

MEASLES: INFECTION CONTROL MANAGEMENT - CHW POLICY®

DOCUMENT SUMMARY/KEY POINTS

- Measles is a highly contagious disease, spread by direct contact with respiratory secretions or by airborne spread¹
- The incubation period is from 7 to 21 days (usually 9 to 12).
- Use of vaccination, both pre-and post-exposure, is the most common and preferred strategy for preventing transmission of measles. Measles vaccine is effective if MMR/MMRV is given within 72 hours of exposure or a dose of immunoglobulin can be given between 3 and 6 days (144 hours), but not both
- Implementation of this policy for **exposed patients** is the direct responsibility of appropriate clinical line managers caring for affected patients.
- Implementation of this policy for **exposed staff** is the direct responsibility of appropriate line manager for those affected staff.
- In addition to standard precautions, Airborne Precautions **must** be commenced immediately following the notification of a probable or confirmed measles.
- The index case should be discharged or, if required, transferred to the Isolation Ward (*or PICU if required*) for five days following the onset of the rash, depending on the child's medical condition. Immune suppressed children will need isolation for a longer period (7 – 28 days).
- The children who have been in contact with the index case **must** be notified to Infection Control and immunisation status ascertained.
- The child who has been in contact with measles, who is deemed not immune and needs to stay in hospital, must be transferred to the Isolation ward for the period of 7 to 21 days post exposure. Otherwise, the child should be sent home for isolation at home for that period.
- In the Emergency ward, if a child has suspected measles or is a known measles contact, the child must be placed in a single room.
- If staff have documented evidence of only one dose of MMR/MMRV, they need to receive a second dose to be considered fully vaccinated.
- If staff have *been exposed to measles* and have documented evidence of only one dose of MMR, they need to receive a second dose of MMR/MMRV within 72 hours post exposure to be considered fully vaccinated. Pregnant staff exposed to measles should seek immediate advice from Work Health Safety & Injury Management Department or the Infection Control Team.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
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Team Leader:	Clinical Nurse Consultant	Area/Dept: Infection Control

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This Policy/Procedure may be varied, withdrawn or replaced at any time. Compliance with this Policy/Procedure is mandatory.

CHANGE SUMMARY

- Minor wording changes in the following sections:
 - Introduction
 - Mode of Transmission
 - Clinical Manifestations
 - Children exposed to measles
 - Emergency Department
- References updated.

READ ACKNOWLEDGEMENT

- Medical and Nursing staff working in clinical areas should read and acknowledge this document.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

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1 Introduction

Measles is a paramyxovirus, genus *Morbillivirus* and is highly contagious. It is spread by direct contact with respiratory secretions or by airborne spread, where it can survive for up to two hours¹. Patients are potentially contagious for four days before and four days after the rash appears^{1,4}.

The incubation period is variable and can be from 7 to 21 days (usually 9 to 12^{2,3}). A clinical diagnosis of measles is not always reliable¹, so laboratory confirmation should be sought in all sporadic cases.

Use of vaccination, both pre-and post-exposure, is the most common and preferred strategy for preventing transmission of measles¹. Measles vaccine is effective if MMR/MMRV is given within 72 hours of exposure¹ or a dose of immunoglobulin can be given if between 3 and 6 days (144 hours) post exposure^{1,2,3} but not both.

2 Command and Control

- Implementation of this policy for exposed patients is the direct responsibility of appropriate clinical line managers caring for affected patients.
- Implementation of this policy for exposed staff is the direct responsibility of appropriate line manager for those affected staff.
- The line managers will take advice and direction from Infection Control staff and the Infectious Diseases team.
- Issues of dispute between clinical line managers and Infection Control / Infectious Diseases team will be referred to the Director of Clinical Operations who in turn will refer any issues to the Chief Executive, if required, for resolution based on best evidence and expert advice.
- If there is no policy on a particular issue or the policy needs updating then there needs to be further discussion between clinical line managers, Infection Control, Infectious Diseases team, OH and S (if required) and the Director of Clinical Operations to develop a consensus agreement based on best evidence. If a dispute arises about policy it is to be referred to the Chief Executive for resolution.
- Measles is a reportable infection to Public Health Units (PHU); sometimes the notification comes from the PHU.
- A Reportable Incident Brief (RIB) will be sent to NSW Department of Health on any potential media interests or problems. This decision and responsibility lies with the Executive Support Manager.
- When a provisional diagnosis of measles has been made the Infectious Diseases team or/and Infection Control will determine the type and level of response and provide advice on implementation of this policy.
- Infectious Diseases team or Infection Control Practitioner will notify the Director of Clinical Operations of identification of any isolates of measles. The Director of Clinical Operations will in turn notify the Chief Executive.
- A report on management of any measles will be made to the next Infection Control Committee meeting.

3 Mode of Transmission

The measles virus resides in the mucus in the nose and throat of infected people⁴. Measles is usually spread when a person breathes in the measles virus that has been coughed or sneezed into the air by an infectious person³. Droplets spray into the air and the droplets remain active and contagious on contaminated surfaces for up to two hours⁴.

4 Clinical Manifestations

- Measles is infectious from the beginning of the prodromal period (5 days before the rash appears³), for up to 4 days after the appearance of the rash¹.
- The prodrome, lasting 2-4 days, is characterised by fever, followed by cough, coryza and conjunctivitis¹. Koplik spots may be present on the buccal mucosa³.
- A maculopapular rash follows (usually 2-7 days after the onset of the prodrome³), typically beginning on the face and upper neck, and then becoming generalised¹.
- Measles is often a severe disease, frequently complicated by otitis media and bronchopneumonia.
- Measles encephalitis has a mortality of 10 to 15%, and 15 to 40% of survivors of this complication have permanent brain damage¹.
- Subacute sclerosing panencephalitis (SSPE) is a late complication of measles in about 0.5 to 1 per 100 000 measles cases¹. It causes a progressive brain damage and is always fatal¹.
- Complications from measles are more common and more severe in chronically ill and in children less than five years of age¹.

5 Notification of Measles

Infection Control and clinical infectious diseases must be notified if a child has confirmed or suspected measles. See [Appendix 1](#).

When a case of measles occurs in a ward, the following procedures should be followed:

Index Case - (the patient with measles)

The index case should be discharged or, if required, transferred to the Isolation Ward (or PICU if required) for five days following the onset of the rash, depending on the child's medical condition. Immune suppressed children will need isolation up to 28 days. This is to be determined by the Infectious Diseases team.

The children who have been in contact with the index case must be notified to Infection Control and immunisation status ascertained. Children who have been exposed and are deemed at risk must follow the procedure below.

The child who has been in contact with measles, who is deemed not immune and needs to stay in hospital, must be transferred to the Isolation ward for the period of 7 to 21 days post exposure. Otherwise, the child should be sent home for isolation at home for that period.

Note: If the index case was nursed in isolation using airborne precautions (i.e. in Variety Ward or PICU in a single room) for at least four days prior to the appearance of the rash, no precautions are needed other than that the child must remain isolated for a further four days.

Children exposed to measles

Children who have been immunised against measles are not at risk. MMR vaccine is given to children at age 12 months and a second dose at 4 years¹. From July 2013 the regimen was changed to giving the second dose 18 months with the MMRV vaccine. The initial MMR dose provides protection to 95% of those immunised, rising to 99% with the second dose. Anyone who has not received 2 doses of MMR/MMRV is at risk of measles infection. A past history of measles is not reliable.

Children under nine months of age should be given normal immunoglobulin. They will eventually need to be immunised with the measles vaccine, but not until at least three months after the immunoglobulin.

Children over 12 months of age who have not been immunised, should be given the measles vaccine (or measles/mumps/rubella /varicella vaccine) unless they are immunocompromised (leukaemia, post-transplant patients lymphoma, immunosuppressed equivalent to 2 mg/kg/day- Prednisone or congenital immune deficiency) when they should be protected post exposure with immunoglobulin. Children over 12 months of age with HIV infection exposed to measles should be given the measles vaccine, unless severely immunocompromised (See Australian Immunisation Handbook).

The Medical Consultant should be notified and parental permission for the vaccine and immunoglobulin is required.

Children exposed to measles who have not previously been immunised should, if possible, be discharged home after receiving active (MMRV) within three days of exposure or passive (immunoglobulin) immunisation three to six days (144 hours) after exposure. If this is not possible they should be isolated from the 7th to 21st day after contact.

6 Infection Control Precautions

The Infection Control Team should be contacted to advise and assist with the implementation of the Infection Control precautions.

- Standard Precautions **must** be maintained at all times, whether or not the patient is known to have measles.
- Laboratory screening for measles is done by NPA or urine immunofluorescence or by serology.
- **Adherence to precautions is our best defence against the transmission of measles**
- Standard precautions include the following:
 - Wash hands **before** patient contact,
 - Handwashing with 2% Chlorhexidine solution **after** patient contact, **and**
 - Use of alcohol gel or hand rub **after** patient contact. Allow gel to dry.

In addition to standard precautions, Airborne Precautions must be commenced immediately following the notification of a probable or confirmed measles. These precautions apply to all persons entering the room (Medical staff, Nurses, Physiotherapists, Pathology collectors, patient relatives and visitors, etc).

Airborne Precautions

Airborne Precautions are designed to reduce the risk of airborne transmission of infectious agents. Airborne transmission occurs by dissemination of either airborne droplet nuclei (small-particle residue [$5\mu\text{m}$ or smaller in size] of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles containing the infectious agent⁶. Micro-organisms carried in this manner can be dispersed widely by air currents and may become inhaled by or deposited on a susceptible host within the same room or over a longer distance from the source patient, depending on environmental factors; therefore, special air handling and ventilation are required to prevent airborne transmission⁶. Airborne Precautions apply to patients known or suspected to be infected with measles which is transmitted by the airborne route.

- Wash hands **before** patient contact, with 2% Chlorhexidine solution
- Wear non-sterile gloves and gown during contact with patient and/or their environment,
- Wear protective eyewear and a P2 mask when entering the room.
- Protective eyewear and P2 masks **must** be worn during intubation and suction.
- Handwashing with 2% Chlorhexidine solution **after** patient contact, **and**
- Use alcohol handrub. Allow alcohol to dry.

Patient Placement

Place the patient in a room that has:

1. air conditioning with 6 to 12 air changes per hour, and
2. 100% exhaust
 - o Keep the room door closed at all times and the patient in the room. When a single room is not available, place the patient in a room with a patient who has active infection with the same micro-organism, unless otherwise recommended, but with no other infection⁶. When a single room is not available and cohorting is not desirable, consultation with infection control is advised before patient placement.

Children with measles cannot be nursed at Bear Cottage or discharged to Ronald McDonald house.

Personal Protective Equipment (PPE)

- Staff who are non-immune should not enter the room
- Standard and Airborne Precautions apply.

Patient Care Equipment

The patient should have his/her own equipment such as stethoscopes. The equipment should be wiped over with 70% Isopropyl alcohol or alcohol impregnated wipes, before being returned into general circulation.

Room Management

- Minimal items should be kept in the room.
- Only essential items should be taken into or stored in the room. Unused stock is to be discarded when the patient has been discharged from the room.
- Patient medical record, old notes and x-rays must be kept outside the child's room.
- Transfer of a Patient from Shared Room unless the other patients have measles
- Infection Control to be notified of any patient who has shared a hospital room with the child with measles for contact tracing and isolation if required
- The immunisation status of the contact is to be ascertained
- The contact is then given MMRV or immunoglobulin as appropriate
- If the contact has been discharged then it is reported to the Public Health Unit for follow up.
- Infectious cleaning of the room and bathroom is required as per Section 10 of this policy, with attention to the bed locker, all surfaces and fixtures. Bed screen and shower curtains are to be changed.

7 Other Departments for Diagnostic Tests

- If a child with measles requires a diagnostic test (e.g. x-ray), this must be negotiated with relevant staff in conjunction with Infection Control
- The receiving department must be notified in advance of the patient's positive measles status.
- All surfaces such as the chair and x-ray table used by the patient must be cleaned as per Section 9 of this policy following completion of the test. The cleaning must be attended before the equipment is use for another patient.

8 Operating Theatres

- If a child with measles requires emergency surgery, this must be negotiated with staff in conjunction with Infection Control or Clinical Infectious Diseases.
- The operating theatre suite must be notified in advance of the patient's measles status.
- All surfaces such as the bed and theatre table used by the patient must be cleaned as per Section 6 of the [Infection Control: Precautions for Operating Suite policy](#). The cleaning must be attended before the equipment is use for another patient.

9 Patient Activity Outside Room

- The child cannot use the outside areas in the hospital grounds.
- The child cannot visit the common food outlet areas.
- The child cannot visit the Starlight Room.
- The child cannot visit Ronald McDonald House.
- The child cannot attend the schoolroom.
- The child cannot visit other inpatients.
- Activities and school can be organised in the room.
- All other activities must be negotiated with Infection Control.

10 Room Cleaning Requirements

- Daily cleaning as per the Cleaning Services policy.

11 Linen and Waste

- Used linen and waste should be managed as per Standard Precautions. Linen and waste bags should be removed from the room and taken directly to the collection area.

12 Pathology Specimens

- Pathology personnel must comply with Standard Precautions when entering and leaving the room.
- Non-immune pathology staff should not enter the room.
- Seal specimen receptacles correctly and label accurately.
- Place specimen and pathology form into a plastic biohazard specimen bag for transport.
- Tourniquet is to be cleaned before use on any other patient (may be left in room for the duration of patient stay and then cleaned or discarded).

13 Food Services

- The combination of hot water and detergent in a dishwasher is sufficient to decontaminate eating utensils.
- Used eating utensils should be sent directly to the Food Services department.

14 Parents, Carers, Relatives and Visitors

- Visitors other than parents or carers are not allowed to visit the patient unless considered to be immune. This must be ascertained before entering the room.
- Visitors must always wash their hands when leaving the patient room. The use the alcohol gel or hand rubs. Allow gel to dry.
- After leaving the room the parents, careers, relatives and visitors have no restrictions.

15 Infectious Status

Clearance that the patients are no longer infectious must be obtained from Infection Control or the Clinical Infectious Diseases Team before stopping isolation.

16 Patient and Family Education

- Education and support for the patient and relatives is fundamental to the compliance and understanding of the management of measles.
- Discussion should take place before discharge to ensure the patient and family is fully informed about immunisation.

17 Staff Precautions

- Standard Precautions must be implemented at all times.
- Staff can look after other children if required.

Staff exposed to measles:

- OH&S are to be notified immediately by the Infection Control team that there has been staff exposure to measles.
- Staff born before 1966 are considered to be immune¹. Surveys suggest that 95% to 98% of those born before 1966 are immune to measles due to exposure to the disease¹.
- Staff born since 1966 are considered to be susceptible to measles (unless serological evidence indicates immunity, or they have documented evidence of having had 2 doses of measles vaccine in the past)¹. They will need to follow the same procedure as an unimmunised person and have measles vaccine (MMRV) given to them within 72 hours of exposure or a dose of immunoglobulin if between 3 and 6 days (144 hours) post exposure^{1,2,3}.
- The vaccine can be given by WHS Coordinator or by the CNC immunisation if available. At other times the staff member should use the Emergency Department or their family doctor to obtain a vaccine.
- A list of staff exposed to measles will be drawn up by the relevant area managers (e.g. Emergency, ward, OPD, etc) in conjunction with Infection Control, and will be sent to OH and S as soon as possible.
- Staff should be followed up as per [Appendix 2](#).

Preventing Transmission of Measles

All personnel should be aware of their immune status to measles. Staff who are sero-negative should receive vaccination with MMRV before contact or within three days of exposure¹. Staff born after 1966 should have documentation of having received two doses of MMRV vaccine or of being seropositive for measles¹. If staff have documented evidence of only one dose of MMR, they need to receive a second dose to be considered fully vaccinated¹. Pregnant staff who are exposed to measles should seek immediate advice from Occupational Health, Safety and Rehabilitation Coordinator or the Infection Control Team.

18 Cleaning of Room and Bathroom after Discharge

- Cleaning as per Cleaning Services Infectious Cleaning.

19 Emergency Department

Identifying a patient with measles

Airborne Precautions are to be instigated immediately following identification of a patient with suspected or confirmed measles.

When a case of measles occurs in the Emergency ward, the following procedures should be followed:

- If a child has suspected measles or is a known measles contact, the child must be placed in a single room. .
- Patient placement
 - Require a dedicated room to ensure the child does not leave that room.
 - Airborne Precautions are to be implemented immediately.
 - Depending on the patient's clinical status, the most senior doctor on duty is to negotiate with the admitting team for the patient to be transferred directly to isolation ward for admission or assessed / admitted in ED.
 - Advise Bed Management / AHNM of bed requirements as soon as known.
 - Priority for appropriate bed placement is to be given to the patient with measles.
 - Equipment must be dedicated for the sole purpose of the patient.

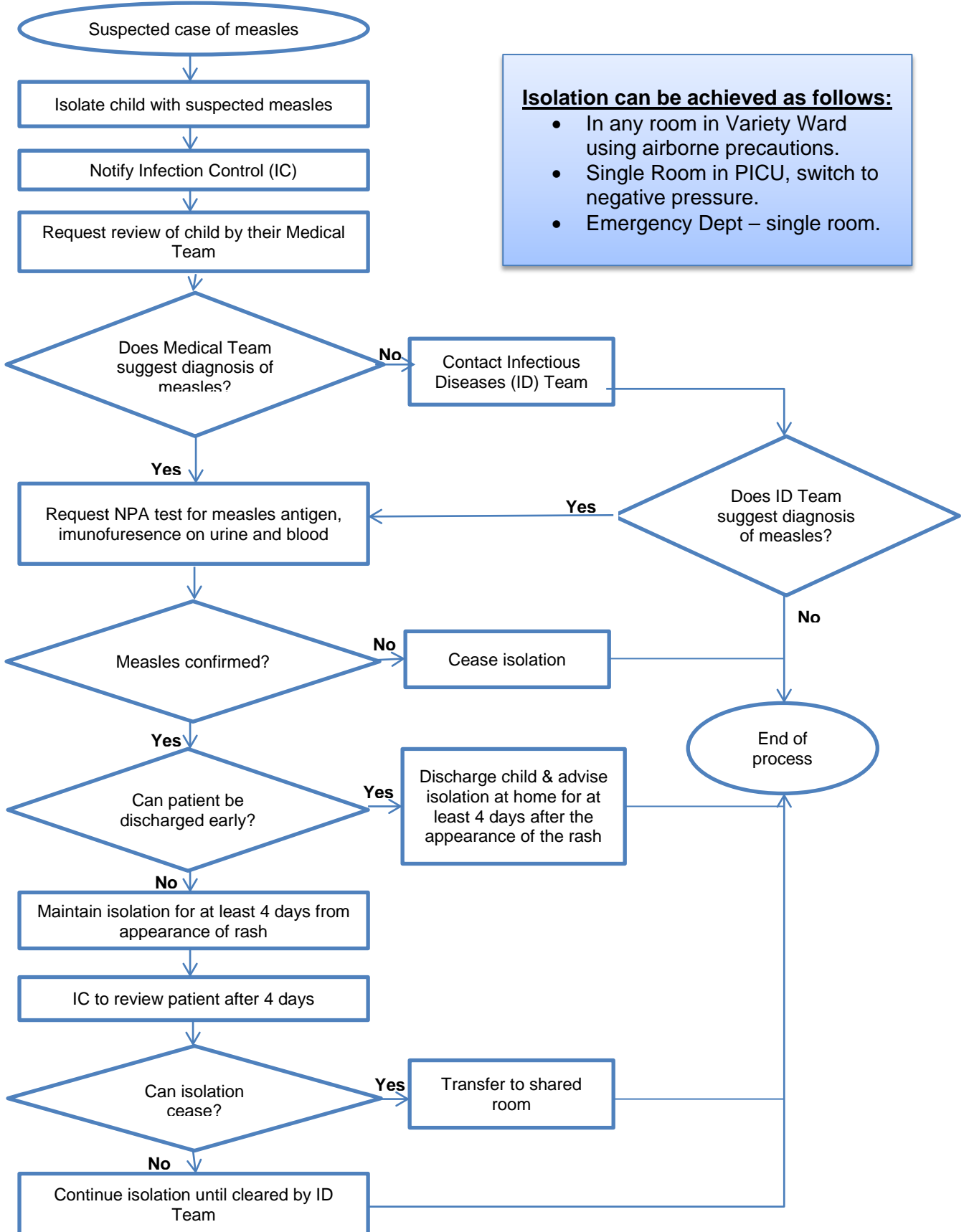
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Appendix 1: Management of a Suspected Case of Measles



Isolation can be achieved as follows:

- In any room in Variety Ward using airborne precautions.
- Single Room in PICU, switch to negative pressure.
- Emergency Dept – single room.

Appendix 2: Management of Staff Exposed to Measles

