National Wound Care Guide

An introduction to recognising and assessing common wounds and injecting injuries in people who inject drugs

SDF
Scottish Drugs Forum

Preface

This resource aims to help people working within harm reduction and injection equipment provision (IEP) services, and anyone who works with people who inject drugs, to assess injection sites and identify potential complications arising from injecting street drugs.

The guide discusses different types of injuries and wounds, signs and symptoms of infection, prevention and simple treatments. It also describes problems with the lower limb which can occur as a result of injecting.

This guide has drawn on ‘An introductory guide to assessing and understanding common wounds with people who inject drugs’ (2020) with kind permission from the authors Alec Dunn and Tim Gauthier.

"We must work together to find practical and simple solutions to make woundcare more accessible in Scotland for people who use drugs"

- Sophie Given

Introduction

Many people who inject drugs experience a range of associated problems from simple pain at the point of injection to serious life-threatening conditions such as botulism or anthrax infection. Injecting-related wounds among people who inject drugs are very common.

Early identification of potential complications is important. Being able to give advice and information on simple wound first aid is essential as complications and medical interventions can be reduced and significantly impact on lower morbidity and mortality.

It is important to provide clear and accurate information to people who inject, so that they can understand common conditions and possible warning signs of more serious issues.

Stigma has a profound impact on the lives of people who inject drugs. It is associated with risky injecting behaviours, including sharing syringes and other injecting supplies. Stigma can lead to people not seeking timely treatment for wounds or even life-threatening infections. It is crucial that staff support, and encourage, discussion about injecting behaviours and prevent delay in people getting appropriate medical advice and support.

Wounds may be an indicator of injecting technique and can help identify the person-centred harm reduction advice needed. The provision of sterile equipment and information may also help to reduce wounds and infection. Some people will self-diagnose, treat and even share medications such as antibiotics and heparin. Education should include information regarding safer injecting, skin hygiene, early intervention for skin breakdown, the rotation of injection sites and venepuncture techniques.

This guide addresses the most common issues associated with injecting injury. It is written to help anyone who works with people who inject drugs to become more confident in the identification, assessment and simple treatment of injecting injuries and wounds. A glossary of terms is included.

It is important that workers practice within their own skill set. However, injecting harms may be seen by anyone, and all workers should be aware of the appropriate local services to which people with injecting injuries causing serious or ongoing concerns can be directed.

Contents

1 Wound Healing and Assessment

Wound Healing

Workers who want to practice effective wound first aid or care should understand the wound healing process. Understanding normal wound healing allows delayed wound healing and deterioration to be quickly identified and managed.

This includes knowledge of the stages of wound healing: inflammation, destruction, proliferation (granulation), and maturation. Each of these stages is necessary for wound healing. Disruption or stagnation in one stage may prevent subsequent progression to other stages and often relates to chronic inflammation or bacterial presence and may prevent healing.

Wounds not effectively treated in the early stages may develop a greater amount and type of bacteria (microbial burden), which prolongs the inflammatory process and hinders the formation of granulation tissue. This, in turn, leaves the wound open for a prolonged period and increases the risk of bacteria and other microbes penetrating deeper into the tissue. Wounds that are colonised by bacteria can produce a biofilm that reduces, or even eliminates, the efficacy of topical treatments.

With chronic non-healing wounds, debridement (whether by mechanical or autolytic means) may be necessary to remove the wound's biofilm / bacterial burden.

Signs of increased bacterial burden in ongoing, non-healing wounds include prolonged inflammation, increasing pain, development of pus (purulent) drainage, foul odour, or an increase in the size of the wound. In this situation referral to a trained professional is important and topical antimicrobials, like iodine or silver, and possibly debridement, may be necessary for wound healing.

Ideally, people with chronic wounds (present 4 weeks or more) would be referred to a local wound or tissue viability service.

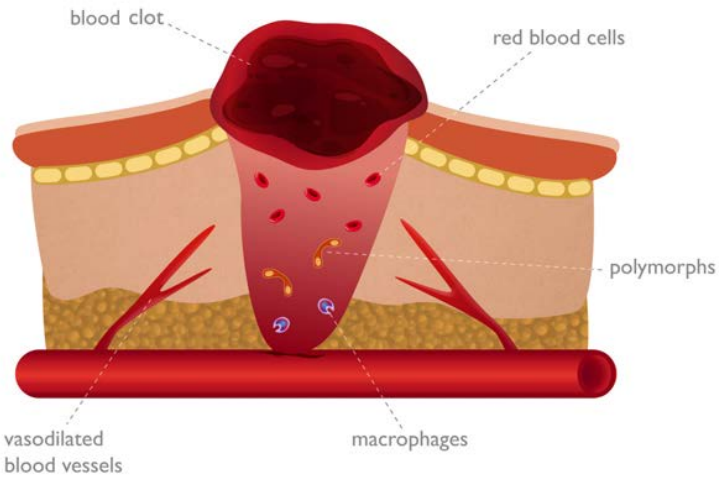
The stages of wound healing are described next, these stages may overlap or co-exist in a wound at any one time. Healing times will vary depending on the type of wound and the individual's own health.

Top tips:

Some of these medical terms can be confusing - find a full glossary of terms at the back of the guide

Stages of Wound Healing

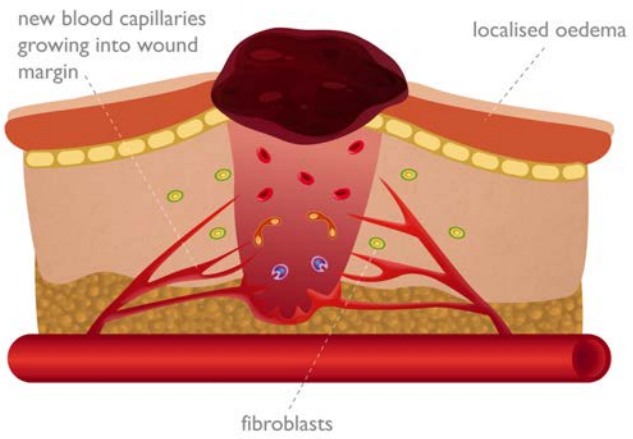
1. Inflammation



This stage stops bleeding and preserves surrounding tissue by mobilising the initial immune response and phagocytosis (the digestion of foreign materials). Platelets and clotting factors stop wounds bleeding by causing a clot to form. Capillaries dilate causing an increase in blood flow which brings blood and white cells to the area. Phagocytic white cells and macrophages move in, then a fibrin matrix forms.

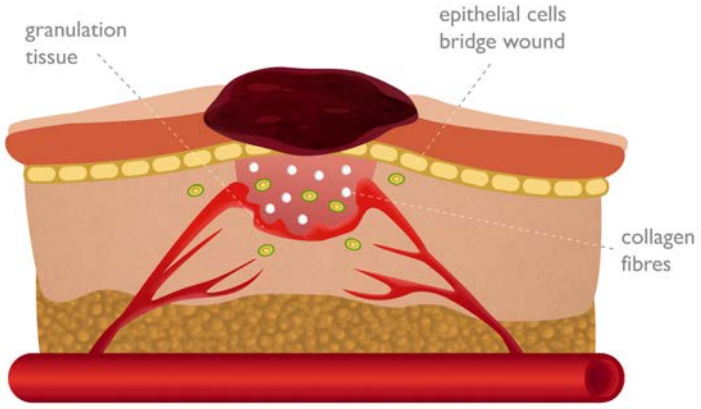
2. Destruction

The fibrin matrix degrades, and blood vessels become more permeable in order to allow protective fluids into the injured area. White cells line the blood vessels to destroy any invading bacteria. Macrophages stimulate the formation of fibroblasts which stimulate angiogenesis (the formation of new blood vessels - capillaries).



Stages of Wound Healing

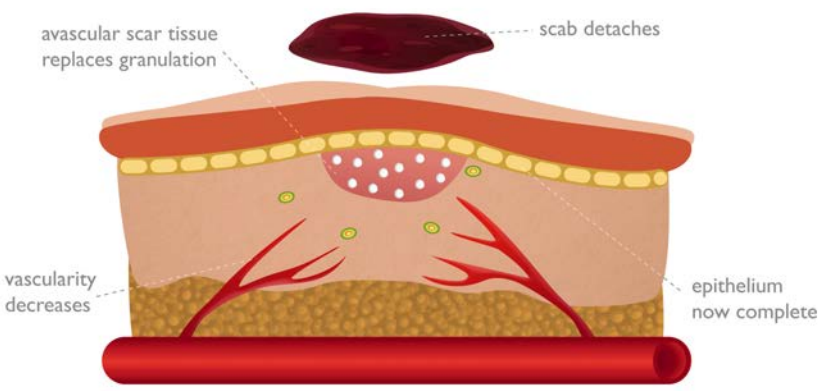
3. Proliferation



Proliferation occurs with the formation of granulation tissue, or the extracellular matrix. This is a fragile, highly vascularised tissue that is composed of collagens, proteins, and elastin. Capillaries begin regrowing and remodelling and fibroblasts multiply forming scaffolds of collagen fibres which support the capillaries.

4. Epithelialisation and maturation

Epithelial cells from the wound edge and hair follicles migrate in. Vascularity decreases and collagen fibres contract. Red granulation tissue changes to avascular scar tissue. There is a reduction in wound size and strengthening of scar tissue.



Wound Assessment

Where possible, wound identification and assessment should be part of any assessment with someone who uses drugs, and in particular, as part of the transaction to provide injecting equipment. All wounds should be initially assessed and then reassessed when renewing any dressings, or if there are reports that the wound has changed in any way.

Assessing the person is important (before looking at the wound) as this can help identify any systemic illness. Initially the worker should ask about the history of the wound, how it started, whether the person is currently injecting or when they last injected. Some people may have expectations that would be useful to identify such as if they are expecting antibiotics or analgesics. For example, someone presenting with a groin sinus may not be wishing a wound to heal as they are currently injecting into the site and have limited other venous access, but may be concerned about a lump or discharge. This early discussion may also help identify areas in which injecting practices can be improved as part of a harm reduction approach.

Check for signs of systemic infection such as feeling unwell (malaise), muscle pain (myalgia), fever, shivering, and headache.

Consider urgent referrals if any of these signs are present. This referral can be to a GP or where necessary, by calling 111 or 999.

Things to Ask:

- Colour of base of wound – red / yellow / green / black?
- What percentage is each colour of tissue?
- Appearance of surrounding skin – colour and condition - dry / flaky / excoriated?
- Size – circumference and depth?
- Is there an unpleasant odour?
- Discharge (exudate) – colour / amount?
- Heat on and around injecting site?
- Any clinical signs of infection? heat; swelling (oedema); spreading redness; pain or tenderness; malodour; pus or discharge?
- Presence of spreading redness, tightness, swelling / oedema, pain local to the wound (cellulitis)?
- Is there a loss of function to the hand or foot if the wound is on a limb?
- Is there a loss of sensation, pins and needles, cramp, or loss of movement or power in the leg which may indicate an arterial problem or reduced blood flow (ischaemia)?

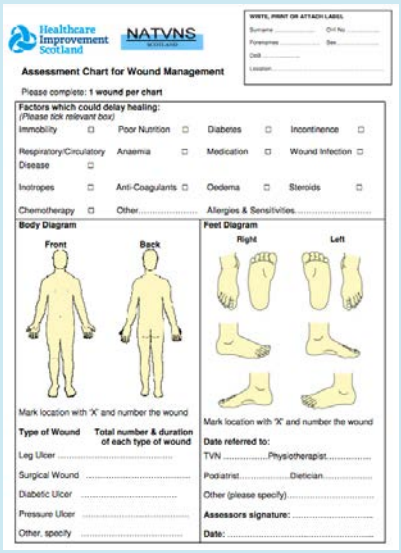
Useful Resources for Wound Assessment

Scottish Wound Assessment and Action Guide (SWAAG) Quick Reference Guide (Figure 1):

www.healthcareimprovementscotland.org/our_work/patient_safety/tissue_viability_resources/quick_reference_swaag_guide.aspx

Scottish Wound Assessment and Action Guide (SWAAG)

www.healthcareimprovementscotland.org/programmes/patient_safety/tissue_viability_resources/wound_assessment_action_guide.aspx



General Wound Assessment Chart (Figure 2):

www.healthcareimprovementscotland.org/our_work/patient_safety/tissue_viability_resources/general_wound_assessment_chart.aspx

The first two pages can be used to aid in assessment and to keep a record of whether a wound is improving or deteriorating. The full resource can be found at the end of the guide (Appendix A).

These resources (Fig 1 & 2) should be used by staff specifically trained in wound care.

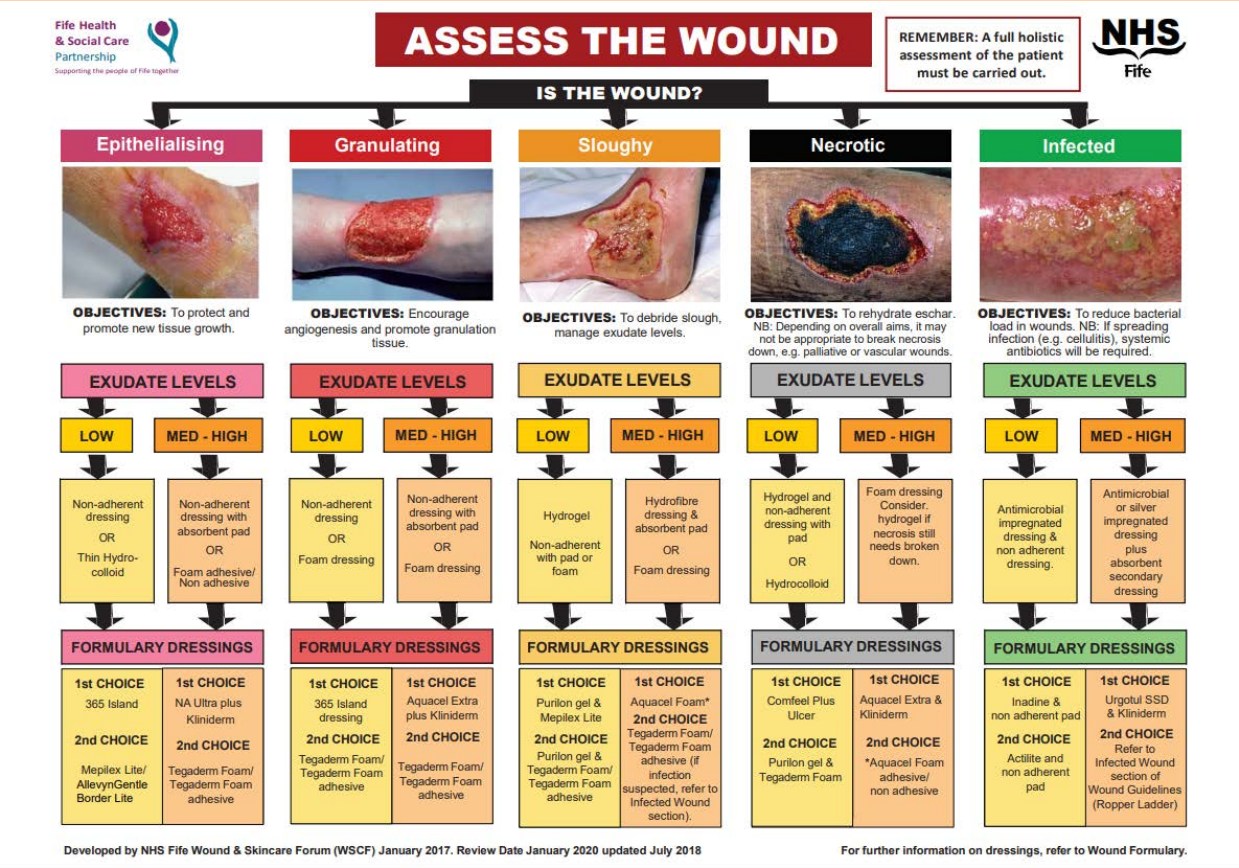
General Assessment Questions:

- How long have you had the wound(s)?
- What have you injected?
- When did you inject?
- Was there anything different about the injection– did you get the drugs from the usual source?
- Have you been injecting in and around the wound(s)?
- How do you usually manage the wound(s)?
- What problems has the wound(s) been giving you?
- Are there any issues at home, work, or with your health that may delay the healing of the wounds?
- Do you have any allergies or sensitivities to dressings or creams /ointments?

Useful Resources for Wound Treatment

Local areas usually have their own wound management formulary and guidance for choosing wound treatment products that should be referred to.

Figure 3 provides details and examples of different types of wounds and suggested wound products.



NHS Fife Wound Assessment and Treatment Planner (Figure 3):
www.fifeadtc.scot.nhs.uk/formulary/woundcare-formulary.aspx

When to Refer?

Referrals

Consider the best referral route for the person and for their local area. This may be a local GP, Practice Nurse, Specialist Wound Care or Tissue Viability Service, or for urgent situations or emergencies, call for an ambulance and / or escort or direct to hospital as appropriate.

Urgent referrals

Make urgent referrals if any of the following are observed:

- Pulsating lumps (pseudoaneurysm).
- Large abscesses that are spreading; painful abscesses or infection over a joint.
- Systemic infection (malaise, fever, chills, myalgia (muscle pain), tachycardia (racing heartbeat).
- Systemic infection symptoms and sepsis should be considered with a heart rate over 100, systolic blood pressure under 90, limited urine output, with or without a fever.
- Exposed bone.
- Sudden or acute swelling of legs, hands, feet. Obvious abnormalities (does it feel wrong/ scary?).
- Patients who appear acutely ill or for whom any delay of care could have dire consequences to their life.

Specialist referrals

- Infected wounds with a need for antibiotic treatment
- Wounds associated with chronic conditions
- Wounds in need of incision and drainage or debridement
- Non-healing large wounds and ulcers
- Leg ulceration

2 Common Injecting Injuries

Missed Hits

Missed Hit vs. Abscess
A missed hit is a local site of inflammation that occurs when someone “misses” the vein when attempting to intravenously inject, and the injection ends up in the subcutaneous tissues (below the skin). A missed hit may present with similar properties to an abscess (red, slightly painful, swollen) but will often end up as a simple lump. Uncomplicated missed hits will, in most cases, begin as red inflamed areas but the redness will fade within 12 hours. Abscesses will typically take longer to develop and become red, hot and painful.

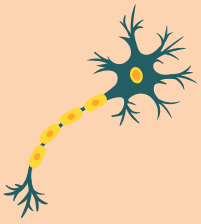
Missed Hits vs. Pseudoaneurysm
Pseudoaneurysm (or false aneurysm) typically forms when someone has injected in an artery in error (usually the femoral) causing a weakened blood-filled bulge or lump between the artery wall layers. This will pulsate and is a risk for a life threatening bleed (haemorrhage) and needs urgent surgical attention.

Signs and Symptoms
Missed hits most commonly occur in subcutaneous tissue, but they can also involve nerves and arteries. They tend to be hard and sometimes unsightly lumps near or overlying veins where injections have entered the tissues and become enclosed in a hardened capsule. They can be long lasting and unsightly. Prolonged redness (erythema), pain, heat, and swelling are all signs of complications and may indicate an abscess is forming.

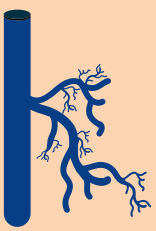
Some drugs such as cocaine are numbing to the tissues (cocaine is a powerful anaesthetic), this can cause misses to be more likely.

Associated Complications:

Injecting into an **artery**, aside from being quite painful, causes the substances to travel directly to the distal tissues, where an inflammatory and histamine cascade can be provoked. Arterial injections can cause thromboembolism, pseudoaneurysm, haemorrhage, or compartment syndrome, with a high degree of risk when major arteries are accessed by mistake (e.g. femoral or carotid arteries). The limb may turn white or flush bright red. It is recommended that anyone showing signs and symptoms of an arterial injection seek urgent medical care.



Nerve injections are often described as sharp, electric or burning. Pain often radiates up and down (proximal and distal) to the injection site. Complications from nerve involvement can lead to loss of sensation and function as well as long lasting (chronic) pain.



Venous ruptures are not true misses as most of the drug is contained within the vein, but the leaked drugs/ contaminants may still cause pain, inflammation, or infection.

Risk Factors

- Technique: Blunt, barbed or damaged needle and selecting the wrong needle type for the vein chosen for injecting (too long, too large a gauge).
- A rushed injection, poor lighting, injecting in a public space (fear of police, security, public), tremor/shakes, poor eyesight, misidentifying a vein, insertion angle too steep or too low, speed of insertion too fast or too slow (veins typically roll when the injection is slow), flushing.
- Vein (venous) rupture: injecting into small/ fragile veins (hands/ feet), tourniquet too tight, injecting too quickly or before loosening tourniquet.
- Dehydration.
- Stimulants such as cocaine (powder and freebase/crack) and methamphetamines, cause the blood vessels to constrict (vaso-constrictive), irritate body tissues, provoke inflammation, and delay healing.
- Heroin and crack cocaine require the use of an acidifier to free the drug from the base to which it is bound for it to be injected. Citric acid or Vitamin C is commonly used but often too much is used. Other acids often used in street injections, such as vinegar (acetic acid), can be corrosive to the blood vessels, inflammatory, and irritating to the tissues. Lemon juice carries the risk of fungal infections.

Figure 4. Missed Hit

Treatment

Monitor closely for complications especially infection e.g. redness, heat, pain, swelling and superficial cellulitis, and complications: pulsing lumps (pseudoaneurysm), lymphangitis, bacteraemia, nerve compression, pain, disability, and systemic infections.

It is important to provide education about safer injecting practices: tourniquets, vein care, differences between arteries and veins, location of injecting site and good skin hygiene. Where possible, encourage individuals to use safer spaces for injecting. When someone has an appointment or is visiting a service allow access to a sink to wash hands and injection sites.

Top tips:

1- A simple massage of the lump in the direction of travel of the vein may breakdown the hard capsule.

2- Ask how much acid is being used to prepare drugs and in what order. It is best practice to add the acidifier last and use as little as possible.

Groin Sinuses

Definition
Groin sinuses may form when the femoral vein is repeatedly punctured, creating an open track directly to the vein. The femoral vein is the largest vein in the leg. The sinus is a tube usually lined with skin (epithelial tissue) from the surface skin to the femoral vein. The sinus allows easy access to inject.

Signs and Symptoms
The sinus may start as a series of puncture marks on the surface of the skin overlying the vein and eventually a track or sinus forms. Over time, the femoral vein becomes scarred and a palpable lump forms. This lump signifies that the vein is becoming blocked.

Figure 5. Groin Sinus

Risk Factors
Repeated injection in the same site causes scarring and blockage (occlusion). This causes the venous blood flow to slow and become sluggish. This slow flow makes a blood clot (or thrombosis) more likely to form. The femoral vein may block completely and the venous blood return has to travel in smaller surrounding veins – these may become twisted and lumpy (varicose) and become much more visible on the surface of the surrounding skin. These surface veins are unsuitable to inject into as they tend to be stretched and leaky (permeable) and prone to rapid collapse.

Treatment
It is important to identify if the sinus is still being used to inject into. Injecting in the groin is likely to cause skin and venous changes distal to the injection site, further down the leg. Groin infections are serious and any signs of redness, heat, pain or abnormal or pulsating swelling requires urgent hospital assessment.

Phlebitis, Track Marks and Vein Scarring

Figure 6. Phlebitis.
Photo by Alec Dunn 2015

Figure 7. Track marks.
Photo by Alec Dunn 2015

Figure 8. Track marks and scarring.

Definitions

Phlebitis is an acute, temporary, inflammation of a vein resulting from injury or infection. Sometimes phlebitis is caused by, or causes, a clot (or thrombus) at the site of infection, in which case the term thrombophlebitis is used.

Track marks are small scabs and scarring (possibly with localised inflammation) along veins or areas of current injection.

Scarring of veins may occur with repeated use of certain veins for injection.

Signs and Symptoms

Phlebitis is characterised by raised and hardened (often described as “ropey”) veins. Phlebitis will be painful and tender and may also be red. Signs and symptoms of suppurative phlebitis are the same as phlebitis as described above, plus redness (erythema) to surrounding tissue and a high fever. Always look for signs and symptoms of sepsis (increased respiratory rate, pale/mottled skin, fever, a racing heart, low urine output and low blood pressure in later stages).

Phlebitis near the groin may cause progression of a clot and possibly lead to pulmonary embolism.

Track marks will be a series of scabs or scars along frequently used veins for injection.

Scarring is characterised by raised and hardened veins, which may also be ropey and roll easily. Scarred veins without inflammation (non- phlebitic) will not be tender.

Prevention

- Accurate venepuncture and access to appropriate equipment.
- New needles for each injection to prevent vein damage and to reduce risk of infection.
- Use of alcohol swabs prior to injection, but not after (alcohol damages healthy tissue, provokes inflammation/scarring and delays coagulation and wound closure).
- Adequate compression of injection site post-injection to stop bleeding (haemostasis) and help wound closure.
- Rotating injection sites, especially avoiding injection sites distal to previous damage.

Treatment Information

Moderate to severe phlebitis should be referred to a health care professional. If the person has signs of systemic infection or a clot/ thrombus, they should be referred to hospital.

Avoid injecting into veins that show signs and symptoms of phlebitis, as this will provoke an inflammatory response, delay healing, increase the risk of infection, and the risk of clot formation. It is also recommended that injection sites immediately distal to the site of phlebitis be avoided for injection.

Conservative management of simple phlebitis includes rest, elevation, and non-steroidal anti-inflammatory drugs (e.g. aspirin or ibuprofen). Most of the time phlebitis is self-limiting, but it is important to monitor phlebitis carefully as it may lead to more serious complications (suppurative phlebitis, thrombophlebitis, lymphangitis) and may co-occur with other serious complications such as deep vein thrombosis (DVT) or cellulitis.

Scarring and track marks may be lessened by topical treatments such as simple moisturiser like aqueous cream. Scarred veins have a much higher risk of infection and should not be used for injection.

Skin and Muscle Popping

Definition

Skin and muscle popping refer to two different injecting practices. Skin popping is the injection of drugs into subcutaneous tissue, and muscle popping is the injection of drugs into muscle. Due to the unsterile nature of street drugs, skin and muscle popping is generally damaging to body tissues. This is especially true for stimulants, which also cause vasoconstriction, that in turn prevents absorption, prolongs inflammation and delays wound healing.

People may choose these injection practices for a variety of reasons; most commonly due to having collapsed, scarred, or difficult- to-find veins. Muscle popping is the more dangerous of the two techniques as the injection may linger in the muscle, potentially causing cell and tissue death (necrosis).

Signs and Symptoms

Skin and muscle popping can lead to lumps (granulomas) and abscesses. Older wounds related to skin and muscle popping look like small circular white or purple scars overlying injecting sites. Those who inject into muscles are much more likely to experience serious skin and soft tissue infection and blood-poisoning such as bacteraemia and sepsis.

Figure 9. Skin and muscle popping

Treatment

Treatment is aimed at minimising infection risk and harm reduction. Skin popping results in small wounds and scars which can be covered with simple dressings if wet.

Muscle popping is more serious and can cause deep infection, people who inject into muscle should be observed carefully for signs of systemic infection and sepsis.

Complications

Infections are the primary danger of muscle popping and particularly deep infections that may not present themselves until they are well developed. These can be difficult to identify and treat. Any deep abscesses, cellulitis, and muscle pain will most likely require investigation and antibiotic therapy and may also require surgical debridement, depending on severity. Suspected deep infections should be referred to hospital urgently.

Puffy Hands

Definition
A ‘puffy hand’ is a chronic, non-painful hand swelling. It is a complication of injecting into the small veins of the hand but can also affect the feet. Fluid lies in the interstitial spaces, causing swelling and skin puffiness.

The exact cause is unknown but repeated injections into the extremities may lead to the breakdown of the lymphatic system in that area, causing lymphatic fluid to back up and lead to the puffy appearance. The destruction of the lymphatic networks in the hands and feet is exacerbated by missed hits, but infection and inflammation may also contribute to this process. The use of quinine in cutting drugs may also contribute to puffy hands. Other research has shown a correlation between staphylococcal infections and puffy hands. Puffy hands tend to be more common in women than men.

Signs and Symptoms
Chronic, non-painful swelling of the extremities.

Figure 10. Normal hand and puffy hand

Prevention

- Avoid injecting into hands or feet
- Safer injecting techniques and skin hygiene
- Accurate vein identification
- Use a tourniquet
- Hit the vein correctly

Treatment information

- Remove any tight rings or jewellery on hand / wrist
- Hand exercises – making a fist, and touching each finger to the thumb, and elevation
- Long term, compression therapy gloves or sleeves may help
- Puffy hands may continue to remain swollen even with abstinence from injection drug use

Osteomyelitis

Definition

Osteomyelitis (OM) is an infection of the bone. It is difficult to diagnose based on overt signs and symptoms, and usually an X-ray is required. Osteomyelitis should be suspected for any wound where bone or tendon is exposed or where it is possible to probe directly to the bone during wound care. Deep wounds that are slow to heal and that recur frequently in the same site should raise some suspicion. Acute or persistent pain and tenderness along a bony prominence or within and around a joint in the context of an infectious process should also warrant a high degree of suspicion.

Osteomyelitis of the peripheral bones, the spine, and the hip are common sites for infection among people who inject drugs. It is important to regularly assess vital signs for anyone with a diagnosis or suspicion of OM as there is an increased potential for these infections to become systemic.

Several comorbidities carry a high association with OM, particularly diabetes, chronic immunosuppression, and peripheral vascular disease.

Signs and Symptoms

- Fever and chills
- Malaise and weakness
- Bone pains
- Loss of function of the affected extremity
- Localised swelling, deformity, or pain

Treatment

Osteomyelitis will be diagnosed by imaging, biopsy, and lab investigations. Treatment will usually require long- term antibiotics and possible surgical intervention. People who have experienced osteomyelitis in the past are more at risk for developing future infections at the same site.

3 Peripheral Vascular Disease

Peripheral Vascular Disease

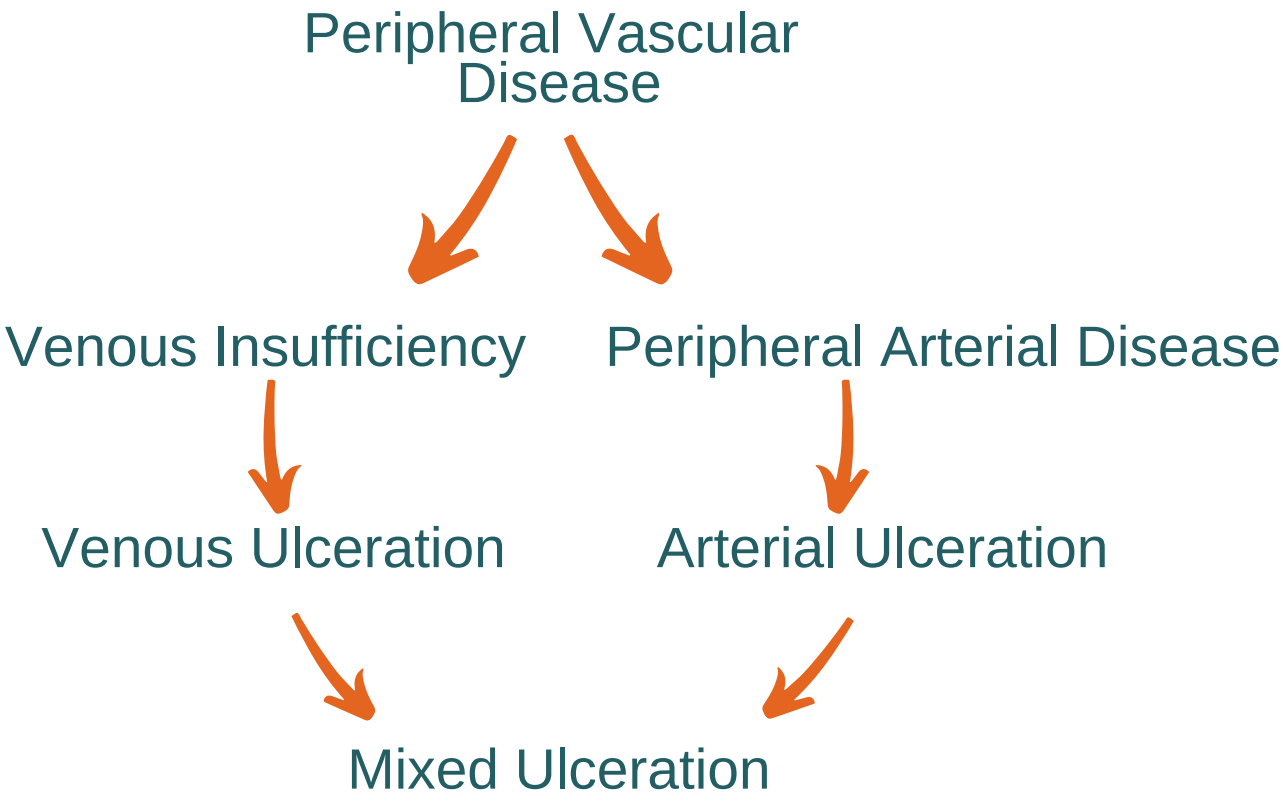
Definition

Peripheral vascular disease (PVD) is a term that is generally applied to poor blood circulation in the legs. There are two main categories of PVD: **venous insufficiency** and **peripheral arterial disease**. Understanding the difference between these two conditions is crucial when assessing the different types of wounds on the legs and possible treatment plans.

Both venous insufficiency and peripheral arterial disease can lead to chronic wounds that do not easily heal because of impaired circulation, increased pressure within the tissues and prolonged inflammation. It is possible to have mixed arterial and venous insufficiencies, so a detailed lower leg assessment is vital when making a diagnosis.

The damage to veins and vein valves, and arteries from misses, caused particularly by injecting drugs in the groin or legs, may exacerbate pre-existing problems for people with poor circulation. Poor circulation may prevent wounds from healing, and chronic wounds may develop.

The most common type of chronic wound in people who inject drugs for many years is venous leg ulceration. Ulceration may appear many years after injecting has ceased.



Venous Insufficiency and Venous Ulceration

Venous Insufficiency

Definition

Venous insufficiency describes the poor return of blood from the extremities (toes, foot and ankle) and usually applies to the legs. Venous insufficiency may be made worse by damage to vein valves and vein walls secondary to injection (if injection occurs in the lower legs), and from femoral vein narrowing and obstruction from groin injecting. When venous return is compromised in the lower legs, blood pools in the big veins in the lower legs (venous hypertension) and begins to leak out into the tissues of the legs.

Eventually, if the area becomes overwhelmed with the amount of fluid, the tissue will open and lead to ulceration.

Signs and Symptoms

- Dull ache in legs
- Thread veins
- Varicose veins
- Skin staining (brown pigmentation)
- Eczema (venous dermatitis)
- Inverted champagne bottle shaped leg
- Itchy skin
- Ankle and leg swelling (oedema)
- Ulceration usually shallow with ill-defined edges and often positioned around the gaiter area

Venous Ulceration

Definition

Venous leg ulcers are the most common type of chronic wound in people who inject drugs. They are end-stage venous disease and usually occur after the appearance of other venous signs. These ulcers occur when poor venous return leads to venous hypertension, pooling, engorgement, and venous leakage or rupture.

Figure 11. Leg ulcer with slough

Signs and Symptoms

Signs of venous disease include:

- Thread veins
- Ankle flare - visible veins on the inner (medial) ankle
- Varicose veins
- Inverted champagne bottle shaped leg
- Brown skin staining
- Ulceration

Venous leg ulcers can be shallow and irregularly shaped, may be of any size and can be quite large. The wound appearance varies depending on inflammation, microbial burden, necrosis, and trauma. The surrounding skin may be dark (staining is present in most limbs chronically affected by venous insufficiency) and the leg may be swollen and oedematous.

Healthier wound bases are red and granulated but chronic ulcers may have:

- Dead tissue that is yellow / grey loose and stringy material (slough)
- Dry and necrotic black tissue (eschar)

Dead tissue significantly increases the risk of infection and needs to be removed by a specialist in the safest way possible.

If signs and symptoms of infection are present, antimicrobial therapy (topical, systemic, or both) may be required.

Figure 14 provides an overview of the signs of vein damage from leg and groin injecting which include venous ulceration.

Figure 12. Venous leg ulcer with skin staining

Figure 13. Venous leg ulcer with necrosis and spreading cellulitis

Risk Factors

- Deep vein thrombosis (DVT) or previous clots in the leg
- Injecting ‘below the belt’ in the groin and / or the legs
- Standing for a long periods of time
- Fracture of the leg bones
- Family history
- Reduced mobility

Prevention

People with any type of peripheral vascular disease should avoid injecting into the legs or groin. For people who inject into their legs, it is important to communicate the benefits of rotating sites, changing needles between injections and using the smallest gauge possible. People who have injected in the femoral vein are more likely to develop DVT and this is also a risk factor for ulceration.

Treatment

Venous leg ulcers tend to be chronic (present four weeks or more), take a long time to heal, and can recur. Compression therapy is the gold standard of care for venous ulceration, and promotes wound healing by improving venous return.

Compression therapy should only be used by healthcare professionals trained in its application. It may be used when the person has clear signs of venous disease and poor venous return, and when a vascular assessment using Doppler ultrasound (ABPI) has been undertaken to rule out arterial insufficiency. Compression may be applied as bandages, wraps, or as compression hosiery and is the single most effective treatment.

Compression bandaging is usually used for larger or more wet ulcers. Compression hosiery (socks or stockings) may be worn over the top of dressed ulcers if the ulcers are smaller or less exuding. Compression leg ulcer hosiery kits also deliver high pressure and can be used to promote healing. This type of therapy in most instances will require referral to a Practice Nurse or GP. Some areas in Scotland have a dedicated wound care service for people who inject drugs. Check locally as they may be able to help.

Care for venous ulcers may include washing in warm water along with a topical dressing appropriate to the level of exudate. This may be a simple non-adherent dressing under bandaging, or an adhesive dressing such as a hydrocolloid under compression hosiery. Leg exercises such as walking can help improve circulation through mechanical support of the lower venous system, primarily through the calf-muscle pump.

Once the venous ulcer has healed, compression therapy is required long term to prevent recurrence.

Figure 14. Signs of Venous disease - photo courtesy of NHS Lothian

Peripheral Arterial Disease

Definition

Peripheral arterial disease describes the reduced blood flow to the extremities such as the toes because of narrowed arteries (and may be caused by high blood pressure (hypertension) and hardened arteries (atherosclerosis) or surgery. It is important to consider drugs that may further constrict the blood vessels e.g. stimulants like cocaine, methamphetamine and nicotine all possess vasoconstrictive properties that may exacerbate arterial wounds or delay wound healing. People who inject in the groin or the legs may also have caused damage to arteries, or developed infections which may require surgery, subsequently affecting the arterial circulation to the legs.

Peripheral arterial disease may have no symptoms in 50% of people, so any compression therapies should only be initiated after a full vascular assessment, including Doppler. Diagnosis of peripheral arterial disease includes the ankle-brachial pressure index (ABPI) - a comparison of pressures between arm (brachial) and foot (pedal) arteries and in some cases vascular studies such as Duplex scans.

Urgent vascular referral should be made if ABPI is less than 0.6.

Signs and Symptoms

- Pain with walking and activity (intermittent claudication) relieved at rest
- Absence of hair on legs – shiny, hairless, skin
- Pain when legs are raised
- Numbness
- Cold extremities
- Thread-like or absent pulse
- Ulceration over bony prominences, such as feet or ankle bones
- Ulcers are often small, round, deep and punched out in appearance

Figure 15. Arterial leg ulcer

Arterial Ulceration

Definition

Arterial ulcers are caused by poor circulation in the extremities due to arterial flow impairment such as narrowing or obstruction. Poor circulation (ischaemia) leads to inadequate oxygen and nutrient delivery to the area and will lead to chronic non-healing wounds. Though they are most common in the lower extremities, they may also occur on other parts of the body. Arterial ulcers may also be referred to as ischaemic wounds.

Risk factors

- High blood pressure (hypertension)
- Cardiovascular disease
- Peripheral vascular disease
- Trauma & surgery on arteries
- Smoking / Nicotine use
- Cocaine / methamphetamine use
- Injecting into the arteries
- Diabetes
- Arteritis
- High cholesterol
- Family history

Signs and Symptoms

Arterial ulcers will typically be round, pale, and punched out in appearance. They may be quite deep. The surrounding skin may be black (necrotic) or gangrenous. They can be wet or dry, and there may be no surrounding inflammation.

Signs and symptoms that indicate arterial disease may include pain with walking (claudication) or at rest or on elevation, shiny tight looking skin, little to no hair on the legs, and signs of compromised circulation (e.g. cool to touch, poor capillary refill, weak pulses). Pain may be dulled due to nerve disease (neuropathy).

Peripheral Arterial Disease and Arterial Ulceration

Prevention
A referral to a health care professional for vascular assessment should be recommended prior to beginning treatment as long-term peripheral vascular disease can lead to gangrene, amputation, and death.

Treatment
Lifestyle changes can help increase circulation in the legs, including:

- Stopping smoking
- Exercise
- A healthy diet
- Treating high blood pressure

There are surgical and medical options for treating PVD as well.

Meticulous foot care should be encouraged. Healing will only occur with improvement of circulation to the extremities, so prevention and education is a key strategy.

Complications
People with PVD are at high risk of non-healing ulceration leading to serious infections in their lower extremities. Infections can easily lead to gangrenous or black (necrotic) tissue, amputations, catastrophic infections, and death because of the poor blood supply.

4 Infections

Abscesses

Definition

An abscess is an encapsulation of pus that builds up within tissue, caused by a localised reaction against pathogens. Although abscesses can occur anywhere within the body, they represent one of the most common skin and soft-tissue infections among people who inject street drugs. Abscesses are the body's defence against infectious substances and pathogens. By 'walling off' the area and flooding it with white blood cells, the body is attempting to contain the infection.

The act of injecting drugs places people at greater risk of acquiring an abscess by pushing the body's surface bacteria (skin normal flora) into deeper tissue. Abscesses in injectors often contain oropharyngeal bacteria (bacteria from the mouth and throat).

Abscesses may also result from missed hits when the injection goes into the tissues rather than the vein. Harm reduction strategies are essential to reduce the risk of developing an abscess. Hand hygiene, clean equipment and cleaning the skin with alcohol prior to injecting can help reduce the incidence of abscesses.

Signs and Symptoms

Abscesses begin as closed wounds (Figure 18). When they occur near the skin's surface, they will be raised, red, swollen, and usually pus-filled and may

Figure 16. Abscess with spreading cellulitis

be tender or painful. Skin may be noticeably warmer around the site due to increased blood flow and inflammation. Deep abscesses may not show skin changes but the person may be unwell with fever and potential for sepsis.

Abscesses may open over time due to manipulation (picking, scratching, squeezing), or they may swell and open to the tissue's surface as the body forces the contents to the surface. Other times, abscesses will heal without opening as the body deals with this internally. Abscesses may require intervention to open and release their contents (called incision and drainage).

An open abscess may drain any combination of pus, clear or serous fluid, or blood. They may dry and scab over and, depending on the person's immune system and circulation, may take a considerable amount of time to heal. Age, stress, nutrition, drugs used, homelessness, comorbidities and immunodeficiency may all delay wound healing.

Risk Factors

- Not cleaning the injection site and hands before injecting.
- A missed hit.
- Injecting drugs cut with damaging substances (pathogens, irritants, vaso-constrictors).
- Injecting cocaine, as it is a local anaesthetic and missing the vein may be painless.
- Injecting amphetamines, as they are vasoconstrictive and more inflammatory to the tissues.
- Reusing a needle causes blunting of the point of the needle, this causes more skin trauma when reusing, which makes venous access more difficult and damages tissue further.
- Reusing cookers and filters, which can increase the microbial burden.
- Reduced immunity.
- Skin colonised with aggressive pathogens (e.g. MRSA, IGAS).
- Injecting into areas that already show signs of damage and inflammation.
- Injecting into areas with poor circulation (e.g. venous stasis, diabetic foot).
- Licking needles or using saliva to clean skin or mix the drugs.
- Available drugs and what type of drug they are cut with.

Primary Prevention

- Hand and skin hygiene before and during injection process.
- Skin cleansing with alcohol swabs prior to injection. Avoid the use of alcohol swabs post-injection as this can cause pain, decrease clotting and prevent healing.
- Use clean/sterile equipment, needles, syringes, filters, cookers, tourniquets.
- Sharing supplies used for injection, including water, significantly increases the risk of blood borne virus transmission and infection.
- Use sterile or boiled water to prepare – avoid saliva.
- Choose injection sites that are easy to see, are palpable and that have good perfusion. Avoid sites that are close to important structures such as arteries, nerves, tendons, and bone.

Secondary Prevention

- Avoid picking or squeezing the wound. This may exacerbate the inflammatory response, promote the spread of infection and delay healing.
- Monitor for the spread of inflammation and infection into surrounding tissues (advancing erythema/redness, heat, tenderness).
- Assess for systemic illness: fever, chills, myalgia/ arthralgia (muscle/joint aches), lymphadenopathy, lymphangitis (streaking), tachycardia, and tachypnoea.

Treatment Information

- Keeping the area clean with soap and water (if closed), and not injecting in that site.
- Small (less than 2cm across). abscesses may be left to heal with or without antibiotic cover.
- Greater than 2cm across; treatment by incision and drainage may be required, with or without systemic antibiotics.
- If an abscess needs to be incised, drained, and debrided, this should only be done by a medical professional. If done incorrectly, there is potential to inadvertently spread the infection to surrounding tissues, causing serious injury and delay healing.
- Abscesses that require incision and drainage may require packing to keep the wound open to enable continued drainage. Without packing, the body may try to close the incision prematurely, with the risk of encapsulation of the abscess cavity and chronic infection.
- Topical antimicrobial dressings or systemic antibiotics may be required, depending on the pathogen, the extent of the wound, any signs of systemic infection and the individual's immune function.
- Be aware that a pulsating lump may be a pseudoaneurysm, especially in the groin, and this requires urgent hospital treatment.
- Some abscesses will heal on their own over time. They may also spread beyond their border and become more serious infections.

Top Tip

It may be necessary to educate people that antibiotics need to be prescribed to treat specific infections. Using the wrong antibiotics can be ineffective, may promote resistance and potentially cause serious adverse harm. Antibiotics target the bacterial infection in the tissues, and wound care can help manage the infection.

Complications

Abscesses may resolve on their own, though they may also develop into more serious infections. Warning signs that require medical attention include; red or black streaks running along the veins away from the abscess (streaking or lymphangitis), a swollen and red area growing widely (and possibly rapidly) around the abscess (cellulitis), and the general signs and symptoms of systemic infection (feeling unwell, muscle pain, fever), which could indicate bacteraemia or sepsis. While this section focuses primarily on abscesses involving the skin and surrounding tissues, abscesses can also occur internally (e.g. brain, epidural space), as pathogens injected directly into the blood stream may cause infections wherever they find an opportunity.

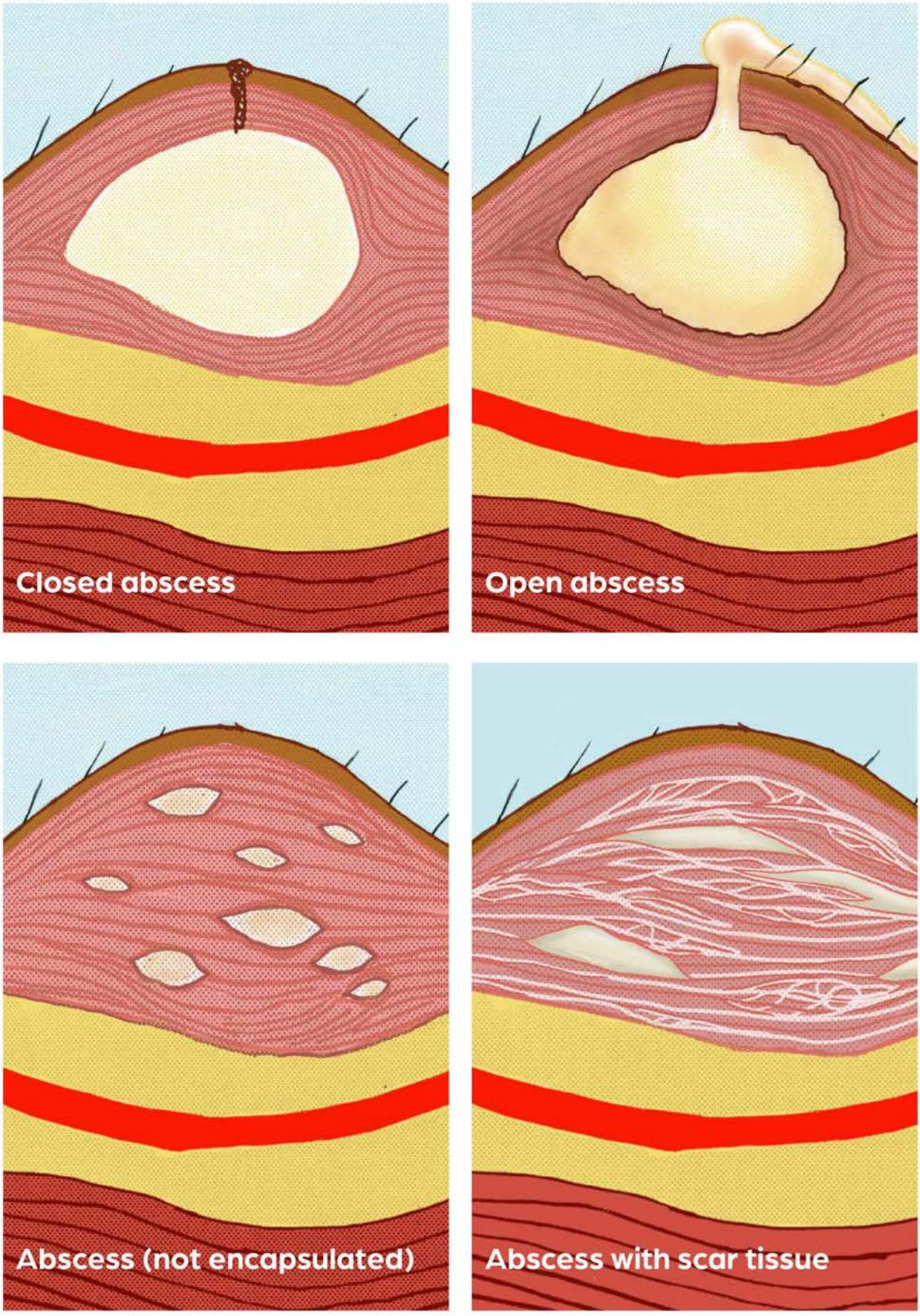


Figure 18.
Abscess cross sections showing how different abscesses behave. Note the proximity of the blood vessel in red.

Cellulitis and Erysipelas

Definition

Cellulitis is an inflammation of the deeper layers of the skin (the dermis and subcutaneous fat layers) caused by bacterial infection. Cellulitis may occur secondary to an abscess or other wound type, or independently. It may appear in areas where there is no history of injecting but may still be related to injection hygiene or contaminated drug supply.

Erysipelas (an infection of the more superficial dermis related to venous insufficiency) is often confused with cellulitis. Over time, erysipelas can extend into the deeper tissues (cellulitis) or can disseminate and become systemic. Therefore, the assessment and management of erysipelas remains the same as for cellulitis.

Signs and Symptoms

Cellulitis will appear as a red, swollen area with diffuse, or patchy, borders. It is generally very painful and tender to the touch. The skin may be warm or hot.

Like cellulitis, erysipelas will present with pain, heat, erythema, and tenderness but the borders will be well defined. Erysipelas can overlap with cellulitis, making it difficult to distinguish between these two syndromes.

Risk factors

- Not cleaning skin before injecting
- Reusing needles, cookers, and filters
- Poor venous circulation in extremities

Figure 17. Cellulitis in the left foot. Source: Colm Anderson, 2006, Licensed under the creative commons, retrieved from Wikimedia commons

Figure 18. Cellulitis in the hand and wrist. Source: Alec Dunn, 2015.

Treatment information

Suspected cellulitis should be referred to a healthcare professional for diagnosis and antibiotics. It may be helpful to trace the border of the reddened area with a marker. The tracing allows clear identification of reducing or increasing redness. It is very unusual to have bilateral cellulitis so alternative diagnosis should be considered. It is important to regularly assess for signs and symptoms of systemic infection for anyone with cellulitis and to refer to an emergency department as this may indicate bacteraemia or sepsis. Systemic signs and symptoms may include fever, chills, malaise, increased respiration rate, tachycardia, and lymphangitis.

Even when systemic antimicrobial therapy is initiated, it is important that wound care is still provided when open wounds are present. Systemic antimicrobials address the infection within the tissues, while topical anti-microbials such as iodine or silver may address the infection (and other contamination) occurring in the wound bed and on the wound surface.

Complications

Cellulitis may resolve unassisted, though typically it will need a course of antibiotics. Cellulitis can be a high risk for developing more serious complications including sepsis, endocarditis, necrotising fasciitis, and infections of the bones and lymphatic system. These complications are explained in detail later in the guidelines (Section 5). Cellulitis in the leg may be confused with deep vein thrombosis (clots in the large veins of the legs), which also presents as a unilateral red, swollen, painful extremity.

Top tip

Tracing around the redness (the border) of suspected cellulitis, will allow for the individual to gauge whether or not the redness is spreading. If this is the case, they should seek urgent medical advice.

Deep Vein Thrombosis

Careful assessment should differentiate cellulitis from thrombosis. An established DVT in the leg may present with a red and swollen limb but would not usually be hot and tender to touch. Suspected DVTs should be referred to hospital.

5 Life Threatening Conditions

Sepsis

Definition
Sepsis is a systemic and life-threatening inflammatory response due to an infection. It can cause a dangerous and drastic drop in blood pressure (septic shock) and, if untreated, will lead to death. Though uncommon, people who inject drugs are at a higher risk of developing sepsis secondary to localised infection, due to regular exposure of pathogens within the circulatory system. Sepsis may be easy to miss, so it is important to fully assess anyone who may be at risk.

Initially, the body mounts a response referred to as the systemic inflammatory response syndrome (SIRS) that is easy to confuse with other milder illnesses. SIRS is characterised by fever, tachycardia, and tachypnoea, along with an elevated white blood cell count. Therefore, anyone with a risk of infection (effectively all people who are actively injecting), feel ill, and are tachycardic, tachypnoeic, and febrile should be encouraged to seek urgent or emergency care. SIRS symptoms have some notable similarities to opioid withdrawal. Sepsis and SIRS are often undiagnosed in people who inject drugs. Be aware that people who inject drugs often seem very resilient and may appear to be in less distress than they actually are.

Sepsis can develop quickly into **septic shock**, and once someone is in shock, emergency care is essential to prevent death. Visible signs of active septic shock include a decreased level of consciousness, a weak and thread-like pulse, and pale/grey skin.

As a rule, be cautious and do not hesitate to seek further help.

Signs and Symptoms

- Fever and chills
- Shortness of breath
- Malaise and weakness
- Confusion
- Myalgia (muscle pain)
- Severe abdominal pain
- Hypotension (low blood pressure)
- Tachycardia
- Sudden swelling in legs/abdomen
- Decreased urine output

Assessment

Count the heart and respiratory rate, and, if possible, take the person's blood pressure, temperature, and oxygen saturation levels. Having two of the following four criteria meets the definition of systemic inflammatory response syndrome (SIRS):

- Heart Rate over 90 beats per minute
- Respiratory Rate over 20 breaths per minute
- Temperature over 38^{o}C less than 36^{o}C.
- Elevated White Blood Cell Count

SIRS criteria are sensitive but not specific, so people meeting SIRS criteria should be referred for further investigation. Additionally, if the individual is hypotensive (systolic BP<90) and is hypoxic, then septic shock should be suspected. Hospital treatment for sepsis will involve antibiotics, IV fluids, and may need to involve respiratory and circulatory support.

What to do if you suspect someone has sepsis?

If sepsis is suspected, take the person directly to seek urgent medical care and / or call 999.

Other Useful Resources

NICE Guidance:
www.nice.org.uk/guidance/ng51/resources/sepsis- recognition-diagnosis-and-early-management-1837508256709

Managing suspected sepsis in children and young people:
www.nice.org.uk/guidance/ng51/resources/algorithm-for-managing-suspected-sepsis-in-children-and-young-people-aged-1217-years-outside-an-acute- hospital-setting-pdf-2551485714

Anthrax

Definition
Anthrax is a bacterium which creates spores that can infect the body, producing lethal poisons that can lead to death. The infection has been found to be most common in those who use heroin and is most likely to be acquired through:

- Spores entering the skin or tissues under the skin (such as fat or muscle), via injecting. contaminated heroin into the body
- Breathing in spores while smoking or snorting contaminated heroin (inhalation).

Signs and Symptoms
Early identification of anthrax can be difficult, especially among people who use drugs as general health may be poorer. How someone reacts also depends on the point of entry of the spore, through the skin (via injection) or through the lungs (via smoking). Infection at the injection site was the most common presentation in the 2009-10 outbreak in Scotland.

Anthrax infection in the skin (classical cutaneous / skin anthrax):

- Usually occurs 2-7 days after exposure.
- Usually begins as a raised/swollen itchy red bump, similar to an insect bite.
- Within 1-2 days, developing into a clear blister/abscess and then an ulcer which may be painless. It may also be black in the centre.
- Flu-like symptoms, with fever, headache and/or nausea, having difficulty breathing.
- Person-to-person spread of cutaneous anthrax is extremely rare.

Treatment
If a person who injects drugs shows any of the above symptoms, actively assist them to be seen urgently by their nearest hospital Accident and Emergency department. This means taking someone to hospital or arranging for someone else to take them.

Top Tip
Keep up to date with outbreak alerts given out when recording IEP transactions using online software (currently NEO). In Scotland, if there is an outbreak this information will be shown there.

Are there risks to workers and family?
The risk to non-heroin using individuals appears to be minimal. There are no documented cases of infection spreading from one person to another because of any form of intimate physical or sexual contact. However, there is a potential risk from touching skin lesions, especially where skin is broken.

Botulism

Definition
There are a variety of types of botulism, including food-borne, wound and infant botulism. Wound botulism is the most common type in the UK and since 2000 there have been over 150 reported cases of wound botulism among people who inject drugs. The mortality rate of wound botulism in the UK is around 5 – 10%.

Signs and Symptoms
Botulism infection can result in paralysis or partial paralysis of parts of the body. Some symptoms include:

- Slurred speech, difficulty speaking
- Difficulty swallowing
- Difficulty with tongue and lip movements
- Blurred or double vision
- Drooping or falling of the upper or lower eyelid
- Extreme weakness
- Inflammation at the injection site
- Paralysis that can affect legs, arms and muscles that control breathing.

Left untreated, botulism will get progressively worse and if not treated quickly, botulism can lead to death.

What to do if someone has symptoms?
If an individual who uses drugs experiences any of the above symptoms, they should be actively supported to seek urgent medical attention from the nearest hospital.

Risk factors
Botulism occurs due to infection with the bacteria Clostridium Botulinum. This bacterium is commonly found in soil, dust, river, and sea sediments. It can, and does, end up in batches of drugs. Contamination can occur at the manufacturing stage, during transportation, at the point where adulterants are added, and there is also a risk of contamination at the drug preparation stage. The bacteria itself is not harmful however given favourable conditions (lack of oxygen) it produces highly poisonous toxins (botulinum toxin). There is no way for a person who uses drugs to tell whether their drug is contaminated with these bacteria. If there have been alerts around recent cases of infection or contaminated drugs, particular care should be taken. Wound botulism may occur in people who inject contaminated drugs intra-muscularly (muscle popping) or sub-cutaneously (skin popping) and therefore these practices should always be avoided if aware of an alert. It may also be caused through an accidental ‘missed’ hit.

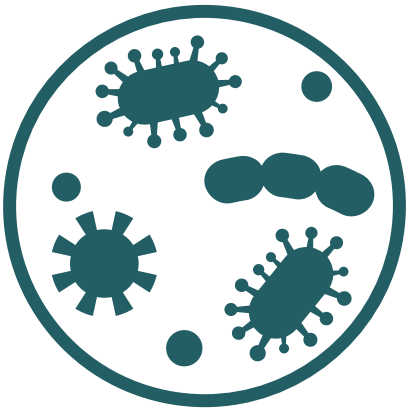
Top Tip
Risk of botulism infection can be reduced if drugs are injected directly into the vein. Injecting technique should always be discussed as part of harm reduction interventions.

Group A Streptococcus and Staphylococcus Aureus Bacteraemia

Definition
Group A Streptococcus (GAS) and Staphylococcus Aureus (S. Aureus) are part of the body's natural bacterial flora and are commonly found in the nose, throat, skin, groin, or anal area. Most of the time, these bacteria do not cause any problems however, infection occurs when these bacteria enter the body via a wound (including injecting sites).

Staphylococcus aureus bacterium infections are commonly referred to as SAB infections.

MSSA (Methicillin Sensitive Staphylococcal Aureus) or MRSA (Methicillin Resistant Staphylococcal Aureus) are common types of staphylococcus infections. MSSA is sensitive to antibiotics whereas MRSA is resistant to some antibiotics. Both infections are common in the UK and often referred to as hospital acquired infections.



People who inject drugs are at a greater risk of becoming ill with MSSA or MRSA as injecting creates an entry point to the body for these bacteria. Since 2011, there has been an increase year on year of reported MRSA and MSSA infections among people who inject drugs.

Infection can be caused by bacteria on the person's own body, bacteria from other people or environmental objects like soft furnishings or towels, or, in the case of S. Aureus, from household pets. These bacteria can be passed person to person through sharing drug paraphernalia (e.g. injecting equipment, spoons, filters and pipes).

There is also the possibility the substance itself is contaminated. In the case of the 2014-15 outbreak it is believed S. Aureus and GAS were spread person to person.

Invasive GAS (IGAS), is a more severe infection which can lead to conditions such as necrotising fasciitis, Fournier's gangrene, and streptococcal toxic shock syndrome.

These are life threatening conditions which require urgent medical treatment.

Signs and Symptoms

SAB and GAS can cause a range of symptoms in many areas of the body ranging from localised skin and soft tissue infection to widespread and serious systemic infection. A person can experience one or more of these symptoms:

- Heat, swelling, redness, aches and pain around wound, joint or muscles
- Pus and/ or unpleasant smell from site of wound
- Wounds that will not heal
- Abscess
- Cellulitis – red, painful, hot, swollen, tender, blistered skin
- Fever, chills, tachycardia
- Dizziness, confusion, disorientation
- Shortness of breath, fast breathing, difficulty breathing
- Coughing up mucus
- Pain in chest
- Headache
- Unexplained ‘bruising’ or rash
- Sore throat, difficulty swallowing
- Sore ear(s)
- Vomiting, nausea and diarrhoea

What to do if someone has symptoms?

Left untreated these infections often become progressively worse and can lead to death. Early identification and treatment are vital. If any of the symptoms mentioned are present, medical attention should be sought.

Top Tip

Three harm reduction tips to prevent these bacteria:

1. Wash hands and maintain good personal hygiene.
2. Discuss alternative routes for drug administration, such as wrapping in cigarette paper and swallowing (called bombing), smoking and rectal administration (UYB).
3. If injecting, wash hands and injection site before use. New injecting equipment and paraphernalia should be used for every injection. Drugs should be filtered prior to injecting. Discuss the need for acidifier depending on drug type and ensure the substance is injected directly into a vein. Intramuscular and sub-cutaneous injections are associated with a greater amount of tissue damage which in turn facilitates bacterial infection developing.

Necrotising Fasciitis/ Fournier's Gangrene

Definition

Necrotising fasciitis (sometimes referred to as the flesh-eating bacteria/bug) is a rare infection of the deep layers of the skin and connective tissue. This typically affects immunocompromised individuals and has a higher prevalence among people who inject drugs. Toxins released by bacteria destroy tissue, while also causing severe localised inflammation that isolates the area from the body's immune response. This can lead to a cascading infection that destroys skin, fat, muscle, and connective tissue and spreads throughout the body.

Necrotising fasciitis describes an infectious process, not a specific type of flesh-eating bacteria. Most commonly the bacteria involved is Group A Streptococcus (GAS), however, other mixed infections can be present (e.g. Staph. Aureus, Strep. Pyogenes, E. Coli).

Amongst people who inject drugs, particularly male groin injectors, this infectious process can take place leading to a condition known as Fournier's gangrene. Different to necrotising fasciitis, it specifically invades the genital and perineum region.

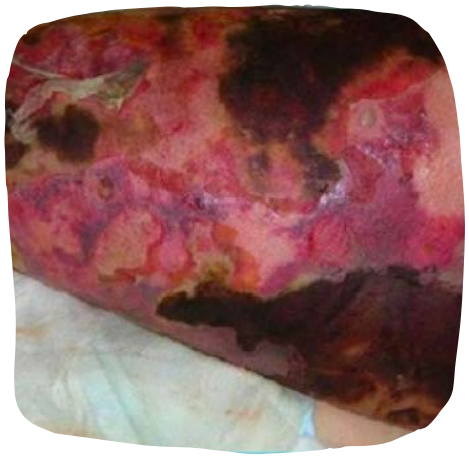


Figure 19. Necrotising fasciitis.
Source: Smuszkiewica, P., Trojanowska, I., and Tomczak, H, 20

Signs and Symptoms

The surrounding tissue may exhibit red, pink, yellow, brown, black, and green tones. These wounds may be large and weepy or may not be open at all. They will be painful and swollen and shiny. Systemic symptoms include a high fever, dehydration, weakness, and other septic-like symptoms. Necrotising fasciitis may develop secondary to untreated/ unresolved cellulitis or abscess.

Treatment

People with suspected necrotising fasciitis should be referred directly to A&E. This requires urgent medical attention as it may lead to sepsis, gangrene, amputation, and death. Treatment will involve intravenous antibiotics to resist the spreading of the infection and will involve surgical debridement of necrotic tissue as well as a long course of healing.

Endocarditis

Definition

Endocarditis is an infection of the inner lining of the heart (the endocardium), in which bacterial microbes adhere to heart valves, eventually causing permanent damage. People who inject drugs are at a higher risk of developing infective endocarditis due to the frequent injection of external bacteria into the circulatory system, especially when they have pre-existing endocardial/ valvular damage, as this increases the risk of microbial attachment. Bacteria that grow within the heart and break off in clumps are called septic emboli. These may cause organ damage, pulmonary embolism, and stroke.

Signs and Symptoms

The early stages of endocarditis may present with several ominous but inconclusive symptoms including:

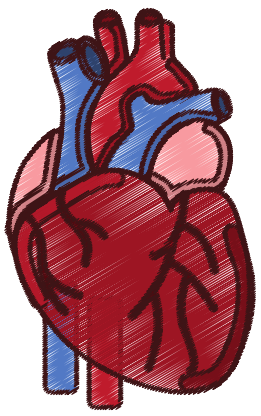
- Fever (may be on/off in chronic infections)
- Weakness/ fatigue
- Anorexia
- Difficulty breathing
- Persistent cough
- Pulmonary crackles
- Chest discomfort
- Muscle / joint pain
- Night sweats
- Splinter haemorrhages and petechiae (tiny purple, red or brown spots on the skin)
- Sudden or progressive swelling in the legs/abdomen
- A new heart murmur
- Late-stage endocarditis may present with symptoms similar to septic shock (endocarditis is often accompanied by sepsis).

Treatment

As with sepsis, if endocarditis is suspected the person should be immediately referred to emergency care. Treatment will usually involve long-term intravenous antibiotics, and if there is damage to the heart valves, then surgical valve replacement may be indicated and necessary.

Prevention

Prevention and education are very important for people with a history of endocarditis, as they are at a higher risk of re-infection. Prevention includes meticulous hygiene prior to injection and not reusing needles for injection, as well as education regarding symptoms of endocarditis.



6 Blood Borne Viruses

Hepatitis C and HIV

There are many harm reduction resources addressing Hepatitis C and HIV/AIDS. These topics are beyond the subject of this guide. However, people accessing harm reduction services may require information about BBVs, testing and diagnosis.

Top Tip

If someone is currently injecting drugs, they should have regular BBV testing in accordance with local policy and availability.

HIV

The threat of HIV transmission remains high amongst people who inject drugs. Since late 2014 there has been a continued outbreak of HIV in Glasgow and West Central Scotland among people who inject drugs. Frequency of injecting and sharing injecting equipment are two key risk factors. Access to sterile injecting equipment is vital.

Once infected, the body starts to fight the virus and releases its antibodies. These antibodies start to show within 1-2 weeks and continue to multiply. After around three weeks a person may have some symptoms, typically characterised as a flu-like illness.

Early signs include fever, swollen glands, muscle aches and tiredness. These symptoms can last a few weeks. Symptoms do not appear in everyone and therefore regular testing (three monthly) should be prioritised within all harm reduction services. It is important to remember there is a “window period” between exposure and being able to detect the virus with a test. This is at least four weeks.

More information can be found at: www.aidsmap.com/topic/how-hiv-works

Hepatitis C

Scotland currently has around 21,000 people chronically infected with Hepatitis C, with most transmissions through injecting related routes. Chronic Hepatitis C infection can interfere with the body’s immune system function and this also has potential implications for wound healing. Treatment for Hepatitis C is now very easy and almost always successful. Healthcare workers in harm reduction settings should strive for testing to be made available on-site, with follow-up protocols to ensure positive tests result in access to treatment. If testing is not possible, information and referrals to free or low-cost testing should be made available.

7

Top 10 Tips and Practical Resources

10 Top Tips for Wound Care

1. **Be aware of your capability - anyone can do First Aid but specific wound care interventions should be undertaken by staff trained in wound care. If unsure always seek advice or refer to a health care professional.**

2. Most wounds heal best in a warm and moist environment although this can also encourage bacteria to thrive. Seek advice if unsure.

3. Irrigating with warm water is appropriate for most wounds. Alcohol swabs should not be used for wound cleansing.

4. Wet wounds should be covered and dry wounds (larger in size than a 10p coin) should also be covered with simple dressings such as premierpore or mepore until full assessment can take place.

5. Keep in mind that many antimicrobial wound products are also cytotoxic and should be reserved for wounds considered to be infected or heavily colonised.

6. Abscesses require regular monitoring for increasing size / pain and spreading cellulitis.

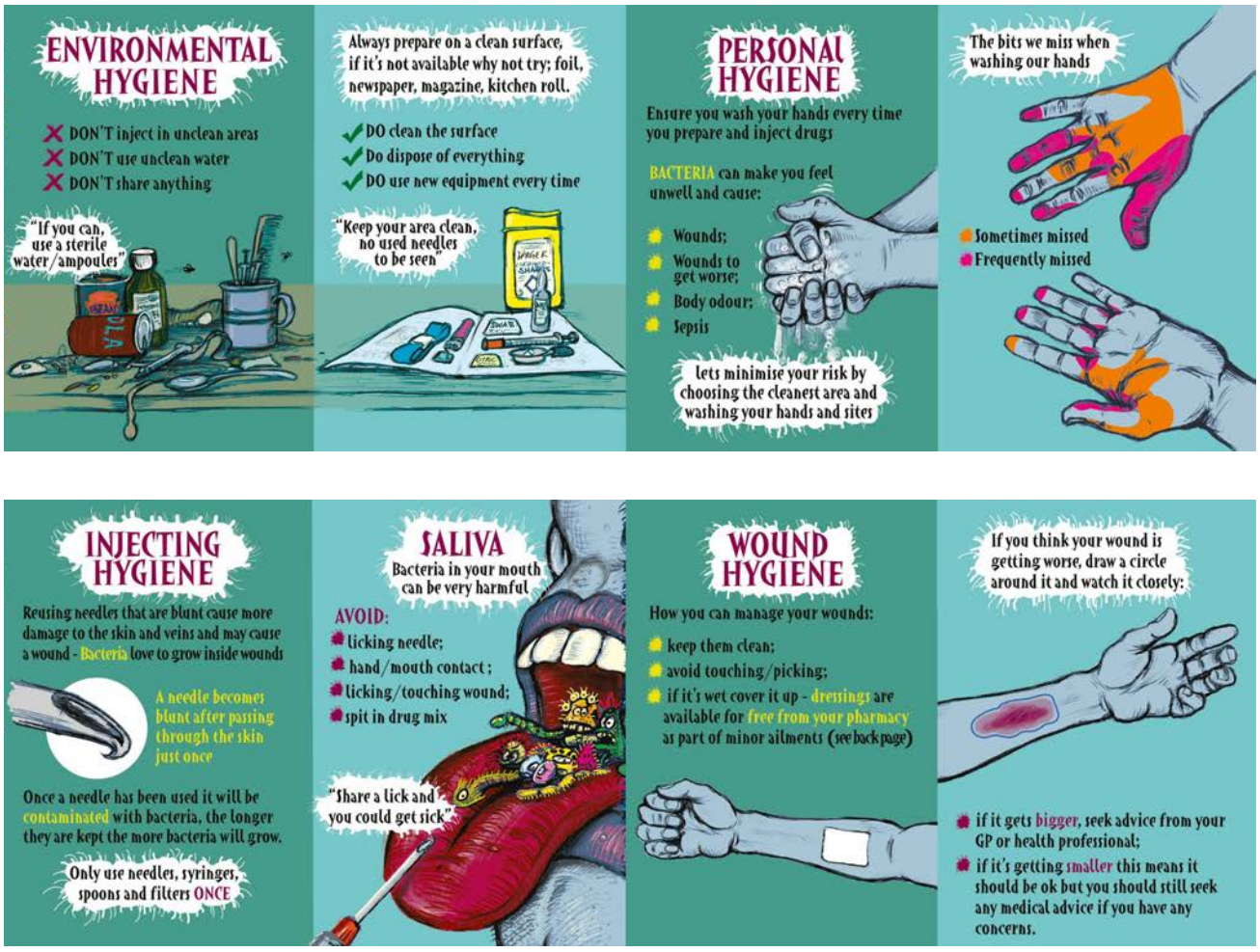
7. Wounds surrounded by a spreading redness or inflammation can be drawn round with a pen – check the status of the redness by inspecting the line – if the redness is extending beyond the line then antibiotics may be required. If the redness has shrunk, then antibiotics may not be required.

8. Signs of infection and inflammation may be less obvious in immuno-compromised and diabetic individuals.

9. Always refer any leg wounds that have not healed within two weeks for vascular assessment – this may be from a wound clinic, or a community or practice nurse.

10. ACT- Ask, Check, and Treat. Start a conversation, look at injecting sites and offer wound care services. Where this is not possible, know where people can go.

Let's Give Bacteria the Boot



Top Tip:

Why not print out copies of this leaflet to give out in your service. It offers practical harm reduction advice to people who use drugs to help prevent bacterial infections. Available at: www.sdf.org.uk/people-who-inject-drugs-can-give-bacteria-the-boot-with-new-sdf-booklet/

Self-Care Wound Leaflet

Self Care Advice:

Looking after your wounds at home

- Always try to cover your wound using a simple dressing.
- Change every seven days unless it is leaking, has fallen off, or is stained as below.
- Dressings are available free from your pharmacy

When to change your stained dressing ?

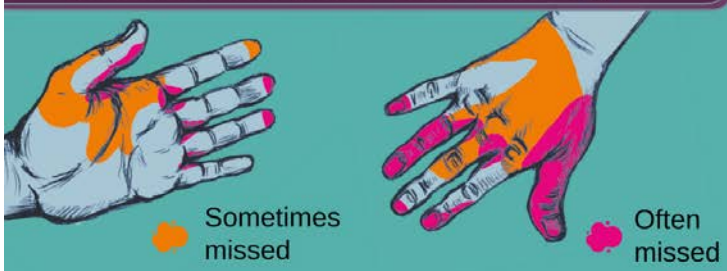
Do not change | Do not change | Change dressing

Infection checklist

- ☐ Heat, redness or swelling around the wound that is getting worse
- ☐ Wetter than before
- ☐ More painful
- ☐ More yellow, green or black in the wound than before
- ☐ Bigger or deeper
- ☐ Bad smell

If you have any signs of infection which are not getting better, and you feel unwell, **call 111 for advice.**

What we miss when hand washing



- Use soap to wash your hands for at least 20 seconds; before preparing or taking drugs and before or after cleaning or changing wound dressings.

Keeping your wounds clean

- Avoid touching or picking your wound.
- If it's wet, cover it up.
- **If you think your wound is getting worse, draw a circle around the wound on your skin and watch for spreading redness.**

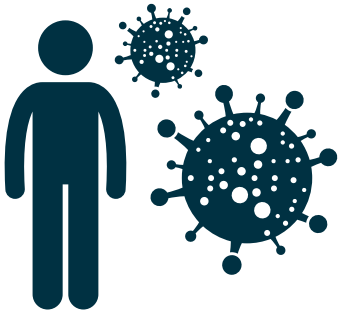
- If the redness gets **bigger** seek advice from your GP or other health professional, like a pharmacist.
- If it's getting **smaller** it means it should be OK but still seek medical advice if you have any concerns.

SDF Scottish Drugs Forum

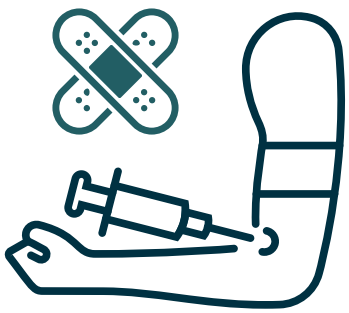
Free wound care e-learning at www.sdf.org.uk/training

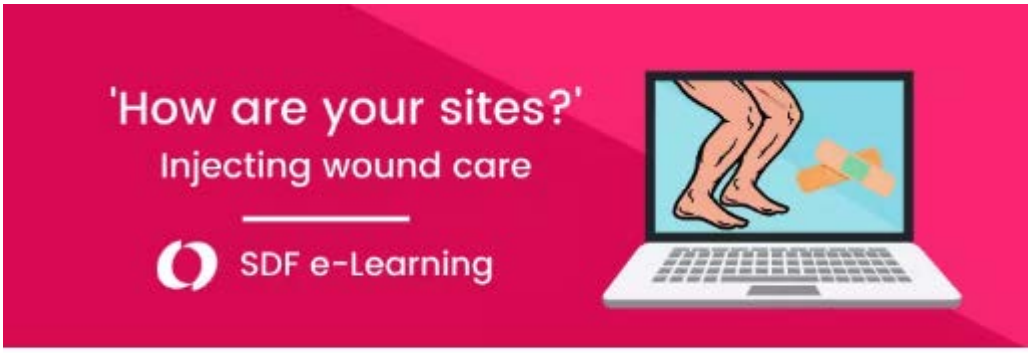
SDF e-Learning

Top tip:
These free e-learning resources are available to anyone. You can even suggest to those you support to use them for a greater understanding of drug use and the associated problems.



The e-learning course will give a brief overview of bacterial infection and various outbreaks. It gives participants the opportunity to explore harm reduction information relevant to bacterial infection. The course will provide an overview of the main signs and symptoms which practitioners should be aware of and will encourage participants to think about and develop a response relevant to their services.





This e-learning course discusses harm reduction related to injecting sites. It aims to help workers assess sites and offer accurate advice to people who inject drugs.

Appendix A: Wound Assessment

Healthcare Improvement Scotland

NATVNS SCOTLAND

WRITE, PRINT OR ATTACH LABEL	
Surname	CHI No .....
Forenames	Sex.....
DoB	
Location.....	

Assessment Chart for Wound Management

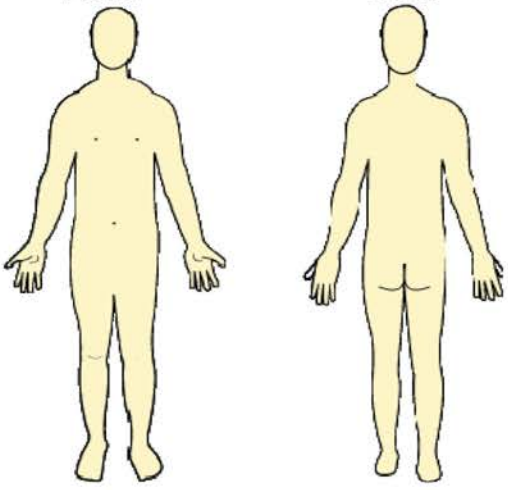
Please complete: **1 wound per chart**

Factors which could delay healing:
(Please tick relevant box)

Immobility	☐	Poor Nutrition	☐	Diabetes	☐	Incontinence	☐
Respiratory/Circulatory Disease	☐	Anaemia	☐	Medication	☐	Wound Infection	☐
Inotropes	☐	Anti-Coagulants	☐	Oedema	☐	Steroids	☐
Chemotherapy	☐	Other.....		Allergies & Sensitivities.....			

Body Diagram

Front **Back**

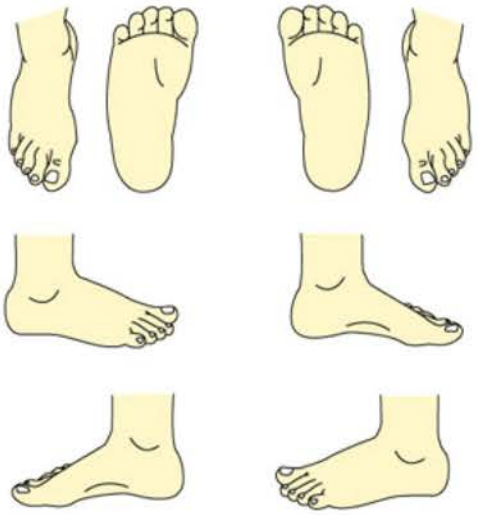


Mark location with 'X' and number the wound

Type of Wound	**Total number & duration of each type of wound**
Leg Ulcer	
Surgical Wound	
Diabetic Ulcer	
Pressure Ulcer	
Other, specify	

Feet Diagram

Right **Left**



Mark location with 'X' and number the wound

Date referred to:

TVN .....Physiotherapist.....

Podiatrist.....Dietician.....

Other (please specify).....

Assessors signature: .....

Date: .....

Appendix A

Formal Wound Assessment

Complete on initial assessment and as at least every 7 days/ or if treatment is being changed or significant change in wound

Date of Assessment								
Analgesia required *(Refer to local pain assessment tool)*	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Regular/ongoing analgesia								
Pre-dressing only								
Wound Dimensions (enter size)								
Length (cm/mm)								
Width (cm/mm)								
Depth (cm/mm)								
Or trace wound circumference								
Is wound tracking/undermining (cm/mm)								
Tissue type on wound bed (enter percentages)								
Necrotic (Black)	%	%	%	%	%	%	%	%
Sloughy (Yellow/Green)	%	%	%	%	%	%	%	%
Granulating (Red)	%	%	%	%	%	%	%	%
Epithelialising (Pink)	%	%	%	%	%	%	%	%
Hypergranulating (Red)	%	%	%	%	%	%	%	%
Haematoma	%	%	%	%	%	%	%	%
Bone	%	%	%	%	%	%	%	%
Tendon	%	%	%	%	%	%	%	%
Wound exudate levels/ type (tick all relevant boxes)								
Low								
Moderate								
High *								
Serous (Straw)								
Haemoserous (Red/Straw)								
Purulent (Green/Brown/Yellow)*								
Peri-wound skin (tick relevant boxes)								
Macerated (White)								
Oedematous *								
Erythema (Red)*								
Excoriated (Red)								
Fragile								
Dry/scaly								
Healthy/intact								
Signs of Infection * 2 or more of these signs may indicate possible infection								
Heat *								
New slough/necrosis(deteriorating wound bed)*								
Increasing pain*								
Increasing exudate*								
Increasing odour*								
Friable granulation tissue*								
Treatment objectives (tick relevant box)								
Debridement								
Absorption								
Hydration								
Protection / promote healing								
Palliative / conservative								
Reduce bacterial load								
Assessors Print Initials								
Re-assessment date								

Appendix A

Wound Treatment Plan

Complete on initial assessment and ONLY UPDATE when treatment or dressing product type / regime ALTERED.

Date	Cleansing method and Dressing Choice, Include Number of dressings products used and Rationale for Treatment	Frequency	Care plan discussed with patient / carer? Yes/No /Comment	Sign/Print/ Designation	Date discontinued / sign and print

Date	Cleansing method and Dressing Choice, Include Number of dressings products used and Rationale for Treatment	Frequency	Care plan discussed with patient / carer? Yes/No /Comment	Sign/Print/ Designation	Date discontinued / sign and print

Date	Cleansing method and Dressing Choice, Include Number of dressings products used and Rationale for Treatment	Frequency	Care plan discussed with patient / carer? Yes/No /Comment	Sign/Print/ Designation	Date discontinued / sign and print

Appendix A

Wound Dressing Change Log and Evaluation (complete at EVERY dressing change)

Date & Time	**Wound Number**	**No. of dressing products (sheets / ribbons) removed from wound**	**Reason for dressing change** (include if swab or photography taken)	**Evaluation/ Comment**	**Sign and Print Name**

8. Glossary of terms

Angiogenesis: The formation of new blood vessels
Arthralgia: Joint pain
Autolytic: Bodies own natural capacity for getting rid of dead tissue
Avascular: No or few blood vessels present in tissues
Bacteraemia: Bacteria in the blood stream
Biofilm: Collection of microorganisms that can form a layer on a wound
Bony prominence: Projection of bone
Capillaries: Small blood vessels
Carotid: Major artery or vein in the neck
Cellulitis / cellulitic: Inflammation / infection of the cells characterised by spreading redness
Chronic/ chronicity: Lasting four weeks or more
Coagulation: Clotting process
Co-morbidities: Two or more diseases or conditions existing at the same time
Compartment syndrome: A painful and potentially serious condition caused by bleeding or swelling within an enclosed bundle of muscles – known as a muscle compartment
Cutaneous: Of the skin
Cytotoxic: Lethal to cells
Debridement: Removal of usually dead or damaged tissue
Differential diagnosis: Alternative diagnosis
Distal: Furthest away position from the heart
Embolism: A blocked artery caused by a foreign body, such as a blood clot or an air bubble
Epithelial: Surface skin layer
Excoriated: Where the skin has been traumatised / worn away
Erythema: Redness
Febrile: Raised feverish temperature
Femoral: Major artery or vein in the groin
Fibroblast: Cells responsible for making collagen and elastin
Gangrenous / gangrene: Dead tissue
Granulation tissue: Newly formed vascular tissues
Granuloma: Benign growth or capsule in the skin
Haemostasis: Control of bleeding
Histamine: An enzyme produced in response to injury or healing – can cause itch
Hypoxia/hypoxic: Without oxygen
Immunodeficiency / compromise: Full or particle impairment of the immune system
Inflammation: A sequence of events following injury which is characterised by heat redness pain and swelling as part of the body's defence process
Interstitial: The space between cells within tissues
Intradermal: Within the dermis
Lymph/ Lymphatic: The fluid that flows through the lymphatic system through lymph nodes
Lymphadenopathy: The enlargement of one or more lymph nodes
Lymphangitis: Inflammation of the lymphatic channels that occurs as a result of infection at a site distal to the channel
Macrophages: Cells that digest foreign material
Malaise: Feeling unwell
Malodour: Bad smell
Microbes/ microbial: Small organism that can cause disease
Myalgia: Muscle pain
Neuropathy: Loss of nerve sensation
Occlusion/ occluded: Blocked or blocking
Oedema / oedematous: Swollen with fluid in the tissues
Palpable: Use of fingers to feel something like a pulse
Pathogen: A microorganism capable of producing disease
Permeable: Leaky
Proximal: Closest position to the heart
Suppurative: Discharging pus
Tachycardia: Fast heart rate over 100 beats per minute
Tachypnoeic: Rapid breathing rate of over 20 breaths per minute
Thromboembolism: Obstruction of a blood vessel by a blood clot that has become dislodged from another site in the circulation
Topical: Relating or applied directly to a part of the body
Varicose: Twisted lumpy and distended – usually applies to veins
Vasoconstriction: When blood vessels constrict and become narrower

9 Bibliography

- Amode, R., Bilan, P., Sin, C., Marchal, A., Sigal, M.-L., & Mahé, E. (2013). Puffy Hand Syndrome Revealed by a Severe Staphylococcal Skin Infection. Case Reports in Dermatological Medicine, 376060. doi: 10.1155/2013/376060.
- Birk T.J., Kirsner R.S., Pieper B., & Templin T.N. (2007). Injection Drug Use: An Underestimated Cause of Venous Disease. Archives of Dermatology, 143, 10, 1305–1309.
- Brown, P.D., & Ebright, J.R. (2002). Skin and Soft Tissue Infections in Injection Drug Users.Current Infection Disease Reports, 4, 5, 415–419. doi: 10.1007/s11908-002–0008-0.
- Bryant, R and Nix, D (Eds) (2016) Acute and Chronic Wounds, 5th Edition Elsevier, St Louise.
- Chouk, M., Vidon, C., Deveza, E., Verhoeven, F., Pelletier, F., Prati, C., & Wendling, D. (2017). Puffy Hand Syndrome. Joint Bone Spine, 84, 1, 83–85. doi:10.1016/j.jbspin.2016.05.001.
- Coull, A (2016) Leg ulceration in young people who inject drugs :causative factors, and how harm may be reduced. Unpublished PhD thesis. University of Stirling.
- Coull, A.F., Kyle, R.G., Hanson C. L., and Watterson, A. (2021) Risk factors for leg ulceration in people who inject drugs: a cross-sectional study. Journal of Clinical Nursing, 15th February, doi: 10.1111/jocn.15716.
- Coull, A. and Sharp, A. (2018) Understanding leg ulceration associated with intravenous drug use. Nursing Times, 114, 6, June 31 - 34.
- Dunn, A. and Gauthier, T. (2020) An introductory guide for assessing and understanding common wounds with people who inject drugs.
- Ebright, J.R.& Pieper, B. (2002). Skin and Soft-Tissue Infections in IV Drug Users. Infectious Disease Clinics of North America, 16, 3, 697–712.
- Elwell, R (2021) The red leg pathway. www.thebls.com.
- Grau, L., Arevalo, S., Catchpool, C., & Heimer, R. (2002). Field Action Reports.Expanding Harm Reduction Services through a Wound and Abscess Clinic. American Journal of Public Health, 92, 12, 1915–1917. doi: 10.21t05/AJPH.92.12.1915.
- Henriksen, B. M., Albrektsen, S. B., Simper, L. B., & Gutschik, E. (1994) Soft tissue infections from drug abuse.Acta Orthopaedica Scandinavica, 65, 6, 625-628.
- Hirsch, C. S. (1972) Dermatopathology of narcotic addiction. Human Pathology, 3, 1, 37-53.

- NHS Scotland / NATVNS (2021) Wound and Skin Care of Lower Limbs with Cellulitis apps.nhslothian.scot/ refhelp/guidelines/ResourcesLinks/Tissue%20Viabilty Cellulitis%20pathway-April%202020.pdf
- NICE (2017) Sepsis: recognition, diagnosis and early management guideline [NG51] NICE. https://www.nice.org.uk/guidance/ng51
- Public Health England, Health Protection Scotland, Public Health Wales, and Public Health Agency Northern Ireland. (2019) Shooting Up: Infections among people who inject drugs in the UK, 2018. London: Public Health England.
- Rainey, J (2002) Wound Care A Handbook for Community Nurses. Gateshead, Whurr Publishers
- Roose, R., Hayashi, A., & Cunningham, C. (2009). Self- Management of Injection Related Wounds Among Injecting Drug Users. Journal of Addictive Diseases, 28, 1, 74–80. doi: 10.1080/10550880802545200.
- SIGN (2010) Management of chronic venous leg ulcers. SIGN, Edinburgh
- Singer, A. & Talan, D. (2014). Management of Skin Abscesses in the Era of Methicillin-Resistant Staphylococcus Aureus. New England Journal of Medicine, 370, 1039–1047. doi: 10.1056/NEJMra1212788
- Torka, P. & Gill, S. (2013) Cotton Fever: An Evanescent Process Mimicking Sepsis in an Intravenous Drug Abuser. Journal of Emergency Medicine, 44, 385–387.

This guide has been adapted for Scottish use by Sophie Given, Infection Prevention and Control Practitioner, University Hospitals Bristol and Weston NHS Foundation Trust and Dr Alison Coull, Specialist Nurse Wound Care, NHS Lothian and Lecturer at Queen Margaret University, Edinburgh on behalf of the Scottish Sexual Health and Blood Borne Virus Prevention Leads (Non-Sexual Infection) Group.

Published January - 2022

Scottish Drugs Forum

91 Mitchell Street, Glasgow, G1 3LN
t: 0141 221 1175
f: 0141 248 6414
e: enquiries@sdf.org.uk

www.sdf.org.uk

- @SDF news
- facebook.com/scottishdrugsforum
- youtube.com/user/scottishdrugsforum