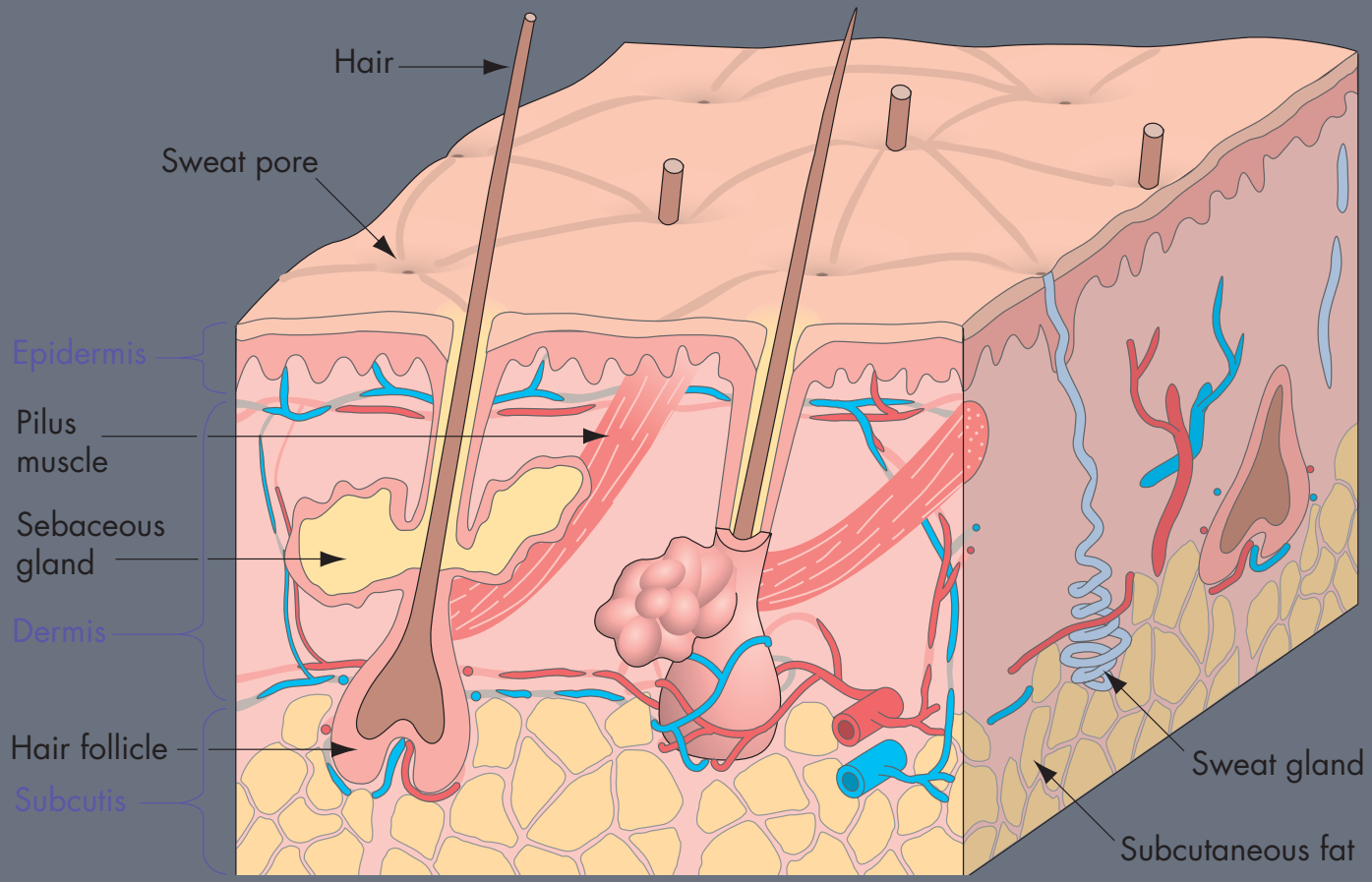
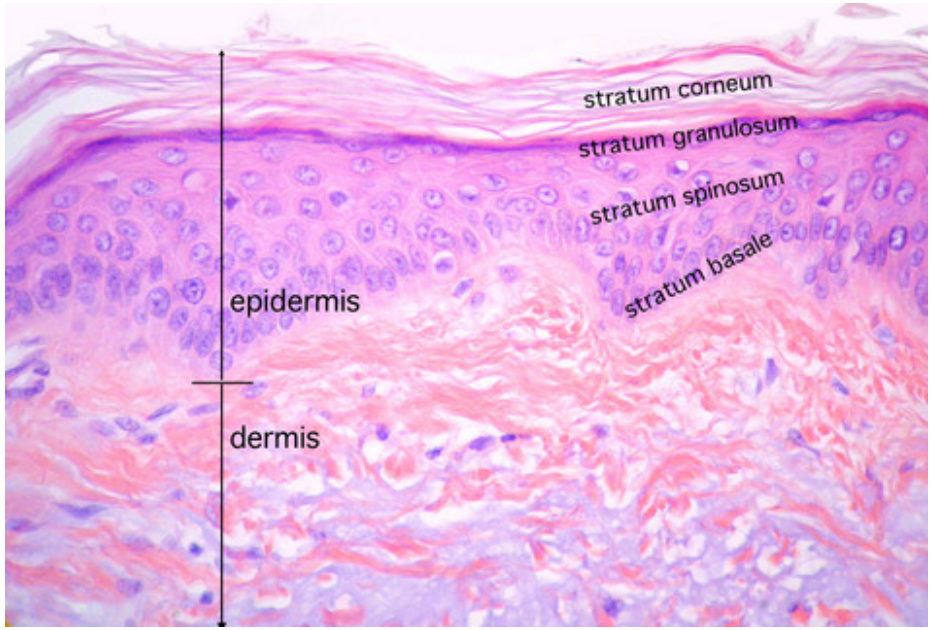


SKIN HISTOLOGY, SCC, BCC

Sarah Forsyth, Liverpool Hospital

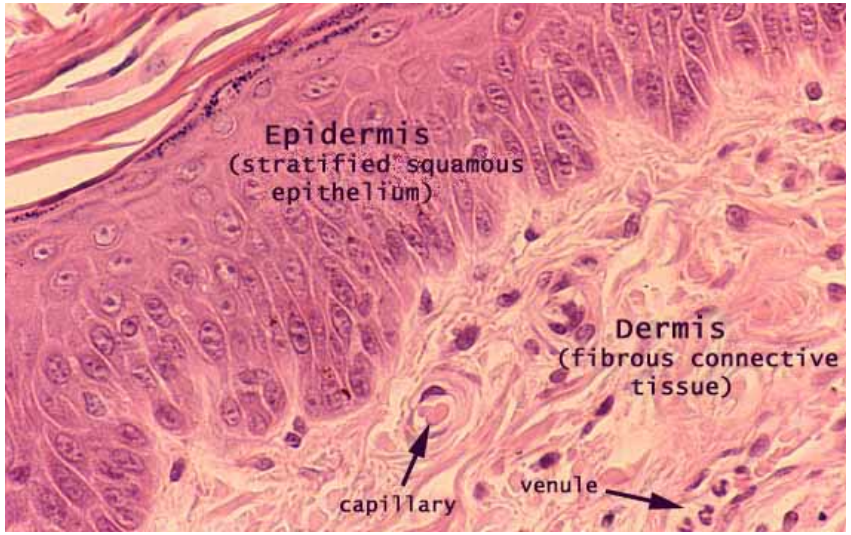
SKIN

- Three elements:
  1. Epithelium = Epidermis
  2. Connective Tissue = Dermis
  3. Subcutanous fat/panniculus carnosus = Hypodermis



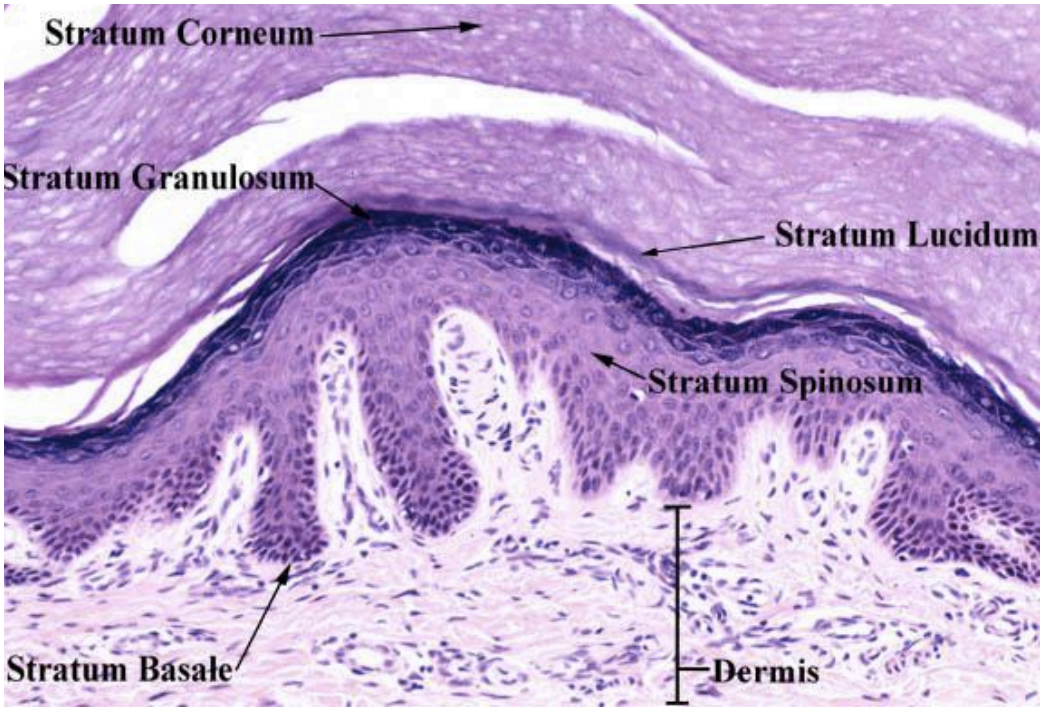
Epidermis

- Epithelium = epidermis
- Ectodermal in origin
- Keratinised stratified squamous epithelium
  - Keratinocytes arranged in layers
- 5 layers
- Skin appendages are specialised derivatives of the epidermis
  - Sebaceous glands, sweat glands, nails, hair



Layers of Epidermis

1. Stratum Corneum
2. Stratum Lucidum
3. Stratum Granulosum
4. Stratum Spinosum
5. Stratum Basale



THICK VS THIN SKIN

- Refers to the thickness of the ***Stratum Corneum***
- Thick skin:
  - Sole of foot
  - Epidermis (S.Corneum) thick, dermis thin
- Thin skin
  - Forearm
  - Epidermis thin, dermis thick

Colour of skin

- Degree of pigmentation produced by melanocytes
- Melanocytes found in ***S.Basale***
  - Dendritic cells, neural crest origin
  - Make melanin granules -> transferred from melanocytes via membrane processes to keratinocytes in the S.granulosum & S.spinosum
  - Difference in skin colour between races -> not related to melanocyte numbers
  - In darker skins the melanocytes are more active and produce more pigment
  - White skin becomes tanned because UV light stimulates melanocyte activity

Epidermis

- Sweat glands:
  - 3 million, all over skin except lips, glans penis, TM
  - Greatest concentration: palms & soles, face
  - Coiled test tubes -> extend below dermis into SC tissue
  - Two types:
    - Eccrine: majority, deliver water to surface to regulate temp.
    - Apocrine: axilla, areola of breast, urogenital regions, open into hair follicles, under control of sex hormones (become active at puberty)

Epidermis

- Sebaceous glands
  - Confined to hairy skin
  - Grape like cluster beside a hair follice
  - Open via a short duct into the side of a hair follicle
  - None on palms/soles

Dermis

- CT = dermis, 95% of the skin
- Mesodermal in origin
- Two layers
  - Papillary
  - Reticular
- Consists of:
  - Bundles of collagen fibres
  - Elastic tissue
  - Blood vessels, lymphatics, nerves

Dermis

1. Papillary Layer
   - Superficial layer
   - Fine collagen and elastin fibres
   - Capillary & lymphatic network

2. Reticular Layer
   - Coarse branching collagen layered parallel to skin surface

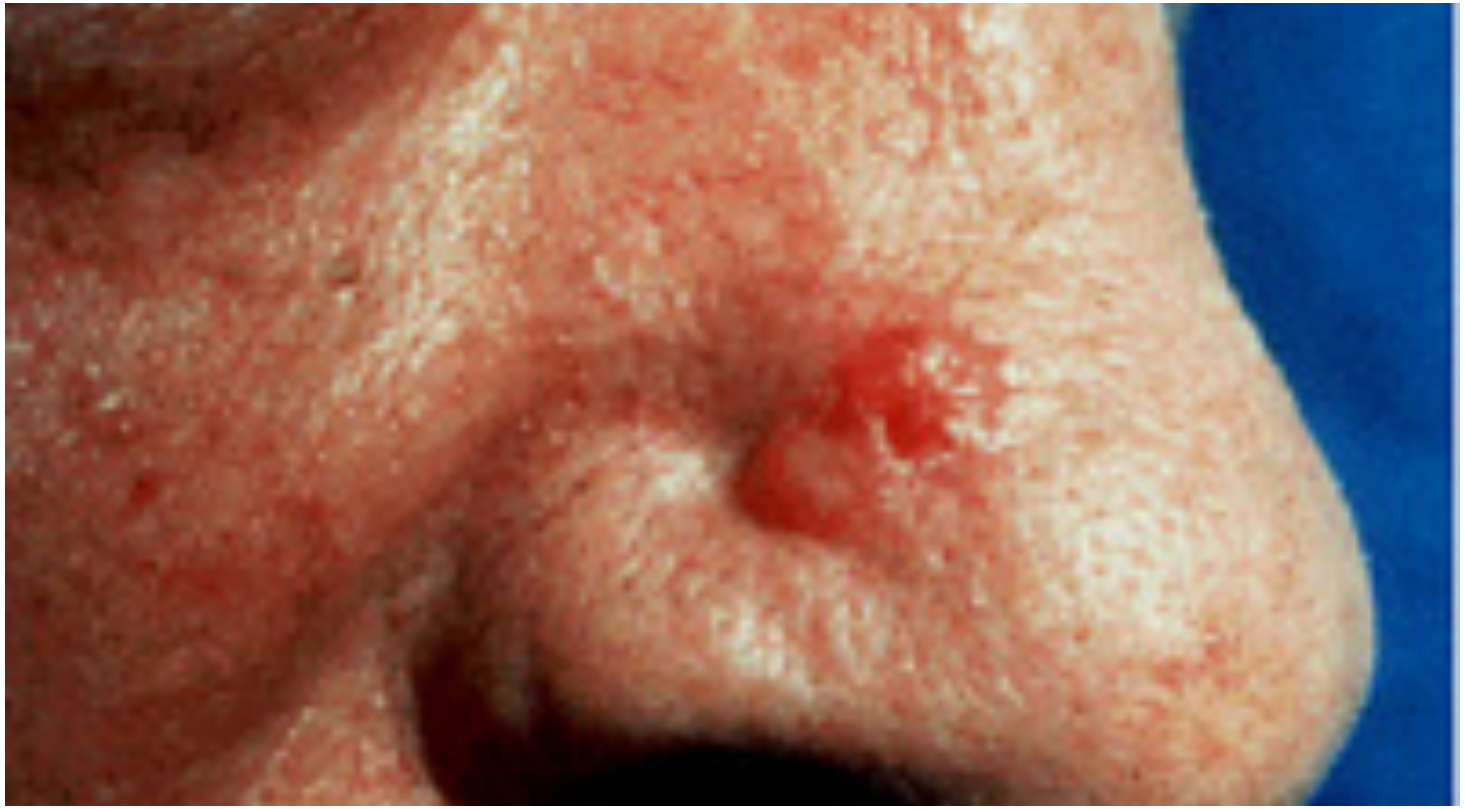
Dermo-epidermal junction

- Where the dermis & epidermis meet
- 3-D wave like arrangement

Specialised cells of the skin

- Langerhans cells: APC's -> T cells
- Merkel cells, meissner & pacinian corpuscles: play a role in mechanosensation

Basal Cell Carcinoma



BCC

Slow growing, locally invasive, malignant epidermal tumour

- Arise from pluripotent cells in the basal epidermis
- Metastasis extremely rare
- **Incidence:** 1500 per 100,000 in Australia (M>F), 40-80 y.o's
- 90% found in face above line between lobe of ear & corner of mouth

- **Aetiology:**
  - Sun exposure/UV radiation
    - 33% arise in parts of body not sun exposed
  - Radiation
  - Immunosuppression
  - Scars
  - Arsenic exposure
  - Xeroderma pigmentosum
  - Gorlin's Syndrome

BCC - Types

Localised

1. **Nodular**
2. **Nodulocystic**
3. Cystic
4. Pigmented
5. Naevoid

90% of BCC's are nodular or nodulocystic

Generalised

1. Superficial
   - Multifocal or superficial spreading
2. Infiltrative
   - Morphoeic, ice pick, cicatrising

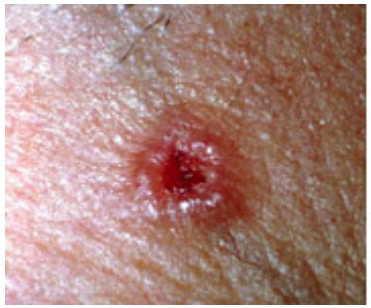
BCC - Pathology

Macroscopically:

- Raised, rolled edges, pearly, telangectasia, central ulceration

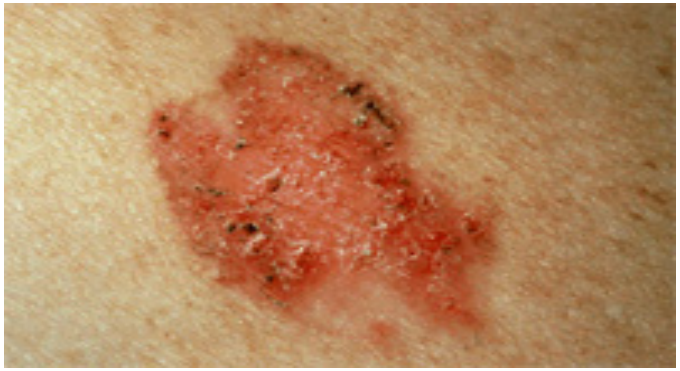
1. Nodular

- Shiny, pearly nodule
- May ulcerate leading to central depression with raised, rolled border
- Slow growing
- Head & neck, elderly



2. Superficial

- Scaly, irregular plaques
- Often multiple, trunks & limbs,
- Younger population



BCC – Diagnosis & histology

- Clinical features are the key to dx
- If any doubt → biopsy
  - Curretage, shave biopsy, punch biopsy
  - Excisional biopsy is the treatment of choice for primary BCC

Histological Features

- *Nests* of ovoid, *basal* cells with hyperchromatic nuclei & scanty cytoplasm (resemble cells of basal layer of epidermis)
- Single outer *pallisading* layer margins of cell nests -> this layer actively divides

BCC - Treatment

Surgical vs. Non-surgical treatment options

- **Depends on:**
  - Age, comorbidities, type, size, site
- **High risk features**
  - Recurrent
  - Size > 2cm
  - Nose, eyelids, temple, pre & post auricular, scalp
  - Incompletely excised
  - Micronodular, infiltrative, sclerosing types
  - Perineural invasion

BCC – Surgical excision

- Most effective Rx for primary BCC
- Margins
  - **Small BCC < 20mm:** 4-5mm peripheral margins, will be clear in > 95% of cases
  - **Large BCC:** 13-15mm surgical margins, will be clear in > 95%
  - **Recurrent BCC:** cure rates lower than primary lesions, need wider margins 5-10mm
  - **Incompletely excised:** Reported 67% recurrence rate if margins grossly involved, 33% recurrence within 2 years if microscopic involvement of margins

BCC – Other options

1. Destructive

- **Curettage:** lesion scraped out & base cauterised. Suitable for low risk lesions (small, well-defined margins, non aggressive type, non critical site)

- **Cryotherapy:** lesion freezed with liquid nitrogen. Suitable for well defined, esp multiple, non aggressive types, non critical sites

2. Moh's Micrographic Surgery

- Used for poorly demarcated, recurrent, or incompletely excised BCC's

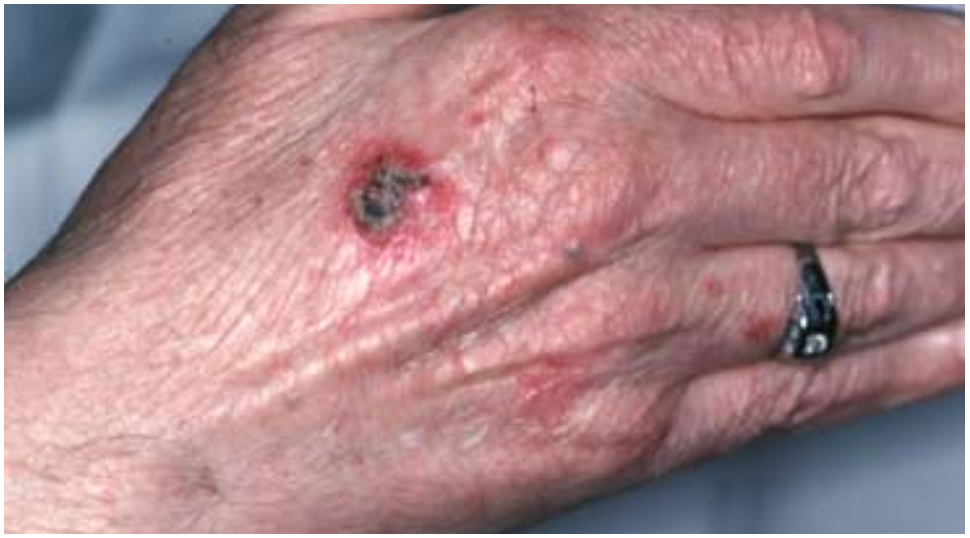
Moh's micrographic surgery

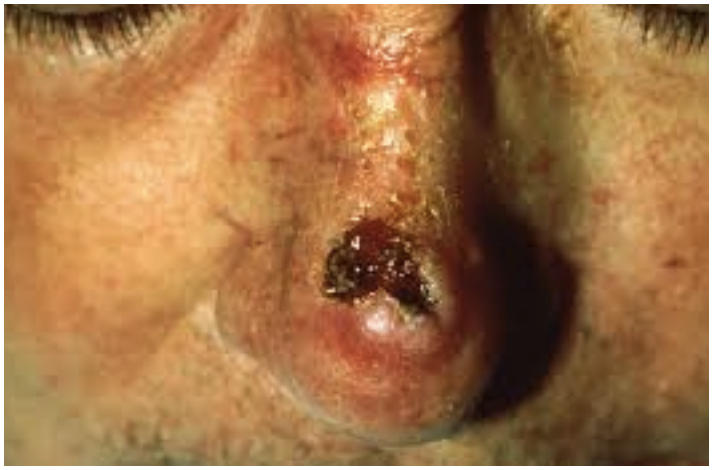
- Excision under microscopic control
- Demonstrated to minimise recurrence rates and maximise conservation of surrounding tissue
- Performed under LA
  - Initial excision of the tumours visible extent
  - Histotechnician maps, sections & stains tissue
  - Surgeon examines for presence of residual tumour and excises more from relevant parts
- In theory, full evaluation of deep & lateral margins
- Complete excision rates exceed 99% in experienced hands

BCC – non surgical mx

- Radiotherapy
- Topical therapy
  - Imiquimod (Aldara): immune response modifier, for use in biopsy proven superficial BCC, 5x weekly for 6/52
  - Topical 5-FU
- Photodynamic therapy
  - Photosensitiser applied to superficial or small nodular BCC then exposure to strong light source

Squamous Cell Carcinoma





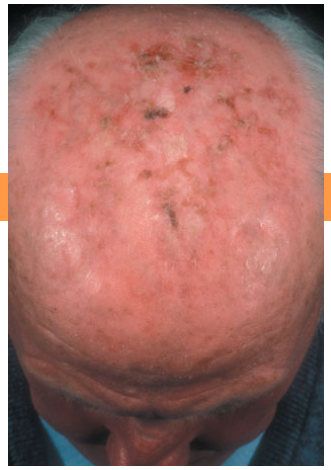
SCC

A malignant tumour of keratinising cells of the epidermis

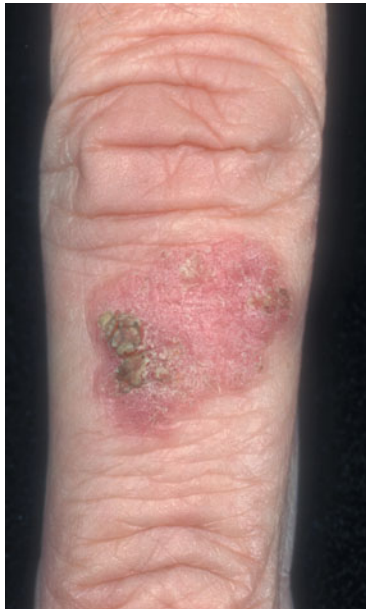
- Arises from S.spinosum (and sometimes S.basale) layer of epidermis
- Locally invasive, able to metastasise (**2%** of cases)
- 2nd most common skin cancer (4 times less common than BCC), M>F

- **Aetiology**
  - Chronic UV light (fair skin types)
  - Previous ionising radiation
  - Chronic wounds/ulcers/burns/scars → Marjolin's ulcer
  - Immunosuppression
  - Premalignant lesions → Solar keratosis, Bowen's disease
  - Xeroderma pigmentosum
  - HPV 5/16 (associated with SCC oropharynx, anogenital)

SCC – Pre malignant



- **Actinic/solar keratoses**
  - Usually multiple in sun exposed sites
  - Areas of dyskeratosis and cellular atypia
  - Erythematous macule -> sub epidermial inflammation
  - 20% go on to form SCC's
- **Bowen's disease**
  - SCC in situ -> 3-11% progress to SCC
  - Usually solitary
  - Slowly enlarging, erythematous, scaly, well defined plaque
  - Full thickness epidermal dysplasia



SCC - Pathology

Macroscopic features

- Ulcer with everted edges and central scab, with surrounding inflamed, indurated skin

Microscopic features

- Irregular nests of atypical keratinocytes/squamous epihelium *invading dermis*
- Keratinisation – well differentiated tumours produce keratin → **keratin pearls**
- Stains positive for cytokeratins 1&10
- Adjacent changes of solar keratosis
- Broder's histological grading

Prognostic Factors

1. **Invasion**
    1. Deeper = worse prognosis, >6mm, 15% will have met
    2. Surface size: >2cm worse prognosis
2. **Histological grade**
    1. The higher the Broder scale, the worse the prognosis
3. **Site**
    1. Lips, ears = higher recurrence rates
4. **Aetiology**
    1. Higher metastatic potential if arise in burns, scars, ulcers, areas of skin irradiated
5. **Immunosuppression**
    1. Will invade further
6. **Perineural involvement**

SCC - Management

- **Metastatic potential depends on:**
  - site, size, depth
  - histological differentiation
  - host immunosuppression
- **High risk features:**
  - Recurrent
  - Size > 2cm
  - Rapidly growing tumour
  - LN mets
  - Incomplete excision
  - Close histological margins < 2mm
  - Thickness > 6mm
  - Poorly differentiated, perineural invasion

SCC – Surgical mx

1. Primary lesion

- Low risk SCC (< 2cm): 5mm margins
- High risk SCC (>2cm): up to 10mm margins

2. Metastases

- **Local**
  - "intransit metastases" removed by wide margins
- **Regional LN Metastases**
  - US guided FNA of suspicious nodes
  - LN dissection for involved nodes
  - Consider SLNBx for large, high risk lesions & negative nodes

SCC – non surgical mx

Radiotherapy

- Can be used for treatment of primary SCC in poor surgical candidates
- As adjuvant therapy in lesions with high risk of recurrence (eg. poorly differentiated, closed margins)
- As adjuvant therapy post LN dissection with high risk of regional relapse eg. Multiple nodes involved, extracapsular extension