

CHAPTER 16 - DERMATOLOGY

1 INTRODUCTION

There are a number of dermatological conditions which are disqualifying initially from an Aviation Medicine point of view.

Most of the conditions are treatable to a level where Class 1 and 2 certification is possible. There are a few specific lesions which are disqualifying.

Some skin conditions are a manifestation of a more serious medical disorder which must be identified and treated before certification can be considered.

There are some acute dermatological conditions that are caused by infection. This can be bacterial, viral or mycotic. Some acute conditions can be caused by allergy, parasites or insect bites. When some acute problems occur, a pilot has to be assessed as temporarily unfit and treated. Where possible a cause must be found, to prevent a recurrence. Some severe allergic responses can be fatal should they recur. Insect stings or bites are perhaps the most common cause in this category.

Some dermatological disorders can be disfiguring, which whilst not in itself causing a safety problem, may present in such a way as to upset others on the flight deck, and amongst the cabin crew. These cases require handling with common sense and tact if they are to be dealt with sympathetically and fairly.

The advent of higher speed air travel and the ease with which deck crew reach and stay in summer climates, has resulted in a greater increase in skin lesions caused by UV light in fair skinned people. These lesions need careful identification so as not to miss a malignant melanoma or a squamous cell carcinoma. Both of these lesions have the ability to metastasise, a melanoma more so than a squamous cell carcinoma. Diagnosis can only be made by biopsy.

The one condition which occurs quite commonly is a 'basal cell epithelioma', sometimes called a 'basal cell carcinoma' or rodent ulcer. It is a low grade skin tumour which confines itself to the skin and does not metastasise.

Those authorities who rigidly apply their regulations in order to maintain standards often put the 'Basal Cell Epithelioma' into the Malignant Tumour Section, which can be disqualifying. Such a condition is not disqualifying as it causes no risk and cannot compromise flight safety. This particular skin lesion serves as a good example to remember when considering all of the disorders discussed in these guidance notes.

The AMEs/AMCs/AMs must use a great deal of common sense and logic at all times, but especially in this section, where a small skin lesion can cause a great deal of trouble, such as a malignant melanoma, whereas a large plaque of Psoriasis whilst being disfiguring is not a compromise to flight safety.

2 ECZEMA (EXOGENOUS, ATOPIC, VARICOSE, SEBORRHOEIC, NUMMULAR AND POMPHOYLX)

2.1 Definition

The terms 'eczema' and 'dermatitis' tend to be used synonymously, eczema being commoner in Europe and Asia and dermatitis in the United States. Eczema is derived from the Greek word

ekzeim meaning to boil over or break out, and in this chapter eczema will be used in preference to dermatitis.

Eczema denotes a special sequence of inflammatory changes in the skin, which though similar can vary from patient to patient. Likewise the clinical features can vary depending on the severity and/or chronicity of the disease and site involved. The principal signs are redness, swelling, blisters (large or small), scaling which may be loose and thin, or thick (hyperkeratosis), exudation of serum, which may be severe leading to weeping, or moderate and mix with the scales of the skin to form crusts. Fissures or splits may occur particularly on the palms or soles. Thickening of the skin referred to as lichenification is particularly likely to occur due to continued scratching in atopic eczema. Changes in pigmentation may occur, and this may be seen as hyper- or hypopigmentation. This physical sign is most apparent in coloured people and is sometimes the most obvious sign of the eczema. Purpura or bleeding into the skin is not common but may occur after continual scratching, particularly on the legs.

The appearance of any particular case of eczema may include one or two, or several of the above features, and thus one case of eczema may vary from another. In addition, the eczema in an individual patient may vary from one site of the body to another.

It should be emphasised that eczematous changes in the skin are completely reversible, and it is often helpful for the physician to be able to stress this point when the pilot consults him. In aircrew it is always advisable to assess as temporarily unfit the pilot until the acute phase is over.

2.2 Classification

The classification of eczema is difficult and not very satisfactory. This is because in the past some of the terms given to eczema have been based on the appearances of the eruption, while others have been based on so-called aetiological factors, or specific sites of eruption. Thus there has been considerable overlap in the terminology, one type of eczema having three or four names depending upon which criteria the name was given.

At the present time the eczemas are divided into two main groups. First, that in which the eczema is due to specific external factors, the eczema sometimes being termed exogenous. The subdivision is particularly important because if the exogenous factors are identified and avoided, this in itself may result in a cure.

Unfortunately the lesions of exogenous eczema are identical to those of endogenous eczema. However the distribution of the eczema, the occupation of the patient, and direct questioning concerning self-medication with topical preparations and cosmetics etc. may well give a clue to exogenous factors. In some instances such as nickel eczema, or clothing eczema, the distribution and localisation of the eczema suggests the diagnosis.

Exogenous eczema is usually subdivided into:

- a true allergic or contact eczema, in which the patient has an allergy to a certain substance; and
- b irritant eczema in which a substance damages the skin directly.

Until we understand more about endogenous eczema the classification will have to remain arbitrary, based on clinical criteria, and the classification below has been found to be the most useful.

a *Atopic eczema*

This is the commonest type of eczema seen in childhood, and is often associated with a family history of asthma and hay-fever.

b *Seborrhoeic eczema*

This derives its name from the fact that the sites involved are those with the greatest sebum production per area of skin surface, e.g. scalp, face, back and chest.

c *Nummular or discoid eczema*

Derives its name from the clinical appearances, i.e. it occurs as small circumscribed areas of eczema.

d *Varicose or hypostatic eczema*

This is the eczema on the lower leg associated with impaired venous drainage of the limb.

e *Pompholyx eczema of the hands and feet (dyshydrotic eczema, prickly heat)*

This tends to be symmetrical occurring on the palms and soles, sides of the digits and their dorsal surface over the distal two phalanges. This is quite common in aircrew and is often associated with changes in temperature and humidity and heavy sweating.

Any type of eczema (endogenous or exogenous) may lead to spread of the eruption with more general involvement of the skin, which if it becomes complete is referred to as erythroderma or exfoliative dermatitis.

3 EXOGENOUS ECZEMA

3.1 General considerations

Eczemas in this group are due to the skin coming into contact with chemicals, natural or synthetic. There are certain clues which may be present and should be looked for in establishing a diagnosis of exogenous eczema. In the early stages a sharp delineation between the affected skin and the normal skin may be apparent. Some sites are more commonly affected than others and there are three factors which determine these sites of exogenous or contact eczema. First, certain parts of the body are more likely to be in contact with chemicals e.g. hands, face, neck, and genitalia (by transference of the chemicals from the hands). Secondly, the thickness of the skin – if the hands are exposed to the chemicals, the eruption is more likely to appear first on the back of the hands than on the palms, because the skin is thinner on the back and the chemicals more easily absorbed. Thirdly, the absorption of chemicals into the skin is enhanced by moisture and thus parts of the body which secrete large amounts of sweat, or where the evaporation of sweat is impaired by opposing skin surface and lack of air (e.g. groins, axillae and flexures of the limbs) are more likely to be affected. This point is well illustrated by contact eczema due to stockings in which the eruption first appears on the feet and popliteal fossae due to greater absorption of the allergen into the skin at these sites. This condition may arise at any time in Aircrew, and may require a temporarily unfit assessment during the acute phase or until the cause is found.

a *Spread*

The eruption in contact eczema ranges from a faint erythema to an acute blistering. It should always be borne in mind that eczema may subsequently appear at other sites of the body which have not been directly in contact with the chemical. This spread of the eczema may be due to 'autosensitisation' from the primary eczematous skin or due to absorption of the exogenous chemicals which affect the skin at distant sites. Although this secondary spread of eczema may occur to any part of the skin, it has a tendency to spread to certain sites with some allergens. For example, eczema due to nickel sensitivity frequently spreads to the skin around the eyes and the ante-cubital fossae. This may be the presenting pattern to the physician. At present the factors which cause eczema to spread to secondary sites

are not fully understood but some eczemas spread after a matter of days and others only after months or even years, with continuing eczema at the primary site.

b *Cause*

The cause of contact eczema may be primary irritant (non-allergic) or an allergenic (sensitising) agent.

3.2 **Primary irritant eczema**

Substances which cause this type of eczema may be divided into two classes.

a *Strong*

These are usually caustic substances that air crew may come into contact with at work, such as strong acids or alkalis, or chemical solvents. These are likely to produce eczema after only one or two exposures, usually as a result of inadequate protective precautions at work or, if the exposure occurred at home, of ignorance of the possible hazard. The commonest sites are the hands or face. It is not practicable to give a comprehensive list of these strong caustic substances but the patient's occupation or hobbies will usually offer confirmatory evidence if the diagnosis is suspected.

b *Weak*

There are substances not caustic or directly damaging to the skin but which after prolonged or repeated exposures will induce eczema. In this category comes the commoner skin complaints, continual exposure to detergents, hands in water too frequently with inadequate drying and cold windy conditions. Various solvents, degreasers and abrasives encountered in the patient's occupation can also cause this type of eczema. Other factors, such as humidity, trauma, dryness of the skin, sweating and secondary infection may all play a part in this type of eczema.

Once again the commonest site is in the hands. In the mild form the skin is dry and scaling with slight erythema, but in the more severe and chronic forms there is thickening of the skin (hyperkeratosis) and splits or fissures. The back and palms of the hands tend to be equally affected.

3.3 **Allergic contact eczema**

There are numerous chemical substances with which we come into contact in our everyday life that are capable of sensitising the skin so that eczema occurs. Why some patients develop an allergy to chemicals and others do not is as yet unknown. The number of known skin allergens is now so numerous that mention will be made only of the commoner substances likely to cause contact eczema. Such allergy can be tested for by patch testing. Hence small samples of suspected items and of common offending allergens in pure form are applied under standardised conditions onto the patient's back. The carefully marked areas are then read at 2 and 4 days. Interpretation of such results is not always straight forward and patch testing is best performed in a specialised developing unit. 'User' testing can however be helpful – e.g. suspected cream can be rubbed into the same area on the forearm daily – a positive reaction sometimes taking several days to be obvious.

a *Rubber and elasticised garments*

Rubber gloves and suspenders frequently cause eczema but any article of clothing with rubber or elastic can have a similar effect.

b *Metals*

Nickel is the commonest metal to cause sensitivity, and is most frequently found in suspenders, jewellery clips and brassiere clips.

c *Dyes*

Dyes in clothing and shoes can all cause contact eczema. Hair dyes are also a common cause of trouble.

d *Cosmetics*

There are various organic chemicals and preservatives in cosmetics which can sensitise patients. Substances in face creams, moisturisers, lipstick, eyeshadow, and nail varnish can all cause contact eczema.

e *Leather*

Chemicals in the leather or used in the tanning process can sensitise patients, and this may present as eczema due to a hatband, shoes or watch strap.

f *Therapeutic Preparations*

i Topical Local Anaesthetics

Local anaesthetics are not infrequently found in creams and ointments prescribed by doctors for irritating conditions particularly pruritus ani and haemorrhoids. It should be remembered that these substances are potent sensitisers and if eczematous changes occur contact eczema to these substances should be excluded by stopping their use and/or by patch tests.

ii Topical Antihistamines

Although these substances are widely prescribed and easily obtainable from a chemist, there are many dermatologists who consider that there are no indications for their use. Antihistamines applied topically have a high incidence of sensitisation and acute eczema after their use or exacerbation of an existing skin condition suggests sensitivity.

iii Topical Antibiotics and Antiseptics

Neomycin and soframycin are probably the commonest topical antibiotics to cause sensitisation. If either of these is used combined with a topical steroid the diagnosis of a contact eczema may still be difficult as the steroid suppresses the response to sensitisation. If eczema is proving particularly chronic or shows exacerbation after the use of these substances, patch tests to the antibiotics should be carried out. Acriflavin, still a commonly used antiseptic, often causes contact eczema.

iv Patients may become sensitive to ear drops and eye drops which are particularly common offenders. The diagnosis is suggested by exacerbation or persistence of an eczematous condition or by appearance of eczema in addition to the condition which is being treated with the drops. Lanolin sometimes used in medical ointments and in a number of cosmetics can also give rise to sensitivities in some patients.

Preservatives are now necessary additives to ensure the sterility of creams and can cause sensitisation. e.g. parabens and benzalconium.

3.4 Treatment and management of contact eczema

The most important point in the management of contact eczema is to prevent further exposure of the skin to the substance which is responsible for the reaction. If this is done, no further treatment

may be required. If further exposure is not prevented then there is no treatment which will keep the patient clear of eczema.

a *Topical therapy*

Only bland and non-sensitising substances should be used. Topical antihistamines and local anaesthetics should be avoided. Most severe cases should be referred.

b *Systemic therapy*

c *Corticosteroids*

These are required, and justifiable, only in a small number of patients with contact eczema in whom the eruption is very extensive and acute.

d *Antibiotics*

Not infrequently acute eczema becomes secondarily infected. If so a broad spectrum antibiotic should be given by mouth.

e *Antihistamines and sedatives*

An acute eczema is very irritating and causes a great deal of discomfort. Oral antihistamines taken daily are helpful because of their anti-pruritic and hypnotic action. Care must be taken when these preparations are prescribed as the sedentary effects may take some time to wear off.

It should be emphasised that the changes occurring in the skin in eczema are completely reversible, and it is often helpful for the physician to be able to stress this point when the pilot consults him. In aircrew it is always advisable to assess as temporarily unfit the pilot until the acute phase is over.

4 ENDOGENOUS ECZEMA

4.1 Atopic eczema

a *Symptoms*

Although usually seen in children it can occur in adults and involve any part of the skin. This type of eczema is associated with a personal or family history asthma or hay fever. The name implies an allergic eczema. The exact cause is unknown but is becoming more common.

It usually presents in childhood but 5% of cases may persist into adult life. A smaller percentage will develop asthma or hay fever in early adult life.

The condition has been largely screened out of the military pilot population, but cases can and do occur in the growing younger civil pilot population.

b *Treatment*

Topical steroids are only 'suppressive' not curative. Topical or systematic antibiotics may be needed to cure secondary infection. Antihistamines may be required in the acute irritating phases. It may be best to assess as temporarily unfit the pilot or crew member until the acute phase is over. Hay fever or asthma, if it develops, usually responds to modern inhalers of local steroid bronchodilators and only rarely is depot steroid injection necessary.

4.2 Varicose eczema and ulceration

a *Symptoms*

This condition is seen in older aircrew and is due to venous stasis. Varicose veins may be present, but there are other causes of venous incompetence, such as deep vein conditions. A previous thrombophlebitis may predispose to this type of eczema. The commonest site is the medial side of the lower leg above the malleolus. It usually begins with a red itchy scaly patch. In severe cases it may breakdown and become infected.

b *Treatment*

It can be a serious problem in long haul aircrew. Changes in pressure and temperature do not help healing. A temporarily unfit assessment may be necessary with some investigation into the cause with doppler flow studies possibly leading to surgery as the only way to stabilise and cure the condition. Early varicose veins should be treated in all aircrew to prevent such eczema or ulceration developing. Many aircrew play down the importance of varicose veins and varicose eczema. The AME should always check the condition and see if there has been any change in any early varicose vein development.

4.3 Seborrhoeic eczema

a *Symptoms*

Eczema is confined to areas of maximal grease secretion – the scalp, eyebrows, moustache, naso-labial folds and ears. More rarely the great flexures and central chest and back can become involved. Secondary infection is quite common. Most authorities now believe that *Pityrosporum* yeasts are the most significant trigger for the eczema. These yeasts feed on skin lipids and their numbers increase with humidity, after antibiotics and with lowered immunity. Predisposed individuals develop eczema in response to a high enough population.

This is an endogenous type of eczema. The term 'seborrhoea' can be misleading as it is not always present. Whilst the exact cause is unknown it can be precipitated by overwork, lack of sleep and fatigue.

The problem in professional aircrew is that it can disturb other crew and passengers.

It can be present as a diffuse scaly condition of the scalp or around the ears, hence the disagreeable appearance. It can also cause severe intertrigo of the axilla or groin areas with resulting pain, irritation and discomfort.

b *Treatment*

Topical steroids with anti fungal medication can be used with great success for intertrigo. The scalp eczema may resolve with the better 'dandruff' shampoos, zinc pyrethione, sulphur and imidazole containing shampoos curtail the yeast population.

When the condition develops it should be treated as soon as possible. A temporarily unfit assessment may be necessary until the condition becomes socially acceptable in appearance.

The Intertrigo form tends to be seen in overweight aircrew, so weight control is important to prevent opposing skin surfaces from chaffing. Proper laundry helps to reduce clothing abrading already affected areas. Handwashed underclothes in the Hotel sinks is a well known cause for the Intertrigo form of eczema.

4.4 **Nummular eczema**

a *Symptoms*

This form of endogenous eczema occurs in young and middle aged adults, particularly in those with dry skins. It can last for several months on the exterior surfaces of the limbs, occasionally all over the trunk but eventually tends to clear.

It can occur very quickly and the skin can breakdown.

b *Treatment*

This will require a temporarily unfit assessment until the condition stabilises and dries. Steroid topical creams should be used. Return to flying status depends on the general skin condition and the routes flown. The skin condition will improve without extremes of temperature and humidity.

4.5 **Pompholyx eczema**

a *Symptoms*

This type of condition is for some reason becoming more common. It is characterised by the skin bubbling either on the hands or feet. It can be aggravated by extensive sweating. It tends to occur in 'attacks' which run a self limiting course of two and four weeks. It can become chronic if not treated properly. Severe cases in aircrew can be very uncomfortable especially if affecting the hands, with extreme tenderness and skin cracking.

b *Treatment*

A temporarily unfit assessment in severe cases may be necessary with topical steroid and antifungal treatment. Antihistamines may be necessary if there is irritation. The usual precautions are necessary when taking antihistamines.

5 **PSORIASIS**

5.1 **Symptoms**

This is a common skin disorder which affects approximately 2% of all races at some stage in their life.

It is frequently seen in aircrew, and can run a life long benign chronic course. Chloroquine and its derivatives can some times precipitate or aggravate Psoriasis. In those aircrews who need anti malarials, questions should always be asked about any skin conditions.

The commonest age of onset is between fifteen and thirty years. Care must be taken in the selection of aircrew who may present with some form of the condition at pre-employment or first licensing medical examination.

What can be a minor condition can develop into a severe discoid type which whilst it may not cause any physical limitation in younger aircrew, it could present a social problem from scaling, in appearance, or itching and scratching and so on.

Its distribution and presentation are well known. When on the knees, elbows and sacral region, this may be acceptable, but it can appear on the scalp or the hands. It may then be unacceptable until treated. The nails when affected may also not be acceptable for others to look at.

5.2 Treatment

It is not an easy condition to treat. Friction and scratching can worsen the condition. 'PUVA' cabinets have resulted in almost complete remission in some crew members. There are other drugs available which should only be given under the guidance of a Dermatologist.

Whilst a temporarily unfit assessment may be necessary in severe cases, very few people, despite appearances, have permanently lost their licence as a result of having psoriasis.

5.3 Psoriatic arthritis

Five percent of psoriatics will go on to develop some form of arthritis. This is not a rheumatoid type. It is often referred to as sero-negative arthritis. The finger, knee and ankle joints are commonly affected.

Treatment is non-specific in using NSAID's. A diet high in oily fish can give modest benefit.

There are a few cases on record when the arthritis was bad enough to have to stop flying. In those cases treatment would have to be seen to produce normal hand or leg function.

Physiotherapy would also be needed to restore normal function.

It must also be stated that rarely 'Psoriatic Arthropathy' can occur without the skin lesions of Psoriasis.

The diagnosis has to be made on clinical features and exclusion of other causes of arthropathy such as gout and systemic lupus erythematosus. There is often a family history of psoriasis.

6 PITYRIASIS ROSEA

6.1 Symptoms

This annoying skin condition of younger adults has a differential diagnosis which includes secondary syphilis, some forms of eczema, psoriasis and tinea corporis.

The herald patch always starts the condition but never on the face, always on the trunk. On direct questioning the pilot may admit a mild sore throat, malaise and feeling unwell. Within a few weeks other lesions begin to appear on the trunk, and can cover the trunk completely.

Apart from the appearance the condition is frequently symptomless. There may be some irritation. It runs a self limiting course and usually clears within six months.

No treatment has been shown to be of value, though itching may respond to sun exposure.

It is never severe enough to warrant a temporarily unfit assessment although in the severe phase the appearance of the condition may be unacceptable for a few weeks.

6.2 Lichen Planus

This condition is another of the papulosquamous eruptions of unknown aetiology. Whilst not as common as psoriasis, it does account for one per cent of all new cases seen in skin clinics. It affects young and middle aged adults of both sexes.

It appears as flat topped bluish shiny papules. It can appear on the arms or legs, therefore making it unacceptable on the grounds of appearance.

6.3 **Treatment**

If left untreated it usually lasts for several months and then tends to disappear.

Topical corticosteroids are helpful in alleviating the irritation.

It can occur in the mucous membranes, the buccal mucosa being the commonest site. This can cause diagnostic problems as it can occur around the vulva and vaginal mucosa.

The vast majority of these lesions will undergo spontaneous resolution.

7 **FUNGAL INFECTIONS**

7.1 **Symptoms**

These are very common in aircrew, more so in long range crews visiting exotic places on a regular basis.

Disorders of the skin, hair and nails caused by fungus have become more prevalent in the last twenty years.

There are many types of fungal infection, most of which respond to the new oral antifungals. Many however will respond to topical preparations containing econazole/miconazole etc. Some preparations have hydrocortisone added to resolve the itching and inflammation caused by the infection.

Whilst such infections rarely require a temporarily unfit assessment for medical reasons, some can present as being socially unacceptable.

If oral antifungals are used, care must be taken in aircrew with regards to side effects which can include headache, drowsiness and GI upsets. Photosensitivity has also been recorded. Terbinafine seems to cause far fewer side effects, but occasional patients experience nausea or urticaria.

The common fungal infections include a number of similar organisms which target specific areas.

Ringworm is a non medical term for fungus infections and the name is derived from a small inflammatory lesion which spreads out to form a ring-like skin pattern. The disorders that the fungus causes are referred to as 'Tineas', and can affect the feet (Tinea Pedis), the groin (Tinea Cruris), the body (Tinea Corporis), or the scalp (Tinea Capitis).

Tinea Pedis (Athletes foot) can if severe, cause pain and discomfort on walking and be a reason for a temporarily unfit assessment whilst treatment is initiated to cover the acute phase.

Tinea Capitis affects the hair and the skin of the scalp. It can be unsightly and a reason to ground and treat in the acute phase.

7.2 **Treatment**

Specimens of scrapings of skin toe nail clippings or plucked hairs should be sent to a good laboratory for culture. This is best started with antifungal/hydrocortisone mixtures in creams and ointments. There are shampoo mixtures for Tinea Capitis.

Oral anti fungals may be needed if topical applications fail, or the condition is serious enough to warrant oral use initially.

7.3 **Tinea Versicolor**

(Pityriasis Versicolor) is a fungal condition caused by *Malassezia Furfur*.

It appears as fawn coloured patches on the upper trunk, the neck and the upper arms, which may coalesce to form confluent areas.

In sunlight the affected areas do not pigment. It can be unsightly and therefore be a cause for a temporarily unfit assessment.

8 CANDIDIASIS

8.1 **Symptoms**

Candida albicans is a yeast. It most commonly affects the skin and mucous membranes, and rarely it can also cause systemic disease, such as gastroenteritis, endocarditis, septicaemia and meningitis.

Candidiasis is most frequently found in moist areas of skin.

When it appears as intertrigo it often presents erythematous macerated skin in the axilla, between the fingers, in the vulva spreading on to the buttocks and down the thighs. *Candida* vulvitis is a common presenting symptom of Diabetes Mellitus.

Ideally the diagnosis should be established by microscopy and culture.

8.2 **Treatment**

Oral treatment is now possible with single dose prescriptions. Topical remedies are effective and can be combined with a corticosteroid such as Hydrocortisone when pruritis is severe.

In its most acute cases the crew member should be assessed as temporarily unfit until the condition is under control and without discomfort.

8.3 **Oral Mucocutaneous Candidiasis**

a *Symptoms*

Candida of the mouth is often referred to as 'Thrush'. It is more common with the advent of HIV infection. The appearance of creamy white patches on the mucous membranes of the mouth should alert the AME to a diagnosis of candida, but also be aware of any other underlying reason.

b *Treatment*

A temporarily unfit assessment is necessary until the condition improves with oral or topical anti fungals. Failure to improve requires further investigation.

8.4 **Candida Vulvo Vaginitis**

This type of problem is not uncommon in female aircrew and cabin crew. It can cause great pain and discomfort. The aircraft environment is not conducive for treatment so the person must be

assessed as temporarily unfit until the condition begins to improve and is comfortable. Remember this condition can be the presenting feature in Diabetes Mellitus.

9 VIRAL INFECTIONS

9.1 General considerations

The commonest skin virus presents as warts. The virus affects the epidermal cell causing cellular proliferation and excess keratin.

Warts are, despite popular opinion, contagious. Warts occur almost anywhere, but commonly on fingers, feet, and ano and genital areas, and rarely on the face.

Warts can be unsightly on the hands and painful on the feet. Treatment is difficult and can cause considerable morbidity, fortunately natural resolution always occurs eventually.

Peri-anal and genital warts can be a cause of not only discomfort but embarrassment. The most effective method of treatment is to paint lesions with a 25 percent solution of podophyllin in spirit or tinct benz co.

9.2 Herpes Simplex

a Symptoms

This condition has increased in its numbers over the last twenty years. It is characterised by a small group of blisters.

The commonest site is the lips (herpes labialis). It is usually preceded by a tingling or burning sensation and can be precipitated by an illness with a high fever (herpes febrilis) or after exposure to the sun or wind.

It can be unsightly on the face. It can cause pain and discomfort. Genital Herpes Simplex can be very uncomfortable and incompatible with the work environment in the acute stages.

b Treatment

Acyclovir has proved to be very useful if started at the initial outbreak.

In severe cases referral to a Dermatologist is necessary. The crew member must be assessed as temporarily unfit during this treatment phase as the condition is contagious.

If the condition does not improve in 5 to 10 days, deficiencies in the immune system should be considered.

9.3 Herpes Zoster (Shingles)

Skin lesions due to the herpes zoster virus tend to occur in the area supplied by one particular sensory root ganglion.

It commonly affects the thoracic nerves. If the ophthalmic division of the fifth cranial nerve is involved conjunctivitis and keratitis may occur in addition to the skin lesions. This is a condition requiring the crew member to be assessed as temporarily unfit immediately and treatment started as soon as possible. Referral to an Ophthalmologist may be required to monitor the effects on the eye.

In the otic form of Zoster in which the geniculate ganglion is involved, there may be an accompanying Bell's Palsy with lesions in the external ear and tongue.

Obviously the crew member must be assessed as temporarily unfit until the Bells Palsy has improved and any other complications have resolved.

Herpes Zoster accompanied by generalised chicken pox must be investigated as it can be the presenting feature in Hodgkins Disease, or Leukaemia, or deficiencies in the immune system. In such cases referral to the AMS may be necessary as the crew member may be assessed as temporarily unfit for some time.

Herpes Zoster has one post skin eruption complication that can cause problems for aircrew. This is post herpetic neuralgia. The older the patient, the worse can be the pain. Strong analgesics even opiates may be necessary. If this is the case, then the crew member will have to be assessed as temporarily unfit until the pain has gone, which may be some weeks.

10 BACTERIAL INFECTIONS

10.1 General considerations

The commonest bacterial skin infection is Impetigo, usually caused by staphylococcus aureus in colder climates, and B haemolytic streptococcus in tropical countries. Whilst it is predominantly a disease of children, it is quite common in the flying population. This latter infection can give rise to renal and cardiac complications.

It is therefore important to ground these cases, investigate and treat as soon as possible. It is a highly contagious condition, which responds to topical and systemic antibiotics.

10.2 Beard Folliculitis (Sycosis Barbae)

Bacterial infection can cause folliculitis in the beard area. It is more common in Africans than Caucasians due to the shorter curling hairs growing back into the skin.

It can be very unsightly and aircrew so affected may need to be assessed as temporarily unfit whilst being treated.

10.3 Syphilis

a Symptoms

This disease is still very present in the world and is not uncommon amongst aircrew. It is covered elsewhere in the guidance material and in JAR–FCL Part 3 Appendix 7.

The only point to be made here, is that the AME must always ask about skin lesions. The AME must be aware of any reports of painless ulcers, a generalised psoriatic like rash, or crops of discrete papules, like viral warts. These are skin manifestations of primary and secondary syphilis. Tertiary Syphilis can be present as reddish brown lesions appearing in groups called Gummae, which are a mass of syphilitic granulation tissue, or as chronic interstitial glossitis.

b Treatment

Penicillin is still the drug of choice. It is the best however that this disease is treated and followed up in a Specialist genito-urinary Clinic.

11 DRUG ERUPTIONS

Almost any drug/medication can produce a skin eruption. This may mimic most skin conditions or produce bizarre patterns of reaction in the skin. Any member of aircrew or cabin crew presenting

with any skin condition no matter how obvious, must as a part of the history taking, be asked about having taken any medication, in the immediate past or at present. Laxatives, tonics, pain killers, anti malarials all count as drugs/medication as well as any prescription drugs.

Some drugs/medication may have been taken for some length of time before a reaction occurs.

Despite a wide variation in pattern, below are some guidelines to suggest when a drug/medication may be the cause.

- a It is frequently widespread and symmetrical.
- b It commonly appears as an inflammatory response with widespread itching.
- c It is often of sudden onset.
- d It can be associated with a constitutional upset, such as malaise or fever. Other organs may be affected.

Some drugs can cause specific patterns of skin reaction, as follows:

a *Urticaria and angioneurotic oedema*

Can be caused by penicillins and the salicylates. Other drugs causing urticaria include thiouracil, isoniazid, various vaccines, serums, and quinine.

b *Exanthem or morbilliform eruption*

This is a widespread macular erythematous eruption. It can be caused by Ampicillin, NSAIDs, gold, para-amino salicylic acid (PAS) phenothiazines and barbiturates.

c *Erythema multiforme*

This well recognised annular erythematous and vesicular condition occurs predominantly on the exterior surfaces of the hands, forearms and feet. It is commonly caused by sulphonamides, tetracyclines and NSAIDs.

d *Photosensitivity*

This is important with aircrew visiting sunny climates. The acute erythematous eruption on exposed areas can in some cases cause blistering. It is caused commonly by phenothiazines, particularly chlorpromazine. Tetracycline is another cause as can be sulphonamides, quinidine and thiazide diuretics.

e *Blistering eruptions*

Large blisters can occur with sulphonamides, but they have been described after penicillin, NSAIDs and barbiturates.

f *Purpura*

This is commonly seen on the legs. It can be caused by NSAIDs, quinidine and chloramphenicol.

g *Erythema nodosum*

These painful reddish indurated plaques usually seen on the front of the legs can be caused by sulphonamides.

h *Lichen planus-like eruptions*

These can be caused by B blockers, anti-diabetic agents and gold.

i *Acne*

Systemic corticosteroid therapy can cause acne. It can also be induced by iodides, phenytoin, steroids and in some cases the oral contraceptives.

j *Lupus erythematosus*

This syndrome can be induced by procaine amide and hydralazine.

k *Pigmentation*

Oral contraceptives can cause facial pigmentation mainly distributed on the cheeks and forehead. (Melasma)

l *Pruritus ani and vulvae*

These are a common complication of broad spectrum antibiotics and due to candidal overgrowth.

The diagnosis of these skin reactions is often difficult. Once a drug/medication has been suspected of causing a skin reaction, it should be avoided if possible. It may be necessary to assess as temporarily unfit the crew member in the acute phase and treat with systemic antihistamines. In several cases systemic steroids may be necessary. A temporarily unfit assessment may be mandatory in cases as severe as this, with reference to the AMS if the AME has any doubts about how long the condition will last or take to treat.

12 PEMPHIGUS (BULLOUS DISORDERS)

12.1 Symptoms

This is a Bullous disorder in which the predominant sign is blistering of the skin and mucous membranes. It is not common but can occur in early to middle age. It can be a serious condition if left untreated. A temporarily unfit assessment is mandatory.

12.2 Treatment

This is always with high doses of systemic steroids. It is best handled by a Dermatologist under hospital/clinic conditions as the doses of steroid required are high.

There are other Bullous disorders which are fairly rare. All cases should be referred to a Dermatologist for full investigation. All aircrew should be assessed as temporarily unfit until a diagnosis is established. Referral to the AMS should be considered in all cases.

13 MALIGNANT CONDITIONS OF THE SKIN

13.1 General considerations

These lesions can present aircrew and the AMS with a number of problems.

Up until now, there were no separate rules and regulations to cover this group of conditions. It is hoped that by listing the various conditions, the management of these cases will be made easier. In all cases where any doubt exists, the diagnosis will always be confirmed by biopsy.

13.2 Basal Cell Epithelioma

a *Symptoms*

This condition is sometimes referred to as a Rodent Ulcer. It is the commonest 'malignant' tumour of the skin. It is more common in those aircrew who are exposed to high UV light conditions. The lesion is more frequent in fair skinned people. It is rarely seen in young people, occurring more in the middle aged group. If left untreated the lesion can erode deeper tissues causing serious ulceration problems later on in life.

It usually occurs on the face, the commonest site being below the eyes or on the sides of the nose. It has a pearly appearance, breaking down centrally to form bleeding crusts. Anyone presenting with a skin lesion about which any doubt exists should have it biopsied.

b *Treatment*

If the diagnosis of Basal Cell Epithelioma is made by biopsy then treatment should be started immediately.

Surgery is the treatment of choice offering a 95% cure rate. Other forms of treatment are not recommended in aircrew. Regular follow up should be maintained. There are no reasons for a temporarily unfit assessment aircrew with this condition.

13.3 Squamous Cell Epithelioma

a *Symptoms*

This group of lesions is also considered to be part due to over exposure to UV light.

The commonest site is the face, but this lesion can also affect the mucous membranes particularly the lips or tongue. Other sites are the backs of hands and ears.

It often begins as a small nodule with overlaying thick scale which becomes oval with a flat top. It can be unsightly which may be the first time an opinion is requested.

b *Prognosis*

This diagnosis should be established by biopsy and then the lesion treated by surgery.

There are no reasons for assessing as temporarily unfit aircrew with this condition, providing the biopsy shows complete excision. If excision is not complete, further surgery is required.

13.4 Malignant Melanoma

a *General*

This can be a very serious condition. It requires the AME to be alert for any lesion he may see or have reported to him at routine examination, that may have suddenly appeared, any lesion that has changed in any way, become irritable, may bleed when touched, have an irregular shape or have a surrounding pigmented halo. The lesion may not always be pigmented. It can occur anywhere on the body surface but the legs have a relatively higher incidence in women and the trunk in men. Malignant melanoma usually, but not always, arise in pre-existing 'moles'.

b *Prognosis*

Early 'thin' lesions are cured by surgery, but a percentage of patients with older 'thicker' lesions may develop distant spread (Metastases) (see Oncology Chapter).

c *Treatment*

This is surgical, usually by wide excision and graft if necessary. A temporarily unfit assessment is mandatory at this stage. Providing the biopsy shows a wide clear excision there is usually no need to assess as temporarily unfit the aircrew for more than it takes the excision or graft wound to heal. The AMS must be informed. If secondary deposits occur, then a temporarily unfit assessment is mandatory. The treatment will vary if secondary deposits occur according to each particular case. The AMS must be notified in all cases and any decision about recertification should only be made by the AMS.

14 ACNE

14.1 **Acne**

Acne is now used synonymously with and has virtually replaced the term Acne Vulgaris. It is essentially a disorder of adolescence but can persist into adulthood. It can present as a difficult social problem in young applicant aircrew.

Fortunately the new drug Roaccutane, derived from Vitamin A, has enabled dermatologists to cure even the most severe cases of cystic acne, and provided they are adequately treated such individuals need no longer be discouraged from flying.

14.2 **Rosacea**

This is a skin disorder of young and middle aged adults. It only affects the face and in some cases the eyes, in the form of Rosacea Keratitis, where there is pain and photophobia. There may be blepharitis, conjunctivitis, iritis and even episcleritis. It can become chronic. The condition nearly always responds to Tetracycline taken for at least six weeks. Cases of this sort should be referred to the AMS for assessment.

15 LUPUS ERYTHEMATOSUS, SCLERODERMA AND DERMATOMYOSITIS

These three conditions are known as collagen diseases. Whilst they all have specific cutaneous appearances, there may also be systemic involvement.

a *Discoid Lupus Erythematosus*

Although confined to the skin, can become a chronic problem which may not require a temporarily unfit assessment but should be managed through the AMS. It can be adversely affected by sunlight which may prevent someone continuing with a flying career.

Systemic LE presents with skin lesions in about half of those affected.

Such cases require a great deal of care and management. All cases should be assessed as temporarily unfit and referred to the AMS.

Recertification for Class 1 or 2 may be considered where a period of remission has allowed the treatment to be stopped.

b *Scleroderma*

This can affect the kidneys, gastro intestinal tract and lungs. All cases should be assessed as temporarily unfit and referred to the AMS.

c *Dermatomyositis*

This is a disorder involving skin and skeletal muscle. In adults it is associated with internal malignancy in 50% of cases. All cases should be assessed as temporarily unfit and referred to the AMS. The prognosis is variable and recertification may be considered where appropriate.

16 URTICARIA

This is an acute dermatological response often to some extraneous cause. It is also called 'hives' or 'nettle rash'. It can be very severe and can be caused by drugs, foods, heat, cold, trauma, sunlight, plants etc. However in many patients no cause is found. In general it runs a self-limiting course.

It can be a medical emergency if the tongue, pharynx or larynx are involved as the person may asphyxiate.

Any crew member suffering from this condition must seek urgent medical advice and receive immediate treatment. They may have to be assessed as temporarily unfit until the severe episode has passed and the effect of any antihistamine treatment wears off.

There are several other forms of this type of erythema, one is Erythema Multiforme. This can present as mild or in a very severe form; Stevens-Johnson syndrome being one of the most important and severe.

A temporarily unfit assessment and hospitalisation may be necessary. The AMS must be informed.

Recertification may only be considered after the condition has settled down. A careful history must be taken to exclude a possible precipitating factor such as a particular drug which should be avoided in the future.

17 CUTANEOUS PRESENTATIONS OF SYSTEMIC DISORDERS

These conditions will be discussed in detail elsewhere in this manual under the various subject headings. They are mentioned here, as some can present with skin lesions and should not be forgotten. These conditions can be serious.

a *Diabetes Mellitus*

An annular plaque lesion can frequently be seen on the front of the legs in developing Diabetes Mellitus. The lesion can ulcerate and be persistent. Full investigation is required.

b *Lipid Metabolism*

Deposits of lipids can result in the formation of xanthalasmata around the eyelids, or xanthomata on the elbows, knees or tendons.

Whilst the skin lesions are not serious, they may point to underlying problems. Full investigation is required.

c *Gout*

This painful condition of joints may present with skin tophi on the ears, hands and occasionally on the exterior surface of the joints. Further investigation is required.

d *Erythema Nodosum*

This is a distinct clinical entity. The lesions occur characteristically on the anterior surface of the legs below the knees. The lesions can be very painful and red. Immediate further investigation is required with a temporarily unfit assessment until the acute phase is over. Recertification may be considered when the condition has settled down if a cause can be identified.

e *Sarcoidosis*

This condition can be diagnosed in a number of ways. In the skin characteristic fleshy smooth papules, nodules or plaques may appear. All cases should be referred to the AMS for consideration of recertification.

f *Purpura*

This is a skin lesion resulting from a disorder of the blood or blood vessels.

Any case of purpura must be assessed as temporarily unfit and fully investigated. All cases should be referred to the AMS before recertification.

18 PARASITIC INFESTATION AND INSECT BITES

There are a number of conditions of the skin caused by parasites or insect bites which may be unsociable in aircrew and when seen or known about by others.

Personal hygiene must be emphasised

18.1 Scabies

This is a fairly common disorder, totally curable. It is caused by an insect mite (*Sarcoptes Scabei*) which can be passed from person to person in a close environment, such as crew bunks.

The presenting symptom is nearly always irritation, with tiny tracks on finger webs, wrists, elbows, groins etc. It can be present with a generalised erythematous rash, or as discrete excoriated papules.

The most satisfactory way to confirm the diagnosis is to scrape a lesion and examine for a mite under a low power microscope.

Treatment is standard world-wide. Gamma Benzene Hexachloride, or pyrethrum should be applied to all the skin from the neck to the soles of the feet. It is important to repeat this procedure 24 hours later. Irritation may continue for a week or two.

Any member of aircrew should be assessed as temporarily unfit and treated, as should any close friend or relative.

18.2 Lice

There are three forms of this condition, head, body and pubic lice. It is a socially unacceptable condition especially in aircrew. It can cause intense embarrassing irritation. It can be passed from persons to persons living or working in close proximity to each other. The diagnosis can be made by visual sighting of the lice.

Modern treatment can eradicate the condition within 24 hours.

18.3 Insect bites

These can cause severe reactions in some people necessitating urgent medical treatment. Some bites can become quickly infected. Medical advice should always be sought preferably from someone with aviation medicine knowledge who understands the route structures, and where in the world, the aircrew may have been bitten. This can be important in the treatment of more severe cases, and where the reaction from the bite has taken some hours to appear.

19 PHOTO SENSITIVITY

This term is used to describe an abnormal response to UV irradiation. The commonest condition seen in aircrew, which can give rise for concern is sunburn. This can cause great pain and discomfort. Care and education are very necessary for all aircrew where travel between extremes of climate occur with increasing regularity. The desire to get a 'tan' can overcome knowledge that to prevent sunburn, exposure must be graduated. Going to sleep in shadow can lead to a leg or an arm becoming exposed as the sun moves round. Painful sunburn can interfere with the safe operation of an aircraft. It must be prevented. Sunscreen preparations are available to reduce the likelihood of burning. Sunburn can prevent necessary useful sleep which itself can cause fatigue in aircrew. Regular indoctrination is necessary of all crew members to avoid sunburn. Over exposure over a long period of time can initiate wrinkling and atrophy of the skin, plus a number of associated conditions. Exposure to UV light can initiate more malignant skin conditions as described earlier. Photosensitivity can occur as a result of some drugs taken orally and in the condition called Porphyria. All cases of photosensitivity need investigation with possible referral to the AMS. If the cause is not found then certain restrictions may need to be imposed. Full recertification may not be possible.

20 TROPICAL DISEASES

There are really only three tropical diseases which need to be mentioned in this chapter which are noted for the skin presentations. They are discussed fully in the chapter on Tropical Disease.

a Yaws

This is a tropical disorder caused by a spirochaete, not unlike syphilis. It has, like syphilis, three stages which can cause crusted lesions developing from a single spot. It can ulcerate in a later stage. Treatment by Penicillin is simple.

b *Cutaneous Leishmaniasis*

The problem with this tropical condition is that it can take weeks or even months to develop. The aircrew affected may not recall where the condition may have started. Insect bites usually on the face or limbs, lead to long lasting nodules which grows and ulcerates. It is also known as the 'Oriental Sore'. After a few months if secondary infection does not occur the sore may heal spontaneously leaving a depressed scar. It can recur. Diagnosis is best made by biopsy.

c *Leprosy*

This condition caused by a Mycobacterium can be missed because few European doctors think of the possibility. The disease can infiltrate the skin causing unsightly plaques and skin thickening. There are five or six different types of leprosy. Hypopigmentation of the skin can be a presenting sign.

Diagnosis is made by biopsy. Fortunately modern treatment can cure the condition completely.

21 DISORDERS OF THE HAIR

Anyone who suffers from acute hair loss should seek medical advice, as it can be manifestation of a more systemic problem. This is to be distinguished from normal ageing hair loss. (Common baldness).

Excessive hair growth in women can be very occasionally the presenting symptom of an androgen producing tumour or some other endocrine disorder. Such cases need to be assessed as temporarily unfit and fully investigated.

22 DISORDERS OF PIGMENTATION

a *Vitiligo*

The commonest disorder of pigmentation. Where there are symmetrical patches of complete depigmentation e.g. eyelids, backs of hands, genitalia, knees etc. Whilst this condition may be socially and cosmetically distressing, it rarely has any systemic cause.

b *Hyperpigmentation*

This tends to occur commonly after an inflammatory condition of the skin. It can however be found in more serious conditions such as Addisons Disease, Renal failure and a number of other serious conditions.

All cases should be assessed as temporarily unfit and fully investigated. The case should be referred to the AMS if there is any problem with the diagnosis or management. Recertification may be allowed when the condition is fully understood and under control.

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