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**ADMINISTRATIVE ORDER**

No. 2005-0021

**SUBJECT: Guidelines on the management and control of meningococcal disease**

**I. BACKGROUND**

Meningococcemia or the septicemic form of the disease is one of the 16 diseases targeted by the National Epidemic Sentinel Surveillance System (NESSS), which is based on 200 sentinel hospitals all over the country. An average of 100 meningococcemia cases is reported every year, without seasonal variation.

The largest recorded outbreak of meningococcal disease in the Philippines started at the end of September 2004 in the Cordillera Administrative Region. The epidemic strain was serogroup A, sequence type 7. Over 150 cases and 40 deaths were identified by the end of February 2005. The unexpected and unusual increase of meningococcal disease caused public anxiety and brought serious effects on the economy. Meningococcemia, the septicemic form of meningococcal disease led to severe disease and death to at least 50% of cases in the early stage of the outbreak.

Meningococcal disease is caused by *Neisseria meningitidis*, a Gram-negative diplococcus. Of the 13 serogroups of *N. meningitidis*, most disease is due to serogroups A, B, C, Y, and W-135.

The bacteria spread from an infected carrier to another person and is transmitted by droplets or secretions from the upper respiratory tract. The bacteria are very fragile and do not survive in natural conditions outside the human body. *N. meningitidis* is a normal inhabitant of the human nasopharynx and carriage of meningococci is relatively common. Increased rates of meningococcal carriage have been observed in smokers, overcrowded households, and military recruits.

Meningococcal disease usually presents as meningitis or septicemia, or a combination of the two. Septicemia, with or without meningitis, can be particularly severe and has considerably greater mortality than meningococcal meningitis. Meningococcal septicemia (also known as meningococcemia) can have a fulminant and rapidly fatal course which causes meningococcal disease.

Severe skin lesions may lead to gangrene and limb amputation. In the severe form of the disease, fulminant septicemia, the patient's condition deteriorates very rapidly with circulatory shock and may die within 24 hours.

## **II. STATEMENT/DECLARATION OF POLICY**

1. To reduce the fatality of meningococemia, immediate treatment with antibiotics should be instituted and all health facilities should have standby stocks of benzyl penicillin for immediate treatment of meningococemia.
2. All health facilities should immediately report any suspect case of meningococcal disease so that public health measures are carried out to prevent its spread.
3. Tracing and chemoprophylaxis of contacts of patients should be carried out as soon as notified.
4. Routine vaccination against meningococcal disease is not recommended.
5. Decision on vaccination against meningococcal disease shall be based on the attack rate, fatality, age group affected.
6. A system and network for surveillance and reporting of meningococcal disease from the local level shall be developed and strengthened.
7. A mechanism for disseminating information on the management and control of meningococcal diseases to government and private health workers shall be established.
8. Support from and collaboration among government, non-government and private organizations shall be sought for the dissemination of this guidelines.
9. This management policy shall be subject to continuing review and evaluation by technical experts.

## **III. OBJECTIVES**

### **A. General Objective:**

To reduce mortality and morbidity due to meningococcal disease.

### **B. Specific Objective**

1. To ensure early recognition and early treatment of meningococcal disease.
2. To ensure appropriate management of meningococcal disease in the hospital setting by providing a standard set of guidelines.
3. To provide guidance for surveillance of meningococcal disease and for laboratory diagnosis of cases.
4. To provide a common definition of terms and to identify the appropriate prevention and control measures.

## **IV. SCOPE OR SPHERE OF APPLICATION**

This Administrative Order shall serve as a reference for public health managers, health care workers and other interested groups and stakeholders for common understanding of terminologies and public health responses to effectively control meningococcal disease outbreaks.

## **V. IMPLEMENTING GUIDELINES**

## A. Case Definitions

For routine surveillance, cases should be classified as “suspect”, and “confirmed.”

### 1. Suspect case

Acute fever AND at least one of the following:

- a. hemorrhagic rash (e.g., petechia or purpura)
- b. meningeal signs (e.g., nuchal rigidity or stiff neck)

AND at least one of the following:

- c. clinical diagnosis of meningococcal disease
- d. Gram negative diplococci from CSF or blood

### 2. Confirmed Case

Suspect case and

- a. isolation of *N. meningitidis* from a sterile site (CSF, blood) or
- b. positive test for *N. meningitidis* DNA from a sterile site (CSF, blood)

## B. Early recognition and treatment, mode of administration and transfer to hospital

Both the public and health care professionals should be educated and informed about the mode of transmission, importance of chemoprophylaxis and **early** recognition, **prompt** treatment and admission/referral to a hospital. Any delay increases the risk of death.

### 1. Early recognition

- a. After an incubation period of 3-5 days, up to 10 days, signs and symptoms of meningococcal disease include fever, weakness, joint and muscle pains. The most characteristic feature of meningococcal septicemia is a hemorrhagic (petechial or purpuric) rash that does not blanch under pressure. **A hemorrhagic rash does not disappear when a glass is pressed on to it (glass test).** However, a rash is not always present, especially in the early stages. In the early stage of development the rash may blanch with pressure thus resembling a viral exanthem. The rash can appear rapidly on any part of the body including the palms and soles. Petechial rashes are usually discrete, 1 to 2 mm lesions that may proceed to form larger ecchymotic lesions.

Meningitis may occur with or without signs of septicemia. The patient with meningococcal meningitis develops stiff neck, convulsions, delirium, altered mental status and vomiting.

- b. Physicians and other health care workers should ensure that an acutely unwell patient with a systemic febrile illness is completely undressed with measures to ensure modesty and privacy so that a thorough search for a hemorrhagic rash can be undertaken.
- c. Because not all patients with meningococcal disease have a rash, especially in the early stages, physicians should ensure that a patient with a systemic febrile illness, particularly a child, be promptly reassessed.

### 2. Early treatment

a. Early administration of benzylpenicillin to suspected cases of meningococcal septicemia has been shown to reduce mortality in three retrospective studies in England. Those not given parenteral penicillin before hospital admission were 2-times more likely to die than those given penicillin. The greatest benefit of parenteral penicillin was seen in those who were most ill, i.e. those with a hemorrhagic rash.

b. Benzylpenicillin or aqueous penicillin should be given intravenously, if this is not feasible the intramuscular route may be used.

c. **Dosage:**

Initial doses of benzylpenicillin for suspected cases of meningococcal disease:

|                 | Doses             |
|-----------------|-------------------|
| <b>Children</b> |                   |
| < 1 year        | 500,000 units (u) |
| 1– 9 years      | 1 M u             |
| ≥10 years       | 2 M u             |
| Adult           | 2 M u             |

d. If penicillin is not available, chloramphenicol or ceftriaxone may be given :

**Chloramphenicol**

|                 | Doses        |
|-----------------|--------------|
| <b>Children</b> | 25mg/kg/dose |
| <b>Adult</b>    | 1 gram IM    |

**Or Ceftriaxone**

|                 | Doses      |
|-----------------|------------|
| <b>Children</b> | 50mg/kg IM |
| <b>Adult</b>    | 1 gram IM  |

e. Benzylpenicillin should be available in the local health centers to patients suspected of having the disease prior to transfer and referral to the hospital. Physicians and nurses should be ready to administer the drug to suspected cases.

f. Penicillin should be withheld **only** if an individual gives a history of either an anaphylactic or an immediate hypersensitivity reaction (such as difficulty in breathing, angioedema, generalized urticarial rash) after a previous dose of penicillin.

g. Blood should be drawn and should be sent to the hospital for culture.

As much as possible, blood for culture should be obtained prior to administration of antibiotics, but obtaining samples should not delay initiation of antibiotic therapy.

### **3. Transfer to Hospital**

- a. Health workers should refer and transfer patient to the appropriate hospital immediately. If patient is critically ill, a health worker, preferably a physician, should accompany the patient.
- b. Any of the following signs and symptoms present will warrant immediate transfer:
  - a hemorrhagic rash;
  - changes in level of consciousness;
  - signs of meningeal irritation;
  - patient is a close contact of a diagnosed case of meningococcal disease even if the current patient received chemoprophylaxis.
- c. The hospital where the patient is to be transferred should be informed ahead of time. The Provincial or City Health Office or RESU should be informed of the case so that contact tracing can be immediately initiated.

### **C. Clinical Management in the Hospital Setting**

The clinical management of meningococcal disease consists of the following:  
1) Diagnostic work-up 2) Use of Antibiotics 3) Supportive therapy and 4) Chemo-prophylaxis

#### **1. Diagnostic work-up**

- a. Routine examination
  - CBC typing with platelet count
  - Blood culture
  - Gram stain of CSF
  - CSF qualitative and quantitative analysis
  - Culture of blood and CSF
- b. As much as possible, blood culture should be obtained prior to administration of antibiotics, but obtaining samples should not delay initiation of antibiotic therapy.
- c. A lumbar puncture should be performed if the patient is stable. For patients who are unstable or have clinical manifestations of coagulopathy, the lumbar puncture may be deferred. CSF obtained after initiation of antibiotic therapy may be sterile but pleocytosis will be evident.

#### **2. Antibiotics**

- a. The use of antibiotics has significantly altered the prognosis of meningococcal disease. With appropriate antimicrobial therapy, the expected mortality is about 8 – 10%. Prompt institution of antibiotic therapy for suspected meningococcal infection is life saving.

- b. Appropriate and effective management of meningococcal infection demand early intervention, effective antibiotic therapy and early recognition of the problems of DIC, shock, heart failure, prolonged mental obtundation, pericarditis and pneumonia.
- c. Penicillin G remains as the drug of choice  
Dose: 250,000 U/kg/day, maximum of 12 M units/day given every 4-6 hours

Penicillin therapy however does not eradicate the carrier state. Patients treated with penicillin should be given prophylaxis prior to discharge to avoid reintroduction of the organism in the household or community in general.

d. Alternative Agents

- **Chloramphenicol** – is an alternative choice for penicillin for patients hypersensitive to penicillin  
**Dose:** 75 – 100 mg/ kg /day, maximum of 2 g/day given in 4 divided doses
- Third generation cephalosporins have been successful in the treatment of meningococcal infections. They may be used in cases of penicillin resistance.
  - > **Ceftriaxone** : 75 – 100 mg/ kg/day, maximum of 4 g/day given in 1-2 divided doses.
  - > **Cefotaxime**: 200 mg/kg/day, maximum of 8 g/day
- Ceftriaxone (or Cefotaxime) can eliminate the nasopharyngeal carrier state; therefore there is no need to give prophylaxis prior to discharge to patients treated with ceftriaxone or cefotaxime.

**Summary of Antimicrobial therapy**

| Antibiotic        | Treatment   |
|-------------------|---|
| Benzyl Penicillin | Child: 250,000 u/kg/day,<br>Maximum 12 million u/day<br>Adult: 1.8 g IV every 4 hours<br>To be given in 4 divided doses for 7-10 days |
| Ceftriaxone       | Child: 75 – 100 mg/kg/day<br>Maximum 4gm/day<br>Adult: 2 or 4g IV<br>To be given in 1 or 2 doses for 7 – 10 days                      |
| Cefotaxime        | Child: 200 mg/kg/day<br>Maximum 8g/day<br>Adult: 2g IV<br>To be given IV every 6 hours for 7 days                                     |
| Chloramphenicol   | Child: 75 – 100 mg/kg/day<br>Maximum 2 gm/day<br>Adult: 500 mg/dose<br>To be given IV every 6 hours for 7-10 days                     |

### 3. Supportive Therapy

In addition to antibiotics, other therapy should be given where medically appropriate. Patients with coagulopathy or disseminated intravascular coagulation (DIC) or with central nervous system (CNS) manifestations may require high-level

maintenance of blood pressure and tissue perfusion and management of cerebral edema.

a. Administer O<sub>2</sub> if necessary, in cases of signs and symptoms of hypoxia, DIC or coagulopathy, or heart failure which manifest as the following:

- Hypoxia – tachypnea, exertional dyspnea, mood changes, headache, hypertension or hypotension, hyperpnea, cyanosis, polycythemia, dimness of vision, somnolence, stupor, coma
- DIC or coagulopathy – thrombocytopenia, prolonged prothrombin time and partial thromboplastin time, decreased fibrinogen, presence of fibrin split products, presence of fragmented red blood cells in peripheral blood smear
- Heart failure – tachypnea, tachycardia, easy fatigability, dyspnea, neck vein engorgement, cardiomegaly, etc.

b. Insert IV fluids – D5LRS, D5 0.9 NaCl or Plain LRS

c. Use of steroids remains controversial. Studies failed to demonstrate a beneficial effect in meningococcal infection

d. The problem of DIC is ominous however Heparin treatment is not indicated

e. Fluid replacement

- Give IVF: Crystalloids – Plain LRS or Plain 0.9 NSS at 10–30 ml/KBW IV bolus in < 20 mins
- If there is NO improvement, give colloids (Dextran, Haemacel, Haes- Steril) if available, at 10 ml/KBW in < 20 mins
- If with improvement, maintain on D5LRS alternating with D51MB or D5 0.3NaCl
- Blood transfusion if with active bleeding
  - > Give fresh frozen plasma at 15 ml/KBW if with prolonged PTT (20 seconds above the control or 2 times the control); or patient has impending shock despite crystalloid infusion in the absence of colloids
  - > May give platelet concentrate (1 unit/ 7 KBW) or cryoprecipitate (1 unit/ 5 KBW) if with signs of DIC
  - > Give packed red blood cells (10 ml/KBW) when blood loss is < 25% of the blood volume
  - > Give whole blood (20 ml/KBW) when there is gross bleeding or significant blood loss (>10% blood loss in adults or >25% blood loss in pediatrics of total blood volume at 80 ml/kg)

f. Adult Respiratory Distress Syndrome

- May require intubation

g. Patient with fulminant infection requires admission and best be managed in the ICU

#### **D. Chemoprophylaxis**

The goal of chemoprophylaxis is to prevent transmission of meningococci from carrier to individuals who are susceptible to invasive disease and to prevent disease in newly colonized individuals. It is essential that all contacts be treated immediately and concurrently, otherwise untreated carriers could infect contacts who have already completed prophylaxis.

*N. meningitidis* is known to spread from person to person and cause epidemics. The mode of transmission is via direct contact with respiratory droplets or secretions (coughing or sneezing).

The goal of antibiotic chemoprophylaxis is to prevent transmission of meningococci from carrier to individuals who are susceptible to invasive disease and to prevent disease in newly colonized individuals. It is essential that all contacts be treated immediately and concurrently, otherwise untreated carriers could infect contacts who have already completed prophylaxis.

### **1. Indications for chemoprophylaxis**

- a. Household contact of an index case
- b. Young daycare center contacts
- c. Persons who have had significant contact with the oral/nasal secretions of an index case
- d. Health Care Workers who have had intimate exposure to nasopharyngeal secretions (e.g., mouth to mouth resuscitation; intubation).

Most public health authorities recommend that persons in contact with the patient for as long as 7 days before the onset of illness be considered for prophylaxis. Index patients should receive chemoprophylaxis before discharge unless they have been treated with ceftriaxone (or cefotaxime).

### **2. Disease Risk for Contacts of Individuals with Meningococcal Disease**

#### **High risk: Chemoprophylaxis recommended (close contact)**

- a. Household contact; especially young children
- b. Child care or nursery school contact during 7 days before onset of illness
- c. Direct exposure to index patient's secretions through kissing or through sharing toothbrushes or eating utensils, markers of close social contact during 7 days before onset of illness
- d. Mouth-to-mouth resuscitation, unprotected contact during endotracheal intubations during 7 days before onset of illness
- e. Frequently slept or ate in same dwelling as index patients during 7 days before onset of illness

#### **Low risk: Chemoprophylaxis not recommended**

- a. Casual contact: no history of direct exposure to index patient's oral secretions (e.g., school or work mate)
- b. Indirect contact: only contact is with a high-risk contact, no direct contact with the index patient
- c. Health care professionals without direct exposure to patient's oral secretions.

#### **In outbreak or cluster**

- a. Chemoprophylaxis for people other than those at high risk should be administered only after consultation with the local public health authorities

### **3. Recommended chemoprophylaxis Regimens for High-Risk contacts and people with invasive meningococcal disease**



| Age of Infants, Children and Adults        | Dose   | Duration                       | Precautions  |
|--|--|--------------------------------|--|
| <b>Rifampicin</b><br>≤ 1 mo<br><br>> 1 mo  | 5 mg/kg, orally every 12 hour<br>10 mg/kg (maximum 600 mg), orally every 12 hour | 2 days<br><br>2 days           | May interfere with efficacy of oral contraceptives & some seizure prevention and anticoagulant medications; may stain soft contact lenses. |
| <b>Ceftriaxone</b><br>≤ 15 y<br><br>> 15 y | 125 mg, intramuscularly<br><br>250 mg., intramuscularly                          | Single dose<br><br>Single dose | To decrease pain at injection site, dilute with 1% lidocaine   |
| <b>Ciprofloxacin</b><br>≥ 18 y             | 500 mg, orally   | Single dose                    | Not recommended for people < 18 years of age   |

## E. Laboratory Diagnosis

(See Annex for details on laboratory processing, referral and reporting)

### 1. Collection of Samples

- Samples should be collected by the attending physician at the time of admission, before antibiotic therapy is started and should always be transported and analyzed immediately at room temperature.
- All samples must be handled in sterile conditions and consequently, must be sent to the bacteriology laboratory first.

- Blood (for all cases)

**Adult:** Extract 10 ml blood. Inoculate 4 mL in BHI broth (2 mL each in 2 “20 ml BHI broth)

**Child:** Extract 8 mL blood. Inoculate 2 mL in a “20 ml BHI broth”.

**Plain tube:** 3 mL ( acute sera) upon admission  
3 mL (convalescent sera) before discharge

**EDTA tube:** 3 mL (part will be used for CBC and platelet count)

**Note:** Among the above, BHI broth is the highest priority.

- Cerebrospinal Fluid (CSF)

Collect 2 mL CSF if clinical signs suggest meningitis (in addition to the blood samples) into 3 sterile tubes/vials labeled 1, 2, and 3.

- Post mortem samples (CSF or blood) can be tested but must be collected as soon as possible.

## **2. Transport to the Laboratory after Collection**

- a. Specimen, particularly cerebrospinal fluid, should always be transported immediately to the laboratory at room temperature.
- b. Proper handling should be observed to avoid breakage and hazard of infection. Consequently, sample delivery to the laboratory should be done by hospital personnel and not entrusted to the watcher or family of patient, to avoid delay.

## **3. Recording**

- a. A laboratory form for the specimen should also be filled up by the medical technologists for completeness of data.
- b. The specimen is processed (Annex A) and a copy of the initial laboratory results should be provided immediately to the admitting physician and the PESU/CESU.
- c. All specimens of suspect meningococcal disease cases should be sent to the Research Institute for Tropical Medicine (RITM). A copy of the laboratory results should be sent to the referring hospital and to the RESU.

## **F. Infection Control**

1. In addition to standard precautions, droplet precautions are recommended until 24 hours after initiation of therapy.
2. Hospital personnel are rarely at risk even when caring for patients, thus, only those with intimate exposure to nasopharyngeal secretions (mouth to mouth resuscitation) or unprotected exposure during endotracheal intubation warrants chemoprophylaxis.

## **G. Surveillance**

1. The objectives of disease surveillance are:
  - a. To ensure prompt identification and appropriate management of cases;
  - b. To ensure prompt identification of all relevant contacts to enable the institution of appropriate public health responses;
  - c. To ensure the prompt identification of outbreaks of invasive meningococcal disease to enable the rapid institution of control measures;
  - d. To enable the monitoring of changes in the epidemiology of the disease in relation to serogroup, serotype and antibiotic susceptibility; and
  - e. To monitor the effectiveness of current control measures and provides evidence for further review of national guidelines.
2. Exposure Classification
  - a. Primary Case  
A case that occurs in the absence of previous known close contact with another case-patient.
  - b. Linked or associated Case  
Case among defined close contacts with onset of illness within one month of primary case.
3. Data Collection, Reporting and Analysis (Annex : Flow of reporting)
  - a. Once a suspect meningococcal disease case is reported, he/she should be admitted to an identified referral hospital for the necessary diagnostic examination and treatment.

- b. The admitting physician of the referral hospital should also inform the Provincial/City Epidemiology Surveillance Unit so that the assigned staff should immediately go to the hospital to interview the patient or the accompanying relative.
- c. A standard case investigation form should be filled up by the staff during the interview (Annex C).
- d. Once, the case investigation form is filled up, the assigned staff should update the master list and the case-based record of the surveillance data.
- e. The PESU is normally responsible for reporting suspect and confirmed cases to NESSS, for maintaining a database and for local feedback of surveillance data.
- f. The PESU will then inform the field operations group of the local government units (LGUs) for contact tracing and chemoprophylaxis.
- g. The assigned local health teams will then do contact tracing and chemoprophylaxis and at the same time fill up the contact tracing form (Section VIII)
- e. The contact tracing forms are then submitted back to the RESU or the local ESU.

## H. Public Health Management

### 1. Sporadic Cases

#### a. Prophylaxis

- The goal of antibiotic chemoprophylaxis is to prevent transmission of meningococci from carrier to individuals who are susceptible to invasive disease and to prevent disease in newly colonized individuals. It is essential that all contacts be treated immediately and concurrently, otherwise untreated carriers could infect contacts that have already completed prophylaxis. Most public health authorities recommend that persons in contact with the patient for as long as 7 days before the onset of illness be considered for prophylaxis.

#### b. Contact tracing

- The contact investigation should be conducted promptly. Ideally, prophylaxis should be started within 24 hours after the diagnosis of the case.
- Identify all people who were close contacts during the 7 days prior to the onset of illness in the case. Obtain information about contacts, including the time and type of exposure, and record it on the **Contact Tracing Form** (Annex D).
- Provide as much detail as can be allowed by interviewing the patient and/or the contact, and by reviewing the medical record; additional data may be provided in separate sheets of paper.
- The setting and mode of the exposure can be answered either by writing the corresponding letter of the choices shown in the upper right corner of the Form or by writing the specific answer.
- If prophylaxis was not given, write the phrase NOT GIVEN across the spaces provided for "prophylaxis".
- Advise contacts to do the following as soon as possible:
  - > Obtain appropriate chemoprophylaxis. (Because the period of risk extends to 1 month after the case's onset date, it is considered to be of little value to administer chemoprophylaxis after this time.)
  - > Consult immediately in the event that they develop febrile illness in the month following occurrence of a case.
  - > Educate contacts. Provide a fact sheet if necessary.

- In institutionalized settings (i.e. day care centers, orphanages, barracks and prisons) where contacts have been identified:
  - > Request that the administrator of the facility make a list of the names of persons who are contacts of the case (i.e. persons in the same room, dormitory residents).
  - > Recommend prophylaxis for contacts.
  - > Alert the staff to be observant for persons who develop high fever, rash, irritability, behavioral changes, stiff neck, body aches, chest pain, or breathing difficulty. Any person who develops any of these symptoms must be seen by a doctor immediately.
  - > Immediately report any person who is diagnosed as having meningococcal disease to the local health authorities.
- Once identified, close contacts should receive chemoprophylaxis. In addition vaccination should be given if disease due to strain that is vaccine preventable.

**c. Chemoprophylaxis regimens for High Risk contacts and people with invasive meningococcal disease (Please see Section D3)**

**d. Vaccination (Refer to Letter F)**

- If disease is due to serogroup A, C, W155 or Y strains, vaccination should be carried out as soon as possible after case identification.
- It is still recommended for up to 4 weeks after admission of the index case (the period of highest risk).
- Either bivalent or quadrivalent polysaccharide meningococcal vaccine may be used, however for A and C disease, bivalent vaccine is recommended.

**2. Outbreaks**

**a. Establishment of an Operations Center or Command Post**

- Following the confirmation of a meningococcal disease outbreak, an Operations Center or Command Post should be established.
- A task force should be organized at the Center to coordinate public health actions: contact tracing, chemoprophylaxis, vaccination of close contacts, public education, intensified surveillance, and information and media management.
- Composition

- > Field Operations
- > Epidemiology and Surveillance
- > Hospital Operations
- > Laboratory
- > Communications Depending on circumstances

Such groups may include field epidemiologists, public health physicians, medical microbiologists, infectious disease specialists, pediatricians, public health nurses and media liaison officers. Each group has a leader, preferably, somebody from the local area.

A reporting system with clear reporting relationships must be established to ensure that the public, media and key individuals, including those from other organizations (e.g. local government units, educational institutions), are kept informed.

The size of each group and the frequency of meetings will vary according to the nature and extent of the outbreak.

- Functions of each group
  - > Field Operations Group
    - \* Gathering of first hand information regarding the outbreak;
    - \* Assessment of capability of local infrastructure and the availability of resources for implementation of strategies such as vaccination, should they be required;
    - \* Meeting of local health workers to give accurate advice;
    - \* Holding of community assemblies to discuss issues and concerns
    - \* Development of a list of health workers, school officials, environmental health officers, media persons, and others who might play a part in the local management of the outbreak
    - \* Reports/provides updates and recommendations to local government executives on prevention and control of meningococcal disease
  - > Epidemiology and Surveillance Group
    - \* Development of clear and concise case definition
    - \* Active daily laboratory surveillance
    - \* Active clinical surveillance in hospital emergency departments and clinicians
    - \* Intensified passive surveillance with laboratories, clinicians and hospitals to emphasize the need for immediate notification by a rapid reliable means (e.g. cellular phone) on suspicion of diagnosis
    - \* Collection and rapid analysis of epidemiological data on cases
    - \* Collection of information for contact tracing
    - \* Collection of microbiological data on cases.
    - \* Testing should include a full range of specimens-blood, CSF for culture, plasma for PCR, etc
    - \* Development of bi-directional feedback mechanism for the timely dissemination of information
    - \* Maintenance of intensified surveillance until incidence rates have returned to pre-outbreak levels
  - > Laboratory Group
    - \* Collection, transport, processing and referral of CSF, blood samples of suspect meningococcal cases.
    - \* Linkage with the Epidemiology and Surveillance group and with the Hospital Group
  - > Communications Group
    - \* Coordinates, organizes activities for communication with the public, health care professionals, persons at risk, affected communities and the media

- \* Preparation of a communication plan or strategy should be considered at the initial meetings of the response team.
- \* Establishment of information systems for the general public and other communication methods, such as websites and hotlines
- \* Selection of a single spokesperson who is experienced in dealing with the media, is authoritative, and is able to present the facts clearly
- \* Conduct of press conferences as necessary

b. Contact Tracing and Chemoprophylaxis ( Refer to Sections D and H1-b)

c. Mass Vaccination (Refer to Sec I -3)

## I. Vaccination

### 1. Meningococcal Vaccine

- a. Meningococcal polysaccharide vaccines are available as bivalent (groups A and C) or tetravalent (groups A, C, Y, W 135) vaccines.
- b. The vaccines are purified; heat-stable lyophilized capsular polysaccharide from meningococci of the respective serogroups.
- c. These vaccines are safe and only rarely result in significant systemic reactions. No significant change in safety or reactogenicity has been observed between bivalent or tetravalent meningococcal vaccines.
- d. Group A polysaccharide vaccine shows poorer immunogenicity and short duration of protection in those below 2 years of age.
- e. In children, the duration of protection following one dose of group A and/or C meningococcal polysaccharide increases with age, and recipients aged 4 years or more are likely to be protected for several years with a slow decline in efficacy over a 3-year period.
- f. Both group A and group C polysaccharides have documented short-term efficacy levels of 85% to 100% in children aged more than 2 years and in adults.
- g. Although group A polysaccharide may induce antibodies and immunologic memory even in infants as young as 3 months of age, infants need two doses of group A-containing vaccine at 2-3 months interval to induce adequate titers of antibody.
- h. Group C, Y and W135 polysaccharides have also been proven safe and immunogenic only in children aged 2 years and above. In children under 2 years of age, repeated immunization with group A meningococcal polysaccharide vaccine induces antibodies correlating with protection against group A meningococcal disease which is not seen in other purified polysaccharide vaccines.
- i. Group C conjugate vaccines are produced by linkage of the polysaccharide to carrier proteins, either a non-toxic mutant of diphtheria toxin or tetanus toxoid. These vaccines are not largely available. Preliminary data from the United Kingdom based on serum bactericidal assay suggest that three doses of meningococcal conjugate vaccine given beginning at 2 months of age and at intervals of 2 months provide high levels of protection in infants.

### 2. Recommendation on Use of Meningococcal Vaccine

- a. **Meningococcal polysaccharide vaccines are not generally used in routine infant immunization programs.**
- b. Meningococcal polysaccharide vaccine is recommended for protection of close contacts. When a sporadic case occurs, the close contact (any age) need to be protected by a vaccine and chemoprophylaxis with antibiotics to cover the

delay between vaccination and protection. The vaccines may provide adequate protection after 10-14 days following injection.

- c. Meningococcal polysaccharide vaccines are recommended for use in controlling epidemics of meningococcal disease caused by serogroups included in the vaccine through large-scale emergency immunization of the population at risk.
- d. Since meningococcal outbreaks tend to affect specific age groups, the precise target population for immunization may vary with the epidemiological situation.
- e. As emergency vaccination in most cases is prompted by group A outbreaks, combined polysaccharide vaccines may also be offered even to infants as young as 3 months of age.
- f. During outbreaks of proven group C etiology, group C conjugate vaccines should be considered for protection of this age group where possible.
- g. Polysaccharide vaccines has not shown to develop herd immunity through substantial reduction of meningococcal carriage. Thus, during an outbreak, efforts should therefore be made to reach all persons in groups at high risk of disease who may benefit from the vaccine.

### 3. Mass Immunization Campaigns

#### a. Rationale of Mass Immunization

- Mass immunization campaigns that reach at least 80% of an entire population can halt an epidemic caused by the serogroups.
- Factors that need to be considered for mass vaccination campaigns are the geographical distribution of the cases, the age-specific attack rates, and the resources available.
- Vaccination should be concentrated in the area where the epidemic is maximal.
- If resources are limited, it may be necessary to restrict vaccination to the age groups most at risk, namely those with the highest attack rates or accounting for the largest proportion of case.
- Offer early vaccination to personnel involved in management of the epidemic as well as medical technologists working in the microbiology laboratory and health care providers in the affected area, regardless of age.

#### b. Vaccination Recommendation for Organization-based Outbreaks

| Setting   | Clustering <sup>a</sup> of Cases  | Vaccination  |
|---|---|--|
| Day care center   | 2 or more suspect cases (or confirmed cases of the same serogroup) within 4 weeks | If confirmed cases are of serogroups A, C, W, Y: all children and staff 2 years and older. |
| Preschool, primary school, secondary school or college/university | 2 or more suspect cases (or confirmed cases of the same serogroup) within 4 weeks | If confirmed cases are of serogroups A, C, W, Y: members of the same group(s) as the cases |
| Other organizations (workplaces etc.)                             | 2 or more suspect cases (or confirmed cases of the same serogroup) within 4 weeks | If confirmed cases are of serogroups A, C, W, Y: members of the same group(s) as the cases |

<sup>a</sup> Groups should be defined to the most specific groupings available (groupings within childcare centers, teammates, classmates, yearmates, members of the same workgroup etc.). If cases occur in a single class in a school, chemoprophylaxis is indicated for classmates, not for year mates.

### c. Community outbreaks

- Vaccination Criteria for Community Outbreaks
  - \* Vaccination should be offered to selected age groups within the community population if the incidence in the affected age group(s) is high
  - \* The attack rate is computed using probable and confirmed cases as the numerator.
  - \* At risk populations are defined geographically by using natural or political boundaries that most closely conform with the residence data for most of the outbreak patients.
- Vaccination Recommendation for Community Outbreaks

| Setting           | Vaccination Threshold   | Remarks  |
|-------------------|---|--|
| General community | If the attack rate is 10/100,000 or more in a defined population, with at least 3 confirmed cases, within a 3 month period, consider vaccination. | Considerations for the final decision to vaccinate will include the following:<br>a. Case fatality ratio<br>b. Incidence of meningococemia<br>c. Age specific attack rates<br>d. Serogroup |

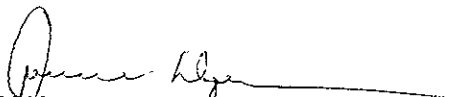
### d. Steps that should be taken by public health administrators for Mass Vaccination

- Carefully and clearly define target population must be and strictly adhere to the definition must be complied with.
- Identify a person who will be responsible for coordinating the vaccination program.
- Prepare for adequate supplies of vaccine, taking into consideration the number of doses, specific target groups, syringes, needles, cotton balls, alcohol and vaccine carrier.
- Coordinate/Facilitate for transport, cold chain and storage facilities.
- Mobilize adequate number of trained personnel to assist with the mass Vaccination.
- Prepare sites for vaccination clinics.
- Prepare a schedule for vaccination and for 'catch-up' for those who missed the first round of vaccination.
- Establish adequate communication (telephone, cell phones, radios, fax machines etc) with the coordinating office, regional and local health office, local chief executive and the vaccination clinics).
- Prepare vaccination cards which will include relevant details of vaccines such as name, sex, age or date of birth, address, date of vaccination, vaccine batch number, adverse event/reaction to vaccine of vaccination clinic) so that vaccine uptake and maybe vaccine efficacy may be determined. These data may be helpful for the future.
- Make available necessary consent forms and IEC materials in the local dialect as much as possible.
- Prior to the scheduled vaccination day, distribute consent forms and provide information to parents or guardians about the risks, expected reactions and benefits of vaccination for them to make an informed decision.



## **VI. EFFECTIVITY**

This order shall take effect 15 days after filing from the UP Law Center or upon posting/publication in the DOH Intranet.

  
**FRANCISCO T. DUQUE III, MD, MSc**  
Secretary of Health

## **ANNEXES :**

### **LABORATORY DIAGNOSIS**

#### **I. Processing of laboratory samples and reporting**

##### **A. In hospitals with capability in culture and identification of isolates:**

###### **1. Processing of Samples**

- **Blood samples**

**BHI broth with blood:** incubate at 35°C. Observe for signs of growth (turbidity, lysis). Subculture on chocolate agar and/or blood agar plate after overnight incubation, 48 hours, 3 days, 5 days and 7 days of incubation. Incubate plates up to 48 hours at 35°C in CO<sub>2</sub> incubator or in a candle jar.

**Plain tube:** centrifuge and collect the serum in a cryovial, indicate in the label if acute sera or convalescent sera, keep at 4°C.

**EDTA tube:** separate 0.8 mL in another tube and use for CBC and platelet tests. Centrifuge the rest and aseptically collect the plasma and the buffy coat in a cryovial, keep at 4°C.

- **Cerebrospinal fluid (CSF)**

- > Inoculate TI (trans-isolate) medium aseptically with 0.5 mL of CSF. 1 drop onto Chocolate Agar Plate (CAP). Streak for isolation, then incubate in CO<sub>2</sub> incubator if available or in candle jar at 35°C. If no growth after overnight incubation, re-incubate CAP for another 24 hours.
- > Put one (1) drop in BHI broth. Incubate at 35°C overnight. Subculture on CAP, then incubate plate at 35°C up to 48 hours. Proceed to "Identification of isolates".
- > Perform WBC count in hemocytometer.
- > Put 1 drop on slide for Gram staining (use the pellet after centrifugation if volume is sufficient)
- > Put 1 drop on slide for differential count (Giemsa staining)
  - \* If required, give 0.5 mL to the Chemistry laboratory to determine protein and glucose concentration.
  - \* If there is no growth after one (1) day of incubation of the CAP and there are no bacteria on the gram staining, but the CSF (microbiologic and chemical) results are consistent with bacterial meningitis, Latex Agglutination Tests can be performed (if available).
  - \* Keep the remaining CSF at 4°C.

###### **2. Identification of the Isolates**

- macroscopic examination of colonies : grayish translucent small (1mm) colonies

- Gram staining: Gram negative, coffee-bean-shaped diplococcus (ensure purity)
- oxidase test : positive (blue or purple color)
- carbohydrate utilization test (on CTA) : glucose and maltose positive (yellow) lactose and sucrose negative (no change in color)

NOTE: Isolates from a hospital laboratory will be forwarded to the Referral Hospital laboratory for identification at room temperature.

## **B. In other Hospital Laboratories with no capabilities in culture and identification of isolates:**

### **1. Preliminary Processing**

#### **• Blood**

**BHI broth with blood:** incubate at 35°C overnight (less than 37°C) if with incubator. If without incubator, leave at room temperature until transport. Do not refrigerate. Do not put in a box with cold packs.

**Plain tube:** centrifuge and collect the serum in a cryovial, indicate the level if acute sera or convalescent sera, keep at 4°C.

**EDTA tube:** separate 0.8 ml in another tube and use for CBC platelet. Centrifuge the rest and collect aseptically the plasma and the buffy coat in a cryovial tube, keep at 4°C.

#### **• Cerebrospinal fluid**

\* Inoculate TI (trans-isolate) medium aseptically with 0.5 ml of CSF. Incubate overnight at 35°C. A cotton-plugged sterile needle should be inserted to TI medium before incubating inside CO<sub>2</sub> incubator. In the absence of TI medium, use BHI broth (for blood culture). If without incubator, leave at room temperature until transport.

\* Perform WBC count in hemocytometer from #3 vial/ tube

\* Put 1 drop on slide for Gram staining (use the pellet after centrifugation if volume is sufficient).

\* Put 1 drop on slide for differential count (Giemsa staining)

- If required, give 0.5 ml to the chemistry lab to determine protein and glucose concentration.
- Keep all the rest of the CSF at 4°C.

## **C. Referral and Transport to a hospital with capability in culture and isolate identification**

### **1. Blood and CSF**

Incubated BHI broth with blood and CSF in Trans-Isolate (T I) medium will be sent for culture, isolation and identification to a hospital with capability. Remove plugged sterile needle before transport to avoid spillage of sample.

Both incubated samples should be **transported at room temperature**. Upon reaching the referral hospital a cotton-plugged sterile needle should be inserted to TI medium before incubating inside CO<sub>2</sub> incubator.

### **2. Serum, plasma and extra CSF**

Serum, plasma and extra CSF samples must be transported to the referral hospital with ice packs (**cold temperature**).

- All samples will be sent with the referral form of the laboratory (*refer to Annex D: Laboratory Referral Form on page 22, one copy will be kept at the laboratory*)

**D. All laboratories: Referral of isolates and specimen to the National Reference Laboratory (RITM)**

For all suspected cases, serum (from plain tube), plasma (from EDTA tube) and the isolate (if available) will be sent to RITM with the referral form. Referral system for the region will be centralized, the Referral Hospital laboratory in the region being the coordinating center.

All samples and isolates must be sent to the referral hospital for identification and transport to the National Reference Laboratory (RITM) with the referral form (transport at 4°C for serum and plasma, **room temperature** for the isolates).

**E. For the Referral Hospital Laboratory:**

1. Isolates: transport to RITM at room temperature or 4°C either in tube, plate media or on fiber-tipped applicator swab in silica gel packages (if silica gel is used, seal properly around the stick to prevent exposure to oxygen during transport).
2. Serum, plasma and extra CSF samples: transport at 4°C
3. All the samples must be labeled with the complete name, age and sex of the patient and type of specimen.
4. All samples including isolates should be sent with the laboratory form for meningococcal disease suspected cases (See Laboratory Referral Form) *one copy will be kept at the referring laboratory.*

**F. Reporting of Results**

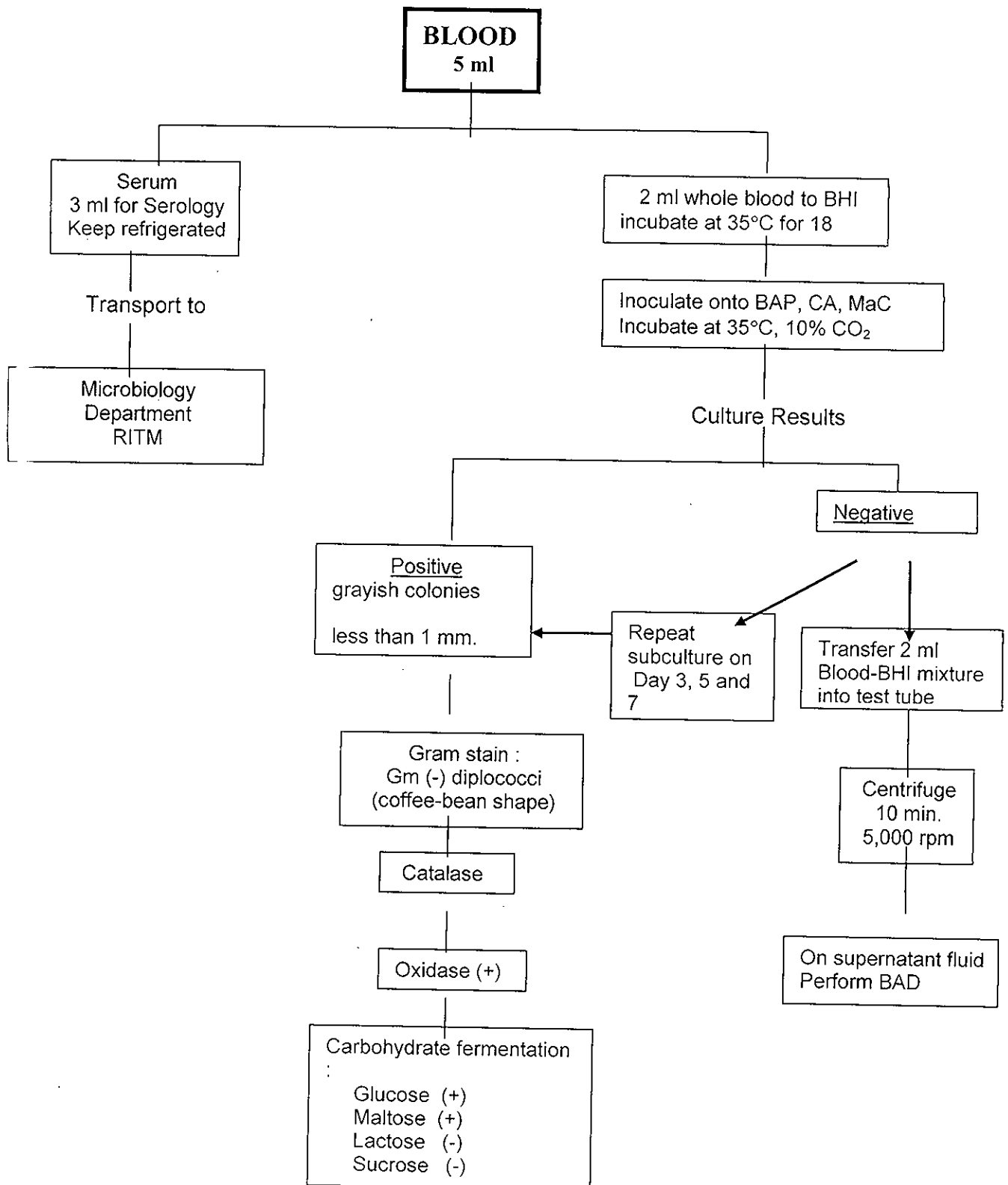
**1. Referral Hospital laboratory**

Results (preliminary and final) will be forwarded to the isolation ward (where patient is confined), CDP annex, Chief of Hospital, Regional Director and RESU/NEC.

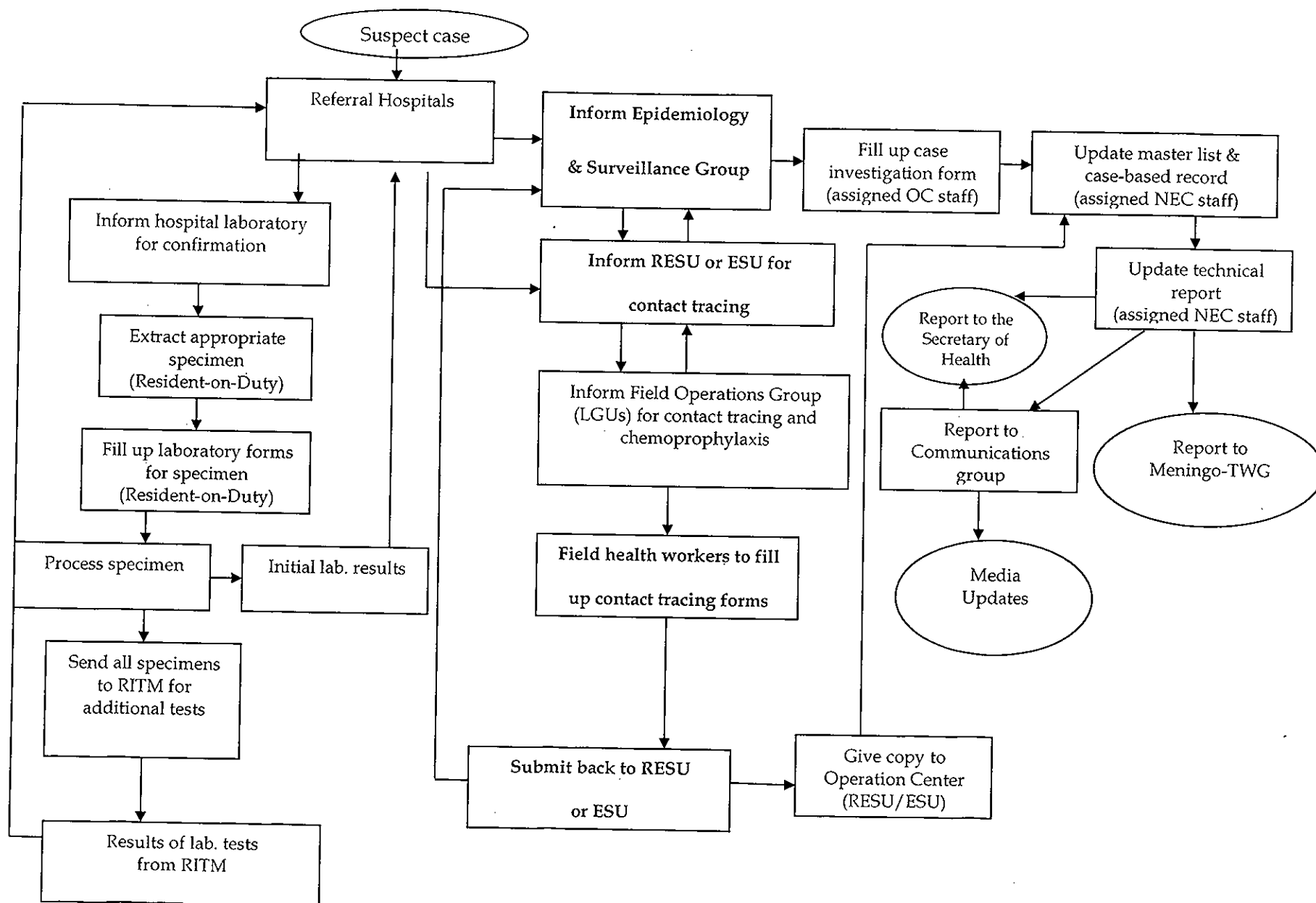
**2. Other hospital laboratories**

Results (CSF cell count, gram stain, differential count, sugar and protein) will be forwarded to the isolation ward, Chief of Hospital, Provincial Health Officer, Regional Director and RESU/NEC.

**Laboratory Diagnosis of Outbreaks  
from Suspected Meningococemia Specimen**



## Annex B Flow of Reporting



# ANNEX D

Contact Tracing Form (for Meningococcal Disease)

Name of Patient \_\_\_\_\_ Age \_\_\_\_\_ Sex \_\_\_\_\_

Permanent Address \_\_\_\_\_

Place of Work / School \_\_\_\_\_

Kindly fill the following table in order to describe the occurrences of close contacts; please provide as much detail as can be allowed by interviewing the patient and/or the contact, and by reviewing the medical record; additional data may be provided in separate sheets of paper.

## \*Settings and Modes of Exposure/ Contact

Contacts are individuals who have had close contact with a case at some point during the period 10 days prior to the onset of illness in the case to 24 hours after the start of antibiotic treatment in the case.

Examples of **settings**: (a) household, (b) day care, (c) health care, (d) school, (e) work or occupational settings, (f) party/ festivity/ gathering, (g) others, please specify.

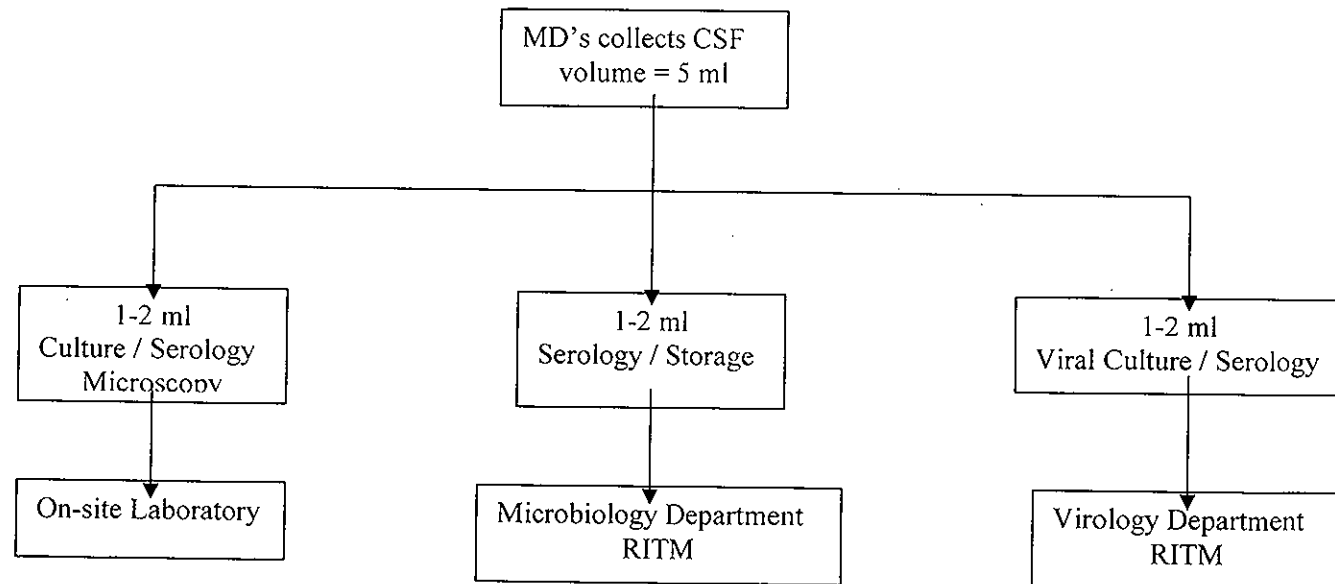
Examples of **modes**: (a) shared food, beverages, utensils, cigarettes, or other objects, (b) kissing or mouth-to-mouth resuscitation, (c) inadvertent droplet contact, intubation, suctioning, (d) others, please specify.

| Name of Contact | Age | Sex | Relationship to Patient | Exposure/ Contact*<br>(write the corresponding letter) |          |       | Present Addresses and Contact Numbers<br>(include possible addresses & numbers) | Prophylaxis |      |      |               |
|-----------------|-----|-----|-------------------------|--|----------|-------|---|-------------|------|------|---------------|
|                 |     |     |                         | Date   | Setting* | Mode* |   | Date        | Drug | Dose | Given By Whom |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |
|                 |     |     |                         |  |          |       |   |             |      |      |               |

Interviewed by: \_\_\_\_\_ (Name/ District/ Position)

Sample Collection for the Differential Diagnosis  
of Suspected Meningococemia Cases

**CEREBROSPINAL FLUID (CSF)**





## Convalescent

