Doncaster and Bassetlaw Hospitals NHS
NHS Foundation Trust

Paracentesis for Malignant Ascites Procedure

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Date written/revised:	November 2012
Approved by:	Patient Safety Review Group
Date of approval:	Feb 1st 2013
Date issued:	11 February 2013
Next review date:	November 2015
Target audience:	Clinical Staff

Amendment Form

Please record brief details of the changes made alongside the next version number. If the procedural document has been reviewed **without change**, this information will still need to be recorded although the version number will remain the same.

Version	Date	Brief Summary of Changes	Author
Version 1	November 2012	This is a new procedural document, please read in full.	Dr Anne-marie Carey and Lesley Barnett

Contents

1. INTRODUCTION

1.1. **Ascites:** is an accumulation of fluid within the peritoneal cavity of the abdomen and can occur in association with many conditions such as cancer, cirrhosis of the liver, congestive cardiac failure, and protein depletion[1].

1.2. **Paracentesis:** is the procedure of removing ascitic fluid from the abdominal cavity. The commonest causes of malignant ascites are primary tumours of breast, colon, ovary, stomach, pancreas and bronchus. Paracentesis is a simple procedure, which can be performed as a day case (usually only removing 2-4 litres maximum), occasionally if clinically indicated in patients own home (small volume paracentesis) or as an inpatient. In tense ascites there may be up to 12 litres of ascites present. Removal of 4–6 litres is usually enough for to give symptomatic relief. Removal of more than 4-6 litres increases the risk of hypovolemia and adverse effects, but may give symptom relief for longer until the ascites re-accumulates.

1.3. **Symptoms**: of ascites can be distressing and include abdominal distension, abdominal pain, nausea, vomiting, early satiety, anorexia, lower body oedema and breathlessness.

1.4. **Benefits:** Paracentesis aims to improve the symptoms of ascites. It can improve symptoms in up to 90% of cases, with some benefit seen after just two hours of drainage, although it may take breathlessness 72 hours to improve.7 It is less likely to improve the associated symptoms of oedema, fatigue, poor mobility and malaise.

1.5. **Risks:** The removal of large volumes (> 6 litres), particularly in patients with renal or hepatic impairment, can cause a fluid shift with hypotension leading to symptoms of dizziness, fatigue and malaise (affects up to 3%). There is a risk of perforation of an abdominal viscus, haemorrhage (1-2%, a particular risk if the INR is raised or the platelets are low), infection and pulmonary embolus from a dislodged thrombus.

1.6. **Prognosis:** It should be remembered that with the exception of chemotherapy-sensitive carcinoma of the ovary, the prognosis in patients with ascites is usually poor (2-3 months). In those very near the end of life, there may be safer ways to control symptoms. Therefore, the guiding principle for management of malignant ascites should be aimed at relieving symptoms, should not add to the patients' burden and should be minimally invasive.

2. PURPOSE AND SCOPE

The guidelines aim, using the best evidence available, to base treatment on patient reported symptoms, reduce time for the procedure as an inpatient, and reduce unnecessary risk, tests and intravenous fluid treatment.

3. DUTIES AND RESPONSIBILITIES

3.1 The overall responsibility for the organisation lies with The Chief Executive of DBH NHS Foundation Trust. However, all nursing and medical staff are accountable for their own actions and omissions and must apply their knowledge and skills at all times in any given situation.

3.2 Registered nurses and doctors have a responsibility to keep their knowledge and skills up to date in order to maintain their required competencies. Report near-misses, clinical incidents and any serious incidents in relationship to a paracentesis procedure (as per NMC and GMC guidance).

3.3 The Managing Director of Doncaster Community Integrated service is responsible for ensuring that systems and processes are in place.

4. PROCEDURE - PARACENTESIS

For most patients, paracentesis is the treatment of choice and relieves symptoms in up to 90% patients. For some patients diuretics and other treatment modalities have a place in controlling rate of reaccumulation of ascites.

Paracentesis may not be appropriate if the prognosis is very short and the patient is rapidly deteriorating. If the prognosis is very short but patient has troublesome symptoms, a brief paracentesis of 1-2 litres can be considered to reduce discomfort.

Ideally the patient should be admitted as an inpatient for the first procedure. Uncomplicated follow up procedures may be arranged as a day case and in some situations, e.g. for symptom relief in terminal care, paracentesis can be carried out in the home setting.

4.1 Type of ascites:

Ascites is usually either a transudate (protein level less than 30 g/l in ascitic fluid) or an exudate (protein level greater than 30 g/l). Transudates are usually seen in those with liver failure, from cirrhosis or metastases (and resulting portal hypertension). A trial of diuretics may be appropriate if the renal function permits. Exudates are seen usually with intra-abdominal malignancy, and diuretics are unlikely to be helpful.

If there is uncertainty regarding the type of ascites and whether diuretics may help, a serum ascites albumin gradient (SAAG) can be taken. This is performed by sending a specimen of ascitic fluid to the biochemistry laboratory for measurement of protein and albumin levels. This albumin level is subtracted from the serum level and if the value is greater than 11 g/l, a trial of diuretics may be helpful post drainage to slow the rate of reaccumulations. [3]

4.2 Indications for procedure:

- Pain, discomfort or tightness due to stretching of the abdominal wall.

- Dyspnoea, usually exacerbated by exertion, due to upward pressure on the diaphragm.
- Nausea, vomiting and dyspepsia due to 'squashed stomach syndrome'.
- Patients are usually symptomatic only when the abdominal wall is tensely distended.

4.3 Contraindications to paracentesis

- Local or systemic infection
- Low white cell count / neutropenia
- Coagulopathy: platelets < 40×10^9 /L or INR > 1.4
- Limit paracentesis to 4-6 litres maximum if:
  - Hepatic or renal failure (creatinine >250mmol/L)
  - Albumin < 30g/L or sodium < 125mmol/L

4.4 Complications of paracentesis

- After a large volume paracentesis (usually > 6 litres), the compensatory large-fluid shifts from circulating volume into extracellular fluid can decompensate the patient's cardiovascular system leading to hypovolaemia, and in severe cases, collapse and renal failure. Low albumin or sodium level can exacerbate this effect.
- The paracentesis site may continue to leak ascitic fluid post procedure. This may rarely continue to leak over days to weeks requiring stoma bag to collect fluid. The patient needs to be warned about the possible leaking which may otherwise cause distress.
- Perforation of an abdominal viscus e.g. bowel perforation, is a risk especially if intestinal obstruction is present.
- Haemorrhage (a particular risk if the INR is raised or platelets are low).
- Infection is a rare complication providing an aseptic technique is used.

4.5 Investigations prior to procedure

4.5.1 Ultrasound scan (USS)

If there is clinical evidence of substantial ascites in the form of tense abdomen and fluid thrill it is usually safe to proceed to drainage without USS imaging. An ultrasound scan will confirm the presence of ascites, and may determine if the fluid is 'pocketed' 'loculated' by tumour, adhesions etc.

A scan should be performed if:

- Ascitic fluid is not easily clinically identified i.e. possible other causes of abdominal distension such as hepatomegaly, abdominal tumour etc
- Difficulty with previous drainage or suspected loculation of ascites
- There is a chance of bowel obstruction

If any diagnostic uncertainty or the patient has previously been noted to have loculated ascites, arrange ultrasound scan with marking of maximum collection of ascites

If there is ascites clinically, or it is radiologically confirmed but the abdomen is not tense and there is no fluid thrill consider deferring the procedure as benefit will be limited.

4.5.2 Blood tests

In order to proceed with a safe paracentesis, the following should be considered as a guide. In some cases if likely benefits outweigh the risks, paracentesis can be performed despite poor blood results. In these cases, the patient should be made aware of the increased risk as part of obtaining informed consent.

- A platelet count and clotting screen should be measured in at-risk patient. Stop routine anticoagulation (3 days for warfarin, 1 day for subcutaneous heparin) before the procedure. INR should be 1.4 or less and platelets greater than 40×10^9/L to safely proceed.
- A serum albumin and U&E should be taken if:
    - More than 4-6 litres is to be removed, and the patient has oedema, or
    - The patient is clinically dehydrated, or
    - The patient has reacted badly to previous paracentesis

Caution should be exercised in those with:	**Rationale**
INR greater than 1.4	Risk of haemorrhage. Consider the use of vitamin K to normalise the INR before proceeding
Platelets below 40	Risk of haemorrhage
Significant anaemia	May be worsened by haemorrhage, lower reserves for coping with procedure. May make correct attribution of symptoms more difficult.
Low sodium (less than 126)	Poor prognostic indicator. Paracentesis can cause further electrolyte disturbance
Abnormal potassium	Paracentesis can cause further electrolyte disturbance
Poor renal function	Lower reserves for dealing with fluid shift
Hepatic impairment	Lower reserves for dealing with fluid shift, may be associated with raised INR
Low protein and albumin (less than 20)	Likely to re-accumulate more quickly due to low oncotic pressure (production rate exceeds drainage rate), leading to significant intravascular depletion
Low white cell count / neutropenia	Risk of infection

4.6 Diuretics

Diuretics can be considered in those with a prognosis of several months as it takes 4-8 weeks to eliminate the excess fluid. Consider them where the serum ascites albumin gradient (SAAG) is >11g/L.[5] In these cases, the success rate of spironolactone is 60% at 300mg. The patients most likely to respond to diuretic

therapy are those with liver metastases and liver failure, from cirrhosis. They will have a serum-ascites albumen gradient of >11g/dL and this can be used as a guide to the likelihood of response to diuretics.

- Measure baseline urea and electrolytes
- Measure abdominal girth and weight prior to starting diuretics
- Start with spironolactone 100-200mg mane
- Increase dose by 100mg every 5-7 days to achieve a weight loss of 0.5-1kg/24hours
- Typical maintenance dose is 300mg mane
- Consider adding furosemide 40mg mane if desired weight loss not achieved after 2 weeks (max 160mg)
- Monitor U&Es carefully as electrolyte disturbance (particularly hyperkalaemia) and hypotension may occur.
- Stop diuretics if do not achieve satisfactory reduction in ascites, cause renal impairment or not tolerated.

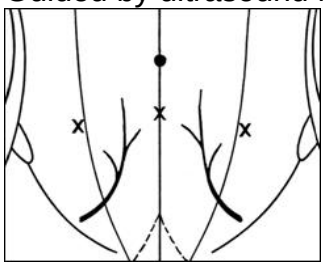
4.7 Other treatment modalities

Indwelling peritoneal catheter and peritoneo-venous shunts have been used in patients with a prognosis of >3 months. These can allow patients to manage their recurrent malignant ascites at home. Thus negating the need for regular hospital/hospice admissions for repeat large volume paracentesis.

Systemic and intraperitoneal chemotherapy has been used but, other than in chemosensitive ovarian carcinoma and lymphoma, no benefit has been shown.

Procedure

Action	Rationale
BEFORE THE PROCEDURE:	
Assess to confirm the presence of ascites	Exclude other conditions such as bowel obstruction and distension due to tumour
Blood tests *(*See section 5.5*)*	Ensure a safe procedure.
Stop anticoagulation (3 days for warfarin, 1 day for subcutaneous heparin)	Minimise the risk of haemorrhage
Consider ultrasound (See section 5.5)	If previous drainages have been difficult e.g. loculated fluid or there is doubt over the presence of fluid
If it is intended to drain to dryness, or large volume paracentesis (> 6 litres) stop diuretics (if used solely for ascites) 48h before procedure.	Minimise complications during procedure
PROCEDURE:	
Obtain valid witnessed informed consent	This should be clearly documented in the notes
Take the patient's pulse and blood pressure (See section 6.1)	To inform speed of drainage.
Prepare a trolley of equipment	
Ask the patient to empty their bladder	To minimise the risk of perforation

Ask the patient to lie supine in a comfortable position with the backrest slightly raised	To allow gravity to assist in the drainage
Confirm once again the presence of ascites. The usual site for paracentesis is the left side but can be in either iliac fossa at least 10cm from midline or supra-pubically (with empty bladder). The chosen site should: ▪ avoid scars, ▪ tumour masses, ▪ distended bowel or bladder, ▪ liver ▪ inferior epigastric artery that runs 5cm either side of the midline (see below), or be ▪ Guided by ultrasound marking ▪  Usual sites for paracentesis, avoiding the inferior epigastric arteries.	To minimise risk of complications such as perforation and haemorrhage
Action	**Rationale**
Open dressing pack on trolley with "no touch" technique Wash hands thoroughly, glove and prepare equipment Clean the area with sterile solution e.g. chlorhexidine 2%	To minimise the risk of infection
Use aseptic technique throughout	To minimise the risk of infection
Infiltrate up to 10ml of 2% lidocaine for injection into the area to be cannulated. Start subcutaneously and gradually infiltrate deeper until fluid is aspirated from the peritoneal cavity. Wait 3 minutes or until the patient reports numbness on testing with a needle prick.	For patient comfort and to aid cooperation with the procedure If fluid is **not** obtained **consider whether it is safe to proceed**. In obese patients, peritoneum may not be reached with1½ inch needle. **If there is any concern re safety of proceeding stop and review and/or obtain ultrasound to confirm presence and site of ascites.**
Insert large bore needle, cannula or Bonanno catheter into the peritoneal cavity. A scalpel is rarely required	At this point a sample can be taken for protein and albumin levels if required
Apply a drainable catheter bag	To collect and measure the ascitic fluid
Apply an adhesive dressing to the catheter if	To prevent it from becoming dislodged.

it is to remain in situ	Sutures are rarely required
Document the procedure, plan for drainage and required frequency of observation in the notes	
Take and record regular blood pressure and pulse measurements, and note the volumes drained. (See section 6.1)	This is normally required hourly, but may be more frequent in a high-risk patient. This allows monitoring of the fluid shift and guides decisions on the need for IV fluids.
If the patient becomes unwell, clamp the tube, take pulse, blood pressure and temperature and seek medical advice.	There is a risk of perforation, infection and hypovolaemia with this procedure
POST PROCEDURE:	
Remove the catheter once the specified volume has been drained, or the drainage has slowed to a minimum.	Uncontrolled drainage may lead to
Aim to remove the drain by 24 hours (max 72 hours)	To minimise the risk of infection
The patient should be asked to lie on the opposite side to the drainage site for removal	Lying on the opposite side minimises the risk of leakage from the site
Apply a sterile gauze and adhesive dressing to the area. If leakage is heavy, a stoma bag may be required (Sometimes patients need a stoma pack over the site for several days). Sutures are rarely required.	To maintain asepsis and protect the wound
Patients often feel 'washed out' and weak during and in the last few hours after the procedure. Usually rest and reassurance (and analgesia if there is discomfort) are sufficient. If there is greater cause for concern, check blood pressure, assess need for medical review, intravenous fluids and consider other complications of paracentesis if appropriate.	Exclude possible post procedural complications
The patient may well need prn medication for breakthrough abdominal ache or soreness at the drain site and prn medication should always be available. **Escalating pain, not controlled by prn medication, requires medical review.**	Patient comfort Exclude possible post procedural complications

4.8 Drainage rate and amount

Total amount drained will depend on the individual patient, their blood results, previous experiences with paracentesis, the apparent volume on clinical assessment of paracentesis and the location of the patient.

Most patients will tolerate the procedure well. If the patient is normotensive prior to procedure, it is safe and effective to drain up to 5 litres over the first 4 hours without intravenous fluid replacement.[6] The patients most vulnerable to symptomatic hypotension (hypovolaemia) are those with ascites arising secondary to portal hypertension. In patients with massive liver metastases, hepatocellular carcinoma +/- cirrhosis, or venous outflow obstruction the risk of hypovolaemia is higher. **Hence the importance of asking the patient to report symptoms of dizziness, and BP monitoring**. There is no evidence to support intravenous albumin replacement in malignant ascites.

Observations	**Rate**	**Fluids**
Systolic Blood Pressure greater than 100 prior to and throughout procedure Check BP and pulse hourly for the first four hours, then as required	Free drainage of up to 5L over the first 4 hours, then reduce rate and drain 1L per hour until drainage slows to a minimum or the required amount is drained	Not usually required
Systolic blood pressure less than100 prior to or during procedure Check BP and pulse hourly	Drain 1/2L per hour and limit total amount drained. Stop if BP falls significantly or symptoms of hypovolaemia develop (e.g. dizziness, increasing fatigue and malaise)	Consider fluid replacement with IV saline
Renal failure or dehydration		Consider fluid replacement with IV saline
Liver cirrhosis		Consider 20% albumin, 100ml for every 2L drained

5. TRAINING/SUPPORT

Nursing professionals will receive appropriate competency based training and direction on paracentesis procedure and management. The professional position outlined in the NMC Code of Professional Conduct, states clearly that:

> Paragraph 6.2
> *'To practice competently, you must possess the knowledge, skills and abilities required for lawful, safe and effective practice without direct supervision. You must acknowledge the limits of your professional competence and only undertake practice and accept responsibilities for those activities in which you are competent'.*

The General Medical Council Good (GMC): Good Medical Practice (GMP) sets out the core standards of behavior expected of doctors practicing in the UK. As per GMC Good Medical Practice: Duties of a doctor Medical professionals will provide a good standard of practice and care.

- Keep your professional knowledge and skills up to date
- Recognise and work within the limits of your competence

6. MONITORING COMPLIANCE WITH THE PROCEDURAL DOCUMENT

What is being Monitored	Who will carry out the Monitoring	How often	How Reviewed/ Report to
Education and Training	Specialist Palliative Care Consultant	Quarterly	Training sessions to be provided as required. Attendance record kept.
Numbers of procedures	Specialist Palliative Care Consultant/ Imaging Nursing Team	Quarterly	Audit of practice. Results to each CSU and action plan to be developed to address.
Complications associated with procedure	Specialist Palliative Care Consultant/ Imaging Nursing Team	Quarterly	Audit of practice. Results to each CSU and action plan to be developed to address.

7. DEFINITIONS

Ascites: is an accumulation of fluid within the peritoneal cavity of the abdomen and can occur in association with many conditions such as cancer, cirrhosis of the liver, congestive cardiac failure, and protein depletion[1].

Paracentesis: is the procedure of removing ascitic fluid from the abdominal cavity. The commonest causes of malignant ascites are primary tumours of breast, colon, ovary, stomach, pancreas and bronchus. Paracentesis is a simple procedure, which can be performed as a day case (usually only removing 2-4 litres maximum), occasionally if clinically indicated in patients own home (small volume paracentesis) or as an inpatient. In tense ascites there may be up to 12 litres of ascites present. Removal of 4–6 litres is usually enough for to give symptomatic relief. Removal of more than 4-6 litres increases the risk of hypovolemia and adverse effects, but may give symptom relief for longer until the ascites re-accumulates.

8. EQUALITY IMPACT ASSESSMENT

An Equality Impact Assessment (EIA) has been conducted on this procedural document in line with the principles of the Equality Analysis Policy (CORP/EMP 27) and the Fair Treatment For All Policy (CORP/EMP 4).

The purpose of the EIA is to minimise and if possible remove any disproportionate impact on employees on the grounds of race, sex, disability, age, sexual orientation or religious belief. No detriment was identified.

A copy of the EIA is available on request from the HR Department.

9. ASSOCIATED TRUST PROCEDURAL DOCUMENTS

- Hand Hygiene Policy - PAT/IC 5
- Safe use and Disposal of Sharps Policy - PAT/IC 8
- Collection and Handling of Pathology Specimens - PAT/IC 11
- Spillages of Blood and Other Body Fluids Policy - PAT/IC 18
- Standard Precautions Policy - PAT /IC 19
- Aseptic Non-Touch Technique Policy - PAT/T 32
- Privacy and Dignity Policy - PAT/PA 28
- Policy for Consent to Examination or Treatment - PAT/PA 2
- Mental Capacity Act 2005 Policy and Guidance - PAT/PA 19
- Policy for the Transfer of Patients and their Records - PAT/PA 24

10. REFERENCES & ACKNOWLEDGEMENT

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7. McNamara P. Paracentesis--an effective method of symptom control in the palliative care setting? Palliative Medicine. 2000: **14**(1):62-4. (OS)
8. National Institute for Clinical Excellence The PleurX peritoneal catheter drainage system for vacuum-assisted drainage of treatment-resistant, recurrent malignant ascites March 2012

Acknowledgement:

Policy and procedure for paracentesis. The Rowans Hospice, 2011 Accessed through www.palliativedrugs.com

Guidelines for the Management of Malignant Ascites, St Peters Hospice, Bristol 2008 Accessed through www.palliativedrugs.com

Guidelines for the Management of Malignant Ascites, St Francis Hospice, Romford, 2003 Accessed through www.palliativedrugs.com

Guidelines for the Management of Malignant Ascites, St Joseph's Mercy Hospice, 2005 Accessed through www.palliativedrugs.com

APPENDIX 1

EQUIPMENT REQUIRED FOR PARACENTESIS

Needles (orange × 1, green needle × 2)	
Syringes (two 10ml)	
Local anaesthetic (10ml of Lignocaine 1% or 2%)	
Sterile cleaning solution e.g. Chlorhexidine 0.05% aqueous solution (Unisept) / Povidone iodine	
Large bore venflon (16G or 18G) or *Bonanno* catheter pack (To discuss with Doctor)	
Sterile dressing pack	
Sterile gloves	
Large sterile drainable catheter bag with stand	
Sterile gauze	
Adhesive dressing e.g. mepore, hypafix	
Inco pad	
Paracentesis kit	
Plastic apron	
Sharps bin	

APPENDIX 2

PleurX Drains

For some patients with large volume recurrent ascites a PleurX drain may be considered

Please contact the DSA staff for advice DRI x4712

Possible advantages of using Pleurx to manage recurrent malignant ascites:

- Avoids the need for repeat needle drainage procedures (paracentesis).
- Less visits to hospital and reduced hospital length of stay.
- Home management
- Prevents large build-up of fluid as you can drain smaller quantities, more often. This may give better symptom control
- Pleurx is usually well tolerated and has few complications.

The NICE guidance[8] suggested that the lives of patients suffering from treatment-resistant ascites can be improved by the PleurX system, as the drainage of fluids can be carried out by patients at home. PleurX frees patients from the limitations of gravity drainage procedures which can take longer periods of time and restricts patient's movement.