Krankenhaus-Infections-Surveillance System (KISS)
Hospital Infection Surveillance System

MRSA-KISS:

Protocol
Methicillin-resistant *Staphylococcus aureus* surveillance in hospitals
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1. Purpose of MRSA monitoring for hospitals

Because MRSA management is usually organized on a hospital level, it is the goal of MRSA monitoring in MRSA-KISS to consider the efficiency of MRSA management on a hospital-wide level and not unit-by-unit.

This protocol serves primarily to provide hospitals participating in MRSA-KISS with necessary specifications and definitions in order to standardize data collection and analysis. Secondarily, it allows nonparticipating hospitals to collect data according to these definitions and evaluate their results analogically. In this way, hospitals not participating in MRSA-KISS can benchmark themselves with the reference data provided by the project.

The following protocol is directed at interested hospital hygienists, infection control personnel and clinicians that want to be involved in MRSA surveillance.

Any comments for further definitions or clarifications are welcome.

2. Requirements for participation and duties of KISS institutions

Participating hospitals must fulfill the following requirements:

- Chief physician must agree to participate in MRSA-KISS
- Employment of full-time infection control personnel or hygiene specialists
- Strict usage of the obligatory specifications found in this protocol (Additional information relevant for quality management may also be recorded in addition to the required data, of course)
- Data collection and transfer of hard copies of data by the data transfer program webKess
- Readiness to communicate descriptive parameters (structure and process parameters of individual wards and the entire hospital, e.g. number of beds)
- Readiness to participate in validation measures

KISS institutions promise participants to:

- Provide expert advice and support during surveillance
- Handle data strictly confidentially
- Provide participating hospitals with data analysis

3. Methods

Participants

Any hospital can participate regardless of involvement with other KISS modules. MRSA data collection must take place for an entire hospital. However, the data collected are usually available in most hospitals.
The data should be collected and sent to the NRZ once per year over webkess (www.webkess.de). Data collection takes only inpatients into account. Persons in outpatient care or “polyclinics” are not included in surveillance.

**Calculation of MRSA rates**

The following figures are calculated:

<table>
<thead>
<tr>
<th>Name</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total incidence density</td>
<td>Total MRSA cases per 100 patients</td>
</tr>
<tr>
<td>Hospital-onset MRSA incidence density</td>
<td>Total hospital-onset MRSA cases per 1000 patient days</td>
</tr>
<tr>
<td>MRSA prevalence upon admission</td>
<td>Total admitted cases of MRSA to hospital per 100 patients of that hospital</td>
</tr>
<tr>
<td>Average daily MRSA burden</td>
<td>Total inpatient MRSA patient-days per 100 patient-days</td>
</tr>
<tr>
<td>MRSA-day associated hospital-onset MRSA rate</td>
<td>Total hospital-onset MRSA cases per 1000 inpatient MRSA patient-days</td>
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**Standardization**

In order to evaluate a hospital’s MRSA management, the data are standardized by calculating rates according to the size of screening measures.

The following groups are formed:

1. Frequency of nasal swab <= 2 per 100 patients
2. Frequency of nasal swab >2 and <=7 per 100 patients
3. Frequency of nasal swab >7 and <=15 per 100 patients
4. Frequency of nasal swab >15 per 100 patients

Similarly, the rates for hospitals without rehab wards and hospitals with rehab wards are evaluated separately.

**Comparison of MRSA rates**

The MRSA rates named above are calculated yearly by the NRZ for participating hospitals and made available as reference data.
4. Documentation specifications

<table>
<thead>
<tr>
<th><strong>MRSA</strong></th>
<th>Methicillin/oxacillin-resistant <em>Staphylococcus aureus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td>Calendar year of surveillance period</td>
</tr>
<tr>
<td><strong>Hospital abbreviation</strong></td>
<td>Give abbreviation as provided by NRZ</td>
</tr>
<tr>
<td><strong>Total nasal swabs</strong></td>
<td>Total number of nasal swabs in hospital</td>
</tr>
<tr>
<td><strong>Copy strain adjusted</strong></td>
<td>Copy strains are defined as a repeated isolate of the same species of bacteria with the same antibiogram from a single patient regardless of isolation site.</td>
</tr>
<tr>
<td><strong>Patient adjusted</strong></td>
<td>Only single swabs of a patient are counted, not control swabs.</td>
</tr>
<tr>
<td><strong>Rehabilitation unit or department present</strong></td>
<td>Select if the hospital has a rehab unit or units</td>
</tr>
</tbody>
</table>

**MRSA case**
MRSA cases are counted, not patients. If an MRSA patient is re-admitted with MRSA, the second admission is a new case. MRSA cases, however, are counted only hospital-wide, so transfers between wards are not counted as new cases. If a patient remains in hospital over the turn of the year, then the case is counted only for the year during which it appeared.

**Community-onset MRSA**
MRSA colonization or infection was apparent upon admission or evidence is found in material taken within the first three days after admission.

**Hospital-onset MRSA**
First evidence of MRSA was found in material taken after the 3rd day after admission. Cases of MRSA in which colonization may have been present at admission but no material was taken in the first three days and no evidence from attending physicians or hospitals is available are also considered hospital-onset.

**Inpatient MRSA patient-days**
Total patient days from the diagnosis of MRSA (date of sampling) to release or end of isolation for MRSA or until year’s end. Patient days starting on Jan 1 generated by cases from the previous year are counted, but the cases are not counted a second time. If a patient is released from isolation during inpatient treatment and sent again to isolation upon new evidence of infection, then all patient days in isolation are counted. The case is not counted a second time because the hospital stay is continuous.

**Patient days**
In general, hospital administrations count patient days as the day of admission until the day before discharge (i.e. the day of discharge is not counted). For example, Patient A was in the hospital from Jan 1 to Jan 10 or for 9 patient days. (For the calculation of diagnosis-related groups (DRG) it is
important to know if a patient was transferred to a “peripheral” hospital. Some administrations include the days a patient was in the “peripheral” hospital in their total patient days. These days cannot be included in the total for MRSA-KISS because the patient was not physically present in the participating hospital, but instead in the “peripheral” hospital).

NO outpatient days.

**Total patients**
Total number of all patients (=total cases) in a hospital between Jan 1 and Dec 31 of one year without internal transfers.

5. Example cases

5.1 General cases

**Case 1:**
Admitted January 1. MRSA colonization recognized at admission. Cleared on Day 12.

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<tr>
<th>Day</th>
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Recorded for MRSA-KISS:
One community-onset case of MRSA, 12 MRSA-days.

**Case 2:**
Admitted January 1 because of MRSA infection, died on day 12.

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<tr>
<th>Day</th>
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Recorded for MRSA-KISS:
One community-onset case of MRSA, 12 MRSA-days.

**Case 3:**
Admitted on January 1 without knowledge of MRSA. Screening on 4th inpatient day (>third post-admission day); result of screening on 6th day is “MRSA colonization.” On 11th day, surgical site infection with MRSA (A2)

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</table>
Recorded for MRSA-KISS:
One hospital-onset case of MRSA, 12 MRSA-days.

Legend
Known MRSA  Inpatient day

5.2 Calculation for MRSA-KISS over turn of the year
Case 1:
Admitted on December 25. MRSA colonization recognized at admission. Discharge on January 8.

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<th>Date</th>
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<th>28</th>
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<th>30</th>
<th>31</th>
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</tbody>
</table>

Recorded for MRSA-KISS:
2009: One community-onset case of MRSA, 7 MRSA-days.
2010: 8 MRSA-days (no new case!)

Case 2:
Admitted on December 25 without knowledge of MRSA. Screening on 4th inpatient day, result of “MRSA colonization” and discharge on January 8.

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Recorded for MRSA-KISS:
2009: One hospital-onset case of MRSA, 4 MRSA-days.
2010: 8 MRSA days.

Case 3:
Admitted on December 31. MRSA colonization recognized at admission. Discharge on January 8.

<table>
<thead>
<tr>
<th>Date</th>
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</table>
Recorded for MRSA-KISS:

2009: Not counted because there was no overnight stay in 2009.
2010: One community-onset case of MRSA, 8 MRSA-days.

Legend

<table>
<thead>
<tr>
<th></th>
<th>Known MRSA</th>
<th>Inpatient day</th>
</tr>
</thead>
</table>

The following list should be filled out for inpatients and entered into webKess online by March 31 of the following year.
**MRSA-KISS Form**

<table>
<thead>
<tr>
<th></th>
<th>Total number of MRSA cases</th>
<th>Community-onset cases</th>
<th>Hospital-onset cases</th>
<th>Inpatient MRSA patient-days</th>
<th>Total number of patient-days</th>
<th>Total patients (including internal transfers)</th>
<th>Total patients (without internal transfers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire hospital (all wards)</td>
<td></td>
<td></td>
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</tbody>
</table>
6. Legal Notice

Nationales Referenzzentrum (NRZ) für Surveillance von nosokomialen Infektionen
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Fax: 030/4547 2612

Contact persons for MRSA-KISS and their addresses can be found on the NRZ homepage, www.nrz-hygiene.de.

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