Pseudomonas aeruginosa are opportunistic pathogens that pose a particular risk to patients who are compromised. There has been an association between the presence of aeruginosa in water from taps and other outlets and infection/colonisation in patients in augmented care units.

Augmented care involves paediatric or adult critical care, neonatal and burns units.

ALS Environmental are able to offer analysis to test for and confirm the presence of Pseudomonas aeruginosa. This is in accordance with the Health Technical Memorandum (HTM) 04-01 addendum “Pseudomonas aeruginosa - advice for augmented care units.

The DoH lays a specific guidance for the monitoring of Pseudomonas aeruginosa due to its ability to grow in very low nutrient aqueous environments and is particularly significant as a cause of non-socomial infections.

### TABLE 1

<table>
<thead>
<tr>
<th>Hazard</th>
<th>CFU in 100ml</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>0</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>1-10</td>
<td>Retest and refer back to those responsible for the Water Safety Plans to determine what actions are required</td>
</tr>
<tr>
<td></td>
<td>&gt; 10</td>
<td>Investigate cause and put corrective actions in place</td>
</tr>
</tbody>
</table>

The HTM04-01 addendum outlines the potential impacts of samples taken from pre and post flush, as outlined in Table 2:

### TABLE 2

<table>
<thead>
<tr>
<th>CFU in 100ml</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>High P. aeruginosa count pre-flush (&lt;10cfu/100ml) and low post-flush count (&lt;10cfu/100ml)</td>
<td>Suggestive of a local outlet problem</td>
</tr>
<tr>
<td>High P. aeruginosa count pre-flush (&gt;10cfu/100ml) and high post-flush count (&gt;10cfu/100ml)</td>
<td>Suggestive of a systematic problem</td>
</tr>
</tbody>
</table>
### Table 3

<table>
<thead>
<tr>
<th>Type</th>
<th>Method</th>
<th>Laboratory variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas species</td>
<td>Water samples are filtered through a 0.45μm membrane and placed onto selective agar and incubated. Following incubation, presumptive colonies are confirmed using an oxidase test</td>
<td>No casein hydrolysis, limited or no growth on pseudomonas-CN agar at 37°C</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Water samples are filtered through a 0.45μm membrane and placed onto selective agar and incubated. Following incubation, presumptive colonies are confirmed by pigment production and casein hydrolysis</td>
<td>Grow well at 37°C, produce pigment of Pseudomonas-CN agar</td>
</tr>
</tbody>
</table>

The method used to analyse for *Pseudomonas aeruginosa* follows the guidance in "Annex 4 – Microbiological examination of water samples for *P. aeruginosa*." Our UKAS 17025:2005 accredited method uses a secondary confirmation stage to reduce the risk of type I errors occurring in the laboratory.

Type I errors occur when a false positive result is reported in the laboratory. Type II errors occur when a positive result is falsely rejected.

ALS Environmental are able to offer a wide range of analysis to help assist healthcare facilities in the identification of bacteria and protozoa that may have a pathogenic nature, especially in the immunocompromised. Our Microbiological analytical laboratories in Coventry and Wakefield can offer testing for:

- Legionella
- E-coli
- Coliforms
- Streptococcus
- Staphylococcus
- Legionella PCR – 24
- Cryptosporidium

ALS are able to provide results for *Pseudomonas aeruginosa* utilising our rapid confirmation technique; this allows us to provide customers with confirmed positive results a day quicker than the standard culture method. This confirmation technique is allowed under the HTM04-01 addendum and is DWTS accredited for drinking waters. The rapid confirmation utilises culture-based methods and can provide a broad speciation for a range of bacteria including Legionella, Coliforms and E-coli. This enables our clients to act quicker with confidence in the laboratory results, something that is critical when dealing with immunocompromised patients.

**References**