Basal Cell Carcinoma

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Epidemiology
According to the American Cancer Society there are approximately 5.4 million basal (BCC) and cutaneous squamous cell carcinomas (cSCC) diagnosed each year in the US, with 80% of these being BCC. Men are twice as likely to develop BCC and this typically occurs between the ages of 40 – 60. Australia has the highest incidence of BCC (percentage of total population) in the world. In the United States, rates of BCC are higher in states near the equator, such as Hawaii and Florida. All these geographic predilections are related to increased exposure to ultraviolet (UV) radiation.

Risk Factors
Risk factors for developing BCC can be divided into two categories: genetic predisposition and environmental exposure.

1. Genetic Predisposition
   Some people are born with genetic medical conditions that increase the likelihood of developing BCC. Gorlin's Syndrome and Xeroderma Pigmentosum are two medical conditions that put patients at a significantly increased chance of developing BCC. Fair skin is another risk factor. Skin tone can be classified by the Fitzpatrick scale; those with lower numbers are at higher risk for BCC:

Fitzpatrick Skin type	Typical features	Tanning ability
I	Pale white skin, blue/green eyes, blond/red hair	Always burns, does not tan
II	Fair skin, blue eyes	Burns easily, tans poorly
III	Darker white skin	Tans after initial burn
IV	Light brown skin	Burns minimally, tans easily
V	Brown skin	Rarely burns, tans darkly easily
VI	Dark brown or black skin	Never burns, always tans darkly

2. Environmental Exposure
   Ultraviolet (UV) light exposure from both natural (sunlight) and artificial (tanning beds) is the major risk factor for developing BCC. Interaction with ionizing radiation and certain chemicals, such as arsenic, can also increase risk. Patients with weakened immune systems are also at higher risk for developing BCC.

Prevention
   Sun Protection - Given the clear association between UV radiation and BCC, sun protection forms the cornerstone of primary prevention. Some guidelines for keeping safe include:
   - Use of broad-spectrum sunscreen with an SPF of 30 or higher
   - Long-sleeved shirts and wide-brimmed hats

- Wearing sunglasses with UV protection
- Avoiding sun exposure during 10am – 4pm (highest UV concentration)

Treatment

Most of the time, BCC is treated by removing the lesion, either in a physician's office or in the operating room. Some smaller lesions may be treated with other treatments to the skin. For patients who are unable to undergo surgery due to other medical problems, radiation and certain types of chemotherapy are available.

1. Topical treatments
   - Liquid Nitrogen: "Freezing" of concerning areas.
   - Curettage & Diathermy: Minor procedures to remove the skin cancer cells.
   - Imiquimod 5%: This is a cream applied to early, superficial BCC.
   - 5-fluorouracil (5-FU): This is a topical 5% cream/solution and is applied twice daily for four to six weeks generally for superficial BCC.

2. Surgical – Gold Standard
   - Mohs Surgery: This involves removing the cancer in stages to make sure all the cells are removed. This may take several 'stages' that are done the same day in a dermatologist's office.
   - Surgery with margin analysis: This involves removing the tumor with a rim, or margin, of normal tissue around it. National Comprehensive Cancer Network (NCCN) guidelines currently recommend 4mm clinical margins for standard surgical excision of low risk tumors.

3. Radiation Therapy
   Useful alternative to surgery for patients who can't have surgery due to other medical conditions.

4. Chemotherapy
   *Vismodegib/*Sonidegib - These are a new type of oral medication called Hedgehog pathway inhibitors. They have been approved for patients with BCC that has spread to other parts of the body (rare), locally advanced BCC that has recurred following surgery, or as a treatment prior to surgery in select cases.