

# Infection control support training, in a hospital of KSA for containment of Middle East respiratory virus syndrome coronavirus (MERS-CoV)

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## Abstract

In September 2012, the World Health Organization announced the discovery of a novel coronavirus. This virus has been named the Middle East respiratory syndrome coronavirus (MERS-CoV). MERS-CoV has been identified in several countries in the Arabian Peninsula. This was a very crucial activity at the time when the kingdom is trying to combat the MERS-CoV. The main objective of our weeklong activity was to provide educational and technical assistance based on the organization's specific needs. The doctors, nurses, and paramedics from various departments of the hospital were trained, and their knowledge on universal precaution methods in health-care setup was reinforced. The results of the weeklong infection control support training is as follows: doctors, 29%; nurses, 83%; and housekeeping staff, 33%, were trained.

**KEY WORDS:** Infection control, Middle East respiratory virus syndrome coronavirus (MERS-CoV), universal precaution

## Introduction

In September 2012, the World Health Organization announced the discovery of a novel coronavirus. This virus has been named the Middle East respiratory syndrome coronavirus (MERS-CoV). MERS-CoV has been identified in several countries in the Arabian Peninsula. A small number of cases have also been reported in Europe, Asia, North Africa, and, in March 2014, the United States; all of the cases reported in the countries outside of the Middle East had either traveled to the Middle East or had been in close contact with a sick person who had recently traveled to the Middle East. Common symptoms in patients with MERS-CoV include a respiratory illness with fever, cough, shortness of breath, and breathing

difficulties. Most patients have experienced pneumonia. Some patients have also revealed kidney failure. Outbreaks in health-care facilities have been frequent. Patients with underlying comorbidities such as diabetes, heart or lung disease, or immunosuppression appear to be at the highest risk of developing severe disease. Fortunately, it appears that the virus is not readily transmitted from person to person. Limited transmission has occurred in household settings where there were close family contacts. It can also spread from infected patients to health-care personnel.<sup>[1]</sup>

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## Materials and Methods

A team comprising of public health doctor, microbiologist, infection control paramedics, and quality control personnel took an assignment in a hospital of Saudi Arabia during the MERS-CoV epidemic in the year 2014, in the month of June. The main objectives of the mission was to inspect all the departments in the premises of the hospital and train the

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doctors and paramedical staffs regarding safe practices for self-protection, while treating and taking care of MERS-CoV patients.

The training comprised classroom presentation on symptoms of MERS-CoV infection, modes of transmission, safe transfer of suspect to isolation ward, and safe disposal of articles used by the patient.

Hands on training on hand hygiene, universal precaution, and sterilization of equipments was given on wards and intensive care units (ICUs).

Summary of the activities taken up is as follows:

**Day 1:** A baseline survey was conducted at the organization to list down the priorities for improvement. One classroom session was conducted in which we focused upon general information about the MERS-CoV and the specifics related to the clinical and the nonclinical practices. We also conducted a pre- and a postassessment test during the sessions other than the demonstrations on few safe practices. Seventy-seven nurses and one technician attended the session.

**Day 2:** The second day was a mix of classroom sessions with demonstrations and on-the-job trainings for the staffs. Three classroom sessions were conducted in which we focused upon general information about the MERS-CoV and the specifics related to the clinical and the nonclinical practices. We also conducted a pre- and a postassessment test during the sessions other than the demonstrations on few safe practices. Thirteen doctors, five nurses, one technician, and 56 nonclinical staffs attended the classroom sessions. On-the-Job trainings and simulation exercises were conducted in dialysis department and OPD. Four doctors and 18 nurses attended the sessions.

**Day 3:** On-the-job trainings were conducted in many areas that included ER and triage, ICU, ward/isolation, and laundry, laboratory, and housekeeping units. Besides other basic training and workshops (with return demonstrations), we also conducted role-plays or simulation exercises in the areas. This was basically done to check the response of the staffs under specific circumstances; 42 members participated actively during the hands-on training in total during the day.

**Day 4:** On-the-job trainings were conducted in many areas that included dialysis, mortuary, isolation wards, radiology, and medical records departments. Twenty-seven members participated actively during the hands-on training in total during the day.

**Day 5:** We went around the hospital once again to understand if there were any pending issues that required a more focused approach. Hands-on sessions were taken for more staffs in OPD and ER. Five doctors and 14 nurses attended these hands-on sessions.

## Results

The results of this study are presented in Tables 1 and 2.

## Conclusion

The following changes were observed after weeklong training.

1. Areas improved
  - Updated ICP guidelines issued by the MoH have been incorporated in infection control manual.

**Table 1:** Top 10 priorities based on hospital preassessment on day 1

No.	Priority listed on day 1	Status on day 5
1.	The signage for 5 moments of Hand hygiene, <sup>[2,3]</sup> hand hygiene steps, and donning and doffing of PPE were missing in all the patient-care areas	Posters and pamphlets put up in all the relevant patient-care areas
2.	All hand hygiene steps were not followed	Performed as per KSA MoH guidelines
3.	Donning and doffing of PPE steps not in sequence as per MoH/WHO <sup>[4]</sup> guidelines and areas for wearing and removal not clear	Staff were taught the steps and places for donning and doffing
4.	There was no curtain policy	Policy made and incorporated in the infection control manual
5.	There was no MERS-CoV admissions log book and no visitors logbook in ER, isolation unit, and ICU	Made in all the three areas and staff made known its relevance
6.	The mortuary had no hand rub; staff was unaware of cleaning protocols	Hand rub issued and placed
7.	The ambulance did not have checklist for cleaning of the ambulance	Cleaning checklist made and its documentation explained to the staff
8.	CSSD does not keep a record of which load from areas have gone in which cycles and, thus, even though they have a recall policy, it cannot be implemented. Bowie Dick and biological indicators not used	Record of loads per cycle made thus ensuring traceability. Bowie Dick and biological indicators not available still
9.	The laundry staffed did not have gowns, and shoe covers were of low quality, which tear with minor abrasions too	Gowns kept as part of PPE and store informed to keep better quality of shoe covers
10.	The biomedical waste department was not following the waste disposal guidelines. No color code for the mops existed <sup>[5]</sup>	They were strapping the waste paper bags but have to sustained. Mops color coded.

**Table 2:** Hospital score

Parameter	Actual trained	Target number of staff	%
Hospital staff trained in classroom training (%)			40.7
Doctors	13	44	29.5
Nurses	120	144	83.3
Housekeeping	56	170	33
Other staff	2	12	17
Hospital staff trained in hands-on training (%)	110	370	30
Overall satisfaction with the classroom training (%)	91		
	Before, %	After, %	Difference
Staff assessment (improvement in pre- and posttests taken in classroom training)	56	86	30
Hospital assessment (improvement in pre- and postinspections score)	77	91	14

- Awareness among health-care workers (HCWs) was the key area of action although the hospital has well-defined infection control policies. The mode of transmission, symptoms, importance of hand hygiene, and personal protective equipment (PPE) donning and doffing steps were made clear to doctors, nurses, dieticians, technicians, housekeeping, administration, MRD, mortuary and Ambulance services, and bio-medical waste management departments.
2. A checklist in the ambulance for PPE has been made and supply kept.
  3. Curtain policy incorporated.
  4. Signage and posters for hand hygiene and PPE and information for visitors for signs and symptoms have been put up in relevant areas, and the HCW are now aware that mass communication with patients, visitors, and HCW is a part of their responsibilities.
  5. Overall assessment (postinspection score): 91%.

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