Crimean Congo Hemorrhagic Fever
Türkiye's Experience

Protective Measures and Infection Control

Esma ERYILMAZ EREN, MD, PhD, YECMM

University of Health Sciences, Kayseri City Training and Research Hospital

Department of Infectious Diseases and Clinical Microbiology

Infection Control Committee

Kayseri, Türkiye

Presentation Plan

Risk of nosocomial transmission of CCHF

High-risk situations

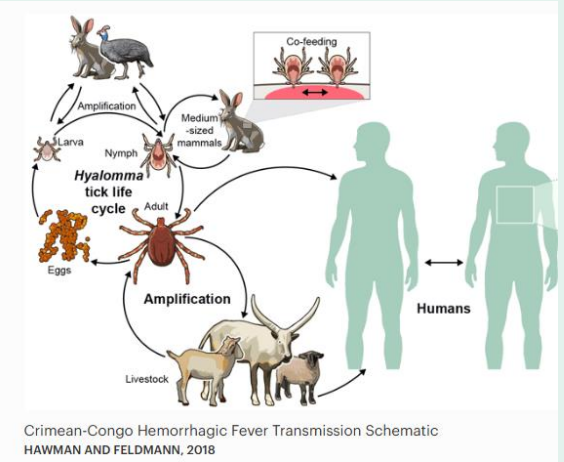
Infection control strategies in hospital and rural

Key Lessons from Türkiye

Early outbreaks

- **Limited awareness**
- **Delayed diagnosis**

increased transmission



Pellejero-Sagastizábal G,et al. *Clin Microbiol Infect*.2025;31(8):1298-1306.
Srivastava S, et al. *Health Sci Rep*. 2024;7(9):e70053.
Ahmed Aet al. *BMC Infect Dis*. 2021;21(1):35.

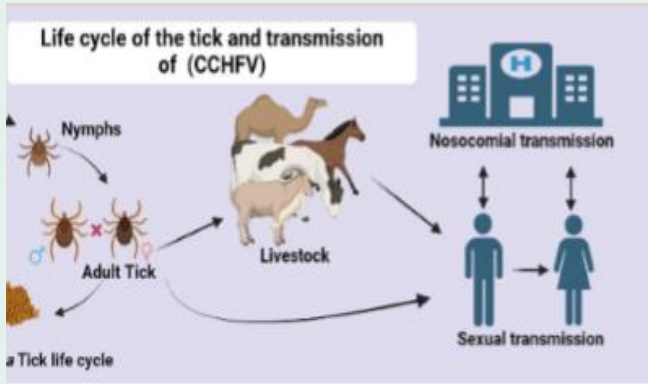
Transmission

Main routes

- Tick bite
- Contact animal blood/tissue
- Human-to-human transmission

Healthcare setting

- Blood
- Body fluids exposure
  - During invasive procedures
  - High risk units, ICUs and laboratories



https://www.cdc.gov/crimean-congo-hemorrhagic/about/index.html#cdc_disease_basics_causes_risk_spread-how-it-spreads
https://www.who.int/news-room/fact-sheets/detail/crimean-congo-haemorrhagic-fever

Nosocomial Transmission

- Türkiye
- Pakistan
- Iran
- Russia
- UAE

Caused by

- Needle injuries
- Inadequate use of PPE

Most nosocomial infections occur **before CCHF is suspected/diagnosed**

Gaina A,et al. The Lancet Infectious Diseases, 2023; 23, e330-e331
Frank MG, et al.Emerg Infect Dis. 2024;30(5):854-863.

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Dispatch

Crimean-Congo Hemorrhagic Fever among Health Care Workers, Turkey

Aysel Kocagul Celikbas, Başak Dokuzoğuz, Nurcam Baykam, Sebnem Eren Gok, Mustafa Necati Eroğlu, Kenan Midilli, Herve Zeller, and Onder Ergonul

Author affiliations: Ankara Numune Training and Research Hospital, Ankara, Turkey (A.K. Celikbas, B. Dokuzoğuz, N. Baykam, S.E. Gok, M.N. Eroğlu); Istanbul University, Istanbul, Turkey (K. Midilli); Institut Pasteur, Lyon, France (H. Zeller); Koç University, Istanbul (O. Ergonul)

Table 1. Clinical and laboratory findings of HCWs in whom Crimean-Congo hemorrhagic fever developed after occupational exposure, Turkey, 2004–2011*†

HCW, outcome	Body temperature, °C	Bleeding	Leukocytes/ mm^3	Platelets/ mm^3	AST	Al
1, survived	38.5	No	800	42,000	425	34
2, survived	37.2	No	1100	53,000	145	8
3, died	40.5	Ecchymosis, hematemesis, melena, hematuria	11,100	40,000	251	27
4, survived	40.5	No	2,900	78,000	150	11
5, survived	39	Epistaxis	1,800	58,000	167	12
6, survived	40.5	No	1,800	44,000	123	21
7, survived	39.1	No	3,100	13,000	418	13

*HCW, health care worker; AST, aspartate aminotransferase; ALT, alanine aminotransferase; APTT, activat score index.
†Reference values: leukocytes, 4,000–11,000/mm^3; platelets, 150,000–450,000/mm^3; AST, <50 IU/L; ALT, < 400 mg/dL.

Table 2. Demographic features of HCWs with occupational exposure to Crimean-Conger hemorrhagic fever virus, Turkey, 2004–2011*

Episode, outcome†	HCW age, y/sex/profession	Procedure	Transmission route	Ribavirin for postexposure prophylaxis	Ribavirin for therapy (d after symptom onset)	Fatal
Episode 1; survived, her baby died	36/M/nurse	Wound care	Contact with surgical wound without protective equipment	No	Yes (0)	No
	31/F/nurse	Intubation, aspiration	Aerosol and droplet and contact without protective equipment	No	No	No
Episode 2; died	28/F/nurse	Phlebotomy	Needlestick	No	Yes (3)	Yes
Episode 3	41/M/physician	Resuscitation	Aerosol and droplet	–	Yes (0)	No
	26/M/physician	Nasal tamponade	Indirect contact	–	Yes (0)	No
	29/M/physician	Nasal tamponade	Indirect contact	–	Yes (0)	No
Episode 4; survived	30/M/nurse	Phlebotomy	Needlestick	No	Yes (1)	No
Episode 5; survived	30/F/nurse	Phlebotomy	Needlestick	Yes	–	No
Episode 6; survived	24/F/physician	Phlebotomy	Needlestick	Yes	–	No

*HCW, health care worker; –, ribavirin not necessary.
†Outcome for the index case-patient in each episode.

4 were caused by needle injuries
2 were caused by lack of PPE
2 were asymptomatic, 1 HCW died
Full PPE is important

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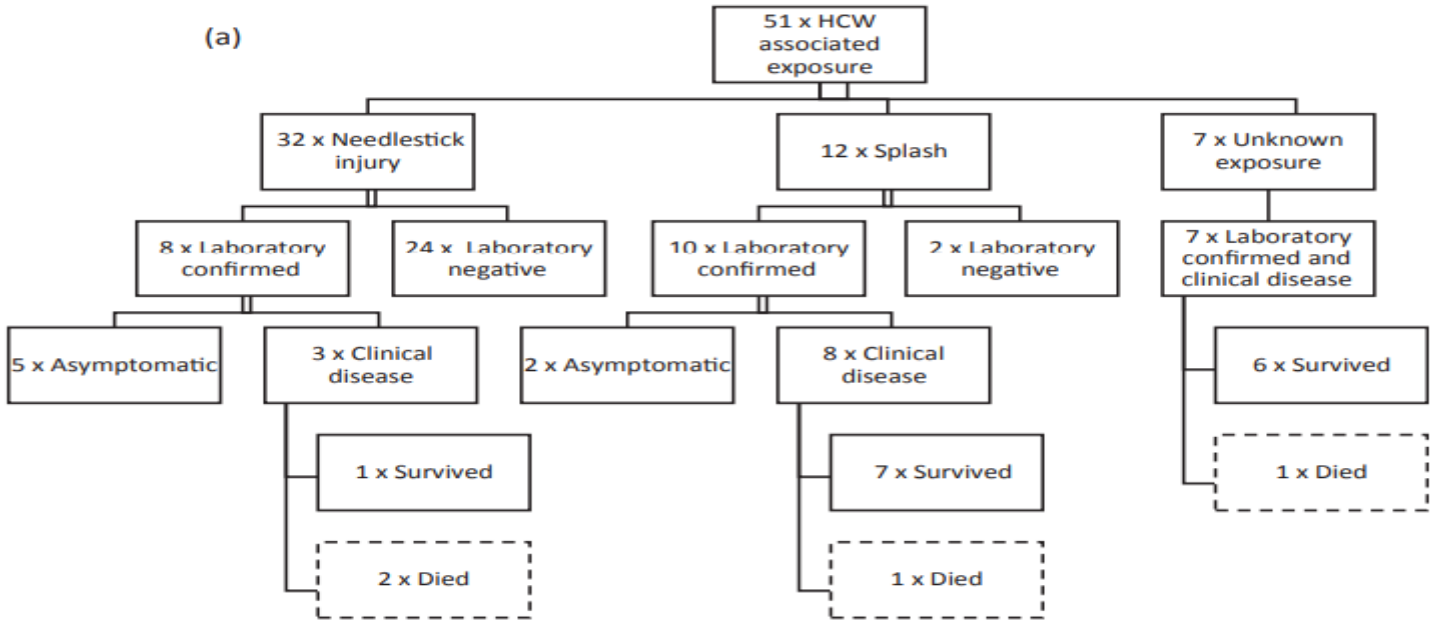
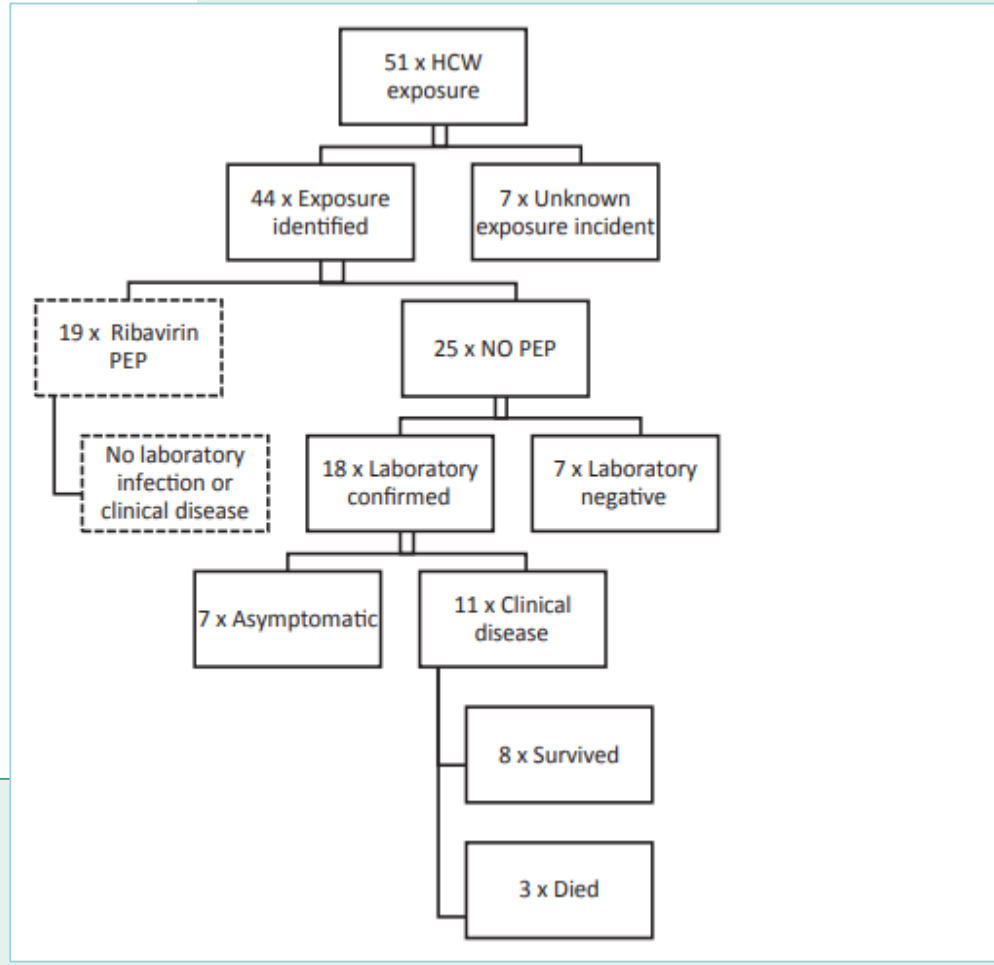
RESEARCH NOTE · Volume 22, Issue 4, P387.E1-387.E4, April 2016 · *Open Access* Download Full Issue

Healthcare-associated Crimean-Congo haemorrhagic fever in Turkey, 2002–2014: a multicentre retrospective cross-sectional study

H. Leblebicioglu [1] · M. Sunbul [1] · R. Guner [2] · ... · G. Yilmaz [9] · T.E. Fletcher [1],[10] · N.J. Beeching [10],[11] ... Show more





- 25/51 (49%) had laboratory-confirmed infection, 4 of died
- The overall mortality rate was approximately 16%
- Most common way of transmission was needlestick injury
- 2 of unknown exposure was working in laboratory
- Ribavirin prophylaxis and full PPE is important

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Volume 24, Number 9—September 2018

Synopsis

Systematic Review and Meta-analysis of Postexposure Prophylaxis for Crimean-Congo Hemorrhagic Fever Virus among Healthcare Workers

Önder Ergönül, Şiran Keske, Melis Gökçe Çeldir, İlayda Arjen Kara, Natalia Pshenichnaya, Gulzhan Abuova, Lucille Blumberg, and Mehmet Gönen

Author affiliations: Koç University, Istanbul, Turkey (Ö. Ergönül, M.G. Çeldir, İ.A. Kara, M. Gönen); American Hospital, Istanbul (Ş. Keske); Rostov State Medical University, Rostov-on-Don, Russia (N. Pshenichnaya); South-Kazakhstan State Pharmaceutical Academy, Shymkent, Kazakhstan (G. Abuova); National Institute for Communicable Diseases, Johannesburg, South Africa (L. Blumberg)

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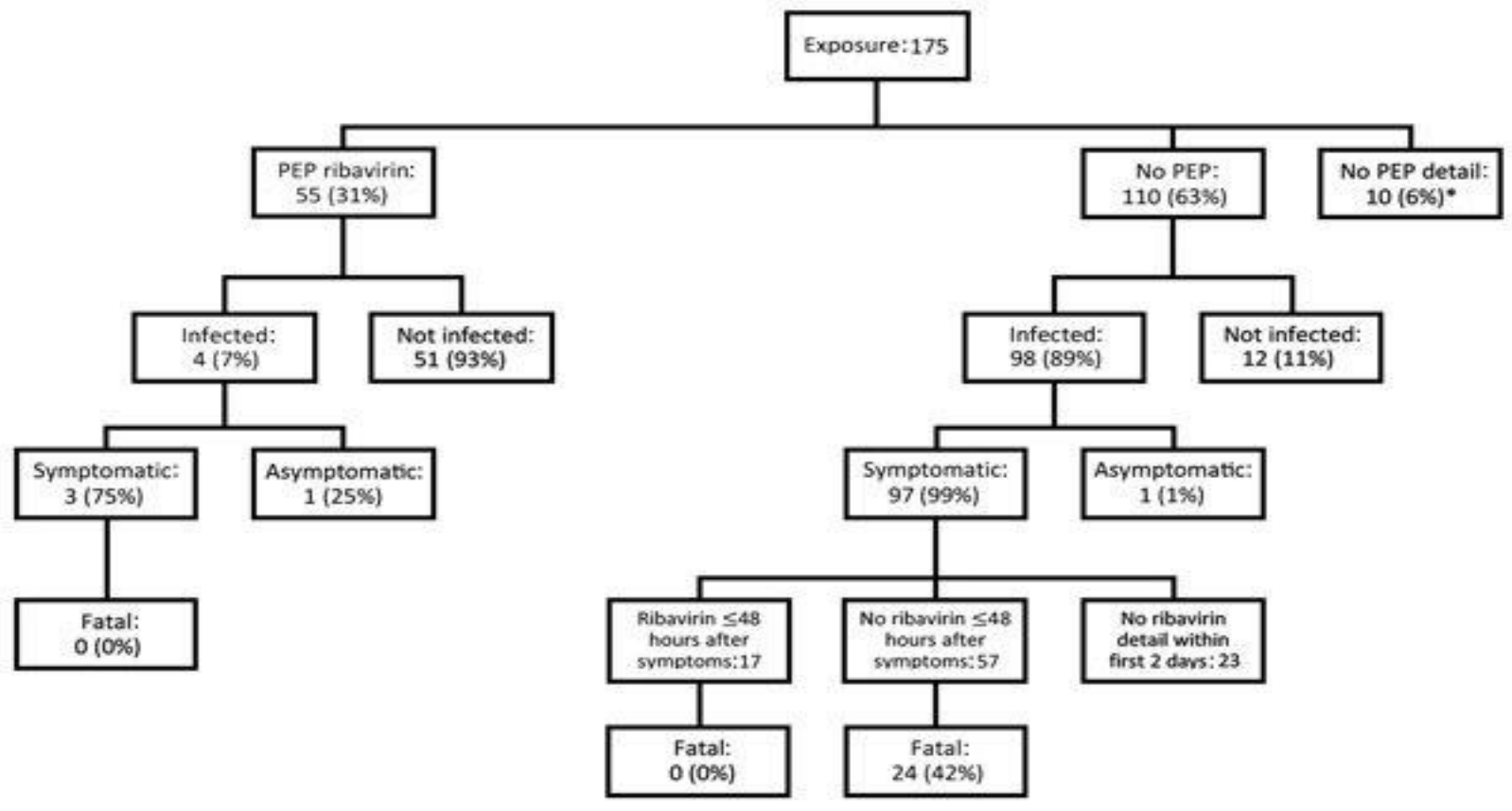
Methods

Results

Discussion

Between 1976 and 2017



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Methods
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The most significant risk factors among healthcare workers:

- Exposure to blood or body fluids (OR ≈ 4.2)
- Being a doctor or nurse (OR ≈ 2.1)
- Contact with deceased CCHF patients (OR ≈ 3.8)

- PEP with ribavirin reduced the odds of infection (OR 0.01),
- Ribavirin use ≤48 hours after symptom onset reduced the odds of death (OR 0.03, 95% CI 0–0.58).
- The odds of death increased 2.4-fold every day without ribavirin treatment

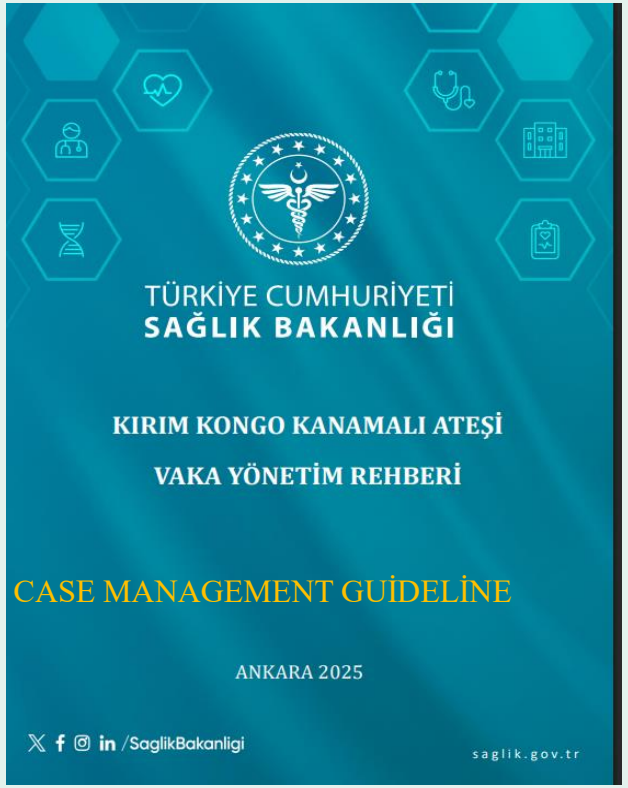
Ribavirin should be recommended as PEP and early treatment for workers at medium-to-high risk for CCHFV infection.

Nosocomial Transmission

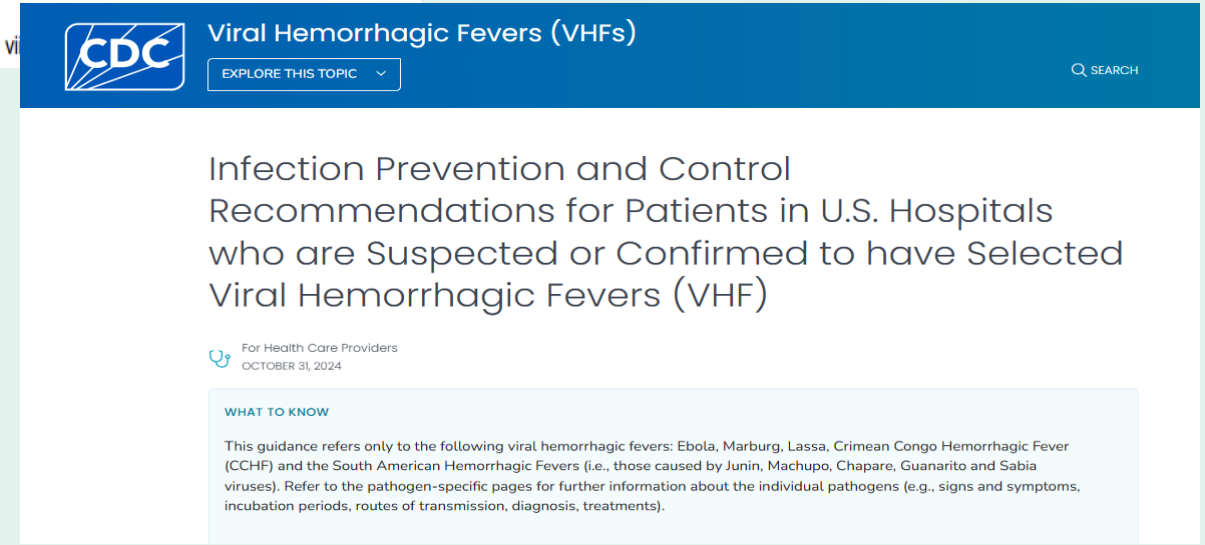
- Awareness rising campaign
- Training programmes

No nosocomial transmitted case from 2016

In 2025, Only two injuries were reported to the Ministry of Health



Infection Prevention Measures



Infection Control Principles Healthcare Settings

Key components

- Hand hygiene
- Patient isolation
- Use of protective equipment
- Safe disposal of infectious materials
- Controlled burial procedures

- https://ekutuphane.saglik.gov.tr/Ekutuphane/kitaplar/kirim-kongo-kanamali-atesi-vaka-yonetim-rehberi.pdf
- Fazlalipour M, et al. *BMC Infect Dis*. 2024;24(1):1312.

Infection Control Principles

Healthcare workers **must be trained** on

- Transmission routes
- Infection prevention measures
  - Barrier precautions and personel protective equipment

Patients and their relatives should be informed

CCHF, transmission and preventive measures

https://ekutuphane.saglik.gov.tr/Ekutuphane/kitaplar/kirim-kongo-kanamali-atesi-vaka-yonetim-rehberi.pdf

Infection Control Principles
Generally Principles

- **Standard** precautions- always
- **Contact** precautions- contact with contaminated fluids or indirect contact with contaminated equipment or materials
- **Droplet** precautions- splashes or spraying of body fluids (eg blood) that contact the mucosal surfaces
- **Airborne** precautions- aerosol generating procedures

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Infection Control Principles
Patient Isolation

For **suspected or confirmed** cases

- Single patient room if possible
- Restricted visitors
- Warning signs outside patient room
- Dedicated medical equipment

Component	Recommendation	Comments
Patient Placement	• Single patient room (containing a private bathroom) with the door closed ◦ Adequate space for donning (putting on) and doffing (taking off) PPE • Facilities should maintain a log of all people entering the patient's room	• Consider posting personnel at the patient's door to ensure appropriate and consistent use of PPE by all people entering the patient room

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https://www.cdc.gov/viral-hemorrhagic-fevers/hcp/infection-control/?CDC_AAref_Val=https://www.cdc.gov/vhf/ebola/clinicians/evd/infection-control.html

Infection Control Principles

- Define a doffing area
- Clean routinely this area

https://www.cdc.gov/viral-hemorrhagic-fevers/hcp/infection-control/?CDC_AAref_Val=https://www.cdc.gov/vhf/ebola/clinicians/evd/infection-control.html

Personal Protective Equipment

Essential PPE

- Gloves
- Impermeable gowns
- Face shield/Eye protection

N95 masks required
Intubation
Bronchoscopy
Surgery
Resuscitation
Obvious bleeding, vomiting, or diarrhea

CDC: Avoid aerosol generating procedures, if possible

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Personal Protective Equipment

Final Statement	Agreement rate, %	Consensus level
• Healthcare personnel who treat CCHF utilizing aerosol-producing procedures (aspiration, intubation, etc.) should wear HEPA-filtered masks (N95) and goggles (face shields).	96.88	**Very high consensus**
• The use of N95 masks is required to prevent the transmission of infection to laboratory personnel handling patient samples.	87.5	**High consensus**
• Healthcare workers who have participated in aerosol-generating procedures (e.g., intubation, bronchoscopy, and resuscitation) without wearing an N95 mask on a patient with a confirmed diagnosis of CCHF, should be initiated with prophylactic ribavirin treatment after exposure.	87.5	**High consensus**

Consensus levels were defined as follows: very high consensus (median score of 5, interquartile range [IQR] <1, and >95% agreement at score 5); high consensus (median score of 4–5, IQR <2, and ≥80% agreement at scores 4–5); moderate consensus (median score of 4–5, IQR <3, and 65–79% agreement at scores 4–5).

Infection Control Principles
Medical Waste Management

- Use single-use materials
- Dispose infectious materials according to medical waste procedures
- Do not recap needles
- All needles and sharps should be handled with extreme care disposed in puncture-proof, sealed containers

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Infection Control Principles
Patient Isolation

CDC

- Limit the use of needles and other sharps
- Phlebotomy, invasive procedures, and laboratory testing should be limited to the minimum necessary

https://www.cdc.gov/viral-hemorrhagic-fevers/hcp/infection-control/?CDC_AAref_Val=https://www.cdc.gov/vhf/ebola/clinicians/evd/infection-control.html

Infection Control Principles
Disinfection

- Common disinfectants
  - Bleach solutions
  - Soap and detergents
  - Chlorhexidine or iodine antiseptics
- Hand decontamination
  - 70% alcohol-based disinfectants

CDC
EPA approved disinfectans
List L

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https://www.cdc.gov/viral-hemorrhagic-fevers/hcp/infection-control/?CDC_AAref_Val=https://www.cdc.gov/vhf/ebola/clinicians/evd/infection-control.html

Infection Control Principles
Environmental Cleaning

Environmental contamination must be minimized through

- Use of appropriate disinfectants
- Bleach solutions are commonly used for surface and fluid decontamination

1/10 solution

•Blood and body fluids

•Ambulances

•Corpses

1/100 solution

•Surfaces

•Medical equipment

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Prevention Strategies
Management of Deceased Patients

Preparations at the hospital

- Full protective equipment must be used (contact-airborne)
- The body should be sprayed with a 1:10 bleach solution
- Placed in a body bag, sealed, and sprayed again with a 1/10 bleach solution
- The body must be buried in a leak-proof coffin
- The grave must be at least 2 metres deep

CDC

•Cremate the body.

•If cremation cannot be done because of safety concerns, the body should be buried in a standard metal casket or other comparable burial method.

Infection Control Principles

High-Risk Diagnostic Procedures-Laboratory

Diagnostic procedures require:

- Biosafety protocols
- Secure sample transport
- Trained personnel

in Türkiye

- Reference laboratories perform confirmatory testing**.**

Infection Control Principles
Post-exposure Management

Steps after **exposure:**

1. Wash with soap and water, apply 70% alcohol
2. Medical evaluation
3. Incident reporting
4. Monitoring for 14 days

Possible intervention

- Ribavirin prophylaxis

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Prevention Strategies
Public Health Measures

Public health measures

- National surveillance system
- Training programs
- Tick awareness campaigns
- Rural education

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Prevention Strategies in Field

- Wear clothes that **cover most of the body**
- Put **trouser legs inside socks**
- Prefer **light-colored clothing** to easily see ticks
- Be careful in **fields, gardens, forests, and picnic areas**

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Prevention Strategies in Field

After leaving risk areas

- Check the whole body for ticks
- Pay attention to hidden areas
  - Behind the ears
  - Armpits
  - Groin
  - Behind the knees
  - Parents should also check children carefully

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Prevention Strategies in Field

Tick Removal

- If a tick is found, remove immediately
- Do not touch with bare hands
- Use gloves, cloth, or plastic bag
- The earlier the tick is removed, the lower the infection risk

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Prevention Strategies in Field

After Tick Removal

•Dispose of the tick in a closed container with alcohol

•Do not crush the tick

•Monitor symptoms for 10 days (fever/fatigue/muscle pain/headache/nausea/vomiting/diarrhea)

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Infection Control Principles Conclusion

- CCHF have significant occupational risk
- Early recognition is critical
- Strict infection control measures prevent hospital transmission

Thank you for your attention