



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Paris, Paris, France<sup>d</sup>; Clinical Immunology Laboratory, Groupe Hospitalier Universitaire Paris-Sud, Hôpital Kremlin-Bicêtre, Assistance Publique-Hôpitaux de Paris, Le-Kremlin-Bicêtre, France<sup>e</sup>; Cerba Healthcare, Cerballiance-Ile-de-France Ouest, Hôpital Privé de l'Ouest Paris, Trappes, France<sup>f</sup>; and Department of Immunology, Bichat Hospital, Paris, France.<sup>g</sup>

Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Reviewed and approved by the IRB of Hôpitaux Universitaires Paris Nord Val de Seine (HUPNVS), Paris 7 University, Assistance Publique Hôpitaux de Paris (AP-HP) (IRB 00006477).

Reprint requests: Vincent Descamps, MD, PhD, Department of Dermatology, Bichat Hospital, 46 rue Henri Huchard, 75877 Paris, France

E-mail: [vincent.descamps@aphp.fr](mailto:vincent.descamps@aphp.fr)

#### REFERENCES

1. de Masson A, Bouaziz J-D, Sulimovic L, et al. Chilblains are a common cutaneous finding during the COVID-19 pandemic: a retrospective nationwide study from France. *J Am Acad Dermatol*. 2020;83:667-670.
2. Hadjadj J, Yatim N, Barnabei L, et al. Impaired type I interferon activity and exacerbated inflammatory responses in severe Covid-19 patients. *MedRxiv*. 2020. <https://www.medrxiv.org/content/10.1101/2020.04.19.20068015v1>. Accessed May 14, 2020.
3. Wrensch F, Winkler M, Pöhlmann S. IFITM proteins inhibit entry driven by the MERS-coronavirus spike protein: evidence for cholesterol-independent mechanisms. *Viruses*. 2014;6(9):3683-3698.
4. de Lang A, Baas T, Smits SL, Katze MG, Osterhaus AD, Haagmans BL. Unraveling the complexities of the interferon response during SARS-CoV infection. *Future Virol*. 2009;4(1):71-78.
5. Fallet B, Narr K, Ertuna YI, et al. Interferon-driven deletion of antiviral B cells at the onset of chronic infection. *Sci Immunol*. 2016;1(4):eaah6817.

<https://doi.org/10.1016/j.jaad.2020.06.1018>

### Multidisciplinary care of epidermolysis bullosa during the COVID-19 pandemic—Consensus: Recommendations by an international panel of experts



*To the Editor:* The 2019 novel coronavirus (COVID-19) pandemic became apparent in China during the International Congress on Epidermolysis Bullosa (EB) in London, in January 2020. Many patients with EB have medical problems that make them a

vulnerable population of patients.<sup>1</sup> We developed an international consensus to suggest the best management of patients with EB during the pandemic.

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus enters host cells using its spike protein binding to the cell receptor angiotensin converting enzyme 2 (ACE2), which is expressed in several tissues. Mucosae have high ACE2 expression, particularly the nasal epithelium. ACE2 is also expressed in the basal layer of keratinocytes and sebaceous glands of normal skin as well as in vascular endothelial cells, but its expression in wounded EB skin has not been studied.<sup>2</sup>

A questionnaire was drafted by an author (D.M.) into a table of suggested modifications to the management of EB during the COVID-19 pandemic. Fifty-seven well-known experts on EB were selected based on membership of the international Clin-et group or clinical expertise in EB, or both, demonstrated at International EB Congress participation. Responses and reasons for each response were requested individually to the lead author based on an ideal scenario, rather than what actually may happen in some centers with financial constraints. A priori, consensus was considered to be the agreement of more than 70% of respondents with the suggestion. Questionnaires were returned by 44 of the 57 EB experts, representing several areas of clinical expertise in EB (dermatology, pediatrics, internal medicine, and surgery) from 5 continents. After addition and revision of some items and 3 cycles of revoting, consensus was achieved for all items, which are summarized in Supplementary Table I (available via Mendeley at <https://data.mendeley.com/datasets/zmpncb6zpr/2>).

The main change in usual practice was the introduction of photographs from the patient/family and teledermatology as the primary visit for patients with less severe EB, with dressing supplies sent to the patients directly. For those patients with EB with significant internal disease, monitoring tests (blood and urine) must continue but can be obtained by local laboratories or family doctors close to home.<sup>3</sup> If telehealth images are insufficient to assess lesions, assessments should be conducted at the EB center.<sup>4</sup>

One of the greatest fears of families caring for patients with severe forms of EB is how they will be perceived on admission to hospitals, especially institutions with limited resources, including ventilators. Because patients with EB often appear frail and emaciated, health care workers unfamiliar with the condition may underestimate their resilience and incorrectly assume that they have a low likelihood of survival.<sup>5</sup> If a patient with EB required

anticoagulation to manage COVID-19, there might be additional bleeding from the skin or mucosae, but blood transfusions will compensate for this. Supplemental Table I details protection for the skin and mucosae that is required for wearing masks and ventilation.

Dedee F. Murrell, *BMBCh, MD, FRCP*,<sup>a</sup> Anne W. Lucky, MD,<sup>b</sup> Julio C. Salas-Alanis, MD, PhD,<sup>c</sup> David T. Woodley, MD,<sup>d</sup> Francis Palisson, MD,<sup>e,f</sup> Ken Natsuga, MD, PhD,<sup>g</sup> Milos Nikolic, MD, PhD,<sup>b</sup> Mae Ramirez-Quizon, MD,<sup>i</sup> Amy S. Paller, MD,<sup>j</sup> Irene Lara-Corrales, MD, FRCPC,<sup>k</sup> Mobammadreza Amir Barzegar, MD,<sup>l</sup> Eli Sprecher, MD, PhD,<sup>m</sup> Cristina Has, MD, PhD,<sup>n</sup> Martin Laimer, MD, MSc,<sup>o</sup> Anna L. Bruckner, MD, MSCS,<sup>p</sup> Asli Bilgic, MD,<sup>q</sup> Arti Nanda, MD,<sup>r</sup> Diana Purvis, MD,<sup>s</sup> Alain Hovnanian, MD, PhD,<sup>t,u</sup> Slobodna Murat-Sušić, MD, PhD,<sup>v</sup> Johannes Bauer, MD,<sup>o</sup> Johannes S. Kern, MD, PhD, FADC,<sup>w,x</sup> Christine Bodemer, MD, PhD,<sup>y,z</sup> Linda K. Martin, FADC,<sup>aa</sup> Jemima Mellerio, BSc, MD, FRCP,<sup>bb</sup> Cezary Kowaleski, MD PhD,<sup>cc</sup> Susan J. Robertson, FADC,<sup>w,dd</sup> Leena Bruckner-Tuderman, MD,<sup>n</sup> Elena Pope, MSc, FRCPC,<sup>k</sup> M. Peter Marinkovich, MD,<sup>ee</sup> Jean Y. Tang, MD, PhD,<sup>ee</sup> John Su, FADC, FRACP, MCRIFRCPC,<sup>x,ff</sup> Jouni Uitto, MD, PhD,<sup>gg,bb</sup> Lawrence F. Eichenfield, MD,<sup>ii,jj</sup> Joyce Teng, MD, PhD,<sup>ee</sup> Mark Jean Aan Koh, MD,<sup>kk</sup> Sang Eun Lee, MD, PhD,<sup>ll</sup> Phuong Khuu, MD,<sup>ee</sup> Heather I. Rishel, MD, PhD,<sup>mm</sup> Mette Sommerlund, MD, PhD,<sup>nn</sup> Karen Wiss, MD,<sup>oo</sup> Chao-Kai Hsu, MD, PhD,<sup>pp</sup> Tor Wo Chiu, *BMBCh, FRCS, FCSHK, FHKAM*,<sup>qq</sup> and Anna E. Martinez, *FRCPCR*

From the Department of Dermatology, St George Hospital, University of New South Wales, Sydney, Australia<sup>a</sup>; Cincinnati Children's Epidermolysis Bullosa Center, Cincinnati Children's Hospital, Cincinnati, Ohio<sup>b</sup>; DebRA (Dystrophic Epidermolysis Bullosa Research Association) Mexico, Monterrey, Mexico<sup>c</sup>; Department of Dermatology, University of Southern California, Los Angeles, California<sup>d</sup>; Dystrophic Epidermolysis Bullosa Research Association DebRA (Dystrophic Epidermolysis Bullosa Research Association) Chile<sup>e</sup> and Clinica Alemana, Universidad del Desarrollo, Santiago, Chile<sup>f</sup>; Department of Dermatology, Hokkaido University Graduate School of Medicine, Sapporo, Japan<sup>g</sup>; Department of Dermatovenereology, University of Belgrade School of Medicine, Belgrade, Serbia<sup>h</sup>; Department of Dermatology, University of the Philippines, Philippines General Hospital, Manila,

Philippines<sup>i</sup>; Departments of Dermatology and Pediatrics, Children's Hospital, Northwestern University, Chicago, Illinois<sup>j</sup>; Section of Dermatology, Hospital for Sick Children, Toronto, Ontario, Canada<sup>k</sup>; Skin Research Center, Shahid Beheshti University of Medical Sciences, Tebran, Iran<sup>l</sup>; Department of Dermatology, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel<sup>m</sup>; Department of Dermatology, Medical Center-University of Freiburg, Freiburg, Germany<sup>n</sup>; EB Haus, Department of Dermatology, Paracelsus University, Salzburg, Austria<sup>o</sup>; Pediatric Dermatology Department, University of Colorado School of Medicine, Children's Hospital Colorado, Aurora, Colorado<sup>p</sup>; Department of Dermatology, Akdeniz University, Antalya, Turkey<sup>q</sup>; Pediatric Dermatology Unit, As'ad Al-Hamad Dermatology Center, Kuwait<sup>r</sup>; Department of Dermatology, Starship Children's Health, Auckland, New Zealand<sup>s</sup>; Department of Genetics, Institut National de la Santé et de la Recherche Médicale Unité Mixte de Recherche 1163, Laboratory of Genetic Skin Diseases,<sup>t</sup> and Institut des Maladies Génétiques (IMAGINE),<sup>u</sup> University of Paris, Paris, France; Department of Dermatovenereology, University Hospital Centre, Zagreb, Croatia<sup>v</sup>; Dermatology Department, The Royal Melbourne Hospital, Melbourne, Victoria, Australia<sup>w</sup>; The University of Melbourne, Parkville, Victoria, Australia<sup>x</sup>; Department of Dermatology, Necker Enfants Malades Hospital, University of Paris, Paris, France<sup>y</sup>; Reference Centre for Genodermatoses and Rare Skin Diseases (MAGEC), Paris, France<sup>z</sup>; Department of Dermatology, Sydney Children's Hospital, University of New South Wales Faculty of Medicine, Sydney, New South Wales, Australia<sup>aa</sup>; Adult Epidermolysis Bullosa Service, St John's Institute of Dermatology, St Thomas' Hospital, London, United Kingdom<sup>bb</sup>; Department of Dermatology and Immunodermatology, University of Warsaw, Warsaw, Poland<sup>cc</sup>; Department of Dermatology, The Royal Children's Hospital, Melbourne, Victoria, Australia<sup>dd</sup>; Department of Dermatology, Stanford University Medical Center, Palo Alto, California<sup>ee</sup>; Monash University, Eastern Health, Melbourne, Victoria, Australia<sup>ff</sup>; Department of Dermatology and Cutaneous Biology, Thomas Jefferson University, Philadelphia, Pennsylvania<sup>gg</sup>; Sidney Kimmel Medical College, Philadelphia, Pennsylvania<sup>hh</sup>; Departments of Dermatology and Pediatrics, University of California, San Diego, California<sup>ii</sup>; Department of Pediatric Dermatology, Rady Children's Hospital, San Diego, California<sup>jj</sup>; Dermatology Service,

*KK Women's & Children's Hospital, Singapore<sup>kk</sup>; Department of Dermatology, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea<sup>ll</sup>; Rishel Pediatric Dermatology, PC, Rishel Enterprises, LLC, San Francisco, California<sup>mm</sup>; Department of Dermatology, Aarhus University Hospital, Aarhus, Denmark<sup>nn</sup>; Department of Dermatology, University of Massachusetts Medical School, Worcester, Massachusetts<sup>oo</sup>; Department of Dermatology, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan<sup>pp</sup>; Chinese University of Hong Kong, Hong Kong, China<sup>qq</sup>; and Paediatric Dermatology Department, Great Ormond Street National Health Service Foundation Trust, London, United Kingdom.<sup>rr</sup>*

*Funding sources: None.*

*Conflicts of interest: Dr Lucky is an investigator/advisor board member for Abeona, Amryt, and Lenus. Dr Paller is an investigator/advisory board member for Abeona. Dr Anna Bruckner is an investigator for Fibrocell, ProQR, and Phoenix Tissue Repair. Authors Murrell, Salas-Alanis, Woodley, Palisson, Natsuga, Nikolic, Ramirez-Quizon, Lara-Corrales, Barzegar, Sprecher, Has, Laimer, Bruckner, Nanda, Purvis, Hovnanian, Murat-Sušić, Bauer, Kern, Bodemer, Mellerio, Kowaleski, Robertson, Bruckner-Tuderman, Pope, Marinkovich, Tang, Su, Uitto, Eichenfield Teng, Kob, Lee, Khuu, Rishel, Sommerlund, Wiss, Hsu, Chiu, and Martinez have no conflicts of interest to declare.*

*IRB approval status: Not applicable.*

*Correspondence and reprint requests to: Dedee F. Murrell, BMBCh, MD, FRCP, Department of Dermatology, St George Hospital, University of NSW Faculty of Medicine, Sydney, NSW 2217, Australia*

*E-mail: [d.murrell@unsw.edu.au](mailto:d.murrell@unsw.edu.au)*

## REFERENCES

- Has C, Bauer JW, Bodemer C, et al. Consensus reclassification of epidermolysis bullosa and other disorders with skin fragility. *Br J Dermatol*. 2020. <https://doi.org/10.1111/bjd.18921>.
- Hamming I, Timens W, Bulthuis MLC, Lely AT, Navis GJ, van Goor H. Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. *J Pathol*. 2004;203:631-637.
- Ramirez M, Murrell DF, Fine JD. Management of epidermolysis bullosa. *Exp Opin Orph Drugs*. 2013;1(4):279-293.
- Mellerio JE, Robertson SJ, Bernardis C, et al. Management of cutaneous squamous cell carcinoma in patients with epidermolysis bullosa—best clinical practice guidelines. *Br J Dermatol*. 2016;174(1):56-67.
- Bruckner AL, Losow M, Wisk J, et al. The challenges of living with and managing epidermolysis bullosa: insights from patients and caregivers. *Orphanet J Rare Dis*. 2020;15(1):1. <https://doi.org/10.1016/j.jaad.2020.06.1023>

## Fighting COVID-19: Early teledermatology lessons learned



*To the Editor:* Coronavirus disease 2019 (COVID-19) has exacerbated the unequal access to medical care experienced by historically marginalized patient populations.<sup>1</sup> Early data demonstrate that the infection and death rates in predominantly black neighborhoods are 3-fold and 6-fold higher, respectively, than in predominantly white neighborhoods.<sup>2</sup> In response to the pandemic, academic and private dermatology practices have both quickly rolled out teledermatology service in an effort to continue access to care. Our study evaluated early practice patterns to identify any variations in the quality of and access to teledermatology services.

We randomly selected 274 teledermatology visits conducted during the month of April 2020 in the Department of Dermatology at Beth Israel Deaconess Medical Center. We reviewed each visit and extracted the following information: age, preferred language, diagnoses, disposition, visit type (telephone vs video), and visit duration. In addition, we randomly selected 250 in-person visits conducted during the month of February 2020 for a prepandemic comparison.

Before the pandemic, 32% of patients seen in person were older than 65 years, and 7% of patients seen in person were non-English speaking, those defined as necessitating interpreter service (Table D). During the pandemic, 23% of patients seen in teledermatology were older than 65 years, and 3% of patients seen in teledermatology were non-English speaking (Table I).

The 2 most common diagnoses seen in teledermatology, other than a lesion of concern, were acne at 19% and dermatitis at 18% of total visits (Table II). Nearly all teledermatology visits with these diagnoses led to a recommendation for discharge or follow-up via subsequent teledermatology visits. In contrast, 60% of teledermatology visits for evaluation of lesion(s) led to a recommendation to follow-up in person for re-evaluation or biopsy, or both. Lastly, 75% of teledermatology visits with durations of 20 minutes or greater were conducted