

Supplementary Material 2

CHATGPT 4 – RESPONSES

Heat Rash Diagnosis: Erythema ab igne

1. A 15-year-old adolescent with ulcerative colitis (UC) is evaluated for an unusual rash on the abdomen. The patient was admitted to the hospital for management of pain related to UC. The patient reports that she noticed the rash developing slowly over the last few weeks. Over time it has darkened and started to develop open sores. On examination, hyperpigmented and erythematous reticulated patches with scattered erosions are present on the central and lower abdomen. Upon further questioning, the patient reports that for several months she has regularly applied a heating pad to her abdomen to alleviate pain. What is your diagnosis? Cutis Marmorata Livedo reticularis Erythema ab igne Cutaneous COVID-19

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Based on the description provided, the most likely diagnosis for the rash on the abdomen of the patient with ulcerative colitis (UC) is "Erythema ab igne". Erythema ab igne is a skin condition caused by long-term exposure to heat without direct contact with a hot object. This condition is typically characterized by a reticular, net-like pattern of erythema and hyperpigmentation. It often occurs in individuals who use heating pads or hot water bottles to relieve chronic pain or discomfort, which aligns with the patient's reported use of a heating pad for pain management.

The other options listed:

1. **Cutis Marmorata:** This is a condition that presents as a mottled, marbled appearance of the skin when exposed to cold temperatures. It typically resolves with warming and is not associated with heat exposure or ulcerative colitis.
2. **Livedo Reticularis:** While this also presents as a reticular pattern on the skin, it is more associated with vascular conditions and changes in blood flow, not with heat exposure.
3. **Cutaneous COVID-19:** Skin manifestations of COVID-19 can vary widely, but they typically do not present as hyperpigmented, reticulated patches with a history of localized heat exposure.

Given these considerations, Erythema ab igne is the most fitting diagnosis. However, for an accurate diagnosis and appropriate treatment, a physical examination by a healthcare professional is essential.

2. A 38-year-old black woman presents with a history of relapsing rash. The patient reports experiencing 2 to 3 flares of the rash per year, generally in the summertime, over the past 20 years. The rash is extremely pruritic, involves the face and extremities but tends to spare the trunk. The rash resolves with administration of oral steroids. Extensive rheumatologic serologic workup evaluating for systemic lupus erythematosus and dermatomyositis has been negative. Physical examination

reveals annular erythematous plaques on the face and extremities, with each plaque studded with a single central small flaccid bulla. What is the most likely diagnosis? Polymorphous light eruption
Contact dermatitis Solar urticaria Erythropoietic porphyria

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Based on the description of the patient's symptoms and clinical findings, the most likely diagnosis is Polymorphous Light Eruption (PMLE).

Here's why:

1. **Polymorphous Light Eruption (PMLE):** This condition is characterized by a relapsing rash that occurs in response to sun exposure, which aligns with the patient's reports of flares during summertime. PMLE often presents with annular erythematous plaques and can be extremely pruritic (itchy). The face and extremities are commonly affected areas, as they are more frequently exposed to sunlight. The improvement with oral steroids is also consistent with PMLE, as steroids can help reduce inflammation.
2. **Contact Dermatitis:** While this condition can cause an itchy rash, it is usually linked to direct contact with an irritant or allergen. The pattern described (flares during summertime, annular plaques, and sparing of the trunk) does not typically align with contact dermatitis.
3. **Solar Urticaria:** This is a reaction to sun exposure that typically presents as hives (urticaria) rather than annular plaques. It tends to occur within minutes of sun exposure and resolves more quickly than the described scenario.
4. **Erythropoietic Porphyria:** This condition can cause photosensitivity but is less likely given the patient's long history, specific rash characteristics, and the pattern of her symptoms.

Given these considerations, PMLE seems to be the most fitting diagnosis. However, it's important to note that for an accurate diagnosis and appropriate management, a dermatologist's evaluation is essential.

3. A 24-year-old woman presents with a spreading rash on her arms. A single patch first appeared approximately 2 weeks ago. The patient reports that the rash was somewhat itchy and continued to enlarge despite application of 1% hydrocortisone. Subsequently, new patches arose on both arms. The patient exercises at a local gym at least 3 days each week and is in good health. Examination reveals multiple erythematous patches with crusting. Removal of a crust by curettage revealed slight purulence. What is the likely diagnosis? Psoriasis Sweets syndrome Ecthyma Tinea incogniti

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Based on the description provided, the most likely diagnosis for the 24-year-old woman with a spreading rash on her arms is "Ecthyma."

Here's the rationale for this diagnosis:

1. **Ecthyma:** It is a skin infection characterized by erythematous patches with crusting and, upon removal of the crust, purulence (pus) can often be observed. Ecthyma is typically caused by a bacterial infection, often by *Staphylococcus aureus* or *Streptococcus pyogenes*, and is deeper than impetigo, another common skin infection. The patient's history of exercise at a gym (which can expose her to bacteria) and the progression of her symptoms despite

the application of 1% hydrocortisone (a mild steroid not effective against bacterial infections) support this diagnosis.

The other options are less likely:

2. **Psoriasis:** This chronic skin condition typically presents with well-defined plaques with silvery scales, not usually with purulent crusts. Psoriasis is also not typically described as purulent or crusting.
3. **Sweet's Syndrome:** Also known as acute febrile neutrophilic dermatosis, it is characterized by the sudden onset of fever and painful plaques on the skin, but it does not typically present with crusting and purulence.
4. **Tinea Incognito:** This is a fungal infection modified by inappropriate steroid use. It might present with spreading patches, but these are typically scaly and not purulent.

However, it's important to note that an accurate diagnosis and appropriate treatment should be determined by a healthcare professional, ideally a dermatologist, through physical examination and possibly laboratory tests.

4. A 64-year-old woman with stable hypothyroidism presents to the clinic after experiencing sudden hair loss 2 weeks following a mild COVID-19 infection that was confirmed by a positive COVID-19 rapid antigen test. She had no prior history of hair loss and denies starting new medications, recent illnesses, or psychosocial stressors. The scalp shows enlarging circumscribed patches of nonscarring alopecia. Other findings included pitting on multiple fingernails. Laboratory blood work was normal, including complete blood counts, electrolytes, antinuclear antibodies, erythrocyte sedimentation rate, C-reactive protein, dehydroepiandrosterone-S, and thyroid stimulating hormone. What is the most likely diagnosis? Trichotillomania Tinea capitis Alopecia areata Secondary syphilis

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Based on the provided information, the most likely diagnosis for the 64-year-old woman experiencing sudden hair loss and showing enlarging circumscribed patches of nonscarring alopecia, along with pitting on fingernails, is "Alopecia Areata."

Here's the rationale for this diagnosis:

1. **Alopecia Areata:** This autoimmune condition is characterized by sudden, patchy hair loss that often manifests as circumscribed patches of nonscarring alopecia. The presence of nail pitting is also a common finding in alopecia areata. The recent history of a mild COVID-19 infection could be a triggering factor, as physical or emotional stress (including illnesses) can precipitate or exacerbate autoimmune responses. The normal laboratory blood work, including thyroid function tests, further supports this diagnosis, as alopecia areata is not typically associated with abnormal blood tests.

The other conditions are less likely:

2. **Trichotillomania:** This is a hair-pulling disorder often associated with psychosocial stressors, which the patient denies. It typically does not present with nail pitting.

3. **Tinea Capitis:** This is a fungal infection of the scalp, more common in children, and would likely present with signs of inflammation, scaling, and possibly broken hairs, not typically with nail pitting.
4. **Secondary Syphilis:** While syphilis can cause hair loss, it usually presents with other systemic symptoms and a distinct rash. The patient's lack of recent illnesses or new medications, as well as normal blood work including antinuclear antibodies and erythrocyte sedimentation rate, make this diagnosis less likely.

It is important to have a healthcare professional, preferably a dermatologist, confirm the diagnosis and initiate appropriate treatment.

5. A 45-year-old Black man presents to the emergency department with a painful blistering rash. He started taking an antibiotic 3 weeks ago and over the last several days he reports feeling feverish with joint pains and irritation in both eyes. Yesterday he developed purple marks on his lower abdomen that progressed to fragile blisters. The rash is rapidly spreading to his arms and legs and he now has sores in his mouth and bilateral eye redness. On physical examination, there are painful, dusky purpuric macules on the trunk, arms, legs, and abdomen with large areas of blistering with superficial erosions. What is the most likely diagnosis? Erythema multiforme Ataphylococcal scalded skin syndrome Generalized fixed bullous drug eruption Steven-Johnson syndrome/toxic epidermal necrolysis

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The presentation described for the 45-year-old man strongly suggests the diagnosis of "Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis" (SJS/TEN).

Here's the rationale for this diagnosis:

- **Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis (SJS/TEN):** This is a severe, life-threatening reaction often triggered by medications, such as antibiotics, which the patient recently started taking. The symptoms including fever, joint pains, eye irritation, sores in the mouth, and a painful blistering rash with purpuric macules and large areas of blistering and erosions are characteristic of SJS/TEN. The rapid progression of the rash and the involvement of mucosal surfaces (such as the mouth and eyes) are particularly indicative of this condition.

The other conditions are less likely:

1. **Erythema Multiforme:** While it can present with similar skin lesions, erythema multiforme often has a target-like appearance and is usually less severe than SJS/TEN, with less mucosal involvement.
2. **Staphylococcal Scalded Skin Syndrome (SSSS):** This typically affects children and presents with widespread redness and blistering that resembles scalded skin. It's less likely in this patient due to his age and the presence of mucosal involvement.
3. **Generalized Fixed Bullous Drug Eruption:** While this could be caused by a drug reaction, it usually presents as localized or few blisters at fixed sites and does not typically include mucosal involvement or systemic symptoms like fever and joint pains.

Given the severity and life-threatening nature of SJS/TEN, immediate medical attention, likely including hospitalization and consultation with a dermatologist and other specialists, is crucial for this patient.

6. A 60-year-old healthy Black man presents with a history of a lesion on his foot. He has no medical problems, takes no medications, and has no personal or family history of skin cancer. The lesion presented about 6 months ago, grew slowly, and is not currently bothersome for the patient. He does not have any similar lesions elsewhere on the body. On physical examination, an erythematous, smooth, dome-shaped papule is found on the plantar aspect of the right foot. What is your diagnosis? Hidradenoma Pyogenic granuloma Verruca vulgaris Poroma

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Based on the description of a slowly growing, non-bothersome, erythematous, smooth, dome-shaped papule on the plantar aspect of the foot in a 60-year-old healthy Black man, the most likely diagnosis is a "Poroma".

Here's the rationale for this diagnosis:

1. **Poroma:** A poroma is a type of benign sweat gland tumor. It typically presents as a small, flesh-colored, pink, or red tumor, and can appear smooth and dome-shaped. Poromas are commonly found on the palms and soles, which matches the location of the lesion in this patient. Their slow growth and lack of symptoms are also characteristic of poromas.

The other options seem less likely given the description:

2. **Hidradenoma:** Also a benign glandular tumor, but it typically presents as a solid, cystic tumor on the scalp, face, trunk, and extremities. The sole of the foot is a less common location.
3. **Pyogenic Granuloma:** This is a rapidly growing, reddish, often pedunculated lesion that can bleed easily. It typically appears following trauma or irritation, and its growth is usually much faster than the slow growth described in this case.
4. **Verruca Vulgaris (Common Wart):** Caused by the human papillomavirus (HPV), these warts are often rough and irregular in texture. The description of the lesion as smooth and dome-shaped does not align well with the typical appearance of verruca vulgaris.

It is important for the patient to have a healthcare professional, preferably a dermatologist, evaluate the lesion to confirm the diagnosis and discuss appropriate management.

7. A 61-year-old woman presents with a 7-month history of a bump on the front of her left knee. The lesion is slightly tender but otherwise is asymptomatic. She is concerned that the lesion may be cancerous. She has no other medical problems and takes vitamin D daily. On physical examination, a firm subcutaneous tumor is noted on the left knee measuring 8 cm without overlying skin changes. She has no other similar lesions elsewhere on her body. What is your diagnosis? Synovial cyst Ganglion cyst Pigmented villonodular synovitis Lipoma

ChatGPT

Based on the description of a 61-year-old woman with a 7-month history of a firm, slightly tender, subcutaneous tumor measuring 8 cm on the front of her left knee without overlying skin changes, the most likely diagnosis is a "Lipoma".

Here's the rationale for this diagnosis:

1. **Lipoma:** Lipomas are benign tumors of fat tissue that typically present as soft, movable, and painless lumps under the skin. They can become slightly tender but are generally asymptomatic. The size and location, as well as the lack of overlying skin changes, are consistent with a lipoma.

The other conditions listed are less likely given the specifics of the case:

2. **Synovial Cyst:** These are fluid-filled sacs arising from the synovial membrane of a joint or tendon. They typically occur near joints and can be tender. However, they are usually smaller than the size described here and are often associated with joint pathology, which was not mentioned in the case.
3. **Ganglion Cyst:** This is a noncancerous lump that often develops along the tendons or joints of your wrists or hands, but can also appear on ankles and knees. They are generally smaller and more fluctuant than what is described.
4. **Pigmented Villonodular Synovitis (PVNS):** This is a joint disorder that usually affects the knee. It's characterized by inflammation and overgrowth of the joint lining. However, it typically presents with more symptoms such as pain, swelling, and stiffness in the affected joint, which is not in line with the asymptomatic nature of this patient's lesion.

It's important for the patient to have a healthcare professional, potentially including a specialist, evaluate the lesion to confirm the diagnosis and discuss appropriate management, especially considering her concern about it being cancerous.

8. A 65-year-old man presents with a recurring rash on his back. He has had the rash several times before, most often during the summer, and it was treated successfully with an antifungal shampoo prescribed by a prior dermatologist. The rash is not itchy or painful. He has a history of depression and hypertension. On physical examination, hyperpigmented macules coalescing into patches with very fine white scale are found. The lesions are scattered primarily on his upper chest and upper back. What is your diagnosis? Pityriasis rosea Tinea corporis Vitiligo Tinea versicolor

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Based on the description of a recurring rash on the upper chest and upper back of a 65-year-old man, characterized by hyperpigmented macules coalescing into patches with very fine white scale, and a history of successful treatment with an antifungal shampoo, the most likely diagnosis is "Tinea Versicolor".

Here's the rationale for this diagnosis:

1. **Tinea Versicolor:** This is a common fungal skin infection caused by an overgrowth of yeast that lives on the skin's surface. It typically presents with hyperpigmented or hypopigmented

macules and patches with a fine scale, often on the upper chest and back. Tinea versicolor is known to recur, especially in warm, humid environments like summer, and is effectively treated with antifungal medications, including shampoos containing selenium sulfide or other antifungal agents.

The other conditions seem less likely:

2. **Pityriasis Rosea:** This usually presents as a single, larger, herald patch followed by smaller lesions in a Christmas tree pattern, but it's typically itchy, which does not align with the patient's symptom-free presentation.
3. **Tinea Corporis (Ringworm):** This fungal infection typically presents as itchy, red, circular rashes with a clear center, not as hyperpigmented patches with fine scaling.
4. **Vitiligo:** This is characterized by the loss of skin pigment, resulting in white patches, which is not consistent with the hyperpigmented and scaly presentation described.

Given the history and clinical presentation, Tinea Versicolor is the most fitting diagnosis. However, it is always advisable for the patient to consult with a healthcare provider for an accurate diagnosis and appropriate treatment plan.

9. A 22-year-old woman presents for evaluation of progressive skin changes on her neck and arms beginning sometime around puberty. She tried various over-the-counter anti-itch, antiaging, and eczema creams that were ineffective. She has no personal or family history of skin conditions and is otherwise healthy. Review of systems is negative for skin laxity, joint hypermobility, or vision changes. Physical examination reveals numerous nontender, noninflammatory, yellow, 2- to 5-mm papules that coalesce into reticulated plaques on the nape of her neck and bilateral antecubital fossa. A punch biopsy demonstrates fragmentation and calcification of elastic fibers. What is your diagnosis
GGXC-mediated coagulation factor deficiency
ENPP1-mediated premature arterial calcification
Pseudoxanthoma elasticum
Ehlers-Danlos syndrome

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The description of progressive skin changes characterized by nontender, noninflammatory, yellow, 2- to 5-mm papules that coalesce into reticulated plaques, particularly on the nape of the neck and antecubital fossae, along with the punch biopsy findings demonstrating fragmentation and calcification of elastic fibers, strongly suggests the diagnosis of "Pseudoxanthoma Elasticum (PXE)".

Here's the rationale for this diagnosis:

1. **Pseudoxanthoma Elasticum (PXE):** PXE is a genetic disorder affecting the elastic fibers of the skin, eyes, and cardiovascular system. The classic skin manifestation includes yellowish papules that become confluent, forming plaques with a cobblestone or chicken-wire appearance. The distribution on the neck and antecubital fossae is typical. The histopathological findings of fragmentation and calcification of elastic fibers are diagnostic of PXE.

The other conditions listed are less likely based on the information provided:

2. **GGXC-mediated coagulation factor deficiency:** This refers to a group of genetic disorders affecting blood clotting factors. It does not typically present with skin findings like those described in the patient.
3. **ENPP1-mediated premature arterial calcification:** This condition involves the calcification of arterial walls. While calcification is a feature, it does not present with the skin changes described here.
4. **Ehlers-Danlos Syndrome (EDS):** EDS is a group of disorders affecting connective tissue and can include symptoms like skin laxity and joint hypermobility. However, the specific presentation of yellow papules and plaques, along with the biopsy findings, is not characteristic of EDS.

Given the findings, Pseudoxanthoma Elasticum seems to be the most fitting diagnosis. However, as always, confirmation of the diagnosis and appropriate management should be pursued under the guidance of a healthcare professional.

10. A 47-year-old otherwise healthy woman presents to the clinic with several concerns. Over the past several months, she has experienced thickening of her skin around her hands, forearms, and face. Her fingers turn blue and then pale when she is exposed to cold. Additional recent symptoms include fatigue and gastroesophageal reflux. She takes no medications and has no family history of autoimmune disease. On physical examination, the patient has skin thickening on the hands, forearms, and face. She also has hypopigmented macules on the hands and lower legs. What is your diagnosis? Morphea Stiff-skin syndrome Systemic sclerosis Scleredema

ChatGPT

Based on the description of a 47-year-old woman experiencing skin thickening around her hands, forearms, and face, along with color changes in her fingers when exposed to cold (likely Raynaud's phenomenon), as well as symptoms of fatigue and gastroesophageal reflux, the most likely diagnosis is "Systemic Sclerosis" (also known as Scleroderma).

Here's the rationale for this diagnosis:

1. **Systemic Sclerosis (Scleroderma):** This is a chronic autoimmune disease characterized by fibrosis (thickening and hardening) of the skin and sometimes internal organs. The described symptoms of skin thickening, Raynaud's phenomenon (fingers turning blue and pale in response to cold), fatigue, and gastroesophageal reflux are typical manifestations of systemic sclerosis. Hypopigmented macules can also be seen in this condition.

The other conditions are less likely given the presentation:

2. **Morphea:** This condition presents with localized patches of sclerotic skin but does not typically involve systemic symptoms like Raynaud's phenomenon or gastroesophageal reflux.
3. **Stiff-Skin Syndrome:** This rare condition is characterized by progressive skin thickening, but it is usually limited to the lower body and does not include systemic symptoms or the vascular changes seen in Raynaud's phenomenon.

4. **Scleredema**: While this involves skin thickening, it typically affects the upper back and shoulders and is not usually associated with Raynaud's phenomenon or the range of systemic symptoms described.

It's important for the patient to receive a comprehensive evaluation by a healthcare professional, ideally including a rheumatologist, for accurate diagnosis and appropriate management of systemic sclerosis, if confirmed.