



Public Health
England

Managing cases of “suspected Ebola”

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Learning Objectives

To recognise credible risk factors for Ebola

To consider the differential diagnosis of Ebola

The importance of treating the patient in a timely fashion

For the disease they actually have, including empirical therapy

How to arrive at the correct diagnosis

And what to do while you wait for the patient and carers

How to protect health care workers at risk of exposure

How to manage the overall public health response

In a proportionate manner

Managing political expectation

Managing concerns in other colleagues



Principal features of disease

Ebola

Fever, sore throat

Diarrhoea

Vomiting

Haemorrhage

Sepsis picture

Low wbc & platelets

And....

Meningococcal disease

Enteric infections

Malaria

Leptospirosis

Dengue.....

Rickettsia.....

Not very unique!



Obvious bleeding



Ebolu – Gulu c/o Gail Carson



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Ebola, Sudan



Key prognostic factors

CT at presentation: poor if less than 20

Hypocalcaemia

Renal failure

Anaemia

Concurrent malaria

Basic electrolyte measurement, Full Blood Count & correction of abnormal findings improve survival

Experimental treatment used includes monoclonal antibodies





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Ebola transmission

Blood

Parenteral, needles, scratches,
conjunctiva

Urine & Diarrhoea

Splashes, ? Aerosol risk

Handling bodies/funeral rites

Semen

May persist for months eg
Marburg, Ebola

Aerosol

Mostly theoretical

Concerns – Renton strain Ebola





WHO case definition

Suspected case

- a. Any person, alive or dead, suffering or having suffered from a sudden onset of high fever and having had contact with:
- a suspected, probable or confirmed Ebola case;
 - a dead or sick animal
- b. Any person with sudden onset of high fever and at least three of the following symptoms:
- headaches - lethargy
 - anorexia / loss of appetite - aching muscles or joints
 - stomach pain - difficulty swallowing
 - vomiting - difficulty breathing
 - diarrhoea - hiccups; **OR**
- c. Any person with inexplicable bleeding; **OR**
- d. Any sudden, inexplicable death





The African visitor from Makeni

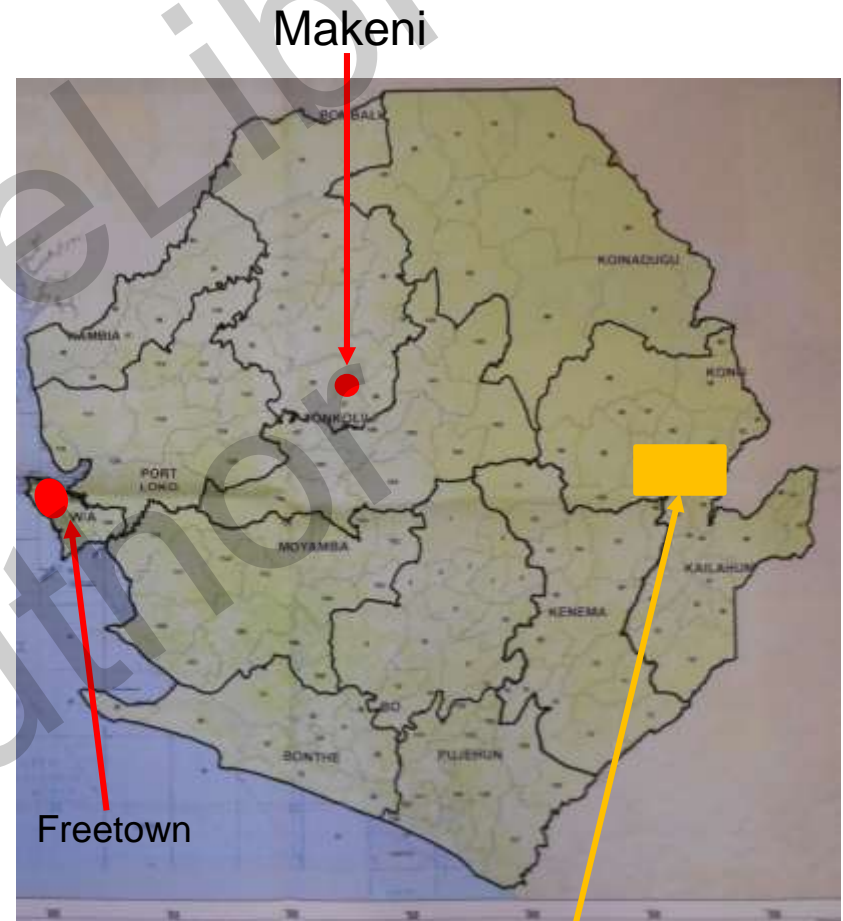
45 year old man appears in
Emergency Room in your local
General Hospital

African origin, resident in your area

Feels unwell with fever and sweats

What else do you need to know at this
stage?

Sierra Leone



Unconfirmed reports of a VHF like illness
last week

Makeni at sunset





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Further information

Wealthy businessman visiting family

Modern block-built house

Air conditioning, water & septic tank drainage

Ate at home or in restaurants

Dressed in local casual style

Exposure history

No funerals

No contact with dead bodies

No contact at with sick people

Did not handle raw meat

Did wash car in local river





What do you advise the ER doctor?

What should you do with the patient?

Any specific questions you should ask?

What should the staff do?

What laboratory tests should you request?

What is the risk to staff:

In the Emergency Room?

In the lab?

Whom should you inform (if anybody) at this stage?





Additional history & immediate action

Travel dates

Malarial prophylaxis

Full symptoms including

Diarrhoea / Vomiting

Bruising/Bleeding

Abdominal pain

Localising symptoms

Disease progression

Patient in separate cubicle

Full PPE if incontinent of body fluids

Samples for diagnosis/other investigations

Plan admission of patient: where?



Poller et al Journal of Infection 2018



Laboratory tests

Malaria rapid test and/or film*

Full blood count & platelets*

Clotting screen (PT & APTT) *

Urea (BUN) & electrolytes *

Liver Function tests *

Blood Cultures *

EDTA, urine, serum for VHF tests

Where will you send these?

Turn-around time?

semper accipere urina



*These can be done in a modern automated laboratory, but many labs will refuse.....



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Since 2012... Imported Fever Service

National specialist
diagnostic and clinical
advice for imported fevers

Serves hospital-based
Infection specialists

PHE Porton Rare &
Imported Pathogens
Laboratory (RIPL)

In collaboration with the
Hospital for Tropical
Diseases (London) and
Tropical Infectious
Diseases Unit (Liverpool)

Local team call
Fever Service

Answered by
Trainee or
Consultant
(24/7, 365)

Case details
taken

Advice given:
clinical,
infection control,
diagnostics

Local team
called with
results & clinical
feedback



0844 77 88 990

Diagnostics

- 'Panel testing'

Clinical

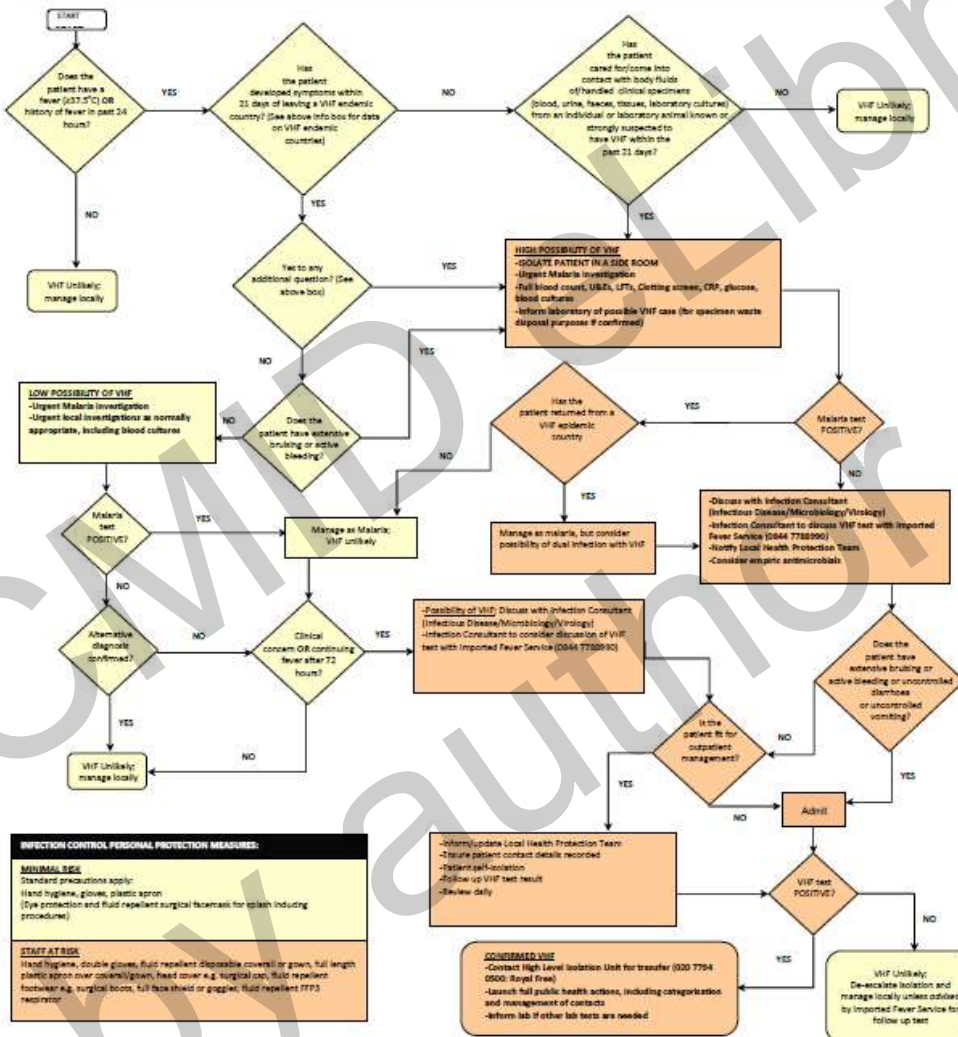
- Case discussed within FS clinical network



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VHF ENDEMIC COUNTRIES
 Information on VHF endemic countries can be found at <https://www.gov.uk/viral-haemorrhagic-fevers-origin-precursors-transmission-and-guidance> or see VHF in Africa map at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/365645/VHF_Africa_950_640.png

ADDITIONAL QUESTIONS
 -Has the patient travelled to any area where there is a current VHF outbreak? (<http://www.promedmail.org/>) OR
 -Has the patient lived or worked in basic rural conditions in an area where Lassa Fever is endemic? (<https://www.gov.uk/viral-haemorrhagic-fevers-origin-precursors-transmission-and-guidance>) OR
 -Has the patient visited caves / mines, or had contact with or eaten primates, antelopes or bats in a Marburg / Ebola endemic area? (<https://www.gov.uk/ebola-and-marburg-haemorrhagic-fevers-outbreaks-and-case-locations>) OR
 -Has the patient travelled in an area where Crimean-Congo Haemorrhagic Fever is endemic (<http://www.afpa.int/afpa/Default.aspx?tabid=20080913engPage1>) AND sustained a tick bite* or crushed a tick with their bare hands OR had close involvement with animal slaughter? (*If an obvious alternative diagnosis has been made e.g. tick typhus, then manage locally)



INFECTION CONTROL PERSONAL PROTECTION MEASURES:

MINIMAL RISK
 Standard precautions apply:
 Hand hygiene, gloves, plastic apron
 (Eye protection and fluid repellent surgical facemask for splash inducing procedure)

STAFF AT RISK
 Hand hygiene, double gloves, fluid repellent disposable coverall or gown, full length plastic apron over coverall/gown, head cover e.g. surgical cap, fluid repellent footwear e.g. surgical boots, full face shield or goggles, fluid repellent PPE3 respirator



Results on this patient

Full blood count

Hb 120 (male 140-160), WCC 14.3 (5-11), Neutrophils 11.2
Platelets 35 (120-400)

Urea & Electrolytes

Raised urea, creatinine, sodium and potassium upper limit normal

Liver function

Raised ALT and small rise in ALP, raised bilirubin

VHF panel PCR tests

Lassa, Ebola, Marburg, CCHF, RVF, Dengue, Chikungunya PCR negative
Malaria PCR negative

Leptospirosis PCR POSITIVE in urine and EDTA, EDTA CT 18.2

What would you do next?

What would you do if malaria film and PCR were positive?

What do you need to UNDO if anything?

Case 2



Distribution of EVD cases by place of residence as of 11 February 2019 (n = 101)

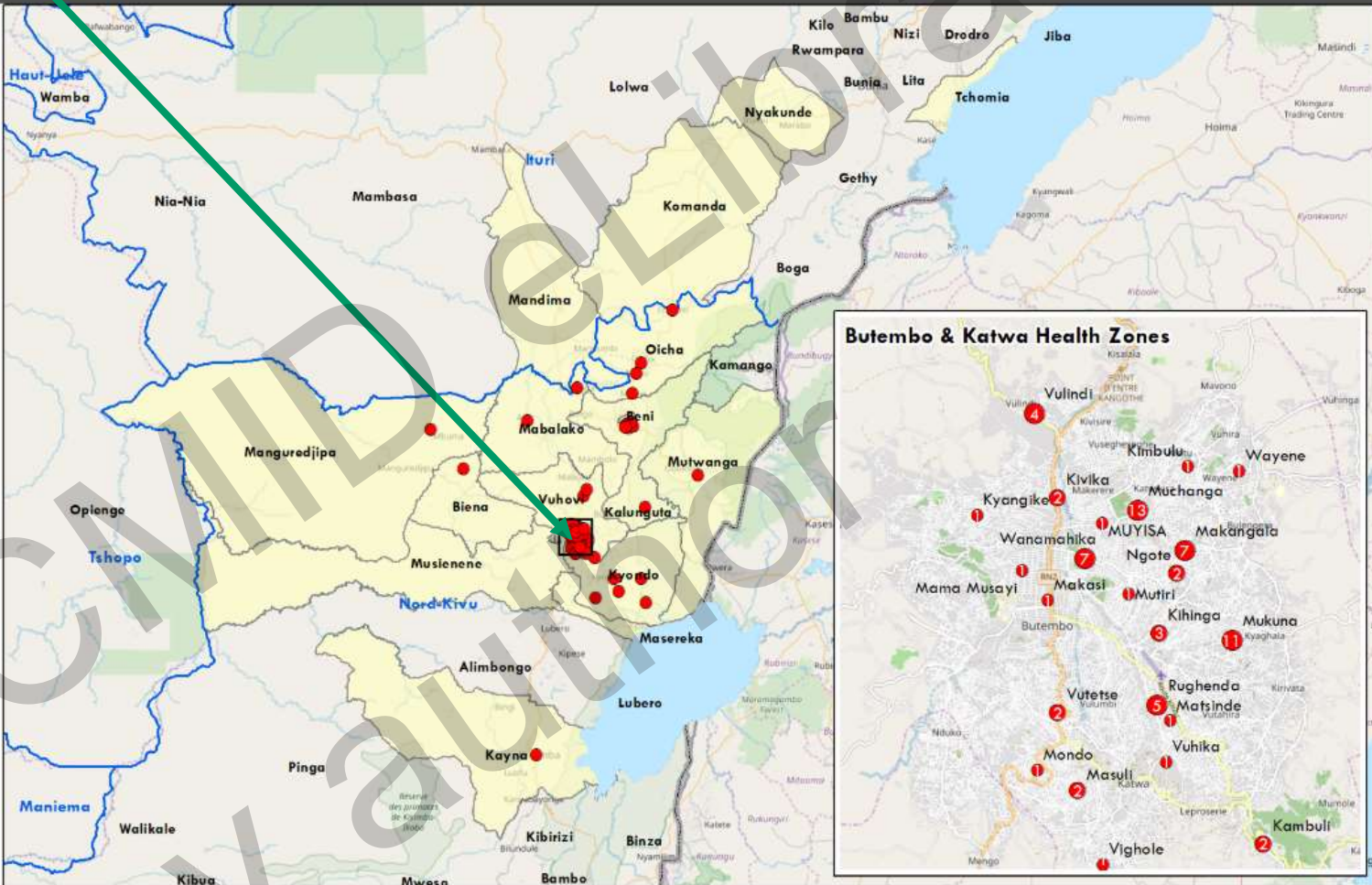


Number of confirmed and probable cases reported in the last 21 days (22 January - 11 February 2019)

- 1
- 2 - 3
- ≥ 4

- Health Zone reporting confirmed or probable cases
- Province
- National boundary

* Circles on the map represent the approximate locations of cases based on the village of residence. Cases with invalid village names or village names that could not be identified have been mapped by health area.



Data Source: World Health Organization, The Ministry of Health Democratic Republic of the Congo, OpenStreetMap
Map Production: WHO Health Emergencies Programme



The boundaries and names shown on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

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Case 2

39 year old nurse returning from DRC

Working in a treatment centre in Muyisa

Wore PPE to nurse patients with suspected/confirmed Ebola

No known breaches of PPE

Arrived in your hospital ER this morning from airport

Returned by plane from Kinshasa

Kinshasa to Brussels on Brussels Airlines

Brussels to Amsterdam on KLM

Schiphol to City on train

Became unwell on plane with vomiting and diarrhoea

Not clear if this was entirely in the lavatory



In Emergency Room

Patient waited 15 minutes in open area until seen

Findings

Unwell for 24 hours, fever, rigors, diarrhoea and vomiting

Had taken malarone for malarial prophylaxis

Now barely able to stand

Temperature 38 C, pulse 120, tender abdomen

Senior doctor called

Patient isolated immediately, PPE donned

Malaria rapid test ordered, blood sent to lab, not processed

No other treatment or support offered at this stage



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Samples sent for VHF screen: What next?

Results: Ebola PCR positive CT 18

Who should you inform and when?

Where will the patient be managed?

What treatment should be offered?

What contact tracing is needed?

Who should do this?

What prophylaxis can be offered to anybody exposed to her body fluids?

What do you tell the Press and Media





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Contact treatment



Post-exposure prophylaxis against Ebola virus disease with experimental antiviral agents: a case-series of health-care workers

Michael Jacobs, Emma Aarons, Sanjay Bhagani, Ruairidh Buchanan, Ian Cropley, Susan Hopkins, Rebecca Lester, Daniel Martin, Neal Marshall, Stephen Mepham, Simon Warren, Alison Rodger

Summary

Background Although a few international health-care workers who have assisted in the current Ebola outbreak in west Africa have been medically evacuated for treatment of Ebola virus disease, more commonly they were evacuated after potential accidental exposure to Ebola virus. An urgent need exists for a consensus about the risk assessment of Ebola virus transmission after accidental exposure, and to investigate the use of post-exposure prophylaxis (PEP). Experimental vaccines have occasionally been used for Ebola PEP, but newly developed experimental antiviral agents have potential advantages. Here, we describe a new method for risk assessment and management of health-care workers potentially exposed to Ebola virus and report the use of experimental antiviral therapies for Ebola PEP in people.

Lancet Infect Dis 2015;
15: 1300-04

Published Online
August 26, 2015

[http://dx.doi.org/10.1016/S1473-3099\(15\)00228-5](http://dx.doi.org/10.1016/S1473-3099(15)00228-5)

See [Comment](#) page 1248

Department of Infection

Dependent on risk: favipiravir orally ± Zmab for very high risk
Nil & observe for minimal/low risk patients

You MUST assess each risk individually



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Management of patient



Evidence-based guidelines for supportive care of patients with Ebola virus disease

François Lamontagne, Robert A Fowler, Neill K Adhikari, Srinivas Murthy, David M Brett-Major, Michael Jacobs, Timothy M Uyeki, Constanza Vallenias, Susan L Norris, William A Fischer 2nd, Thomas E Fletcher, Adam C Levine, Paul Reed, Daniel G Bausch, Sandy Gove, Andrew Hall, Susan Shepherd, Reed A Siemieniuk, Marie-Claude Lamah, Rashida Kamara, Phiona Nakyeeyune, Moses J Soka, Ama Edwin, Afeez A Hazzan, Shevin T Jacob, Mubarak Mustafa Elkarsany, Takuya Adachi, Lynda Benhadj, Christophe Clément, Ian Crozier, Armando Garcia, Steven J Hoffman, Gordon H Guyatt

Lancet 2018; 391: 700–08

Published Online

October 17, 2017

[http://dx.doi.org/10.1016/S0140-6736\(17\)31795-6](http://dx.doi.org/10.1016/S0140-6736(17)31795-6)

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The 2013–16 Ebola virus disease outbreak in west Africa was associated with unprecedented challenges in the provision of care to patients with Ebola virus disease, including absence of pre-existing isolation and treatment facilities, patients' reluctance to present for medical care, and limitations in the provision of supportive medical care. Case fatality rates in west Africa were initially greater than 70%, but decreased with improvements in supportive care. To inform optimal care in a future outbreak of Ebola virus disease, we employed the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) methodology to develop evidence-based guidelines for the delivery of supportive care to patients admitted to Ebola treatment units. Key recommendations include administration of oral and, as necessary, intravenous hydration; systematic monitoring of vital signs and volume status; availability of key biochemical testing; adequate staffing ratios; and availability of analgesics, including opioids, for pain relief.

Rapid correction of physiological abnormalities is key
Use empiric treatment for common diseases e.g. artesunate,
ceftriaxone, doxycycline



What do most ? Ebola actually have

FALCIPARUM MALARIA

Shigellosis or other enteric disease

Leptospirosis

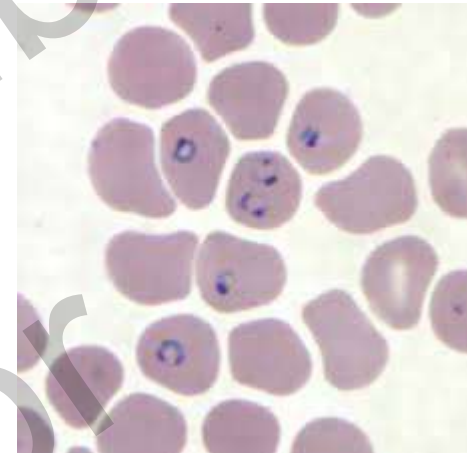
Rickettsia

Other sepsis bacteria

Dengue

Lassa

CCHF.....



CDC



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Who does what?

Always involved

Hospital ER & ID team
Hospital Medical
Microbiologist/virologist
Specialist laboratory and advice team

May lead on to

Specialist specimen transport
Emergency services or contractor
Referral to specialist ID unit

When required

Local Public Health
Contact tracing, local press
National referral hospital team
Specialist care
Infection Control teams
Decontamination teams
National Public Health
Policy and national advice
Health Ministry and & Government

For deliberate release:

Police
Home Office/Affairs Ministry
Military and specialist teams



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Summary

Always take a full history

Isolate suspects while you make a diagnosis

Use PPE if they are “Wet Cases”

Always RULE in diagnoses as well as rule out

TRAET the patient

- Offer empiric therapy

- Start supportive therapy

Don't tell everyone unless you have anything useful to say, or they can help

Do thorough contact tracing

Have Press lines ready very early when you know there is a case....

& *semper accipere urina* or you'll miss something sooner or later...