

# Dear Colleague

## COVID-19 Updates

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### New York City Department of Health and Mental Hygiene

Dermatologic Manifestations Associated With COVID-19

September 24, 2020



Operating room nurses with protective masks and gloves, Bellevue Hospital, May 1950. Department of Public Charities Collection. [Image courtesy of NYC Municipal Archives.](#)

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## **COVID-19 Information and Guidance**

Updated information is available on the NYC Health Department's [COVID-19](#) web pages.

- [Information for Providers](#): Recent health alerts and advisories, testing information, provider webinars and clinical guidance
- [Resources for Health Care Facilities](#): Guidance for inpatient, outpatient and long-term care, and other settings
- [COVID-19 Data](#): Daily updates of recent and overall data on test results (both diagnostic and antibody), cases, hospitalizations and deaths by ZIP code of residence, borough, age, sex, race/ethnicity and neighborhood poverty

### **Updated Guidance**

- [COVID-19 Provider FAQ](#)
- [Health Advisory #37: All Point-of-Care COVID-19 Test Results Must be Reported Electronically](#)

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## **Dermatologic Issues and COVID-19**

Skin manifestations have appeared in COVID-19 patients and may provide insights for early diagnosis or severity of disease. Prolonged use of personal protective equipment (PPE) can cause dermatologic issues. Possible remedies and prevention are available for health care workers.

### **Skin Lesions Associated With Having COVID-19**

COVID-19 infection can be associated with various skin manifestations. A review of 18 case reports and case series published through April 2020 found that the most common were morbilliform maculopapular exanthems (36%), papulovesicular rashes (35%), painful acral red purple papules (15%), urticaria (10%), livedo reticularis lesions (3%) and petechiae (1%); lesions tended to be localized on the trunk (67%) and hands and feet (19%) ([Sachdeva 2020](#)).

A study of 375 people in Spain with confirmed or suspected COVID-19 and cutaneous manifestations classified lesions into five clinical patterns: maculopapular eruptions (47%), urticarial lesions (19%), acral areas of erythema with vesicles or pustules (pseudo-chilblain) (19%), other vesicular eruptions (9%), and livedo or necrosis (6%). Vesicular eruptions tended to appear earlier and the pseudo-chilblain pattern later in the clinical course of disease. The authors noted that pseudo-chilblain lesions appeared in less severe cases and maculopapular or urticarial lesions were associated with more severe disease ([Galván-Casas 2020](#)).

Some patients hospitalized with COVID-19 have developed retiform purpura and necrotic cutaneous ulcerations, which may be related to microvascular injury due to thrombosis; complement activation may be a possible underlying mechanism and pressure-related ischemia a contributor to localized retiform purpura ([Bosch-Amate 2020](#); [Magro 2020](#)). Cutaneous manifestations of multisystem inflammatory syndrome associated with COVID-19 in children have also been reported in isolated cases among adult inpatients ([Shaigany 2020](#); [Moghadam 2020](#)).

## The Case of “COVID Toe”

During the first peak of COVID-19 transmission, researchers shared evidence of an apparent increase in incidence of pernio/chilblains in several countries ([Duong 2020](#)). Subsequently, a registry hosted by two international dermatology professional associations gathered a case series to identify pernio-like lesions associated with COVID-19 ([Freeman 2020](#)). Colloquially referred to as “COVID toe,” the condition is a superficial inflammatory vascular response of acral skin that is typically associated with cold exposure and has now been linked to confirmed or suspected COVID-19 (**Figures 1 and 2** are images from patients who tested negative for COVID-19) ([Massey 2020](#); [Roca-Ginés 2020](#)).

Of 505 patients with dermatologic manifestations in the [Freeman case series](#), 63% had pernio-like lesions. Of these, 84% were located on the feet, 5% on the hands, and 10% on the feet and hands. Mechanisms proposed include inflammation, with or without lymphocytic vasculitis and pro-thrombotic coagulopathy, with an inflammatory rather than pro-thrombotic etiology favored. However, the study was not limited to people with confirmed COVID-19 and may be subject to confirmation bias as 55% of participants had no symptoms other than pernio-like lesions. Moreover, two prospective case series of chilblain-like lesions conducted in Spain and Belgium failed to identify any cases in patients with laboratory-confirmed COVID-19 ([Herman 2020](#); [Roca-Ginés 2020](#)). Lack of laboratory confirmation by polymerase chain reaction or antibody testing may be due to false-negative results, testing before or after virus may have been detectable, or mild or asymptomatic infection that would not incite an antibody response.

Other authors have suggested that some reported chilblain-like lesions may be caused by people staying at home during the pandemic and leaving their feet bare ([Hernandez and Bruckner 2020](#)).



**Figure 1.** Acral erythema pattern on the plantar pads of the toes. Image used with permission from [Roca-Ginés 2020](#).



**Figure 2.** Inflammation of one toe showing a dactylitis pattern. Image used with permission from [Roca-Ginés 2020](#).

## Skin Manifestations as an Indicator of COVID-19

Once better characterized, dermatologic manifestations could serve as an early indicator of infection and aid in timely diagnosis. In one review involving 72 patients, skin lesions developed before the onset of respiratory symptoms or COVID-19 diagnosis in 13% of patients ([Sachdeva 2020](#)). A review of 44 studies involving 507 COVID-19 patients with cutaneous manifestations found that skin lesions were the first symptom in 15% of 88 patients with information on onset; overall, however, lesions appeared an average 10 days *after* the onset of systemic symptoms (range, one to 30 days) ([Zhao 2020](#)).

Findings on dermatologic manifestations of COVID-19 should be interpreted with caution, and more research and rigor are needed before conclusions can be reached. The studies described in this letter did not necessarily limit their analyses to people with confirmed COVID-19 and did not use a standardized definition of suspected COVID-19.

## Racial and Ethnic Bias in Identifying Skin Disease Related to COVID-19

While Black and Latino New Yorkers are [far more likely](#) to be diagnosed with COVID-19, the existing scientific literature does not adequately assist clinicians in promptly identifying cutaneous manifestations of COVID-19 in people with darker skin. Although skin disease can present differently in light and dark skin, historical racism in the field of dermatology has led to a lack of representation of darker skin in research and textbooks.

With the exception of a recent textbook dedicated to the diagnosis and treatment of persons with darker skin ([Taylor and Kelly 2016](#)), dermatology textbooks have [mostly lacked images](#) of patients with darker skin. The bias towards studying and treating lighter skin can lead to misdiagnosis, delayed care, and poorer health outcomes for people of color. In one study, almost half of dermatologists reported that their medical training did not involve exposure to patients with darker skin ([Lester 2019](#)).

This bias has continued with COVID-19. Lester et al. ([2020](#)) found a complete absence of images of cutaneous manifestations of COVID-19 in darker skin tones in relevant literature. A subsequent study examining possible “COVID toe” in people with darker skin noted that the cutaneous manifestations are more subtle ([Daneshjou 2020](#)). Recognizing the different manifestations of “COVID toe” in people with darker (**Figure 3**) and lighter skin (**Figure 4**) is crucial to providing appropriate care for patient populations affected by COVID-19.



**Figure 3.** COVID-toe in a patient of Southeast Asian descent. Image used with permission from Dr. Amy Paller, Northwestern University.



**Figure 4.** COVID-toe in a White teenager. Image used with permission from Dr. Amy Paller, Northwestern University.



The bias towards light skin can also be seen in this letter, as we were unable to find and obtain images of other skin conditions in darker skin. Dermatologists and scientific journals urgently need to document and disseminate images of cutaneous manifestations of COVID-19 among patients with darker skin.

## Dermatologic Effects of Wearing Personal Protective Equipment

The extended use of PPE during COVID-19 has been associated with adverse dermatologic effects in health care workers. Studies have found that prolonged use of face coverings is associated with inflammatory papules, aggravation of acne and rosacea, seborrheic dermatitis, delayed pressure urticaria, and hyperhidrosis, while increased hand washing can result in irritant contact dermatitis, particularly with the use of overly hot water and alkaline soaps ([Wollina 2020](#)). Post-inflammatory hyperpigmentation is also a concern, particularly in health care workers with darker skin. A survey of 542 doctors and nurses engaged in front-line COVID-19 patient care in Hubei, China, found a 97% prevalence of occupational skin problems, particularly on the nasal bridge (83%) and to a lesser extent, on the cheeks, hands and forehead; health care workers who wore N95 masks or goggles for more than six hours each day or who washed their hands more than 10 times each day had double the prevalence of skin problems of those who did not ([Lan 2020](#)).

## Preventing Skin Problems Among Health Care Workers

- Hands should be clean and dry before putting on gloves. After removing gloves, wash hands and then apply a skin care product ([Wollina 2020](#)).
- Moisturizers and barrier creams may prevent occupational hand dermatitis ([Bauer 2018](#)). Use a lighter, fragrance-free moisturizer during work hours; more lipid-rich emollients can be used off-shift ([Balato 2020](#)). Products with mineral oil or petrolatum may damage latex gloves and other protective equipment ([Voeller 1989](#)).
- To help reduce facial-skin friction, wear a properly fitted mask and apply moisturizers on the face before donning protective equipment ([Masood 2020](#)).
- Skin indentations caused by masks or goggles usually regress spontaneously (**Figure 5**) ([Yan 2020](#)).



**Figure 5.** Skin indentation due to facemask use. Image used with permission from [Masood 2020](#).

## **Selected Publications**

Freeman EE, McMahon DE, Lipoff JB, et al. [The spectrum of COVID-19-associated dermatologic manifestations: an international registry of 716 patients from 31 countries.](#) *J Am Acad Dermatol.* 2020;83(4):1118-1129.

This report highlights the cutaneous manifestations associated with COVID-19 in patients in a registry hosted by the American Academy of Dermatology and International League of Dermatological Societies.

Jia JL, Kamceva M, Rao SA, Linos E. [Cutaneous manifestations of COVID-19: a preliminary review.](#) *J Am Acad Dermatol.* 2020;83(2):687-690.

Skin disease related to COVID-19 may be underreported, which could delay diagnosis and control measures, particularly in patients with mild or asymptomatic COVID-19.

Kerber AA, Soma DB, Youssef MJ. [Chilblains-like dermatologic manifestation of COVID-19 diagnosed by serology via multidisciplinary virtual care.](#) *Int J Dermatol.* 2020;59(8):1024-1025.

This letter describes a chilblains-like skin lesion presenting in a patient whose nasopharyngeal swab for SARS-CoV-2 polymerase chain reaction was negative but serum SARS-CoV-2 immunoglobulin G antibodies were positive. The findings suggest that the lesion may have been a delayed manifestation of COVID-19, while demonstrating the effectiveness of telehealth to provide high-quality multidisciplinary care.

Lipsker D. [A chilblain epidemic during the COVID-19 pandemic. A sign of natural resistance to SARS-CoV-2?](#) *Med Hypotheses.* 2020;144:109959.

The author hypothesizes that in a few genetically predisposed individuals, contact with SARS-CoV-2 triggers a strong interferon response, of which chilblains are the cutaneous expression. This strong interferon response may allow clearing of the virus without the intervention of the adaptive immune system and could suggest a natural resistance to SARS-CoV-2 infection in some individuals.

Long H, Zhao H, Chen A, Yao Z, Cheng B, Lu Q. [Protecting medical staff from skin injury/disease caused by personal protective equipment during epidemic period of COVID-19: experience from China](#). *J Eur Acad Dermatol Venereol*. 2020;34(5):919–921.

This report describes clinical features of prevalent skin conditions in medical staff caring for COVID-19 patients caused by hand hygiene and personal protective equipment, and provides appropriate preventive and therapeutic strategies.

Shaukat N, Ali DM, Razzak J. [Physical and mental health impacts of COVID-19 on healthcare workers: a scoping review](#). *Int J Emerg Med*. 2020;13(1):40.

The most common adverse health conditions reported by healthcare workers during the COVID-19 pandemic were fever (85%), cough (70%), and weakness (70%); 97% reported skin damage related to prolonged use of personal protective equipment.