

Proper Mask Disposal: How Toxicology Helps Fight the Covid-19 Pandemic

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INTRODUCTION

The Covid-19 pandemic has led to a 'new normal', where the general public is adopting infectious disease prevention measures set by scientists and health officials. Current COVID-19 prevention measures to reduce or stop transmission include handwashing, physical distancing, stay home orders, and quarantine, as well as encouraging the use of masks in public areas by community members.

Tackling the COVID-19 pandemic requires all health sectors, even those not traditionally involved with infectious diseases. Therefore, a holistic approach is required to mitigate its spread. Toxicologists play an imperative role in developing and implementing such measures in a viral epidemic (1). Their robust and pragmatic training in risk assessment and management, such as on handling the hazardous materials, can be mobilized to support the Covid-19 response.

TOXICOLOGY IN A PANDEMIC

Medical toxicologists, in particular, have a key role to play in acting as a knowledge resource for physicians and "voice of caution" for the public (2). This includes advising clinicians on potential adverse reactions to COVID-19 therapeutic options, including serum sickness and ventricular dysrhythmias from indicated to controversial use of recombinant protein therapeutics chloroquine as well as investigating the impact of the virus on drug metabolism (which will greatly impact medication success, viral infectivity and patient outcomes). Moreover, toxicologists can help optimize existing medical and public health systems, by helping identify at risk populations (ex- individuals suffering from substance abuse) and establishing standards for effective mask usage for community members(3). Medical toxicologists are well experienced in conducting observational studies and randomized controlled trials. They have scientific knowledge, personnel and logistics that can be mobilized to conduct research on the infectious pandemic.

MASK DISPOSAL

Face masks, intended to trap droplets released when

someone talks, coughs or sneezes, mitigate the spread of COVID-19 by controlling its source. This means that any mask, including those worn by asymptomatic individuals is potentially infected at the time of disposal(4).

Current recommendations on discarding used masks emphasize the importance of not touching the front of the mask during removal and washing hands using soap and water for at least 20 seconds or using alcohol-based hand sanitizer after discarding and disposing of masks in a covered container. However, as mask disposal information must be sought on public health websites and can be difficult to find, indecorous disposal of masks is on the rise and may allow the virus to flourish. When worn or discarded incorrectly, masks themselves become a source of infection (5). This is particularly important for long-term care facilities or households with elderly and immunocompromised individuals, where improperly discarded masks can lead to severe repercussions.

Medical toxicologists, with immense experience with risk assessment analysis of hazardous materials, are well positioned to incorporate proper mask disposal practices into public COVID-19 communication. A key message should encourage the public to carry disposal bags to temporarily store masks in areas where a garbage bin may not be easily accessed. Secondly, garbage bins where the masks are discarded should be labelled, to discourage mask disposal in improper locations (ex. recycling bins).

ENVIRONMENTAL JUSTICE

Wherever possible, barriers to proper disposal methods should be reduced to improve public compliance. However, we must also consider the impact of such guidelines on marginalized groups and ensure that stricter disposal guidelines do not augment existing socioeconomic and health inequities (6).

It is important to remember that Individual and community capacity to comply with disposal guidelines may vary depending on public knowledge, socioeconomic determinants and health system infrastructure. At the same time, we must craft disposal guidelines keeping environmental injustice in mind and the harsh reality that individuals living in poverty are more

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Table 1. Summary of guidelines for the disposal of masks and used tissue papers

	When to dispose	References
	Mask becomes wet/damp/soiled/torn	(4,11–14)
	After single use	(4,11–14)
Mask removal Method		
	Remove ear loops from ears	(15)
	Wrap mask up with ear loops	(15)
	Do not touch front of mask	(4,16,17)
	Do not shake mask in process	(13)
Disposal method		
	Double bag used mask with other personal waste	(15)
	Throw into lined wastebasket	(11–13,15)
	Seal garbage bags, check for holes	(18)
	Place at least 4ft distance between your containers and obstacles (eg- vehicles) to reduce physical contact with garbage by collector	(19)
	Wrap in tissue paper or plastic bag and throw into garbage bin (public space)	(11–13,15,16,20,21)
	Do not leave on ground or in shopping carts	(11,15)
Post Disposal		
	Wash hands for 20s with water and soap	(11–13,15,16,20,21)
	Use hand sanitizer if hand washing unavailable	(16,17,20)
For Handlers		
	Maintain at least 6 ft distance during garbage pick up	(18)
	Cleaning and disinfection of high contact surfaces (eg- steering wheels and control panels)	(18)
Reducing Household Hazardous Waste from mask disposal		
	Check with local waste agency for local mask disposal protocol	(22)
	Regularly clean high contact surfaces in home (eg- kitchen counter, furniture, kitchen cupboards)	(22)

likely to be exposed to toxins(7). Mask disposal guidelines must balance the need for stringent COVID-19 prevention measures in high risk areas as well as the availability of resources.

THE WAY FORWARD

Hazmat specialists and medical toxicologists should be consulted in the development of mask disposal guidelines that are specific to the challenges faced in a particular region or community. Additionally, toxicologists can play a vital role in developing educational and awareness materials for both the general public and physicians about disposal guidelines. Moving forward, we must modify current toxicology curricula to include strategies for communicable disease management to ensure that emerging toxicologists are equipped to adequately address the dynamic needs of a pandemic (8). On a larger scale, we should highlight the importance of toxicologists in public health education to raise awareness and interest in toxicologic science (9,10).

The COVID-19 pandemic has reinforced the strategy that all branches of health/medicine including toxicologists are needed to be on board to manage the pandemic. In the fight against the COVID-19 pandemic, we must mobilize all resources to research, develop and implement guidelines pertaining to hazardous waste disposal. We have summarized

the guidelines for the safe disposal of masks and used tissue papers from different public health sources partly derived from toxicology related references (Table 1).

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