PROTOCOL FOR ASSESSMENT FOR LIVER TRANSPLANTATION IN PATIENTS WITH CHRONIC LIVER DISEASE

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Royal Infirmary
Edinburgh

June 2012
Valid until June 2013
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INTRODUCTION

The assessment of patients for liver transplantation will take place in the Scottish Liver Transplant Unit (SLTU) and will cover two phases:

**Phase I**
1. Establish the diagnosis and stage.
2. Ensure there are no alternative relevant medical or surgical therapies.
3. Exclude contraindications to transplantation.
4. Complete the assessment workup

**Phase II**
1. Ensure that the patient and his/her relatives are prepared for making an informed decision about liver transplantation.
2. Prepare the patient for the waiting list.
3. If patient rejected ensure aware of potential for seeking a second opinion.
ADMISSION FOR ASSESSMENT

Referral for liver transplant assessment is considered for patients who have end-stage liver disease, liver tumour, or who have an intolerable quality of life as a result of liver disease.

The decision to accept or refuse a referral must be made by a consultant. The case notes, with a referral letter, are the preferred mode of referral. Patients with alcoholic hepatitis are generally not admitted for assessment. The transplant co-ordinator will arrange the patient’s admission to the Transplant Unit from home. *The nurse in charge in Ward 206T will arrange transfer of inter hospital transfer of patients.* This will usually be within 4 weeks and any delay should be communicated to the referring consultant. In order that the assessment process is completed for the weekly assessment meeting, where possible, admission will be arranged for the beginning of the week.

**Investigation Plan**

*Outstanding investigations will be organised by the transplant co-ordinator at the request of the medical staff.*

Investigations and visits will be documented in the patient’s timetable to facilitate the assessment process.
ASSessment of Suitability for transplantation

1. Confirmation of Diagnosis

Patients coming to the SLTU for assessment are referred from a variety of hospitals and may not have had investigations performed as required for transplant assessment (Appendix 2). Their original hospital records and radiographs must be obtained and reviewed so that unnecessary duplication of investigation is avoided.

Hepatic Parenchymal Disease
1. Contact referring hospital; NB previous biopsy to be sent to Dr Bellamy, Pathology RIE
2. Notify pathologist re pending admission

The diagnosis of the underlying liver condition must be established as firmly as possible from review of previous medical records supplemented by any necessary additional investigations. Histological confirmation should be obtained if there is doubt regarding the diagnosis, unless contraindications to liver biopsy are present, and a review of previous liver biopsy should be requested from Dr Bellamy.
2. Disease Severity

The severity of the liver disease is the single most important criterion for liver transplantation. The current severity of liver disease should be documented using the Pugh, MELD and UKELD score. Minimal listing criteria now exist and for non-HCC patients a UKELD of 49 or above is required for listing unless one of the following variant syndromes is present.

**Variant syndromes and definitions for selection to the adult elective liver transplant waiting list**

i. Diuretic resistant ascites  
Ascites unresponsive to or intolerant of maximum diuretic dosage and non responsive to TIPSS or where TIPSS deemed impossible or contraindicated and in whom the UKELD score at registration is less than or equal to 49.

ii. Hepatopulmonary syndrome  
Arterial PO2 less than 7.8 kPa. Alveolar-arterial oxygen gradient greater than 20 mm Hg. Calculated shunt fraction greater than 8% (brain uptake following technetium macro-aggregate albumin), pulmonary vascular dilatation documented by positive contrast enhanced trans-thoracic echo in the absence of overt chronic lung disease.

iii. Chronic hepatic encephalopathy  
Confirmed by EEG or trail making tests with at least two admissions in 1 year due to exacerbations of encephalopathy that has not been manageable by standard therapy. Structural or neurological disease must be excluded by appropriate imaging and if necessary psychometric testing.

iv. Persistent and intractable pruritus  
Pruritus consequent on cholestatic liver disease which is intractable after therapeutic trials which might include cholestyramine, ursodeoxycholic acid, rifampicin, ondansetron, naltrexone and after exclusion of psychiatric co-morbidity that might contribute to the itch.

v. Familial amyloidosis  
Confirmed transthyretin mutation in the absence of significant debilitating cardiac involvement or autonomic neuropathy.

vi. Primary hyperlipidaemias  
Homoyzgous familial hypercholesterolaemia with absent LDL receptor expression and LDL receptor gene mutation.

vii. Polycystic liver disease  
Intractable symptoms due to the mass of liver or pain unresponsive to cystectomy or severe complications s secondary to portal hypertension.

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EEG, electroencephalogram; LDL, low density lipoprotein; TIPS, transjugular intra-hepatic stent.  
*Gut 2008;57:252-257.*
3. General Health and Specific Problems

An overall assessment of general health and fitness for transplantation is important particularly in older subjects. The following investigations should be undertaken (Appendix 2):

**Haematology:**
- Full blood count.

**Liver function:**
- Liver function tests, ie. albumin, total protein, bilirubin, alk phos, GGT, AST, ALT, ferritin, alpha-1-antitrypsin, alpha fetoprotein and caeruloplasmin, a full coagulation screen initially followed by prothrombin time only thereafter.

**Renal function:**
- Urinalysis (dip stix), urea, creatinine, sodium, potassium and total CO2 concentrations. The creatinine clearance should be measured in all patients. Refer patients with eGFR < 30ml to renal physician on for transplant during assessment week.

**Metabolic:**
- Fasting plasma glucose. Diabetes mellitus is diagnosed when the fasting glucose is > 7.8 mmol/l, random glucose > 11.2 mmol/l or the glucose 2h after 75 g glucose orally is > 11.1 mmol/l.
- Fasting full lipid screen.
  - Bone density should be measured in all patients in whom this has not been undertaken within the previous 12 months either during assessment or while on the waiting list. If possible referring units should be asked to carry this out.

**Respiratory:**
- Chest x-ray.
- Pulmonary Function Tests.

**Heart:**
- ECG.

**Microbiological investigations:**
- culture of urine, ascites, sputum (if available) and any other relevant site (eg. lines). Screening for MRSA should be undertaken on samples including nasal swabs.

**Serology:**
- One brown serology should be sent for HBV (HDV if HBV+), HCV and HIV, CMV, EBV and VZV.
  - The patient’s blood group should be checked with 2 separate samples.

4.  Radiology and Endoscopy

**Hepatic Circulation**

The hepatic artery and the portal and hepatic veins will be examined by CT scan.

Portal hypertension will be assessed from evidence of splenomegaly determined by ultrasound, hypersplenism determined by peripheral blood count and the presence of varices and/or portal gastropathy by upper gastrointestinal endoscopy (unless this has been done at the referring hospital within the previous 6 months or patient on prophylactic beta-blockers).
If the patient has not had a surveillance endoscopy in the previous 6 months then the transplant coordinator will arrange this on booking their admission. Prophylaxis should be started for grade II and III varices if identified.

Oesophageal variceal bleeding (or acute upper gastrointestinal bleeding of undetermined origin in the presence of varices) will be treated by repeated variceal banding or TIPSS.

5. Viral Hepatitis

Hepatitis B and C

Patients with hepatitis B and hepatitis C infections considered for transplantation must have assessment of the activity of viral infection. This will include measurement of HBsAg, anti HBC, HBeAg, anti HBe and HBV-DNA for hepatitis B infection. The Delta agent should be sought in all patients with hepatitis B infection by testing for delta antigen and anti-delta. Patients with hepatitis C infections should have anti HCV, HCV-RNA including titre and genotype should be checked in all cases. Patients who are HBV-DNA positive will be treated with oral anti-virals before and after transplantation. Ideally they should be HBV-DNA negative at the time of transplantation. Patients with HIV need to be discussed with Professor Clifford Leen (Infectious Diseases, WGH).

6. Malignant Disease

Patients admitted for assessment with known hepatic malignancy should be discussed with the surgeons before admission. The hepatobiliary rota can be consulted for this purpose. The diagnosis of hepatocellular carcinoma will normally have been established by a combination of CT, MRI scanning and by alpha-fetoprotein measurements. Biopsy of hepatocellular carcinoma should not be carried out where these investigations clearly point to the diagnosis to reduce the risk of tumour seeding.

A lesion must be seen on 2 forms of imaging with typical characteristics to count as HCC. The size of a HCC will be the larger of the two if there is a discrepancy. The listing criteria at present are:

- Single tumour<5cm diameter or
- Up to 5 tumours all < 3cm or
- Single tumour between 5 and 7cm with no evidence of progression (<20% volume increase) over a six month period. Locoregional therapy or chemotherapy may be given at this time.
- A contrast CT scan will be carried out on ALL assessments. This can and if possible should be done at the referring hospital; Dr Patel will report the scans here during the assessment week.

- MRI scan only for patients with suspected or proven HCC based on the initial CT scan.

- Patients *without* HCC will not have an MRI scan

- TACE (or RFA) will be offered to all patients on the waiting list with multifocal tumours, and all solitary tumours > 4cm, unless they have contraindications, eg poor synthetic function, or are likely to be transplanted very quickly.

- Patients on the waiting list with diagnosis including HCC should undergo alphafetaprotein measurement every month and CT scanning every six weeks.

Extra hepatic metastases should be sought with a chest x-ray, CT scan of chest and abdomen before listing.

7. **Nutritional Assessment**

All patients admitted for assessment will be seen by the dietician. The nutritional assessment will categorize patients as being either well nourished, moderately malnourished or severely malnourished. Any patient that is unable to meet their nutritional requirements will be considered for oral and/or enteral nutritional support as is appropriate. The anthropometric data collected on each patient includes:- Height (m), Weight (kg), Body Mass Index (kg/m²), Tricep Skinfold Thickness (mm), Mid Arm Muscle Circumference (cm), Grip Strength (kg) and Girth (cm).

8. **Age**

Advanced age is a relative contraindication to transplantation, and in such patients particular attention should be paid to an overall assessment of their general health.
9. Psychological State
Psychological evaluation is always required in patients with established or suspected alcoholic liver disease or substance misuse, and may be required in patients with other forms of liver disease.

**Alcoholic Liver Disease/ Methadone Use**  Dr Smyth, (or Dr Potts) should be informed about these patients when they are admitted to SLTU. UK guidelines exist (appendix 3 and 4) for listing patients with alcoholic liver disease and substance misuse.

These patients will be asked to sign a contract relating to abstinence from alcohol and willingness to undertake prescribed treatment for alcoholism following transplantation (Appendix 5). Patients in whom alcohol is believed a co-factor in causing liver failure should also sign the contract. **Other patients who are considered appropriate for referral to Dr Smyth for reasons such as depression, previous drug misuse problems. Such referrals should generally come from the Consultant Physician on-call.** Quality of life is important in determining the need for transplantation, and sometimes may be the main indication where liver function otherwise seems reasonable. Dr Smyth should be contacted in the first instance about quality of life in patients where this is the major factor in consideration for transplant. Professor R O’Carroll and others may be involved in making this objective assessment.

10. Social Support
Patients with social problems will be seen by the liver transplant unit social worker. Where possible a social report should be sought from the referring hospital.

11. Exclusion Criteria
Systematic recording of the above should identify patients with exclusion criteria.

**Absolute contraindications** include:
Active extra-hepatic sepsis, extrahepatic malignancy, active alcohol or other substance abuse, and severe cardiac, respiratory or renal dysfunction not attributable to underlying liver disease, hepatocellular carcinoma > 5 cm diameter.

**Relative contraindications** include:
Age > 65 years, previous major upper abdominal surgery, portal vein thrombosis, diabetes mellitus with complications, and moderate cardiac, respiratory or renal dysfunction not related to the underlying liver disease. Previous alcohol or substance abuse and poor social circumstances are also relative contraindications.

12. Care of Assessment Patients with Specific Liver Related Problems (Appendix 6)
Specific liver related problems are managed as per guidelines in the Centre for Liver & Digestive Disorders: Clinical Care Guidelines for Junior Doctors, last updated 2007.
DECISION REGARDING LIVER TRANSPLANTATION

All patients will be discussed at the weekly transplant meeting and decisions will take account of the views of the medical staff, nursing staff, social worker, transplant co-ordinator and dietician. The transplant co-ordinator will be responsible for ensuring that a completed assessment form (Appendix 2) and the patient’s SLTU and referring hospital records are available at this meeting. This meeting will decide on the advisability of transplantation and its urgency. Patients accepted for transplantation and their relatives will be informed about the transplantation and will be counselled. Patients rejected will be made aware of right to second opinion and the potential mechanisms for this. The discussion details of both the assessment meeting and patient consultation are recorded on a proforma on the day of assessment (Appendix 2).

The physician on for transplant during the assessment week will contact the referring team after the assessment meeting to ensure they are aware of the decisions regarding transplantation and planned follow-up. This will be followed up with a letter dictated within 72 hours of the assessment meeting.

**Follow up on waiting list**

Arrangements for medical follow-up for patients on the waiting list and for patients in whom a decision on transplantation has been deferred must be made clear to the referring consultant, the general practitioner and the patient. Patients who are not accepted for transplantation are referred back to the referring consultant.

**Varices**

Patients who have had previous variceal bleeding need to have follow-up arrangements made for variceal banding or TIPSS surveillance. Patients who have not had previous variceal bleeding who are discharged on the transplant waiting list and who have medium or large varices will be treated with carvedilol or with banding.

**Bone Density**

Patients with untreated osteoporosis ( T score < -2.5) will receive disodium pamidronate 90mg by slow intravenous infusion once and six months later if they remain on the transplant waiting list.
ADMISSION FOR TRANSPLANTATION

When a liver becomes available, the transplant co-ordinator and consultant surgeon will identify a suitable recipient from the waiting list. The medical registrar will be informed and he/she will inform the medical consultant. The transplant co-ordinator will contact the potential recipient.

On admission the following will be carried out:

1. Admission history and examination concentrating particularly on events since the patient’s most recent review.

2. Investigations:
   - Full blood count
   - Liver function tests including AST + TP
   - Full coagulation screen
   - Urea, creatinine, sodium, potassium and total CO2.
   - Glucose
   - Ascitic tap - for polymorph count and culture unless this has been done in the previous week. Ensure the ascites polymorph count is phoned back to the SLTU as soon as possible.
   - Chest x-ray
   - Electrocardiogram
   - Abdominal ultrasound if not done in previous 4 months

3. Consent for operations signed by patient *(or reaffirmed)*.

4. Blood transfusion - Cross match 10 units of red blood cell concentrate

5. The patient may have given consent to a clinical trial. Information regarding the trial will be at the front of the notes and will highlight any additional bloods or procedures required. The Senior Research Nurse (Janice Davidson) should be made aware the patient has been admitted for transplant she can also be contacted if there are any concerns regarding the trial.
Histocompatibility and Immunogenetics (H&I) support for SLTU from July 2012

Historically the RIE SNBTS H&I laboratory has provided crossmatching, antibody testing and HLA typing of patients and donors to support the SLTU. Following recent publications and an analysis of local data, the following services will be provided in the future to support the management of patients transplanted within the SLTU:

1) DNA from patients and donors will be stored i.e. no HLA typing will be undertaken unless indicated by antibody testing (see below).

2) At the time of transplant serum will be screened for HLA antibodies.

3) If positive this serum will be tested for the presence of donor specific antibodies (DSA).

4) To identify the presence of DSA, HLA typing will be performed on stored donor DNA and patient DNA if necessary.

5) For all DSA positive cases the H&I staff will contact the transplant coordinators 1 month post transplant to request a sample to see whether HLA-DSA levels have dropped or persist at the pre-Tx level.

6) Results will be reported to the coordinators and the hepatologist managing the patient at the time of testing.

No change should be made to the samples being sent to the H&I laboratory.
APPENDIX 1

Referral for Liver Transplant Assessment

1. PATIENT'S NAME:
   DOB:
   CHI:
   ADDRESS:

   HOME TEL. NO:

2. IF IN-PATIENT - WARD:
   HOSPITAL:
   TEL. NO:
   CONSULTANT:

   a) Please phone co-ordinator 0131 242 1721
      OR
      Fax this to 0131 242 1722

      And post to: Liver Transplant Co-ordinators
                   Transplant Unit
                   Royal infirmary of Edinburgh
                   51 Little France Cres
                   Edinburgh
                   EH16 4SA

Consultant Signature ............................................................................................................................................
## Assessment for Liver Transplant

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<tr>
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### Blood

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<td>WBC</td>
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<td>PT</td>
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### Urine Results:

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### Complications of cirrhosis:

- Encephalopathy:
- Varices:
- Date of Last Endoscopy
- Bleeding Varices:
- Ascites:

### MRI
- CT:

### ECG:

### Pulmonary Function Tests:

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### Bacteriology:

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### Virology:

- CMV
- HIV
- HCV
- HBs Ag
- EBV:

### Nutrition:

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### Childs-Pugh Score:

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### UKELD:

### Meld score:

Assessment Protocol 2012
**Transplant Unit**  
**Assessment Meeting Summary Document**

<table>
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**Summary of relevant issues from assessment week**

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Appendix 3

CONTRA-INDICATIONS TO LISTING

1. Alcoholic hepatitis- clinical syndrome of jaundice, coagulopathy rather than histological diagnosis

2. Repetitive episodes (more than 2) of non-compliance with medical care where there was not a satisfactory explanation. This should not be confined to management of their liver disease.

3. Return to drinking following full professional assessment and advice (this includes permanent removal from the list if found to be drinking while listed)

4. Concurrent or consecutive illicit drug use (except occasional cannabis use)

2 Assessment

- Patients admitted for a transplant assessment irrespective of diagnosis should be screened for current and past illicit substance use as part of the clinical interview. This should include misuse of over the counter medications (OTCs) and apparent misuse of pain relief medication.
- Any patient considered to have a significant drug taking history should be assessed by a specialist in substance misuse; the term ‘significant’ must be interpreted by the clinical, multi-disciplinary team.
- Adequate time and resources should be made available to allow this specialist to undertake this process.
- Assessment should include problematic or dependent use as well as recent use. It should also identify substance use and stability within the patient’s wider social support network, and take into account mental health and criminal justice issues as appropriate.
- Services should endeavour to develop and implement joint screening and assessment protocols between hepatology and substance misuse services to ensure effective care pathways are in place.

2.1 Contraindications

Contraindications to listing for transplantation include the following:

I. Current ongoing intravenous use of illicit or non-prescribed substances
II. Two or more recent (within 2 years) incidences of unexplained and significant non compliance with treatment – not necessarily confined to the management of liver disease
III. Current failure to comply with the assessment and treatment process for transplantation, including refusal to provide consent for gaining access to information pertaining to drug treatment and prescribing
IV. Recent past history of cross dependency (substituting from one drug to harmful/problematic use of another), within the last 2 years; this requirement could be relaxed for patients who have switched drugs within 2 years but have been stable since maintaining engagement in substance misuse services
V. Length of abstinence should be 2 years ideally, but not less than 6 months, where a patient has been dependent on a drug. The patient should have the opportunity to engage in an optimum substance misuse treatment programme.

2.2 Potential Contraindications

Potential contraindications allow issues of concern to be factored in without necessarily attempting to weight issues against one another in the absence of good evidence. The importance of potential contraindications should be discussed between the transplant team and substance misuse specialist and interpreted with clinical judgement on a case by case basis.

I. Current legally prescribed intravenous drug use (i.e. Diamorphine or Physeptone). Some patients are long term yet stable IVDUs and their use of prescribed IVDU opiates is as part of a long term agreed treatment plan. Others may be more recent presentations who have failed on an optimum treatment programme but are a high risk group. Assessment here needs to be done by a specialist
II. Insufficient social support network to remain abstinent from illicit drugs, and where it is not possible to work with the patient to facilitate a suitable and acceptable social support package
III. Lack of motivation to move away from drug using culture/area, within the confines of opportunity
IV. Current illegal drug use
V. Past history of cross dependency (substituting from one drug to harmful or problematic use of another, within the last 2-5 years
VI. Reluctance to agree to drug treatment and after-care or to sign a treatment agreement
VII. Active ongoing alcohol use in the presence of HCV, where there is clear evidence of medical advice to become abstinent.
3 Transplantation and Substitute Prescribing

The recommendations regarding this area are given in the context of limited research data. Small studies are favourable to consideration of transplantation whilst on a substitute prescription e.g. Methadone maintenance therapy (MMT).

Analgesia post transplantation will need careful consideration and may require an agreed plan between the anaesthetist, pain team and substance misuse specialist. Awareness of potential issues relating to patient controlled analgesia (PCAs) will also be required, and risk factors should be assessed and a local management plan effected accordingly. The potential for misuse should be balanced with the knowledge that opiate tolerant patients are likely to need higher doses than an opiate naive person.

3.1 Methadone

MMT is a safe, well evidenced treatment for patients unable to become opiate free. It is commonly a long term treatment. Patients on a stable MMT should be offered assessment for transplantation where medically indicated. Stability - individually measured as a continuum, not an absolute - indicates abstinence from other illicit drug use (predominantly other opiates, stimulants – including cocaine and crack cocaine). There should be treatment engagement with a drug treatment service and the patient should have an agreed care plan and a named key worker (though it should be acknowledged that it is now common practice to transfer stable patients to GP management. MMT patients should not be asked to reduce their methadone simply for the purpose of transplantation as this has the potential to destabilise them and provoke a relapse to other drug use.

Evidence suggests the likelihood of a prolonged ITU stay post transplant and the requirement for larger doses and longer treatment for post-operative analgesia.

3.2 Buprenorphine

The same requirements apply in the context of substitute prescribing as for MMT (as in 3.1). Due to its method of action as a partial opioid agonist-antagonist there will be issues around peri-operative analgesia. Where possible, conversion to methadone peri-transplant will assist with this issue. This should be undertaken in consultation with a substance misuse specialist.

3.3 Prescribed I/V Diamorphine or Physeptone

Where clinically possible, conversion to oral substitution therapy should be considered, in view of concerns including venous access and sepsis. This decision needs consideration and team discussion incorporating the patient and substance misuse specialist.

3.4 Benzodiazepines

Careful assessment should be made where there is past or current significant use of benzodiazepines – whether prescribed or illicit – and the context of this use. Replacement of opioids and alcohol with benzodiazepines can occur, and thus their use might mask a relative risk to relapse. It is worth noting that benzodiazepines are also associated with high risk behaviours and cognitive and memory impairment, and so their use may actively trigger relapse.

4 Drug Screening

Drug screening should be arranged where there is concern about concurrent illicit drug use. Where a patient is on MMT they should be undergoing drug screening as part of their programme with the substance misuse team, and consent to obtain drug test results from the substance misuse team should be given. A positive screen for illicit drugs (except cannabis) prior to transplant is a contraindication to listing. Post transplant a positive screen is a clear prompt for intervention and support. Whether drug testing is via mouth swab or urinalysis, and whether it is a supervised process or not will depend on the practice of individual units.
4.1 Drug Screening and Alcohol Agreements

These should be undertaken on the basis of past history or where there is perceived risk of alcohol being used to substitute for other drugs (commonly opioids). This approach to testing requires each unit to consider its approach to the process of screening questions for alcohol and drug use and referral to the substance misuse specialist. Blood alcohol levels can be taken during blood tests or randomly requested. A “drugs of abuse” screen can be undertaken with a urine sample via the toxicology laboratory. All patients assessed for transplant listing should give explicit consent to future drug and alcohol testing from this period onward, as considered appropriate by the unit.

5 Treatment Agreement

A treatment agreement is recommended as a useful process for a number of reasons. It can outline a statement of intent including treatment engagement, commitment to the programme and consent to share appropriate information with relevant agencies. Any potential consequences to non-concordance with the treatment agreement (e.g. non-attendance, refusal of or positive drug screens) should be made clear in the agreement. Past behaviour documented in a comprehensive assessment is a better guide to stability and engagement than the signing of a treatment agreement. Consent should be part of a treatment plan.

6 Post Transplant Follow-up

It is recommended that follow-up with the local drug/support services – where required - is explicit in the agreement and should also form part of the care plan at the substance misuse service. Follow-up within the transplant programme should also clearly monitor and document substance use – preferably with monitoring by a substance misuse specialist – and the transplant team should actively encourage referral to and engagement with substance misuse services in the event of a relapse.

8 Outcome Monitoring

In order to monitor the outcome of transplant listed patients with a significant illicit drug history, appropriate clinical data should be recorded. Consent for this to occur should be given at the same time as the drug and alcohol screening.
1. For patients where alcohol is the only cause of liver disease

SCOTTISH LIVER TRANSPLANTATION UNIT
Secretary  0131-242 1719
Fax No.    0131-242 1739

ALCOHOL AND YOUR LIVER

Name:  Date:

Address:

We believe you have developed liver failure because of damage caused by excessive drinking. As part of our assessment you will see a psychiatrist and a social worker, and you will require investigations to rule out damage caused to other organs by alcohol.

We do not know at this stage whether a liver transplant will be necessary or appropriate for you. Sometimes liver disease can improve considerably if the patient stops drinking completely - even when their disease is quite advanced. If you are one of these patients then a liver transplant may be unnecessary, but continuing to abstain from alcohol will be very important. In these circumstances we can arrange help for you by placing you in contact with one of your local alcohol counselling services, depending upon what is available and your wishes.

Equally, it is of enormous importance for your future health to stop drinking completely if you are placed on the waiting list for a liver transplant, both before and after transplantation. In these circumstances we believe you have a responsibility to cooperate as far as further drinking is concerned. We make the following requirements:-

1) You will be required to sign a formal undertaking not to drink alcohol again.

2) You must be prepared to cooperate with any alcohol rehabilitation programme that is recommended by medical staff. This will not apply to all patients, but it will be our decision rather than yours whether it will apply to you.

After Transplant:

3) Your subsequent medical follow-up will include occasional interviews with our alcohol nurse counsellor.

4) There will be occasional random testing for alcohol in your blood or urine.
2. For patients where alcohol and another process have contributed to the of liver damage

SCOTTISH LIVER TRANSPLANTATION UNIT
Secretary 0131-242 1719
Fax No. 0131-242 1739

ALCOHOL AND YOUR LIVER

Name: Date:

Address:

We believe you have developed liver failure which has been contributed to by excessive drinking. As part of our assessment you will see a psychiatrist and a social worker, and you will require investigations to rule out damage caused to other organs by alcohol.

We do not know at this stage whether a liver transplant will be necessary or appropriate for you. Sometimes liver disease can improve considerably if the patient stops drinking completely - even when their disease is quite advanced. If you are one of these patients then a liver transplant may be unnecessary, but continuing to abstain from alcohol will be very important. In these circumstances we can arrange help for you by placing you in contact with one of your local alcohol counselling services, depending upon what is available and your wishes.

Equally, it is of enormous importance for your future health to stop drinking completely if you are placed on the waiting list for a liver transplant, both before and after transplantation. In these circumstances we believe you have a responsibility to cooperate as far as further drinking is concerned. We make the following requirements:-

1) You will be required to sign a formal undertaking not to drink alcohol again.

2) You must be prepared to cooperate with any alcohol rehabilitation programme that is recommended by medical staff. This will not apply to all patients, but it will be our decision rather than yours whether it will apply to you.

After Transplant:-

3) Your subsequent medical follow-up will include occasional interviews with our alcohol nurse counsellor.

4) There will be occasional random testing for alcohol in your blood or urine.
ALCOHOL AND YOUR LIVER

Name: Date:

Address:

INFORMATION SHEET FOR THE CONTRACT

This letter introduces an important document which we want you to consider carefully. It is not a legally binding contract - rather it is a pledge, a promise, a solemn undertaking we want you to make which we hope will ensure you will not drink alcohol in future.

We regard it as essential that you never drink again because we know that the outlook is bad for you if you do. We would also remind you that a transplant is living tissue from a dead individual whose family have agreed to this donation, and we believe you have a responsibility to them. Finally, if patients with liver transplants return to drinking the public are put off donating organs, and we can transplant nobody without the consent of our donors’ families.

This document represents your side of the bargain we are striking - in return you will be listed for transplant and treated by our unit. We cannot give you a guarantee that you will have a liver transplant but we can assure you that it is very likely - and only the lack of a suitable donor or the development of a medical contraindication will prevent this. On the other hand if you are unwilling to agree to our conditions and sign this document it is unlikely we will take a chance with you.

We recognise this is a major commitment for you to make and you can take as much time as you need to make up your mind. We want you to take at least 24 hours and we want you to discuss this with close family members. You may also wish to discuss this with your family doctor or perhaps the hospital specialist who referred you to us. Of course we will be willing to answer any questions you may have.
CONTRACT

Name: ........................................... ..............................................
Date: ........................................... ..................

Address:

ALCOHOL AND YOUR LIVER

I solemnly agree to abide by the following requirements:

1) I will never drink alcohol again.

2) I am willing to cooperate with an alcohol rehabilitation programme if this is considered necessary by medical staff.

3) I agree to interviews with an alcohol nurse counsellor at the Royal Infirmary as part of my medical follow-up.

4) I understand and agree that there will be occasional random testing for alcohol in my blood or urine.

Signed: ........................................................................................

Name: ........................................................................................

Dated: .....................................................................................

Witnessed: ..................................................................................

Name: ........................................................................................
Appendix 6

Guidance for care of specific liver related disorders.

This guidance is taken from the Centre for Liver & Digestive Disorders: Clinical Care Guidelines for Junior Doctors, last updated 2007. The link below will take you to the booklet on the intranet.


1) HYponatraemia

- A low serum Na+ rarely indicates depletion of whole body Na+.
- Symptoms and signs relate to rate of onset rather than the degree of hyponatraemia.

What to do:-
1. Assess volume status of patient and check SERUM and URINARY OSMOLARITY and URINARY Na+.
2. Review previous biochem results to assess rate of fall in Na+. Check serum glucose (exclude ADDISON’S DISEASE), TFTs (exclude HYPOTHYROIDISM) and request CXR if no recent CXR (exclude SIADH).
3. Management depends on degree of hyponatraemia and rate of fall. If appropriate, fluid restrict (1.5L daily) patients and stop all diuretics when serum Na+ < 125 mmol/L.
4. Consider daily human albumin solution if Na <120mmol/L.

2) POOR URINE OUTPUT

- Hepatorenal syndrome is common in patients with chronic liver disease.
- More that one aetiology may be present at one time e.g. volume depletion (including bleeding, excess diuretics, poor oral intake), sepsis, drug toxicity.

What to do:-
1) Assess volume status of patient (clinically and by reviewing fluid balance charts for previous 24-48hours).
2) Examine patient for signs of sepsis or GI blood loss.
3) Check U&Es. If acidotic, also check ABGs.
4) If clinically hypovolaemic → STOP ANY DIURETICS → IV FLUID CHALLENGE
5) Consider prophylactic broad septrum antibiotics if underlying sepsis is a possibility.

If no improvement occurs then discuss with senior colleagues as CVP monitoring +/- inotropic support may be required.

3) SPONTANEOUS BACTERIAL PERITONITIS (SBP)

- Often asymptomatic
- Common cause of confusion/ encephalopathy/ ?sepsis
- Common in hospital in-patients

Defined as the presence in ascites of WBC >250/mm, usually predominantly polymorphs, in the absence of an obvious source of peritonitis (e.g. bowel perforation).
DIAGNOSIS: - diagnostic ascitic tap. Ascitic fluid should be sent for urgent gram stain, WCC count and MC+S (5mls universal container and set of blood culture bottles should be sent to micro). Bedside inoculation of ascitic fluid to blood culture bottles will increase bacterial yield. Presence of >1 type of organism should raise the possibility of bowel perforation.

TREATMENT: - IV Piperacillin/ Tazobactam 4.5g every 8 hours (reduce dose in renal impairment) and IV HAS. Modify antibiotics once bacteriology result is known.

Prophylaxis with Norfloxacin 400 g od is recommended for ALL PATIENTS with ascites.

4) HEPATORENAL SYNDROME (HRS)

- Patients with liver disease can develop renal impairment for numerous reasons e.g. pre-renal (excess diuretic use, sepsis, haemorrhage, inadequate volume replacement post paracentesis), nephrotoxic drugs (GN, ATN)
- NOT all renal impairment in patients with liver disease is due to HRS

Defined as “a clinical condition that occurs in patients with chronic liver disease, advanced hepatic failure and portal hypertension characterised by impaired renal function and marked abnormalities in the arterial circulation and activity of the endogenous vasoactive systems. In the kidney there is marked renal vasoconstriction that results in a low GFR. In the extra-renal circulation there is predominance of arterial vasodilatation...”

For the diagnosis of HRS to be made the following should be present:

**Major criteria**

1. Acute or chronic liver disease with advanced liver failure and portal hypertension
2. Creatinine greater than 1.5 mg/dl (130 µmol/L) or creatinine clearance < 40 ml/min
3. Absence of shock, bacterial infection, current or recent nephrotoxic drugs and exclusion of GI or renal fluid loss
4. No sustained improvement after diuretic withdrawal and plasma expansion with 1.5L saline
5. Proteinuria should be <500/dl with absence of ultrasound, renal obstruction or parenchymal disease

**Minor criteria**

Urine volume <500 ml/day, urine sodium <10mmol/day, urine osmolality > plasma osmolality, urine red cells <50 /hpf, serum sodium <130 mmol/L

**TYPES OF HRS**

**Type 1** = a rapid deterioration with doubling of serum creatinine to > 2.5 mg/dl (220 µmol/l) or a reduction in creatinine clearance of >50% within two weeks (survival is 2-3 weeks without renal replacement therapy or OLT).

**Type 2** = a more moderate or stable reduction in renal function

**TREATMENT OF HRS:**

1. Exclude causes of pre-renal failure
2. Ensure adequate filling especially with intravenous albumin (CVP monitoring often helpful): if no improvement in renal function-
3. Consider the use of vasoconstrictors, particularly terlipressin (glypressin) initially 1 mg bd increasing to 2 mg bd with or without intravenous albumin. However be aware of contraindications to terlipressin including IHD and PVD
4. If these fail consideration should be given to the use of TIPSS, renal replacement therapy (RRT), MARS and liver transplantation.

**Decisions about RRT should be made long before it is required clinically**

5) **ENCEPHALOPATHY**

- Clinical signs can vary greatly e.g. from mild confusion to deep coma
- Diagnosis is made on clinical grounds- EEG rarely required

What to do: -
1) INVESTIGATION AND MANAGEMENT AS FOR CONFUSED PATIENT (refer to earlier section).
2) Stop diuretics for 24-48 hours and look for obvious precipitants e.g. sepsis, UGI bleeding, dehydration, constipation, over sedation.
3) Phosphate enemas BD +/- oral lactulose
4) Consider broad spectrum antibiotics once cultures taken.
5) Early ITU referral if airway compromised.

If recurrent encephalopathy occurs in patients with TIPSS, consider shunt revision.