Rash and Skin Disorders

This episode will be a combination of objectives for both skin disorders and rash. Let's get started!

In a patient with a persistent or recurrent rash explore issues of:

a) **Exposure to skin irritants or allergens**
b) **Adherence to the treatment plan**
c) **Use of confounding medications and treatments (e.g., topical anesthetics, topical steroids, home remedies)**

Rash Objective 1+ 7/ Skin Disorder Objective 1+4

In a patient with a new rash:

a) **Take a focused history and do an appropriate skin examination**

It is important to examine the whole patient, even when prompted by concern of a localized skin lesion. A systemic approach will ensure you don't miss any areas. This includes checking from head to toe: scalp, back of neck, oral cavity, intertiginous areas (such as the axilla, skin folds, between digits), nails, perineum, soles of the feet.

b) **If the diagnosis remains unclear obtain a more detailed history and examination, including the entire mucocutaneous system and other body systems as indicated**

Important details to include in the history include:

- Previous episodes and previous treatments in order to further investigate (ie. With a biopsy, skin shaving) or intensify treatment
- History of contacts, exposure, or travel. Eg. infectious causes, new detergents, occupational history
- Medication/drugs—common offenders are antibiotics [penicillin, sulfonamides], corticosteroids, NSAIDs, and anti-epileptics
- Family history of skin conditions
- Associated symptoms such as pain, pruritus, bleeding, exudate, blistering/ulcerations, fever, aches

Rash Objective 2

When assessing a patient with a rash look for and recognize common patterns to aid diagnosis.

Various descriptive patterns exist to describe the look and shapes of rashes.

- Discoid/nummular: circular lesions
- Annular: ring shaped
    - Eg. Annular urticaria, erythema annulare centrifugum, fungal annular lesions
- Target: concentric rings of different colors in vascular based inflammatory conditions.

- Serpiginous: snake like
    - Eg. Larva migrans, scabies mites
- Erythroderma: total redness of skin due to eczema, psoriasis, drug eruptions and other rare disease
    - Presents with a very large area of skin inflammation, which affects temperature regulation, and fluid and electrolyte balance
- Symmetrical distribution: endogenous/systemic cause of rash
    - Eg. Psoriasis, atopic dermatitis, viral exanthemata
- Asymmetrical: exogenous cause
    - Eg. Skin infection, fungal infection

Rash Objective 3
Use appropriate terminology with respect to lesion type, shape, arrangement, and distribution to facilitate communication and documentation
Dermatologic terminology is necessary for proper documentation and communication between consultants. Pictures of lesions will be included in the show notes. A few common descriptions include:

- Macules: circumscribed change in skin colour that is no more than 1 cm in size and completely flat. If you can feel it, then it is not a macule.
- Patch: Identical features as a macule except it is called a patch if the lesion is >1 cm in size.
- Papules: palpably raised lesion, <1cm
- Plaque: raised lesion >1cm
- Nodule: Solid, round or ellipsoid lesion that is larger than a papule.
- Vesicles: <0.5cm clear fluid filled blister
- Bullae: >0.5cm blister
- Pustule: vesicle containing pus
- Cyst: A cavity containing liquid, solid or semi-solid material that can present superficially or deep.
- Erosions and Ulcers: Both are used to describe defects within the skin surface with erosions used specifically when the defect is confined to the epidermis and ulcers which extend into the dermis or deeper.
- Scale: loss of damaged stratum corneum, fragments into layers when scratched
    - Eg. psoriasis
- Crust: Develops when serum, blood, or purulent exudate dries on the skin surface. Appear yellow to green depending on the causative fluid.

Rash Objective 4/ Skin Disorder Objective 5
In an unwell patient presenting with a rash:

a) **Identify potential life-threatening systemic conditions (e.g., meningococcal septicemia, necrotizing fasciitis, toxic shock, Stevens-Johnson syndrome)**
b) **Initiate treatment and/or urgent/emergent referral**

- **Steven Johnson Syndrome** (<10% skin involved) / **Toxic epidermal necrolysis** (>30% skin involved)
    - This is a rare immune mediated skin reaction
    - It is often triggered by drugs (85% of cases) 1-3 weeks after a new drug is started or infection (15% of cases)
    - Common culprits are anticonvulsants, antibiotics, allopurinol, sulphonamides, NSAIDs, and barbituates
    - Starts with a prodromal flu-like illness: Fever >39C, sore throat, rhinorrhea, cough, aches. It can progress to sepsis, electrolyte disturbance, and multiorgan failure as well.
    - Leads to sudden onset severe mucosal ulceration, painful purpuric macules with blistering, epidermal sloughing
    - Mainstay is to treat aggressively as the earlier a patient with SJS/TEN are diagnosed and management is initiated, the better the prognostic outcome
        - This can be done by treating the underlying trigger, including:
            - Stopping the causative drug, and
            - Treating infections with IV fluid resuscitation and wound management
            - Patients are best managed in an intensive care or burn unit
            - Medical management also includes systemic glucocorticoids and high dose immunoglobulins

- **Necrotizing soft tissue infections**
    - Unfortunately, this has a very high mortality rate of 20-80%
    - Initial signs include diffuse erythema, swelling, warmth, and tenderness out of proportion with presentation
    - Late findings include crepitus, bullae, skin necrosis, and loss of sensation
    - Treatment requires ICU admission with aggressive surgical debridement and broad-spectrum antibiotics
- **Meningococcal infection**
    - Petechial rash involving trunk, lower body, mucous membranes (oral and ocular), may have purpura, ecchymotic lesions
- **Chemical or non-chemical burns**
    - In the acute stage, start with fluid Resuscitation for burns
        - Modified Brooke Formula 2mL x %BSA x kg Ringer's Lactate. We give 1/2 in first 8 hours, and then 1/2 in next 16 hours

    - Then employ wound management principles in order to keep the wound moist for better healing.

Skin Disorder Objective 2

In a patient presenting with a skin lesion, distinguish benign from serious pathology (e.g., melanoma, pemphigus, cutaneous T-cell lymphoma) by physical examination and appropriate investigations (e.g., biopsy or excision).

- To distinguish malignant lesions from benign lesions, a common rule for physical exam is the ABCDE rule
    - A stands for asymmetry
    - B for border, particularly an irregular border
    - C is for uneven color within the lesion
    - D is diameter greater than 0.5cm
    - E is evolution of the lesion, whether it is growing or changing over time
- Another general rule of thumb for patients is the "ugly duckling rule", where if one lesion looks different from the rest, they should probably get it looked at
- The most important risk factors for skin malignancy is fair skin and cumulative sun exposure
- **Skin malignancy** is generally divided into 3 main types
    - Basal Cell Carcinoma is the most common and most benign skin malignancy
        - The classical appearance of a nodular BCC is a raised pearly white nodule with telangiectasias. However, superficial BCC is composed of red scaling plaques with thready border
        - Diagnosis and treatment consists of a full or partial-thickness biopsy (such as a punch, curettage, or shave biopsy)
        - Prognosis is excellent with these lesions and there is a very low rate of malignancy spreading beyond the local area and they are generally slow growing
    - The most important big bad to not miss is, of course, melanoma
        - It is diagnosed and treated with full-thickness excisional biopsy with 0.5-2cm safety margin (according to Breslow thickness)
        - The prognosis of the disease highly dependent on Breslow thickness and there is high potential of metastasis
        - Early recognition greatly increases chance of survival. Patients with a personal history of melanoma should have a complete skin exam done by their family doctor or dermatologist regularly as they are at higher risk of developing a second melanoma. In addition, lymph node examination should be conducted at each visit
    - Squamous Cell Carcinoma
        - Often presents with persistent ulceration, crusting, hyperkeratosis, erythema in sun exposed areas such as the face, scalp, ears, and legs

        - However, unlike BCCs, SCCs are associated with a risk for metastasis, commonly in immunosuppressed patients
        - Treatment involves surgical excision + biopsy
        - Of note, Actinic keratosis (AK), is a premalignant lesion that can rarely develop into SCCs. They often occur also as a side effect of too much fun in the sun.
            - AKs are treated with cryotherapy or topical therapies such as imiquimod or fluorouracil cream
- **Cutaneous T-cell lymphoma** (Mycosis Fungoides)
    - This occurs with lymphocyte infiltration in progressively over many years, which can be a presenting complaint or after lymphoma diagnosis
    - It starts with pruritis, leading to oval patches, then thickened plaques, and finally skin tumors
- **Pemphigus**
    - This is not to be confused with the more common and less severe *Pemphigoid* blistering diseases (e.g., bullous pemphigoid)!
    - Pemphigus is a group of life threatening autoimmune blistering and erosive diseases affect both cutaneous and mucocutaneous sites. Most common of these is pemphigus vulgaris, though there are also foliaceous, IgA, and paraneoplastic
    - Treatment involves systemic steroids and then long term immunosuppression with azathioprine or mycophenolate. Wound dressings are also important to avoid infection

Rash Objective 5/ Skin Disorder Objective 3 + 6
In a patient with an undiagnosed rash:

a) **Consider a systemic disorder (e.g., systemic lupus erythematosus, diabetes, celiac, Wegener's granulomatosis, lupus, drug reaction)**
b) **Investigate appropriately (e.g., scraping, culture, biopsy, lab work)**
c) **Pursue further investigations and/or refer as indicated regardless of negative results**

- **Wegener's granulomatosis** is a disease involving small to medium vessel necrotizing vasculitis. This presents at purpura of the lower extremities, focal necrosis and ulcerations
- **Systemic lupus erythematosus (SLE)**
    - Lupus erythematosus is group of diverse and persistent autoimmune inflammatory disease
    - The typical acute reaction we associate with systemic lupus presents with
        - The classic malar (or butterfly) rash that resolves without scarring, often appearing after sun exposure and mistaken for a sunburn

        - And bullous or maculopapular lesions, mucosal erosions/ulcerations, photosensitivity, and diffuse hair loss
    - On the other hand, sub-acute and chronic cutaneous lupus are often confined to only the skin without any symptoms of systemic lupus.
        - Subacute CLE resembles psoriasis with flat, scaly patches
        - Chronic CLE leads to discoid indurated hyperpigmented plaques above the neck
- **Diabetes**
    - Some cutaneous manifestations of diabetes include: acanthosis nigricans and diabetic dermopathy, which are light brown oval scaly patches over the pretibial area
    - Regular examination of high risk patients, such as those with diabetes, peripheral vascular disease, or are bed/chair bound is very important to assess for skin ulcers
    - In these high risk patients, minor skin lesions need to be treated aggressively with regular wound care, and antibiotics if appropriate, to prevent formation of chronic wounds and potential surgery in the future
- **Celiac**
    - Dermatitis Herpetiformis ("Celiac of the skin")
        - Pruritic papulovesicular rash on extensor
        - Can biopsy to confirm celiac
        - Recurrent aphthous stomatitis
- **Drug reaction**
    - Drug reactions are often an immunological response, oftentimes to antibiotics
    - Exanthematous drug eruptions are maculopapular, widespread, symmetrical rash within a few days to 3 weeks of starting a drug
    - Urticarial rashes are typically IgE mediated reactions
    - A fixed drug eruption is a well circumscribed inflammatory lesion that develops in the same area after each ingestion of the offending agent within 30min to a few hours
    - And again, severe drug reactions can lead to SJS/TENs syndrome
    - Treatment involves discontinuation of the responsible drug and topical steroids and/or antihistamines

Rash Objective 8
In a patient with an infectious rash:

a) **Manage contagion risk**
b) **Ensure that public health bodies are informed when indicated**

- There are multiple rashes that are reportable, including
    - Chicken pox: which starts on the face and extends to the trunk and extremities

        - It evolves from papules to vesicles to pustules
        - Incubation is 14-21 days, with infectious timeline lasting from 1-2 days pre-rash until the vesicles are crusted
- Lyme disease
    - Where I live in Ontario, this is endemic and often transferred by tick bites
    - An erythematous macule will evolve into erythema migrans and systemic symptoms such as joint pain, fever, and malaise later on
    - Based on time of tick attachment, there is an algorithm to antibiotic treatment that we will link in the show notes
- Measles
    - This is a macular rash that starts on the face and spreads downward
    - There is an upper respiratory tract infection prodrome
    - The virus can incubate for 10-14 days and is infectious from 4 days prior until the eruption of the rash
- Rubella
    - Macules and papules start on the forehead prior to spreading elsewhere, then the rash fades in reverse order
    - The infection incubates for 14-21 days
    - Infectivity starts 7 days prior to rash until 5 days after rash

Rash Objective 6/ Skin Disorders Objective 7
In a patient being treated for a new or persistent skin condition (e.g., acne, psoriasis), determine the impact on the patient's personal and social life.
As the objective states, it is very important to realize that although dermatologic disease may not always cause mortality, there is a lot of morbidity associated. A commonly used scale to quantify quality of life is the Dermatology Life Quality Index for adults suffering from skin disease.

Resources:

Dermatology Skin lesions