Fortifying Health Care Facilities against Corona Virus



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Knowledge about the invisible and intelligent enemy with strategic warfare capabilities is **Power**

This presentation is for the use of Health Care Facilities (HCF). However, the principles can be applied for all the establishments.

How Corona Virus Spreads?

1. Sneezing, Coughing, Laughing and Talking

- Micro droplets directly infect when breathing the air contaminated with Corona virus by
 - Sneezing
 - Coughing
 - Laughing and
 - Talking
- Less than 20 percent of transmission occurs in this way (air-borne transmission)

2.Through Hands

- Hands are contaminated by
 - Droplets formed during sneezing, coughing, laughing and talking, settles on surfaces and such surfaces get contaminated with Corona virus
 - Hands of an infected person gets contaminated while sneezing/coughing and all the surfaces touched by the infected person get contaminated
- When face, eyes, nose and mouth are touched by the contaminated hands, the infection spreads
- More than 80 percent of transmission occurs in this way (Hand borne transmission)

Strategies to block and or destroy the virus

1.Universal use of face masks (<20 %)

- Prevents air-borne transmission
- Prevents surface contamination

2.Hand wash with soap and water (>80 percent)

- Prevents hand borne infections
- Frequent Hand washing by the infected person also prevents the contamination of surfaces frequently touched by the hands

Strategies to block and or destroy the virus

3.Disinfection of Surfaces frequently touched by hands

- Prevents surface borne transmissions

4. Natural ventilation

- Disperses the viruses from the air
- Reduces surface contamination

5. Social distancing of one or two metres distance

– Prevents airborne transmission

Source Reduction Strategies

1. Universal Face Mask

-Denies source to air and consequently surfaces

2.Surface Cleaning

- -Denies source to hands
- 3. Hand wash by infected people
 - Denies source to surfaces frequently touched by the hands

4.Hand wash by all

-Denies source to infect humans by all means

Estimated longevity of Corona Virus in the environment

- 1.Under Sunlight
 - -Few hours
- 2.Naturally ventilated east-west facing room
 - -One or two days
- 3.Cool conditions
 - -Four to five days

Why Hospitals are High Risk Places than a Crowded Market?

- People with fever, Influenza like Illnesses, vulnerable people, people with co-morbid conditions, asymptomatic visitors and other potential cases like those requiring lab test, come from all its catchment areas to Health Care Facilities as Out Patient/In Patient
- Larger are the hospitals, greater the vulnerability



If adequate and comprehensive infection control measures are not taken on continuous basis by a dedicated team with sufficient support staff,

Hospitals will become

Amplifiers of COVID-19.

Dedicated Infection Control Team

- Infection Control Team headed by a senior person with requisite dedicated housekeeping staff is a must for every health facility
- CCTV monitoring by the head of the team to identify the good practices and





gaps

Knowledge is Power: Empower Health Care Personnel to protect themselves and their family members

- Symptoms
- Mode of transmission
- Infection control practices with focus on hand wash, face mask and disinfection practices
- Use of disinfectants
- Use of Hand Sanitisers
- Advantages of Hand Wash in running water



Knowledge is Power: Empower Health Care Personnel to protect themselves and their family members

- Use of various types of disinfection equipment
- Use of PPE



- Prevention of carrying the infection into homes from hospital
- Protecting Vulnerable people
- Hospital practice with respect to fever cases and COVID-19
- Improving innate immunity

Knowledge is Power: Empower Health Care Personnel to protect themselves and their family members

- Home care of positive people
- Psychological care of patients
- Bio-medical waste management
- Management of dead bodies



Am I responsible?



Yes. Everyone is Responsible

Entrance of the Health Care Facility



- Anyone entering and leaving a Health Facility should wash hands with Soap and Running water
- Everyone should wear good quality face mask properly





 Thermal screening of all by using non-touch thermal scanners

At Hospital Entrance

Security staff:

- Security staff should be given the responsibility and authority to ensure everybody washes their hands before entering/leaving the hospital campus or any building inside the hospital campus.
- Non-touch infra-red thermal scanner should be used for screening for fever.
- SpO₂ to be measured for anyone with fever and should be directed to fever clinic.



Why Non-touch infra-red thermal scanner?

- It detects fever a day before the individual feels fever.
- Case investigation, Treatment, isolation,

disinfection and containment measures

can be started well in advance



Why monitoring with Finger Pulse-Oximeter?

• It detects Silent Hypoxia at the earliest

• SpO2 level should be measured while

coming to and leaving the health facility.



At Hospital Entrance

- Any hospital functionary with Influenza Like Illness (ILI) symptoms or fever detected by the thermal scanner
 - should undergo home quarantine which is considered as on duty after clinical examination, lab testing and appropriate training on home care with pulse-oximeter and single breath counting up to 30.
- All hospitals should have signage boards directing to Fever/ILI Out Patient Department.



Determinants of Infection Prevention at the Entrance

- Anyone entering and leaving the Health Care Facility (HCF) should wash hands with soap and running water.
- Similarly everyone should wear good quality mask: Anyone is coming without wearing a mask, should be issued a mask by the security at the entrance itself.
- Those with fever should be separated and sent to fever OP/ward.



Anyone failing to wash hands and not wearing a mask should not be permitted entry/exit into the HCF.

At Parking Place





- Hand Wash with running water should be available both at Car Parking and Two Wheeler/Cycle Parking
- Drivers should not move around inside the hospital premises unnecessarily
- Drivers should maintain social distancing at parking area or resting area

At Parking Place



- Disinfection of steering, door handles, keys using 1% sodium hypochlorite solution/ 5% Lysol.
- Drivers residing in containment zones should not be allowed to drive vehicles





• Drivers to maintain social distancing and follow required do's and don'ts

At Parking Place



• Hand wash facilities and Hand Sanitisers at Parking is a must

 Parking regulation to prevent dust: dust will carry Corona Virus





Dust bins at parking place

Hygiene Measures



- **Respiratory etiquettes to be followed**
 - Mouth & nose to be covered with handkerchief while coughing or sneezing
 - Used tissues to be disposed off properly



Spitting to be prohibited

Maintain Social distancing



Hygiene Measures



• Mandatory Hand Wash and Sanitisers at all vantage points

Allow natural ventilation and free flow of air





Posters on COVID-19 Prevention



General Sanitation

- Frequent cleaning focusing on lavatories,
 drinking water and handwashing areas
- Paper napkins instead of cloth towels





• Dust bins should be available at

strategic points inside the facility



Use of Broomsticks



- Broomsticks should not be used in any Health Care Facility
- Prevention of dust generation in the Health Care Facility is not permitted
- Street Chappals are not permitted in to the HCF
- Train security and House keeping staff should be assertive to prevent littering
- Vacuum cleaners should be used
- Only wet mopping is permitted.

Elevators- Highest Risk





- Unnecessary use of elevators to be discouraged
- Healthy should avoid using lifts
- For getting down staircase to be preferred







Social Distance in Health Care Facility

Social Distance



- Maintain 6 feet distance at all places in the Health Care Facility
- Large gatherings inside the health facility to be avoided





 Visitors should be prohibited unless the patient needs help

Social Distance



Specific markings for regulation of people coming to the health facility

 Signage to instruct people to keep clear from entry/exit



Hospital Pharmacy



- Prescriptions should be sent to pharmacy electronically
- Medicines should be sent to the patients in the concerned sections
- Separate access to be provided for people directly coming to hospital pharmacy
- Materials received from outside should be handled with care

 Home delivery staff should be screened thermally before going for delivery of medicines

Hospital Laboratory



- Separate entry provision for people coming from outside to labs is a must
 - Patients should not be sent from all
 sections/departments of the hospital: instead
 nurses in all sections/departments to be
 trained to collect samples and specimens sent
 to lab safely
- Lab technicians for home sampling should be screened thermally before going for sample collection
Cash Counter





- Maintain social distance
- Encourage cashless transfer
- People from different

sections/departments should not unnecessarily come to cash counter

Hand Sanitiser must at cash counter

Hospital Process Re-organisation

Communication Facilities



 Communication through electronic modes to be encouraged

• Video conference facilities



ILI / Fever OPD

- Separate waiting area for people with respiratory symptoms
- Proper signages directing ILI, fever, SARI cases to triage area
- Fevers cases should be treated separately to prevent spreading infection to others
- In OPD room, at least two metres distance should be maintained to limit close contact between triage staff and potentially infectious patient

ILI / Fever OPD

- Health Information about COVID 19 symptoms and respiratory etiquette and hygiene should be displayed at appropriate places
- Lab sample collection, medicine issue and any other hospital service within the same block should be available with adequate precautions.
- People visiting fever clinics should not be allowed to move around inside the hospital.
- Doctors and staff posted in fever clinic/infectious diseases department should not move to other sections in the hospital.



Isolation facility

- Every hospital should have a facility for isolation room for the suspect cases
- The isolation area should have a separate entry and exit
- Separate rooms should be available for donning of PPE before entering isolation ward and doffing PPE while leaving isolation ward



Isolation facility

- Isolation ward should have separate rooms to admit SARI cases to prevent cross infection and it should be properly ventilated.
- Restrict the movement of patients in isolation facility for medical purpose only.
- Each department should function separately as stand alone units to avoid cross infection



Hospital Timings

 Should be spread out for the whole day so that crowding is avoided



Staggering of consultations,
scheduling of services, lunch
hours/coffee breaks

Visitors



- Visitors should be completely banned.
- Video call facilities to patients may be arranged if absolutely warranted

Hospital Infection Control Team

- Infection Control Team should move around the Health Care Facility and suggest appropriate measures for infection control
 - Doctors, staff and patient movement
 - Scheduling
 - Protection of vulnerable
 - Parking
 - Hospital Timings
 - Barricading different sections/departments
 - Enabling procedures to reduce movement
 - Lab, Pharmacy, canteen, cash counter, registration counter functioning

People requiring special care in a health facility



Pregnant Women



Children less than 10 years





Separate OP place and timing

- Separate OP place and timing to be planned for
 - Pregnant women
 - -Children
 - -Sixty plus
 - -People with co-morbid conditions
 - -People with immune deficiency conditions

Why Special Care for 60 plus and people with co-morbid conditions?

- With increasing age and co-morbid conditions innate immunity decreases
- The ability of the virus to infect and the susceptibility to get infected are higher among 60 plus and people with co-morbid conditions.

Why Special Care for pregnant mothers and children?

- For any kind of Influenza Like Illness (ILI), pregnant, lactating and children are vulnerable.
- Although the current data available suggest that children and pregnant are not particularly vulnerable, the general rule should be followed.

Why all Pregnant Women should be RT-PCR tested for Corona virus, five days before EDD or immediately on admission in a separate room in a health facility?



- Two-thirds of deliveries occur in government hospitals: Unless Corona positive mothers are admitted in separate rooms, High Risk Pregnant mothers - PIH, GDM, Heart diseases will be at risk.
- Confidence of doctors and nurses will be enhanced
- Since pregnant do not venture out much, testing all pregnant women will be an excellent default sample for detecting the entry of infection in an area.

To be admitted in separate room if admission is required

• Should be tested for SARS CoV-2 by RTPCR

60 Plus people

- If negative, may be moved to general ward or shared rooms
- Diabetes or hypertension to be checked
- Innate immunity boosting medicines and diet to be prescribed.
- Younger age people should be discouraged from 60 plus

People with co-morbid conditions

- To be admitted in separate room if admission is required
- Should be tested for SARS CoV-2 by RTPCR
- If negative, may be moved to general ward or shared rooms
- Diabetes or hypertension to be checked
- Innate immunity boosting medicines and diet to be prescribed.
- Younger age people should be discouraged from people with co-morbid conditions

Cancer Patients

- To be admitted in separate room if admission is required
- Should be tested for SARS CoV-2 by RT-PCR
- If negative, may be moved to general ward or shared rooms
- Diabetes or hypertension to be checked
- Innate immunity boosting medicines and diet to be prescribed.
- Younger age people should be discouraged to be with them

Elective Surgeries

- Defer surgery for at least for 14 days for those with epidemiologically heightened risk.
- If necessary after test negative, surgery can be performed after 7 days
- In case of life saving emergency, surgery can be undertaken with due care

At Canteen in a Health Facility



 Precautions while handling supplies/inventories

• Before entry in and exit from cafeteria Hand Wash and face mask are mandatory





• Eating arrangement in cafeteria to ensure adequate social distancing

At Canteen in a health facility



- Staff/waiters to wear masks and hand gloves
- Staff to follow social distancing norms in the cafeteria/ canteen/ dining halls/ kitchen





 Tables to be sanitized each time customer leaves

Care of Health Care Personnel



Mandatory Criteria



•

Only healthy and medically fit, non-smoking, without any co-morbid conditions are allowed to work in Health Care Facilities



No one is allowed to work without mask



Staff requiring special care in a health facility



 Avoid front-line work and take extra precautions for high risk employee

Staggering of duty hours, lunch hours/coffee breaks

Care of Health Care Personnel



- Monitoring of Health of the staff while coming for duty and leaving the health facility
 - Non-touch thermal scanning
 - SpO2 monitoring by using a Finger Pulse-Oximeter

• Any sickness among the staff should be informed immediately and treated



Exempted category of staff in fever OP, fever Inpatient wards and isolation facilities.

- Immune deficiency conditions like those on chemotherapy, radiotherapy and other conditions.
- Those who underwent transplant procedures.
- Chronic Kidney Disease (CKD)
- Chronic Liver Diseases
- Uncontrolled diabetes mellitus
- Uncontrolled hypertension



Exempted category of staff in fever OP, fever Inpatient wards and isolation facilities.

- Extremely obese people
- COPD/Bronchial Asthma
- People with haemoglobinopathies



- Any other severe co-morbid conditions
- Pregnant staff and Lactating mothers
- 60 plus staff working in Health Care Facilities

 Exempted category of staff may be posted at no risk or low risk duties like data management, logistics management, tele-training, tele-counselling, teleconsultation, CCTV monitoring and similar activities.

• All staff should be screened for diabetes, hypertension and other co-morbid conditions and treated properly

 Exempted category of staff should not be posted in fever OP, fever Inpatient wards and isolation facilities.

Innate Immunity and SARS CoV-2

- SARS CoV-2 infection in individuals with weak innate immunity results in COVID-19.
- Cytokine storm affects the epithelium of the lungs





Innate Immunity

- Epithelial integrity
- Ciliary function of respiratory mucosa
- Nasal and mucopolysaccharides in respiratory and nasal secretions are capable of fighting influenza viruses.



Innate Immunity

- The ability of innate immunity to fight the invading microorganisms is reduced
 - With increasing Age
 - Nutritional deficiencies particularly vitamins, micro-nutrients and proteins
 - co-morbid conditions
 - hormonal imbalances like hypothyroidism



Tobacco and Innate Immunity

- Tobacco in any form, particularly smoking severely impairs the ability of Respiratory Tract to fight against Corona Virus
- Any staff smoking should be advised to quit smoking immediately: Benefit of quitting smoking starts in the next few days to the individual and family members.

Corona Virus has special affinity to smokers

Innate Immunity boosters

Nutrition Component	Key Functions related to COVID- 19	Sources
Proteins	Essential for production of antibodies, enzymes, hormones, plasma proteins, haemoglobin and coagulation factors	Milk, egg, meat, fish, pulses, nuts, beans
Vitamin-A	Necessary for epithelial integrity: Anti-infective nature helps in immune response to infections	Liver, eggs, butter, cheese, whole milk, fish, meat, papaya, mango, carrots

Innate Immunity boosters

Nutrition	Key Functions related to	Sources
Component	COVID-19	
Vitamin-D	Essential for collagen	Sunlight, cheese,
	maturation,	butter, egg, fish,
	Essential for normal growth	milk
Vitamin-C	Essential for epithelial integrity	Tomato, orange,
	and collagen formation	lemon, guava, amla,
	Collagen provides supporting	green leafy
	matrix for blood vessels	vegetables

Innate Immunity boosters

Nutrition	Key Functions related to	Sources
Component	COVID-19	
Zinc	Essential for most of the	Cheese, butter, egg,
	enzymes,	fish, milk
	Insulin formation requires zinc,	
	Immunity function	
Nutritious	Essential for boosting innate	Fruits, green leafy
food	immunity	vegetables, egg,
		fish, meat

Prophylactic Medicines

Medicine	Dose	Duration
Tab.Vitamin C	500 mg daily	10 days
Tab.Multi	Any Available preparation	10 days
vitamin		
Zinc	20 mg or any available	10 days
	preparation	
Kabasura	Adults-60ml	Seven days :Two days
Kudineer	Children-30 ml	gap and seven days
		Total: 14 days.
Method for preparation and usage of Nilavembu Kudineer and Kabasura Kudineer Herbal Powder (for single person)

- Dissolve 5 gm of Nilavembu Kudineer or Kabasura Kudineer Herbal powder in 240ml of water and boil it well and reduce to 60 ml, filter the same and drink this within 3 hours.
- Dosage advised is 60 ml for Adult and 30 ml for Children.
- To be taken for 7 days. After two days gap to be taken for another 7 days (Total:14 days)







Disinfection







Disinfection

- 1% Hypochlorite solution for wet mopping of floors
- Surfaces frequently touched by hands in the hospital should be disinfected with 5% Lysol (1 litre of Lysol in 9 litres of water) using Knapsack sprayer and small hand sprayers
- Buses and other vehicles in the Hospitals and surfaces frequently touched by hands should be cleaned with Lysol

Disinfection

- Ambulances should be disinfected with 1% Hypochlorite Solution after every trip followed by water washing
- Computer mouses, credit/debit card machines, computer key boards, telephones and similar objects should be disinfected with hand sanitiser (Excessive Hand Sanitiser should not be used
- Cash counter, pharmacy counter, waiting area, lift and other similar areas should be disinfected on hourly basis with Lysol.

Excessive use of Hand Sanitiser in closed rooms and closed vehicles can cause fire accident



- Lysol
- Sodium Hypochlorite solution (liquid chlorine)
- Bleaching powder (Powder/granules)



- Hand Sanitisers
 - Every facility should prepare hand sanitisers for their use as per standard guidelines.

Disinfection Equipment

- Power sprayers can be used for outside areas
- Knapsack sprayers can be used for inside the buildings/wards/surfaces frequently touched by hands
- Small hand sprayers should be kept in all nursing stations
- Whenever Metal sprayers are used for spraying hypochlorite solution, wash the sprayer thoroughly with water.



Small Sprayers



Small Sprayers should be available handily at all nursing stations for frequent disinfection as and when necessary



Knapsack Sprayers



Knapsack Sprayers should be used inside the hospital buildings including wards, verandahs and other areas.



Petrol operated Power Sprayers



Petrol Operated Power Sprayers should be used outside the hospital buildings since they generate combustion smoke.

High Power Vehicle Mounted Spraying Machines





Vehicle Powered Large Spraying Machines



High Power Spraying Machines

- To be used to spray pathways inside the hospital campus
- Outside the building areas
- Canteen areas



- Parking areas
- Helps in disinfection of large areas and also contains dust, since contaminated dust are likely to contain Corona virus.

Availability of Sprayers

- All kinds of sprayers are available in stores selling Agro products
- Pressure pumps are also available in Machine tools shops in various powers generally used for washing vehicles.



Lysol IP (Cresol IP 50% V/V and Liquid Soap 50 % V/V)

5 percent Lysol

-One litre of Lysol in 9 litres of water

• 2.5 percent Lysol

-One litre of Lysol in 19 litres of water



Caution: Lysol to be added to water for dilution: Water should not be poured into Lysol solution

WHO recommended Product Concentration (V/V)

Formulation-1	Formulation-2
•Ethanol 80%	 Isopropyl alcohol 75%
•Glycerol 1.45%	•Glycerol 1.45%
 Hydrogen peroxide 0.125% 	•Hydrogen peroxide 0.125%

Every Health Facility should produce Hand Sanitisers with WHO recommended formula for its own requirements

1 % Liquid Chlorine

- 500 grams of bleaching powder (33 % available chlorine)
 dissolved in 15 litres of water or 1 kg in 30 litres of water
- Liquid chlorine
 - Available as Sodium or Calcium hypochlorite solution



 Depending on the concentration it can be diluted to 1 percent with water.

Caution: Chlorine solution to be added to water for dilution: Water should not be poured into chlorine soltion

Hand Sanitisers

- In Health Care Settings particularly before and after examining a patient
- Wiping the surfaces of instruments frequently touched by hands like biometric device, computer mouse, key pad and similar surfaces which are not disinfected frequently by regular house keeping staff.



Caution

- Hand Sanitisers
 - are not substitutes for Hand Wash



- are not effective on Hands with dirt and sweat
- Hand Sanitisers are effective only on clean hands
- Hospitals should have both Hand Wash facilities and Hand Sanitiser facilities preferably Non-touch

dispensars.

Uses of Hand Sanitisers



- In Health Care Settings particularly before and after examining a patient
- Wiping the surfaces of instruments frequently touched by hands like biometric device, computer mouse, key pad and similar surfaces which are not disinfected frequently by regular house keeping staff.

Please Remember



- Hand Sanitisers
 - -are not substitutes for Hand Wash
 - -are not effective on Hands with dirt and sweat
- Hand Sanitisers are effective only on clean hands

How do Soaps act?

- Corona virus coat is made up of proteins and fats
- Any Soap destroys corona viruses completely
- Soap has two sided molecules
 - One end of the molecule is attracted to water



• Fat coat of the virus is literally pulled apart by soap molecules and destroys the corona viruses



Experiment to understand how soap destroys Corona Virus

- Take about 200 ml water in a transparent container
- Add about 50 ml of oil to water in the conical flask
- We can see oil floating on water
- Then add soap solution and shake for 20- 30 seconds
- Now we can see oil is completely dissolved in water
- 20-30 seconds hand wash with soap completely annihilates corona viruses



How do Hand Sanitisers act?

- Corona virus coat is made up of proteins and fats
- Corona viruses easily stick to hands
- Alcohol is polar
- Alcohol breaks down the lipid and protein coating of the viruses and kills them





Hand Wash with soap and water vs Hand Sanitisers



Hand Wash	Hand Sanitisers
Useful for Hand Hygiene in all settings	Mostly useful in Health Care Settings
Removes both dirt and germs	Kills germs and does not remove dirt
Effective in all situations	Not effective on dirty hands and hands with sweat
Absolutely safe in all aspects	Highly inflammable: Should be careful in storing and not recommended for closed rooms



Hand Wash with Soap and water vs Hand Sanitisers



Hand Wash	Hand Sanitisers
Low cost on long term basis	Except for Health Care Settings, costlier for common use
Running water helps in uniform spread of water and soap	Uniform spread of alcohol based hand sanitiser needs experience
20-30 seconds required for each hand wash	20 seconds for hand sanitisation and three applications over 3-5 minutes for pre surgical hand preparation

Risk Management

- Hand sanitisers contain high concentration of alcohol which is inflammable.
- Should not be used inside a closed room or closed car or also while the engine is running or hot.
- Do not produce large quantities at a time
- Large quantities should not be stored inside the hospital premises or stored in a separate safe place



Reporting of a Positive Case among the staff



• Disinfection procedure for places/areas visited by patient in past 48 hours

• Till the building/block is disinfected, services to be suspended only in the identified areas.





Work can be resumed after disinfection as per protocol

Reporting of Cluster of Positive Cases among the staff



- Building/block to be closed for 48 hours after thorough disinfection
- Services suspended, till the building/block is disinfected and fit for re-use





Risk assessment, isolation, and quarantine of contacts, case referral and management

We have provided PPE and Hand Sanitizers to all staff. Is it not enough?

- Please remember humans are fighting
 - a most powerful, strategic smart and

intelligent enemy named SARS CoV-2



- When one route is blocked, the enemy finds another route
- Please remember PPE will be effective only when all possible actions are taken to block and destroy the enemy at all points in the Health Care Facility.

CCTV monitoring

- All infection control protocols should be monitored in CCTV by the head of the Hospital Infection Control Team.
- Necessary corrective actions to be taken then and there.
- Good practices to be appreciated and rewarded.



Bio-Medical Waste

- Bio Medical wastes should be disposed as per the protocols
- Adequate quantity of hypochlorite solution or bleaching powder should be sprayed on all kinds of wastes generated in the hospitals, since they are likely to contain Corona Virus.

Hand wash, Cleaning, Disinfection, Hand Sanitisers and PPE decide the course of war











Safe guarding the Health Care Personnel is the Highest Priority in the war against the



microorganisms

