

A 10-year-old boy is brought by his parents to the emergency department for the evaluation of headaches, fever, chills, and a rash over his neck, chest, and axillae. The rash appeared today, and for the past two days the child was complaining of a sore throat. He has no history of allergies, and his immunizations are up-to-date. His blood pressure is 112/70 mmHg, pulse is 108/min, respirations are 20/min, and temperature is 38.3°C (101°F). Examination reveals an erythematous rash with a sandpaper-like texture, and which blanches with pressure. There is submandibular tender lymphadenopathy, and the throat is erythematous with gray-white exudates. What is the most likely diagnosis?

- ☐ A. Kawasaki disease
- ☐ B. Staphylococcal scalded skin syndrome
- ☐ C. Scarlet fever
- ☐ D. Herpangina
- ☐ E. Mononucleosis
- ☐ F. Toxic epidermal necrosis
- ☐ G. Stevens-Johnson syndrome



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- ☐ A. Kawasaki disease [4%]
- ☐ B. Staphylococcal scalded skin syndrome [3%]
- ☒ C. **Scarlet fever** [86%]
- ☐ D. Herpangina [2%]
- ☐ E. Mononucleosis [3%]
- ☐ F. Toxic epidermal necrosis [1%]
- ☐ G. Stevens-Johnson syndrome [1%]

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### Explanation:

User Id: XXXXXXXXXX

The patient most likely has scarlet fever. Scarlet fever is caused by strains of Group A streptococcus that produce erythrogenic exotoxins. It has the same mode of transmission and age of distribution as streptococcal pharyngitis. The illness may follow a streptococcal pharyngitis, wound infections, burns, or streptococcal skin infection. It begins acutely after an incubation period of 1 to 7 days. Initial symptoms include fever, chills, toxicity, abdominal pain, and pharyngitis. The rash initially appears on the neck, axillae, and groin within 12 to 48 hours, and subsequently generalizes within 24 hours. The rash characteristically has a punctate or finely papular texture which is sometimes readily palpable; hence, the "sandpaper-like" description. The pharynx is typically erythematous, swollen and possibly covered with gray-white exudates. The area around the mouth appears pale in comparison with the extremely red cheeks, giving the appearance of "circumoral pallor." Towards the end of the first week, desquamation begins in the face, progresses down the trunk, and finally extends to the hands and feet. The treatment is Penicillin V (drug of choice). Erythromycin, clindamycin, and first generation cephalosporins are good alternatives for patients who are allergic to penicillin.



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**(Choice A)** Kawasaki disease is a probable differential diagnosis, due to the patient's lymphadenopathy, changes in the buccal mucosa (pharyngitis and strawberry tongue), and rash; however, to make this diagnosis, at least one additional criterion must be present. That is, there should either be changes in the peripheral extremities or bilateral conjunctival injection. In a real clinical setting, it may be difficult to distinguish scarlet fever from Kawasaki disease, especially in children who are carriers of Group A Streptococcus; however, a rapid response to penicillin therapy generally confirms the diagnosis of scarlet fever.

**(Choice B)** Staphylococcal scalded skin is caused by exfoliative strains of *S. aureus*, and is characterized by the development of superficial flaccid bullae followed by an extensive exfoliation of the skin. It is most common in infancy, and rarely occurs beyond five years of age.

**(Choice D)** Herpangina is a throat infection caused by enteroviruses, especially Coxsackie A. It is characterized by a high fever and a severe sore throat that may result in a complete inability to swallow, sometimes necessitating IV hydration. Ulcerative lesions are found on the palate, tonsils, and pharynx. Sometimes, these lesions appear on the palms and soles, in which case the infection is called hand-foot-mouth disease.

**(Choice E)** Mononucleosis can also present with exudative pharyngitis and lymphadenopathy; however, the characteristic rash of this patient makes scarlet fever the more likely diagnosis.

**(Choice F)** Toxic epidermal necrolysis is another form of cutaneous hypersensitivity that is sometimes considered to be a variant of Stevens-Johnson syndrome. Most cases are



generation cephalosporins are good alternatives for patients who are allergic to penicillin.

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**(Choice F)** Toxic epidermal necrolysis is another form of cutaneous hypersensitivity that is sometimes considered to be a variant of Stevens-Johnson syndrome. Most cases are secondary to medications, such as sulfa drugs, anticonvulsants, and NSAIDs. Similar to staphylococcal-scalded syndrome, it presents with extensive erythema, tenderness, and blister formation, followed by denudation of the epidermis. Mucous membranes are severely affected, and shedding of the nails may occur.

**(Choice G)** Stevens-Johnson syndrome is a severe variant of erythema multiforme. It is characterized by skin lesions of erythema multiforme (target lesions), followed by inflammatory bullae of two or more mucous membranes. Sometimes, the GI, respiratory, or GU tracts may also be involved.

#### Educational Objective:

Scarlet fever is characterized by fever, toxicity, pharyngitis, sandpaper-like rash, circumoral pallor and strawberry tongue. It is caused by strains of Group A streptococcus that produce erythrogenic exotoxins. Penicillin V is the drug of choice.