palmoplantar pustular psoriasis who had achieved a meaningful clinical response at weeks 16 and 52 when continuing secukinumab up to week 148.

Ulrich Mrowietz, MD,[a] Hervé Bachelez, MD,[b,c] Arthur David Burden, MD, FRCP,[d] Michael Rissler, PhD,[e] Christian Sieder, PhD,[f] Roberto Orsenigo, MD,[g] and Piotr Jagiello, MD, PhD[e]

From the Psoriasis Center at the Department of Dermatology, University Medical Center, Schleswig-Holstein, Campus Kiel, Germany[a]; Service de Dermatologie, Hôpital Saint-Louis, Sorbonne Paris Cité Université Paris Diderot, Paris, France[b]; Inserm UMR1163, Institut Imagine, Paris, France[c]; Institute of Infection Inflammation and Immunity, University of Glasgow, United Kingdom[d]; Novartis Pharma, Basel, Switzerland[e]; Novartis Pharma GmbH, Nuernberg, Germany[f]; and Novartis Farma SpA, Origgio, Italy.[g]

Funding sources: The 2PRECISE study was funded by Novartis Pharma AG, Basel, Switzerland.

Disclosure: Dr Mrowietz reports grants and personal fees from Novartis and personal fees from Almirall, AbbVie, Boehringer Ingelheim, Celgene, Janssen, Lilly, and UCB during the conduct of the study. Dr Bachelez reports grants and personal fees from Novartis and personal fees from Almirall, AbbVie, Boehringer Ingelheim, Celgene, Janssen, Lilly, and UCB during the conduct of the study. Dr Burden reports grants and personal fees from Novartis and personal fees from Almirall, AbbVie, Boehringer Ingelheim, Celgene, Janssen, Lilly, and UCB during the conduct of the study. Drs Rissler, Sieder, Orsenigo, and Jagiello are employees of Novartis.

IRB approval status: Approved by participating centers.

Reprints not available from the authors.

Correspondence to: Ulrich Mrowietz, MD, Klinik für Dermatologie, Venerologie und Allergologie, Universitätsklinikum Schleswig-Holstein, Campus Kiel, Arnold-Heller-Str. 3, Haus C, 24105 Kiel, Germany

E-mail: umrowietz@dermatology.uni-kiel.de

REFERENCES

1. Mrowietz U. Pustular eruptions of palms and soles. In: Goldsmith LA, ed. *Fitzpatrick's Dermatology in General Medicine*. New York, NY: McGraw-Hill; 2012:252-259.
2. Langley RG, Elewski BE, Lebwohl M, et al. Secukinumab in plaque psoriasis—results of two phase 3 trials. *N Engl J Med*. 2014;371:326-338.
3. Mrowietz U, Bachelez H, Burden AD, et al. Secukinumab for moderate-to-severe palmoplantar pustular psoriasis: results of the 2PRECISE study. *J Am Acad Dermatol*. 2019;80(5):1344-1352.

https://doi.org/10.1016/j.jaad.2020.06.038

A pilot study of the impact of facial skin protectants on qualitative fit testing of N95 masks

To the Editor: The COVID-19 pandemic has necessitated prolonged use of N95 masks, leading to superficial wounds, purpura, and indentations on health care workers' faces.[1,2] The use of skin protectants may prevent skin irritation caused by N95 masks[2] by providing a barrier and/or redistributing pressure; however, the impact on respirator fit has not been evaluated. This study assesses the impact of the use of skin protectants on N95 respirator qualitative fit test (QLFT) results and user comfort.

We enrolled adult employees at Brigham Health and Dana-Farber Cancer Institute previously fit-tested for N95 masks (N = 25) via a standardized QLFT protocol[3] (see Supplemental Materials; available via Mendeley at https://doi.org/10.17632/sj6tr3mp9r.1). Each participant underwent QLFT for 5 types of skin protectants on a 3M (St Paul, MN) 1860 N95 mask after self-application using a standardized protocol (Fig 1 and Supplemental Table I; available via Mendeley at https://doi.org/10.17632/sj6tr3mp9r.1). Participants underwent repeated QLFT of their respirator for each dressing and rated dressing comfort (Supplemental Fig 1; available via Mendeley at https://doi.org/10.17632/sj6tr3mp9r.1).

Most participants were female (76%), with an average age of 28 years. QLFT passing rates ranged from 88.0% for Cavilon film (3M) to 56.0% for DuoDERM CGF (ConvaTec, Oklahoma City, OK), with the highest failure rates noted with movement maneuvers (Tables I and II). Overall, 9 (36.0%) participants passed with all 5 materials. Mepitac tape (Mölnlycke, Gothenburg, Sweden) and DuoDERM CGF (88.0% positive rating) were reported to be more comfortable than Cavilon film (22.0%). Cavilon film and DuoDERM CGF had the most negative qualitative comments, with odor and impact on mask fit or seal quality as common concerns, respectively.

In this study, we found that the use of skin protectants to prevent skin irritation may interfere with N95 respirator fit. Mitigation of skin irritation from prolonged N95 use is a concern, but workers should not trade efficacy for comfort. Most fit test failures were observed with movement, suggesting that the impact of skin protectants on fit may not be obvious to the wearer.

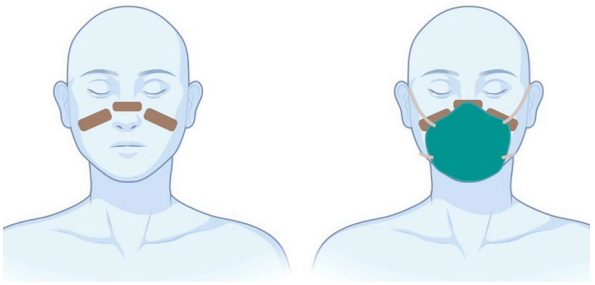

Fig 1. Standardized placement of facial protectants before donning N95 Masks (created with BioRender.com). DuoDERM (ConvaTec, Oklahoma City, OK) CGF, DuoDERM Extra Thin, and Mepitac Soft Silicone Tape (Mölnlycke, Gothenburg, Sweden) were precut into 3 uniform 2 × 5−cm dressings. Hydrocolloid bandages used were a combination of Band-Aid brand (Johnson & Johnson, New Brunswick, NJ) and readily available generic bandages, which came in a 2 × 5−cm rectangle size and a 3 × 5−cm oval size. For DuoDERM Control Gel Formula (CGF), DuoDERM Extra Thin, and Mepitac Soft Silicone Tape, participants were instructed to first place 1 dressing on the nasal bridge (starting centrally and moving laterally) and then 2 on the bilateral cheeks. For the hydrocolloid bandages, participants were instructed to apply 1 oval hydrocolloid bandage on the nasal bridge and two 2 × 5−cm rectangle bandages on the bilateral cheeks. For the Cavilon film, participants were instructed to apply the liquid protectant on the same 3 areas of the face. Cavilon film was tested last on each participant because it leaves a residue. Participants were instructed on removal, including lifting the bandages laterally to reduce discomfort and removing the Cavilon film with a facial cleanser or alcohol wipe.

These results reinforce current guidelines, which recommend against placing any material(s) between the skin and mask or to retest fit if skin protectants are applied.[4,5] Proposed strategies for replacement of brand or style of N95 are reasonable, but these results show that current recommendations for liquid protectants should be reconsidered.[4] Health care workers electing to use skin protectants should confirm appropriate fit before use in clinical settings.

Although these data suggest heterogeneity in the impact of skin protectants on QLFT, the study was insufficiently powered to make definitive statements on the relative safety of these products. Nonetheless, it is important to consider how different materials affect respirator fit and comfort; no dressing had a complete QLFT passing rate. Passing rates were highest with Cavilon film (88%), but it had the most negative (24%) comfort ratings.

This study is limited by sample size and a single N95 model tested. It does not evaluate the efficacy of skin protectants over longer periods of time. Larger studies examining fit and user experience across different mask and dressing types are warranted. Until these issues are further studied, health care workers and institutions electing to use facial skin protectants should ensure adequate fit by undergoing fit testing with facial skin protectants in place before use in high-risk clinical settings.

Table I. Study outcomes: Participant demographics/characteristics

Characteristics	Value
Sex, n (%)	
Male	6 (24)
Female	19 (76)
Race, n (%)	
White	11 (44)
Asian/Pacific Islander	8 (32)
Hispanic or Latino	3 (12)
Black	2 (8)
Other	1 (4)
1860 mask size, n (%)	
Small	16 (64)
Regular	9 (36)
Age, y	
Mean	28
Median	27
BMI range, kg/m^2, n (%)	
18.5-24.9	11 (44)
25-29.9	6 (24)
≥30	8 (32)

BMI, Body mass index.

We thank the individuals and volunteers at the Greater Boston Pandemic Fabrication Team, a collaboration between Harvard and the Massachusetts Institute of Technology to meet urgent needs for medical supplies during the COVID-19 pandemic, for their support and assistance.

Ai-Tram N. Bui, BA,[a] Zizi Yu, BA,[a] Karen Lee, BS,[b] Sara J. Li, BS,[b] William G. Tsiaras, MD, PhD,[a,b] Sherry H. Yu, MD,[b] Nicole R. LeBoeuf, MD, MPH,[a,b,c] and Arash Mostaghimi, MD, MPA, MPH[a,b]

From Harvard Medical School[a]; Department of Dermatology, Brigham and Women's Hospital[b]; and Center for Cutaneous Oncology, Dana-Farber Cancer Institute, Boston, Massachusetts.[c]

Drs LeBoeuf and Mostaghimi contributed equally to this article.

Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Reviewed and approved by the Partners Healthcare IRB (no. 2020P001209).

Reprints not available from the authors.

Table II. Outcome measures by dressing type, n (%)*

Outcome measures	Cavilon†	Hydrocolloid bandages	DuoDERM Extra Thin‡	Mepitac Soft Silicone Tape§	DuoDERM Control Gel Formula‡
Qualitative mask fit test					
Passed all components	22 (88)	21 (84)	18 (72)	16 (64)	14 (56)
Stage failed					
Seal check	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Regular breathing	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Deep breaths	1 (4)	0 (0)	1 (4)	0 (0)	2 (8)
Head side to side	2 (8)	0 (0)	1 (4)	2 (8)	0 (0)
Head up and down	0 (0)	2 (8)	2 (8)	4 (16)	5 (20)
Bending forward	0 (0)	2 (8)	1 (5.9)	2 (8)	4 (16)
Reading passage	0 (0)	0 (0)	1 (5.9)	1 (4)	0 (0)
Comfort of dressing					
Positive	6 (24)	21 (84)	21 (84)	22 (88)	22 (88)
Neutral	13 (56)	3 (12)	4 (16)	2 (8)	1 (4)
Negative	5 (20)	1 (4)	0 (0)	1 (4)	2 (8)
Qualitative negative comments by category					
Sensation on skin	4 (16)	0 (0)	0 (0)	0 (0)	0 (0)
Feeling of mask fit/seal quality	0 (0)	3 (12)	3 (12)	3 (12)	10 (40)
Dressing adhesiveness	4 (16)	0 (0)	4 (16)	0 (0)	1 (4)
Dressing odor	8 (32)	0 (0)	0 (0)	0 (0)	0 (0)

*Primary outcome measures of qualitative fit test with failure rates for respective testing maneuvers and secondary outcomes of comfort of skin protectants and comments regarding comfort.
†3M, St Paul, MN.
‡ConvaTec, Oklahoma City, OK.
§Mölnlycke, Gothenburg, Sweden.

Correspondence to: Arash Mostaghimi, MD, MPA, MPH, Department of Dermatology, Brigham and Women's Hospital, 221 Longwood Ave, Boston, MA 02115

E-mail: amostaghimi@bwh.harvard.edu

REFERENCES

1. Lan J, Song Z, Miao X, et al. Skin damage among health care workers managing coronavirus disease-2019. *J Am Acad Dermatol*. 2020;82(5):1215-1216.
2. Gheisari M, Araghi F, Moravvej H, Tabary M, Dadkhahfar S. Skin reactions to non-glove personal protective equipment: an emerging issue in the COVID-19 pandemic. *J Eur Acad Dermatol Venereol*. 2020;34(7):e297-e298.
3. Occupational Safety and Health Standards. Appendix A to 1910.134—fit testing procedures (mandatory). August 2004. Available at: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppA. Accessed June 11, 2020.
4. American Academy of Dermatology. Preventing and treating occupationally induced dermatologic conditions during COVID-19. April 2020. Available at: https://assets.ctfassets.net/1ny4yoiyrqia/1evNAmDqSmw6w9dhozuJGZ/303efdeff53db6e0347df52c65baf4bc/OCC_Derm_Conditions_V11_30Apr2020.pdf. Accessed June 11, 2020.
5. Nurses Specialized in Wound, Osteotomy, and Continence Canada. Prevention and management of skin damage related to personal protective equipment (PPE). 2020. Available at: http://nswoc.ca/ppe/. Accessed June 11, 2020.

https://doi.org/10.1016/j.jaad.2020.06.069

Dermatoses of the world: Burden of skin disease and associated socioeconomic status in the world

To the Editor: Resources exist describing the prevalence and incidence of skin disease globally, but the global burden of skin disease and how it relates to socioeconomic status is largely unknown.[1] A measurement of the morbidity of skin disease is disability-adjusted life years (DALYs), defined as years of life lost because of premature mortality in the population plus the years lost due to disability for people living with a health condition or its consequences. This observational study seeks to compare the relationship between the burden of skin disease in 195 countries worldwide and socioeconomic status in 2017.

The factor used to measure socioeconomic status was 2017 gross domestic product (GDP) per capita data from the World Bank.[2] Information on the DALYs of the most common dermatoses was obtained from the latest Global Burden of Disease Study (GBD) 2017 data sets. Three categories of dermatoses were analyzed for each country: neoplastic, inflammatory, and infectious. Countries were ordered in a heat table with rows from highest (most wealthy) to lowest (least wealthy), and each country was numerically ranked in the world from 1