# ABOUT THE AUTHORS

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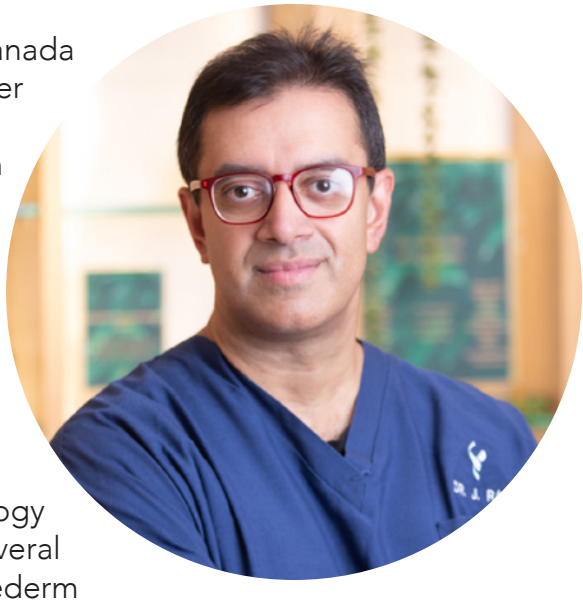

Dr Rao is a board-certified dermatologist licensed in both Canada and the United States. He is also a certified cosmetic and laser surgeon, having completed an accredited fellowship in 2004 with the American Academy of Cosmetic Surgery in southern California. Dr. Rao has a very busy and popular practice in the Alberta DermaSurgery Centre. Located in the heart of Edmonton, Alberta, Dr. Rao specializes in medical, aesthetic, surgical and research dermatology.

Dr. Rao serves as a Clinical Professor of Medicine and was a previous Dermatology Residency Program Director at the University of Alberta. In 2007, Dr. Rao created ConsultDERM™, a very popular and successful teledermatology platform that continues to help physicians and patients in several Canadian provinces and territories. He has also founded Telederm Outreach, a philanthropic remote dermatology service to provide assistance to third world countries.

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# IDENTIFYING DERMATOLOGICAL EMERGENCIES IN OUT-PATIENT CARE: WHEN TO BE WORRIED

## INTRODUCTION

Dermatological emergencies require early identification and must be addressed immediately. According to a study from 2005, dermatological concerns constitute 15-20% of visits to family physicians and emergency departments. Understandably, different cutaneous manifestations may be challenging to categorize as the presentation of various lesions may overlap with respect to the diagnosis. It is essential for physicians providing outpatient care to consider that although lesions may only appear to be manifesting on the skin, systemic involvement may be a factor or may follow depending on the pathology of the underlying illness. As physicians seeing patients in outpatient care settings may be the first point of contact for patients, familiarity with the identification of specific lesions, the timeline of their occurrence, signs and symptoms at presentation, and their causes are valuable information needed to determine the urgency of their patients' situation. This article identifies some common lesions of concern that may require closer attention and some of the dermatological emergencies associated with these lesions.

## PRESENTING LESIONS OF CONCERN

### Morbilliform eruption

Morbilliform refers to a lesion that resembles measles in its morphology and distribution.[2] Morbilliform eruptions can be described as symmetrical, erythematous blanching macules and papules.[3]

### Palpable purpura

Palpable purpura is usually the consequence of vascular inflammation in the skin and extravasation of blood, and can be described as firm, raised palpable discoloration of the skin or mucous membranes, which can be several centimeters in diameter.[4] Patients with purpuric rashes and febrile or signs of toxicity require emergent evaluation.[5]

### Petechiae

Petechial rashes are associated with several causes, including trauma, hematological abnormalities, and infection resulting in hemorrhage into the dermis.[6] They can affect the skin and mucous membranes and are characterized as non-blanching pin-point spots, measuring less than 2 mm in size.[6] The characteristic difference between purpura and petechiae is that petechiae spots measure less than 2 mm.

### Violaceous lesions

The term violaceous refers to a bluish-purple colour and can characterize many lesions, some of which may not necessarily be an emergency. When seeing a violaceous lesion, it is essential to recognize that these lesions may potentially indicate early signs of necrosis or hemorrhage.

### Bulla

Bulla refers to blisters which are greater than 5 mm in diameter. The rapid evolution of skin lesions to bulla can be cause for concern.

**Table 1** provides a summary of these above-mentioned lesions of concern and the dermatological emergencies associated with them.

## STEVENS-JOHNSON SYNDROME (SJS)/ TOXIC EPIDERMAL NECROLYSIS (TEN)

SJS and TEN are variants of a single entity which are distinguished by whether they involve less than 10% of the total body surface area or greater than 30%, respectively.[7] They begin as acute medical emergencies characterized by peeling of the skin that subsequently progresses to potentially life-long consequences (pigmentation, xerosis, alopecia, etc.). SJS and TEN are associated with systemic symptoms, multi-organ involvement, and mucocutaneous manifestations. The incidence of SJS/TEN is approximately 4–6 cases per million person/year. The mortality rate for SJS is approximately 5% and approximately 40% for TEN. Analysis has shown that 50% of cases of SJS and 80–90% of cases of TEN are caused by medication use (**Table 2**) and occur 4 to 21 days after initiating the implicated medication. Systemic symptoms occur 1-3 days before mucocutaneous lesions and are characterized by fever, malaise, cough, rhinorrhea, and difficulty swallowing.[8] Cutaneous lesions of SJS and TEN generally appear first on the face and thorax, followed by symmetrical spreading to other parts of the body. Early cutaneous lesions begin as erythema and rapidly

| Lesion | Differential Diagnosis |
|---|---|
| Morbilliform Eruption | TEN/SJS<br>DRESS<br>Rickettsial infections<br>Viral infection |
| Palpable Purpura | Meningococcemia<br>Disseminated gonococcal disease<br>Endocarditis<br>Henoch-Schönlein purpura (HSP)<br>Rocky mountain spotted fever |
| Bulla(e) | Bacterial infection (impetigo, cellulitis)<br>Viral infection (HSV, hand-foot-mouth)<br>TEN/SJS<br>Mucous membrane pemphigoid<br>Meningococcemia<br>Necrotizing fasciitis<br>Staphylococcal scalded skin syndrome |
| Petechiae | Purpura fulminans<br>Disseminated intravascular coagulopathy (DIC)<br>Thrombotic Thrombocytopenia Purpura (TTP) |
| Violaceous | Necrotizing fasciitis |

*Table 1: Lesions of Concern and Possible Dermatological Emergencies[5,16]; courtesy of Rao, MD and Motamedi, MD*

| Drug Class | Drug Name |
|---|---|
| Xanthine oxidase inhibitors | Allopurinol |
| Antibiotics | Trimethoprim-Sulfamethoxazole<br>other sulfonamide antibiotics<br>Aminopenicillins<br>Cephalosporins<br>Quinolones |
| Aromatic anticonvulsants | Carbamazepine<br>Phenytoin<br>Phenobarbital |
| Oxicam NSAIDs | Diclofenac<br>Etodolac<br>Indomethacin<br>Ketorolac<br>Nabumetone<br>Sulindac |

*Table 2: Drugs with a "high" risk of inducing SJS/TEN[17]; courtesy of Rao, MD and Motamedi, MD*

progress into a blistering, maculopapular eruption followed by skin sloughing.[8] Early identification of signs and symptoms is paramount to reducing mortality, as increased mortality is associated with the involvement of a large proportion of total body surface area.[9] However, prodromal symptoms that initially present may be considered typical influenza-like symptoms, which patients may not consider as necessitating the need to visit their primary care provider. For this reason, patients who present with systemic illness, symmetrical and diffuse erythema after recently starting a medication must be immediately evaluated for SJS/TEN. Management of SJS or TEN requires a multidisciplinary approach. The implicated drug, should be discontinued, and immediate intensive care support initiated.

## DRUG REACTION WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS (DRESS)

DRESS is a morbilliform drug eruption that causes an array of clinical symptoms involving multiple organ systems and the skin. Its reported incidence is estimated at more than 10 cases per million per year and current research is not conclusive on whether a racial predilection exists for the diagnosis of DRESS. The median age at diagnosis is approximately 51 years for men and 55 years for women with less than 10% of patients being younger than 20 years.[10] As the name suggests, the offending trigger in DRESS is a medication; high-risk culprits are listed in **Table 3**. The symptoms of DRESS are latent and may begin anywhere from 2 to 3 weeks after initiating the offending drug. Patients usually present with a widespread pruritic, maculopapular, morbilliform rash, symmetric across the trunk and extremities. Other clinical symptoms include facial edema, enlarged lymph nodes, and a fever of >38oC.[10] The overlapping presentation of DRESS and SJS/TEN is undeniable. However, the key to the differential diagnosis between these illnesses is that patients with DRESS usually do not have mucosal surface and palm involvement. The rash in DRESS patients is also pruritic, whereas, in SJS/TEN, this is not the case.[11]

DRESS management includes the immediate cessation of the instigating medication, supportive care, and inpatient monitoring depending on the severity of the symptoms. Symptom relief involves the use of systemic corticosteroids, which commonly result in dramatic improvements.[10]

| |
|---|
| Carbamazepine |
| Phenytoin |
| Phenobarbital |
| Zonisamide |
| Mexiletine |
| Lamotrigine |
| Dapsone |
| Salazosulfapyridine |
| Allopurinol |
| Minocycline |
| Abacavir |
| Nevirapine |

*Table 3: Drugs with a "high" risk of inducing DRESS[10]; courtesy of Rao, MD and Motamedi, MD*

## MENINGOCOCCEMIA

Meningococcemia is a severe and life-threatening infection caused by meningococci bacteria (*Neisseria meningitidis*). Although meningococcemia can affect patients of any age, the greatest number of reported cases are in children < 1 yr and adolescents between the ages of 16 and 23 years of age.[12] Clinical manifestations of meningococcemia involve multiple organ systems. In the early stage, symptoms can include an upper respiratory tract infection (URTI), fever, headache, vomiting, lethargy, and in 70% of cases, a non-blanching petechial/purpuric rash, commonly on the trunk or extremities.[12] Meningococcemia is a medical emergency, and therefore if it is suspected, immediate hospital referral is necessary.

## NECROTIZING FASCIITIS (NF)

Necrotizing fasciitis (NF) describes a group of relatively uncommon, but life-threatening infections of the skin, soft tissues, and muscles. The annual incidence of NF is estimated at 500–1,000 cases and its prevalence globally has been reported to be 0.40 cases per 100,000 population with a reported predilection for men, with a male-to-female ratio of 3:1.[13] Early identification of NF can result in the salvage of soft tissue, the reduced chance or extent of amputation, and possibly reduced mortality for patients. Breakage of the skin, whether it be from a laceration, burn, or surgical procedure, is strongly associated with NF.[13] Any age group is susceptible to NF; however, those > 50 years of age are more likely to be affected due to the increased prevalence of co-morbidities in this age group, including diabetes and other vascular diseases.[13] In its early stage, NF may be resemble a soft-tissue infection, such as cellulitis. However, with NF, the infection initially occurs in the fascia. Therefore, margins of the erythema, which lend to the suspicion of a soft-tissue infection, are usually ill-defined with NF. As a result, the pain in the area extends and is much more exaggerated than what clinicians would expect to see with a soft-tissue infection.[14] If left unaddressed or in the case of the lack of clinical response to treatment, a violaceous dusky lesion begins to form about 3 to 5 days after initial symptoms appear, followed by bulla formation and necrosis. Patients may also present with signs and symptoms of septic shock such as being febrile, tachycardic, and hypotensive.[15] The hallmark feature of NF is pain that is disproportional to cutaneous symptoms. Patients who present in this manner and present with other systemic symptoms, including malaise, lethargy, and disorientation, should be assessed immediately.[15] NF is a rapidly progressing infection; prompt identification and the use of anti-microbial therapy are necessary. Patients with suspected NF should be hospitalized. The monitoring of other organ systems is essential to controlling the severity and progression of the infection.[15]

## SUMMARY AND CLINICAL PEARLS

This article has identified a small number of diseases that would constitute a dermatological emergency. However, identifying lesion types and the significance of their distribution pattern is important, particularly when those lesions occur abruptly. Clinicians should take care to note some of the presenting symptoms discussed here, the drug products that may induce certain conditions (SJS/TEN/DRESS) and refer patients for hospitalization as required.

**Important considerations when assessing a patient who reports unusual and abrupt cutaneous lesions**

- ✓ Abrupt cutaneous lesions accompanied by signs of cognitive impairment and multi-system involvement commonly constitute an immediate need for urgent care
- ✓ Patients who are on immunomodulating medications or have a chronic illness that makes them immunosuppressed may be more susceptible to hypersensitivity reactions and aggressive infections
- ✓ Lesions that distribute symmetrically and begin as erythema with rapid (1-2 days) progression into maculopapular rashes followed by (2-3 days) bullae formation require immediate attention
- ✓ Pain which is out of proportion in areas of suspected subcutaneous infection should be thoroughly worked up
- ✓ Failure of conventional treatments and escalated worsening of symptoms should be indicative of the need for urgent care
- ✓ A thorough history of new medications started within the last several weeks should be taken when morbilliform eruptions are present
- ✓ Timing can be crucial for improved outcomes; if a patient's onset of symptoms has been > 48 hours and they or their family report rapid debilitation in health, an immediate need for hospitalization is required

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