GUIDELINES FOR THE HANDLING OF DEAD BODIES OF SUSPECTED OR CONFIRMED COVID-19

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A. GUIDELINE FOR TRANSPORTING BODIES WITH SUSPECTED OR CONFIRMED COVID-19 FROM EMERGENCY DEPARTMENT OR WARD TO MORTUARY

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C. GUIDELINE FOR THE DISPOSAL OF COVID-19 BODIES

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E. MANAGEMENT OF POST-MORTEM SPECIMENS IN CASES WITH SUSPECTED OR CONFIRMED COVID-19
INTRODUCTION

This guideline is intended for all parties involved in the management of COVID-19 bodies. The parties involved include all facilities under Ministry of Health Malaysia (MOH), private hospitals as well as other governmental and non-governmental agencies.

The SARS-CoV-2 virus that causes COVID-19 is classified as a Hazard Group 3 (HG3) pathogen. The primary mode of transmission of this virus is via aerosol.

Any handling of a dead body is an aerosol generating procedure (AGP). Although the patient may have died, the SARS-CoV-2 virus has been found to remain viable in nasopharynx of a dead body up to 35 hours (Postmortem Stability of SARS-CoV-2 in Nasopharyngeal Mucosa. Fabian Heinrich, Kira MeiBner, Felicia Langenwalder et al.: January 2021. Emerging Infectious Disease 27(1): 329-331) stored in a regular temperature body storage. Local experiences also showed that the isolation of the virus from lung tissues of autopsied COVID-19 body following 80 hours. The virus was even isolated from the lung tissue of a decomposed body.

Key Considerations

- COVID-19 fatalities may occur in health-care facilities, at home or in other locations.

- The safety and well-being of those who attend to dead bodies is critical. They should ensure strict compliance to PPE protocol.

- The decision on risk of infectivity depends on various factors and should be made on a case-by-case basis. The decision should be made by a team consisting of the treating clinicians preferably ID physicians and the Forensic Medicine Specialist.

- For mandi kapan and religious rituals involving washing of bodies, these procedures should not be carried out in a room that has turbulent airflow such as fans, blower and split air-conditioning.
Risks posed by handling COVID-19 bodies can be categorized into the following:

1. Low-risk
   Activities include those where there is minimal direct contact e.g. preparation of the body for viewing and release of the deceased for burial or cremation.

2. Medium-risk
   Activities include manual handling of exposed bodies or other activities that result in droplets/aerosols generation (e.g. external examination of bodies and nasopharyngeal sampling, body preparation after autopsy etc).

3. High-risk
   Activities include Aerosol Generating Procedure and direct contact such as autopsy, embalming or other invasive procedures.

A. GUIDELINE FOR TRANSPORTING OF BODY WITH SUSPECTED OR CONFIRMED COVID-19 FROM EMERGENCY DEPARTMENT OR WARD TO THE MORTUARY

1. Bodies of suspected or confirmed COVID-19 shall be sent from the Emergency Department (ED) or ward to the mortuary as soon as practicable.

2. Healthcare workers must comply with PPE protocol (refer Section D).

3. Sampling for all suspected COVID-19 cases shall be taken in ED or ward by the respective team.

4. Relatives are STRiktLY PROHIBITED to handle the body.

5. Body shall be prepared in the ED or ward (i.e. the Last Office) by the healthcare workers in ED or ward before the body is sent to the mortuary.

6. Body preparation in the ED or ward:

   The body must be wrapped with linen and placed into one (1) body bag. Then the body bag must be wiped or sprayed especially at and around the zipper with disinfectant (0.5% sodium hypochlorite).

7. Body transfer from the ED or ward shall be carried out by minimum 2 healthcare workers. The healthcare workers must wear appropriate PPE (refer Section D).

8. On arrival at the mortuary, the body must be immediately placed in a designated refrigerated body storage compartment/area.
B. GUIDELINES FOR THE MANAGEMENT OF SUSPECTED OR CONFIRMED COVID-19 BROUGHT IN DEAD (BID)

B1. Guideline for the Management of Suspected or Confirmed COVID-19 BID by Other Than Police to ED

B2. Guideline for the Management of Suspected or Confirmed COVID-19 BID by Police to the Mortuary

B1. GUIDELINE FOR THE MANAGEMENT OF SUSPECTED OR CONFIRMED COVID-19 BID BY OTHER THAN POLICE TO ED

1. The suspected or confirmed COVID-19 cases may be BID to ED by those other than the police, such as the family members, members of the public or ambulance, depending on the circumstances.

2. Although it is recommended to perform PCR / rapid molecular testing on BID cases, the testing for COVID-19 may use RTK professional in ED. Positive results will be accepted by the Forensic Department as COVID-19. A negative result will be accepted as such unless a post-mortem examination is required in which event PCR/rapid molecular testing shall be done.

3. Police report shall be lodged in accordance to ED protocol.


   4.1 The sampling shall be taken by the ED staffs. The body shall then be sent to the mortuary (refer Section A).

   The next of kin shall be informed by the ED staffs regarding the sampling procedure, the turnaround time for the result and subsequent procedures that entail, depending on the COVID-19 analysis results.

4.2 If results POSITIVE:

   4.2.1 If post-mortem was not requested by the police:

   • The police officer or the respective Emergency Medical Officer may provide the cause of death and the ED staff shall notify the respective District health Office (PKD).

   • The body shall be released with strict adherence to the COVID-19 body disposal guideline with all the necessary documents.
4.2.2 If post-mortem is required, the respective Forensic Medicine Specialist / Medical Officer shall perform the post-mortem examination and provide the cause of death.

- The post-mortem examination shall be conducted in a Biosafety Level (BSL) 3 post-mortem suite or minimally in autopsy facilities with negative pressure post-mortem suite.

- The body shall be released with strict adherence to the COVID-19 body disposal guideline with all the necessary documents.

4.3 If the result is NEGATIVE, the police shall be informed for subsequent medicolegal investigation of death regarding the necessity for post-mortem examination.

5. For confirmed (known case) COVID-19

- The respective Emergency Medical Officer may provide the cause of death after discussion with clinicians preferably ID physicians. The body shall be sent to mortuary (refer Section A) and to be released accordance to the cases (infective or not infective) /with strict adherence to the COVID-19 body disposal guideline with all the necessary documents.

- The police shall be informed for subsequent medicolegal investigation of death regarding the necessity for post-mortem examination.

B2. GUIDELINE FOR THE MANAGEMENT OF SUSPECTED OR CONFIRMED COVID-19 BID BY POLICE TO THE MORTUARY

1. The handling of body at the scene shall be done by the police and may be supervised by the respective Assistant Environmental Health Officer. The body must be placed into one (1) body bag. The body bag must be wiped or sprayed especially at and around the zipper with disinfectant (0.5% sodium hypochlorite).

2. The receiving mortuary staffs shall:

2.1. Wear appropriate PPE.

2.2. Obtain a police order (Polis 61) and/or 3A form (Refer Appendix B2(i)) for post-mortem examination.

2.3. Communicate or discuss the case with the Forensic Medicine Specialist of the referral centre or department to decide the management of the post-mortem examination in suspected or confirmed COVID-19 case.
2.4. Notify the case to the state CPRC or local hospital Unit Kesihatan Awam.

3. PCR/ rapid molecular samplings for COVID-19 shall be taken in the designated mortuaries. If there are bodies BID by the police solely for screening, preferably PCR/rapid molecular analysis to be commenced, however RTK professional test will be acceptable in dire situation.

4. Samplings for COVID-19 shall be taken in the designated mortuaries. Refer section D for appropriate PPE.

4.1 Check deceased prior COVID-19 status via database. If deceased has record of Covid-19 prior to death, ID physician/physician in charge may be consulted.

5. The body shall be kept in the designated body freezers until the laboratory test result of COVID-19 is available.

6. If the result is POSITIVE, the police shall be informed for subsequent medicolegal investigation of death and the necessity for post-mortem examination:

6.1 If post-mortem is required, the respective Forensic Medicine Specialist/ Medical officer shall perform the post-mortem examination and provide the cause of death.

6.2 The post-mortem examination shall be conducted in a Biosafety level (BSL) 3 post-mortem suite or minimally in autopsy facilities with negative pressure post-mortem suite.

6.3 The body shall be released with strict adherence to the COVID-19 body disposal guideline with all the necessary documents.

7. If the result is NEGATIVE, the police shall be informed for subsequent medicolegal investigation of death regarding the necessity for post-mortem examination.
C. GUIDELINE FOR THE DISPOSAL OF COVID-19 BODIES

1. It is recommended that COVID-19 bodies (whether post-mortem is done or not) shall be disposed (burial or cremation) as soon as practicable.

2. For the purpose of identification of COVID-19 body by relatives, the process shall be done in the mortuary with strict compliance to PPE requirements.

3. For bodies still pending COVID-19 screening results, the body shall still be handled as COVID-19 bodies until the results are made available. This SOP is not applicable to non-COVID-19 bodies.

4. For COVID-19 bodies embalming must be avoided and exportation to foreign countries is prohibited.

5. **Religious procedures for disposal of body** should be based on the risk of virus transmission as stated in the *Key Considerations section of this guideline.*

5.1. **Muslim body** may undergo “mandi kapan” (ritual bathing) but subject to the following recommendations:

- Avoid Aerosol Generating Procedures (AGP).

- Avoid using hand shower/jet spray and splashing water. However, it is recommended bottle spray to be used.

- The washing needs to be handled by fully vaccinated trained individuals with proper PPE. Minimal PPE: N95 mask, gloves, face shield and long-sleeve water resistant gown.

- Fully vaccinated family members / relatives may be allowed (maximum 2 persons) to observe and to assist the “mandi kapan” with strict compliance to PPE and any safety instructions given.

   **N.B:** However, for cases where full autopsy had been performed, where continuity of airways had been completely disrupted by the autopsy, these bodies might be considered for full “mandi kapan”.

5.2. **For non-Muslim**, religious last rites/ritual may be conducted with minimal handling of the body subject to the following recommendations:

- Avoid Aerosol Generating Procedures (AGP).

- Avoid using hand shower/jet spray and splashing water. However, it is recommended bottle spray to be used.
- The washing needs to be handled by fully vaccinated trained individuals with proper PPE. Minimal PPE: N95, gloves, face shield, scrub-suit and long sleeve water resistant gown.

- Fully vaccinated family members/relatives may be allowed (maximum 2 persons) to observe the religious last rites/ritual with strict compliance to PPE and any safety instructions given.

- If change of clothing is needed, drape the clothing over the body. Make sure the mouth and any wounds or leaks are covered with waterproof bandage or mask.

6. Once religious last rites/ritual are completed, body bag is zipped/sealed and the outer layer of body bag to be disinfect with 0.5% sodium hypochlorite.

7. All religious procedures should be conducted ONLY by trained funeral service personnel with strict adherence to SOP and appropriate PPE under the supervision of the Assistant Environmental Health Officer.


8.1. COVID-19 bodies should be taken for burial or cremation directly from the mortuary as soon as practicable.

8.2. For non-Muslim, bodies may be placed in coffins with air-tight sealed glass cover. Body bag may be unzipped to expose the face. Outer surface of coffin to be disinfect with 0.5% sodium hypochlorite or > 70% alcohol prior to viewing before burial or cremation.

8.3. Family members are prohibited from opening the sealed coffin or sealed body bag. Supervising Assistant Environmental Health Officer must ensure this precaution is strictly adhered to.

8.4. The burial or cremation process should be conducted by trained personnel with strict adherence to SOP and appropriate PPE under the supervision of the Assistant Environmental Health Officer.

9. Deaths occurring in private hospitals shall follow the same procedure as outlined above. The body is to be released for burial or cremation from the Private Hospital.
### D. RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) IN THE MANAGEMENT OF DEAD BODIES WITH SUSPECTED OR CONFIRMED COVID-19

<table>
<thead>
<tr>
<th>SETTING</th>
<th>TARGET PERSONNEL</th>
<th>ACTIVITY</th>
<th>TYPE OF PPE</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>At site / ward / ICU / ETD</td>
<td>HCW Police</td>
<td>Wrapping / handling of the body</td>
<td>• N95 mask&lt;br&gt;• Eye protection (face shield/ goggles)&lt;br&gt;• Isolation gown (fluid repellent long sleeved gown)&lt;br&gt;• Gloves</td>
<td>• Performing hand hygiene before and after interaction with the body</td>
</tr>
<tr>
<td></td>
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<td>*use of coverall does not offer additional protection and not recommended</td>
</tr>
<tr>
<td>Ward / ICU / ETD / mortuary</td>
<td>HCW</td>
<td>Transfer of body to mortuary&lt;br&gt;Receiving body from ward/ ED or police</td>
<td>• Surgical mask&lt;br&gt;• Eye protection (face shield/ goggles)&lt;br&gt;• Isolation gown (fluid repellent long sleeved gown)&lt;br&gt;• Gloves</td>
<td>*use of coverall does not offer additional protection and not recommended</td>
</tr>
<tr>
<td>SETTING</td>
<td>TARGET PERSONNEL</td>
<td>ACTIVITY</td>
<td>TYPE OF PPE</td>
<td>NOTE</td>
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</tr>
<tr>
<td>Ward / ICU / ETD / Mortuary</td>
<td>HCW</td>
<td>Performing Nasopharyngeal / oropharyngeal swab sampling or other non-invasive sampling (including packaging / labelling of specimens)</td>
<td>• N95 mask &lt;br&gt; • Eye protection (face shield / goggles) &lt;br&gt; • Long sleeved plastic apron &lt;br&gt; • Gloves</td>
<td>*use of coverall does not offer additional protection and not recommended</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transport of specimens</td>
<td>• Surgical mask</td>
<td></td>
</tr>
<tr>
<td>Autopsy room</td>
<td>HCW</td>
<td>Performing autopsy &lt;br&gt; • Confirmed COVID-19 &lt;br&gt; • Suspected/SARI/ARI/ILI (if high index of suspicion or CXR reported as Probable COVID-19, regardless of RT-PCR NP/OP swab result)</td>
<td>• PAPR &lt;br&gt; • Eye protection (face shield / goggles) &lt;br&gt; • Isolation gown (fluid repellent long sleeved gown) &lt;br&gt; • Gloves &lt;br&gt; • Boots/footwear protection</td>
<td>• Autopsy should be performed at Biosafety level (BSL) 3 autopsy room or BSL 2 with negative pressure autopsy room  &lt;br&gt; • Instruments used during mortuary care, or during the autopsy should be cleaned and disinfected immediately after use.</td>
</tr>
<tr>
<td>SETTING</td>
<td>TARGET PERSONNEL</td>
<td>ACTIVITY</td>
<td>TYPE OF PPE</td>
<td>NOTE</td>
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<td></td>
<td></td>
<td>Performing autopsy</td>
<td>• N95 mask</td>
<td>• Autopsy can be performed at Biosafety Level (BSL) 2</td>
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<td>- ARI/ILI (with low index of suspicion, negative rRT-PCR NP/OP swab result and CXR reported as non-COVID-19)</td>
<td>• Eye protection (face shield / goggles)</td>
<td>• Instruments used during mortuary care, or during the autopsy should be cleaned and disinfected immediately after use.</td>
</tr>
<tr>
<td></td>
<td>Mortuary</td>
<td>Washing the body / shrouding (kafan)</td>
<td>• Isolation gown (fluid repellent long sleeved gown)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Religious body handlers / Funeral service personnel</td>
<td></td>
<td>• Gloves</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• Boots/footwear protection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mortuary</td>
<td>Viewing of body for identification</td>
<td>• Surgical mask</td>
<td>• Religious body handlers / funeral service personnel should be trained in washing the body and donning and doffing of PPE</td>
</tr>
<tr>
<td></td>
<td>Family members / next of kin</td>
<td></td>
<td>• Gloves *</td>
<td>• Performing hand hygiene before and after interaction with the body</td>
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<td></td>
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<td></td>
<td>• Plastic apron *</td>
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<td></td>
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<td></td>
<td>*if needed</td>
<td></td>
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<tr>
<td>SETTING</td>
<td>TARGET PERSONNEL</td>
<td>ACTIVITY</td>
<td>TYPE OF PPE</td>
<td>NOTE</td>
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</tr>
</tbody>
</table>
| Burial / cremation site | HCW / Religious body handlers | Disposal of body  
  - Transporting body to burial site / cremation  
  - Burial / cremation | Well fitted surgical mask  
  - Isolation gown (fluid repellent long sleeved gown)  
  - Gloves  
  - Boots / footwear protection | view the body for identification  
  - Family members / next of kin should stand at a minimum distance of 1 meter from the body.  
  - According to Public Health SOP |
| Autopsy room / Mortuary / Hearse | HCW / Religious body handlers | Cleaning and decontamination procedure | Well fitted surgical mask / N95 mask based on risk assessment  
  - Isolation gown (fluid-repellent long-sleeved gown / apron)  
  - Gloves  
  - Rubber boots | * adhere to OSH attire requirement when handling the chemical |
### E. MANAGEMENT OF POST-MORTEM SPECIMENS IN CASES WITH SUSPECTED OR CONFIRMED COVID-19

<table>
<thead>
<tr>
<th>TEST</th>
<th>SPECIMEN</th>
<th>CONTAINER</th>
<th>RECOMMENDED PACKAGING / STORAGE TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. JABATAN KIMIA MALAYSIA (JKM)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Toxicology analysis</td>
<td>Blood, Urine</td>
<td>Universal bottle</td>
<td>*Triple layer packaging</td>
</tr>
<tr>
<td></td>
<td>Tissue (Liver etc)</td>
<td>Sterile container</td>
<td></td>
</tr>
<tr>
<td>2. Deoxyribonucleic acid (DNA) analysis</td>
<td>Blood</td>
<td>FTA card</td>
<td><strong>Put into a biohazard plastic bag, seal it and put into an envelope. Label the envelope with deceased’s details and a biohazard mark.</strong></td>
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<tr>
<td></td>
<td>Bone, Tissue</td>
<td>Sterile container</td>
<td>*Triple layer packaging</td>
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<td></td>
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<tr>
<td>3. Forensic analysis</td>
<td>Hair, fingernails</td>
<td>Sterile container</td>
<td>*Triple layer packaging</td>
</tr>
<tr>
<td></td>
<td>Clothing</td>
<td>Paper/envelope and then put into a plastic package.</td>
<td>Disinfect plastic package with 0.5% sodium hypochlorite.</td>
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<tr>
<td></td>
<td>Swabs</td>
<td>Sterile container</td>
<td>*Triple layer packaging</td>
</tr>
<tr>
<td></td>
<td>Gunshot residue</td>
<td>Gunshot residue (GSR) collection kit</td>
<td>***Place in 2 biohazard plastic bags.</td>
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<tr>
<td>4. Others</td>
<td>Others</td>
<td>Respective containers</td>
<td>Depending on containers.</td>
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<tr>
<td>B. DEPT OF PATHOLOGY/INSTITUTE FOR MEDICAL RESEARCH</td>
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<td>---------------------------------------------------</td>
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<tr>
<td>1. Real-time Reverse Transcription-Polymerase Chain Reaction (rRT-PCR) COVID-19</td>
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<tr>
<td>Nasopharyngeal swab (NPS)/Oropharyngeal swab (OPS)</td>
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<tr>
<td>Viral transport media (VTM)</td>
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<tr>
<td>*Triple layer packaging</td>
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<tr>
<td>2-8°C if &lt; 5 days</td>
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<tr>
<td>-70°C (dry ice) if &gt; 5 days</td>
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<tr>
<td>Tissue samples</td>
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<tr>
<td>VTM/Sterile container</td>
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<td></td>
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<tr>
<td>*Triple layer packaging</td>
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<tr>
<td>2-8°C if &lt; 24 days</td>
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<tr>
<td>-70°C (dry ice) if &gt; 24 days</td>
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<tr>
<td>2. Antigen Rapid Test Kit (RTK-Ag)</td>
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<td>NPS</td>
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<tr>
<td>VTM</td>
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<tr>
<td>*Triple layer packaging</td>
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<tr>
<td>3. Histopathology</td>
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<tr>
<td>Airways, lungs, other organs</td>
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<tr>
<td>Cassettes in formalin-containing container (sample: 10% neutral buffered formalin ratio = 1:10)</td>
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<tr>
<td>Standard packaging (Refer &quot;WORKFLOW GUIDELINE II&quot;)</td>
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<tr>
<td>4. Serology (Dengue, Leptospirosis, Melioidosis, Hep B/C, HIV etc.)</td>
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<td></td>
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<tr>
<td>Blood</td>
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<tr>
<td>Plain tube with gel (yellow cap)</td>
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<tr>
<td>***Place in 2 biohazard plastic bags and put inside a cooler box. Place form at the outer layer of the box.</td>
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<tr>
<td>5. Cultures</td>
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<tr>
<td>Blood</td>
<td></td>
<td></td>
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<tr>
<td>Bactec bottle</td>
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<td>CSF</td>
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<td></td>
<td></td>
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<tr>
<td>Bijou bottle</td>
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<tr>
<td>Swab</td>
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<td></td>
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<tr>
<td>Amies/Stuart Transport Medium</td>
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<td></td>
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</tr>
<tr>
<td>Tissue, Urine, Fluid</td>
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<tr>
<td>Sterile container</td>
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<tr>
<td></td>
<td>PCR for various infectious agents (Dengue, Leptospirosis etc.)</td>
<td>Tissue (Liver, spleen, kidney etc.)</td>
<td>Sterile container</td>
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<tr>
<td>7.</td>
<td>PCR for other respiratory pathogens</td>
<td>Tracheal swab</td>
<td>VTM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lung swab</td>
<td>VTM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lung tissue</td>
<td>Sterile container</td>
</tr>
<tr>
<td>8.</td>
<td>Inborn error of metabolism</td>
<td>Blood</td>
<td>Lithium-heparin tube, EDTA tube</td>
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<td></td>
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<td>Whatman filter paper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urine</td>
<td>Sterile container</td>
</tr>
<tr>
<td>9.</td>
<td>Entomology</td>
<td>Maggots</td>
<td>Sterile container containing 70% alcohol</td>
</tr>
</tbody>
</table>
## DEPTs OF FORENSIC MEDICINE

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diatom analysis</td>
<td>Tissues (limited to lung and another organ)</td>
<td>Formalin-containing container</td>
<td>*Triple layer packaging</td>
</tr>
<tr>
<td>2</td>
<td>Histopathology</td>
<td>HPE slides/Paraffin-embedded tissue blocks</td>
<td>Appropriate container</td>
<td>Standard packaging</td>
</tr>
</tbody>
</table>

*Triple layer packaging
- 1st layer: Container & disinfect outer part
- 2nd layer: Biohazard/JKM plastic bag
- 3rd layer: Outer container

## WORKFLOW GUIDELINE: Specimens to JKM, Pathology, IMR and Forensic Medicine laboratories

### 1) Pre-sampling
- Liaise with microbiologist/virologist/pathologist, respective subspeciality forensic pathologist, infectious disease (ID) physician, toxicologist/chemist etc. where necessary (depending on cases).
- Liaise first with laboratory that performs the analysis where necessary i.e: respective laboratory in JKM, histopathology unit / pathology laboratory in respective state, diatom laboratory etc.
- Prepare for sampling procedure
  - Appropriate personal protective equipment (PPE) for task
  - Tools/equipment for sampling
  - Packaging sets for transportation of samples
  - Specimen handling area
  - Biohazard waste bin
o Sampling team & Specimen handling team
o Respective laboratory request forms
o Fill in all details in the request form beforehand and mark 'Biohazard specimen' at the front page.

2) During sampling
   - Perform sampling. Put in appropriate container (first layer packaging).
   - Seal cover with parafilm (2 layers).
   - Spray with disinfectant (10% sodium hypochlorite).
   - Handover specimen to handling team.

3) Specimen handling area
   - Spray with disinfectant (10% sodium hypochlorite).
   - Wrap with gauze and tie it with a rubber band.
   - Put in another container/biohazard plastic bag (second layer packaging).
   - Put in multipurpose container “bekas serbaguna” (third layer packaging).
   - Disinfect its outer layer using universal wipes or disinfectant spray.
   - Put in polystyrene box containing ice pack. Seal its cover with tape.
   - Label at the outer part, indicating BIOHAZARD specimens.
   - Disinfect outer layer of box using universal wipes or disinfectant spray.
   - Send to the respective laboratories.
II. WORKFLOW GUIDELINE : Histopathology specimens to Pathology and Forensic Histopathology laboratories

1) Pre-sampling
   - Liaise with microbiologist/virologist/pathologist, respective subspeciality forensic pathologist, infectious disease (ID) physician, toxicologist/chemist etc. where necessary (depending on cases).
   - Liaise first with laboratory that performs the analysis where necessary i.e: respective laboratory in JKM, histopathology unit / pathology laboratory in respective state, diatom laboratory etc.
   - Prepare for sampling procedure
     - Appropriate PPE for task
     - Tools/equipment for sampling
     - Packaging sets for transportation of samples
     - Specimen handling area
     - Biohazard waste bin
     - Sampling team & Specimen handling team
     - Respective laboratory request forms
     - Fill in all details in the request form beforehand and mark 'Biohazard specimen' at the front page.

2) During sampling
   - Perform sampling. Cut tissue block specimens (with a length, width and height of 3 - 5 cm) for conventional paraffin embedding, and immediately put into the slide cassette.
   - Transfer into container with 10% formalin solution for fixation. Spray outer container with 0.5% sodium hypochlorite.
   - Hand over specimen to handling team.

NB: Auxiliary examination below, if needed to be done, shall follow the appropriate handling of the specimens before taking routine histopathology samples.
   - Hematoxylin-eosin staining.
   - Special staining.
   - Immunohistochemical staining.
o Immunofluorescence staining.
o Virus isolation and gene sequencing of secretion and tissue blocks.
o In situ detection of viral RNA or viral protein antigens in tissue sections.
o Ultrastructural examination of tissue sections.
o Detection of virus particle.

3) Specimen handling area
   • Spray outer container with 0.5% sodium hypochlorite.
   • Keep specimen fixed in 10% formalin solution for 48-72 hours.
   • Send the specimen to respective laboratory for processing.
IMPORTANT NOTES

1. The above guideline, particularly the packaging of specimens, shall be in tandem with each state’s respective Pathology departments SOP for COVID-19 specimens.

2. The decision on postmortem specimens shall be made on case-by-case basis and is not limited to the list in the guideline. The list is not comprehensive and may change in line with evolving information and knowledge of COVID-19.

3. Communicate with the respective laboratories or referral center before sampling or autopsy as part of pre-autopsy planning.

4. Cases for autopsy are mostly brought in dead (BIDs) with scarce or no information available hence, it is justifiable for various specimens to be sent for investigations.

5. For histopathology specimens, avoid frozen sections and grossing partially fixed specimens, if possible.

6. Prolonged formalin fixation (more than 2 weeks) of histopathology specimens may interfere with some immunohistochemical and molecular diagnostic assays.
REFERENCES


21. Packaging Samples COVID-19 For Pathology Department, Hospital Melaka. 17 April 2020.
ANNEX 20

Appendix B2(i)

LAMPIRAN 3A

AKTA PENCEGAHAN DAN PENGAWALAN PENYAKIT BERJANGKIT 1988
(Seksyen 16 – Perintah Bagi Pemeriksaan Mayat)

Kepada :

Ruj. Kami :

Tarikh :

Tuan/ Puan,

PEMAKLUMAN KES KEMATIAN DISYAKI COVID-19

Adalah saya ........................................................., Nc. Kad Kuasa: .................................

Nama pegawai diberi kuasa dan cop
dengan ini memaklumkan bahawa kematian kes ini:

<table>
<thead>
<tr>
<th>Nama simat :</th>
<th>No. Kad Pengenalan :</th>
<th>Umur :</th>
<th>Jantina :</th>
<th>Bangsa :</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No. Kad Pengenalan Waris :</td>
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<td></td>
</tr>
<tr>
<td>No. Telefon :</td>
<td>Alamat :</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

adalah disyaki COVID-19 berdasarkan mana-mana kriteria berikut:

| i) Kes berada dalam kawasan kadar insiden kes COVID-19 ≥ 21/100,000 populasi (kawasan merah) | Ya / Tidak |
| ii) Mempunyai sejarah mengunjungi negara yang terlibat COVID-19 dalam tempoh 14 hari kebelakangan | Ya / Tidak |
| iii) Mempunyai sejarah kontak dengan kes positif / disyaki COVID-19 dalam tempoh 14 hari kebelakangan | Ya / Tidak |
| iv) Mempunyai sejarah gejala COVID-19 (mana-mana gejala pernafasan seperti sesak nafas, batuk atau sakit tekak dengan/ tanpa demam) | Ya / Tidak |

2. Oleh itu, pihak Tuan/Puan adalah diarahkan untuk membawa mayat untuk pemeriksaan lanjut oleh Pegawai Perubatan.

Saya yang menjalankan amanah,

.................................................................................................

(Cop Pegawai Diberi Kuasa :)

.................................................................................................
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