

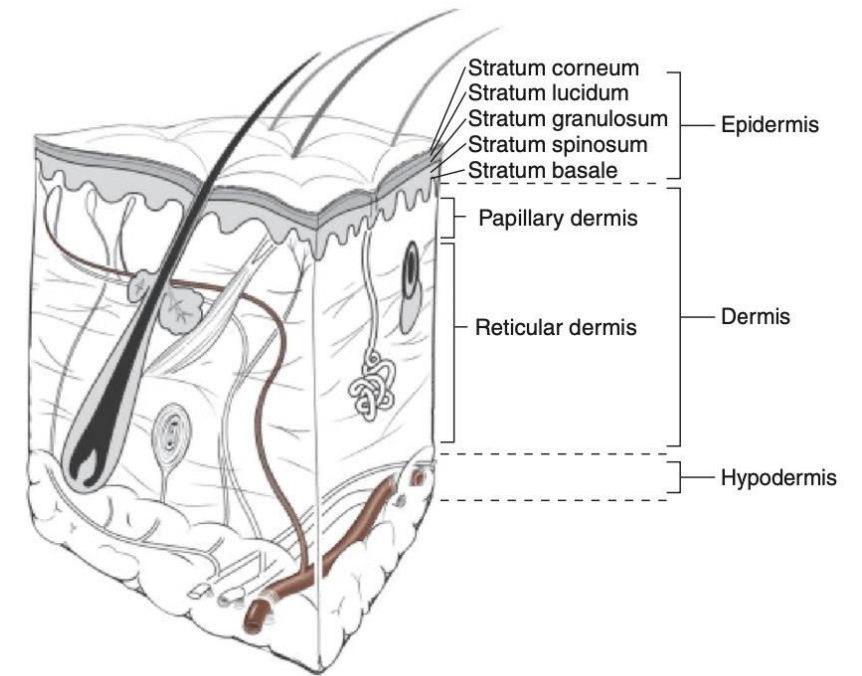
# Skin tumors

# Definition and function

- Skin: the largest organ in the body and covers the body's entire external surface.
- It is the largest body organ and constitutes 16% total body weight
- Function:
  - Protection – act as physical barrier to microorganisms and other dangers like UV light
  - Metabolic – has a role in vitamin D synthesis
  - Regulatory – essential for thermoregulation of body temperature through various means like insulation and sweating.

# Anatomy

- Skin mainly composes of 3 layer:
  1. Epidermis (outer most)
  2. Dermis
  3. Hypodermis
- Each of these layers is composed from different cell types to serve accommodate the different functions of skin.



# Cells types of the different skin layers

	<b>Cells</b>	<b>Appendages</b>	<b>Function/Responses</b>
Epidermis	Keratinocyte (predominant) Melanocyte  Langerhans cell Merkel cell		Protective barrier Pigmentation UV protection Immunity (antigen presentation) Constant touch and pressure Static two-point discrimination
Dermis	Fibroblast  Macrophage Mast cell	Hair follicle Sebaceous gland Eccrine sweat gland Apocrine sweat gland Naked nerve fiber  Meissner's corpuscle  Pacinian corpuscle  Bulb of Krause Ruffini ending	Collagen/elastic fiber Ground substance Scavenger Allergic response  Sebum Thermoregulation Sweat Pain Temperature Chemoreceptor Light touch Dynamic two-point discrimination Vibration Deep pressure Temperature (cold) Sustained pressure Temperature (hot)
Hypodermis	Adipocyte		Insulation Energy
Muscle	Striated muscle cell		Movement

## *Five Layers of Epidermis*

<b>Layer</b>	<b>Cell Types</b>	<b>Clinical Significance</b>
Stratum corneum	Nonviable keratinocytes	Responsible for thickness of glabrous skin Exfoliates with use of topical tretinoin
Stratum lucidum	Nonviable keratinocytes	
Stratum granulosum	Marginally viable keratinocytes	Thickens the most with tissue expansion
Stratum spinosum	Viable keratinocytes	
Stratum basale	Mitotically active keratinocytes, melanocytes, tactile cells, nonpigmented granular dendrocytes	Origin of various skin cancers

# Approach to skin lesions

- As in any medical problem a detailed **history** and **physical exam** is essential.
- **History:**
  - A standard P.P helps in identifying age, sex and Ethnicity.
  - We also ask about the lesion itself:
    - onset/duration
    - single or multiple
    - Location/s on body
    - Size of the lesion
    - Changes in size, shape, color
    - Any bleeding and/or ulceration
    - Symptoms
    - Similar or previous outbreaks
    - Any personal and/or family history of skin cancers
    - Other **risk factors**, ie excessive sun exposure, fair skin, large number of naevi, immunosuppression, outdoor occupation etc.
- We also obtain rest of history to make sure we have full picture

- Physical exam:
- We focus on the Lump examination (3S's, 3C's, 3T's, 1F):
  - Site - Size – Shape
  - Contour – color – consistency
  - Tenderness – transillumination – temperature
  - Fluctuance (movable and compressible) or Fixed (to skin, subcutaneous tissue or deep structures)
- A head-to-toe exam is necessary to make sure nothing is missed.

- These observations can help narrow down the diagnoses as some lesions have a recognizable patterns like:
  - **Basal cell carcinomas** usually appear as pink pearly papules with telangiectasias
  - **Squamous cell carcinomas** are often pink, rough papules, patches, and plaques.
  - **Melanomas** are characteristically brown-to-black lesions with asymmetry, irregular borders, color variegation, and diameters greater than 6 mm
  - **Basal cell carcinomas and squamous cell carcinomas** are commonly noted on parts of the head and neck that receive the most cumulative UV radiation over the course of a lifetime.
  - **Melanomas** can occur anywhere on the body and are most frequently discovered on the backs and shoulders of men and the lower limbs of women.
  - It also helps in estimating the risk of said lesions as studies found the face to be the highest risk area for melanoma.

- Lastly for us to make a definitive diagnosis a biopsy is a must, as it is the gold standard.





# Benign skin lesions

Done by *Maram Ayyad*

# SEBORRHEIC KERATOSES

- Benign skin growths stemming from the epidermis are often present in older individuals as multiple raised lesions with an irregularly rounded shape.
- These growths feature a rough, crumbly, waxy surface and can vary in color from yellowish to brownish-black.
- They commonly occur on the face, neck, and trunk.
- Should removal be sought, treatment options may include excision or curettage followed by electrodesiccation, along with the application of topical agents like trichloroacetic acid, or cryotherapy using liquid nitrogen.



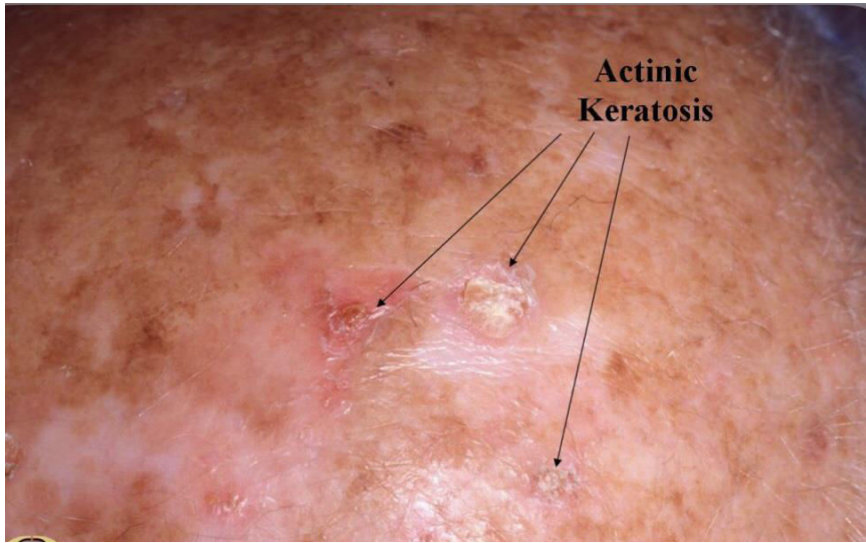
# Actinic Keratoses

Resulting from sun exposure, these lesions primarily affect elderly individuals with fair skin.

They appear as small, often multiple, flat-to-slightly raised patches with a rough or scaly texture, ranging from red to yellowish-brown to black.

Typically found in sun-exposed areas, they carry a risk of developing into squamous cell carcinoma, although metastasis is uncommon.

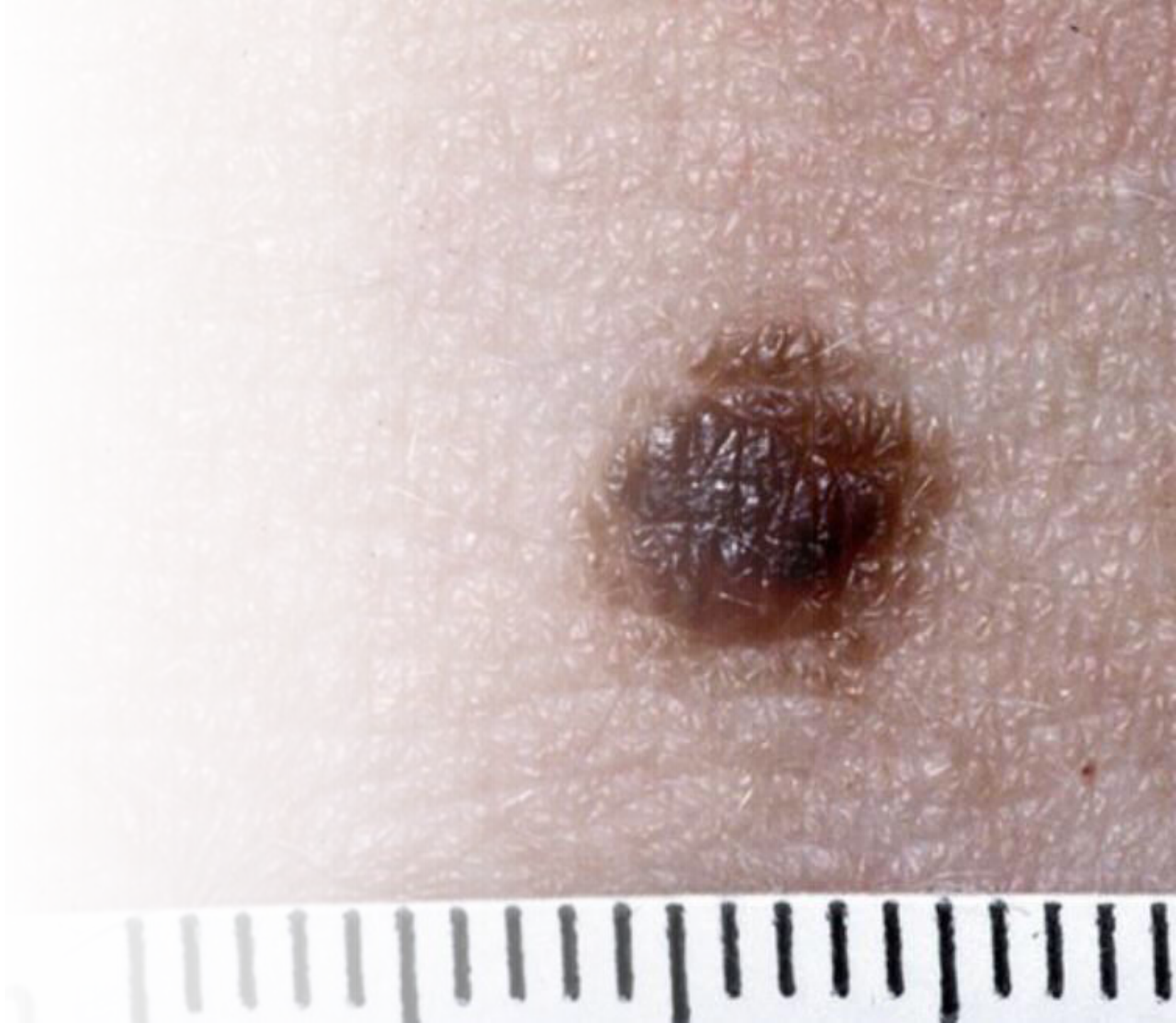
Treatment involves observation, excision, cryotherapy, dermabrasion, topical applications of imiquimod or 5-fluorouracil for 2 to 6 weeks when necessary, and photodynamic therapy.



# Nevi

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- Junctional nevus cells reside in the epidermis and at the dermal-epidermal junction.
- These small, well-defined, light brown or black spots can appear anywhere on the body.
- Nevi are rare in individuals over 40, and any new lesion in this age group warrants consideration for possible melanoma.



# Epidermal Inclusion Cysts



- These cysts, lined with epidermal cells containing lipid and keratinous material, are often asymptomatic but may be removed for diagnostic, preventive, or cosmetic reasons.
- Excision should encompass the entire cyst lining without interruption to prevent recurrence, along with any associated skin tract or drainage site.

# Neurofibromas

- Benign tumors arising from Schwann cells, neurofibromas are commonly associated with neurofibromatosis.
- Typically soft and lobulated, they vary in size and often do not require excision unless symptomatic, increasing in size, or for cosmetic purposes.





# Ganglion Cysts

- Subcutaneous cysts attached to joint capsules or tendon sheaths, commonly seen in young to middle-aged women.
- These firm, round masses occur most frequently on the wrist dorsum but can appear elsewhere.
- Surgical excision with removal of the capsular attachment and a portion of the joint capsule minimizes recurrence.



# Lipomas

- These benign tumors composed of fat are among the most prevalent human neoplasms, with minimal malignancy potential.
- Typically soft and subcutaneous, they vary in size. While small, asymptomatic lipomas can be monitored, symptomatic or rapidly growing ones should be removed.
- Large lipomas warrant evaluation through biopsy, and efforts should be made to excise them completely during the initial operation to prevent recurrence.

# Basal cell carcinoma

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# BCC

- BCC is the most common form of skin cancer, it is 4-5 times more common than squamous cell carcinoma
- 95% of cases occur between 40 and 79 years of age
- Greater than 80% occur in the head and neck
- The most common location of BCC is the nose
- It is the most common malignancy of the eyelid
- They are slow growing and locally invasive but rarely metastasize (less than 0.1 %)

# Risk factor

- Fitzpatrick skin type 1 and 2 have increased risk (see below)
- Sun exposure
- Advancing age
- Immunosuppression
  - AIDS, organ transplant medication
  - 13 fold increase in 10 years incidence of nonmetastatic skin cancer in transplant population vs general population
- Carcinogen exposure
  - UV light, ionizing radiation, arsenic, hydrocarbon

# Risk factor count...

- Genetic mutation
  - Albinism
  - Nevoid basal cell syndrome( Gorlin's syndrome)
  - Xeroderma pigmentosum ( XP )
- Premalignant lesions
  - Nevus sebaceus of Jadassohn : present at birth on scalp or face, the risk of malignant degeneration to BCC is 10% to 15%

**Table 15-1** *Fitzpatrick's Classification of Sun-Reactive Skin Types*

<b>Skin Type</b>	<b>Color</b>	<b>Reaction to First Summer Exposure</b>
I	White	Always burn; never tan
II	White	Usually burn; tan with difficulty
III	White	Sometimes mild burn; tan average
IV	Moderate brown	Rarely burn; tan with ease
V	Dark brown*	Very rarely burn; tan very easily
VI	Black	Do not burn; tan very easily

\*Asian Indian, Asian, Hispanic, or light African descent.

# Recurrence

- Depends on :
  1. Size
  2. Location ( head and neck > trunk and extremity )
  3. Borders
  4. Rate of growth
  5. Pathology
  6. Neural involvement (paresthesia, pain, numbness, and muscle weakness)
  7. History of radiation
  8. Immunosuppression
- 30% to 50% will recure within 5 years
- New lesions tend to be the same histopathologic type as previous lesions



**TABLE 32-3****High-Risk Factors for Local Recurrence or Metastases for Basal Cell Skin Cancer****Risk Factors**

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Area L  $\geq$ 20 mm

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Area M  $\geq$ 10 mm

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Area H, any size

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Aggressive growth pattern

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Poorly defined borders

---

Immunosuppression

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Site of prior RT

---

Recurrent **BCC**

---

Perineural involvement

---

Area H, “mask areas” of face (central face, eyelids, eyebrows, periorbital, nose, lips, chin, mandible, preauricular and postauricular skin, temple, ear), genitalia, hands, feet; Area M, cheeks, forehead, scalp, neck, and pretibial; Area L, trunk and extremities.

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# Biology

- Tumors originate from the pluripotential epithelial cells of the epidermis and hair follicles (basal keratinocytes) at the dermoepidermal junction.

# Type of BCC

- **Nodular**

- Most common histologic type ( 50% to 60% )
- Well defined borders, flesh colored, pearly nodule with overlaying **telangiectasias**( small widened blood vessels on the skin )
- May be ulcerated, central ulcer surrounded by rolled border ( rodent ulcer )



- **Superficial spreading**

- 9% to 15% of BCC ( second most common type )
- Located in the epidermis, no dermal invasion
- Flat, pink, scaly patches with ulcerations and crusting, usually multiple, on the trunk
- Often mistaken for fungal infection, actinic keratosis, psoriasis, or eczema



- **Micronodular**

- 15% of BCC
- Small rounded nodules of tumor the size of hair bulbs



- **Infiltrative**

- 7% of BCC
- Opaque yellow-white color, blends with the surrounding skin
- Tumor islands of variable size with jagged configuration



- **Pigmented**

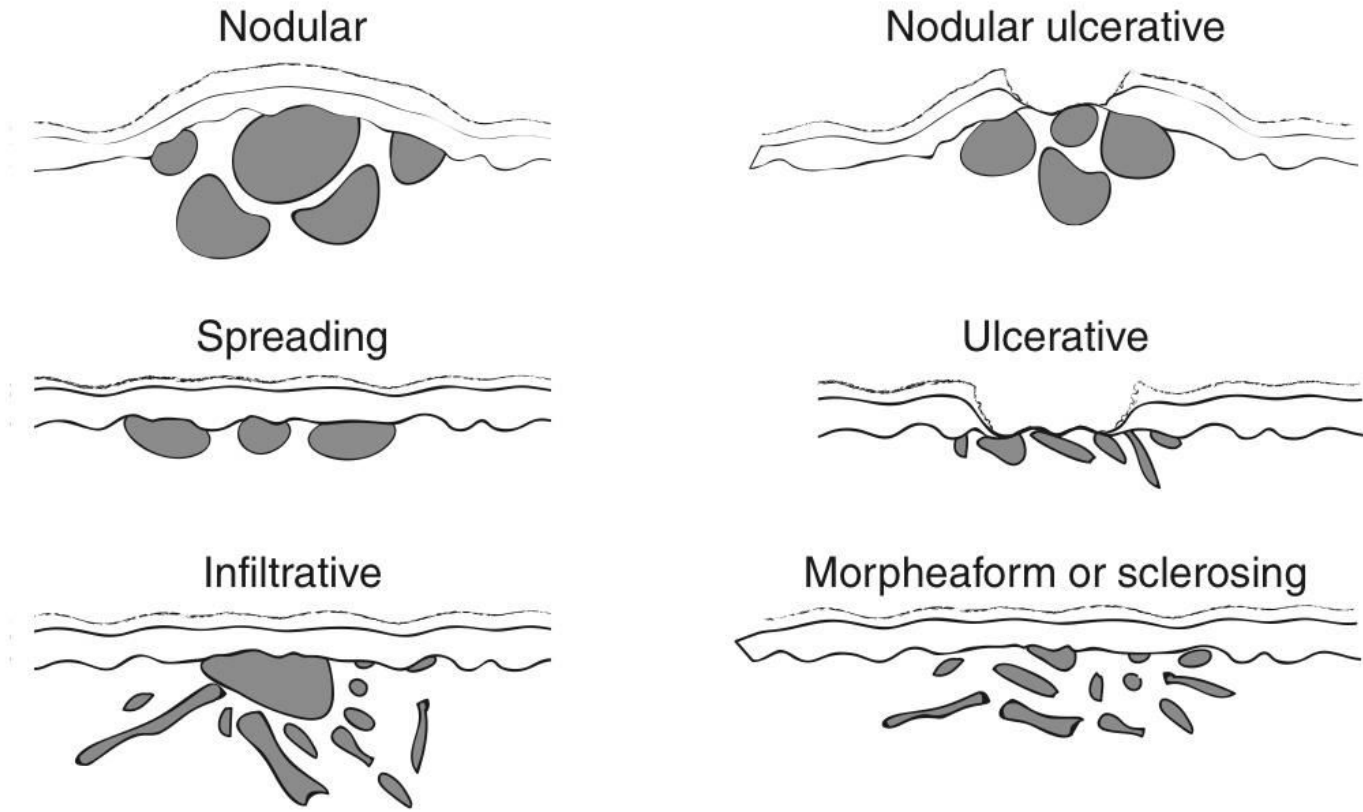
- 6% of BCC
- Pigmentation from melanin
- Often confused with melanoma



- **Morpheaform (sclerosing or fibrosing)**

- 2% to 3% of BCC, the most aggressive type of BCC
- Typically described by patients as an “enlarging scar” without a history of trauma
- Usually an indurated, flat, or slightly elevated papule or plaque with a white to yellow scarlike appearance
- Rarely ulcerates
- High incidence of positive margins after excision





**Fig. 15-1** Histologic types of basal cell carcinoma.

# Management of BCC



# General Principles

- What to consider?
  - Risk of recurrence
  - Conservation of tissue and function
  - Patient expectations and cosmetics

High-risk BCC

# High-risk BCC

- Preferred → Mohs micrographic Surgery (MMS)
  - Intraoperative peripheral and deep en face margin assessment
  - Ensures TOTAL tumor excision
  
- When is it used?
  - Minimal tissue excision is required (e.g. face)
  - Management of positive margins after tumor excision
  - Reserved for high-risk, recurrent, or complex lesions due to limited availability

# High-risk BCC

- Alternatives
  - Surgical excision with wide margins
    - 4mm → on face or low-risk
    - 10mm → on trunk/extremities and/or high-risk
  - Radiotherapy
    - Patients who cannot undergo resection (e.g. elderly)
    - Can be considered in cases of perineural or large nerve invasion

Low-risk BCC

# Low-risk BCC

- Preferred → Resection
- Surgical Excision
- Shave removal
  - Superficial BCC on trunk and extremities
- Curettage and Electrodesiccation (C&E)
  - In NON-HAIR bearing areas
  - Avoid in cosmetically sensitive areas

# Low-risk BCC

- Alternatives:
  - Radiotherapy
  - Cryotherapy
  - Topical pharmacotherapy (i.e., imiquimod or 5-fluorouracil)
  - Photodynamic therapy

Follow up



# Follow up

- Observe every 6-12 months for 5 years
- Patient education
  - About photoprotective measures
  - Self examination

Cutaneous

Squamous cells carcinoma

- \* **Demographics:**

- SCC is second most common skin cancer after BCC.
- Common on face, hands, forearms
- 60% of all tumors of external ear

- \* **Risk Factors :**

- Fitzpatrick skin type: Types I and II have increased risk
- Sun exposure: Cumulative exposure strongly correlated to SCC
- Carcinogen exposure: Pesticides, arsenic, organic hydrocarbons
- Immunosuppression: 253-fold increased risk for SCC in renal transplant patients.
- Viral infection: HPV and herpes simplex
- Radiation: Long-term latency between exposure and disease

- Chronic wound caused by thermal burn, discoid lupus, fistula tract, osteomyelitis
- Psoralen and ultraviolet A light (PUVA) for psoriasis treatment
- Premalignant lesions:
  - Actinic keratosis/solar keratosis
  - Leukoplakia: Most common premalignant lesion of oral mucosa. Mucosal changes with white patch .
  - Keratoacanthoma :Smooth dome-shaped mass of squamous cells and keratin plug, it is grows rapidly over 1-6 weeks and ulcerate with central crusting. tumors spontaneously regress over 2-12 months and heal with scarring.Larger or atypical lesions should be treated as SCC
  - Bowen disease

# Bowen's disease

- Red scaly lesion
- Usually found in the elderly or immunosuppressed
- Best regarded as SCC in situ
- 3-5% become invasive SCCs
- Treatment options include topical treatment with 5-FU, imiquimod, cryo, curettage, PDT, or excision



### Squamous cell carcinoma on the lip



This erythematous, crusted nodule on the lip represents a

### Cutaneous squamous cell carcinoma



An erythematous, hyperkeratotic papule is present on the skin.

### Keratoacanthoma



A dome-shaped nodule with a keratotic core on the skin.

\* **Recurrence and Metastasis:**

- Local metastasis occurs to regional nodal basins.

TIP: Lymph node examinations are critical.

\* **Biology**

- SCC arise from the malpighian or basal layer of epidermis.

# Risk Factors for Recurrence SCC:

<b>Clinical Features</b>	<b>LOW RISK</b>	<b>HIGH RISK</b>
Site and Size	Area L; <20 mm Area M; <10 mm	Area L; ≥20 mm Area M; ≥10 mm Area H;
Margins	Well defined; R0	Undefined or R1
Immune Suppression	Absence	Presence
Exposition to radiotherapy or chronic inflammatory process	Absence	Presence
Rapid growth	Absence	Presence
Neurological symptoms	Absence	Presence
<b>Histology</b>	<b>LOW RISK</b>	<b>HIGH RISK</b>
Grading	G1 or G2	G3
Adenoid-squamous, Adenoid-cystic, Desmoplastic, Metaplastic, Carcinosarcoma	Absence	Any Variant
Thickness or level of invasion	≤6 mm and no subcutaneous invasion	>6 mm or subcutaneous invasion
Perineural, lymphatic or vascular invasion	Absence	Presence



## **\*Types of SCC :**

All types are histologically similar with irregular masses of squamous epithelium proliferating downward toward dermis.

- Verrucous :Exophytic and slow growing .Common on palms and soles, less likely to metastasize.
- Marjolin's ulcer:Typically arise in chronic wounds (burn scars, fistulas).Metastasis to lymph nodes is common.
- Subungual :Squamous changes involving the nail bed. Presents as erythema, swelling, and localized pain followed by nodularity and ulceration

## **\*Treatment :**

- Biopsies of suspicious lesions are essential. Treatment modalities include medical, destructive, and surgical excision.

- Medical

A-Radiation: Used for primary treatment with a 90% cure rate. Examples include:

- Debilitated patients unfit for surgery

- High-stage large tumors needing additional therapy

- Recurrent tumors requiring multimodal treatment

B-Oral Medications: Retinoids can reduce precancer and skin cancer development in some patients, despite drawbacks like increased adverse reactions and teratogenic effects.

## D-Chemotherapy:

Typically used as adjuvant therapy for large tumors, recurrent, or metastatic disease. Examples include:

- Cisplatin alone or combined with 5-FU.

- Cetuximab, showing tumor regression with low toxicity in some studies

C-Topical Treatments: 5-FU is effective against precancerous lesions like actinic keratosis

- Destructive Treatments:

- Curettage and Electrodesiccation, Cryosurgery: Reserved for small superficial lesions, its main drawback is that it doesn't provide a sample for checking the margins

- Photodynamic Therapy: Particularly effective against precancerous lesions.

- Surgical:
- Excision
- Wide local excision is a good treatment option with 95% cure rate.
- Most recent recommendations are based on size, grade, location of tumor, and depth of invasion.
- Generally 4-6 mm margins are recommended.
- Frozen sections often give false negatives.

Mohs micrographic surgery

- 95% cure rate for primary SCC

- Lymphadenectomy
- - This is indicated for clinically palpable nodes.
- Fine-needle aspiration (FNA) or open lymph node biopsy: Used to confirm metastatic disease
- Sentinel lymph node dissection (SLND): maps nodal status with less morbidity, especially for high-risk SCC. If positive, proceed with lymphadenectomy.
- Elective lymph node dissection (ELND): removes clinically negative nodes, typically for tumors extending to nearby areas.

**\* Follow-Up**

-Patients Treated for SCC should be observed frequently with full H&P, complete skin and nodal examination.

**Thank you**