicative of subsequent outcome. Alternative biomarkers of disease evolution are required if informed therapeutic decisions are to be made within this early stage of hospital admission.

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## ABSTRACT WITHDRAWN

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## IS A VIRTUAL PHARMACY-LED HUB AND SPOKE MODEL EFFECTIVE IN MANAGING PRIMARY BILIARY CHOLANGITIS WITH OBETICHOLIC ACID?

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Background Primary Biliary Cholangitis (PBC) is a progressive, autoimmune condition that damages interlobular bile ducts and can lead to end-stage cholestatic liver disease. First line therapy is ursodeoxycholic acid (UDCA) at a dose of 13–15 mg/kg/day. Unfortunately, 20–30% of patients do not demonstrate an adequate response to UDCA and 5–10% do not tolerate it. Obeticholic acid (OCA) is a licensed second-line option approved for use by NHS England where prescribing is restricted to specialist centres, requiring multi-disciplinary team (MDT) approval. As a specialist centre, King's College Hospital NHS Foundation Trust (KCH) established a hub and spoke model to ensure equity of access to treatment, which is led by the specialist liver pharmacy team.

Method Patients were referred to the KCH PBC MDT using a standardised form emailed to the specialist liver pharmacist. Cases were presented to the MDT and spoke sites were informed of the decision by email. Spoke sites were responsible for monitoring and liaison with KCH. Patients were counselled and consented for homecare supply over the telephone by the specialist pharmacist or specialist pharmacy technician. Spoke site clinicians and patients were advised to contact the liver pharmacy team for further advice or in the case of adverse events. All prescribing was undertaken by the specialist pharmacist, with blood tests and follow up appointments managed by the spoke sites and requested by the hub site when prescribing at 3–6 monthly intervals.

Results Over 21 months, a total of 98 cases were referred to the PBC MDT at KCH. 56% were recommended to start OCA, 30% to start bezafibrate, 5% were recruited into clinical trials, 2% were recommended no change, 1% was referred for itch advice, 1% was referred for a transplant assessment and 1% was given an alternative diagnosis of ductal plate malformation.

Of the 56 patients recommended to start OCA, 5/55 (9%) patients were lost to follow up, 1 patient did not start taking OCA due to side effect concerns, and 1 patient moved abroad. 48 patients started treatment, 38 of which remained on OCA at month 12. 18/38 (49%) patients saw a reduction in ALP to <1.67xULN over the 12 month period. 15/48 (31%) patients experienced adverse events, the most common of which was pruritus (7/48 [15%]). 10/48 (21%) stopped OCA due to adverse events.

Conclusion A virtual pharmacy-led hub and spoke model is safe and efficient whilst allowing convenience for patients over a wide geographical area.

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