Measures regarding disinfection and waste management as pertaining to an at least probable case of Ebola virus infection in Germany

All measures ought to be discussed with the local health authority and if applicable with the Medical Competence and Treatment Center for patients with highly contagious infections.

Disinfectants with proven, at least limited virucidal effectiveness (active against enveloped viruses; see document "Testing and Labeling of Disinfectant Activity against Viruses") are sufficient for disinfection of contamination with Ebola virus. Disinfectants with (fully) virucidal effectiveness, i.e. agents that are also active against non-enveloped viruses, can also be used. Disinfectants of type AB from the List of Robert Koch Institute tested and approved disinfectants and disinfection methods (short "RKI list") or the Disinfectant List of the Association for Applied Hygiene (short "VAH list") with limited (or full) virucidal activity are appropriate in this instance.

Staff engaged in disinfection activities must wear personal protective equipment according to a situational risk assessment. In case of a high risk potential, e.g. due to massive contamination with bodily fluids or for confirmed Ebola virus infection, personal protective equipment as specified in chapter 7.2.3. of the Framework Ebola Virus Disease must be used. Personnel must be specially instructed and trained in donning and doffing procedures of personal protective equipment.

Further information about measures for suspected or confirmed Ebola fever patients are available in the Framework Ebola Virus Disease.

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**Hand disinfection**

While caring for a probable or confirmed case of Ebola virus infection, personal protective equipment including gloves must be worn. After doffing of gloves or after any contamination, hands are to be disinfected with a hand disinfectant with proven at least limited virucidal effectiveness (virucidal disinfectants can also be used). For practical reasons, these disinfectants can also be used for disinfection of other accidentally contaminated areas of the skin. Further information is available in the RKI list, section 2.3, and the VAH list as well as in the recommendations of the Commission for Hospital Hygiene and Infectious Disease Prevention at the Robert Koch Institute on Hand Hygiene. For disinfection of mucous membranes octenidine dihydrochloride / phenoxyethanol- or chlorhexidine-containing drugs or povidone-iodine complexes (7.5%) can be used according to their certified areas of application, for example Octenisept, Skinsept mucosa, Braunol. For the application on eyes 5% povidone-iodine complex is suitable.

**Skin disinfection**

**Mucous membrane disinfection**

**Surface disinfection**

All surfaces clearly or potentially contaminated with body fluids, as well as skin contact areas, are to be disinfected by thorough wiping with approved disinfectants according to the RKI list, section 2.2, or the VAH list. For conducting surface disinfection, reference is made to the recommendations of the Commission for Hospital Hygiene and Infectious Disease Prevention at the Robert Koch Institute on Hygiene Requirements for Surface Cleaning and Disinfection. Wearing the required protective clothing, visible contamination (e.g. with blood, vomitus) has to be absorbed into a single-use cloth drenched with surface disinfectant and discarded as infectious waste according to waste code number 180103*. These areas should be wiped twice with disinfectants prior to an overall surface disinfection (see document Decontamination / disinfection in biological threat situations).

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* If feasible, disinfection measures (surfaces, rooms, medical devices, laundry) and waste management can be postponed until the results of laboratory diagnostics to confirm an ebolavirus infection are available. In the meantime, spread of a possible contamination needs to be prevented (e.g. seal off potentially contaminated areas).
| **Disinfection of medical devices (instruments and equipment)** | All instruments and technical equipment contaminated or potentially contaminated with body fluids from patients with EVD are to be disinfected individually and specifically. Depending on the reprocessing instruction of the respective instrument or equipment, a surface disinfection (by wiping) or an instrument disinfection (by dunking) needs to be performed. Contaminated devices which cannot be fully disinfected are to be discarded according to waste code number 180103*.

Advise on the reprocessing of medical devices can be found in the recommendations of the Commission for Hospital Hygiene and Infectious Disease Prevention at the Robert Koch Institute and the Federal Institute for Drugs and Medical Devices on **Hygiene Requirements for Processing of Medical Devices**.

Disinfection of large equipment has to be individually planned. It depends on the estimated degree of contamination and should be performed in accordance with the general rules for disinfection and the manufacturer’s specifications. In addition, fumigation with formaldehyde or hydrogen peroxide is possible. |
| **Room disinfection** | In the exceptional case that it is not possible to clean all contaminated areas by surface disinfection, a room disinfection using formaldehyde or hydrogen peroxide vapors (RKI list, section 3.3) can be considered in addition to the surface disinfection. |
| **Laundry disinfection** | During the care for probable or confirmed cases of Ebola virus infection, single-use bedlinens should be used and subsequently discarded. Potentially contaminated clothing and other potentially contaminated laundry needs to be discarded using appropriate packing procedures and materials. |
| **Waste disposal** | Waste generated in the care for a probable or confirmed case of Ebola virus infection should be thermally inactivated on-site, or – properly packaged according to waste code number 180103* – sent for incineration. Reference is made to the document “**User aid for waste management in the health care setting**”. Prior to the transport of waste, appropriate arrangements for receiving must be made with a suitable special waste incineration plant. If the probable case is not confirmed, waste is to be disposed of according to the common practice of the health care institution.

The packaging and transport of infectious substances is mainly regulated by the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR). The transport of non-inactivated waste from confirmed Ebola fever cases is carried out as class 6.2, category A. Packaging instruction P620 marked as UN2814 applies. Additional safety requirements in relation to ebola virus containing waste can be found in the exemption agreement MV 281, which provides a time-limited exemption for the packaging and transport of waste that may be contaminated with Ebola virus (see **Framework Ebola Virus Disease**, chapter 7.2.4.6). In Germany, appropriate companies that can take over the proper and safe transport of infectious waste are available and are usually already part of the waste management in the clinical practice. If necessary, when using stationary autoclaves, rules for the transport of infectious waste within the facility need to be taken into consideration.

For any probably case of Ebola virus infection first ascertained in physicians’ consultation rooms or other medical settings, disinfection and waste disposal are to be discussed with the local health authority. The final decision about appropriate methods and measures can only be taken after laboratory results are available. Until then, contaminated areas are to be sealed off and clinical waste stored within the restricted area. Should the patient be confirmed to be free of Ebola virus, Ebola virus specific measures are no longer required. |
<table>
<thead>
<tr>
<th>Waste water disposal</th>
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</thead>
<tbody>
<tr>
<td>Waste water including feces and urine which is generated during initial care for a probable EVD case, can be discarded outside the special isolation unit via a separately used toilet into the normal waste water system. In case a bedside commode or bedpan must be used due to limited mobility of the patient, this should preferably be performed with disposable equipment. The content can – using adequate personal protective equipment – be disposed of using the separately used (personalized) toilet. If no disposable equipment is available, the used material, after emptying via the toilet, is to be disinfected directly in the room using an appropriate container with disinfectant of type AB from the RKI list. The contaminated sanitary equipment is to be carefully disinfected. Waste water including feces and urine, which is generated during care for a confirmed EVD case, has to be collected in suitable containers and a disinfectant of at least limited virucidal effectiveness, suitable for disinfection of excretions, has to be added in an effective concentration (primarily limewater according to the specifications of the RKI list of tested and approved disinfectants and disinfection methods; disinfectant type AB ([RKI list, section 2.2]). Subsequently (after the end of the required soaking time) it can be discarded via a separately used fecal drain, if thermal inactivation is not possible. Feces and other body fluids which could not be collected, have first to be covered with a cloth or cellulose that are drenched in disinfectants and then safely absorbed and removed. Alternatively, excretions can be collected in containers containing suitable absorbent material (e.g. incontinence aids). The thus absorbed liquids are subsequently disposed of as infectious waste (<a href="#">waste code number 180103*</a>) as described above.</td>
</tr>
</tbody>
</table>
Appendix

Special waste incineration plants, which stated that they would accept Ebola virus containing waste for incineration

The following list is based on a survey conducted by the Bundesverbandes Deutscher Sonderabfallverbrennungs-Anlagen e.V. among its members in February 2015.

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