

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

- A. GUIDELINE FOR TRANSPORTING BODIES WITH SUSPECTED/PROBABLE/ CONFIRMED COVID-19 INFECTION FROM EMERGENCY & TRAUMA DEPARTMENT OR WARD TO MORTUARY.
- B. GUIDELINES FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES DUE TO SUSPECTED COVID-19 INFECTION.
 - B1. GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES BY OTHER THAN POLICE TO EMERGENCY & TRAUMA DEPARTMENT WITH SUSPECTED/ PROBABLE COVID-19 INFECTION.
 - B2. GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES WITH SUSPECTED COVID-19 INFECTION BY POLICE TO THE MORTUARY.
- C. GUIDELINE FOR THE DISPOSAL OF DECEASED IN CASES DUE TO SUSPECTED/ PROBABLE/ CONFIRMED COVID-19 INFECTION.
- D. RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) IN THE MANAGEMENT OF DEAD BODIES WITH SUSPECTED/ PROBABLE/ CONFIRMED COVID-19
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A. GUIDELINE FOR TRANSPORTING BODIES WITH SUSPECTED/ PROBABLE/ CONFIRMED COVID-19 INFECTION FROM EMERGENCY & TRAUMA DEPARTMENT OR WARD TO MORTUARY

1. Bodies of suspected/ probable/ confirmed COVID-19 infection shall be sent from the Emergency & Trauma Department (ETD) or ward to the mortuary as soon as practicable.
2. Staff must wear the appropriate personal protective equipment and clothing (N95 masks, face shield, long-sleeved fluid-repellent disposable gown and gloves) while handling/ preparing the body.
3. Relatives are **STRICTLY FORBIDDEN** to touch or kiss the body. The number of relatives allowed to view the body for identification must be restricted to **1 PERSON ONLY**. They must wear a minimum of fluid-resistant surgical face masks, and if needed, also wear gloves and protective aprons. They should only be allowed to stand at a minimum distance of 1 meter from the body. If the relatives are unable to come to the ETD/ward, the identification process shall be done in the mortuary.
4. Relatives are **STRICTLY FORBIDDEN** to handle the body under any circumstances.
5. Body shall be prepared in the ETD / ward (i.e. the Last Office) by the ETD / ward staff before the body is sent to the mortuary.
6. Body preparation:

The bodies must be placed in **2 layers of body bags**.

- 6.1. First layer: Wrap body with white cotton linen.
 - 6.2. Second layer: Place body in body bag. It is optional to wipe or spray the bag especially at and around the zipper with disinfectant 0.5% sodium hypochlorite.
 - 6.3. Third layer: Place body in the next body bag, then the body bag must be wiped or sprayed with disinfectant 0.5% sodium hypochlorite.
7. Body transfer from the ward / ETD shall be carried out by 2 staff (one from ETD / ward and one from mortuary). Both staff must wear appropriate personal protective equipment (N95 mask, face shield, gloves, long-sleeved fluid-repellent disposable gown and protective apron).
 8. On arrival at the mortuary, the body must be immediately placed in a designated refrigerated body storage compartment.
 9. Sampling for all suspected or probable COVID-19 cases shall be taken in Emergency & Trauma Department or ward by the respective team.

B. GUIDELINES FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES DUE TO SUSPECTED COVID-19 INFECTION.

- **B1) Guideline for the Management of Brought in Dead (BID) Cases by Other Than Police to Emergency & Trauma Department with Suspected COVID-19 Infection.**
- **B2) Guideline for the Management of Brought in Dead (BID) Cases with Suspected COVID-19 Infection by Police to the Mortuary.**

B1) GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES BY OTHER THAN POLICE TO EMERGENCY & TRAUMA DEPARTMENT WITH SUSPECTED COVID-19 INFECTION.

1. The body/bodies of suspected COVID-19 infection may be brought in dead to Emergency & Trauma Department (ETD) by those other than the police, such as the family members, members of the public or ambulance, depending on the circumstances.
2. For body/bodies that are categorised as brought in dead to ETD, and the clinical history is suggestive of a suspected COVID-19 infection, **the samples for COVID-19 analysis shall be taken by the ETD staff**. This post-mortem sampling shall be done under the authorisation of the respective Hospital Director as per Section 16 of Prevention and Control of Infectious Diseases Act 1988 (Act 342) hence consent from the next of kin is not required. The next of kin shall be informed by the ETD staff regarding the whole procedure, the turnaround time for the result and subsequent procedures that entail, depending on the COVID-19 analysis results.
3. Case notification shall be made to the respective District Health Office (PKD) and a police report shall also be lodged by the ETD staff.
4. The handling of the body/bodies shall be supervised by the Assistant Environmental Health Officer. The body/bodies must be placed in **2 layers of body bags** prior to sending to the mortuary.
 - 4.1. First layer: Place body in body bag. To wipe or spray the exterior surface of the bag especially at and around the zipper with disinfectant 0.5% sodium hypochlorite.
 - 4.2. Second layer: Place the first layer into another body bag. To wipe or spray the exterior surface of the bag especially at and around the zipper with disinfectant 0.5% sodium hypochlorite.
5. The body/bodies shall then be sent to the mortuary using designated pathways and/or hospital vehicle.
6. The receiving medical staff at the mortuary shall:

- 6.1 Wear appropriate PPE.
- 6.2 Keep the body in the designated body freezer.
- 6.3 Communicate/discuss the case with the forensic pathologist at the referral forensic centre for further management.
- 6.4 Notify the case to the following:
 - 6.4.1 The National Crisis Preparedness and Response Centre.
 - 6.4.2 The respective State Health Department (JKN).
7. The body/bodies shall be kept in the designated body freezers until the laboratory test result of COVID-19 is available.
8. If the result is **POSITIVE** and post-mortem was not requested by the police:
 - The respective Emergency Medical Officer shall provide the cause of death.
 - The body shall be released with strict adherence to the COVID-19 body disposal guideline with all the necessary documents.

If the result is **NEGATIVE**, the police shall be informed for subsequent medicolegal investigation of death.

B2) GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES WITH SUSPECTED COVID-19 INFECTION BY POLICE TO THE MORTUARY.

1. Body/bodies of deceased suspected-of COVID-19 infection from outside of hospital setting shall be informed by the police to the respective District Health Office (PKD) and the respective forensic pathologist prior to sending the body/bodies to the mortuary of the designated hospital (in accordance with "*Garis Panduan Pengurusan Kematian Disyaki COVID-19 di Luar Hospital Semasa Pandemik, KKM 2020*").
2. The handling of body/bodies at the scene shall be done by the police and shall be supervised by the respective Assistant Environmental Health Officer. The body/bodies must be placed in **2 layers of body bags**.
 - 2.1. First layer: Place body in the body bag. To wipe or spray the outer layer of the bag especially at and around the zipper with disinfectant 0.5% sodium hypochlorite.
 - 2.2. Second layer: Place the body wrapped with the first layer into another body bag. To wipe or spray the outer layer of the bag especially at and around the zipper with disinfectant 0.5% sodium hypochlorite.
3. The receiving mortuary staff shall:
 - 3.1 Wear appropriate PPE.

- 3.2 Obtain a police order (Polis 61) and/or 3A form (Refer Appendix B2(i)) for post-mortem examination.
- 3.3 Communicate/discuss the case with the forensic pathologist of the referral centre/department to decide the management of the post-mortem examination in suspected COVID-19 case.
- 3.4 Notify the case to the following:
 - 3.4.1 The National Crisis Preparedness and Response Centre.
 - 3.4.2 The respective State Health Department (JKN).
4. Samplings for COVID-19 shall be taken in the designated mortuaries. **PPE to be worn during sampling: scrub suit, N95 mask, face shield, fluid-resistant disposable gown, head cover and boots.**
5. The body/bodies 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:
 - The respective forensic pathologist shall perform the post-mortem examination and provide the cause of death.
 - If internal dissection of the body is to be performed during the post-mortem examination, it is strongly suggested to perform the post-mortem examination in a **Biosafety level (BSL) 3 post-mortem suite**, or minimally in BSL 2 with negative pressure post-mortem suite. It is required to don PPE level 3 with powered air-purifying respirator (PAPR).
 - The body shall be released with **strict adherence to the COVID-19 body disposal guideline** with all the necessary documents.

If the result is **NEGATIVE**, all the proceedings are the same as above **EXCEPT** that the body can be released following the **standard body release/disposal procedure** as per "Standard Operating Procedures of Forensic Medicine Services, MOH Malaysia 2012".

Appendix B2(i)

LAMPIRAN 3A

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

Kepada :

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.....
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Ruj. Kami :

Tarikh :

Tuan/ Puan,

PEMAKLUMAN KES KEMATIAN DISYAKI COVID-19

Adalah saya, No. Kad Kuasa:
Nama pegawai diberi kuasa dan cop

dengan ini memaklumkan bahawa kematian kes ini :

MAKLUMAT KES				
Nama simati :	No. Kad Pengenalan :	Umur :	Jantina :	Bangsa :
Nama Waris :	No. Kad Pengenalan Waris :	Hubungan dengan simati :		
No. Telefon :	Alamat :			

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

i) Kes berada dalam kawasan kadar insiden kes COVID-19 \geq 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,

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Cop Pegawai Diberi Kuasa :

C. GUIDELINE FOR THE DISPOSAL OF DECEASED IN CASES DUE TO SUSPECTED/ PROBABLE/ CONFIRMED COVID-19 INFECTION

1. It is recommended that bodies of suspected/ probable/ confirmed COVID-19 infection (whether post-mortem is done or not) shall be disposed of (burial or cremation) as soon as practicable.
2. The body shall be identified by the relatives either in the ETD/ward prior to sending the body to Forensic Department/Unit **or** in the Forensic Department/Unit, depending on circumstances.
3. In all deaths of suspected/ probable COVID-19 such as SARI, the body shall be prepared and managed as COVID-19 cases and sent to the Forensic Department until the COVID-19 result is available.
 - If the body is confirmed COVID-19 positive, the following management below applies (refer no. 4 onwards).
 - If the result is COVID-19 negative, the body shall be managed as any non-COVID-19 cases.
 - However, the body shall be handled as COVID-19 positive, if clinical history and other relevant investigations suggest **probable** COVID-19 infection despite a negative RT-PCR result.
4. Preparation of the body according to religious rites must be conducted under the supervision of the Assistant Environmental Health Officer.
5. Embalming must be avoided.
6. Confirmed COVID-19 Muslim body shall not be washed (*mandi mayat*). The procedure of *mandi mayat* shall be replaced by *tayammum* over the outermost body bag.
7. For confirmed COVID-19 non-Muslim body, all bodies shall be disposed either by burial or cremation. If any ritual body preparation is to be conducted, the procedure shall be kept at a minimum and done over the outermost body bag.
8. The release of the body to the relatives must be carried out with strict precautionary measures under the supervision of the Assistant Environmental Health Officer.
9. Relatives are prohibited from opening the sealed coffin/sealed body bag and the Assistant Environmental Health Officer must ensure this precaution is strictly adhered to.
10. All bodies with suspected/ probable/ confirmed COVID-19 infection are recommended to be taken for burial or cremation directly from the mortuary, preferably within the same day of the post-mortem examination (if applicable).
11. Deaths occurring in private hospitals shall follow the same procedure as outlined above. The body is to be released for burial/cremation from the Private Hospital.

D. RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) IN THE MANAGEMENT OF DEAD BODIES WITH SUSPECTED / PROBABLE / CONFIRMED COVID-19

	Phase	Target Personnel	Activity	Type of PPE*
1.	Handling of dead body - Recovery at site / death in ward - Transport to mortuary	Healthcare workers Police	Wrapping of body Transfer of body from one location to another	PPE Level 2
2.	Postmortem sampling	Healthcare workers	Nasopharyngeal / oropharyngeal swab sampling Other non-invasive sampling	PPE Level 2
			Handling of specimens	
			- packaging / labelling of specimens	PPE Level 2
			- transport of specimens	PPE Level 1
			- processing histology specimens	PPE Level 1 (with eye protection)
3.	Autopsy - Confirmed - Suspected/SARI/ARI/ILI (if high index of suspicion or CXR reported as Probable COVID-19, regardless of rRT-PCR NP/OP swab result)	Healthcare workers	Aerosol-generating procedures - Lower respiratory tract sampling - Head dissection - Other cavity dissection	PPE Level 3 (PAPR) at Biosafety level (BSL) 3 autopsy room or BSL 2 with negative pressure autopsy room
	- SARI/ARI/ILI (with low index of suspicion, negative rRT-PCR NP/OP swab result and CXR reported as non-COVID-19)			PPE Level 2 at BSL 2 autopsy room

4.	Disposal of dead body	Religious body handlers Healthcare workers	Religious rites Coffining	PPE Level 2
			Viewing by next of kin	PPE Level 1
			Burial / cremation	PPE Level 2
5.	Disinfection - Autopsy room - Mortuary - Hearse	Healthcare workers Religious body handlers	Cleaning Decontamination procedure	PPE Level 2

* Refer Appendix D(i)

Appendix D(i)

Levels of Personal Protective Equipment (PPE)

Protection Level	Protective Equipment
Level I protection (Standard Infection Control Precautions)	Hospital scrub Disposable surgical cap Disposable fluid-resistant surgical mask Disposable apron Disposable latex gloves <u>Consider (if risk of spraying or splashing)</u> Eye & face protection (FRSM & full-face visor or FRSM & goggles)
Level II protection (Contact/Droplet/Airborne Precautions)	Hospital scrub Disposable head cover Medical protective mask (N95) Fluid-resistant disposable gown Disposable apron Disposable latex gloves Goggles/Full-face visor Boot Disposable boot cover Shoe cover (if no boots)
FOR ALL AEROSOL-GENERATING PROCEDURES : FFP3 respirator (and eye protection) or a powered hood respirator	
Level III protection (Enhanced Precautions)	Hospital scrub Disposable head cover Medical protective mask (N95) Fluid-resistant disposable gown Disposable apron Disposable latex gloves Goggles/Full-face visor Boots Disposable boot cover Full-face respiratory protective devices or powered air-purifying respirator (PAPR) OR Tyvek suit PAPR Fluid-resistant disposable gown Disposable latex gloves or long/extended cuff non-sterile, non-latex disposable gloves Boots Disposable boot cover

FRSM Fluid-resistant Type IIR surgical face mask
FFP Filtering face piece

E. MANAGEMENT OF POSTMORTEM SPECIMENS IN CASES WITH SUSPECTED/PROBABLE/CONFIRMED COVID-19

	TEST	SPECIMEN	CONTAINER	RECOMMENDED PACKAGING / STORAGE TEMPERATURE
A.	JABATAN KIMIA MALAYSIA (JKM)			
1.	Toxicology analysis	Blood, Urine	Universal bottle	*Triple layer packaging
		Tissue (Liver etc)	Sterile container	
2.	Deoxyribonucleic acid (DNA) analysis	Blood	FTA card	**Put into a biohazard plastic bag, seal it and put into an envelope. Label the envelope with deceased's details and a biohazard mark.
		Bone, Tissue	Sterile container	*Triple layer packaging
3.	Forensic analysis	Hair, fingernails	Sterile container	*Triple layer packaging
		Clothing	Paper/envelope and then put into a plastic package.	Disinfect plastic package with 0.5% sodium hypochlorite.
		Swabs	Sterile container	*Triple layer packaging
		Gunshot residue	Gunshot residue (GSR) collection kit	***Place in 2 biohazard plastic bags.
4.	Others	Others	Respective containers	Depending on containers.

B. DEPT OF PATHOLOGY/INSTITUTE FOR MEDICAL RESEARCH				
1.	Real-time Reverse Transcription-Polymerase Chain Reaction (rRT-PCR) COVID-19	Nasopharyngeal swab (NPS)/Oropharyngeal swab (OPS)	Viral transport media (VTM)	*Triple layer packaging 2-8° C if ≤ 5 days -70° C (dry ice) if > 5 days
		Tracheal aspirate	Sterile container	*Triple layer packaging 2-8° C if ≤ 2 days -70° C (dry ice) if > 2 days
		Lung swab	VTM/Sterile container	*Triple layer packaging
		Lung tissue	VTM/Sterile container	*Triple layer packaging 2-8° C if ≤ 24 days -70° C (dry ice) if > 24days
		Stool	Stool container/sterile container	*Triple layer packaging 2-8° C if ≤ 5 days -70° C (dry ice) if > 5 days
		Urine	Urine collection container/sterile container	*Triple layer packaging 2-8° C if ≤ 5 days -70° C (dry ice) if > 5 days
2.	Antigen Rapid Test Kit (RTK-Ag)	NPS	VTM	*Triple layer packaging

3.	Histopathology	Airways, lungs, other organs	Cassettes in formalin-containing container (sample:10% neutral buffered formalin ratio = 1:10)	Standard packaging (Refer “ WORKFLOW GUIDELINE II ”)
4.	Serology (Dengue, Leptospirosis, Melioidosis, Hep B/C, HIV etc)	Blood	Plain tube with gel (yellow cap)	<p>***Place in 2 biohazard plastic bags and put inside a cooler box.</p> <p>Place form at the outer layer of the box.</p> <p>(Follow respective local pathology laboratory guidelines)</p>
5.	Cultures	Blood	Bactec bottle	
		CSF	Bijou bottle	
		Swab	Amies/Stuart Transport Medium	
		Tissue, Urine, Fluid	Sterile container	
6.	PCR for various infectious agents (Dengue, Leptospirosis etc)	Tissue (Liver, spleen, kidney etc)	Sterile container	
7.	PCR for other respiratory pathogens	Tracheal swab	VTM	*Triple layer packaging
		Lung swab	VTM	
		Lung tissue	Sterile container	
8.	Inborn error of metabolism	Blood	Lithium-heparin tube, EDTA tube	*Triple layer packaging

			Whatman filter paper	**Put into a biohazard plastic bag, seal it and put into an envelope. Label the envelope with deceased's details and a biohazard mark.
		Urine	Sterile container	*Triple layer packaging
9.	Entomology	Maggots	Sterile container containing 70% alcohol	***Place in 2 biohazard plastic bags.
C. DEPTs OF FORENSIC MEDICINE				
1.	Diatom analysis	Tissues (limited to lung and another organ)	Formalin-containing container	*Triple layer packaging
2.	Histopathology	HPE slides/Paraffin-embedded tissue blocks	Appropriate container	Standard packaging

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

I. 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
 - 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. 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.
 - Immunofluorescence staining.
 - Virus isolation and gene sequencing of secretion and tissue blocks.
 - In situ detection of viral RNA or viral protein antigens in tissue sections.
 - Ultrastructural examination of tissue sections.
 - 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 guideline above, 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 / referral centre before sampling / autopsy as part of pre-autopsy planning.
4. Cases for autopsy are mostly brought in dead (BIDs) with scarce / 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 (>2 weeks) of histopathology specimens may interfere with some immunohistochemical and molecular diagnostic assays.

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