Showcasing pioneering practices in managing patients with liver disease with a focus on hepatic encephalopathy.

Prescribing information for TARGAXAN (rifaximin-α) can be found on page 25.
This booklet was initiated by Norgine Pharmaceuticals Limited and the British Liver Trust and funded by Norgine Pharmaceuticals Limited. The content of the case studies has been provided by the authors. The British Liver Trust and Norgine Pharmaceuticals Limited had no editorial control on the content of the case studies. The content has been checked for factual accuracy to ensure it is fair and balanced and to ensure its compliance with appropriate regulations.

Liver disease mortality rates in the UK have increased 400% since 1970, 62,000 years of working life are lost each year, and the annual cost of treatment stands at a staggering £2.1 billion.¹ This is simply unsustainable, particularly during a time of unprecedented pressure on our NHS. Unless we set a new direction, the situation will continue to spiral.

Prevention is key, but much of the health and financial burden could also be lifted by optimising the diagnosis and management of patients already affected. For example, evidence shows that better management of hepatic encephalopathy (HE) could lead to:²

1. Fewer hospital re-admissions
2. Shorter hospital stays
3. Improved patient experience
4. Savings for the NHS

Whilst significant variation exists across the UK in the management of advanced liver disease,² it is enormously encouraging that some local areas have already set the ball rolling to transform services. The purpose of this booklet is to share the learnings from these pockets of excellence and kick-start conversations in other parts of the country to seize the opportunity for change.

Showcasing pioneering practices in managing patients with liver disease with a focus on hepatic encephalopathy

Foreword by Andrew Langford, Chief Executive, British Liver Trust

1 Lancet Commission on Advanced Liver Disease New metrics for the Lancet Standing Commission on Liver Disease in the UK 2016
2 National Confidential Enquiry into Patient Outcomes and Death Measuring the Units: A Review of Patients Who Died with Alcohol-related Liver Disease 2013
I am grateful to those who have contributed to the booklet; the efforts of these experts to drive progress are commendable and we can learn a great deal from each case study:

- **St Lukes Hospice in Basildon** have ensured patients with advanced liver disease can access early palliative care to meet their holistic needs through joint working and an innovative referral pathway.
- **Belfast Liver Unit** designed a model that ensures patients are directed to and seen by the appropriate staff in a timely fashion.
- **Glasgow Ambulatory Liver Support Service** recognised education and support was pivotal in making patients more receptive and preventing their conditions worsening.
- **Hull Royal Infirmary** produced a clear guideline for clinicians which is helping them to provide high quality responsive patient care.
- **Royal Free Hospital** developed a ‘Shared Care Guideline’ to ensure that multi-disciplinary teams work together effectively to treat patients presenting with hepatic encephalopathy.
- **Queen Elizabeth Hospital** have used a one-stop fibroscan clinic to evaluate the likelihood of liver disease.
- **Queen Elizabeth Hospital** use virtual consultations to improve patient experience and care, and realise savings.
- **Freeman Hospital Liver Unit** focused on best practice in the first 24 hours of patients being admitted to hospital through the development of a care bundle.
- **Royal Cornwall Hospital** combined improved professional education and enhanced skills in diagnostics to identify patients’ conditions at an earlier stage, following which care is provided in the community wherever possible.

Common lessons can be identified around timely treatment, seeing patients in the right setting, and training and education; however, a prescriptive ‘one size fits all’ model would be inappropriate. The case studies are all unique, covering a wide range of geographical settings, demographics and organisational sizes. The shared goal is high quality care in advanced liver disease, but each area must determine how to piece their jigsaw together.

The British Liver Trust, in partnership with Norgine, is committed to supporting communities to tackle the grave challenges posed by advanced liver disease. I am optimistic this booklet will act as a catalyst for commissioners, clinicians and others to consider how services can be transformed and the barriers they may have to overcome. Most importantly, this booklet proves that positive change is possible; our communities rely on us coming together to achieve it.

If you find the booklet useful and have a case study you would like to highlight relating to the care of patients suffering from liver disease and its complications, please contact administrator@britishlivertrust.org.uk for an informal discussion. Shailesh Misty, Senior Brand Manager, Norgine Pharmaceutical Limited, would also welcome any interest, and can be contacted at SMistry@norgine.com.

Andrew Langford
Chief Executive, British Liver Trust
The Shared Care Liver Project: The impact of palliative care

Key points:

- Through joint working and an innovative referral pathway, patients with advanced liver disease can access early palliative care to meet their holistic needs.
- Access to palliative care can play an important role in reducing unnecessary hospital admissions and GP consultations for patients with advanced liver disease.

The need for change

There is growing national recognition that despite the high symptom and psychological burden associated with advanced liver disease, patients currently have limited access to palliative care, with many being referred to palliative care services as late as five days before death.

Limited access to palliative care can affect patient wellbeing and increase unnecessary GP consultations and A&E admissions.

The new service model

The Shared Care Liver Project (SCLP) aims to provide a shared care pathway between Basildon & Thurrock University Hospitals NHS Foundation Trust (BTUH) and St Luke’s Hospice for patients with advanced liver disease, with the aim of ensuring timely access to the support services and interventions patients need. The easily accessible service also helps patients manage distressing symptoms and provides emotional support for patients and families.

The project serves patients at all stages of their disease, including patients identified as candidates for transplantation.

Key features of the project:

- Enhance and embed links and referral pathways between the Liver team at BTUH and St Luke’s Hospice, promoting early patient referral and a parallel planning approach.
- Increase access to the provision of Hospice based holistic, supportive care and advanced care plan for patients with advanced liver disease.
- Streamline the process of, and improve access to timely paracentesis (drainage of abdominal fluid), improving patient experience, reducing hospital admissions and length of stay.

The model allows patients to benefit from the range of clinical and therapeutic services from the hospice whilst remaining under active management for their liver disease from the hospital. Patients referred to the Day Hospice for assessment are offered advanced symptom control, psychological support for themselves and their family, self-management strategies, therapeutic support groups and social worker and/or physiotherapy input to help maximise wellbeing.

Limited access to palliative care can affect patient wellbeing.

Barriers to rolling out the new service model

In 2013, a successful pilot of 20 patients with advanced liver disease was completed. It highlighted that the innovative and unique shared care model could be beneficial to patients with advanced liver disease and their carers. However, in order to test the model a larger scale project needed to be completed in order to demonstrate outcomes effectively.

The main barrier to rolling out the model following the pilot in 2013 was a lack of funding. An application was made to The Health Foundation in 2015 and, based on the positive outcomes from the pilot, funding was awarded to develop the shared care model.

The funding allowed the Hospice to dedicate a Specialist Nurse Practitioner (SNP) to the project for three days a week as well as a project administrator for two days a week.

Another major barrier was the challenge of collecting adequate data in the timeframe. It became apparent that the project’s importance to informing the national picture warranted an extension to the project. As such, The Health Foundation agreed to an extension and the project is due to be completed in August 2017.

Finally, patients’ perception and fears of referral/receiving care in a Hospice was a significant barrier which was overcome by the SNP doing in reach into the liver outpatients clinics.

Outcomes of the new service model

A total of 38 patients have been enrolled and currently 26 patients remain on the project.

Following a holistic needs assessment by the SNP, all patients are measured at least monthly using a range of outcome tools including:

- i-Palliative care Outcome Scores (i-POS)
- Views on Care
- Karnofsky performance status scale
- Phase of Illness
- Severe fatty liver disease quality of life (SFLD-QoL) questionnaire
- Care Support needs Assessment Tool (CSNAT), (offered to all carers)

It is anticipated that all patients will have at least 6 months data. The Marie Curie Research (UCL) unit will be assisting the shared care project team in the analysis of the data and the dissemination of the findings.

Quality of service key performance indicators (KPIs):

- Improved patient experience (POS, service user feedback, satisfaction surveys, stakeholder feedback)
- Improved access to services (POS, service user and stakeholder feedback)
- Reduced morbidity
- Reduction in acute hospital admissions and length of stay (collation of activity data)
- Timely intervention and ease of access for people requiring paracentesis (service user and stakeholder feedback, activity data analysis)
- Improved emotional wellbeing (POS scores and SFLD-QoL, wellbeing tool analysis)
- Improved carer/family support (service user feedback, CSNAT analysis)

For further information please contact Virginia Campbell on 01268 524973 or at VirginiaCampbell@stlukeshospice.co.uk
The Belfast Liver Unit: Change driven by evidence

Key points:
- Producing long-term evidence of progress and patient benefit is crucial to building confidence amongst key stakeholders and securing the necessary resources
- The use of rifaximin as the mainstay treatment for reducing recurrence of HE in patients with liver disease can have a significant impact on outcomes

The need for change
Faced with ongoing capacity concerns and growing numbers of patients with advanced liver disease, the Belfast Liver Unit began a program of service reform to improve patient outcomes and service delivery. Increasingly, patients with liver disease, including those with HE were being admitted through the unscheduled emergency care admissions pathway. The pathway was not as streamlined as it could have been, with liver disease patients too often starting their inpatient journey with a general medical consultant rather than a hepatologist.

The new service model
In an effort to improve care, the Belfast Liver Unit introduced a new service model. The key features included:

1. Ambulatory care
This became a key part of service transformation, ensuring patients were not admitted to hospital where avoidable. Urgent assessments would be carried out through the ambulatory care, helping patients to receive timely diagnosis and the right treatment.

There was an expectation that moving short stay patients, such as those for elective procedures (therapeutic paracentesis, liver biopsy, liver transplant assessment) into an ambulatory setting would have a detrimental effect on ward length of stay and mortality rates.

2. Reform of medical admissions
At trust level, a new medical admissions system was rolled out, incorporating acute medicine at its core with early triage of patients to appropriate specialty. All patients whose primary reason for admission was liver disease were therefore directed to the hepatology team, ensuring they received the right care, at the right time.

3. New consultant team model
To ensure patients were assessed more regularly and new hepatology patients were assessed daily, a new pattern of seven-day in-patient consultant care was implemented with appropriate revision of job plans.

Barriers to rolling out the new service model
It took time to access the required data to evidence the benefits of modernising the service; however, this became possible through positive collaboration between the Trust and commissioners. Articulating the potential to reduce the service’s bed footprint, enhancing patients’ experience of care and achieving cost savings were central to this. Through incremental steps, it has been possible to demonstrate that the model is working successfully, which, in turn, has boosted the confidence of the service’s commissioners.

Outcomes of the new service model
The implementation of the new service model has enabled patients to be kept in the community wherever this is the most appropriate setting for their care, whilst those with known chronic disease can be easily directed to other parts of the service to see the relevant team. The key highlights of the new model include:

- Reduction in the size of the Liver Unit from 25 beds to 21 through appropriate patient management and flow – it is important to note that the mortality rate has not increased during this period despite most low risk patients being moved to ambulatory care
- The 30-day re-admission rate has fallen each year:
  - The mean length of stay has also reduced:

- The total number of hepatology inpatient and ambulatory care episodes has risen from 911 in 2011 to 2,488 in 2016. In the absence of the new model, it is estimated that by October 2014 there would have been 3,079 additional occupied bed days, requiring an additional 8.4 beds
- With a larger proportion of hepatology inpatients being more complex than before the service reform, it was expected that length of stay, re-admission rates and mortality rates would deteriorate. Ongoing analysis of performance indicated that the opposite occurred. The team feel this was due, at least in part, to the following factors:
  - Team focus on patients – the consultant and junior medical team, along with nursing colleagues were able to focus care within one ward area and ensure care was standardised for all hepatology patients
  - Rifaximin use – a supportive Trust enabled rifaximin to be embedded as the mainstay therapy for reducing the recurrence of HE episodes in patients with liver disease, despite limited use in other areas of the UK. Crucially, therapy was involved at an earlier stage
  - Belfast Health and Social Care Trust estimated that the new model had generated in-year savings of £1m from the reduction in bed footprint, even taking into account the liver service paying for ambulatory care; the cost benefits significantly outweigh the investment required

For further information please contact Dr Johnny Cash on 02890633529 or at johnny.cash@belfasttrust.hscni.net

1 Lancet Commission on Advanced Liver Disease – New metrics for the Lancet Standing Commission on Liver Disease in the UK 2016
2 Appendix 1: Prescribing information – Targaxan 550 mg film-coated tablets
3 Rifaximin use – a supportive Trust enabled rifaximin to be embedded as the mainstay therapy for reducing the recurrence of HE episodes in patients with liver disease, despite limited use in other areas of the UK. Crucially, therapy was involved at an earlier stage

The mean length of stay in hospital for patients with advanced liver disease (days)

The 30-day re-admission rate for patients with advanced liver disease following the introduction of the new service model
**Glasgow Ambulatory Liver Support Service:**

Reducing re-admissions through patient education and support

**Key points:**
- The provision of timely and accessible patient information can play a major role in preventing re-admissions and reducing the length of inpatient stay, improving outcomes and saving costs
- Taking steps to put in place practical support to enhance access to liver services makes patients more responsive, helping to prevent deterioration in their condition

**The need for change**

Liver services provided by NHS Greater Glasgow and Clyde historically faced significant challenges in providing high quality care to people affected by decompensated cirrhosis. It was recognised that too many patients who presented with decompensated cirrhosis, and could have benefitted from outpatient management, were not seen for weeks after discharge. Frequently these patients were readmitted with further complications of their liver disease.

The scale of the challenge was clear from a patient audit of this cohort, using appropriate ICD 10 codes. It was found that between 1 January 2013 and 31 April 2014:
- 471 admissions were primarily for decompensated liver disease, 64 resulted in death
- The mean length of stay was 14.7 days
- 11.5% of the admissions lasted for one month or longer

| 212 patients were readmitted within 90 days of discharge |
| The mean time to an outpatient appointment post discharge was 58.8 days |
| The mean time to re-admission following discharge was 58.7 days |

**The new service model**

To tackle these challenges, Glasgow Ambulatory Liver Support Service (GLASS) was established with the primary aim to deliver a 20% fall in re-admissions in this patient group. Its secondary aims were to demonstrate a reduction in total bed days, and total number and length of stay of re-admissions. The GLASS pilot introduced three new interventions:

1. **Pre-discharge patient education**
   Prior to leaving the hospital, patients would be visited at the gastroenterology unit by a GLASS nurse to provide accessible information about their condition. This would include information about liver function and its pathology, as well as education on complications the patient has experienced. The nurse would provide dietary guidance and reinforce alcohol harm messages. Advice would also be offered on discharge medications, their indication and the importance of compliance. The dates for follow up tests and appointments would be confirmed.

2. **Post-discharge review**
   Within one week of discharge, each patient would be offered a review. The follow-up appointment would allow further condition-monitoring and consultation with the medical team regarding adjusting diuretic therapy, screening for encephalopathy, and titrating beta-blockers. The review team would note the patient’s weight, perform appropriate blood tests, and assess the patient’s quality of life indicators. The review would also be used to reinforce educational messages and outline further sources of support, including that of the addictions team (where appropriate), and other allied health practitioners.

3. **Re-admission prevention strategies**
   The GLASS nurse would take a number of steps, designed to prevent further unplanned re-admissions, including:
   - Monitoring of liver blood tests, and urea and electrolytes
   - Titration of diuretics
   - Arrangement of semi-elective or urgent, day case large volume paracentesis
   - Titration of medication for encephalopathy
   - Institution of primary/secondary prevention of variceal bleeding

**Outcomes of the new service model**

The comparison between the periods of August-October 2015 (pre-GLASS) to January-March 2016 (during GLASS pilot) demonstrated the significant benefits of the pilot, delivering its aims. These included:

- Reduction in re-admission rates from 13.5% to 10.5%
- Reduction in primary admission bed days from 1,034 to 534
- Reduction in total admission bed days (including re-admission) from 1,144 to 567 (48.7%), equating to a saving of £152,061
- Reduction in the length of stay (median length of stay for re-admissions fell from eight days to five)
- Of ten patients with first presentations of advanced alcohol related liver disease, all remained abstinent and only one required re-admission; a high impact on first presenters’ abstinence and engagement has potential for the greatest impact over time

For further information please contact either Dr Ewan Forrest at ewan.forrest@ggc.scot.nhs.uk, Mary Martin at mary.martin2@ggc.scot.nhs.uk or Sheila Dickson at sheila.dickson@ggc.scot.nhs.uk at the Walton Liver Clinic, Glasgow Royal Infirmary, Castle Street, Glasgow, G4 0SF. Alternatively, please call 0141 211 2911.
Hull Royal Infirmary:
Simplifying the complex management of patients with suspected Hepatic Encephalopathy

Key points:
• A clear and concise HE management guideline can help to educate clinicians and raise service standards even in the absence of a wider service transformation
• To ensure maximum benefit the guideline should be shared across teams and incorporated into training and education programmes to ensure all relevant staff have access to the information

The need for change
Two local patient audits were carried out by the Hull Royal Infirmary, revealing inconsistencies in the management of HE across the service.

Findings from the audits highlighted the following:
• Whilst treatment was appropriate in the majority of cases of episodic and recurrent HE, gaps were identified in objective HE assessment, documentation of HE grade and investigation for HE precipitant(s)
• Secondary prevention was suboptimal, resulting in potentially avoidable hospital admissions, which were costly and adversely affect patients’ experience and outcomes of care

The new service model
In order to enhance knowledge of effective HE management and drive improvements in the area, a clear and concise internal guideline was developed to set out a standardised practical protocol for clinicians to follow when caring for patients.

The simple tool – introduced in January 2017 – developed by the local hepatology team, helps clinicians to take the appropriate action depending on whether the patient with suspected HE displays typical or atypical symptoms.

To ensure the pathway is followed by non-specialist teams, the guideline was uploaded to the Trust Intranet in March 2017. Furthermore, the guideline has been incorporated into the clinical training and education programme for the Medical Assessment Unit, with teaching delivered by the hepatology team.

For further information please contact Dr Lynsey Corless on 01482 816797 or by email at lynsey.corless@hey.nhs.uk

Barriers to rolling out the new service model
The greatest challenge was the time lag at each stage of the process. Clearly, there is a need for urgent improvements to services, a lengthy process presents a series of obstacles.

Firstly, the initial audit to objectively assess current performance took three months to design followed by nine months of data collection and analysis.

On completion of the audit, the clinical decision-making to draft the policy was very quick and was boosted by strong consensus between clinicians on what should be included. However, having the guideline adopted as a trust-wide resource required ratification by the trust guideline committee, a two-month process.

Outcomes of the new service model
At the time of writing, the guideline had only been in use for a short period of time and data is not currently available to measure its success. The impact of the guideline on patient care will be audited 12 months after its roll-out. This will explore the objective assessment of encephalopathy, exclusion of key triggers, existence of atypical features, the use of different treatment options, and the timeliness of clinical review.

Following the audit and depending on its findings, discussions will take place about how to build on the progress achieved.

In the meantime, clinicians have a clear and easy-to-digest tool for improving the management of HE from day one. This will be invaluable in a busy clinical environment that relies on correct and quick decisions; patients stand to benefit significantly. The feedback from the gastro team has been positive to-date.

Appendix 1: Prescribing information – Targaxan 550 mg film-coated tablets

MHRA, Lactulose 3.3G/5ML oral solution, Summary of Product Characteristics and Patient Information Leaflet
Royal Free London NHS Foundation Trust: Shared responsibility for treating patients with HE

Key points:
• Health specialists, GPs and Clinical Commissioning Groups all have crucial roles to play in the delivery of effective treatment of HE – the Shared Care Guideline provides the impetus to bring multi-disciplinary teams together and work collaboratively to achieve high quality care for patients
• HE patients must understand and be involved in the planning of their ongoing treatment through the Shared Care Guideline
• Adherence to the Guideline by all stakeholders is essential to ensure its effectiveness

Ongoing treatment was unnecessarily delivered in a hospital setting.

The need for change
Too often, the ongoing treatment of patients with HE was unnecessarily delivered in a hospital setting, adding pressure and cost to the system. Despite its significant potential, primary care was unable to make a major contribution to supporting patients’ treatment and their long-term management. For patients, this model of care was undermining their experience of services.

As a result, recognition grew within the area that all local health economy stakeholders had a part to play in working together for the patient to deliver the highest quality of care, in the right place, at the right time.

The new service model
To foster closer collaboration between hospital specialists, GPs and CCGs in treating HE, a Shared Care Guideline for rifaximin was designed. Crucially, as part of this Guideline, patients are also attributed responsibilities, so they are involved and central to treatment choices. Each stakeholder is allocated a set of important responsibilities by signing up to the Guideline:

Consultant and specialist nurse:
• Initiate and prescribe treatment until the GP has agreed to shared care
• Ensure the GP has all necessary instructions about the treatment, as well as relevant information about the patient, including co-morbidities
• Provide advice to the GP when necessary, and evaluate adverse effects
• Supervise the patient through routine clinic follow-up appointments every three to six months and conduct a review every six months to assess needs

GP:
• Prescribe treatment following agreement to shared care
• Monitor the patient’s overall health and wellbeing
• Report adverse events to the consultant

Patient:
• Comply with the treatment as prescribed
• Share concerns about the treatment with the consultant and report any gaps in understanding of the treatment
• Report adverse effects to the specialist or GP

CCGs also have a role in supporting GPs in deciding whether to agree to shared care, as well as to assist trusts in resolving any challenges that may arise from the arrangement.

Barriers to rolling out the new service model
The Shared Care Guideline is only effective if its principles are adhered to by all of the stakeholders involved; this remains the key obstacle, particularly in primary care. Unless patient and treatment information is shared effectively, and there is an understanding of who should be dealing with patient concerns, complications or ongoing monitoring of their needs, the Guideline cannot fulfil its intended purpose. Progress to overcome this challenge will require further discussions to understand how stakeholders can support each other to fulfil their duties under the arrangement.

Outcomes of the new service model
Further work must be undertaken to ensure adherence to Shared Care agreements where they exist. Nonetheless, where implementation has been successful, there are numerous benefits:
• Key stakeholders are working collaboratively for HE care centred around and involving the patient
• The burden on hospitals is eased, with responsibilities allocated appropriately across relevant stakeholders
• The skills and understanding in primary care to support the management of HE have been enhanced which helps to prevent a worsening of patients’ conditions – this improves health outcomes and reduces unnecessary costs to health systems
• Patients have reported a better experience of treatment, with easier access to care in the community. They also understand and feel involved in the management of their condition, which has improved their willingness to comply

The implementation of the Shared Care Guideline provides an important step in the efforts to improve care for patients with HE. The wider take-up of the Guideline will serve to bolster relationships between stakeholders and ensure that future improvements are grounded in a joined-up way of working.

For further information please contact Lynda Greenslade on 0207 794 0500 or at lynda.greenslade@nhs.net

Appendix 1: Prescribing information – Targaxan 550 mg film-coated tablets

adverse events should also be reported to the MHRA: https://www.gov.uk/report-problem-medicine-medical-device
The Queen Elizabeth Hospital Liver Unit:

The one-stop Fibroscan Clinic

Key points:

- Assessing the level of fibrosis in patients with advanced liver disease with a Fibroscan® enables optimal disease management programmes to be implemented.
- Informing better management of advanced disease though the use of a Fibroscan® can reduce the likelihood of serious complications developing and save the NHS money through reduced admissions and protracted bed-stays.

The clinic saves specialist medical clinic slots for patients with established disease.

The need for change

It is important to assess the level of fibrosis in patients with advanced liver disease to identify those patients with significant liver damage who will benefit most from the early implementation of disease management programmes designed to reduce emergency admissions and reduce mortality.

Recognising this, NICE has recently issued guidance to GPs recommending referral of individuals who consume alcohol in a harmful or hazardous manner for a Fibroscan® to assess whether they are at risk of developing liver disease (see NICE guidance NG50).5

However, many secondary care providers worry that this will increase numbers of patients being referred to unsustainable levels and, additionally, may fail to direct individuals without liver disease to appropriate alcohol services.

The new service model

The one-stop Fibroscan Clinic is a nurse-led service that captures patients at risk of future harm from alcohol (in line with the NICE guidance) and provides a one-stop clinic that evaluates the likelihood of liver disease. The Clinic also provides an opportunity to assess whether there is evidence of an incipient alcohol use disorder.

This Clinic combines three elements of care into one clinical interaction: addiction psychiatry, hepatology and education. This creates a single point of care for GP referrers and signposts individuals to specialist addiction services. The nurse specialist delivers patient education and establishes whether the individual needs to be followed up in the liver clinic or whether they can be discharged back to the GP – saving valuable medical clinic slots for patients with established liver disease.

Outcomes of the new service model

Fibroscans® improve patient experience, both when in the care setting and from a much broader life experience perspective. The only alternative to a Fibroscan® is a liver biopsy which may be painful for the patient, requires a day case admission, and carries a small underlying risk of morbidity and mortality (1/10000).6

By contrast a Fibroscan® is a quick, painless, non-invasive procedure that doesn’t require inpatient admission and gives near instantaneous results.

By combining three elements of care into one clinical interaction the clinic saves specialist medical clinic slots for patients with established disease.

Although the one-stop Fibroscan® clinic is currently delivered in the hospital, there is an opportunity for the clinic to be moved out into the community (especially as the department has purchased a portable Fibroscan® machine), further freeing hospital resources.

Existing models of Fibroscanning will be unable to cope with the increased numbers of patients expected as a result of the NICE guidance.

The one-stop Fibroscan Clinic is therefore a timely model of Fibroscan® services that can be delivered more efficiently.

For further information please contact Dr Andrew Holt and Dr James Ferguson at the Liver Transplant Unit, Queen Elizabeth Hospital Birmingham on 0121 627 2000.

5 NICE, NICE Guideline NG50 Cirrhosis in over 16s: assessment and management 2016
6 NICE: Fibroscan Business Case 2013
The Queen Elizabeth Hospital Liver Unit:

Virtual clinics for patients with liver disease
‘Specialist management from your home’

Key points:
• ‘Virtual clinics’ for patients with advanced liver disease can improve patient access to consultations and lessen the physical and psychological burden of travelling long distances for patients
• The virtual clinic helps avoid unnecessary consultations with GPs and hospital admissions, therefore saving the NHS money

The need for change

England has only six dedicated liver transplant units. In large parts of the country patients therefore do not have easy access to regional transplant services and the numerous associated benefits of specialist skills in transplantation and rare or complicated liver disease management. Particularly troubling is the fact that liver transplant patients and those with complex liver diseases can have extensive journeys (i.e. a flight in some cases) at personal expense (i.e. travel costs and time off work) in order to attend the specialist out-patient clinic appointment that they need.

Currently, many patients are waiting for a face-to-face liver specialist consultation. These waits can potentially delay patients with advanced liver disease being given the right treatment for their condition, as well as restricting their access to specialised liver transplant assessments.

The care of patients awaiting or being considered for transplantation is complex and often expensive. Most specialist liver disease models of care are based on patients visiting hospital out-patient departments at specified times with little or no clinical contact in between consultations.

It is important that tertiary care liver services adapt to the UK’s rise in liver disease and maximise the access to the expertise and interventions within such centres. Technologies such as telehealth, telemedicine and self-care apps are currently underutilised in liver medicine, but have the potential to transform the way people engage in and control their own liver health care.
The new service model

University Hospitals Birmingham (UHB) already offers patients with chronic conditions access to ‘myhealth@qehb’, which allows patients electronic access from home (via the internet) to clinic letters, blood results and information about their medical condition and medications.

Virtual clinics for patients with complicated liver disease and/or who have undergone transplantation have been developed using the electronic platform of ‘myhealth@qehb’. Patients are able to book an appointment in a weekly virtual clinic via the myhealth site. At the designated time patients login to ‘myhealth@qehb’ and speak to their clinician via an embedded video link or voice call. The consultation will enable a general review of health and medications as well as the opportunity to address any patient concerns (figure 1).

Compared to face-to-face consultations, virtual transplant clinics are more patient-centered, delivering care when it is needed by the patient. This service is more efficient for patients and the NHS, reducing the need for costly clinic visits and transport. Prompt access to a transplant specialist via the virtual clinic may also improve clinical outcomes through earlier recognition and intervention for recognised complications of transplantation.

The objectives of the virtual clinic intervention are to ensure better, more flexible access for patients in specific areas of the country and improve efficiency by changing the pattern of interaction between patients and transplant specialists.

Barriers to rolling out the new service model

The virtual clinic utilises the recently established ‘myhealth@qehb’ internet portal.

One potential barrier identified early on in the process was that patients require internet access at home via a computer, smartphone or electronic tablet. However given that >90% of UK adults use the internet, it was agreed that this wasn’t a significant barrier. In addition, it is preferred that NHS trusts have electronic access to patient’s medical notes, clinical investigations and ideally electronic prescriptions to fully utilise the functionality of the virtual system.

One initial concern was that patients would feel disadvantaged by a lack of face-to-face consultation and interaction in person. However, initial feedback via electronic patient evaluation forms has highlighted that the virtual clinic has avoided unnecessary consultations with the GP, hospital admissions and has reduced the physical and psychological burden of travelling long distances for patients.

Outcomes of the new service model

At the time of writing, the virtual clinic has only been piloted for a short period of time and data is not currently available to measure its clinical and financial success. However, future outcomes of the virtual liver clinic will be assessed by:

1. Electronic patient and clinician feedback forms, which can be uploaded via the platform of ‘myhealth@qehb’
2. Clinical audit – rates of non-attendance to clinic, medication compliance, clinic out-patient waiting times and avoidable critical incidences

For further information please contact Dr Andrew Holt and Dr James Ferguson at the Liver Transplant Unit, Queen Elizabeth Hospital Birmingham on 0121 627 2000.
Newcastle-upon-Tyne
Freeman Hospital Liver Unit:
The development and implementation of a care bundle for decompensated cirrhosis

Key points:
- Recognising the need for early care to be improved and standardised, liver disease specialists at the Freeman Hospital developed a ‘care bundle’ to ensure that effective treatments are delivered to patients presenting with decompensated cirrhosis
- The introduction of the care bundle was associated with demonstrable improvements in outcomes for patients with decompensated cirrhosis

The need for change
In 2013, the National Confidential Enquiry into Patient Outcome and Death of patients with alcohol-related liver disease report (NCEPOD) identified major deficiencies in the care of people who died from alcohol-related liver disease, less than half of cases were rated as receiving ‘good care’. One of the NCEPOD recommendations was for a toolkit to be developed to establish best practice in the management of the first 24 hours of patients admitted to hospital with advanced liver disease. Evidence shows that correct testing and treatment within the first 24 hours of admission significantly lowers the average length of hospital stay.

In Newcastle, the scale of the challenge before the introduction of the care bundle was clear. Patients admitted with decompensated cirrhosis were:

- Staying in hospital for an average of 11 days
- Receiving the correct diagnostic tests for ascites only 61% of the time
- Having their alcohol consumption correctly documented in 69% of cases
- Not always receiving the appropriate treatment for spontaneous bacterial peritonitis (SBP) or a suspected variceal bleed

The new service model
To tackle these challenges, a team of liver disease specialists from the Newcastle-upon-Tyne NHS Foundation Trust developed a care bundle to improve the care of patients with decompensated liver disease.

The care bundle provides a simple check list of key investigations, and clear guidance on the management of the complications of cirrhosis, such as SBP, variceal bleeding, acute kidney injury (AKI) and HE. The care bundle was designed to help any clinician admitting a patient with decompensated cirrhosis to provide effective treatment. Often these patients have complex medical needs in the first 24 hours, when specialist advice may not be available.

The care bundle is endorsed by the British Society of Gastroenterology and British Association for the Study of the Liver, as well as being recommended for use in all UK hospitals.

The care bundle is freely available and accessible online: http://www.nescn.nhs.uk/wp-content/uploads/2014/05/Cirrhosis-Care-Bundle-v1.2.pdf

It contains:
1. A full list of baseline investigations
It is essential that patients presenting with the symptoms of decompensated cirrhosis receive a full clinical examination upon admission to identify the reason for their further deterioration in liver function. These baseline investigations should include blood tests covering full blood count, urea and electrolytes; liver function tests; a coagulation profile and glucose level tests. All such patients should also be thoroughly screened for sepsis. All patients presenting with clinically detectable signs of ascites should also have an ascitic tap performed to rule out SBP.

2. Alcohol
Over two thirds of patients in the UK admitted with cirrhosis have alcohol as the primary contributory factor. A full patient alcohol history should be documented and, for patients with current excessive alcohol consumption, parenteral thiamine and other B vitamins should be given to treat thiamine deficiency.

3. Infections
Bacterial infections are common in patients with cirrhosis. SBP is the most common infection in patients with cirrhosis. Once diagnosed through an ascitic tap, SBP should be treated with broad spectrum antibiotics as well as intravenous albumin to prevent any worsening of renal function.

4. Hepatic encephalopathy
HE is a further common complication of cirrhosis. For patients displaying signs of encephalopathy it is important to find the cause (gastrointestinal bleeding, constipation, dehydration, sepsis etc) before treating with enemas or laxatives.

Barriers to rolling out the new service model
The care bundle was introduced in Newcastle upon Tyne Hospitals NHS Foundation Trust as part of the Trust’s major Commissioning by Quality and Innovation (CQUIN) improvement projects programme for 2014/15 and has been audited in Newcastle, Sunderland and Cornwall. Doctors in acute care settings are now challenged with completing a range of assessments including venous thromboembolism risk and cognitive assessment.

The main barrier in introducing the care bundle was persuading the junior doctors and staff in the medical assessment unit that it was a “tool” to guide patient management and treatment. This required presentations and tutorials for all the staff but the care bundle is now embedded in routine practice and the junior doctors find it very useful and reassuring.

Outcomes of the new service model
An audit of the effectiveness of the care bundle after its introduction demonstrated that when compared to patients without a completed care bundle, patients with a completed care bundle saw marked improvements in their quality of care:

- Shorter average length of stay in hospital – 8 days compared to 13 days
- Marked improvement in appropriate uses of a diagnostic ascitic tap for SBP from 61% to 86%
- The correct documentation of excess alcohol usage increased from 69% to 85%

For further information please contact either Dr Stuart McPherson, stuart.mcpherson@nuth.nhs.uk or Dr Mark Hudson, mark.hudson@nuth.nhs.uk at Newcastle upon Tyne Hospitals NHS Foundation Trust.
Royal Cornwall Hospitals NHS Trust:

Diagnosing at an earlier stage

Key points:
• The combination of improved professional education and enhanced skills in diagnostics is crucial to identifying and managing patients’ conditions at an earlier stage
• Comprehensive auditing of patients and pathways is an important part of understanding and implementing service improvements

The need for change
The prevalence of cirrhosis in Cornwall stands at 75 per 100,000 population (NICE assumption), but this is potentially underestimated. There is an expected HE prevalence of 37.5% within the cirrhotic group. Whilst the management of HE was felt to be of a high standard within the region, a number of interrelated challenges existed:
• Late detection of cirrhosis and HE in primary care
• Poor diagnosis of HE on emergency admission
• Varied treatment routes for HE amongst Consultant Gastroenterologists
• Lack of access to specialist diagnostic tools for HE
• Insufficient audit with regards to management and clinical outcomes
• Lack of appropriate guidelines and protocols for HE management across primary and secondary care

Additional logistical challenges include Cornwall’s rural geography and poor transport links, posing barriers to attendance at elective appointments.

The new service model
Since 2010, the hepatology team has sought to address these issues, increasing the quality of care for HE patients and ensuring a consistent approach to the management of this debilitating complication of cirrhosis. Positive outcomes in HE management are dependent on engagement from and collaboration between a variety of stakeholders, including clinicians from primary and secondary care, patients, family members and carers.

Liver disease services are provided across the region, with daily liver clinics occurring over six sites, as far west as Penzance to Bodmin in the north east. The hepatology team consists of two consultant hepatologists, a hepatology nurse consultant, two hepatology nurse specialists, a blood borne virus nurse and two assistant practitioners performing fibroscans and coordinating multi-disciplinary team meetings. Key features of the new model included:

Daily liver clinics over six sites as far west as Penzance to Bodmin in the north east.

Challenges include Cornwall’s rural geography and poor transport links.

• Primary care education
  In 2011, a rolling education programme was introduced in primary care, delivered via hepatology clinicians. The programme covers the causes of major liver disease and management of complications of cirrhosis, including HE

• Secondary care education
  Education has also been paramount within the hospital service. In 2015, the care bundle for decompensated cirrhosis was adopted and, in relation to HE specifically, clinicians are primed to enquire with regards to episodes of confusion, encouraging earlier diagnosis of HE

• Diagnostics
  Diagnostics was also pinpointed as a priority in the new service model. Efforts have been made in recent years to enhance skills in this field through the use of critical flicker, ammonia, EEG and audit results against clinical signs. The fibroscan technicians have now incorporated the use of critical flicker frequencies within the scanning list, performing the flicker testing at the time of diagnosing cirrhosis. Furthermore, in 2015, an alcohol liaison team of four nurses was successfully commissioned which helped to build even greater momentum for service change and earlier detection of advanced liver disease

• Community care
  Where appropriate, moving services into the community has formed part of the area’s new approach to delivering care. Fibroscan technicians have been able to work in patients’ homes, whilst a local drug and alcohol service provider, Addaction, has made an important contribution through its residential rehabilitation centre, offering tailor-made recovery programs, and earlier detection.

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8 University of Nottingham Direct targeting of risk factors significantly increases the detection of liver cirrhosis in primary care: a cross-sectional diagnostic study utilising transient elastography 2015
Barriers to rolling out the new service model

Despite NICE’s 2015 guidance, Rifaximin9 for preventing episodes of overt hepatic encephalopathy, local scrutiny of prescribing practice highlighted concerns that Cornwall were the highest prescribers in the South West. Work was undertaken to produce a standard operational policy. The team attended the local Medication Practice Committee and subsequently developed and secured acceptance for shared care guidelines for general practitioners.

Outcomes of the new service model

The service has seen an increase in referrals to hepatology, consistent with an overall increase in liver disease nationally. However, crucially, these referrals have been made noticeably earlier than previously, where too often patients were diagnosed when admitted acutely with decompensated liver disease.

Audit data from 01/01/2015 to 30/09/2016 showed a number of diagnoses:

• 56 patients with HE
• 35 patients with alcohol-related liver disease
• 7 patients with hepatitis C
• 3 patients with cryptogenic cirrhosis
• 5 patients with non-alcoholic steatohepatitis
• 2 patients with autoimmune hepatitis
• 1 patient with primary sclerosing cholangitis
• 2 patients with primary biliary cirrhosis
• 1 patient with alpha-1-antitrypsin deficiency

Of these HE patients, 25 had a documented hospital transplant since January 2015 has required only 15 days as an inpatient.

Moreover, audit data suggests Cornwall’s prescribing practice is within NICE guidance and remains on trajectory with regards to expected prescribing for the prevalence of cirrhosis and HE.

In addition, it is also vital that education is seen as a rolling programme (due to hospital staff turnover) in order to maintain compliance with the decompensated care bundle and identification and treatment of HE.

Other findings from the audit showed:

• With regards to diagnostic tests
  38 patients had documented abnormal ammonia levels whilst five had normal and 13 patients had no levels undertaken
  EEG and critical flicker utilised in aiding diagnosis
  Clinical features of HE were noted in 51 patients
  • Treatment outcomes were well monitored
  All 56 patients were treated with rifaximin for reduction of recurrence of HE episodes with a good response in patients except for in two cases where abdominal pain was experienced
  47 patients had concomitant lactulose therapy
  • Seven deaths were noted across the audit period

Cornwall’s approach ensures early detection of HE, sustainment of quality of life for patients and reduced hospital admissions, as well as the financial burdens associated with this.

As an example, one patient listed for a liver transplant since January 2015 has required only 15 days as an inpatient.

For further information please contact
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Appendix 1: Prescribing information – Targaxan® 550mg film-coated tablets

**Targaxan® 550 mg film-coated tablets.**
**REFER TO FULL SUMMARY OF PRODUCT CHARACTERISTICS (SmPC) BEFORE PRESCRIBING**

**Presentation:** Film-coated tablet containing rifaximin 550 mg.

**Uses:** Targaxan is indicated for the reduction in recurrence of episodes of overt hepatic encephalopathy in patients > 18 years of age.

**Dosage and administration:**
Adults 18 years of age and over: 550 mg twice daily, with a glass of water, with or without food for up to 6 months. Treatment beyond 6 months should be based on risk benefit balance including those associated with the progression of the patients hepatic dysfunction.

No dosage changes are necessary in the elderly or those with hepatic insufficiency. Use with caution in patients with renal impairment.

**Contraindications:**
Contraindicated in hypersensitivity to rifaximin, rifamycin derivatives or any of the excipients and in cases of intestinal obstruction.

**Warnings and precautions for use:**
The potential association of rifaximin treatment with Clostridium difficile associated diarrhea and pseudomembranous colitis cannot be ruled out. The administration of rifaximin with other rifamycins is not recommended.

Rifaximin may cause a reddish discolouration of the urine. Use with caution in patients with severe (Child–Pugh C) hepatic impairment and in patients with MELD (Model for End-Stage Liver Disease) score > 25.

In hepatic impaired patients, rifaximin may decrease the exposure of concomitantly administered CYP3A4 substrates (e.g. warfarin, anti-epileptics, antiarrhythmics, oral contraceptives).

Both decreases and increases in international normalized ratio (in some cases with bleeding events) have been reported in patients maintained on warfarin and prescribed rifaximin. If co-administration is necessary, the international normalized ratio should be carefully monitored with the addition or withdrawal of treatment with rifaximin.

Adjustments in the dose of oral anticoagulants may be necessary to maintain the desired level of anticoagulation. Ciclosporin may increase the rifaximin Cmax.

**Pregnancy and lactation:**
Rifaximin is not recommended during pregnancy.

The benefits of rifaximin treatment should be assessed against the need to continue breastfeeding.

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3 Appendix 1: Prescribing information – Targaxan 550mg film-coated tablets
9 NICE Rifaximin for preventing episodes of overt hepatic encephalopathy 2015
If you find the booklet useful and have a case study you would like to highlight relating to the care of patients suffering from liver disease and its complications, please contact administrator@britishlivertrust.org.uk for an informal discussion. Shailesh Mistry, Senior Brand Manager, Norgine Pharmaceutical Limited, would also welcome any interest, and can be contacted at SMistry@norgine.com.

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