Acknowledgments

UK Standards for Microbiology Investigations (SMIs) are developed under the auspices of Public Health England (PHE) working in partnership with the National Health Service (NHS), Public Health Wales and with the professional organisations whose logos are displayed below and listed on the website http://www.hpa.org.uk/SMI/Partnerships. SMIs are developed, reviewed and revised by various working groups which are overseen by a steering committee (see http://www.hpa.org.uk/SMI/WorkingGroups).

The contributions of many individuals in clinical, specialist and reference laboratories who have provided information and comments during the development of this document are acknowledged. We are grateful to the Medical Editors for editing the medical content.

For further information please contact us at:
Standards Unit
Microbiology Services
Public Health England
61 Colindale Avenue
London NW9 5EQ
E-mail: standards@phe.gov.uk
Website: http://www.hpa.org.uk/SMI

UK Standards for Microbiology Investigations are produced in association with:

UNDER REVIEW
Contents

ACKNOWLEDGMENTS ........................................................................................................... 2
AMENDMENT TABLE ........................................................................................................... 4
UK STANDARDS FOR MICROBIOLOGY INVESTIGATIONS: SCOPE AND PURPOSE ...... 5
SEROLOGICAL DIAGNOSIS OF SYPHILIS ................................................................ 8
SEROLOGICAL DIAGNOSIS OF SYPHILIS ................................................................ 9
NOTIFICATION TO PHE OR EQUIVALENT IN THE DEVOLVED ADMINISTRATIONS .... 11
REFERENCES .................................................................................................................. 12
**Amendment Table**

Each SMI method has an individual record of amendments. The current amendments are listed on this page. The amendment history is available from standards@phe.gov.uk.

New or revised documents should be controlled within the laboratory in accordance with the local quality management system.

<table>
<thead>
<tr>
<th>Amendment No/Date.</th>
<th>3/14.04.14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue no. discarded.</td>
<td>1.2</td>
</tr>
<tr>
<td>Insert Issue no.</td>
<td>1.3</td>
</tr>
</tbody>
</table>

**Section(s) involved**

<table>
<thead>
<tr>
<th>Amendment</th>
<th>Whole document.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Document has been transferred to a new template to reflect the Health Protection Agency’s transition to Public Health England.</td>
</tr>
<tr>
<td></td>
<td>Front page has been redesigned.</td>
</tr>
<tr>
<td></td>
<td>Status page has been renamed as Scope and Purpose and updated as appropriate.</td>
</tr>
<tr>
<td></td>
<td>Professional body logos have been reviewed and updated.</td>
</tr>
<tr>
<td></td>
<td>Standard safety and notification references have been reviewed and updated.</td>
</tr>
<tr>
<td></td>
<td>Scientific content remains unchanged.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amendment No/Date.</th>
<th>2/02.11.11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue no. discarded.</td>
<td>1.1</td>
</tr>
<tr>
<td>Insert Issue no.</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Section(s) involved**

<table>
<thead>
<tr>
<th>Amendment</th>
<th>Whole document.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Document presented in a new format.</td>
</tr>
</tbody>
</table>

| References. | Some references updated. |
UK Standards for Microbiology Investigations #: Scope and Purpose

Users of SMI s

- SMI s are primarily intended as a general resource for practising professionals operating in the field of laboratory medicine and infection specialties in the UK.
- SMI s provide clinicians with information about the available test repertoire and the standard of laboratory services they should expect for the investigation of infection in their patients, as well as providing information that aids the electronic ordering of appropriate tests.
- SMI s provide commissioners of healthcare services with the appropriateness and standard of microbiology investigations they should be seeking as part of the clinical and public health care package for their population.

Background to SMI s

SMI s comprise a collection of recommended algorithms and procedures covering all stages of the investigative process in microbiology from the pre-analytical (clinical syndrome) stage to the analytical (laboratory testing) and post analytical (result interpretation and reporting) stages.

Syndromic algorithms are supported by more detailed documents containing advice on the investigation of specific diseases and infections. Guidance notes cover the clinical background, differential diagnosis, and appropriate investigation of particular clinical conditions. Quality guidance notes describe laboratory processes which underpin quality, for example assay validation.

Standardisation of the diagnostic process through the application of SMI s helps to assure the equivalence of investigation strategies in different laboratories across the UK and is essential for public health surveillance, research and development activities.

Equal Partnership Working

SMI s are developed in equal partnership with PHE, NHS, Royal College of Pathologists and professional societies.

The list of participating societies may be found at http://www.hpa.org.uk/SMI/Partnerships. Inclusion of a logo in an SMI indicates participation of the society in equal partnership and support for the objectives and process of preparing SMI s. Nominees of professional societies are members of the Steering Committee and Working Groups which develop SMI s. The views of nominees cannot be rigorously representative of the members of their nominating organisations nor the corporate views of their organisations. Nominees act as a conduit for two way reporting and dialogue. Representative views are sought through the consultation process.

SMI s are developed, reviewed and updated through a wide consultation process.

---

Footnote: Microbiology is used as a generic term to include the two GMC-recognised specialties of Medical Microbiology (which includes Bacteriology, Mycology and Parasitology) and Medical Virology.
Quality Assurance

NICE has accredited the process used by the SMI Working Groups to produce SMIs. The accreditation is applicable to all guidance produced since October 2009. The process for the development of SMIs is certified to ISO 9001:2008.

SMIs represent a good standard of practice to which all clinical and public health microbiology laboratories in the UK are expected to work. SMIs are NICE accredited and represent neither minimum standards of practice nor the highest level of complex laboratory investigation possible. In using SMIs, laboratories should take account of local requirements and undertake additional investigations where appropriate. SMIs help laboratories to meet accreditation requirements by promoting high quality practices which are auditable. SMIs also provide a reference point for method development.

The performance of SMIs depends on competent staff and appropriate quality reagents and equipment. Laboratories should ensure that all commercial and in-house tests have been validated and shown to be fit for purpose. Laboratories should participate in external quality assessment schemes and undertake relevant internal quality control procedures.

Patient and Public Involvement

The SMI Working Groups are committed to patient and public involvement in the development of SMIs. By involving the public, health professionals, scientists and voluntary organisations the resulting SMI will be robust and meet the needs of the user. An opportunity is given to members of the public to contribute to consultations through our open access website.

Information Governance and Equality

PHE is a Caldicott compliant organisation. It seeks to take every possible precaution to prevent unauthorised disclosure of patient details and to ensure that patient-related records are kept under secure conditions.

The development of SMIs are subject to PHE Equality objectives http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317133470313. The SMI Working Groups are committed to achieving the equality objectives by effective consultation with members of the public, partners, stakeholders and specialist interest groups.

Legal Statement

Whilst every care has been taken in the preparation of SMIs, PHE and any supporting organisation, shall, to the greatest extent possible under any applicable law, exclude liability for all losses, costs, claims, damages or expenses arising out of or connected with the use of an SMI or any information contained therein. If alterations are made to an SMI, it must be made clear where and by whom such changes have been made.

The evidence base and microbial taxonomy for the SMI is as complete as possible at the time of issue. Any omissions and new material will be considered at the next review. These standards can only be superseded by revisions of the standard, legislative action, or by NICE accredited guidance.

SMIs are Crown copyright which should be acknowledged where appropriate.
Suggested Citation for this Document
Serological Diagnosis of Syphilis

Syphilis has re-emerged as an increasing cause of outbreaks across England and Wales in recent years, following a period of rapid decline in numbers resulting in a period when very few cases were seen in the early 1990’s. The current approach to the serological diagnosis of syphilis was established during this period of low numbers of positive cases. Many laboratories only dealt with a few positive cases and lacked experience in interpretation of serological results, and therefore these positive sera were referred to regional and/or reference laboratories for further testing and confirmation.

In the current situation where syphilis does not appear to be in control there is some concern that referral of sera from patients with a positive screening test without further testing may incur a delay in providing the patient with a timely result. This can result from delays due to batching of sera before referral for confirmation, time spent at regional/reference centres and inherent delays in the generation and documentation of reports.

The minimum testing algorithm attempts to readdress this problem and suggests a minimum of tests that should be performed at the primary diagnostic laboratories (marked in red) before extended testing, or confirmation which can be performed at a primary diagnostic laboratories with appropriate expertise or a regional/reference centre (marked in green). Discrepant samples, or those with unusual profiles, should always be referred to a regional/reference centre (marked in orange).

In this algorithm the EIA detecting both IgG and IgM has been chosen as the screening test as it is highly sensitive but slightly less specific than the TPPA/TPHA.

Note:

- If a patient is a known contact of syphilis, or if primary syphilis is suspected, then both EIA IgM and TPPA should be performed
- A second sample should be requested on all new patients to avoid the possibility of labelling, sampling or handling error giving rise to a false result
- The terms RPR and VDRL are used interchangeably. VDRL antigen is not easily obtained and hence most laboratories are using the RPR test
Serological Diagnosis of Syphilis

**Total EIA (IgG / IgM)**
- **Reactive**
  - **TPPA/TPHA** (Qualitative)
    - Reactive: Issue preliminary report: Consistent with treponemal infection. Further results to follow. Perform IgM EIA, Quantitative TPPA/TPHA RPR (if available).
    - RPR\(^b,c\): Reactive/Non-reactive
      - IgM: Positive\(^e\): REPORT: Consistent with recent or active treponemal infection. Advise repeat to confirm.
    - RPR\(^b\): Reactive/Non-reactive
      - IgM: Negative: REPORT: Consistent with treponemal infection at some time. Advise repeat to confirm.
  - Non-reactive
- **Non-reactive**
  - REPORT: Treponemal antibody NOT detected. Please report if at risk of infection.
  - Indeterminate results, send to ref. lab. for further testing and confirmation.

If a known contact of syphilis or primary syphilis suspected
Carry out TPPA and/or EIA IgM

---

\(^a\) = Primary Lab.
\(^b\) = Primary / Regional / Reference Lab.
\(^c\) = Reference Lab.
\(^d\) = Report

---

**UK Standards for Microbiology Investigations | Issued by the Standards Unit, Public Health England**
Footnotes

a) Carry out a clot check. A clot check is done to make sure that there has not been an aliquotting error. It is a repeat test done not from the separated aliquot of serum which has already been test and which has given the initially reactive result, but rather from the original tube of clotted blood which is likely to contain clot and some residual serum and which will have the original patient identifier label from the sender.

b) RPR titre is used in laboratories to help assess whether infection is likely to be recent or adequately treated; a persisting RPR titre of >16 is seldom seen in an adequately treated infection.

c) Failure of a fourfold fall in RPR titre by six months, and an eightfold fall by one year post-treatment raises concerns about treatment failure or reinfection. If the RPR or IgM titres rise significantly raise a concern about reinfection.

d) Treponemal IgM results must be interpreted with care. Positivity reflects active infection but can persist for 12-18 months after treatment of infection.

e) Low IgM levels can indicate: persisting antibody from a previous infection: new infection: nonspecific infection. Low IgM positive will vary depending on the kit used but falls near to the cut-off. A repeat should be requested to detect a rise or fall in antibody level.
Notification to PHE\(^2,3\) or Equivalent in the Devolved Administrations\(^4-7\)

The Health Protection (Notification) regulations 2010 require diagnostic laboratories to notify Public Health England (PHE) when they identify the causative agents that are listed in Schedule 2 of the Regulations. Notifications must be provided in writing, on paper or electronically, within seven days. Urgent cases should be notified orally and as soon as possible, recommended within 24 hours. These should be followed up by written notification within seven days.

For the purposes of the Notification Regulations, the recipient of laboratory notifications is the local PHE Health Protection Team. If a case has already been notified by a registered medical practitioner, the diagnostic laboratory is still required to notify the case if they identify any evidence of an infection caused by a notifiable causative agent.

Notification under the Health Protection (Notification) Regulations 2010 does not replace voluntary reporting to PHE. The vast majority of NHS laboratories voluntarily report a wide range of laboratory diagnoses of causative agents to PHE and many PHE Health Protection Teams have agreements with local laboratories for urgent reporting of some infections. This should continue.

**Note:** The Health Protection Legislation Guidance (2010) includes reporting of Human Immunodeficiency Virus (HIV) & Sexually Transmitted Infections (STIs), Healthcare Associated Infections (HCAIs) and Creutzfeldt–Jakob disease (CJD) under ‘Notification Duties of Registered Medical Practitioners’; it is not noted under ‘Notification Duties of Diagnostic Laboratories’.

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/HealthProtectionRegulations/

Other arrangements exist in **Scotland**\(^4,5\), **Wales**\(^6\) and **Northern Ireland**\(^7\).
References


