Management of laboratory exposure to *Brucella* species: assessing exposure and individual assessment flowchart

1. Assessing the exposure

**Risk Level = HIGH**

<table>
<thead>
<tr>
<th>Persons at Risk</th>
<th>Exposure Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person performing activity and any person within a 5 ft. radius</td>
<td>• work with a <em>Brucella</em> isolate</td>
</tr>
<tr>
<td></td>
<td>• sniffed or opened culture plate</td>
</tr>
<tr>
<td></td>
<td>• mouth pipetted specimen material</td>
</tr>
<tr>
<td></td>
<td>• worked in Class II biosafety cabinet or on open bench without using BSL-3 precautions</td>
</tr>
<tr>
<td>All persons present in laboratory room</td>
<td>Occurrence of widespread aerosol generating procedures*</td>
</tr>
</tbody>
</table>

**Risk Level = LOW**

<table>
<thead>
<tr>
<th>Persons at Risk</th>
<th>Exposure Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>All persons present in laboratory room at distance more than 5 feet from activity</td>
<td>Present in the lab at the time of manipulation of <em>Brucella</em> isolate on an open bench, but who do not have high risk exposures as defined above</td>
</tr>
</tbody>
</table>
Risk Level = NONE

<table>
<thead>
<tr>
<th>Persons at Risk</th>
<th>Exposure Activities</th>
</tr>
</thead>
</table>
| None           | • handling and testing of Brucella isolate in a Class II biosafety cabinet using BSL-3 precautions  
                 • microbiology administrative staff handling sample request forms etc, but not handling opened samples  
                 • exposure NOT in microbiology laboratory eg routine processing of blood samples or urine samples in biochemistry, haematology, blood sciences etc  |

*Widespread aerosol generating procedures include, but are not limited to:
  • centrifuging without sealed carriers
  • vortexing or sonicating
  • accidents resulting in spillage or splashes (ie breakage of tube containing specimen)

Other manipulations may require further investigation. These may include:
  • automated pipetting of a suspension containing the organism
  • grinding, blending or shaking the specimen
  • other procedures for suspension in liquid to produce standard concentration for identification (ie inclusion of steps that could be considered major aerosol generating activities)

(Adapted from USA Centers for Disease Control and Prevention [https://www.cdc.gov/brucellosis/laboratories/risk-level.html](https://www.cdc.gov/brucellosis/laboratories/risk-level.html))

Figure 1 (see next page)

*Specific risk exposures as in list above
¥ Low risk patients – store serum for at least 1 year from exposure
↑ High risk patients – all sera will be stored for 2 years. Baseline serology will be tested in parallel with subsequent samples
Possible laboratory exposure to *Brucella*

**Exposure NOT in bacteriology laboratory (eg, exposure in haematology, biochemistry, blood sciences)**

- **NO risk**
  - Reassure

**Exposure in bacteriology laboratory**

**HIGH risk:**
- Specific risk identified*
- Individual near (<5 feet) if work on *Brucella* spp. performed on open bench
- Individual present in laboratory during *Brucella* spp. aerosol generating event

- Send serology to BRU at:
  - 0 weeks (baseline)
  - 6 weeks
  - 24 weeks

- Administer post-exposure prophylaxis

- **Not pregnant:**
  - Doxycycline 100mg twice daily for 21 days
  - OR
  - Trimethoprim-sulfamethoxazole 160/800mg twice daily for 21 days

- **Pregnant or possibly pregnant** (all cases must be discussed with BRU):
  - Rifampicin 600mg once daily for 21 days
  - OR
  - Rifampicin 600mg once daily with trimethoprim-sulfamethoxazole 160/800mg twice daily and folic acid supplements for 21 days
  - OR
  - Ciprofloxacin 500mg twice daily for 21 days
  - OR
  - Observation only

**LOW risk:**
- Other staff in the laboratory at the time of manipulation on open bench but **NO high risk exposures**

- Send serology for local storage at:
  - 0 weeks (baseline)
  - only send to BRU for testing if becomes symptomatic

*Specific risks include:
- sniffing bacteriological cultures
- direct skin or mucous membrane contact
- present when aerosols generated*
2. Actions: exposure checklist

   a) identify potential exposure event and reinforce need for laboratory containment measures (handle cultures in containment level 3 facilities with the use of a biosafety cabinet) to prevent further exposures

   b) identify individuals exposed or potentially exposed and start Brucella incident summary sheet

   c) determine level of risk of exposed individuals (see figure 1)

   d) inform local Health Protection Team (postcode look-up here https://www.gov.uk/health-protection-team)

   e) contact local occupational health department for follow up of individuals with high risk exposure

   f) complete local clinical incident report

   g) report incident to Health and Safety Executive using RIDDOR form: http://www.hse.gov.uk/riddor/index.htm

   h) contact Brucella Reference Unit (BRU). BRU will provide a specific ILOG reference number which is to be included on all request forms for serum sent for testing

   i) administer post-exposure prophylaxis to individuals with high risk exposure (see figure 1)

   j) active surveillance for febrile illness for all laboratory staff with low risk and high risk exposures for 6 months after the last exposure (patient information leaflets are provided on the BRU website)