Government of Pakistan
Ministry of National Health Services,
Regulations & Coordination

World Health Organization

National Guidelines COVID-19 & PPEs

Guidance on Rational Selection & Use of Personal Protective Equipment

NATIONAL INSTITUTE OF HEALTH

Chief FE&DSD, National Institute of Health
Park Road, Islamabad (44000) Pakistan
Email: fedsd@nih.org.pk

Tel: +92 (51) 9255566 +92 (51) 9255237,

Fax: +92 (51) 9255099

Electronic copy is available at; www.nih.org.pk

Email: fedsd@nih.org.pk

National Institute of Health, Park Road, Chak Shahzad, Islamabad, Pakistan

info@nih.org.pk FE&DSD/IPC/001-2020

Foreword

The importance of Personal Protective Equipment (PPEs) to curtail infections and their spread cannot be understated. The nature of spread of COVID19 necessitate wide use of PPEs by health workers and public. This require adequate and reliable sustained supply of quality assured PPEs at appropriate levels. Equally importantly, the available PPEs should be used rationally by health workers in accordance with their professional responsibilities. Inappropriate use of PPEs can exhaust the supply chain, expose the health workers to the virus and result in loss of limited resources.

These guidelines on rational selection and use of PPEs is in response to the practices in our country. The guidelines lay down standards for the use of PPE for healthcare workers, auxiliary staff, patients and their attendants.

It is expected that these guidelines will be valuable for improving the rational selection and use of PPEs. They were developed after several meetings and consultations with experts in the field. The subject matter is realistic and applicable to the existing local setups in the country.

The guidelines will be pertinent to all healthcare facilities in Pakistan. It is expected that PPEs coupled with appropriate Infection Prevention and Control (IPC) practices will help in reducing risk of acquiring COVID19 infection in health care workers specifically and public at large.

It is Government's top priority to protect and support our frontline health workers in the wake of COVID-19.

I would like to thank WHO and all the colleagues and technical experts who contributed to the development of these guidelines.

I appreciate and endorse that this document be used as the reference for PPE use in healthcare facilities, so as to improve and implement rational PPE use practices nationwide warranting patient safety and the protection of health workers.".

Dr. Zafar Mirza

SAPM/Minister for Health

Ministry of National Health Services, Regulations & Coordination

Contents

Guidance on Rational Selection & Use of Personal Protective Equipment (PPE)

Introduction

Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by the SARS-CoV-2 virus. It has risen to the level of a pandemic and is affecting all aspects of daily life, including travel, trade, tourism, food supplies, and financial markets. To reduce the impact of COVID-19 outbreak conditions on businesses, workers, customers, and the public, it is important to plan according to the specific exposure risks and sources, routes of transmission, and other unique characteristics of SARS-CoV-2.

Preventive measures for COVID-19 disease

Based on the available evidence, the COVID-19 virus is transmitted between people through close contact and droplet transmission. The people most at risk of infection are those who are in close contact with a COVID-19 patient or asymptomatic carrier. Preventive and mitigation measures are key.

The most effective preventive measures in the community include:

- performing hand hygiene frequently with an alcohol-based hand rub if your hands are not visibly dirty or with soap and water if hands are dirty;
- avoiding touching your eyes, nose, and mouth;
- practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue;
- wearing a surgical/medical mask if you have respiratory symptoms and performing hand hygiene after disposing of the mask;
- maintaining social distance (a minimum of 3 feet) from persons with respiratory symptoms.

Additional precautions are required by healthcare workers (HCWs) to protect themselves and prevent transmission in the healthcare settings. Precautions to be implemented by HCWs caring for patients with COVID-19 include using PPE appropriately; this involves selecting proper PPE and being trained in how to put on, remove, and dispose of it.

PPE is only one effective measure within a package of administrative and environmental and engineering controls, as described in WHO's Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in healthcare.

This document has been prepared with the WHO Interim Guidance dated 19 March 2020 as the base for rational utilization of PPE. It is highlighted that each institute can have this as minimal standard but needs to **exercise the bio-risk assessment for using appropriate PPEs**. The institutional IPC Committee or the head of institution where no such committee exists, can play a key role for carrying out the bio risk assessment on the basis of local situation/evidence. The document is live/interim and will keep getting modified in the light of evolving situation.

Bio-risk Assessment for Rational use of PPE:

- use of appropriate disinfectants
- handling of PPEs (When to use PPE, What PPE items to use, The limitations of their PPE, How to put on and remove PPE, How to dispose of PPE correctly, How to clean, disinfect and maintain PPE,
- Considerations as to which PPE items can be used for a whole session of work rather than for a single patient or resident contact

PPE Recommended According to the Setting, Personnel and Type of Activity

Healthcare Facilities

In Patient Facilities

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Inpatient facilities			
Patient room	HCWs	Providing direct care to COVID-19 patients	Surgical/Medical mask/N-95* Gown Gloves Eye protection (goggles or face shield)

		Aerosol-generating procedures performed on COVID-19 patients	Respirator N95 or FFP2 standard, or equivalent. Gown/Tyvek* Gloves Eye protection Apron
	Cleaners	Entering the room of COVID-19 patients	Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals) Boots or closed work shoes
	Visitors** **Preferably no visitors**	Entering the room of COVID-19 patients	Surgical/Medical mask Gown Gloves
Other areas of patient transit (e.g. wards, corridors).	All staff, including HCWs.	Any activity that does not involve contact with COVID-19 patients	Surgical/Medical mask
Triage	HCWs	Preliminary screening not involving direct contact	Maintain spatial distance of at least 3 feet. Surgical/Medical mask
	Patients with respiratory symptoms	Any	Maintain spatial distance of at least 3 feet. Provide Surgical/medical mask if tolerated by patient.
	Patients without respiratory symptoms	Any	Surgical/Medical mask
Administrative areas	All staff, including HCWs.	Administrative tasks that do not involve contact with COVID-19 patients.	Surgical/Medical mask Spatial distance of at least 3 feet.

*** Based upon local risk assessment by IPC Committee**
****Preferably no visitors allowed. However, where there is shortage of HCWs and there is requirement to assist the HCWs a single attendant may be allowed.**

Outpatient Facilities

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Outpatient facilities			

Consultation room	HCWs	Physical Examination of patient with respiratory symptoms	Surgical/Medical mask/N95* Gown Gloves Eye protection
		Physical Examination of patients without respiratory symptoms	PPE according to standard precautions and risk assessment. Surgical/Medical mask Gown Gloves
	Patient with respiratory symptoms	Any	Provide Surgical/medical mask
	Patient without respiratory symptoms	Any	Surgical/Medical mask
	Cleaners	After and between consultations with patients with respiratory symptoms.	Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes.
Waiting room	Patient with respiratory symptoms	Any	Provide Surgical/Medical mask Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 3 feet from other patients.
	Patient without respiratory symptoms	Any	Surgical/Medical mask Spatial distance of at least 3 feet
Administrative Areas	All staff, including HCWs	Administrative tasks	Surgical/Medical mask
Triage	HCWs	Preliminary screening not involving direct contact.	Maintain spatial distance of at least 3 feet. Surgical/Medical mask
	Patients with respiratory symptoms	Any	Maintain spatial distance of at least 3 feet. Provide Surgical/medical mask if tolerated.
	Patients without respiratory symptoms	Any	Surgical/Medical mask

*** Based upon local risk assessment by IPC Committee**

Community

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Community			
Home	Patient with respiratory symptoms	Any	Maintain spatial distance of at least 3 feet. Provide Surgical/medical mask if tolerated, except when sleeping.
	Caregiver	Entering the patient's room, but not providing direct care or assistance	Surgical/Medical Mask
		Providing direct care or when handling stool, urine or waste from COVID-19 patient being cared for at home	Gloves Surgical/Medical Mask Apron (if risk of splash)
	HCWs	Providing direct care or assistance to a COVID-19 patient at home	Surgical/Medical Mask/N95* Gown Gloves Eye protection
Public areas	All individuals	(e.g. schools, shopping malls, train stations)	Surgical/medical mask spatial distance of at least 3 feet
Special considerations for rapid-response teams assisting with public health investigations			
Community			
Anywhere	Rapid-response team (RRT) investigators	Remote Interview suspected or confirmed COVID-	No PPE if done remotely (e.g. by telephone or video conference).

		19 patients or their contacts	Remote interview is the preferred method.
		In-person interview of suspected or confirmed COVID-19 patients and their contacts	Maintain spatial distance of at least 3 feet N95 Gown Gloves Eye protection Confirmed or suspected COVID-19 patients should wear a Surgical/medical mask if tolerated.

*** Based upon local risk assessment by IPC Committee**

Points of Entry

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Points of Entry			
Administrative Areas	All staff	Any	Surgical/Medical mask
Screening area	Staff	Screening (e.g. interviewing passengers with fever for clinical symptoms suggestive of COVID-19 disease and travel history).	Maintain spatial distance of at least 3 feet Surgical/Medical Mask Gown Gloves
	Cleaners	Cleaning the area where passengers with fever are being screened	Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes
Temporary isolation area	Staff	Entering the isolation area, but not providing direct assistance	Maintain spatial distance of at least 3 feet. Surgical/Medical mask Gloves

	Staff, HCWs	Assisting passenger being transported to a healthcare facility	Surgical/Medical mask/N95* Gown Gloves Eye protection
	Cleaners	Cleaning isolation area	Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes
Ambulance or transfer vehicle	HCWs	Transporting suspected COVID-19 patients to the referral healthcare facility	Surgical/Medical mask Gown Gloves Eye protection
	Driver	Involved only in driving the patient with suspected COVID-19 disease and the driver's compartment is separated from the COVID-19 patient	Maintain spatial distance of at least 3 feet. Surgical/Medical mask
		Assisting with loading or unloading patient with suspected COVID-19	Surgical/Medical mask/N95 Gown Gloves Eye protection
		No direct contact with patient with suspected COVID-19, but no separation between driver's and patient's compartments	Surgical/Medical mask
	Patients with suspected COVID-19	Transport to the referral healthcare facility.	Surgical/Medical mask if tolerated
	Cleaners	Cleaning after and between transport of patients with suspected COVID-19 to the referral healthcare facility	Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes

*** Based upon local risk assessment by IPC Committee**

Sampling

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Laboratory or dedicated sampling area	HCWs	Taking Nasopharngeal Oropharangeal Swab of COVID suspects	N95 Gown Gloves Eye protection

Laboratory

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Laboratory	Laboratory workers dealing samples	Laboratory Testing	N95 Gloves Tyvek suits Eye protection (PAPR in case biosafety cabinets are not available)

a. In addition to using the appropriate PPE, frequent hand hygiene and respiratory hygiene should always be performed. PPE should be discarded in an appropriate waste container after use, and hand hygiene should be performed before putting on and after taking off PPE.
b. The number of visitors should be restricted. If visitors must enter a COVID-19 patient's room, they should be provided with clear instructions about how to put on and remove PPE and about performing hand hygiene before putting on and after removing PPE; this should be supervised by a HCW.
c. This category includes the use of no-touch thermometers, thermal imaging cameras, and limited observation and questioning, all while maintaining a spatial distance of at least 3 feet.
d. All rapid-response team members must be trained in performing hand hygiene and how to put on and remove PPE to avoid self-contamination.

NOTE: All the disposable PPEs must be treated and disposed of as infectious waste.

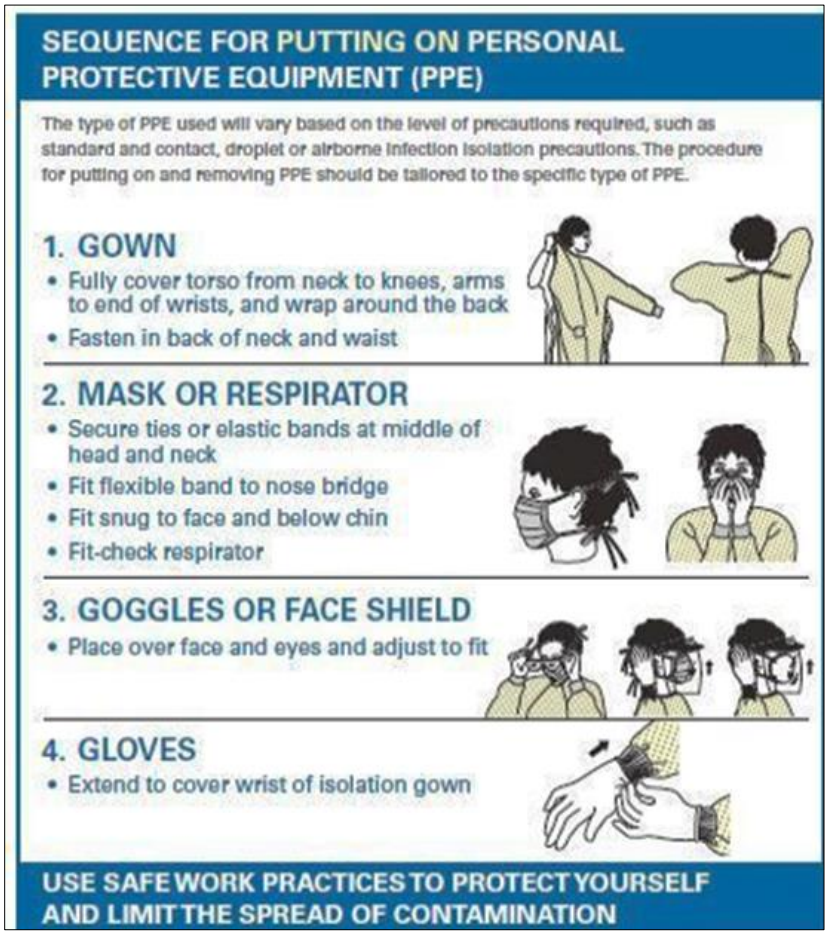
1. Donning and Doffing

Effective use of PPE includes properly wearing, removing and disposing of contaminated PPE to prevent exposing both the wearer and others to infection.

1.1. Donning

Sequence of Donning

a. Hand hygiene/ Hand wash
b. Gown / Apron / Tyvek Suit
c. Surgical/mask
d. Eye Protection (Googles/ Face Shield)
e. Gloves

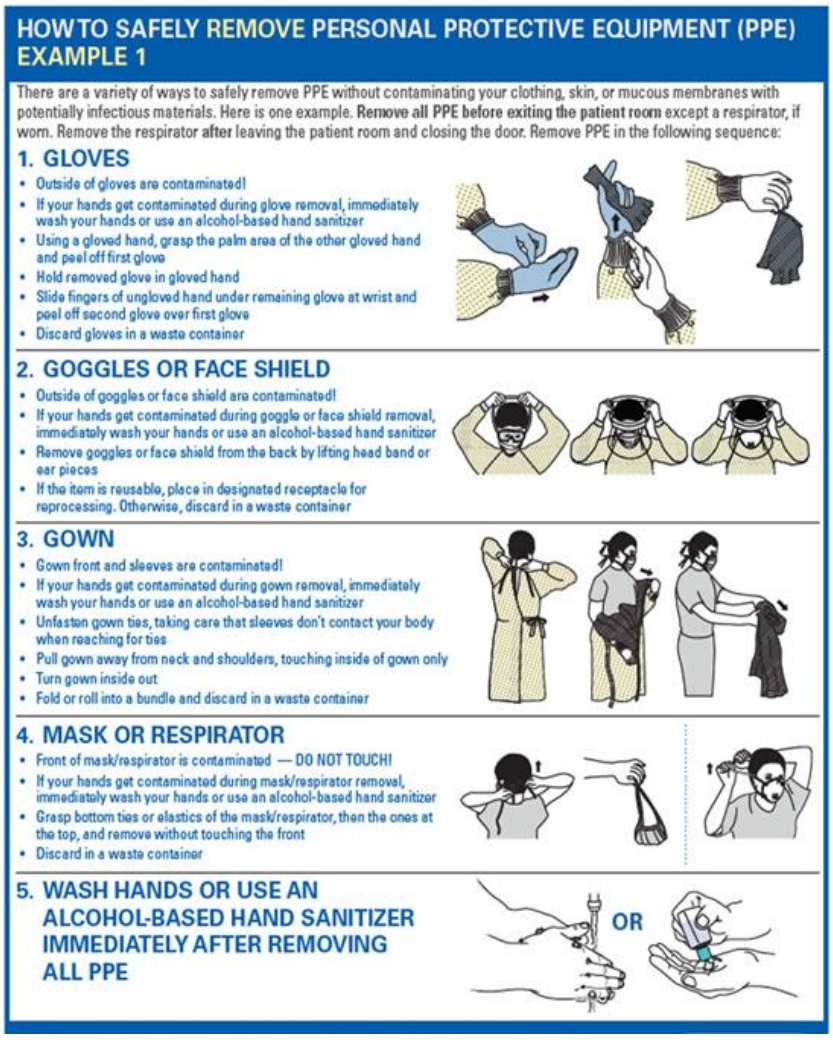


Source: Reproduced from CDC Document

1.2. Doffing

Sequence of Doffing

a. Gloves
b. Hand Hygiene
c. Eye protection
d. Gown
e. Hand Hygiene
f. Mask
g. Hand Hygiene



Source: Reproduced from CDC Document

2. PPE – Specifications

a. **N95 Mask:** 3M Preferably 1860, if not available then 8210 Plus, last preference to 8210, Particulate Respirator, collapse resistant cup shape design with adjustable nose clips, soft nose foam, patented filter media, 3M Company. These N95 respirators, Class I or II devices regulated by the FDA, BFE (Bacterial Filtration Efficiency) according to ASTM F2101, NIOSH certified. SIZE: (70% medium and 30 % large) AND/OR N95.

- Tested for mean particle size of 0.6 Microns.
- Filtering efficiency: More than 95%.
- Aluminum Nose clip for better fit.
- Silicon and latex free.
- Polyester inner and outer shells.
- Head straps are ultrasonically bonded to the mask, no staples are used
- N95 mask Weight below 12 grams.
- N95 mask is NIOSH certified product (N95 without filters are required).

Different countries have different standards; need to be procure from validated sources.

b. **Tyvek Suits:** Classic expert, Cat III, superior type 5/6 protection. SIZE: (70% medium and 30 % large)

c. **Surgical Gowns:** Disposable Isolation Gowns - latex free Knit Cuffs

- Made of non-woven polypropylene material coated with a water repellent agent for added protection.
- Material is breathable which prevents irritating hot temperature build-up.
- Waist ties are designed to tie in back for ease of use.
- Single-use, length mid-calf
- FDA Class I or II medical device, or equivalent
- EN 13795 any performance level, or
- AAMI PB70 all levels acceptable, or equivalent

d. **Nitrile Gloves (Without Powder):** Nitrile Material, latex free, disposable, CE, EN388/ EN 455/EN 374 FDA, any color. Sizes (20 % Small, 50 % Medium, 30 % large)

e. **Latex Gloves:** Disposable Latex Gloves
   - Material: Natural rubber latex
   - Flexibility and strength
   - Wet and dry grip
   - Prevents permeation by chemicals and micro-organisms
   - Puncture, tear-resistant, and abrasion-resistant
   - Standards: ASTM 6319, EN420, and EN455
   - Packing: 100/Box (20 % Small, 50 % Medium, 30 % large)

f. **Surgical Gloves:** Gloves, examination or surgical, nitrile, powder-free, sterile, single-use Gloves should have long cuffs, reaching well above the wrist, ideally to mid-forearm Sizes: small, medium, large

g. **Goggles:** The American National Standards Institute & International Safety Equipment Association
   - (ANSI/ISEA Z87.1-2015) Standard eye protection to prevent or minimize injuries from eye hazards or equivalent standards.

h. **Face Shields:** Anti-fog, with thick sponge, Hypoallergenic foam band can absorb sweat and provide enough room for eyeglasses or safety goggles.
   - Vented foam design for increased air flow and comfort.
   - Sonically welded band gives the face shield added strength and reliability, in elastic band or adjustable Velcro band.
   - Lightweight and comfortable to wear, quick and easy to don.
   - Should offer protection against potential contamination from pathogens, body fluids, or harmful chemical splash.
   - All straps can be sonically welded or secured to the shield with an eyelet for safety.
   - Visor and headgear meet CE EN1731, EN166 and ANSI standard.

i. **Hand Sanitizers (1 Liter):** Alcohol based hand sanitizer. Needs to have a strength of at least 60 percent isopropyl alcohol or 70% ethanol
   - Advanced gel or solution-based hand sanitizer formulation designed for healthcare environments.

- Kills more than 99.99% of most common germs that may cause illness in a healthcare setting.

j. **Disposable Head Covers:** Disposable surgical non-woven cap, for medical care, Hospital use having clip hair net cover.

k. **Shoe Cover:** Disposable Shoe & Boot Covers
   - Waterproof Slip Resistant.
   - Covers contain an elastic band for flexibility
   - Fits all shoes/boots up to size 12.

l. **Gum Boots:** Very light and comfortable
   - Anti-slip with optimal foot support
   - Chemical protection, waterproof, impact-resistant, anti-static.
   - Size 8 & 9 (40 % each), size 10 (10%) and size 11 (10%)

m. **Waste Bins (10 Liters):** Waste disposal bins with covers.
   - Specs: ISO9001:2008. Plastic product, Waterproof
   - Capacity: 10 L bin with pedal.
   - If not available, then any PVC Plastic foot pedaled for healthcare facility use

n. **Biohazard Bags (18 Liters):** Biohazard disposal bag, bright red, features one long flap for easy opening.
   - Printed with biohazard symbol and sterilization indicator patch.
   - Made from high molecular weight high-density polyethylene.
   - Pass ASTM 1922 Tear Resistance or equivalent standards.
   - Size allows bag to be inverted over hand to safely pick up waste.
   - Steam autoclavable at 121°C (250°F).

o. **Mackintosh bed sheets:** Mackintosh rubber sheet
   - Waterproof
   - Thickness minimum 0.35 mm
   - Color Brown/red
   - Size 7x5 feet

p. **Disposable bed sheets:** Disposable Bed Sheets to protect and guard against incontinence and spills.
   - Made from durable tissue and polyethylene film, or non-woven fabric and PE film.

- It should be a non-woven material that is designed for single use.
- Disposable medical linens, sterilization, dust and other effects, lightweight, comfortable, odorless, fiberglass free, non-irritating to the skin, and waterproof. Any colour size 9x7 feet.

q. **Surgical/MedicalMasks:** 3-Ply pleated design with Breath Cool filter offers micro filtration without moisture build-up.
   - Slim aluminum and PVC wire preferably.
   - Fits comfortably over the nose to maintain maximum filtration.
   - Dye-free, chemical-free, fiberglass-free, with latex-free elastic ear loops. middle layer of melt blown non-woven polypropylene or equivalent filtration media.
   - Bacteria Filtration Efficiency (BFE) 80.
   - Size: 7″ x 3.5″
   - ASTM F2100 minimum Level 1 or equivalent.

r. **Absolute Ethanol:** Ethyl alcohol, 99.8+%, CH3CH2OH, molecular weight: 46.07 g/mol, Certified AR meets analytical specification of Ph.Eur., BP, Fisher Chemical.

s. **VTM (Viral Transport Medium):** For collection and transport of samples for Nucleic acid amplification test.
   - Sterile dacron swab in plastic package.
   - Nucleic acid transport medium (20mM Tris (pH 8.0,) 2mM EDTA) 3ml in plastic tube.
   - Comply with the CLSI standard M40-A (for the Quality Control of Microbiology Specimen Transport Devices).
   - Compatible with molecular and cell culture techniques.

t. **PAP Respirators:** The system should contain four primary components, a helmet with power cord, battery, belt and charger.
   - Various components, fan, filter, airflow system and motor, should also be integrated.
   - The filter cartridge should be housed in the helmet, with the filter cover cap (FCC) securely placed over it.
   - Headband adjustments should be positioned for secured wearing.

u. **Sharps Container Boxes:** Puncture-resistant container for collection and disposal of used, disposable and auto-disable syringes and needles.

- 5 L capacity accommodating approximately 100 syringes.
- Boxes to be prominently marked.
- WHO performance specification E10/IC.1.
- WHO/UNICEF standard E10/IC.2 or equivalent.

References

1. WHO Interim Guide 19 March 2020/
2. https://apps.who.int/iris/bitstream/handle/10665/331498/WHO-2019-nCoV-IPCPPE_use-2020.2-eng.pdf
3. CDC Guidelines
4. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html
5. https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/care-for-someone.html
6. Guidance form the Chinese Delegation (with hands-on experience) visiting Pakistan.
7. Infection prevention and control of epidemic-and pandemic-prone acute respiratory infections in health care. Geneva: World Health Organization; 2014.
8. Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth. Geneva: World Health Organization; 2009 (Global Observatory for eHealth Series, 2).
9. Beckman S, Materna B, Goldmacher S, Zipprich J, D'Alessandro M, Novak D, et al. Evaluation of respiratory protection programs and practices in California hospitals during the 2009-2010 H1N1 influenza pandemic. Am J Infect Control 2013;41(11):1024-31. doi:10.1016/j.ajic.2013.05.006.
10. Janssen L, Zhuang Z, Shaffer R. Criteria for the collection of useful respirator performance data in the workplace. J Occup Environ Hyg 2014;11(4):218–26. doi:10.1080/15459624.2013.852282
11. Janssen LL, Nelson TJ, Cuta KT. Workplace protection factors for an N95 filtering facepiece respirator. J Occup Environ Hyg 2007;4(9):698–707. doi:10.1080/15459620701517764.
12. Radonovich LJ Jr, Cheng J, Shenal BV, Hodgson M, Bender BS. Respirator tolerance in HCWs. JAMA 2009;301(1):36–8. doi:10.1001/jama.2008.894.

Contributors

National Institute of Health

1. Maj Gen Aamer Ikram, SI(M), Executive Director
2. Col (Retd) Muhammad Amjad Khan
3. Dr. Saba Savul
4. Dr. Farida Lalani

Shaukat Khanum Memorial Hospital

1. Dr. Faisal Sultan
2. Dr. Salma Abbass

Aga Khan University Hospital

1. Professor Bushra Jamil
2. Dr. Badar Afzal

Armed Forces Institute of Pathology

Brigadier Ijaz Ghani

Gajju Khan Medical College, Mardan

Dr. Amjad Mahboob