MANAGEMENT OF RAYNAUD'S PHENOMENON

1. Establish diagnosis and identify any underlying cause amenable to treatment (1)

Establish whether primary or secondary
If secondary, establish underlying cause, possibilities including:

Connective tissue disease e.g. systemic sclerosis (SSc)-spectrum disorder
Hand-arm-vibration syndrome
Extrinsic vascular compression e.g. cervical rib
Intravascular problems e.g paraproteinaemia
Drugs or chemicals (e.g. beta-blockers, vinyl chloride)

Determine severity: summer as well as winter, functional impairment, current or previous digital ulcers?

Establishing the diagnosis will be informed by:

a. History (including full systems enquiry, drug, family and occupational history)
b. Examination (especially of the hands and face)
c. Investigations:

1. Minimal list (when history and examination strongly suggest primary Raynaud's phenomenon): full blood count (FBC), erythrocyte sedimentation rate (ESR) or C-reactive protein (CRP), antinuclear antibody (ANA) and capillaroscopy
2. 'Usual' list: in addition to 'minimal' list urea and electrolytes (U&Es), liver function tests (LFTs), bone biochemistry, thyroid function tests (TFTs), creatine kinase (CK), immunoglobulins (Igs), C3 and C4, chest (or thoracic outlet) X-ray
3. Other investigations when index of suspicion high, may include:

Autoantibodies: anticentromere, anti-topoisomerase, anticardiolipin, anti-beta2-glycoprotein

4. Fasting lipid profile
5. Thermography (specialist centres only)

2. General/lifestyle measures

a. Patient education. Includes:

Avoid cold exposure and changes in temperature
Keep warm: wear layers of clothes, hand warmers, gloves (including electrically heated, silver)
Paraffin wax
Stop smoking

b. Complementary therapies

Many patients elect to try a number of complementary therapies for Raynaud's phenomenon, including vitamin C, vitamin E, gamolenic acid, gingko biloba, acupuncture and biofeedback (2). Physicians need to be aware of this and actively enquire about these: there may be potential pharmacological interactions with some of these therapies.

c. Useful sources of information:

http://www.raynauds.org.uk/
http://www.sclerodermasociety.co.uk

3. Drug therapy: first line

First line drugs are the calcium channel blockers (CCB), angiotensin receptor blockers (ARB) and selective serotonin re-uptake inhibitors (SSRI). Alpha blockers, angiotensin converting enzyme (ACE) inhibitors and topical nitrate therapy should also be considered.

Some examples, with usual adult dose ranges, are as follows:

CCBs: Nifedipine SR 10mg bd → 40mg bd, amlodipine 5mg od →10mg od, diltiazem 60mg bd→120mg bd (3,4)
ARBs: Losartan 25mg od→100mg od (5)
SSRIs: fluoxetine 20mg od (especially useful in patients prone to vasodilatory side effects) (6)
Alpha-blockers: Prazosin 500 micrograms bd → 2mg bd (7)
ACE inhibitors: Lisinopril 5mg od→ 20mg od (8)

4. Antiplatelet and/or statin therapy

These may be considered as adjunctive therapy, especially in patients with concomitant risk factors (e.g. positive anticardiolipin antibodies, cardiovascular risk factors) (9).

5. Drug therapy: refractory

IV prostanoid therapy should be considered especially in patients with SSc-spectrum disorders, and particularly in cold weather/onset of winter. Iloprost (10,11) and epoprostenol (12) are most commonly used:

IV iloprost. 3-5 days 0.5ng-2ng/kg/min for 6 hours

Oral vasodilators prescribed for Raynaud's phenomenon are generally discontinued for duration of infusion.

6. Phosphodiesterase (PDE)5 inhibitor

May be indicated in refractory disease.

Some examples, with usual adult dose ranges, are as follows:
Sildenafil 20mg / 25mg tds → 50mg tds (13,)
Tadalafil 10mg alternate days → 20mg od (14)

MANAGEMENT OF DIGITAL ULCERATION

1. Establish diagnosis early

Patients should be asked to report ulcers early to allow prompt intervention before the ulcer has enlarged and/or become secondarily infected.

2. Treat any contributory cause

Any contributory cause/complicating factor should be identified and treated, the main examples being:

Infection (including osteomyelitis): Systemic antibiotics (oral or IV depending on severity). Flucloxacillin appropriate first choice, but depends on swab sensitivities. Osteomyelitis requires long term antibiotics – MR scanning may detect osteomyelitis at an early stage.

Underlying calcinosis: Rarely this may require debridement if other digital ulcer healing measures are unsuccessful.

Large (proximal) vessel problems: Angioplasty/surgical revascularisation may be required

Vasculitis/coagulopathy e.g. antiphospholipid syndrome. These are rare, but if present require specific treatment.

Smoking: Smoking cessation.

Exacerbating therapies e.g. beta-blockade: These should be discontinued where possible.

3. Optimal wound care and analgesia

This depends on severity of the ulcer: strive for balance in dry / wet for best wound healing.
If wet, strive to dry e.g. alginates (e.g. Suprasorb), antimicrobials (e.g. Aquacel Ag)
If dry, strive to wet e.g. hydrogel (e.g. Intrasite gel), hydocolloids (e.g. Duoderm)

Analgesia: opiates may be required in the short term.

4. Optimise oral vasodilators or IV prostanoids

Choice of treatment depends on severity.

If outpatient management is appropriate, then oral vasodilator therapy should be optimised either by increasing the dose or substituting/adding alternative vasodilator therapy (see Raynaud's phenomenon algorithm).

In severe cases admit patients for IV prostanoid treatment – consider continuous / extended courses in refractory cases.

5. Consider surgical debridement in patients with necrotic tissue or underlying calcinosis

Surgical debridement should be considered if the ulcerated area is extremely painful / tender or if there is necrotic tissue.

6. Antiplatelet and/or statin therapy

These may be considered as adjunctive therapy (9). Clopidogrel may be preferable to aspirin as many patients have upper gastrointestinal problems.

7. Repeat IV prostanoids or PDE5 inhibitor or endothelin-1 receptor antagonist (ERA)

Repeat IV prostanoid and/or PDE 5 inhibitor may be beneficial in patients with non-healing, recalcitrant ulcers (11, 12, 15).

In patients with recurrent ulcers, bosentan is licensed to reduce the number of new ulcers: 62.5mg bd for 4 weeks then 125mg bd (requires blood monitoring) (16).

8. Consider surgical sympathectomy

Digital (palmar) sympathectomy may benefit patients unresponsive to the above measures, although this is performed only in certain centres. Rarely digital amputation may be required, for the patient unresponsive to all the above measures.

MANAGEMENT OF CRITICAL DIGITAL ISCHAEMIA

1. Establish diagnosis and identify any treatable contributory cause

Patients should be asked to report any permanent finger/toe discolouration *early* to allow prompt intervention before progression to irreversible ischaemia/gangrene.
Any concomitant pathology which could be contributory should be identified, specifically: large (proximal) vessel disease, vasculitis, coagulopathy, thromboembolism, smoking. Investigations may include echocardiogram, angiography, cryoglobulins, immunoglobulins and protein electrophoresis.

2. Treat any contributory cause

Large (proximal) vessel diseae: Angioplasty/surgical revascularisation may be required.

Vasculitis/coagulopathy/thromboembolism. These are rare, but if present require specific treatment.

Smoking: Smoking cessation (17).

3. Admit for IV prostanoid and analgesia

IV prostanoid treatment: Consider continuous / extended courses.
Analgesia: Opiates will most likely be required in the short term.

4. Antiplatelet therapy

Most clinicians prescribe antiplatelet therapy in this acute setting. Clopidogrel may be preferable to aspirin as many patients have upper gastrointestinal problems.

5. Consider statin

Consider short term high dose statin therapy (as is prescribed for other acute vascular events e.g. acute coronary syndrome) (18).

6. Antibiotic if any possibility of infection

Critically ischaemic digits are often infected, and so there should be a low threshold for giving antibiotics.

7. Optimise oral vasodilator therapy (consider PDE5 inhibitor)

Maximise oral vasodilator therapy, including vasodilators in combination. PDE5 inhibitor therapy should be used where first line therapy is inadequate.

8. Consider digital sympathectomy

Digital (palmar) sympathectomy may confer benefit, especially if there is a concern that ischaemia is progressing or may be extending to involve other digits.

9. Surgical debridement if necrotic tissue

Surgical debridement or amputation should be considered if the ischaemic area has progressed to necrosis. However, gangrene of the finger-tips may autoamputate.

10. Short-term anticoagulation

Consider heparinisation if ischaemia progresses despite all other measures and/ or other digits become involved.

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