

TREATMENT OF CELLULITIS IN THE COMMUNITY

Guidebook

A guide for assessment and management

We wish to acknowledge that this document was developed from a protocol based on that of the Thames Hospital Emergency Department and Family Health Team and the Dunedin Hospital Pharmacy Department.

Guidelines for ED Assessment of Cellulitis to determine suitability for Outpatient Management

Contraindications to Outpatient Treatment

Admission to an inpatient specialty for admission is required in the presence of:

1. Systemic Toxicity
 - Fever >38.5C
 - Systemic signs or complications of severe infection HR > 100/hypotension/renal failure
 - Altered mental status
2. Co-morbid Conditions
 - Poorly controlled Diabetes
 - Peripheral ulcers, unless chronic and well managed
 - Immunosuppression
 - Chronic Renal Failure, Cr >250, CrCl <30ml/min
 - Pregnancy
 - Prosthesis
3. Drug Related Issues
 - Allergy to Cefazolin or other cephalosporin type antibiotic
 - Patients unable to take Probenecid (consider drug interactions, if evidence of acute gout, or patient is tested for performance enhancing drugs)
 - On steroids or immunosuppressants
4. Wound condition issues
 - Large, fluctuant abscesses
 - Signs of foreign body, gas producing organism, osteomyelitis
 - Discharging abscess that will require formal debridement
 - Facial or orbital involvement
 - Possibility of necrotising infection
 - Severe pain
 - Joint involvement
 - Underlying fracture
5. Social circumstances
 - Significant disability with lack of appropriate support at home
 - Significant reduction to activities of daily living
 - Lives alone
 - Under 16 years old
 - Living outside District Nurse or Rural Nurse Specialist area

Consider services available through Community Service Co-ordination

- Meals on Wheels
- Home help etc.

All other patients can be considered for outpatient management

(For further information about cefazolin and probenecid, see Appendix at the end of this document)

Assessment and Treatment Guidelines for Cellulitis

- Patient presents to Emergency Department
- Patient accepted for outpatient management

Emergency Department Nurse

- Complete nursing assessment, including vital signs
- Arrange bloods for creatinine and blood glucose if recent results are not already available
- Bacterial swab of cellulitis/wound if requested by ED doctor
- Insert IV cannula and flush
- Cover with Tubigrip for comfort
- Recheck Allergy Status
- Administer oral dose of Probenecid 1g as charted
- Administer first dose IV Cefazolin as charted (diluted with a *minimum* of 20ml diluent and over 10 minutes). Patient to stay in department for 20 minutes after dose.
- Administer analgesia prn
- Provide appropriate wound care / dressings / splints / crutches prn
- Complete nursing documentation; District Nurse referral; ensure patient has given phone number, either landline or cellphone number and **rapid number** if Rural Delivery (RD)
- Fax referral to District Nurse (see Emergency Nurse sing of sheet for phone numbers)
- Ensure doctor has completed documentation and discharge letter
- Review discharge information with patient
- Give pack and documentation to patient

Emergency Department Doctor

- Complete patient assessment, including any wounds or drainage of abscesses
- Outline demarcation line with indelible marker
- Chart Cefazolin and Probenecid as per protocol i.e. on a daily basis
- Chart analgesia required in ED prn
- Prescribe oral Flucloxacillin on outpatient prescription form
- Prescribe analgesia on outpatient prescription form
- Complete documentation and discharge letter
- Ensure pack number, patient details, doctor details and date are recorded in log book

District Nurse

- Daily visits at appropriate times to keep to 24 hour drug administration. Check daily dose of oral Probenecid is taken
- Wound assessments and care
- Daily temperature recordings
- Refer patient to GP if they move off pathway, as per protocol
- Administer medication as charted for 2 further days, (refer back to A&E if not responding to treatment)
- After 3rd dose remove IV cannula
- Advise patient to commence oral antibiotics as per prescription on day 4.
- Check demarcation line

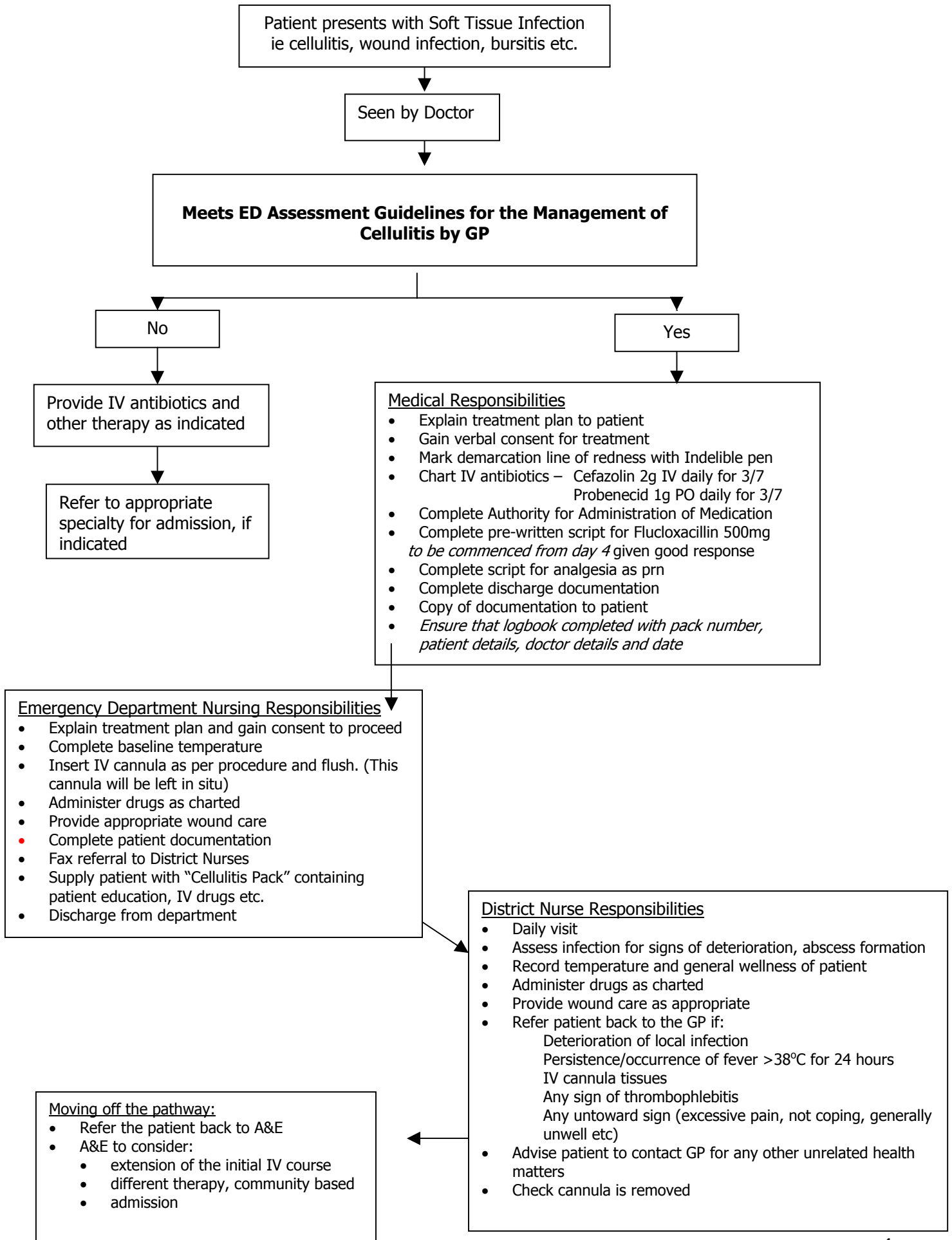
Cellulitis Packs

ALL patients discharged for ongoing outpatient treatment of soft tissue infection will be provided with a pack containing the following:

- Cefazolin 1g vial x 6 (One dose (2g) will be administered in ED from the pack)
- Pre-dispensed pack of oral Probenecid 500mg tablets x 6 (one dose (1g) will be administered in ED from the pack)
- Adrenaline 1:1000 ampoule x 1
- Prewritten prescription for Flucloxacillin signed by ED doctor
- Patient Discharge Information

For every cellulitis pack used, the pack number, patient details, doctor details and date must be recorded in the log book.

Management for Soft Tissue Infection with IV Antibiotics



AUTHORITY FOR ADMINISTRATION OF MEDICATION

Patient sticker

Date:

ADMINISTRATION RECORD

Drug	Dose	Route	Frequency	Doctor's Signature	ED Signature/Date	Day 1 Signature/Date	Day 2 Signature/Date
Cefazolin	2g	IV	ONCE DAILY for 3 days				
NaCl 0.9%	10ml	IV	For flush (PRN)				
Probenecid	1g	PO	ONCE DAILY for 3 days				
Adrenaline 1:1000	0.5ml	IM	ONLY if required for anaphylaxis				

Other Instructions: District Nurses to check patient has self administered oral Probenecid

Authority to be faxed to District nurses and original sent home with patient in kit.

First administration in the community at _____ (time). **Greymouth District Nursing** hours 8am-6.30pm Mon-Fri. 8am-4.30pm Sat, Sun & public holidays. **All other area District Nurses** Monday to Sunday 8am-4.30pm

Doctor's Name Printed	Specimen Signature	Date
Nurse's Name Printed	Specimen Signature	Date

Patient sticker

Date:

EMERGENCY DOCTOR

Code	Please sign each box or record not applicable (N/A)	Signature (N/A)
	WOUND	
W1	Complete patient assessment including any wounds or drainage of abscesses	
W2	Outline demarcation line with indelible marker	
	MEDICATION	
M1	Complete authority for administration of medication	
M2	Chart analgesia prn	
M3	Prescribe oral Flucloxacillin 500mg x 2 capsules QID for 7 days on pre-written prescription form	
M4	Prescribe analgesia on outpatient prescription form	
	DOCUMENTATION	
D1	Complete documentation and discharge letter. Patient to take copy of discharge letter with them for GP if needed to be seen before GP receives copy of ED letter	

Ensure pack number, patient details, doctor details and dates are recorded in log book

VARIATIONS

Day	Code	Variation

Patient sticker

Date:

EMERGENCY NURSE

Code	Please sign each box or record not applicable (N/A)	Signature (N/A)
	WOUND	
W1	Bacterial swab of cellulitis/wound if required by ED doctor	
W2	Provide appropriate wound care / dressings / splints / crutches prn	
	IV	
IV1	Insert IV cannula size 20g or less with extension set and flush (consider location of cannula)	
IV2	Cover with Tubigrip for comfort	
IV3	Education of patient on care of cannula	
	MEDICATION	
M1	Recheck Allergy Status	
M2	Administer first dose IV Cefazolin as charted (diluted with a minimum of 20ml diluent and over 10 minutes)	
M3	Administer oral dose of Probenecid 1g as charted	
M4	Administer analgesia prn	
M5	Provide patient with "Outpatient Cellulitis Pack" including original Authority to Administer meds	
M6	Ensure patient has copy of ED Discharge Summary and photocopy of ED nursing notes	
M7	Educate patient regarding anaphylaxis and dialling 111	
	DOCUMENTATION	
D1	Complete nursing assessment, including vital signs	
D2	Complete nursing documentation and District Nurse referral form (ensure patient has given phone number, either landline or cellphone number and rapid number if Rural Delivery (RD)).	
D3	Fax authority form to District Nurses - Greymouth 03 768 2793 Hokitika 03 755 5058 Reefton 03 732 7098 Buller 03 789 7678	
D4	Discuss discharge information with patient	
D5	Record patient's GP phone number in discharge hand out	

VARIATIONS

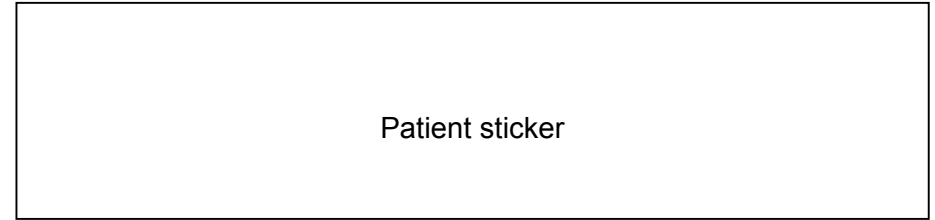
Day	Code	Variation	Initial

Patient sticker

Date: _____

DISTRICT NURSING - DAILY ASSESSMENT OF THE PATIENT			
CODE	Please sign each box or record not applicable (N/A)	DAY 1	DAY 2
	<u>IV CANNULA SITE</u>		
IV1	Dressing is secure		
IV2	Patent cannula, i.e not tissued		
IV3	No sign of phlebitis		
	<u>MEDICATION</u>		
M1	Cefazolin given		
M2	Probenecid taken		
M3	Script for oral antibiotic filled		
	<u>WOUND</u>		
W1	Swelling not increased > than 10%		
W2	Redness not extended significantly over demarcation line		
W3	No increase in exudate		
	<u>PAIN</u>		
P1	No increase in pain		
P2	No reduction in function since previous assessment		
P3	Pain relief effective		
	<u>PATIENT'S GENERAL CONDITION</u>		
C1	Temperature < 38°C		
C2	No increase in unwellness/ systemic illness.		
C3	No new signs and symptoms of infection		
C4	No adverse reaction to antibiotic noted		
<u>VARIATIONS</u>			
Day	Code	Variation	Initial

GUIDELINES FOR DISTRICT NURSE VISIT



Daily visit for two days

Take to home: Needles, syringe, diluent, etc for administration of IV antibiotic
 Dressings as required
 Thermometer.

Complete District Nursing Daily assessment (page 8)

******If anaphylactic reaction to IV antibiotics- administer adrenaline as per Authority for Administration, then dial 111 immediately******

Refer to A&E if:

- IV cannula tissues
- An increase in local infection->10% of demarcation line
- Fever >38 degrees
- Any signs of thrombophlebitis
- Increasing pain or loss of function of the affected area

For any other unrelated health matters please contact the patient's GP or After Hours Primary Service Provider

DISCHARGE CHECKLIST

<i>To be completed by District Nurse</i>	Initial	Date
Two doses of IV antibiotics given		
Decrease in redness and swelling		
Temperature < 37.5		
IV cannula removed		
District Nurse discharge form to GP completed		
Discharge form given to patient		
Script filled for oral antibiotics		
All cellulitis pathway notes to be returned to patients main notes		

Appendix

Cellulitis

Cellulitis is a deep infection of the skin that extends to the subcutis. It begins as a painful, tender, erythematous, warm area that spreads rapidly and produces indistinct borders. Fever, chills, rigors, and sweats are frequent. The infection most often begins at the site of antecedent trauma, which may be minor or major. It may also occur as a result of infection associated with closure of non-sterile wounds and at the site of sutures. Cellulitis frequently extends via the lymphatic system and can produce lymphangitis, lymphadenopathy, abscesses, and bacteremia.

Prior to the age of antibiotics, lymphatic spread of cellulitis was a surgical emergency mandating immediate amputation to prevent septicemia and death.^{1, 5.}

Etiologic agents include *S. aureus*, *S. pyogenes*, Group A beta-hemolytic streptococci, and *Haemophilus influenzae* (primarily in children). Group B *Streptococcus* species is seen in newborns. With the advent of *H. influenzae* vaccine, *H. influenzae* has become an uncommon etiology for this type of infection.

Diagnostic yield of cultures, aspirates, and blood cultures in most cases is low.^{2.} Cultures from aspirates of the leading edge of the cellulitis may be useful for diagnosis.^{3, 4.} In the typical patient, cellulitis should be presumed to be of staphylococcal or streptococcal origin. For severely ill and immunocompromised patients, cultures should be obtained, despite the poor yield, to identify unusual causative organisms. Cellulitis can extend to deeper underlying tissues and has been associated with osteomyelitis and septic arthritis. Septicemia can complicate the picture with metastatic arthritis, meningitis, and seeding of cardiac valves.

1. Ahrenholz DH. Necrotizing soft-tissue infections. *Surg Clin North Am* 1988;68:199-214.

2. Aly AA, Roberts NM, Seipo KS, MacLellan DG. Case survey of management of cellulitis in a tertiary teaching hospital. *Med J Aust* 1996;165:553-556.

3. Fleishcer G, Ludwig S, Campos J. Cellulitis, bacterial etiology, clinical features and laboratory findings. *J Pediatr* 1980;97:591-593.

4. Carson SC, Prose NS, Berg D. Infectious disorders of the skin. *Clin Plast Surg* 1993;20:67-76.

5. Davison AJ, Rotsein OD. The diagnosis and management of common soft tissue infections. *Can J Surg* 1998;31:333-336.

Distinguishing anaphylaxis from a faint (vasovagal reaction)

Reference: MOH Immunisation Handbook 2006

	FAINT	ANAPHYLAXIS
ONSET	Usually at the time or soon after the injection	Usually a delay of 5-30 minutes after injection
SKIN	Pale, sweaty, cold and clammy	Red, raised and itchy rash; swollen eyes and face; generalised rash
RESPIRATORY	Normal to deep breaths	Noisy breathing from airways Obstruction (wheeze or stridor); Respiratory arrest
CARDIOVASCULAR	Bradycardia; transient hypotension	Tachycardia; hypotension; Dysrhythmias; circulatory arrest
GASTROINTESTINAL	Nausea/vomiting	Abdominal cramps
NEUROLOGICAL	Transient loss of consciousness; good response once prone	Loss of consciousness; little response once prone

Cefazolin Sodium

Administration

Reconstitute the vials of Cefazolin, draw up and dilute in a minimum of 20ml of Sterile Water for Injection. Inject solution slowly over a period of 10 minutes.

Adverse Effects

The following reactions have been reported:

Hypersensitivity

Medicine fever, skin rash, vulvar pruritus, eosinophilia, and anaphylaxis have occurred.

Blood

Neutropenia, leucopenia, thrombocythaemia and positive direct and indirect Coombs' tests have occurred.

Renal

Transient rise in BUN levels has been observed without clinical evidence of renal impairment. Interstitial nephritis and other renal disorders have been reported rarely. Most patients experiencing these effects have been seriously ill and were receiving multiple medicine therapies. The role of Cefazolin Sodium for Injection in the development of nephropathies has not been determined.

Hepatic

Transient rise in AST, ALT, and alkaline phosphatase levels has been observed rarely. As with some penicillins and some other cephalosporins, transient hepatitis and cholestatic jaundice have been reported rarely.

Gastrointestinal

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely. Anorexia, diarrhoea and oral candidiasis (oral thrush) have been reported.

Other

Pain on intramuscular injection, sometimes with induration, has occurred infrequently. Phlebitis at the site of injection has been noted. Other reactions have included genital and anal pruritus, genital moniliasis, and vaginitis.

Probenecid

Probenecid prolongs the plasma half life of penicillin and cephalosporins by inhibiting the renal clearance. It may not be effective in patients with CrCl < 30-50ml/min

Adverse Effects

Common: Rash; nausea; vomiting

Infrequent: Headache; dizziness; flushing; sore gums; urinary frequency

Rare: Blood dyscrasias; hepatic necrosis; allergic skin reactions; anaphylaxis; nephrotic syndrome

NB: Probenecid is a banned substance by most sporting organisations, therefore do not give to patients who may be tested for performance enhancing drugs

PATIENT INFORMATION

CELLULITIS

You have a simple soft tissue infection that can be treated as an outpatient. This means that you do not need to stay in hospital but can be treated by the District Nurse over the next 2 days in your home. **During this time you will need to rest and elevate the area involved to allow healing to take place.**

If you have not had contact from the District Nurse by noon please contact them on the numbers listed below according to your location.

The District Nurse will visit you for the next two days to:

- Administer the antibiotic through the Intravenous cannula, and check the site
- Check that the Probenecid tablets are taken
- Look at your wound/infection to check that the treatment is working and that the condition is improving
- Dress your wound as necessary
- Ensure that you are comfortable and managing at home.

For any health matters please contact your GP

THE DRUG TREATMENT

In order to help your body fight the infection, you will need to have 3 doses of an antibiotic (Cefazolin) given directly into your vein in your hand or arm. This way of giving the antibiotic ensures that the infection is treated directly and more quickly. The antibiotic is put through a cannula, which we insert into your vein while you are in the Emergency Department. This cannula will then stay in place until you have received all your doses of the antibiotic.

At the same time that you are having medication through the cannula you will need to take the Probenecid tablets daily. These tablets help the action of the antibiotic by helping it to stay in your system for up to 24 hours so it can fight the infection.

You will need to get your script for oral antibiotics filled at your pharmacy, so that you can start taking them as soon as your intravenous antibiotics have been completed (After 3 doses). Please **take your antibiotics as directed.**

Some patients experience nausea and stomach pain. This is common and will pass, discuss this with your District Nurse or your GP if you have any concerns.

In the unlikely event that you experience serious side effects, such as tongue swelling, shortness of breath, extensive rash, call an ambulance/dial 111 for immediate assistance.

PAIN RELIEF

The doctor in the Emergency Department will have discussed appropriate pain relief with you and may have given you a prescription. This prescription can be filled at any chemist/pharmacy and the medication taken as directed.

Rest and elevation of the area involved will not only help relieve the pain, but also help with the healing process and so is very important. So please rest as much as possible with the affected part elevated ie resting on a pillow, in a sling, etc.

WOUND CARE

If you have a wound, please keep it clean and covered with a dressing. The District Nurses will assess your wound or the area affected by cellulitis every day during the course of your treatment to ensure that it is improving. They will also redress it and be able to advise you on any care that you need.

IV (INTRAVENOUS) CANNULA CARE

Please keep the IV site clean and dry.

The District Nurses will assess your IV site every day before they administer the antibiotic. If anything is not as it should be, they may ask you to return to A&E to have it checked and the cannula replaced if need be.

If the IV line is not functioning you will be required to return to A&E

GENERAL

- **Rest and allow yourself to recover**
- **Drink plenty of water**
- **Please contact the District Nurse if you will not be at home at the arranged time.**

CALL AN AMBULANCE (DIAL 111) IF YOU EXPERIENCE:

- **SHORTNESS OF BREATH**
- **TONGUE SWELLING**
- **EXTENSIVE RASH**

Please inform the District Nurse if you experience any of the following:

- General feelings of being unwell
- Difficulties coping
- Pain at your IV cannula site

If you are worried at any time because you feel unwell or you are getting worse please contact your district nurse (you may have to leave a message on the answer phone, see below for numbers)

OR

your GP

Please state that you are on the treatment of cellulitis in the community programme,

Please contact your GP (Phone _____) for any other unrelated health matters

District Nurse contact details:

Greymouth District Nursing	(8am to 6.30pm Mon-Fri and 8am to 4.30pm Sat, Sun & public holidays)	Ph: 03 768 2721
Reefton District Nursing	7 days 8am to 4.30pm	Ph: 03 732 8413
Hokitika District Nursing	7 days 8am to 4.30pm	Ph: 03 755 8044
Buller District Nursing	7 days 8am to 4.30pm	Ph: 03 788 9030