

Nail Surgery Guidelines

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Contents

1.1 Purpose	6
1.2 Application to practice.....	7
1.3 Knowledge, Skills and Competence (linked to standards of proficiency HCPC)	7
Background	9
Classification	10
Differential Diagnosis.....	10
Factors to consider	10
Treatment options for Onychocryptosis (IGTN)	11
2.1 Conservative treatment.....	11
2.2 Chemical ablation of the nail matrix	11
2.3 Surgical treatment	12
History.....	13
3.1 Vascular assessment.....	15
3.2 Neurological assessment.....	17
Special Conditions	17
3.3 Anticoagulant therapy	17
3.4 Diabetes	18
3.5 Hepatic disease	19
3.6 Autoimmune disorders (AI)	19
3.7 Cytokine inhibitors (Adalimumab, Etanercept, Infliximab, Rituximab).....	20
3.8 HIV	20
3.9 Oral retinoids	20
3.10 Endocarditis.....	21

3.11 Autonomic sympathetic dysreflexia.....	21
3.12 Pregnancy	21
3.13 Infection.....	22
4.1 Hepatic disease	23
4.2 Kidney disease	23
4.3 Antidepressants.....	24
4.4 Antihypertensives	24
4.5 Antiepileptic drugs	25
4.6 Anticonvulsant drugs	25
5.1 Mental capacity.....	27
6.1 Instruments.....	29
6.2 Local anaesthetic.....	29
6.3 Complications of local anaesthesia.....	31
6.4 Emergency equipment.....	32
6.5 Preparing for the procedure	32
6.6 Administering LA	32
6.7 Record keeping	33
7.1 Total nail avulsion	35
7.2 Partial nail avulsion.....	35
7.3 Hypergranulation	36
7.4 Phenolisation.....	36
7.5 After procedure and dressing.....	37
7.6 Post-Operative wound care	38
7.7 Patient information post surgery	38
8.1 Infection prevention and control.....	39
8.2 Location/clinical environment.....	39
8.3 Stock /dressings	40
8.4 Use of chemicals	40
8.5 Waste disposal	41
8.6 Working arrangement and diverse environments.....	41
Appendix 1 Procedural pathway	42

	42
Appendix 2. Nail surgery procedures understanding the options	43
Appendix 3. Consent form	45
Appendix 4	46
Appendix 5. ASA grades	47
Appendix 6. Guidance for the management of anaphylaxis	48
Nail Surgery Checklist	51
Existing nail surgery guidelines consulted in the preparation of this document	55

Review and Amendment Log

Version No	Type of Change	Date	Description of change
V.2	Amendment to current practice	11/03/2019	<i>Update to Nails surgery and LA guidelines</i>
V.3	Update	11/03/2021	<i>Biennial review</i>

1. Introduction

Nail surgery is an intervention carried out by medical specialists, general practitioners, podiatric surgeons and podiatrists, and is practised throughout the world. It is a treatment for pathological nail conditions but is most commonly used to treat onychocryptosis (ingrown toenail) which is a painful condition affecting an estimated 10,000 people annually in the UK. The first toe is the most common site, but lesser toes can also be affected. It is seen in every age group but is common amongst adolescents and has a higher incidence in males. Onychocryptosis is thought to be caused most commonly by trauma and poor nail cutting technique but ill-fitting footwear, excessive sweating, poor hygiene, biomechanical factors and obesity can all contribute. Systemic disease, the aging process and congenital malformation are also causative factors. The condition ranges from mild, which can be treated conservatively, to progressively more painful stages which need surgical measures to resolve.

1.1 Purpose

The purpose of this document is to offer best practice guidelines, which are broad statements of principle using an evidence led, safe practice approach wherever possible and clinical consensus agreement where there is poor or no evidence. It is designed to support the profession in improving nail surgery standards and reducing inappropriate variations in practice whilst promoting the delivery of high-quality, evidence-based care.

The document was collated following careful consideration of the available evidence, professional regulations and other relevant information and will be continually updated as new or further evidence becomes available. It is current as of 2019, having been through a thorough process of consultation with a range of stakeholders including private practitioners, NHS clinicians and Expert Reference groups from across the UK.

It should be noted that as a guidance document, it does not override each healthcare professional's right and duty to make decisions appropriate to each patient, with their valid consent. However, it is advised that any departures from this guidance, together with the rationales and reasons for such deviations, are fully documented and justified within patients' clinical records.

1.2 Application to practice

The standards of proficiency required to maintain Health Care Professions Council (HCPC) registration do not differentiate between independent and NHS practice requirements. Therefore, this guideline is relevant to all podiatrists engaging in this area of practice.

The HCPC Standards of Proficiency (SOPs) for podiatry can be found [here](#). All are relevant to practice, but for the purposes of these guidelines, the following SOPs are considered to be of significant relevance to nail surgery:

Standard 1.1 Know the limits of their practice and when to seek advice or refer to another professional

Standard 10.1 Be able to keep accurate, comprehensive and comprehensible records in accordance with applicable legislation, protocols, and guidelines

Standard 14.6 Understand the structure and function of the human body, together with knowledge of health, disease disorder and dysfunction relevant to podiatry

Standard 14.11 Be able to conduct neurological, vascular, biomechanical, dermatological and podiatric assessments in the context of podiatry

Standard 14.11 Administer relevant prescription only medicines, interpret any relevant pharmacology history and recognise potential consequences for patient treatment

Standard 14.11 Apply local anaesthetic (LA) techniques

Standard 14.11 Carry out surgical procedures for skin and nail conditions

Standard 14.13 Be able to analyse and critically evaluate the information collected

Standard 15.2 Be aware of applicable health and safety legislation, and any relevant safety policies and procedures in force at the workplace, such as incident reporting and be able to act in accordance with these

Standard 15.4 Be able to select appropriate personal protective equipment and use it correctly

Standard 15.7 Know the correct principles and applications of disinfectants, methods for sterilisation and decontamination, and for dealing with waste and spillages

1.3 Knowledge, Skills and Competence (linked to HCPC standards of proficiency)

HCPC SOPs are applicable to all Podiatrists who carry out nail surgery. Regular Continuing Professional Development (CPD) is an essential part of podiatric practice and includes the professionals' ability to evaluate, update and reflect on knowledge.

Podiatrists wishing to undertake nail surgery procedures are required to adhere to the following minimum training standards:

- Annual update training in Basic Life Support (BLS), and the recognition and primary management of anaphylaxis
- Triennial update in the use and administration of Local Anaesthetics (LAs) and other accessible prescription-only medicines (POMs)
- Techniques of LA are normally taught as part of undergraduate training. Their use requires the practitioner's entry on the HCPC Register to be annotated as 'POM-A'
- Entitlement to the use of other accessible POMs is annotated as 'POM-S' within the HCPC Register

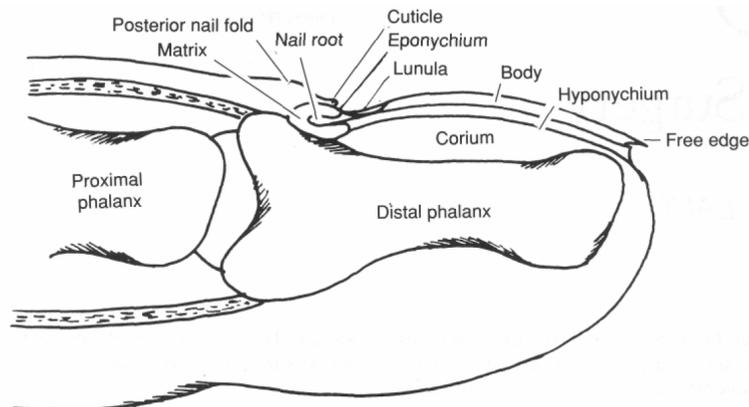
All those assisting in nail surgery procedures must have up to date and thorough knowledge of surgical asepsis.

All podiatrists are reminded of their responsibility to continually update their skills and knowledge in these areas and it is recognised that individuals can achieve this in a variety of ways. It is recommended that all podiatrists maintain an ongoing and updated reflective CPD portfolio of their activities including, for example, all training and courses attended, mentored supervision, peer review, so that they can justify and evaluate their competency.

2. Nail Surgery

Background

Nail Anatomy



Nail avulsion is the most common surgical procedure performed on the nail unit.¹ It may include complete or partial avulsion of the nail plate with or without destruction of the associated germinal matrix (i.e. matrixectomy). Matrixectomy techniques may involve surgical excision, electrical or chemical and on occasion, a combination of excision and ablation.

Nail avulsion with matrixectomy is indicated as effective treatment in a variety of nail conditions including onychia, onychogryphosis, onycholysis, psoriatic nails, onychomycosis and involuted nails, where conservative management has not brought the necessary symptomatic relief.¹ Onychocryptosis (OC “ingrowing toe nails” (IGTN)) is a relatively common problem in the general population: approximately 20% of those people who seek GP advice for a foot problem have IGTN. All nails can be affected, however common presentation involves the hallux. It frequently shows an acute presentation as the periungual skin and associated soft tissue is punctured or traumatised by the medial, lateral or less commonly the distal edge of the nail, breaching skin integrity and creating a portal of entry for micro-organisms, leading to associated pain, inflammation, infection, eventual hypergranulation formation, and shoe wear problems with resultant pain and negative impact on lifestyle.

Classification

Onychocryptosis can be classified into progressive stages. There are several classifications described but they all define stages from a mild condition with some localised and occasional pain to the most severe with associated infection and hypergranulation ('proud flesh'). There is no single consensus of classification, but it is useful to adopt a standardised form of words to benefit clinical decision making and agreed treatment options.

One example could define the various presentation of Onychocryptosis²⁻⁵ as:

Stage 1 (Mild): Nail fold swelling, oedema, erythema, and pain with direct pressure.

Stage 2 (Moderate): As Stage 1, but also showing granulation tissue, within and local to the affected nail fold, pus pocket formation (paronychia) and / or discharge (ulcer formation), localised infection, frank pain (especially with any minor pressure to the affected tissues) and local nail fold hypertrophy.

Stage 3 (Severe): As Stages 1 and 2 but also showing signs of long-standing chronic inflammation: epithelialisation of the granulation tissue, chronic infection of and discharge from the affected sulcus, localised nail lysis, marked nail fold and generalised swelling of the affected toe.

Onychocryptosis is not a self-limiting condition and therefore a Stage 1 problem will progress to Stage 2 and a Stage 2 to a Stage 3.

Differential Diagnosis

It is important to consider the differential diagnoses of IGTN. Examples of painful nail pathologies that may not be resolved by nail surgery can include subungual exostosis, pyogenic granuloma, subungual verruca, glomus tumour, nail unit tumours and inclusion cysts. It is therefore essential that an accurate diagnosis of the underlying pathology is made through a detailed nail assessment and a dermatological, biomechanical / musculo-skeletal and foot wear examination.

Factors to consider

The main factors to consider prior to undertaking nail surgery include:

- the patient's (or patient's advocate's) ability to give valid consent to the intended procedure (including consent to both the local anaesthetic and the surgical intervention) and the after-care regime and its requirements
- suitability to receive local anaesthesia
- a history of anaphylaxis or adverse reaction to any drugs or materials that may be used during surgery or the healing period
- poor tissue healing potential
- blood clotting disorders

- susceptibility to infection / immunocompromise
- psychological or sociological problems
- concomitant deteriorating and/or debilitating disease processes.

Treatment options for Onychocryptosis (IGTN)

2.1 Conservative treatment

Stage 1 IGTN can be treated conservatively. Such treatments include correct nail cutting to reduce trauma imposed by the nail on local soft tissues, use of nail packs / gutters / braces and advice to the patient on correct nail cutting and / or filing techniques. Causative factors should be explored, diagnosed and treated as appropriate, including footwear advice (avoiding slip-on shoes, wearing well-fitting shoes with a wide and deep toe box and positive fixing), measures to overcome foot hyperhidrosis, biomechanical evaluation and the provision of anti-pronatory orthoses, defective interdigital padding and / or orthodigita, excision of a sliver of nail from the outer border of the nail plate (with or without LA but without phenolisation of any exposed matrix). The patient should be made aware of these non-surgical treatment options together with the percentage likelihood of recurrence, as it forms part of informed consent to any subsequent surgical procedure. The Cochrane review 2012 cited 3 studies comparing conservative treatment with varied surgical interventions and concluded that conservative management was less effective than surgical intervention in the prevention of the recurrence of ingrowing toenails¹.

2.2 Chemical ablation of the nail matrix

Stage 2 and 3 (also unresolved Stage 1) presentations of IGTN often require surgical intervention to resolve the problem as they do not usually respond in the long term to conservative treatments with frequent recurrence common following interventions that do not ablate or excise the germinal matrix.

A number of techniques have been developed for partial and total nail avulsion of the nail and destruction or ablation of the nail matrix by a variety of chemicals. Liquefied phenol is the most common chemical used to achieve matrix ablation in the UK, although other appropriate chemicals such as sodium hydroxide and liquid nitrogen can also be considered¹.

Although the application of phenol is more effective than incisional techniques in destroying the nail matrix, it is associated with a longer healing time (delayed wound healing) and a resultant increased risk of post-operative infection⁷.

The topical application of liquefied phenol (carbolic acid, C₆H₅OH) to the exposed nail matrix at a concentration of 80%-89% is used to achieve chemical nail ablation of the nail matrix. It has the potential to cause harmful effects both locally as a chemical burn and systemically. There are several studies that demonstrate a wide range of phenol application times during matrix destruction⁵⁻⁹. A

balance must be achieved when using liquefied phenol to destroy the nail matrix: it should be applied for long enough to effectively destroy the exposed matrix tissue, but not so long that unnecessary collateral tissue destruction occurs⁷. If an ineffective application time is used, subsequent dystrophic nail plate regrowth is likely. In vitro studies have indicated that the minimum application time required to destroy the germinal component of the nail matrix using 89% phenol is 1 minute. The presence of blood or tissue fluid in the exposed matrix area will compromise the effectiveness of liquefied phenol as an ablation agent and therefore tissue haemostasis by the application of a digital tourniquet and pre-drying of the exposed tissue with a sterile swab is advised⁸. Care should be taken during the procedure to ensure that liquefied phenol does not overflow from the matrix area on to surrounding tissues and any excess phenol should be absorbed using a gauze swab.

2.3 Surgical treatment

An onward referral for surgical excision may be considered where healing capacity is reduced, and primary intention healing would be more suitable¹¹. Part of the nail can be removed by incisional nail procedures. The partial wedge resection was first described by Winograd but other techniques are also described in the literature⁶ with several subsequent modifications. The aim of this technique is to remove the problematic portion of the nail and associated nail fold. It is therefore especially useful for hypertrophied unguis labia, for revisionary surgery or where concurrent bony surgery is being planned. The nail is split from distal to proximal in a similar manner to the first step of a PNA. This incision is deepened through the nail plate and nail bed to the bone and extended proximal to the matrix. A second semi-elliptical incision is made incorporating the nail sulcus and matrix and the whole section (nail plate, matrix and sulcus) removed. The exposed phalanx is curetted to remove residual matrix cells and the wound closed with suture. Zadik also described total avulsion of the nail plate, with destruction of the matrix by excision with a surgical knife or scraping away the matrix⁷.



Winograd Procedure

3. Assessing suitability for nail surgery

The aim of the assessment is to ascertain the patient's suitability for the use of local anaesthetic agents and their ability to undergo and tolerate the intended nail surgery procedure, particularly with reference to healing potential. This assessment involves:

1. Comprehensive review of clinical history
2. Assessment of the vascular and neurological status of the lower limb and foot
3. Determination of whether there are any contraindications or cautions to the use of the local anaesthetic, a tourniquet or liquefied phenol
4. Determination of whether the patient can understand and provide informed and valid consent to the administration of a local anaesthetic, the nail surgery procedure and the aftercare regime

History

A detailed history for all nail surgery candidates should be performed and documented. This will include:

Surgical history

To include:

- Major surgery
- Minor surgery including previous use of LA
- Insertion of pins, plates or prosthesis in the region of the LA

Medical history:

To include:

- Immune function, including autoimmune disease
- Blood disorders
- Cardiovascular disease (e.g. hypertension)
- Pregnancy
- Endocrine and metabolic disorders
- Neurological disorders (e.g. epilepsy or depression)
- Cancer, malignancy or tumour
- Current investigations

- Any consultant care

Drug history

To include:

- All prescribed medication
- All over the counter medication
- Any medications prescribed by other practitioners
- All herbal/alternative remedies (e.g. St John's Wort)
- Alcohol use
- Recreational drug use

History of allergies, sensitivities or previous reactions to:

- Local anaesthetic
- Latex
- Medicines
- Other

Psychosocial inquiry to establish

- Health beliefs
- Self-efficacy in relation to post-operative care
- Locus of control to adapt treatment plan and communication style
- Individual environmental contexts, personal goals and expectations

3.1 Vascular assessment

Prior to considering nail surgery, a patient history and lower limb vascular assessment must always be conducted to help clinicians to exclude or confirm significant peripheral vascular disease which may impact on nail surgery healing⁹. History and patient assessment as a minimum must include identification of:

- Modifiable and non-modifiable risk factors

- Non-modifiable: age, gender
- Modifiable: e.g. hypertension, diabetes, current / former smoker, cardiovascular disease, peripheral vascular disease, limb oedema, liver disease, renal function

- Presence of medical conditions e.g. diabetes, rheumatoid arthritis, renal disease
- Palpation of foot pulses

The status of foot and ankle pulses should be assessed by palpation. Pulses should be graded as palpable or non-palpable.

- Assessment of wave form/sounds of pulses:

Evaluate the patient's pulse sounds/waveform within the foot using a hand-held Doppler. It should be carried out by a clinician who has competency to locate pulses and interpret the results. Ideally, all foot pulses should be regular with a rate of 60-70 beats per minute, with normal (biphasic or triphasic) sounds.

Intermittent claudication (IC) and ischaemic rest pain (RP)

Note: IC and RP are indicators of peripheral vascular disease and atherosclerosis. These symptoms may be masked in patients with limited mobility and sensory neuropathy. The use of a validated tool, e.g. the Edinburgh Claudication questionnaire, may be of value in demonstrating presence of claudication.

Differential diagnosis of common causes of exercise-related leg pain.

Patients reporting apparent non-vascular exercise-related lower leg pain should be assessed for other possible causes, e.g. nerve root compression, spinal stenosis, hip arthritis, chronic compartment syndrome, peripheral neuropathy.

- History of venous disease:

The venous status of the lower limb and foot should be assessed, to review for the presence of varicose veins, a history of deep vein thrombosis or varicose vein surgery.

If there are any indications of suspected peripheral arterial disease at this stage, such as non-palpable foot pulses, monophasic Doppler signals, symptoms of intermittent claudication or ischaemic rest pain, further non-invasive vascular assessment must be performed prior to considering nail surgery.

This must include one or more of the following:

- Ankle brachial pressure index or ankle systolic pressure
- Toe brachial pressure index or toe systolic pressure
- Arterial duplex assessment

Where results indicate non-severe peripheral arterial disease, nail surgery should only be considered with caution, taking into account the overall risks and benefits, and in consultation with the patient, their GP and / or the vascular team.

Where results indicate severe or critical limb ischaemia, the issues and decision making relating to nail surgery must be discussed with the local Vascular Team. For example, nail surgery must not be performed following any of the following results without further urgent vascular opinion:

- ABPI is < 0.6 OR ankle systolic pressure is < 70 mmHg
- ABPI is > 1.4 AND foot pulses are non-palpable / monophasic
- Toe systolic pressure is < 40 mmHg

Where an acute nail problem is identified and assessment indicates severe or critical limb ischaemia WITH infection also present, this must be made clear to the vascular team to help facilitate urgent triage, as with severe ischaemia and infection together, there may be a high immediate risk of sepsis, tissue necrosis, gangrene and potential amputation⁴¹.

3.2 Neurological assessment

Neuropathy can lead to foot deformity and abnormal plantar pressures. Lack of protective sensation allows trauma to go unnoticed which can impact on outcome and healing. There are a variety of neurological assessments that can be carried out to determine levels of neuropathy. These include the use of neuropen, the application of a 10g monofilament to plantar skin and using a neurothesiometer or a 128Hz tuning fork on bony prominences.

Special Conditions

This list is not exhaustive but covers the more common conditions you may encounter. There will be other conditions that may need special consideration prior to and during surgical procedures, and liaison with the appropriate specialist colleague should be sought prior to a nail surgery procedure. This may be directly or via communication with the patient's general practitioner (GP).

3.3 Anticoagulant Therapy

The most common anticoagulant medications (ACM) include warfarin, aspirin and clopidogrel (plavix). Newer oral anticoagulant (NOAC) therapies include rivaroxaban (xarelto), dabigatran (pradaxa), apixaban (eliquis) and edoxaban (lixiana). Patients use ACM to prolong the blood clotting time and as such, often have a history of deep vein thrombosis, stroke, coronary artery disease, heart valve replacement, atrial fibrillation and anti-phospholipid syndrome.

The use of anticoagulants should not prevent nail surgery, assuming the patient is suitable in all other respects, although the patient should be alerted that post-operative bleeding may be prolonged and their advised aftercare regime modified to reflect this. Recorded INR (International Normalised Ratio - a measure of the clotting time) values vary in accordance with the patient's individual condition and the higher the INR value, the longer the blood will take to form a clot; in many anti-coagulated cases the INR is maintained by warfarin therapy between 2-3, meaning that the clotting process will take approximately 2-3 times as long as normal (i.e. approximately 10-15mins, rather than the normal 5 minutes). Stopping the use of anticoagulant medication or avoiding surgery is not usually justified in these patients (see [BSDS Guidance](#)).

It is advisable to review manufacturers' recommendations prior to undertaking any procedure with the new range of new anticoagulants (NOACs). Patients taking these medications are not monitored by INR recording so clinicians should consider seeking the opinion of their anticoagulant team prior to undertaking a nail surgical procedure. Whereas the effects of warfarin can be reversed quickly with vitamin K injection, reversal of the anticoagulant effects of NOACs is likely to require specialist advice.

3.4 Diabetes

There is no evidence-based guideline published that precludes nail surgery with phenolisation in relation to an above-normal value for HbA1c, however most guidelines advise that patients with diabetes undergoing intervention procedures should have an HbA1C value of below 9%, 75mmol/mol. Poor pre-operative glycaemic control is strongly associated with impaired healing²⁹. Patients with diabetes who are indicated for nail surgery should have had a valid HbA1c blood test within the last 12 months.

If there is reason why glycaemic control cannot be improved, then several factors should be considered to assess the suitability for nail surgery on an individual basis to aid the decision-making process. These factors include:

- The presenting problem is acute and/or infected (the concomitant infection may be contributing to or the underlying cause of the elevated HbA1c level)
- If the presenting problem is acute and/or infected, is the risk of not treating the acute IGTVN and potential or associated infection greater than the risk associated with the avulsion of the nail, and prolonged healing time if chemical matrix ablation is the procedure of choice?

If these factors support the decision to undertake nail surgery, then the level of risk should be determined, explained to the patient in conjunction with their managing diabetologist and fully documented in the patient case notes.

Alternative options for nail surgery for these patients must also be considered. These include nail avulsion without the use of phenol in cases where the blood supply to the lower limb and foot have been shown to be sufficient to allow healing, but a prolonged healing time is undesirable or not in the patient's best interests. Alternatively, the clinician should consider referral of the patient to the

local diabetes multidisciplinary team (MDT) or surgery team for consideration of an interventional procedure which will allow healing by primary intention. Appropriate contact with the patient's GP may be required to facilitate this.

3.5 Hepatic disease

Hepatic disease is associated with suppression of the immune system and impaired blood coagulation. For example, cases with hepatic sclerosis or splenomegaly (enlarged spleen) secondary to hepatic portal hypertension show a prolonged coagulation time and their suitability for surgery should be reviewed in the same manner as those with other coagulation disorders.

3.6 Autoimmune disorders (AI)

This category includes a wide variety of conditions, all of which are characterised by autoimmune disease leading to chronic inflammatory changes in many tissues and body systems. Patients with AI may be treated with biologic and/or immunosuppressive drugs and/or steroids, all of which suppress inflammation and healing, thereby increasing proneness to infection. AI disorders include rheumatoid arthritis, crohn's disease, psoriasis, and connective tissue and inflammatory disorders such as scleroderma, although this list is not exhaustive. If the patient is deemed suitable for nail surgery but is currently medicated by a regime of disease modifying anti-rheumatic drugs (DMARDs) such as methotrexate, immunosuppressants and/or steroids, they should be fully informed of their increased risk of post-operative infection and their potential for delayed/prolonged healing time.

Some services recommend that consultant advice should be sought prior to undertaking nail surgery with chemical ablation of nail matrix for patients where AI-disease is being managed with biological therapy and there are signs of clinical infection.

The following should be considered prior to any decision to undergo nail surgery:

- Blood tests to determine ESR and CRP to monitor current disease activity
- The risk imposed by the traumatic effect of administering LA by injection, the application of a digital tourniquet and the nail surgery procedure itself on a patient with active disease, as these can all increase the risk of a localised vasculitis and its progression to gangrene
- Raynaud's phenomenon is characterised by an abnormal vasospastic response of the digital arterioles to emotional or temperature changes, potentially even the application of a digital tourniquet. Therefore, nail surgery should never be attempted during a vasospasm and avoided during cold weather.
- The optimum time for surgery may be after the patient has had an exacerbatory or 'flare' period, as recent close monitoring and altered dose of medication will induce greater disease stability. However, the decision to embark on nail surgery and the optimum time for it to take place must be made in full consultation with the patient's disease specialist⁴².

3.7 Cytokine inhibitors (Adalimumab, Etanercept, Infliximab, Rituximab)

Patients with severe psoriasis, crohn's disease and some inflammatory arthropathies may be prescribed this class of drug to control disease symptoms. Patients taking immune/cell growth suppression drugs may need to have their dose adjusted down or stopped by their consultant rheumatologist / immunologist prior to undergoing toenail surgery. Medication with these drugs may need to be stopped 2-8 weeks prior to the date for surgery and prophylactic antibiotics may also be required from the day of surgery and during the healing period.

The podiatrist should liaise with the prescribing consultant or biologics nurse to seek advice on the patient's peri-operative biologic management.

3.8 HIV

Patients diagnosed as HIV positive (HIV+ve) have a depleted immune system due to the disease's effects on T-lymphocyte white blood cells. This is recorded as a CD4 count which gives an indication of how well the immune system is functioning, in particular the body's ability to overcome the human immunodeficiency virus. HIV+ve patients with a CD4 count that is greater than 200 cells/mm³ and a low viral load are considered to show a similar range of postoperative risks and complications as that of the general population and thus, those patients may be considered as suitable for nail surgery assuming that they have no other contra-indications to the procedure. The CD4 count must be reviewed at the pre-operative assessment⁴³.

3.9 Oral retinoids

Oral retinoids (OR) are used in the treatment of acne and psoriasis. They include Acitretin, Adapalene, Tazarotene, Tretinoin and Isotretinoin (Accutane, Roaccutane), with Isotretinoin considered the most potent of these drugs. Medication with oral retinoids may predispose the patient to IGTV and has been known to show both immunosuppressive and anti-inflammatory characteristics. Common side effects can include skin fragility, pyogenic granuloma formation as well as paronychia with staphylococcal aureus infection, especially as many patients on these drugs may be adolescents – the population group most likely to present with onychocryptosis.

The reason for the use of OR and the likely duration of the drug therapy should be investigated. In the treatment of acne, a 20-week course is often initiated. Therefore, consideration should be given as to whether the patient is able to complete the course prior to undergoing nail surgery. Alternatively, if the presenting complaint is a paronychia due to the side effects of the medication, the condition may respond to conservative treatment until the course of medication is complete, and kept under review after their drug treatment, reviewed to ensure that the IGTV does not recur.

Patients who are being treated for psoriasis or persistent adult acne, may be on a permanent low maintenance dose (LMD) of OR. The two main considerations of LMD-drug treatment relate to skin

fragility and delayed post-operative wound healing. If the skin is very fragile, extreme caution should be used in removing the nail plate, especially when separating the eponychium from the nail plate.

As the risk of staphylococcal aureus infections and pyogenic granuloma are increased by OR therapy, the patient should be reviewed post operatively on a more frequent basis than normal. In all cases, a discussion with the GP or dermatologist is essential to ensure the appropriate course of action is being taken.

3.10 Endocarditis

Infective Endocarditis (IE) is a severe, and often fatal, condition characterised by inflammation and bacterial infection of the heart lining and valves leading to severe congestive heart failure, myocardial abscesses, embolic stroke and multiple brain abscesses. It can arise in patients whose heart valves have been damaged, for example, as the result of rheumatic fever.

In light of the issues relating to antibiotic and antimicrobial stewardship, the need for antibiotic cover for patients at risk of developing IE is addressed in NICE guideline²³, which states that “*Antibiotics should NOT be given to adults and children with structural cardiac defects at risk of IE when undergoing dental and non-dental interventional procedures*”. They state that there is “*No consistent association between having an interventional procedure (dental or non-dental) and the development of IE.*”

Therefore, the advice is that prophylactic antibiotics for patients at risk from endocarditis is not recommended unless there is evidence of overt soft tissue infection.^{1,23}

3.11 Autonomic Sympathetic Dysreflexia

Autonomic Sympathetic Dysreflexia develops in individuals with a neurologic level of spinal cord injury at or above the sixth thoracic vertebrae level. This causes an imbalance reflex sympathetic discharge which could lead to potentially life-threatening hypertension, and so these patients should be managed in the acute setting.

3.12 Pregnancy

Pregnancy status of the patient should be established at pre-operative assessment and checked again on the day of surgery. Local anaesthetic must be used with caution in the first and third trimester of pregnancy.

Although no substantive evidence currently exists relating to the possible mutagenic or carcinogenic effects of phenol, the Health Protection Agency has listed it as a Category 3 Mutagen. For this reason, there is greater risk to the pregnant podiatrist if they were to be regularly exposed to phenol fumes compared to the pregnant patient who has one short, very small and controlled exposure to

phenol during the nail surgery procedure. Pregnant clinicians should therefore be excluded from undertaking or assisting with nail surgery procedures following disclosure. Pregnant patients can be treated conservatively until they have given birth or offered resection (with or without LA) without chemical ablation.

The advice relating to breastfeeding whilst being exposed to local anaesthetic or phenol has been updated by the breastfeeding network. ⁴⁴ This states:

- Phenol: 'Safe use' research data is limited, but pharmacokinetic data suggests that risk is low and advantages of continuing breastfeeding greater than risk of phenol'
- Local anaesthetics: Risk of LAs during lactation minimal; LAs have poor bioavailability and short half-life. LAs should not preclude breast-feeding post-procedure
- LAs are widely used in other areas of care for breastfeeding mothers (post-natal sutures; dentistry etc)

<https://breastfeedingnetwork.org.uk/wp-content/dibm/anaesthetic%20and%20breastfeeding.pdf>

This discussion and all points above must be clearly documented in the patient record.

3.13 Infection

The Cochrane Review¹ does not support the use of preoperative antibiotic prophylaxis in nail surgery. Therefore, best practice would indicate that antibiotics should only be used in the presence of infection.

4 Suitability for Local Anaesthetic

The use and administration of Local Anaesthetic requires thorough knowledge of the pharmacological principles, pharmacodynamics and pharmacokinetics of the range of local anaesthetic POM-drugs that HCPC-registered podiatrists are permitted to access for administration during the course of their clinical practice. It is essential that the podiatrist is able to calculate accurate drug dosage relative to the patient's body mass to ensure that the minimal risk of toxicity, accidental overdose and drug interactions is avoided.

4.1 Hepatic disease

Amide anaesthetics are metabolised in the liver. Where liver function is severely compromised the risk of systemic toxicity is increased. As the liver is also involved in the production of coagulation factors, the patient may have prolonged bleeding. There is no clear guideline that states the level of liver disease reached before local anaesthetic may be administered. In principle, digital and ankle block anaesthesia are considered as 'low risk' in terms of the potential to induce LA-related systemic toxicity, as muscle tissue is not involved in the injection technique and local blood vessels are relatively small. Syringe aspiration prior to delivering the anaesthetic drug should also confirm that the tip of the hypodermic needle is not in a blood vessel, so that direct introduction of the LA-drug into the circulation is minimised.

The clinician should consider any other prescription drugs taken by the patient as these too will give a guide to the likely hepatic metabolism of both those and LA drugs. If necessary, the podiatrist should consult with the patient's GP for the results of recent liver function tests (LFT), to determine their suitability to receive LA. When interpreting LFT, frequently a Gamma-Glutamyl Transferase (GGT) test may be taken as an indicator of overall liver function. A value of greater than 100 can indicate liver disease but GGT values may also be increased in patients taking a range of medications such as carbamazepine, cimetidine, furosemide, heparin, isotretinoin, methotrexate, oral contraceptives, phenobarbital, phenytoin and valproic acid. Smoking may also cause elevated GGT levels.

4.2 Kidney Disease

The hepatic metabolites of amide anaesthetics retain approximately 10% of their potential to induce anaesthesia in excitable cells (i.e. sympathetic, parasympathetic, sensory and motor nerves, somatic, smooth and cardiac muscle tissue, and the brain and spinal cord). Hepatic metabolites of LA drugs

are excreted via the kidneys. Therefore, where renal function is severely compromised, the risk of systemic toxicity is increased. There is no clear guideline that states the level of renal disease that precludes the use of local anaesthetics, but the clinician should bear in mind that renal disease is more common amongst people with diabetes than in the non-diabetic population.

The clinician should consider the other prescription drugs that the patient is taking as these may also affect renal function. If necessary, the podiatrist should consult with the patient's GP for results of recent tests of current kidney function and use that information to guide their professional judgement on the patient's suitability to receive LA. Elevated blood creatinine levels are frequently the most sensitive and specific indicator of renal disease as they allow estimation of the renal glomerular filtration rate (eGFR). An eGFR value of less than 60 indicates reduced kidney function or frank renal disease.

In patients with any degree of renal compromise, the lowest effective dose of LA should be administered to reduce the risk of systemic toxicity.

4.3 Antidepressants

Tricyclic antidepressants (TCAs), selective serotonin reuptake inhibitors (SSRIs) and St John's Wort are all known to interact with a variety of other drugs.

Local anesthetic does not interact adversely with these drugs and is safe to use. Patients on TCAs may exhibit oral disturbances, visual disturbances and postural hypotension as normal side effects of the drug. Some patients who have difficulty regulating their TCA dose may also experience central nervous system excitation, mood agitation, cardiac and respiratory effects, and seizures. SSRIs have fewer side effects but rarely may exhibit agitation and confusion, motor disturbances such as muscle rigidity and clonus, hyperthermia and fluctuating blood pressure. Thus, clinician vigilance is essential to differentiate between these uncommon drug side effects and signs of LA drug toxicity.

Monoamine Oxidase Inhibitors (MAOIs) can interact with LA drugs containing adrenaline leading to a hypertensive crisis. LA without adrenaline is safe to use in a patient taking MAOIs. However, due concern must be given to the necessity to administer adrenaline in the event of an anaphylactic reaction. LA should not be administered to patients taking MAOIs if they have had no previous exposure to LA and therefore not in a position to confirm they have no allergy. It may then be necessary to consult with GP or anaesthetist for advice. If a patient taking MAOIs suffers an allergy that requires a vasoconstrictor, emergency services should be informed that the patient is taking MAOIs.

4.4 Anti-hypertensives

Anti-hypertensive medications are prescribed to lower blood pressure (BP) thereby maintaining it within normal levels (120/80-mmHg). Plain local anaesthetic agents do not contain adrenaline and

tend to induce vasodilatation. In higher doses, these LA agents have the potential to lower the patient's BP. Patients on anti-hypertensive drugs may be more prone to hypotensive episodes or the effects of postural hypotension.

The risk of a significant fall in systemic blood pressure is low as the result of digital and ankle anaesthesia, but the risk of inducing significant hypotension increases: when higher doses of LA are administered; if the drug is induced into the general circulation; or with more proximal regional blockade techniques including popliteal blockades. It is good practice in all cases, where possible, to have the patient lying down in a supine position during administration of the LA to reduce the potential for any hypotensive episode. Care should be taken when returning the patient back to an upright position. The patient should be moved slowly, and time allowed for the patient to become accustomed to sitting, before asking them to stand up.

4.5 Anti-epileptic drugs

High doses of LA carry a greater risk of inducing convulsions because of their effects on the central nervous system, thus creating a risk to the patient with epilepsy. Most patients with epilepsy are well controlled and it is generally accepted that it is safe to use LA drugs on patients taking anti-epileptic drugs.

Clinicians should establish whether stress, anxiety, needle phobia or other factors are likely to induce an episode and be aware of the clinical presentation of epilepsy and the appropriate first aid interventions. Patients with epilepsy should be seizure-free for at least 6 months before they undergo any procedure under LA.

4.6 Anti-convulsant drugs

Anti-convulsant drugs suppress central nervous system (CNS) neuronal activity, so the early stages of an LA-drug induced toxic event may be masked in patients taking this type of medication.

There is no direct contraindication to administering LA to patients taking anti-convulsant drugs. However, clinicians should be aware that any LA-induced neuro-toxic event may not follow the usual pattern of CNS-excitation followed by CNS-depression. Normal patient monitoring, patient-related maximum safe dose (MSD) calculation, the use of an injection technique that precludes introduction of the LA agent into a blood vessel by aspirating the syringe before delivering the LA drug, and a heightened awareness of the potential alteration of the typical pattern of the signs and symptoms of a toxic event should ensure a safe and acceptable level of practice.

5 Consent to treatment and mental capacity

Valid and fully informed consent must be sought prior to any procedure, test or treatment. Whatever the context in which medical decisions are made, you must work in partnership with your patients to ensure good care. In so doing, you must:

- listen to patients and respect their views about their health
- discuss with patients all relevant information in terms of diagnosis, prognosis, treatment (including no active treatment) involved including the risks and benefits, in terms that are readily understood by the patient
- discuss reasonable alternative treatments
- outline and discuss what is likely to happen if treatment does not go ahead
- share with patients the information they want or need in order to make decisions
- maximise patients' opportunities, and their ability, to make decisions for themselves
- respect patients' decisions.

This means that patients who are considering nail surgery under LA with phenolisation would need to be made aware of alternative and conservative options, risks and benefits (Appendix 2) of the proposed procedure. In addition, the patient should be made aware of the option of surgical excision as an alternative to phenol matrix ablation and the likely prognosis should the patient decide to opt for no treatment. Following your explanation, it is good practice to ask the patient to relay back to you what you have told them, to allow you to check their understanding of the information you have given. It is also helpful to provide the patient with an explanatory leaflet or direct them to appropriate web-pages. All of this should be documented in the patient's record as part of normal standard practice.

A young person's ability to make decisions depends more on their ability to understand and weigh up options, than on their age. When assessing a young person's capacity to make decisions, you should bear in mind that:

- young people under 16 may have capacity to make decisions, depending on their maturity and competence to understand and fully appreciate what is involved in their treatment.

At 16 a young person can be presumed to have capacity to make most decisions about their treatment and care. This is known as being Fraser (Gillick) competent.

Otherwise, someone with parental responsibility should consent for the child, young person, or adult who is not Fraser (Gillick) competent (e.g. someone with learning difficulties, who may not be able to fully understand what it is they are giving consent to. A 'responsible adult' could be:

- The child's mother or father
- The child's legally appointed guardian
- A person with a residence order concerning the child
- A local authority designated to care for the child
- A local authority or person with an emergency protection order for the child

Please refer to [Clinical standard 2](#) on The College of Podiatry website for further information on consent. The links below offer more information regarding consent and the ethical considerations relevant to consent.

[NHS Consent to treatment \(2016\)](#)

[BMJ \(2017\) Montgomery and informed consent: where are we now?](#)

[The Lancet \(2018\) How Montgomery is reconfiguring consent in the UK](#)

(NB: This advice applies to consent to a procedure, but conflicts with the distinction between an adult and a child in terms of the (POM) medicine's license: in that respect, the use of the POM in a child has to be covered by a paediatric license which applies to anyone under 18 years of age; in medicines licensing terms one becomes an adult at 18 yrs. We have a 'dispensation' to use mepivacaine (LA) in children: this POM has both paediatric (that is a child of 4 years or over) and adult licenses for dental use, but only an adult license for podiatric use. But the MHRA notes it is OK for podiatric use on children's 'off label' use, and the manufacturers (Septodont) recommend that mepivacaine should be used at 50% the adult MSD – that is at 3mg per Kg (not 6mg per Kilo as for adults).

5.1 Mental Capacity

The Mental Capacity Act (2005) protects those people who are unable to make informed decisions for themselves or lack the mental capacity to do so. The Act safeguards vulnerable adults from mistreatment and malpractice in areas such as social care, housing and medical care. Contravening the Act constitutes a criminal offence. The Act led to the appointment of the Independent Mental Capacity Advocate (IMCA) service, which represents the best interests of those who lack personal advocacy, such as with no family or friends and/or who lack mental capacity.

'Mental capacity' (i.e. the ability to make personal decisions that are in one's best interest) cannot be assumed because of a person's age, appearance or behaviour. Neither can anyone assume that a

person cannot make a decision about their care because they have a degree of disability, or that they are unable to make complicated decisions, or that they have been unable to make such decisions in the past. Lack of mental capacity can be a permanent or temporary state.

Those who have mental capacity can set up an advance decision to refuse treatment or accept future treatment. The advance decision constitutes a legal document in which the individual states that they do not want a treatment should they become unable to make that statement at some time in the future, and this stated intent can include their decision to refuse lifesaving treatment. These such decisions are valid from October 2007. An advance decision may only be signed by someone else on behalf of an individual if the individual agrees to making an advanced decision to refuse treatment, and witnesses the person signing the statement to that effect on their behalf.

Who can decide treatment on the patient's behalf?

A Lasting Power of Attorney (LPA) is a legal document where an individual specifies who can make certain decisions for them on their behalf, if they cannot make them for themselves. The appointed attorney must act in the best interests of the person who lacks mental capacity to act independently. Once again, examples of such decisions centre round health/medical treatment and welfare.

The 'Court of Protection' may appoint a 'Deputy', that is someone who can make certain decisions for a person if the person is unable to decide everything on their own, however a Deputy cannot be appointed if an LPA has already been set up.

The whole process of the Mental Capacity Act is overarched by the Court of Protection, which deals with every aspect of the Mental Capacity Act. Sometimes a person's family and the medical team treating that person (who lacks mental capacity) may not agree about a treatment. If this is the case, then the Court of Protection Judge will ultimately make the decision on what is in the best interest of the individual.

The link below offers more information regarding the Mental Capacity Act:

<https://www.legislation.gov.uk/ukpga/2005/9/contents>

See Appendix 3 for consent forms. These are also available on The College of Podiatry website under podiatric practice section.

6 Nail surgery procedure

6.1 Instruments

Instruments used for the purpose of nail avulsions must either be:

- Re-usable instruments that have been processed through a cleansing, and then an autoclave cycle, using sterile water
- Re-usable, pre-autoclaved instruments, from a central sterilisation source, (CSSSD/HDSU)
- Pre-autoclaved disposable instruments, specifically designed for single use, then disposed of according to the normal 'sharps disposal' protocols.

Instruments must be decontaminated correctly and in accordance with the College of Podiatry clinical standards 7 and 8, please find links here [Clinical standard 7](#) [Clinical standard 8](#), Standard 15.7 of the HCPC-SoPs require that the podiatrist knows the correct principles and applications of disinfectants, methods for sterilisation and decontamination, and for dealing with waste and spillages.

6.2 Local anaesthetic

There are number of local anaesthetic (LA) drugs available for podiatric use. These include:

Table 1.

Drug	Brand Name	Maximum Safe Dose (mg per kg)	Onset (mins)	Duration (hours)	PKa
Lidocaine	Xylocaine	3	2-5	1-1.15	7.7
Mepivacaine*	Scandonest	6 for adults	2-5	1.5-2	7.6
Prilocaine	Citanest	6	2-2.5	1.5-2	7.7
Bupivocaine	Marcain	2	15-30	4-6	8.1

Levobupivocaine	Chirocaine	2	10-15	4-6+	8.1
Ropivocaine	Naropin	4.3	10-15	4-6+	8.1
Lidocaine with Adrenaline (1:200 000)		7	2-5	2+	8.1
Bupivocaine with Adrenaline (1:200 000)		2	15-30	8+	8.1

The most commonly used local anaesthetic to achieve digital anaesthesia with nail surgery in UK podiatry is 3% plain Mepivacaine Hydrochloride (Scandonest). This product is not licensed for podiatric use in children. This is because the manufacturers have not applied for a product license for this application. However, The College of Podiatry and the Healthcare Product Regulatory Agency consider the use to be acceptable professional practice and recognises its widespread use amongst suitably qualified and HCPC-POM-A registered podiatrists.

Prior to the administration of analgesia, a maximum safe dose (MSD) for the patient should be calculated in relation to the patient's body mass and the LA drug used. This should be recorded in the patient's notes along with details of the batch number and expiry date. The MSD is the total dose of a drug that can safely be administered to a patient in a 24-hour period. This is calculated in Milligrams per Kilogram (mg/kg). The milligrams are specific to each drug and documented in Table 1, and the kilograms relate to patient body weight, up to a maximum of 70kg. For example, a person weighing 80kg must be not be given a higher MSD than someone who weighed 70Kg, but the MSD for a patient who weighed 50kg (for example) should be proportionally lower, that is 50/70 of the MSD for a 70kg person, for that particular LA drug.

A detailed assessment of the patient's medical history, allergies and current medication must be taken and recorded in the patient's record. It is recommended that adrenaline, either in the form of an easy administer pen or in a 1:1000 solution vial with syringe and suitable needles for drawing solution and injecting, is available in case of anaphylaxis. This should form part of the first aid kit in all podiatry clinics where LA is used. See appendix 4 for the dose of adrenaline to administer dependent on age. All members of the clinical team must undergo recent (within the past year) and appropriate training to recognise and treat patient collapse and anaphylaxis. www.resus.org

The most suitable LA procedure to facilitate nail surgery is a digital block, using the appropriate local anaesthetic agent, with additional local infiltration of LA when required. The injection must be

administered using disposable sterile equipment, or disposable LA cartridges and single-use needle, in a sterilised reusable syringe.

The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 apply to employers whose primary activity is to organise, manage and provide health care. These regulations also apply to both NHS and independent sector providers and includes those situations where health care is provided to people in their own homes.

Employers need to assess the risk of sharps injuries under the principles of the Control of Substances Hazardous to Health (COSHH) regulations. Where risks are identified the sharps in healthcare regulations require them to take specific risk control measures. It is not reasonably practicable to avoid the use of medical sharps when administering LA, therefore the sharps regulations require employers to:

- Ensure that sharps usage is carried out in a safe manner (Ref: Regulation 5 (1) (b)), and workplace protocols should be put in place to minimise the risk of accidental injury.
- Use equipment and handling techniques that prevent the recapping of needles (ref regulation 5 (1) (c))
- Provide and place within the workplace environs secure containers (sharps boxes) together with instruction for safe disposal of medical sharps (Ref Regulation 5 (1) (d))

Safer sharps systems and preventing re-sheathing of needles are now a legal requirement. There are a range of syringes and needles available with a shield or cover that slides or pivots to cover the needle after use. All used equipment must be disposed of correctly.

<http://www.hse.gov.uk/pubns/hsis7.pdf>

6.3 Complications of local anaesthesia

The use and delivery of local anaesthetic agents is frequently non-problematic but in cases where a patient has shown a previous allergic reaction to LA, it is almost certain that this will be repeated with any subsequent exposure to LA and may lead to a clinical emergency and/or patient collapse. Therefore, LA agents should never be administered to patients with previous or known LA allergy; instead, the podiatrist should consider onward referral to the G.P or surgery team.

Some patients may experience hypersensitivity to the local anaesthetic agent, which presents as allergic skin reactions or an asthmatic attack or in more serious cases, may progress to anaphylaxis; a life-threatening immune based reaction. True anaphylaxis identified by the sudden onset of a range of symptoms which may include shortness of breath, wheezing, stridor, generalised soft tissue oedema and erythema, urticaria / hives, hypotension, increased heart rate, abdominal pain, diarrhoea and/or vomiting, a feeling of being very unwell, leading to progressive loss of consciousness and ultimately death if not treated with urgency.

Immediate first aid treatment of anaphylaxis requires intra-muscular injection of adrenaline delivered into the anterolateral portion of the mid-thigh. The injection of adrenaline should be repeated at five-minute intervals until the patient's symptoms reduce: (i.e. the heart rate, breathing and blood pressure returns to normal), whilst continuing to monitor the patient's vital signs (airway, breathing and circulation), or until the patient can be handed over to the emergency services. If oxygen is available, it should be administered at a rate of 15litrs per minute. The emergency ambulance must be called at the onset of the threatening emergency (via 999 call) and the crew alerted that the patient has suffered collapse due to presumed anaphylaxis, and the patient can be removed to hospital. The resuscitation council UK (<http://www.resus.org.uk/pages/reaction.pdf>) have up to date guidelines for health professionals on the management of anaphylactic reactions. (Appendix 4)

6.4 Emergency equipment

Resuscitation equipment

Before the patient enters the clinic and if oxygen is available, ensure that the oxygen mask is connected to the cylinder, that the cylinder is functional, and that the oxygen level is correct. Ensure that the oxygen cylinder is accessible and the pulse oximeter available.

Ensure the anaphylactic pack/pen is in date and easily accessible (remove box from outer packaging). Ensure that all emergency equipment (e.g. the resuscitation mask, spillage kit, goggles and emergency eyewash) is easily accessible.

6.5 Preparing for the procedure

Before the start of the procedure:

Ensure that there is an adequate supply of local anaesthetic (check name and expiry date), 1:1000 adrenaline (check concentration and expiry date), phenol (check bottle for name of chemical and expiry date) and dressings (check expiry date).

Check that sufficient sterile single use equipment is available and in date.

Check that all paperwork has been completed.

6.6 Administering LA

- Verbally confirm identity by asking patient for their full name and date of birth
- Discuss patient medical and pharmacological history

- Ensure patient has no allergy to LA drugs
- Discuss the rationale for using LA and explain risks and benefits, site and method of injection
- Explain how sensory function will be tested to ensure anaesthetic effect
- Document informed consent (required if first use of LA in the specific treatment strategy)
- Ensure MSD is calculated prior to commencement of injection. Consider both systemic and local factors
- Check the LA cartridge, name, concentration, batch and expiry
- Ensure appropriate hygiene levels (e.g. handwashing, hair tied back, gloves, aprons, swab vials with 70% alcohol). Swab injection sites with 70% alcohol or consider 10% Betadine solution for injections to deeper nerves.
- Administer anaesthetic safely: ensure injection not in blood vessel, minimise risk of needlestick injury, maintain constant awareness of injection dose relative to MSD
- Check toe for fully effective anaesthesia using a sterile probe, neurotip or blacks file
- Appropriate safe disposal of needles and neurotips in sharps box
- Document anaesthetic details in patient records.

6.7 Record keeping

Administration of local anaesthetic should be documented within patient's notes. The minimum information required is:

- Site of injection
- Time of injection
- Local anaesthetic drug – name and concentration
- Dose delivered – milligrams (mg), NOT milliliters (ml)
- Batch number
- Expiry date

7 Nail surgery Procedure

The procedures listed below are **examples** of how nail avulsion with phenolisation should be carried out and assume that local anaesthesia has been confirmed. There are a number of acceptable variations of technique which are noted within textbooks and published literature. Clinical judgement should be used in each procedure. There is no evidence to support a maximum tourniquet time but under normal circumstances, 20 minutes should be sufficient to facilitate the avulsion and phenolisation process.

7.1 Total Nail Avulsion

- Apply tourniquet and note time
- Using a Blacks file elevate the eponychium, separating it from the nail, and clear the nail sulci
- Insert an appropriate elevator underneath the nail plate at the free edge of distal nail
- Keeping the elevator parallel (where possible) to the nail bed, push it steadily beneath the nail plate until it reaches the proximal aspect of the matrix. It will “give” to resistance
- Repeat this action until the entire nail is released, paying attention to the corners hidden by the eponychium
- Clamp artery forceps to the lateral half of the nail plate and rotate nail plate inwards until it releases from the sulcus. Repeat for the medial side of nail. (or vice versa). Lift the nail plate free
- Check nail for any missing fragments that would indicate a part of nail may not have been removed. Pay particular attention to the proximal aspect
- Use Blacks file to probe proximal to eponychium to ensure there are no residual parts of nail. Locate any fragments and remove using Blacks file and forceps

7.2 Partial Nail Avulsion

- Apply tourniquet and note time
- Using a Blacks file, separate the eponychium from the specific portion of nail plate that is to be removed
- Insert an appropriate elevator, underneath the specific portion of nail plate to be separated at the free edge of distal nail
- Keeping the elevator parallel (where possible) to the nail bed, push it steadily beneath the nail plate until it reaches the proximal aspect of the matrix. It will “give” to resistance

- Use Thwaites nippers. Slide the flat surface underneath the nail plate until it is aligned to proximal edge of nail deep to the eponychium.
- Cut the nail with one action. Prior to cutting ensure the portion of nail to be removed is broad enough to achieve the therapeutic objective.
- A Beaver Blade (SM61 flat/square chisel) can be used to continue the straight cut under the eponychium. Holding the beaver blade handle firmly, angle it slightly downwards to avoid cutting the eponychium, and push the blade through the remaining nail until it gives
- Clamp on artery forceps and rotate the portion of nail to be removed inwards. Lift the nail free.
- Check nail for any missing fragments that would indicate a part of nail may not have been removed, with attention to the proximal aspect
- Use Blacks file to probe proximal to eponychium to ensure there are no residual parts of nail. Locate any fragments and remove using Blacks file and forceps

7.3 Hypergranulation

If there is any fibrous tissue or hypergranulation tissue that might impede healing, remove this with forceps or an appropriate size blade. Hypergranulation tissue may be removed by sharp dissection or left in situ to shrink away during the healing time, as the case requires.

7.4 Phenolisation

Liquefied Phenol (80% phenol) is routinely used as the matrix ablating agent after the nail / nail segment has been removed. It is a very strong and caustic organic acid and thus, must be handled with great care in accordance with COSHH regulations.

Liquefied phenol may be supplied by the Pharmacy in a small bottle from which a small amount may be decanted into which a Black's file or orange wood stick swab dipped. Phenol has the potential to absorb atmospheric water vapour every time the bottle is opened and become weaker (and less effective).

Alternatively, and preferably, liquefied phenol supplied as 'Ezeswabs' may be used; each Ezeswab consists of plastic test tube in which contains approx. 1ml of liquefied phenol sealed under a membrane. The membrane is broached by the Blacks file, or orange wood stick / swab to allow application of the liquid to the exposed pocket of the nail matrix

There are 2 methods of application most popularly used but there is no evidence to suggest that efficacy of one above the other:

Method 1 - application of phenol with a blacks file

Method 2 - application of liquefied (80%) phenol with orange sticks tipped with a small twist of sterile cotton wool

Generally, 3 x 1-minute applications of liquefied phenol are recommended to effectively cause chemical ablation of the exposed nail matrix. It is good practice that safety glasses or goggles are used when applying liquid phenol and that any phenol that spills out of the sulcus during application is wiped away immediately using a gauze swab. Particular care must be taken that phenol does not leech under the tourniquet as it has the potential to cause a chemical burn to any soft tissue it contacts.

Phenol can be a dangerous chemical if it is not handled correctly. Personal protective equipment must always be used when handling phenol. Any spillage of phenol that comes into contact with skin must be neutralised with Glycerol. Splash or spillage into eyes must be washed with saline. Due to the strength of the spray, it would not be appropriate to spray saline directly into the eye. The saline should be first sprayed into a clean eye-wash cup, or gallipot, which is then applied to the eye. Seek medical attention if necessary

- Batch number, expiry date and colour should be checked (80% phenol should be clear colourless fluid: it discolours (shows a yellow / pinkish hue) as it ages. Discoloured phenol should not be used and disposed of in accordance with COSHH regulations
- If the phenol is supplied in a bottle, the lid should always be replaced between applications
- A fresh cotton bud should be used for each application
- Note should be made of phenolisation times
- Any excess phenol which goes onto skin should be dabbed immediately using a clean swab, and glycerine applied to skin with cotton bud
- Used cotton buds should be disposed of appropriately
- Excess phenol should be swabbed up using gauze at the end of application.
- There is limited evidence to support the irrigation (whether by saline or 0.5% chlorhexidine gluconate) of the nail sulci post phenolisation. Some studies suggest that irrigation will dilute the phenolisation, however other studies suggest that irrigation has a benign effect. There may be a risk that irrigation results in contamination of the surrounding skin which may cause some phenol irritation or burns.

If the gloves of the podiatrist who carried out the procedure become contaminated by phenol or any bodily fluid, the podiatrist must undertake hand decontamination and apply another pair of disposable single use sterile glove, before applying the post-operative dressing.

7.5 After procedure and Dressing

- Remove the tourniquet to restore vascular supply to toe.
- Total tourniquet time should be calculated and recorded in patient record and should not exceed 20 mins.

- Capillary refill should be noted and recorded to confirm the circulation has been restored.
- Arrest any haemorrhage with a temporary non-adherent dressing and digital pressure to achieve haemostasis.
- If a heavy post-op haemorrhage has occurred an absorbent alginate haemostatic dressing can be used with leg elevation until any bleeding has been controlled.
- If there is significant strike through onto dressing then this can be removed and replaced or supplemented with additional absorbent dressings before the patient is discharged.

There is a wide range of studies relating to post-operative wound products, all claiming positive levels of success. This guideline does not recommend any particular dressing, but the principle of using dressings which create low levels of adhesion to the wound bed is encouraged.

7.6 Post-Operative Wound Care

The patient should be given a leaflet to advise them on their aftercare. This should include the emergency contact number and the date of their next expected re-dressing appointment (e.g. 3-5 days after the initial surgery). Patients who are deemed to be at higher risk may need several review appointments until wound healing is achieved, as per clinical judgement prior to discharge. Where appropriate, the low risk patient may be discharged ensuring they have received the appropriate post-operative leaflet giving instruction as to how to care for their wound. The clinician should ensure the patient has full contact details if they require to be further seen.

7.7 Patient Information Post Surgery

The following information should be supplied to the patient

- Details of the procedure that has been carried out
- Name of anaesthetic
- Amount of anaesthetic used
- Follow up appointment date
- Emergency contact information

The patient should be advised on, or supplied with, appropriate dressing materials and given information regarding a dressing's regime.

As a minimum:

- They should be advised not to drive a car or motorbike home, and not to drive whilst foot anaesthesia persists

- The patient should be advised that should the toe start to bleed through the dressing, the dressing must be left in situ but to apply extra dressings; layers of gauze over the top of the existing dressing, and rest with the foot and leg elevated above hip height.
- The toe should be kept dry and dressed until first the redress appointment, and thence kept clean and dressed until the wound has healed.
- The initial dressing may be large; the patient will need to use suitable footwear (e.g. a sandal) to accommodate the large dressing
- If the toe is painful after anaesthetic wears off, the patient can be advised to use a painkiller that would be effective to control headache, such as paracetamol. The patient should be advised that they should not exceed the maximum safe dose (2 x 500mg paracetamol, every 4 hours, to a maximum of 4g (i.e. 8 x 500mg tablets)) in any 24hrs.

8 Health and safety

A risk assessment should be carried out to maintain safety and plan for possible hazards in the pre- and post-operative periods. An emergency plan that details all likely risks and proposes their reasonable management should be in place and understood by all within the clinical area. A COSHH notice should also be available, and the clinical setting should have a written Health and Safety policy which must be specific to each clinic.

The health and safety policy should include risk planning and assessment in the following areas:

8.1 Infection prevention and control

The clinical area should have an infection control policy that details and addresses the specific infection risks that may be associated with nail surgery. Infection control planning should include details of how risk is assessed, appropriate strategies for resolution / reduction to allow the procedure to be safely carried out, and the maintenance of the sterile field and a clean clinical environment.

The procedure must adhere to a robust Aseptic Non-Touch Technique (ANTT), and aprons and appropriate personal protective equipment (PPE) must be worn.

8.2 Location/clinical environment

The clinical room must be clean and suitably prepared for nail surgery. The integrity of the general cleanliness of the clinical room should not be compromised by extraneous matter such as bags, coats and so forth. It is essential that the podiatrist can demonstrate an appropriate standard of general hygiene and hand washing to patients.

All personnel involved with the procedure should have arms bare from the elbow and all jewelry removed. Hand and arm washing (up to the elbows) using a recognised hand washing technique, should use a hand scrub preparation, maintained in skin contact for 5 minutes, rinsed off under running warm water, in the specific hand washing sink. Further details can be found in the clinical environment section of clinical standard 13 on The College of Podiatry website.

8.3 Stock /dressings

The expiry / use by dates on all stock items that are likely to be used during the procedure should be checked and be in date. Sterile packages should be checked that the outer covering is not torn or damaged. Details of all medical stock/dressings used should be recorded in the patient record. The patient can be issued with dressings with written advice regarding re-dressing procedure and future dressing appointment date. The practitioner should be certain that the patient has understood the post-operative dressing requirements and arrangements and record all details regarding dressings and patient advice must be detailed in the patient record.

8.4 Use of chemicals

The clinic should keep, in hard copy format, a folder containing Control of Substances Hazardous to health (COSHH) documentation, for all the chemicals and medicines used in the clinical area.

The correct procedures for nail ablation, should be understood by all in the clinical area.

The patient should have received information about the process of nail ablation and how this will affect the post-operative wound healing. Details of all chemicals used in preparation for and during the procedure should be recorded in the patient notes. These will include:

- The name of the skin preparation agents, their percentages and duration of application
- The name of the LA agent, its percentage, the volume administered (in ml) and the mass of drug delivered (in mg).
- The matrix ablating agent, its percentage, the duration of application
- The primary dressing and any drug it may contain

Detail regarding the disposal and storage and safe use of chemicals can be found in the infection control guidance of the clinical standard document. This is located on the standards of clinical practice on the College of Podiatry website.

8.5 Waste disposal

The Podiatrist is responsible for correctly assessing the type of waste generated and appropriately segregating all waste generated during the operative procedure. All waste will be classified as healthcare waste, but it is necessary to determine whether the waste produced from the procedure is infected or non-infected and process accordingly.

Sharps and chemicals must be disposed of correctly.

Please refer to the College of Podiatry waste guidelines, infection control guidelines 10 and local clinical policies and protocols.

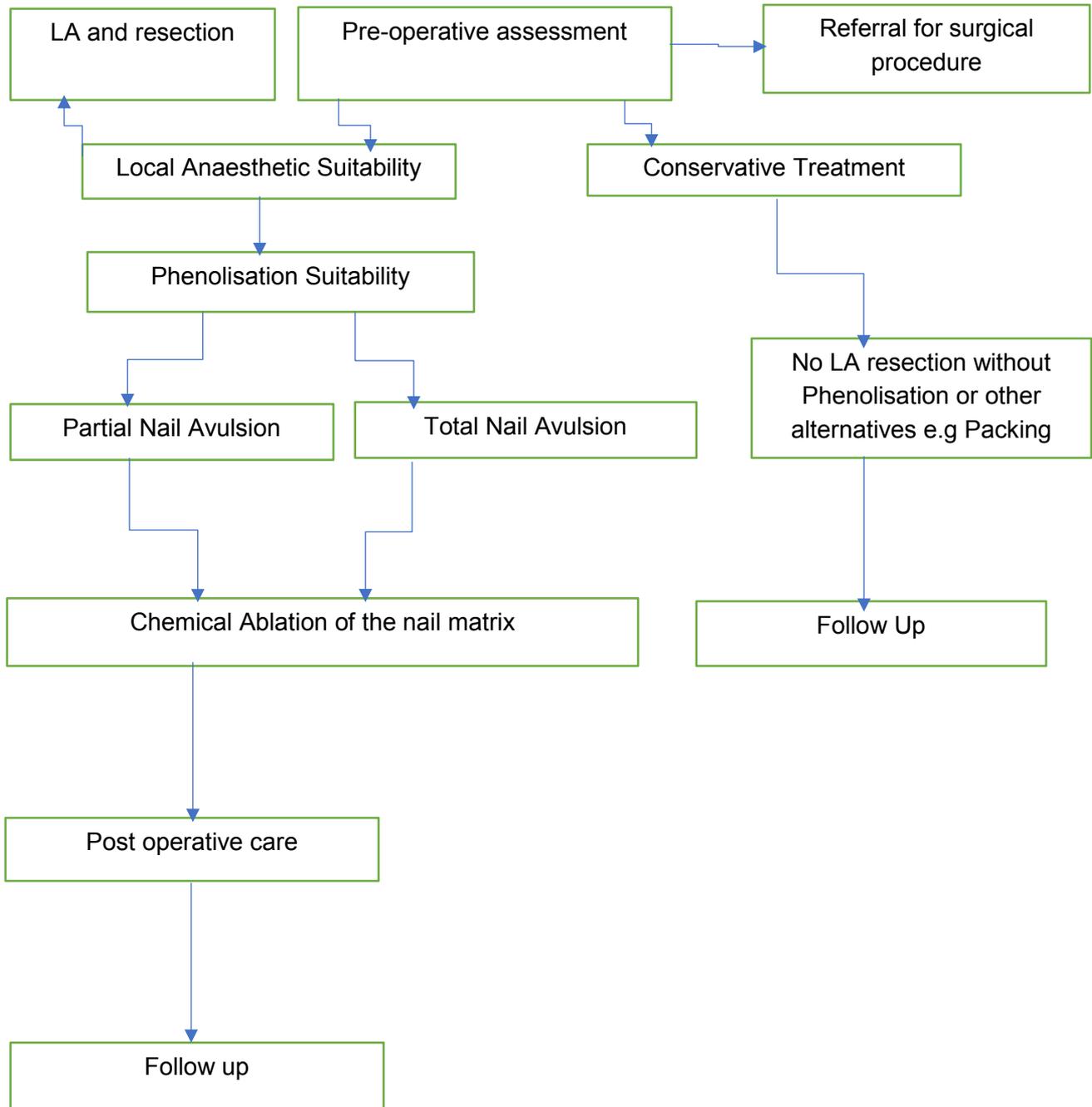
8.6 Working arrangement and diverse environments

Nail avulsion is a relatively safe and effective method of treating a number of nail pathologies. Whilst having assistance with such procedures is highly recommended, it is recognised that single-handed practice (but not lone working) may be necessary at times. Single-handed practice can be undertaken safely if the clinician identifies and minimises the risks associated with these procedures and undertakes proper planning and preparation by carrying out a fully documented risk assessment and emergency plan.

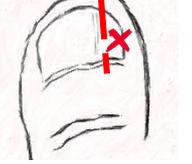
Important considerations for single-handed practice include:

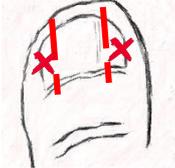
- Planned nail avulsion procedures should not take place in a lone working environment; another person should be on site and close enough to be able to assist in the event of an emergency
- Clear clinical risk assessments and emergency plans should be in place and familiar to all in the immediate environment
- Other staff / work colleagues should be informed that you are undertaking a nail avulsion prior to beginning any procedure
- Other staff (e.g. HCP / Admin / receptionist) should be in the immediate vicinity and able to respond to a call for help within 30 seconds
- Ensure the clinical area has a wall clock with a second hand that is positioned in the clinician's sight line

Appendix 1 Procedural Pathway



Appendix 2. Nail surgery procedures Understanding the options

 <h3>Having your whole nail removed</h3> <p>What will happen to me?</p> <ul style="list-style-type: none"> Your toe will be numbed using a local anaesthetic A tourniquet will be applied to stop your toe bleeding during the operation Your toenail will be completely removed A chemical called phenol may be applied. The table on the right explains your options. 	<table border="1"> <thead> <tr> <th>With phenol</th> <th>Without phenol</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td> <p>Advantages:</p> <ul style="list-style-type: none"> Your whole nail isn't expected to grow back This is the simplest procedure to carry out <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toe will take a bit longer to heal due to the larger wound Your procedure will take a little longer due to the time taken to apply phenol Your toe is more likely to become infected after the operation - especially when an infection was there before <p>Risks:</p> <ul style="list-style-type: none"> Around 10% of patients experience some regrowth, although very few require a further operation </td> <td> <p>Advantages:</p> <ul style="list-style-type: none"> Your operation won't take as long Your wound will heal more quickly than with phenol being applied <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toenail will grow back again <p>Risks:</p> <ul style="list-style-type: none"> There is a very high chance that your problem will happen again </td> </tr> </tbody> </table>	With phenol	Without phenol			<p>Advantages:</p> <ul style="list-style-type: none"> Your whole nail isn't expected to grow back This is the simplest procedure to carry out <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toe will take a bit longer to heal due to the larger wound Your procedure will take a little longer due to the time taken to apply phenol Your toe is more likely to become infected after the operation - especially when an infection was there before <p>Risks:</p> <ul style="list-style-type: none"> Around 10% of patients experience some regrowth, although very few require a further operation 	<p>Advantages:</p> <ul style="list-style-type: none"> Your operation won't take as long Your wound will heal more quickly than with phenol being applied <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toenail will grow back again <p>Risks:</p> <ul style="list-style-type: none"> There is a very high chance that your problem will happen again
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 <h3>Having one side of your nail removed</h3> <p>What will happen to me?</p> <ul style="list-style-type: none"> Your toe will be numbed using a local anaesthetic A tourniquet will be applied to stop your toe bleeding during the operation One side of your toenail will be completely removed A chemical called phenol may be applied. The table on the right explains your options. 	<table border="1"> <thead> <tr> <th>With phenol</th> <th>Without phenol</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td> <p>Advantages:</p> <ul style="list-style-type: none"> The part of your nail that has been removed isn't expected to grow back You are able to keep the rest of your nail Heals more quickly than having your whole nail off <p>Disadvantages:</p> <ul style="list-style-type: none"> This is a slightly more complicated procedure Your toe will still take a bit longer to heal than if phenol isn't applied Your procedure will take a little longer due to the time taken to apply phenol Your toe is more likely to become infected after the operation - especially when an infection was there before <p>Risks:</p> <ul style="list-style-type: none"> Around 10% of patients experience some regrowth, although very few require a further operation </td> <td> <p>Advantages:</p> <ul style="list-style-type: none"> Your operation won't take as long Your wound will heal more quickly than with phenol being applied <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toenail will grow back again <p>Risks:</p> <ul style="list-style-type: none"> There is a very high chance that your problem will happen again </td> </tr> </tbody> </table>	With phenol	Without phenol			<p>Advantages:</p> <ul style="list-style-type: none"> The part of your nail that has been removed isn't expected to grow back You are able to keep the rest of your nail Heals more quickly than having your whole nail off <p>Disadvantages:</p> <ul style="list-style-type: none"> This is a slightly more complicated procedure Your toe will still take a bit longer to heal than if phenol isn't applied Your procedure will take a little longer due to the time taken to apply phenol Your toe is more likely to become infected after the operation - especially when an infection was there before <p>Risks:</p> <ul style="list-style-type: none"> Around 10% of patients experience some regrowth, although very few require a further operation 	<p>Advantages:</p> <ul style="list-style-type: none"> Your operation won't take as long Your wound will heal more quickly than with phenol being applied <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toenail will grow back again <p>Risks:</p> <ul style="list-style-type: none"> There is a very high chance that your problem will happen again
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With phenol	Without phenol
	
<p>Advantages:</p> <ul style="list-style-type: none"> The parts of your nail that have been removed aren't expected to grow back You are able to keep the middle part of your nail • Heals more quickly than having your whole nail off <p>Disadvantages:</p> <ul style="list-style-type: none"> This is a much more complicated procedure It is not possible to perform this procedure on all toenails – many nails just aren't broad enough to remove both sides Sometimes the central part of the nail can separate from the nail bed during the operation, and the whole nail may have to be removed Your toe will still take a bit longer to heal than if phenol isn't applied Your procedure will take a little longer due to the more complicated process and the time taken to apply phenol Your toe is more likely to become infected after the operation - especially when an infection was there before <p>Risks:</p> <ul style="list-style-type: none"> Around 10% of patients experience some regrowth, although very few require a further operation You may need the central part of the nail removed at some point in the future if it becomes separated from the nail bed during the operation 	<p>Advantages:</p> <ul style="list-style-type: none"> Your operation won't take as long Your wound will heal more quickly than with phenol being applied <p>Disadvantages:</p> <ul style="list-style-type: none"> Your toenail will grow back again Sometimes the central part of the nail can separate from the nail bed during the operation, and the whole nail may have to be removed <p>Risks:</p> <ul style="list-style-type: none"> There is a very high chance that your problem will happen again

Having both sides of your toenail removed

What will happen to me?

- Your toe will be numbed using a local anaesthetic
- A tourniquet will be applied to stop your toe bleeding during the operation
- Both sides of your toenail will be completely removed
- A chemical called phenol may be applied. The table on the right explains your options.

Reference: NHS Greater Glasgow and Clyde Podiatry Service 2017.

Appendix 3. Consent Form

Practice Name

**Patient agreement to investigation or treatment
where the patient has capacity to consent**

Patient's surname
 First name
 Date of birth

Name of proposed procedure or course of treatment (use lay terms whenever possible)

I am satisfied that the patient has capacity

I have explained the procedure and what it will involve to the patient. In particular, I have explained; the following intended benefits:

and the following serious or frequently occurring risks:

I have explored the patient's particular circumstances and I note the following matters which may be relevant to this patient's decision making:

I have also discussed the benefits and risks of the following available alternative treatments:

I have answered any particular concerns the patient had and I have explored their reasons for deciding to proceed with this treatment.
 I have advised the patient of the anticipated recovery period and of any restrictions which apply during that period. In particular I have advised the patient that they must not drive while their foot is anaesthetised as it creates an unacceptable risk to them and to third parties. I have also advised that their insurance may be invalid if they drive in these circumstances.
 I have recorded the key aspects of my discussions with the patient in the clinical records.

Signed (Podiatrist) Date / /

Name (PRINT)

To be completed by the patient
 I confirm that the above procedure, potential side-effects and complications, have been explained to me; that I have been advised of alternatives to this procedure, including no treatment. I have been warned that I must not drive whilst my foot is still anaesthetised where this is applicable. I wish to go ahead with the procedure.

Patient's signature Date / /

Name (PRINT)

To be completed by the podiatrist on the day of the procedure
 Confirmation of consent: I have confirmed with the patient that s/he has no further questions and wishes the procedure to go ahead

Signed (Podiatrist) Date / /

Name (PRINT)

Patient with Capacity Consent Form

Patient Name:

DOB:

Please find further details regarding consent on the College of Podiatry website under Standards of clinical practice.

Appendix 4

Instruments for nail surgery must be sterile at point of use and used within a sterile field.

List of instruments

Thwaites Nail Splitter

Halsted Mosquito Artery Forceps

Beaver Mini Blade Handle

Nail Elevator

Tubegauze Applicator

Scissors

Blacks Nail File

Polypropylene Tray, Integral Pots

Sterile drapes (where possible)

Disposable apron or clinical blues

Sterile gloves

Safety glasses, goggles, visor mask

Mask

Sterile cotton bud pack

Tourniquets

Liquefied phenol BP

Small syringe

Glycerine

Sharps box

Haemostatic dressing

Non-adherent dressing

Sterile gauze

Mefix

Appropriate size tubegauze – 01 and 12

Appendix 5. ASA grades

The ASA (American Society of Anaesthesiologists) [Physical Status Classification System](#) is a simple scale that describes an individual's fitness to undergo anaesthesia. The podiatric use of an ASA grading for patients needing nail surgery awards a standardised classification to patient risk status. It may also be useful as part of audit, as well as informing the decision for onward referral to the acute setting / MDT or for an alternative nail procedure.

The ASA states that it does not endorse any elaboration of these definitions. However, anaesthetists in the UK often qualify (or interpret) these grades as relating to functional capacity - that is, the presence of comorbidity that does not (ASA 2) or that does (ASA 3) limit a person's activity.

A podiatric patient undergoing routine nail surgery would usually be expected to have an ASA1 / 2 grading. Routine nail surgery should be avoided, if possible, on ASA3 patients. ASA 4/5 patients are unsuitable for routine nail surgery.

The care of those ASA3 and 4 patients who are in urgent need of essential nail surgery should be undertaken in a hospital setting within the umbrella of care provided by the multi-disciplinary team (MTD).

ASA 1	A normal healthy patient
ASA 2	A patient with mild systemic disease
ASA 3	A patient with severe systemic disease
ASA 4	A patient with severe systemic disease that is a constant threat to life
ASA 5	Moribund patient who is not expected to survive 24 hours with or without surgery

Appendix 6. Guidance for the Management of Anaphylaxis

If a patient has an anaphylactic reaction, the symptoms may include:

- generalised urticaria,
- angioneurotic oedema of the eyes, face, mouth and tongue
- bronchospasm
- severely reduced blood pressure
- cardio-respiratory collapse

If confronted with these, or any other symptoms that may suggest the onset of anaphylaxis, the following principles should be followed:

Check ABCDE's – Note time

- Airway: obstructed or narrowed
- Breathing: increased rate; laboured; rasping; gurgling; absent
- Circulation: pulse rate, quality, regularity; tissue colour; blood pressure
- Disability: review and treat ABC's as required
- Exposure: expose trunk to observe any systemic urticarial; note skin and mucosal changes; minimise heat loss; maintain patient dignity

Diagnosis – Look for

- Acute onset of illness
- Life threatening problems
- Airway; swelling, hoarseness, stridor
- Breathing; rapid, wheeze, fatigue, cyanosis, confusion, absent
- Circulation; pale, clammy, hypotension, faintness, drowsy, pulseless

Call for help – Note time

- If anaphylaxis suspected administer adrenaline to upper lateral thigh – note time
- If necessary commence CPR as per www.resus.org guidelines

- If no improvement after 5 minutes, administer second dose of adrenaline to upper lateral thigh – note time
- If necessary, continue with CPR
- If no improvement after 5 minutes, administer 3rd dose adrenaline to upper lateral thigh – note time
- If necessary, continue with CPR until specialist help arrives

Dose of Adrenaline

Adrenaline	Intramuscular	1:1000
Age	Dose	Volume
Adult	500 micrograms	0.5 ml
Child > 12 years	500 micrograms	0.5 ml
Child 6 – 12 years	300 micrograms	0.3 ml
Child < 6 years	150 micrograms	0.15 ml

Prior to Surgery		During Surgery		Before the Patient leaves the	
Has the patient confirmed their Identity?	<input type="checkbox"/>	Prior to injection is the correct toe marked?	<input type="checkbox"/>	Has the amount of anaesthetic used been logged and the information provided in the form of a post-operative advice leaflet?	<input type="checkbox"/>
Has the procedure been discussed with the patient and confirmed?	<input type="checkbox"/>	After injection - How is the patient? Are there signs of anaphylaxis?	<input type="checkbox"/>	Has the post-operative care plan been reiterated with the patient?	<input type="checkbox"/>
Has the consent form been explained and signed?	<input type="checkbox"/>	Has the marked toe been cleansed and Tourniquet applied?	<input type="checkbox"/>	Is the patient fully aware of the post-operative management? Salt bathing/Dressing procedure/signs and symptoms of clinical infection?	<input type="checkbox"/>
Has the medical history or medication list been checked for any changes?	<input type="checkbox"/>	Has the application time of the tourniquet and phenol been appropriately logged?	<input type="checkbox"/>	Has the first dressing appointment been confirmed with the patient?	<input type="checkbox"/>
Has the patient had any anaesthetic in the last 24 hours?	<input type="checkbox"/>	Has haemostasis been achieved before dressings applied?	<input type="checkbox"/>	Does the patient have any further questions?	<input type="checkbox"/>
After the surgery has been confirmed and consent gained, has the surgery sight(s) been marked?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Has the maximum safe dosage of the patient been adjusted to account for weight if the patient is below 70kgs?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Does the patient have any allergies?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Does the patient require an inhaler?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Does the patient require blood pressure monitoring prior to surgery?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Nail Surgery Checklist

Based on the surgical checklist created by WHO 2008. Ref City Health Care Partnership CIC

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Existing nail surgery guidelines consulted in the preparation of this document

NHS Greater Glasgow and Clyde Podiatry Service.

Northamptonshire Healthcare Foundation Trust

Oxford Health NHS Foundation Trust

City Health Care Partnership CIC

Leicestershire County and Rutland

Salford Royal NHS Foundation Trust

Shropshire Community Health NHS Trust

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