・全数把握及び定点把握
・積極的な疫学調査等による感染症患者
病原体浸淫状況（病原体検出情報・病原体サーベイランスによる）
2次医療圏、都道府県、全国、世界
・感染症に関する罹患及び死亡統計
・過去の集団流行記録や調査成績の保管

②感染症流行
・Diffuse Outbreak
・集団発生（地域内、全国、パンデミー等）
に関する調査・情報

③感染症の流行予測に関する調査・情報；流行予測調査
・患者サーベイランス
・系統的病原体検査
・血清疫学的調査等

④予防接種や感染症予防対策の効果判定に関する調査・情報

⑤感染症に関する総合的ネットワーク：中央感染症情報センター
厚生省保健医療局・結核感染症課
国立試験研究機関、感染症研究所
厚生省大臣官房統計情報部
都道府県本庁主管部（局）課・室
基幹地方感染症情報センター
地方衛生研究所
保健所
市町村・保健センター、地域住民
医師会
定点医療機関（患者、病原体）
感染症指定医療機関等
大学等関係機関・団体等
双方向的情報システムの構築・活用

⑥情報の精度管理とレファレンス機能
病原体検出やサーベイランスにおける検出技術の標準化及び精度管理を行うとともに、標準株・分離株、同定用抗血清、ＰＣＲ用プライマー、ハイブリダイゼーション用プローブ等レファレンス機能を強化する。
（地方微生物バンク、血清バンク等）

⑦感染症に関する研修・教育の企画・実施：
保健所・市町村職員に対する現地疫学や感染症予防対策に関する技術研修プランの作成、健康危機管理・現地疫学研修（Field Epidemiology）

⑧地域住民・専門家・マスコミへの対応：
感染症の予防・治療・対策等に関する住民及び専門家の問い合わせへの対応、マスコミへの情報提供等

⑨感染症に関する情報紙
週報・月報・年報・緊急報の発刊、発信

⑩地方感染症発生動向調査企画委員会
・事務局を担当
・感染症に関する情報の解析専門委員会
・地方感染症情報センター運営委員会（事務局）
・感染症発生動向調査定点医療機関会議

3)地方感染症情報センターの人員
地方感染症情報センターには、
①感染症に関する医学的（臨床的）、疫学的専門知識・経験を有する者
②病原体検査に関する専門的な知識・技能を有する者
③統計学的知識・情報処理技術に関する専門的知識を有する者
で構成する3人以上の、他の部門との兼務のない専任職員が必要でありその確保には、国の強力な指導・支援が必須である。

なお、地方感染症情報センターは、地方衛生研究所に設置するのが最も適当である。

Ｄ．考察

感染症新法下での病原体サーベイランスは、従来実施してきた病原体の検出・特定業務とは分けて実施することとされている。

地方衛生研究所が担当する病原体サーベイランスの対象疾患は、1類～3類感染症では、1類の出血熱を除き、全ての疾患が対象となる予定である。

4類感染症（定点把握）では、咽頭結膜熱・感染性胃腸炎・Ａ群溶血性レンサ球菌咽頭炎・手足口病・ヘルパン

ギーナ・急性出血性結膜炎・流行性角結膜炎・急性脳炎(日本脳炎を含む)・無菌性髄膜炎の９疾患、地研単独又は国立感染症研究所の指導・協力を得て実施する疾患は、インフルエンザ・百日咳・麻疹・流行性耳下腺炎・細菌性髄膜炎・淋菌感染症の６疾患が予定されている。病原体検査体制に関する調査では、百日咳・細菌性髄膜炎・淋菌感染症の検査可能の回答率がそれぞれ５割程度となっており、職員の養成・研修や標準株の供与、試験法等について、国立感染症研究所の強力な支援が必要である。

４類感染症（全数把握）は、国立感染症研究所が担当する疾患が多いが、地研単独又は国立感染症研究所の指導・協力を得て病原体サーベイランスを実施する疾患は、後天性免疫不全症候群・デング熱・ライム病・Ｑ熱・ツツガムシ病・日本紅斑熱・オウム病・乳児ボツリヌス症・破傷風・エキノコックス症・アメーバ赤痢の１１疾患、さらに、劇症型溶血性レンサ球菌感染症及びレジオネラ症は、地研の担当疾患とされている。このうち、デング熱・ライム病・Ｑ熱・日本紅斑熱の実施可能率は全地研の３割以下となっており職員の育成・研修をはじめ、試験法、標準株、血清・プライマー等国立感染症研究所などの強力なる支援が不可欠である。

地方感染症情報センターは、１類から４類感染症の全ての患者情報及び病原体情報を統一的に収集、分析し、一般国民や第一線の医療現場の方々の予防、診療、研究等に役立つ情報を提供・公開する中核的機関として設置されるものであり、オンラインシステムの再構築と併せて、Field Epidemiologyを展開できるマンパワー等のセンター配置（常勤体制）が不可欠である。

何故なら、感染症情報センターの活動は、こうした疫学専門官の分掌業務と不可分であり、地域における感染症対策の基本となるからである。

さらに、ＣＤＣのＥＩＳ（Epidemic Intelligence Service)のような現地疫学専門官（仮称）の養成・研修に本格的に取り組むべきであろうし、保健所及び地方衛生研究所の感染症担当及び情報又はサーベイランス担当の職員を対象として全国レベルで、「現地疫学」の研修講座（実習・野外実地研修を含む）を早急に開設すべきである。

## Ｅ．結論

感染症の発生情報の正確な把握と分析、その結果の国民への提供・公開は感染症対策の基本である。

地方衛生研究所は、１類感染症から４類感染症（定点把握及び全数把握）の病原体サーベイランスを担当し、感染症対策の科学的・技術的中核として機能すべきである。

地方衛生研究所等に設置される「地方感染症情報センター」は、全ての患者情報及び病原体検査情報の一元的な情報発信基地としての活動が期待されており、現地疫学専門官等技術系職員のセンター専任配置が必要である。

## 表１　４類感染症（全数把握）の病原体検査体制（全国７３地研集計表）

| No | 感染症名 | 検査 | | | 検査できない場合に必要なもの | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 可能 | 不可 | % | 試験法 | 標準菌株 | 血清・ﾌﾟﾗｲﾏｰ | 職員の育成・研修 | 人員 | 予算 | 施設 | 機器 |
| 16 | クロイツフェルト・ヤコブ病 | 0 | 73 | 0 | 45 | 23 | 20 | 47 | 37 | 35 | 23 | 17 |
| 41 | Bウイルス病 | 1 | 72 | 1 | 37 | 33 | 32 | 47 | 40 | 36 | 35 | 12 |
| 7 | 黄熱 | 2 | 71 | 3 | 40 | 27 | 27 | 46 | 38 | 33 | 31 | 11 |
| 8 | 回帰熱 | 2 | 71 | 3 | 42 | 26 | 22 | 45 | 38 | 32 | 16 | 8 |
| 40 | ハンタウイルス肺症候群 | 2 | 71 | 3 | 34 | 32 | 31 | 48 | 46 | 29 | 26 | 10 |
| 6 | エキノコックス症 | 4 | 69 | 5 | 37 | 24 | 20 | 47 | 32 | 32 | 12 | 10 |
| 19 | コクシジオイデス症 | 6 | 67 | 8 | 39 | 26 | 17 | 44 | 32 | 28 | 21 | 8 |
| 22 | 腎症候性出血熱 | 6 | 67 | 8 | 36 | 35 | 31 | 48 | 40 | 35 | 26 | 12 |
| 32 | デング熱 | 8 | 65 | 11 | 33 | 31 | 28 | 46 | 31 | 30 | 16 | 11 |
| 13 | 狂犬病 | 9 | 64 | 12 | 32 | 28 | 24 | 43 | 37 | 31 | 22 | 12 |
| 44 | ブルセラ症 | 11 | 62 | 15 | 32 | 32 | 21 | 40 | 31 | 30 | 12 | 7 |
| 47 | 発疹チフス | 13 | 60 | 18 | 27 | 25 | 23 | 34 | 35 | 26 | 16 | 7 |
| 54 | ライム病 | 16 | 57 | 22 | 29 | 26 | 18 | 38 | 30 | 25 | 10 | 8 |
| 12 | Q熱 | 18 | 55 | 25 | 23 | 23 | 19 | 32 | 28 | 24 | 16 | 8 |
| 14 | クラミジア肺炎 | 21 | 52 | 29 | 23 | 24 | 17 | 26 | 24 | 22 | 8 | 7 |
| 35 | 日本紅斑熱 | 23 | 50 | 32 | 21 | 21 | 18 | 28 | 28 | 25 | 10 | 6 |
| 29 | 炭疽 | 28 | 45 | 38 | 22 | 25 | 16 | 26 | 24 | 20 | 13 | 6 |
| 50 | マラリア | 30 | 43 | 41 | 17 | 16 | 6 | 31 | 21 | 16 | 6 | 3 |
| 28 | 先天性風疹症候群 | 33 | 40 | 45 | 18 | 12 | 11 | 20 | 18 | 18 | 5 | 5 |
| 38 | 破傷風 | 34 | 39 | 47 | 18 | 18 | 14 | 24 | 16 | 17 | 2 | 3 |
| 24 | 髄膜炎菌性髄膜炎 | 36 | 37 | 49 | 17 | 14 | 9 | 22 | 18 | 18 | 3 | 2 |
| 39 | バンコマイシン耐性腸球菌感染 | 39 | 34 | 53 | 11 | 13 | 7 | 17 | 17 | 18 | 2 | 1 |
| 4 | ウイルス性肝炎 | 40 | 33 | 55 | 14 | 13 | 16 | 17 | 20 | 19 | 3 | 3 |
| 17 | 劇症型溶血性レンサ球菌感染症 | 41 | 32 | 56 | 16 | 10 | 9 | 16 | 13 | 12 | 3 | 1 |
| 30 | ツツガムシ病 | 46 | 27 | 63 | 14 | 10 | 8 | 17 | 17 | 13 | 12 | 7 |
| 36 | 乳児ボツリヌス症 | 50 | 23 | 68 | 11 | 4 | 7 | 12 | 8 | 9 | 3 | 2 |
| 37 | 梅毒 | 54 | 19 | 74 | 6 | 6 | 5 | 10 | 7 | 7 | 1 | 3 |
| 21 | ジアルジア症 | 55 | 18 | 75 | 6 | 6 | 4 | 12 | 6 | 6 | 2 | 6 |
| 15 | クリプトスポリジウム症 | 56 | 17 | 77 | 8 | 8 | 4 | 11 | 7 | 7 | 1 | 10 |
| 58 | レジオネラ症 | 57 | 16 | 78 | 6 | 5 | 4 | 9 | 9 | 8 | 1 | 1 |
| 1 | アメーバ赤痢 | 58 | 15 | 79 | 7 | 5 | 3 | 13 | 8 | 5 | 1 | 1 |
| 18 | 後天性免疫不全症候群 | 65 | 8 | 89 | 4 | 4 | 4 | 5 | 5 | 4 | 2 | 1 |

## 表２　４類感染症（定点把握）の病原体検査体制（全国７３地研集計表）

| No | 感染症名 | 検査 | | | 検査できない場合に必要なもの | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 可能 | 不可 | % | 試験法 | 標準菌株 | 血清・ﾌﾟﾗｲﾏｰ | 職員の育成・研修 | 人員 | 予算 | 施設 | 機器 |
| 3 | インフルエンザ | 61 | 12 | 84 | 5 | 3 | 3 | 7 | 7 | 8 | 6 | 5 |
| 33 | 伝染性紅斑 | 16 | 57 | 22 | 29 | 24 | 23 | 34 | 26 | 21 | 7 | 8 |
| 34 | 突発性発疹 | 23 | 50 | 32 | 25 | 19 | 18 | 29 | 22 | 16 | 9 | 8 |
| 23 | 水痘 | 34 | 39 | 47 | 16 | 21 | 11 | 16 | 22 | 20 | 7 | 7 |
| 42 | 百日咳 | 37 | 36 | 51 | 20 | 20 | 14 | 23 | 18 | 18 | 2 | 2 |
| 49 | 麻疹 | 45 | 28 | 62 | 15 | 12 | 10 | 27 | 15 | 25 | 5 | 5 |
| 5 | A群溶血性レンサ球菌咽頭炎 | 53 | 20 | 73 | 7 | 4 | 6 | 10 | 11 | 9 | 0 | 1 |
| 46 | ヘルパンギーナ | 54 | 19 | 74 | 9 | 6 | 5 | 10 | 12 | 10 | 7 | 5 |
| 43 | 風疹 | 56 | 17 | 77 | 9 | 6 | 6 | 8 | 11 | 9 | 2 | 2 |
| 56 | 流行性耳下腺炎 | 56 | 17 | 77 | 7 | 4 | 4 | 9 | 9 | 10 | 5 | 4 |
| 31 | 手足口病 | 57 | 16 | 78 | 9 | 6 | 5 | 10 | 9 | 10 | 6 | 5 |
| 2 | 咽頭結膜熱 | 59 | 14 | 81 | 8 | 4 | 4 | 8 | 8 | 7 | 5 | 4 |
| | 感染性胃腸炎（ウィルス性） | 64 | 9 | 88 | 5 | 4 | 3 | 6 | 6 | 7 | 5 | 4 |
| 9 | 感染性胃腸炎（細菌性） | 68 | 5 | 93 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 0 |
| 27 | 尖形コンジローム | 1 | 72 | 1 | 37 | 32 | 26 | 47 | 36 | 32 | 7 | 10 |
| 25 | 性器クラミジア感染症 | 36 | 37 | 49 | 13 | 13 | 11 | 17 | 20 | 17 | 4 | 3 |
| 57 | 淋菌感染症 | 38 | 35 | 52 | 11 | 14 | 8 | 19 | 19 | 16 | 1 | 1 |
| 26 | 性器ヘルペスウイルス感染症 | 46 | 27 | 63 | 9 | 7 | 5 | 14 | 13 | 13 | 6 | 5 |
| 10 | 急性出血性結膜炎 | 56 | 17 | 77 | 8 | 5 | 5 | 9 | 9 | 9 | 6 | 4 |
| 55 | 流行性角結膜炎 | 57 | 16 | 78 | 7 | 4 | 4 | 10 | 10 | 10 | 6 | 5 |
| 48 | マイコプラズマ肺炎 | 29 | 44 | 40 | 24 | 15 | 15 | 30 | 26 | 23 | 8 | 7 |
| 45 | ペニシリン耐性肺炎球菌感染 | 34 | 39 | 47 | 14 | 15 | 10 | 20 | 18 | 17 | 3 | 0 |
| 53 | 薬剤耐性緑膿菌感染症 | 39 | 34 | 53 | 13 | 11 | 7 | 14 | 20 | 19 | 3 | 0 |
| 20 | 細菌性髄膜炎 | 41 | 32 | 56 | 13 | 8 | 6 | 22 | 17 | 19 | 3 | 3 |
| 11 | 急性脳炎（日本脳炎を含む） | 47 | 26 | 64 | 13 | 8 | 7 | 15 | 15 | 12 | 7 | 6 |
| 52 | ﾒﾁｼﾘﾝ耐性黄色ﾌﾞﾄﾞｳ球菌感染 | 50 | 23 | 68 | 8 | 6 | 4 | 8 | 16 | 15 | 1 | 0 |
| 51 | 無菌性髄膜炎 | 58 | 15 | 79 | 8 | 5 | 4 | 10 | 9 | 9 | 8 | 5 |

UK Health Departments

# Management and Control of Viral Haemorrhagic Fevers

## Summary of Guidance from the Advisory Committee on Dangerous Pathogens

# Contents

## Introduction

1. This booklet summarises the main points of *Management and Control of Viral Haemorrhagic Fevers* produced by the Advisory Committee on Dangerous Pathogens (ACDP) which advises the Health and Safety Commission and Health Ministers.

2. The booklet is designed to assist staff in hospital accident and emergency departments who may assess patients with unexplained pyrexia following a recent stay in countries where viral haemorrhagic fevers are endemic. It provides a brief guide to the initial assessment and management of such cases. The full ACDP guidance is available from The Stationery Office and through good booksellers (ISBN 0-11-321860-5; price £11).

3. Further copies of this booklet are available from:

Department of Health
PO Box 410
Wetherby
LS23 7LN

4. The booklet is also available on the following Internet site:
http://www.open.gov.uk/doh/vhf.htm

# 1. Viral haemorrhagic fevers

## Introduction

1.1 Viral haemorrhagic fevers (VHF) are severe and life-threatening diseases caused by a range of viruses. Most are endemic in a number of parts of the world, **most notably Africa, parts of South America and some rural parts of the Middle East and Eastern Europe.** However, environmental conditions in the UK do not support the natural reservoirs or vectors of any of these diseases. Although cases of VHF are occasionally imported into the UK, the risk of epidemic spread in the general population is negligible.

1.2 **There is a risk of secondary infection with these diseases, particularly among hospital and laboratory staff. Accidental inoculation may result from needlestick or contamination of broken skin or mucous membranes by infected blood or body fluids.** Strict infection control precautions are required to protect those who may be exposed.

1.3 The Control of Substances Hazardous to Health (COSHH) Regulations 1994 require employers to assess risks to their employees and others in the workplace including, when appropriate, an assessment of the risk of VHF infection occurring at work. The purpose is to enable decisions to be made about the actions needed to prevent or control the risk. These include setting up practical control measures and providing information and training, monitoring exposure and doing health surveillance where the assessment shows that these are required.

1.4 Four agents of VHF are of concern in the UK because of possible person-to-person spread. These are **Lassa, Ebola, Marburg** and **Crimean/Congo haemorrhagic fevers**.

## The viruses

### Lassa fever

1.5. Primary infection in man probably occurs when broken skin or mucous membranes are contaminated with urine from the natural host of the virus, the multimammate rat in Africa. Variation in virulence has been observed, and in hospital outbreaks in West Africa, there have been mortality rates of up to 60%.

### Ebola fever

1.6 There have been cases in Zaire, Sudan, Côte D'Ivoire and Gabon. The natural reservoir of Ebola virus is unknown but monkeys may be a link to humans. In an outbreak in Zaire in 1995 the mortality rate was 77%. More than 50% of those affected were hospital or home-based carers of Ebola cases.

### Marburg fever

1.7 Marburg disease was first described when laboratory workers in Germany and the former Yugoslavia became infected. All cases were traced either to direct contact with blood, organs or cell cultures from a batch of African green monkeys that had been caught in Uganda, or to the blood of the primary human cases. As with Ebola virus, the natural reservoir of Marburg virus is unknown but acquisition of the infection by monkeys may bring it into contact with man.

Crimean/Congo haemorrhagic fever (CCHF)

1.8 CCHF is caused by a virus which is widespread in East and West Africa, Central Asia and the former USSR. More recently, CCHF or antibody to it, has been detected in Dubai, Iraq, South Africa, Pakistan, Greece, Turkey, Albania, Afghanistan, and India. Transmission is by tick bite.

**Incubation periods and initial symptoms**

1.9 The incubation period for these VHFs ranges from 3-21 days. Initial symptoms include fever, malaise, headache and muscle and joint pains. Nausea, vomiting and diarrhoea may also occur. Ebola and Marburg often cause a measles-like rash after 4-7 days. Obvious bleeding is a later or terminal event. Pyrexia may last as long as 16 days with temperatures up to 41°C.

## 2. Patient assessment and categorisation

2.1 In the UK, most patients who could have a VHF are likely to present to Accident and Emergency Departments either directly or *via* their general practitioner. A VHF infection is possible in any patient presenting with a pyrexia of unknown origin (PUO) shortly after having returned from abroad. However in most cases this can be dismissed on epidemiological grounds alone. **The suggested checklist of enquiries shown in Table 1 (page 5) is designed to help identify patients at risk and to obtain essential information for discussion with clinical and epidemiological advisers**.

### Immediate clinical assessment

2.2 It is difficult to make a firm diagnosis solely on clinical grounds, so epidemiological evidence is essential in assessing a feverish patient with a history suggestive of VHF. Clinicians should seek the help and advice of a specialist in infectious diseases or tropical medicine.

2.3 **Experience has shown that most ill patients suspected of VHF will be suffering from malaria. Laboratory tests to exclude or confirm malaria should be undertaken as soon as possible. Malaria is a serious infection which can be life threatening; prompt treatment can significantly affect the course of disease.** Several blood films should be examined to exclude this diagnosis as false negative results occasionally occur. `Dip-stick' or card tests for *Plasmodium falciparum* may be useful. Treatment may need to be considered in the absence of a firm diagnosis. **No laboratory work should be carried out on specimens from these patients (other than unavoidable emergency tests) until a blood film has been examined for the presence of malarial parasites**.

2.4 Other relatively common causes of febrile illness in travellers returning from Africa include typhoid fever, dengue, rickettsial infections and tropical parasites. Multiple infections are not uncommon in the tropics and the finding of malarial parasites does not absolutely exclude one of the haemorrhagic fevers or other serious infections. In unconscious patients, other conditions such as diabetes, meningitis or stroke should be considered.

### Categorisation

2.5 Most patients who may have VHF present early in the course of disease. They can usually be minimally managed in standard isolation with universal precautions either in casualty wards or at home before removal to medium/high security units. The purpose of risk assessment and patient categorisation in relation to VHF is to provide efficient and timely management for patients, while affording maximum protection for the laboratory and clinical staff involved. **For this purpose, patients are assigned to one of three risk groups: minimum, moderate or high.**

2.6 It is recognised that exact categorisation may be difficult in some cases; uncertainty about possible times or places of exposure to infection or about the nature of the illness should be reflected in the categorisation (for example, an otherwise minimum risk patient may be placed in the moderate risk category while clinical progress is observed or laboratory results obtained). Physical examination and chest X-ray may suggest an alternative diagnosis of fever eg. acute tonsillitis, meningitis or pneumonia.

## Table 1: suggested checklist for patient information in cases of suspected VHF

Date / /

Surname _____

Forenames _____

Address _____

_____ tel _____ Health Authority _____

Consultant in Communicable Disease Control (CCDC) _____ tel _____

Infectious Disease Physician _____ tel _____

Date of birth ___/___/___ Date of onset of illness ___/___/___

*Questions 1-3 help facilitate the initial categorisation of the patient into one of the risk categories found on page 6*

1. Contact with confirmed or strongly suspected case or body fluids/tissue of such a case during 21 days before onset? (Circle) No Unknown Yes

   If yes, specify (Circle) Living patient Dead body Body Fluids/tissue

2 Present in endemic area during the three weeks before onset? (Circle) No Unknown Yes

   If yes, a specify any contact with animals? (Circle) No Yes
   Nature of contact _____

   b specify any outdoor activity? (Circle) No Yes

   Type of activity _____

3 Location(s) of possible exposure(s) _____

   a Nature of possible exposure(s) _____
   Dates of exposure__/__-__/__ Where hospitalised_____
   Date of hospitalisation__/__/__

*Question 4 allows the recording of additional information for initial discussions with infectious disease and public health physicians*

4 Signs/Symptoms. (Circle): Fever Headache Myalgia Pharyngitis Diarrhoea Bloody Diarrhoea Vomiting Rash Bleeding Shock

   If known - Lymphopaenia Thrombocytopenia raised AST Dead

   Other Clinical Information _____

*Questions 5-8 are concerned with basic information for contact tracing and public health actions*

5 Number of contacts exposed to body fluids or caring for the patient while ill or after death_____

   a Contact list with CCDC? (Circle) No Yes

6 Airlines/flight numbers/date of travel from endemic area_____

   _____

   a Intermediate stopping points on journey from endemic area _____
   _____

   b Ill during journey? (Circle) No Unknown Yes

   c Ill during stopover? (Circle) No Unknown Yes

7 Discussed with ID physician / CCDC ? (Circle) No Yes Date_____

8 Other information _____

## 3. Risk categories

### Minimum risk

3.1 This category includes febrile patients who have:

- not been in known endemic areas before the onset of illness;

*or*

- been in endemic areas, (or in contact with a known or suspected source of a VHF), but in whom the onset of illness was definitely more than 21 days after their last contact with any potential source of infection.

### Moderate risk

3.2 This category includes febrile patients who have:

- been in an endemic area during the 21 days before the onset of illness, but who have none of the additional risk factors which would place him or her in the high risk category;

*or*

- not been in a known endemic area but who may have been in adjacent areas or countries during the 21 days before the onset of illness, and who have evidence of severe illness with organ failure and/or haemorrhage which could be due to a VHF and for which no alternative diagnosis is currently evident.

**High risk**

3.3 This category includes febrile patients who:

a) have been in an endemic area during the three weeks before illness and :

- have lived in a house or stayed in a house for more than 4 hours where there were ill, feverish persons known or strongly suspected to have a VHF;

*or*

- took part in nursing or caring for ill, feverish patients known or strongly suspected to have a VHF, or had contact with the body fluids, tissue or the dead body of such a patient;

*or*

- are a laboratory, health or other worker who has, or has been likely to have come into contact with the body fluids, tissues or the body of a human or animal known or strongly suspected to have a VHF;

*or*

- were previously categorised as 'moderate' risk, but who have developed organ failure and/or haemorrhage.

b) have not been in an endemic area but during the three weeks before illness they

- cared for a patient or animal known or strongly suspected to have a VHF or came into contact with the body fluids, tissues or dead body of such a patient or animal;

*or*

- handled clinical specimens, tissues or laboratory cultures known or strongly suspected to contain the agent of a VHF.

## 4. Initial management of patients

### Minimum risk

4.1 Minimum risk patients may, if necessary, be admitted to a general hospital, or to an infectious diseases or tropical diseases department. If there is no immediate threat to life (malaria being excluded), patients may remain at home. Patients in hospital should be managed with standard isolation techniques (i.e. good clinical practice, universal precautions and safe disposal procedures). Over 95% of seriously ill patients in the minimum risk category will have malaria, and symptoms will resolve with appropriate anti-malarial treatment.

4.2 The Infection Control Team should be informed before the patient is admitted, or immediately after admission. The Consultant in Communicable Disease Control (CCDC) may also wish to be informed in certain circumstances, and the locally agreed procedures should be included in routine infection control policies. For patients in the minimum risk category it is not anticipated that any public health action will be needed; statutory notification of suspected VHF is not recommended at this level. Standard procedures for transport of specimens should be used. Patients may be transported by ambulance without special precautions.

### Moderate risk

4.3 Moderate risk patients should be admitted either to the Department of Health designated High Security Infectious Disease Units (HSIDUs) at Coppett's Wood Hospital, north London or Newcastle General Hospital (see Appendix for details) or to intermediate isolation facilities after consultation with the physician in charge. The CCDC should be notified of a suspected case in the moderate category. The aim is to provide a high level of infection control for patient care and particularly for laboratory procedures while an alternative, non-VHF diagnosis is sought. **In more than 95% of cases malaria will be the alternative diagnosis.** Virological tests for VHF are therefore generally not indicated for moderate risk patients.

4.4 The initial malaria test may be carried out locally, but other patient management specimens should be sent to a HSID laboratory and should be transported in accordance with the recommendations in section 5. Contacts should be identified by the CCDC, but unless the patient is re-categorised as high risk the contacts need not be placed under surveillance. The ambulance service will usually transport the patient as an Ambulance Category III removal. Any special needs will be advised by the clinician in charge of the designated HSIDU.

### High risk

4.5 Any patient known or strongly suspected to be suffering from a VHF should be admitted to one of the HSIDUs. Ambulance transport of the patient should be as an Ambulance Category III removal, with any special needs being advised by the clinician in charge of the designated HSIDU. The CCDC should be informed immediately when a patient is categorised as high risk. The CCDC should identify close contacts, place them under surveillance and liaise with other CCDCs and the Public Health Laboratory Service Communicable Disease Surveillance Centre (CDSC) on the identification of contacts who may be in other districts.

4.6 Blood and body fluids from such patients are likely to contain high concentrations of virus. Specimens for patient management tests from high risk or confirmed patients must be sent to a HSID laboratory. Specimens for virological investigations must be sent to an HSID viral diagnostic laboratory equipped to handle Hazard Group 4 biological agents (see Appendix)

**Disinfection and decontamination**

4.7 Areas and equipment used for care of patients in the moderate or high risk category, or confirmed cases, should be adequately decontaminated and cleaned. Fortunately the viruses involved are not highly resistant either to chemicals or to heat. From the point of view of transmissibility they behave like blood-borne viruses such as hepatitis C and the human retroviruses. Control measures against such viruses in domestic and clinical settings are described in the full guidance and in a previous ACDP guidance document, *Protection against blood-borne infections in the workplace: HIV and hepatitis* (HMSO, 1995). Guidance on the decontamination of medical equipment is contained in *Sterilization, Disinfection and Cleaning of Medical Equipment: Guidance on Decontamination Parts 1-3* (Microbiology Advisory Committee to the Department of Health Medical Devices Agency).

## 5. Collection and transport of specimens

5.1 Obtaining and handling laboratory specimens (blood, urine etc.) is the most common cause of cases of VHF in health care settings. Risks are involved in taking the specimens, filling the specimen containers, and transferring samples into testing systems and analyzers. For this reason, **most laboratory tests are discouraged in initial assessment.**

### Specimens from minimum risk patients

5.2 Specimens from minimum risk patients should be handled in accordance with good laboratory practice at a minimum Containment Level 2. Specimens should be tracked and their handling audited.

### Specimens from moderate and high risk patients

5.3 For moderate and high risk patients, blood specimens should be taken by a doctor or nurse experienced in phlebotomy. Urine samples should only be taken by experienced staff (a 20ml syringe should be used to transfer urine from a bedpan to the specimen container). Protective measures include wearing a protective gown; a waterproof protective apron; latex gloves; face mask; and eye protection. Hands and exposed skin should be washed thoroughly after the procedure.

### Collection of blood samples and preparation of malaria films

5.4 The following techniques are recommended when obtaining specimens of blood:

- dry cotton wool balls or gauze swabs (not disposable alcohol swabs) should be used to apply pressure to venepuncture wound;
- use of a vacuum blood sampling system;
- specimen tubes should be labelled with patient details before being filled;
- blood collection by fingerprick or making direct blood films should not be undertaken. Blood films should be made only by an experienced person, using an EDTA sample. They should be dried and fixed to minimise the mobility and viability of viruses before examination. Thick films should NOT be prepared.

**NB: unfamiliar procedures are more likely to lead to accidents and spillages.**

### Disposal of equipment and protective clothing

5.5 All equipment used for blood-taking should be placed into a dedicated sharps box for immediate sealing and disposal. It is convenient to use the sharps box also for small swabs, disposable syringes etc. Larger swabs, gloves, disposable gowns, materials used to clean up spillage, and empty specimen containers should be placed in clinical waste bags which are immediately tied or sealed and then `double-bagged' into a second clinical waste bag for immediate disposal by incineration.

**Transport of specimens**

5.6 It is essential that specimens from moderate and high risk patients are transported in a manner which minimises the risk of infection during transit and on receipt at the laboratory. Those sending specimens should seek advice from the receiving laboratory on safe methods of handling, packaging and transport.

**Retrieval of specimens**

5.7 If the possibility of a VHF has been realised only after specimens have been sent, it should be the responsibility of an identified individual, such as the CCDC or Infection Control Doctor, to ensure that specimens are located quickly, and are appropriately labelled, packed and stored prior to transportation to a HSID laboratory; or made safe by autoclaving or incineration.The identity of those who had contact with these specimens should be ascertained and recorded, taking particular note of any mishap. Local codes of practice should specify procedures and the disinfectants to be used for dealing with spillages. When the case is moderate or high risk, the CCDC should liaise with the Infection Control Doctor of any hospitals involved, the regional epidemiologist/CDSC and the Department of Health.

**Laboratory tests**

5.8 **No laboratory work should be carried out on specimens from these patients (other than unavoidable emergency tests) until a blood film has been examined for the presence of malarial parasites**. In **exceptional circumstances** to preserve the life of the patient, general hospitals without immediate access to a HSID laboratory may be obliged to conduct emergency tests to manage critically ill high risk patients. In such circumstances, **the advice of HSID specialists** should be sought at an early stage, to agree on what emergency tests are required (none of which involves or allows replication of the virus), while minimising the risk to hospital and laboratory staff).

## 6. Viral haemorrhagic fever (VHF) infected bodies

### Post-mortem examination

6.1 **A post-mortem examination on a person known to have died of VHF exposes staff to unwarranted risk and should not be performed.** Where a patient suspected of having a VHF has died it may be necessary on public health grounds to undertake some diagnostic tests including malaria tests. Advice should be obtained from appropriate specialists.

### Body disposal

6.2. Staff wearing protective clothing (non-permeable apron, gown, rubber boots, gloves and face and eye protection) should place the body in a body bag, seal the bag, and spray or wipe it thoroughly with hypochlorite or other appropriate disinfectant before placing it in a robust coffin which should have sealed joints. It should then be kept, by special prior arrangement with mortuary staff, in a separate, identified, cold store unit to await prompt cremation or burial. The body bag should not be opened except by a designated person after consultation with the CCDC.

## 7. Public health actions

### Notification of cases and suspected cases

7.1. The proper officer, who is normally the CCDC[1] of the local authority where the patient is, must be formally notified by the admitting physician of suspected or confirmed VHF cases. Patients in the moderate and high risk categories should be notified as suspected cases. Occupationally caused cases of VHF are notifiable under the Reporting of Incidents, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR).

### Initial action by CCDC

7.2 If a moderate or high risk category patient or a confirmed case has been reported, the CCDC should convene an incident/outbreak control group to take responsibility for ensuring that the measures recommended in the full ACDP guidance are implemented correctly.

### Identification of contacts

#### Close contacts

7.3 Only close personal contacts of a patient with VHF, or with that patient's body fluids, are at risk of contracting the disease. Those incubating the infection are not infectious before the onset of symptoms. For surveillance purposes, close contacts are defined as those who, after the time of onset of the patient's illness:

- had direct contact with the patient's blood, urine or secretions, or with clothing, bedding or other fomites soiled by the patient's blood, urine or secretions (not including saliva);
- cared for the patient or handled specimens from the patient - for example, household members, nurses, laboratory staff, ambulance crew, doctors or other staff;
- had direct contact with the body of a person who had died of viral haemorrhagic fever, either proven or in high or moderate risk categories, before the coffin was sealed;
- had direct contact with an animal infected with VHF, its blood, body fluids, or corpse.

#### Surveillance

7.4 It is the responsibility of the CCDC to ensure that all close contacts are identified and that surveillance is undertaken. All close contacts of a high risk or confirmed case should be kept under daily surveillance for a period of 21 days from the last possible date of exposure to infection. There need be no restriction on work or movement within the UK but the contact's temperature should be recorded daily and enquiry made about the presence of any suspicious symptoms.

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[1]The guidance refers to the employment titles and institutions of England. Other parts of the UK have some variation in designation e g the term Consultant in Communicable Disease Control (CCDC) is generally equivalent to Consultant in Public Health Medicine (CPHM) in Scotland, while the Communicable Disease Surveillance Centre (CDSC) is equivalent to the Scottish Centre for Infection and Environmental Health (SCIEH)

7.5 During surveillance those suffering any rise of temperature above 38°C should be kept under observation at home and, if fever persists for more than 24 hours, advice should be sought from a consultant in infectious or tropical diseases regarding the need for admission to an isolation unit. The Department of Health should be informed about any such decision.

Other contacts of moderate risk/high risk or confirmed cases

7.6 When contact with a VHF patient has not been close, the risk of infection is minimal. Therefore there is no need to trace and/or follow up contacts who are not in the four categories listed above. This includes persons who had shared public transport with the patient, or had social contact only. Where there is uncertainty and, where contact with body fluids is unlikely but cannot be ruled out, it may be necessary to identify such individuals and question them about their exposure. If daily surveillance appears unnecessary, they should be advised to consult their own doctor if they feel unwell within 21 days since their last possible exposure to infection.

**Suspected cases arriving in the UK**

7.7. If a case of suspected VHF is notified to a Port Health Authority, or the Port Medical Officer has reason to suspect VHF in a crew member or passenger of an aircraft or ship, assessment and transfer to appropriate isolation facilities should be carried out in the same manner as if the patient were already in the country. The powers provided by the Public Health (Aircraft) Regulations 1979 or the Public Health (Ships) Regulations 1979 should be used if necessary. The patient should then be assessed, categorised and managed as described earlier in the booklet.

**Appendix**

## High Security Infectious Disease Units and Laboratories:

### High Security Infectious Disease Units and Patient Management Laboratories:

**Coppetts Wood Hospital,**
North London
**Tel: 0181 883 9792**

**Newcastle General Hospital,**
Newcastle
**Tel: 0191 273 8811**

### High Security Infectious Disease Viral Diagnostics Laboratories:

**Public Health Laboratory Service (PHLS) Virus Reference Division,**
Central Public Health Laboratory,
Colindale Avenue,
London NW9 5HT
**Tel: 0181 200 4400**

**Centre for Applied Microbiology and Research (CAMR),**
Porton Down,
Salisbury SP4 0JG
**Tel: 01980 612100**

## Details of local contacts:

**Consultant in Communicable Disease Control:**

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**Consultant in charge at infectious disease hospital:**

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