

# SKIN INJURIES RELATED TO THE USE OF PERSONAL PROTECTION EQUIPMENT IN HEALTHCARE PROFESSIONALS



Prevention Strategies for  
facing the Covid-19 Pandemic



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## REALIZATION



Research Group in Stomal Therapy: ostomy, acute and chronic wounds, and urinary and fecal incontinence - GPET



Brazilian Association of Enterostomal Therapy -SOBEST

## SUPPORT



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(School of Nursing of the University of São Paulo)



Latin American Multidisciplinary Confederation for Wounds,  
Ostomies and Incontinence care (COMLHEI)

# Presentation

In the current scenario that we are living in, with the COVID-19 pandemic, many health professionals have presented skin lesions due to the use of Personal Protective Equipment (PPE). Among these injuries, there are Medical Device-Related Pressure Injuries (MDRPI), mainly caused by the constant use of PPE, mainly the N-95/FFP2 or equivalent respirators and glasses, which are essential for professionals who provide direct medical assistance to patients with suspicion and/or confirmation of COVID-19.

The "MDRPI in health professionals in times of pandemic" are present in all contexts of care and the media has released several images. Such injuries can be painful, cause discomfort and constitute a gateway for infections, in addition to impacting the quality of patient care and the quality of life of professionals.

Therefore, care is essential to maintain the integrity of the health professional's skin. In this context, the Research group in Stomal Therapy Nursing: stomas, acute and chronic wounds, and urinary and anal incontinence, from the University of São Paulo School of Nursing (GPET-EEUSP), in partnership with the Brazilian Association of Enterostomal Therapy (SOBEST), disclose this handbook with the main recommendations for the prevention of MDRPI in health professionals.

In order to write this handbook aimed at Health Professionals, the scientific evidence extracted from national and international Consensus and Guidelines was reviewed, and the main measures for skin protection that can be adopted by health professionals caring for suspected or confirmed COVID-19 patients, were selected. Such recommendations, however, can be complemented with new guidelines as new studies are developed and published since scientific evidence is scarce in the context of the current scenario.

In addition to the recommendations for the protection of the skin of health professionals to prevent MDRPI, this handbook provides important information regarding the COVID-19 pandemic in a national and worldwide context, the use of PPE and self-care measures and the preservation of mental health. The illustrative figures and photos stand out throughout the document.

Enjoy!

Prof. Dr. Paula Cristina Nogueira  
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Coordinators of GPET-EEUSP



# Summary

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# PANDEMIC

The World Health Organization (WHO) declared the new coronavirus pandemic: SARS-COV-2, on March 11, 2020.

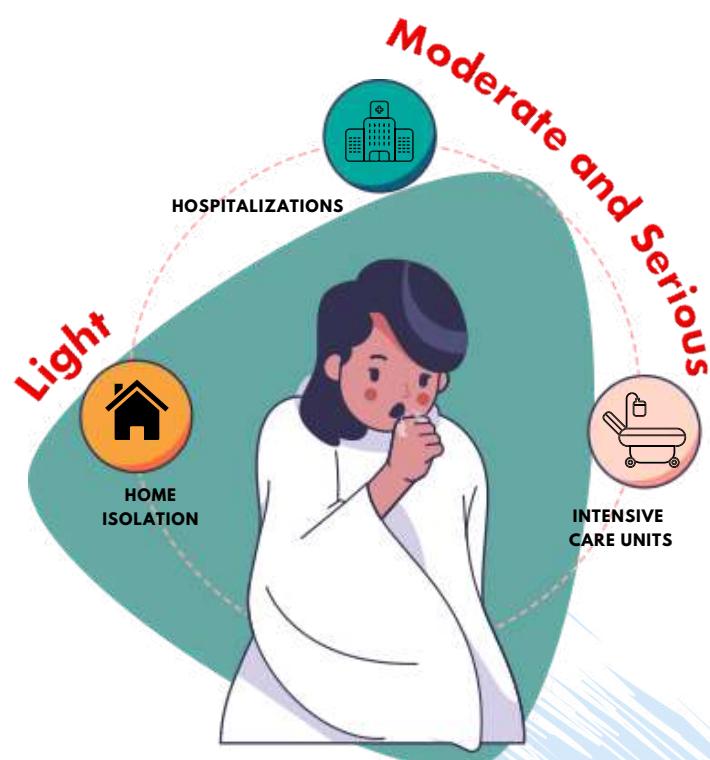


## The pandemic in Brazil and in the world

Recently, in December 2019, an outbreak of pneumonia started in Wuhan-Hubei, China. This infection was caused by a new beta-coronavirus of the severe acute respiratory syndrome (SARS-COV-2). This disease was called COVID-19 (Li et al, 2020). This local outbreak spread rapidly across the world, reaching over 200 countries. On March 11, 2020, the World Health Organization (WHO) declared a pandemic and constituted a Public Health emergency of international importance, the Organization's highest alert level (WHO, 2020; Dong, 2020a).

In Brazil, the first COVID-19 case was confirmed on February 28, 2020. Since then, cases have increased exponentially due to the high transmission capacity of "SARS-COV-2" (WHO, 2020a; Dong, 2020).

THE MANAGEMENT OF PEOPLE AFFECTED BY SARS-COV-2 DIFFERENTIATES IN ACCORDANCE TO THE PRESENTED SYMPTOMS:



# HEALTH PROFESSIONALS FACING THE COVID-19 PANDEMIC

Hand hygiene and antisepsis, and the use of personal protective equipment (PPE) such as masks, glasses, gloves, caps and laboratory coats by health professionals, are the main individual protection measures when assisting people with COVID-19 (WHO, 2020a; GVIMS/GGTES/ ANVISA, 2020).

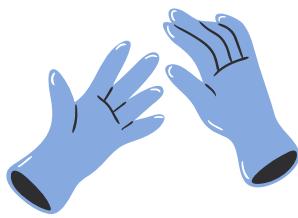


## The World Health Organization recommends the use of PPE:



For health professionals who take direct care of patients, the use of a surgical mask is essential. For procedures that generate aerosols such as intubation, non-invasive ventilation, aspiration, among other precautions, the WHO and the National Health Surveillance Agency (Agencia Nacional de Vigilância Sanitária - ANVISA) recommend the use of N 95/FFP2 or equivalent respirators. In addition, the Brazilian Society of Intensive Medicine Care recommends the constant use of this type of protection in intensive care environments where patients with a confirmed and/or suspicion status of COVID-19 are being treated (WHO, 2020a; AMIB, 2020; GVIMS/GGTES/ANVISA, 2020).

# THE USE OF PPE AND SKIN INJURIES



The WHO recognizes the need to wear a respiratory protection mask, however, it draws attention to the fact that these masks should not be worn for more than 4 hours in a row, due to the discomfort caused by them (WHO, 2020a).

The wearing of PPE and hand hygiene are essential for occupational protection, however, due to the SARS-COV-2 pandemic, the need for frequent hand hygiene and the wearing of gloves has increased the risk of dermatitis and dermatosis, and may cause erythema, dryness, flaking, cracking, itching, secondary infections and worsening of pre existing skin diseases. The prolonged wear of masks, especially N-95/FFP2 respirators and glasses, may increase the risk of pressure injury and/ friction on the face. (Galetto. Et al, 2019; Darlenski and Tsankov, 2020).

## Curiosity

Did you know that a referral hospital for COVID-19 care in China described that 97% of health professionals had skin changes due to the use of PPE (N=542)? The main injury sites were under the nasal bone (83%) correlated with the wear of glasses; cheeks (74.5%) due to the wear of the N95 mask, and forehead (57.2%) due to the use of the "face shield". Hand injuries (74.5%) occurred in those professionals who cleaned their hands more than 10 times a day and who wore gloves for an extended period.

Keep an eye out for injuries at these contact points.

(Lan et al, 2020).



Brazilian nurse working on the front line to combat COVID-19 in an Intensive Care Unit (ICU) in the city of Sao Paulo, Brazil. Images published with permission.

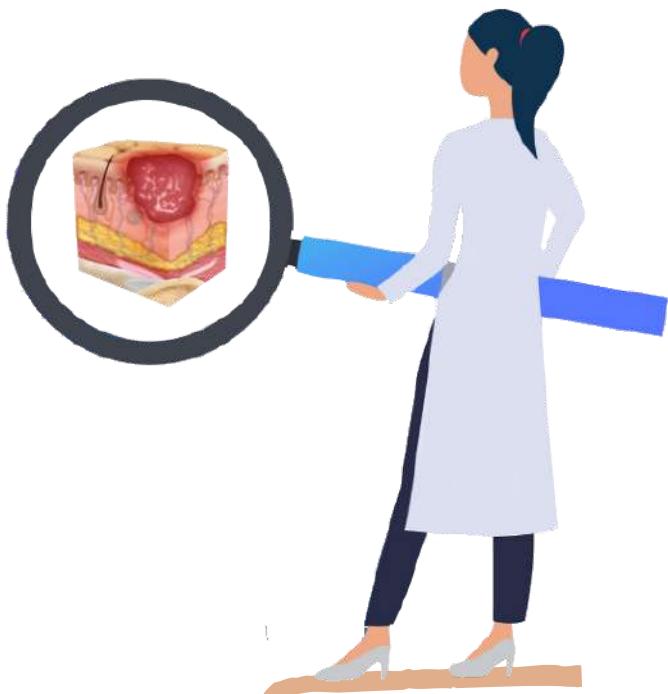


# THE ENTEROSTOMAL THERAPY NURSE WATCHFUL EYE

In view of current demands, care is essential to maintain the integrity of the skin of the professional who is at the forefront of fighting COVID-19, since injuries can have a negative impact on care, quality of life and self-esteem, as well as, presenting itself as an open door for secondary infections in these professionals (Mills, 2020).



**Professor of the Department of Nursing at the Federal University of Espírito Santo (Brazil), working in primary care. Images published with permission.**



Medical Device-Related Pressure Injuries (MDRPI) are defined as resulting from the use of inputs, materials or equipment that are in contact with the skin for healthcare purposes.

Masks, respirators, and personal protective glasses are products that can cause skin damage in healthcare professionals. The injury occurs as a result of pressure of great intensity in small areas, or pressure of lower intensity, but of long duration in larger areas, in combination with friction and shear (NPUAP, 2016; Caliri et al, 2016; Gefen, et al. 2020; NPIAP, 2020).

The injury represents the shape of the device used and must be classified with the same classic system already adopted for pressure injuries (NPUAP, 2016; Caliri et al, 2016; Gefen, et al. 2020; NPIAP, 2020).

# SKIN PROTECTION MEASURES FOR HEALTHCARE PROFESSIONALS

Considering the importance and necessity of frequent use of PPE at the time of the pandemic, this handbook aims to contribute to the self-care guidelines for maintaining the integrity of the skin of health professionals. The proposed skin protection measures were based on scientific evidence from recent international and national studies, consensus and guidelines (Gefen, et al. 2020; NPIAP, 2020; Yan et al, 2020; Lan et al, 2020; WOCN, 2020; Galetto. et al, 2019; EPUAP, NPUAP, PPPIA, 2019; Yamada, 2015)



## So, let's go to the protection measures:

1

Perform hand washing.



(GVIMS/GGTES/ANVISA, 2020)

### Attention:

With frequent hand hygiene and the wearing of gloves which occlude and irritate the skin, changes such as dryness and dermatitis are common. A recent study showed that 76.8% of professionals who wore two pairs of gloves at different times during a six-hour shift, and who washed their hands more than 10 times a day, presented some type of hand injury (Lan et al, 2020).

It must be noted that some of the skin's natural moisturizing factors are water-soluble and can be removed when washing the hands. Therefore, it is necessary to use cosmetic substances that can help in the process of retaining and reducing transepidermal water loss (Yamada, 2015; Yan et al, 2020; Pittet et al, 2009).

# SKIN PROTECTION MEASURES FOR HEALTHCARE PROFESSIONALS

2

Sanitize the skin with liquid soap with a slightly acidified pH (compatible with the skin).



(NPIAP, 2020; Yamada, 2015; Yan et al, 2020)

3

Moisturize the skin daily, especially the hands and face, with cosmetic products with a balanced composition of humectants and active hydrating substances that are quickly absorbed and dried. For the face, it is important to choose products that do not prevent the fixation of adhesives used as an interface for skin protection, and that do not affect the correct positioning of the masks and glasses.



“

Due to the absence of scientific evidence and uncertainties about the risk of SARS-CoV-2 fixing on the skin, it is essential to carry out studies to assess the chemical interaction between the components of moisturizers and the virus.”

**PD: IF DRYNESS OCCURS, INCREASE THE FREQUENCY OF HYDRATION.**

(NPIAP, 2020; Yamada, 2015; Yan et al, 2020)

# SKIN PROTECTION MEASURES FOR HEALTHCARE PROFESSIONALS

4

Protect the skin in the area where the mask/respirator and glasses are attached, when worn for a long period, especially in the regions shown below or where pressure, friction and shear forces are identified, ensuring the correct fit of the mask/respirator and glasses to the face.

Support region of glasses and mask



Zygomatic bone



Front region



Auricular helix and back of ear



Nasal bone

“**PS:** Apply prophylactic coverage as an interface between the skin and the device to reduce the risk of injury: polyurethane foam, silicone, transparent film or hydrocolloid plates, thin or extra thin, so as not to compromise the mask/respirator seal on the skin.”

# SKIN PROTECTION MEASURES FOR HEALTHCARE PROFESSIONALS

5

Program pressure relief minutes by establishing periods for removing the mask/respirator and glasses at least every 2 hours, avoiding contamination of the hands when manipulating the outer layers of these PPE.



“

Remove the mask/respirator as soon as possible following the appropriate removal protocol. Do not touch the front of the mask, since it is considered the most contaminated area of the device.

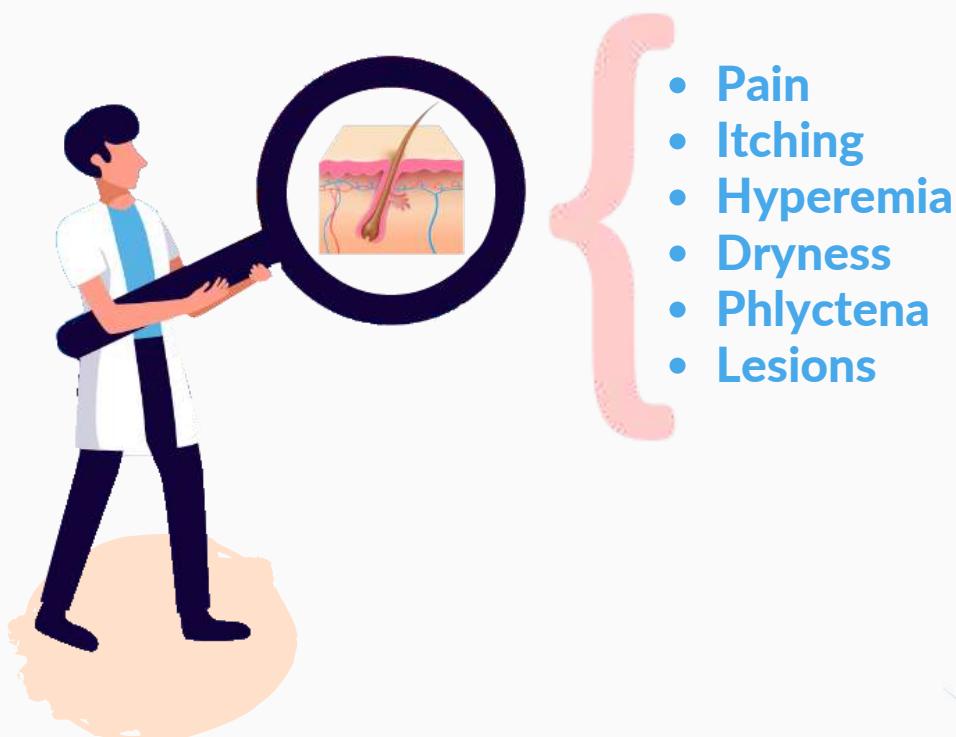
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**PS:** Although you protect the skin, the protective films or creams do not provide pressure relief, even contributing to protection against humidity and friction.

(Udwadia, 2020; Yan et al, 2020; EPUAP, NPUAP, PPPIA, 2019)

6

Inspect the skin after using PPE and look out for signs and symptoms:

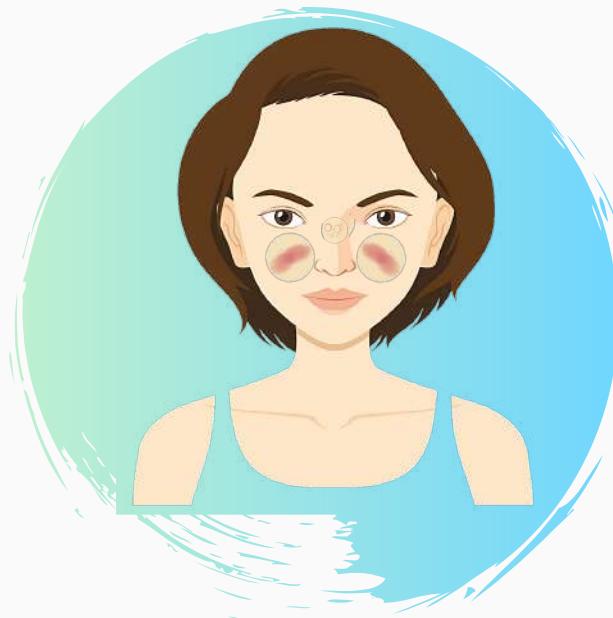


- Pain
- Itching
- Hyperemia
- Dryness
- Phlyctena
- Lesions

# SKIN PROTECTION MEASURES FOR HEALTHCARE PROFESSIONALS

7

Treat, protect and avoid the wear of a mask/respirator and glasses on areas of skin lesions, eczema or hyperemia.



**PS:** In the case of injuries, treatment following an institutional protocol should be conducted with an emphasis on antimicrobial cleaning and reducing the risk of contamination.



“ These are recommendations from ETN, based on the literature available thus far. However, due to the little-explored panorama of the new SARS-COV-2 coronavirus and with the advancement of the scientific literature, they may be altered or complemented. ”

# SELF-CARE MEASURES AND MENTAL HEALTH PRESERVATION FOR HEALTH PROFESSIONALS

The insecurity and fear caused by the COVID-19 pandemic, alarming epidemiological data, risks of disease acquisition and transmission, loss of patients, exhausting working hours, frequent use of PPE and risks of skin damage, can negatively influence the mental health and psychosocial well-being of health professionals (WHO, 2020b). A Chinese study showed that 70% of health professionals at the front line in Wuhan had extreme levels of stress, with symptoms of depression (50%), anxiety (44%) and insomnia (34%) (Lai et al, 2020).



“

Remember that maintaining mental health is essential in stressful times. Look for a specialist, if necessary! ”

**Exercise self-care and practice activities that help you positively:**



**EAT AND HYDRATE WELL**



**KEEP SOCIAL CONTACT, EVEN AT DISTANCE**



**PRACTICE PHYSICAL ACTIVITIES**



**PRACTICE OR EXERCISE YOUR FAITH**



**TAKE BREAKS WITHIN THE EXPEDIENT, IF NECESSARY**



**PRACTICE PLEASANT ACTIVITIES**



**KEEP SLEEP REPAIR**

# Final message

By: RN. Talita dos Santos Rosa

To health professionals who are working hard to combat COVID-19,

We are facing one of humanity's greatest challenges. The perplexity and uncertainty in the face of a bleak world panorama confirmed by statistics on morbidity and mortality leave us fearful and lost. This is all new and scary. Quickly, like never before, the world took on another form, we slowed down, we got paralyzed. Habits and behaviours were reassessed. Handshakes, hugs and kisses became offensive ... we changed. Our vulnerabilities were exposed and what was once an absolute truth and priority has ceased to be. We perceive ourselves to be fragile but, at the same time, we have become strong in the midst of the pandemic. We discovered our importance in the whole, we saw ourselves in the same boat and we will only reach the shore if we accept our selfishness, weaknesses and paddle together.

You, the healthcare professional, are facing thousands of desperate and hopeful looks in search of treatment, cure, reception and assistance. As Pope Francis said in his last speech:

*"The lives of thousands of people are being designed and supported by ordinary people (usually forgotten), who do not appear in the headlines of newspapers and magazines, nor on the big catwalks, but, who today are undoubtedly writing the decisive events of our history: doctors, nurses, supermarket workers, cleaning staff, curators, transporters, police forces, volunteers, priests, nuns and many - but many - others who understood that no one is saved alone".*

Right now, some priorities are being revised, our projects reformulated. What used to make sense to science is now unclear. It is up to you to be strong without putting yourself in the place of invincibility and heroism. We are human, we have been in the front line, in the field of health for a long time, maybe we just didn't have everyone's attentive eyes. Recognized for caring for others, for being selfless. However, in this extremely delicate moment, where your presence is necessary, it is essential that you look at yourself, exercise self-care and preserve your health, so that you can collaborate with the assistance to society effectively.

It was up to you to lead the fight against the pandemic, to embrace the adversities imposed with faith and courage. It will be up to you to exercise your profession as always, with dedication, ethics, responsibility and donation. However, do not forget how important and necessary you are to everyone ... So, BE CAREFUL. The pandemic will pass, support your colleagues, support your institution, share creative solutions, stay positive, pay attention to hygiene and protection measures. We are all together in the fight against COVID-19. All of this will soon pass. Let us maintain awareness about the relevance of public health systems and about us, health professionals!

With a lot of respect and admiration. Stay safe!



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