

## QUESTION

# What are sustainable solutions for pandemic personal protective equipment?

**Julie Kleber, BSN, RN, BMTCN®**, is a clinical nurse IV at Memorial Sloan Kettering Cancer Center in New York, NY. The author takes full responsibility for this content and did not receive honoraria or disclose any relevant financial relationships. Kleber can be reached at [julied7188@hotmail.com](mailto:julied7188@hotmail.com), with copy to [CJONEditor@ons.org](mailto:CJONEditor@ons.org).

Since the inception of the COVID-19 pandemic, supply chains and hospital administrations have been trying to fulfill adequate personal protective equipment (PPE) for staff members to ensure their safety. With varying healthcare institutional policies, PPE has been deemed disposable so we do not lose its effectiveness. The Centers for Disease Control and Prevention (2020) recommends limiting the number of uses for an N95 respirator to no more than five because, at that many uses, it alters the fit for the wearer, leaving them exposed to droplets of a virus. However, when we view this single-use mentality through a sustainable and environmentally conscious lens, what impact is this having on our planet and how can we meet this new challenge?

In March 2020, when the pandemic began, the World Health Organization (2020) estimated that 89 million masks, 76 million gloves, and 1.6 million goggles would be required for the COVID-19 response each month. I estimated for myself that during one shift, I use a minimum of 18 pairs of gloves, even with the best clustering of care (for instance, drawing up *pro re nata* medications or changing gloves after cleaning up a patient who is incontinent).

There have been innovative solutions to mitigate our PPE pollution. One notion is to extend the life of our N95 respirators through the process of sterilization. Companies such as TerraCycle have pivoted in the marketplace to accept PPE and recycle it. For example, surgical face masks, composed of polypropylene, a polymer plastic, are broken down into a raw material, which is then used to manufacture plastic lumber and composite

decking (recycling). Another approach is to break down polypropylene into liquid biofuel via pyrolysis; the biofuel then can be used as fossil fuels for energy (Jain et al., 2020). Lastly, our investment in telehealth could ultimately phase out the need for PPE.

While caring for patients with COVID-19 on my unit, we curbed the use of PPE by calling into a patient's room preemptively to notify them we were going to enter their room and ask if they needed anything additional. We also used a form of telehealth where we positioned a tablet outside a patient's room that connected to the TV monitor inside their room, and we could communicate face to face instead of over a telephone or speaker. If the room had a glass window, this was a bonus. These approaches cut down on the amount of single-use PPE we were using by decreasing the number of additional calls our patients made for simple requests, such as answering questions regarding their plan of care or a new medication they were prescribed.

The COVID-19 pandemic has brought some negative consequences, but it has also sparked a trend of innovation, collaboration, and scientific breakthroughs in record time. Sustainability and how we examine our consumption of single-use items, such as PPE, is necessary to the vitality of our shared planet and is worth investing in.

## RESOURCES

- **Biofuels**  
Explains how to turn personal protective equipment into biofuel  
<https://bit.ly/3H4U1D3>
- **Centers for Disease Control and Prevention**  
Offers resources for optimizing personal protective equipment supplies  
<https://bit.ly/32oWIQL>
- **TerraCycle Zero Waste Box**  
Provides recycling solutions for personal protective equipment  
<https://bit.ly/3Fnwj4z>

## REFERENCES

- Centers for Disease Control and Prevention. (2020, October 19). Decontamination and reuse of N95 respirators. U.S. Department of Health and Human Services. <https://bit.ly/3ehwnqy>
- Jain, S., Yadav Lamba, B., Kumar, S., & Singh, D. (2020). Strategy for repurposing of disposed PPE kits by production of biofuel: Pressing priority amidst COVID-19 pandemic. *Biofuels*. Advance online publication.
- World Health Organization. (2020, March 3). Shortage of personal protective equipment endangering health workers worldwide. <https://bit.ly/3yOALX>

## KEYWORDS

sustainability; personal protective equipment; oncology; nursing; solutions; carbon footprint

## DIGITAL OBJECT IDENTIFIER

10.1188/22.CJON.120