

# **FORENSIC SCIENCE LABORATORIES**

**Ref: MAHARASHTRA CIVIL MEDICAL CODE (UNDER REVISION)**

## **CHAPTER 13**

**13.1.** The former Chemical Analyzer's Department was merged into the Forensic Science Laboratory, Bombay, (Government Resolution, Home Department No.FSL-1 057n420 I-V, dated 3rd February, 1958). Regional Forensic Science Laboratories were established at Nagpur in 1966, Pune in 1979 And Aurangabad in 1981.

(Government Resolution, Home Department No.FSL-1065/62671/XXII, dated 31st October 1966,FSL.0179/1149-POL-4, dated 7th May 1979 and FSL. 1279/28356-POL-4, dated 28th November 1980).

The Forensic Science Laboratories in the State of Maharashtra are under control of the Head of the Department, the Director who is functioning under Government in the Home Department.

**13.2. The Director,** Forensic Science Laboratories is assisted by 1(one) Joint Director and 10 (ten) Deputy Directors: Biology and Serology Divisions- 2, Toxicology Division-I, Physics Division-I, Ballistics Division-I General Analytical and Instrumentation Division -1, Prohibition Division -1 and Regional laboratories-3. There are in addition 21 Assistant directors (Class-I) Prohibition -5, Biology-Serology-5, General Analytical and Instrumentation-4, Physics-I, Ballistics-I and Gazetted Class-II Assistant Chemical Analysers-94 and 1Scientific officer (Photography), Class- I technical officers in this Department are held equivalent to Chemical Examiner and Class-II technical officers are equivalent to Assistant Chemical Examiners for the purpose of clause (a) of sub-section 293 of the Code of Criminal Procedure, 1973, (2 of 1974).

(Government Notification H.D.No. FSL-0174/2/POL-4, dated 19th May 1979)

**13.3.** The Directorate undertakes the following work: -

(1) Analysis and issuing of reports on exhibit submitted by Police and Medical Officers, in cases pertaining to criminal offences (charged under the Indian Penal Code etc.) or investigation of sudden deaths (Section 174 of Code of Criminal Procedure). Analysis of material submitted under the Bombay Prohibition Act and Narcotic Drugs and Psychotropic Substances Act.

(2) Supply expert information within the scope of its duties to any Department of Government, Which may consult it.

(3) Deal with medico legal and toxicological exhibits submitted by Military Medical Officers in the State

(G R., G.O. No. 2569, dated 24th April 1977) and

(G.R.G. D. No. 4260, dated 13th August 1909) and

(G.R., G.D. No. 6145 dated 27th April 1923).

(4) Attend courts of law as Expert Witness, when called upon to do so, despite provision of Criminal Code, Section 293.

(5) Impart training to police and Medical Officers in use of scientific aids in crime investigation and detection.

(6) Accept analytical work on payment of fee from Police and Medical Officer of Administration of Daman, Diu and the State of Goa. .

(Govt. Endorsement H. D.No. FSL-3062/6229- VI, dated 8<sup>th</sup> August 1<sup>st</sup> 1962)

In some cases for sufficient reasons; at its discretion, accept analytical work from other private or public bodies on payment of fee, if necessary:

The fees collected above are credited in full to Government including the fee of Rs. 50 per day of attendance in Court of Law for giving evidence on behalf of a private party.

(G.R.; G.D. No. 3723, dated 7<sup>th</sup> July 1902 and

(G.R., G.D. No. 8386, dated 11<sup>th</sup> February 1936)

**13.4.** The Forensic Science Laboratories provide scientific assistance in crime investigation by way of examination of blood, semen, stains thereof and other. Metrological exhibits in cases of criminal violence; and that of viscera, vomit, and other material in homicidal, suicidal accidental poisoning, that of diverse materials recovered in cases of murder, arson, fire, explosions, thefts, dacoities, vehicle accidents etc. and firearms offences which often yields important physical evidence leading to apprehending the criminal by providing or strengthening a link in the whole chain of evidence. At times an objective laboratory report is helpful in clearing the innocent. The nature of work handle din the various Divisions of the Department is as under:

**(1) Toxicology Division** - Examines biological matter like viscera, vomit, blood, urine, etc. and other material like drugs, insecticides etc. submitted by Medical and Police Officers in homicidal, suicidal or accidental poisoning cases for the detection and quantitation where possible of any poison present in them. Also examines material in animal and bird criminal poisoning cases.

**(2) Physics (including Photography) Division**- Instrumental analysis like spectrographic, thermo-analytical, X-ray, photo micrographic, of trace evidence materials like soil, paint, glass, metal, fibre, fabric. etc. in murder, theft, vehicle accident and other cases. Restoration of erased marks. Examination of tool marks.

**(3) Biology-Serology Division** - Examines blood, semen, saliva and other biological stains in cases of criminal offences of violence. Also examines hair and other biological materials like wood, plant and zoological fragments etc. Carries out medico legal serological work of its own for typing and grouping of stains, and prepares its own biological reagents (anti-sera). Also undertakes enzymatic, gel diffusion, immunoelectrophoretic analysis, examination of bacterial food-poisoning (fatal) cases, skull upper imposition etc.

**(4) Ballistics Division** - Undertakes examination of firearms, bullets, cartridge cases etc. used in crime, examines residues left in gun barrels, remnants of gun powder etc., on skin and clothing and also examine the condition of suspected firearms, evaluates distance of firing and effectiveness (energetic). Examines ' arms/ammunition in cases under Arms Act. The work is done only at Bombay and not at Nagpur, Pune or Aurangabad.

(I.G.P. Memorandum No. G/6162 dated 10<sup>th</sup> May 1967 and Circular memorandum No. G/6162 dated 10<sup>th</sup> September 1969)

**(5) ..General Analytical and Instrumentation Division** -Chemical analysis of materials like petroleum products, cement explosive materials, oils and fats, cosmetics dangerous drugs, industrial chemicals etc. and residues thereof in cases of murder, arson, explosion, theft, cheating, etc. Instrumental analysis-gas / liquid chromatography and ultraviolet / infrared spectrophotometry.

**(6) Prohibition Division** - Examines illicit liquor, wash, ganja, bhang, chars, opium etc, in possession cases and also blood samples (consumption cases) collected under the Bombay Prohibition Act. Also, Excise samples for alcohol strength. Any food or water samples seized by the Food and Drugs Administration or any other public body for the purpose of (ascertaining its fitness for human consumption or in food poisoning cases are ordinarily examined by the Public Health Laboratory / Municipal Analyst, unless deaths are cause or a large number of persons are seriously affected by their consumption to make their examination a matter of urgent public importance.

**13-5.** Rules for Transmission of Articles to the Directorate for Analysis - For making the maximum use of Scientific aid to investigation of various crimes, the following instructions should scrupulously be followed while forwarding material to the Forensic Science Laboratories.

**13.5. (A) Toxicology - (I)** In all cases of suspected poisoning the Medical Officer shall gather as much Information as possible from the Police or the Magistrate on the following lines and forward it to the Director along with the material to be tested.

(i.a.) What interval was there between the last eating or drinking and the first appearance of symptoms of poisoning?

(i.b.) What interval was there between the last eating or drinking and death (if this occurred)?

(i.c.) What were the first symptoms?

(i.d.) Were any of the following symptoms present and if so, state which?

- 1) Vomiting and purging;
- 2) Deep sleep;
- 3) Tingling of the skin and throat;
- 4) Convulsions or twitching of the muscles;
- 5) Delirium and clutching at imaginary objects;
- 6) Contraction/dilation of pupils;
- 7) Cyanosis;
- 8) Smell of breath;
- 9) Frothing (mouth/nostrils).

(i.e.) Were any other symptoms noticed?

(i.f.) Did any other persons partake of the suspected food or drink and if so did they also suffer from Similar or other symptoms of poisoning?.

Any other information available which is likely to prove useful as a guide to the class of poison administered, should at the same times, be furnished. . .

Any related articles in the possession of the Police, of which an analysis may be required, may, at the Same time, be forwarded to the Director with a description of the place from where recovered.

In all cases of death from presumed poisoning the stomach should be tied at both ends and removed from the body so that its contents may be retained; after removal it should be opened, its smell noted, and acidity checked with a litmus paper and recorded, contents received into a perfectly clean bottle and Mucous surface of the stomach carefully examined, its appearance noted and any suspicious particles like pills, fragments thereof etc. found adherent thereto should be picked off with a pair of forceps and placed in a separate small phial for transmission.

(G.R.G.D.No. 71, dated 11<sup>th</sup> January IS92)

In cases of death, suspected to be from poisoning the mucus membrane of mouth respiratory passages, pharynx and esophagus should be examined and any unusual appearance or marks of irritation or corrosion thereon carefully noted.' The vagina of female bodies should be examined, and any foreign Materials preserved separately.

13.5 (A) (i) Medical Officers should preserve Viscera in cases of drowning, burtis, hanging, strangulation, Suspected poisoning and where the causes of death cannot detected. .

(S.G.'s Circular Memo No. PML46/4868/118501B dated 9<sup>th</sup> May 1968) and Home Department, Circular No. PRO 2360/5735<)11X dated 12<sup>th</sup> January 1962).

**13.5 (A) (ii)** The following material is are Commended for carrying out necessary tests in spected poisoning cases:-

(S.G's, Memorandum No.PLM-486316224, dated22nd March 1963)

Material	Quantity
(i) Stomach	Whole
(ii) Stomach contents	300ml. If less is available, the whole quantity
(iii) Small Intestine	1 meter in adults, 2 meter in children and whole in infants.
(iv) Small intestine contents	100 ml: But if less is available, the whole quantity
(v) Liver	400 to 500 grams but whole in infants
(vi) Kidney	½ from each kidney in adults but both the kidneys from children and infants
(viii) Brain	300 grams
(ix) Bones	a piece of long bone about 15 cm
(x) Hair	20 grams or if less is available the whole quantity
(xi) Blood (postmortem)	100 ml (postmortem), 10ml (ante-mortem)
(xii) Vomit	400 ml or if less available the whole quantity
(Xiii) Stomach wash	500 ml or if less is available, the entire quantity
(xiv) Urine	100 ml or if less is available the entire quantity
(xx) Muscle	50-100 grams around the I.M. Injection mark, with similar amount away from injection site, as control

**N.B.:-** Material noted at Serial Nos. (I) to (iv) should be put in one standard wide mouthed viscera bottle and that from (v) to (vii) in another. Standard viscera bottles supplied by Forensic Science Laboratory should be used. In any case narrow mouthed bottles should never be used. When additional material is required to be sent it should be dispatched in separate bottles e.g. brain in one bottle and vomit and/or stomach wash in another bottle; Blood and urine should be set in separate bottles. (S.G. & S. Circular Memo No. PML/18/467/14809/B, dated 7<sup>th</sup> July 1969).

**13.5 (A) (iii) (a)** A piece of long bone and plucked hair should be sent in cases with history of poisoning by arsenic, lead etc. Other bones, skull, or skeleton should never be sent to Forensic Science Laboratories. For identification whether human or not, age, sex, etc. the bones should be sent to the Professor of Anatomy concerned.

(b) Blood and urine should be sent in deaths suspected to have been caused by alcohol poisoning.

(c) All materials i.e. vomit, stomach wash, viscera etc. of the same case should be forwarded at one time only together with pills, bottles etc. attached, if any, by Police from the residence of the victim. If the poison ingested is known its name and composition should be clearly mentioned.

(d) In rare cases where vomit or stomach wash is required to be sent first and viscera is sent later on. Due to death of the victim after considerable time, the fact that vomit etc. of the same person have been forwarded previously should be mentioned in the subsequent forwarding letter giving previous reference number and date.

(e) Vomit and stomach wash etc. should be forwarded with the prescribed form No. CM-24e and Viscera should be forwarded with form No. CM-23e. These forms are prescribed by Government and must be used while sending any material to the Department. (please refer Annexure 'A' and 'B' the forms are available from Manager, Yeravada Prison Press, Yeravada, Pune).

(f) All columns of the forms should be completely and legibly filled in ink and detailed history of the case should be given including signs and symptoms as reported by Police and relatives before treatment was started and also those observed by the Medical Officer himself. Antidotes given if any should also be mentioned. Smell of a poison, or that of material used in the formulation, like the solvent in the case of - insecticides, should be separately and carefully recorded.

(g) Bottles should be properly labelled and stoppered. (Great care should be taken that the lid of the bottle fits tightly.) The precaution is especially necessary if alcohol in exceptional circumstances as in 13.5(A) (h) (ii) is used. Care should be taken to see that the name of the victim, nature of exhibit and case number as given in the forwarding letter tally with those given on the labels. All exhibits should be secured and sealed with sealing wax, which should bear the impression of an official device. A copy of the seal should invariably be sent with each forwarding letter.

It is not necessary for a Medical Officer performing post-mortem examination to preserve bottles containing viscera with himself. In this connection attention is invited to para No. 123 and 145(2) of Police Manual and para 322 of Civil Medical Code, 1951 Edition which emphasize as follows: -

"Bottles containing the viscera or any other medicolegal exhibits which may have to be sent to the Chemical Analyser should be sealed by the Medical Officer concerned and sent to the Officer in charge of the nearest Police Station (under intimation to the office at whose instance the examination was conducted) for sealing and safe custody with the nearest Police Guard until the order of the Magistrate, Superintendent of Police or S.D.P.O. is made known."

The Forensic Science Laboratory to be referred to only in cases of urgent necessity.

Substance ought not be sent to the Forensic Science Laboratory - for analysis when there is neither a reasonable suspicion that poison has been used nor anything in the Post-Mortem Examination of the bodies leading to such supposition. This has also been stressed in I.G. Police's Circular Memo No. G/6162, dated 27- September 1966.

The Inspector General of Police has drawn attention of Police Officers to the above. vide his letter No.G-3304, dated 13 January 1969, addressed to the Commissioners of Police, Pune and Nagpur and to -- All Superintendents of Police (Districts and Railways) for implementation.

It occasionally happens that the

(1) the bottles brought to the Forensic Science Laboratory by the Constables are found to be Ordinary narrow mouthed bottles, which have to be broken open to extract the swollen contents from them.

(2) Sometimes seals are found broken and labels missing rendering impossible the identification of bottles with the description given on 'the' forwarding letters

(3) The bottles are brought tied in dusters or in ordinary bags involving great risk on being broken in transit.

In order to avoid the above, wide mouthed standard bottles along with standard viscera box, already supplied by Forensic Science Laboratory, should be used: The standard viscera box along with empty bottles is returned to the Medical officer through the Police Constable. In case the standard viscera bottles, for any valid reason (e.g. non availability) have not been used initially the relevant bottles may be called back by the Medical Officers from the Police Station where they have been kept in safe custody when the forwarding letters are to be issued and after verifying the labels and seals the contents of these bottles should be transferred to the standard wide mouthed viscera bottles in the presence of the Police and fresh official seals applied on the viscera bottles. They must then be forwarded to the Laboratory along with the forwarding letters and Police authority letters, as has been the practice hitherto. (S.G's Circular Memo No. PMUI8/467114809/H dated 1<sup>st</sup> July 1969).

(h) Preservative used should be mentioned in the forwarding letter. The following preservatives should be used for material containing tissues. No preservative is required for vomit, stomach wash etc.

(i) *In all poisoning cases except by acid.* Saturated solution of common salt should be used. Care should be taken to see that the solution is sufficient and completely covers the materials. As an additional precaution 25 to 50 gms of common salt may be added before sealing the bottles. If the material is not completely submerged in the solution decomposition will take place in spite of the preservative used with the result that gases may form and either undo the lid spilling the contents or even break the bottles.

(ii) *In case where poisoning by acid\* is suspected* - Rectified spirit should be used in all acid poisoning cases and not the common salts solution. Formalin and denatured spirit should never be used

as preservatives in any poisoning case. Rectified spirit may also be used to preserve muscle tissue in case of poisoning by i.m. injection.

\*Mineral acids and not organic like carbolic and oxalic acid, etc ..

(iii) *In deaths due to suspected alcohol poisoning* - In alcohol-poisoning cases never use alcohol as preservative in any form which includes rectified and denatured spirit. In such cases solution of common salt as prescribed in (i) above should be used .

(iv) *Blood samples* should be preserved by adding approximately 10 mg of sodium fluoride and 30 gm of potassium oxalate per 10 ml blood.

(v) *Urine samples* should be preserved by adding 2-3 ml concentrated hydrochloride acid or 2-3 ml chloroform per 100 ml blood.

(vi) *in case of dog bite* a part of brain should be preserved in 50 per cent glycerin (neutral) in isotonic saline for microscopic examination of negri bodies and another part in formalin for histopathological examination.

( Haffkine Institute, Movement of Maharashtra Publication 1964, ;;Rabies and Anti rabic treatment"). This material should not be sent to Forensic Science Laboratories.

While following the above instructions the other general procedure to be followed regarding using Proper devices or seals and sending sample copy of seals, writing forwarding letters in ink, giving in the Forwarding letter the correct designation and postal address of the Medical Officer, writing full and correct Address of the Forensic Science-Laboratory concerned (including pin code) etc. etc. should not be lost sight of.

When the cause of death is not detected because of decomposition of body, the duty of Medical Officer pardoning the post-mortem examination does not end till the viscera is sent to the Forensic Science Laboratory and its opinion obtained in the matter. Poisons can be detected even after decomposition and hence decomposition is not a bar to chemical examination. (S.G's Confidential Circular No. PMU6066/B, dated 12<sup>m</sup> August 1966)

**13.5 (A) (iv)** As a rule, only in genuine cases with direct or indirect evidence of poisoning the vomit, viscera etc. are to be submitted for analysis.

In all other cases the Medical Officers should only preserve the viscera and explain fully why the viscera are preserved to the Police in writing and only if the analysis is absolutely necessary, it should be sent for analysis.

All material submitted should be accompanied by a copy of Police Authorization for Chemical Analysis. In addition whenever samples of viscera are sent the Medical Officer must send details history, symptoms etc. in the prescribed form and also what particular poisoning is suspected.

It may also be noted by all Medical Officers that preserving viscera and sending the same for analysis are two separate acts. Preservation, as cited above, must be done in all cases whether the material is to be sent for analysis on Police Authorization or not.

The following points should be kept in mind:

(1 ) Preservation and dispatch of Viscera is not substitute for a careful post-mortem examination.

(2) Medical Officers should think carefully if preservation and dispatch of viscera is necessary Particularly when causes of death is evident and when there is no history of foul play or poisoning.

(3) Even viscera of persons who have died of pulmonary edema, burns, electric shock are reportedly sent for analysis as a routine, which is not proper. In cases of electrocution, skin at the relevant site should be set for detection of metallic residues.

(4) In all drowning cases viscera may be preserved but not dispatched unless Police desire so. If

death is due to drowning the cause of death should be so mentioned.  
(S.G.'s Circular Memo. No. PML.166/5654/B, dated 13<sup>th</sup> September 1966).

(5) If a Police and Medical Officer agree that death is due to drowning, the viscera should be Preserved. It should be destroyed after 3 months unless advised to the contrary by Police. If the Police and Medical Officer do not agree, the viscera should not be destroyed without Police permission.

(S.G.'s Endorsement No. HSG. 1662/1072/D, dated 17<sup>th</sup> September 1962 on I.G.P.'s letter to the S.G.)

The Inspector General of Police has instructed Police Authorities, that in those cases where it is necessary to send samples to the Forensic Science Laboratory, Police Officers should make a written request to the Forensic Science Laboratory (in duplicate, one copy to the Forensic Science Laboratory another to Medical Officer) forwarding information on the following points: -

- 1) Name of the poisoned person.
- 2) Police Station C.R. and date.
- 3) Section of Law.
- 4) Brief History of poisoning known to the Police.

(S.G.'s Endorsement No; PML',166/5654II', dated 6<sup>th</sup> January 1966)

There are many case of poisoning due to sedatives , tranquilizers and insecticides. Their detection in Visceral material is missed particularly when consumed in smaller quantity. Examination of blood and Urine in such case, would also be useful and as much of Urine and Blood should be collected directly fond balder and the heart as possible. This should be sent to the Forensic Science Laboratory along with Viscera. 11;"0 extra con tamers for blood and urine have already been provided for this purpose with the Standard Viscera Boxes.

(S.G. 's Circular NO.PML.4863/6224/B, dated 2<sup>nd</sup> June 1967)

**13.5. (B) Biology / Serology** - The following material should be sent in cases of murder, assault, rape, Criminal abortion , concealment of birth , etc. along with relevant information for it's characterisation, serological and allied examination .

**Blood-** Post-mortem blood of deceased should be sent as a reference material for grouping. When blood is not available, a piece of muscle and/or molar or premolar teeth or long bones should be sent. Two blood-stains on sterile cotton cloth and a few plucked hair strands should also be sent along with the post- mortem blood samples .

As a reference for grouping, ante-mortem blood and ,two blood stains on sterile cotton cloth, plus a few combed hair strands with root intact, should also be sent after collection from injured victims or suspects whose blood is likely to be present on exhibits sent or being sent by the Police Investigating Officer. It should be. noted that in the case of a suspect his / her blood (2 ml) should be taken provided it is given voluntarily and a certificate should be issued to that effect.

(Government Letter U.D.P.H, and H.D. No. HD/FSL.3064/29239/4263 G dated 9<sup>th</sup> December 1965).

All blood specimens (about 2 ml) sent as a reference for grouping should be preserved in an equal Volume of preservative solution; The preservative solution is prepared by dissolving 5.0 gm of sodium Citrate in 50 ml of distilled water, adding 0.25 ml of formalin solution (containing about 40 per cent w/v of formaldehyde) and making the final volume to 100 ml with distilled water.

Two blood stains (each of about 5 cm diameter) are prepared on sterile cotton cloth immediately after collection of blood (without any preservative) and sent in a labeled envelop only after they have been completely dried.

Molar or per-molar teeth are removed and sent in a labeled sterile vial only after they have been Completely dried.

**Saliva** - Saliva samples should be collected in sterile test tubes, heated in a boiling water bath for 10 Minutes, cooled and transferred to a sterile phial before dispatch. Simultaneously two stains of unheated Saliva (without any preservative) should be prepared on sterile cotton cloth (each of about 5 cm diameter) And sent in a labelled envelope only after they have been completely dried.

**Vaginal/anal Swabs, Smears etc.** In sexual offences vaginal/ anal swabs should be sent along with their smears on microscope slides. Swabs should be taken on sterile gauze! Cloth and their smears prepared on sterile slides. All these should be immediately dried in desiccators and dispatched in a sterile test tube / wrapper (for slides).

**Hair-** Hair samples are required for species-origin and comparative emanation or for enzyme Grouping. When control samples are to be sent for comparison or grouping they should be whole hair Strands (obtained by plucking or combing) and also representative of the hair on the body partls in question.

In rape / sodomy cases pubic hair may be useful for detection of semen and/or blood etc. They Should be carefully collected, immediately dried in a dedicator and sent in a sterile test-tube. For establishing transfer of pubic hair, controls (collected as described above) should be obtained from the accused as well as victim persons. Before collecting control hair samples, loose hair of the accused / victim should be obtained first if necessary by combing gently.

**Nails-** Nails suspected to be stained with extraneous blood should be carefully clipped without Damaging the underlying tissue of the person concerned.

**Tissue and blood in cases of suspected snake bite** - About 5-10 gms of tissue around the bite markpreserved in saturated solution of common salt and 5-10ml of blood preserved in 5% sodium citrate solution.

#### **Collection of dried transferred blood from the person of accused etc.**

Take a clean cotton cloth piece, moisten it with physiological saline (0.9 per cent) and squeeze it. Transfer the dried blood from the stain on the person of the accused, on to this cloth piece by gentle Rubbing. Medical Officer should certify that this blood stain has not resulted from any injury of the Person concerned.

#### **General Instructions:**

Crime Registrant Number, Police Station and preferably outward number and date of dispatch of The concerned forwarding letter of the Police Investigating Officer in connection with which one or more articles are being forwarded by the Medical Officer, should be invariably furnished .

A summary of observations made during post/ ante-mortem examination with special . reference to location and nature of injuries sustained by various person (in criminal like murder , assault , rape etc.) should also furnished.

A detailed reference of any material already. Already sent or likely to be sent near future by the medical officer / police investigating officer pertaining to the same case shoaled also be furnished.

While performing post-mortem examination great care should be taking with regard to the possible presence and collection of extraneous material like foreign hair, fibre , glass particles ,part of the

weapon of assault .tyre marks . etc should be preserved for any subsequent with corresponding material that may be collected by the police investigating officer.

**13.5 ( C ) Ballistics** - The medical Officer should conduct a very careful examination of firearm wounds and record his observations meticulously and neatly in nk so that these along with subsequent examination by the ballistic Expert throw light on the firearm used , the nature of the projectile or projectiles fired , firing distance and its direction as well as the suicidal, homicidal and accidental nature of injuries.

**Clothing of the subject** should be removed with care keeping in mind the possibility of finding Bullet or pellets in them. Should it be necessary to cut and remove the clothing care should be taken to leave, the shot holes intact. The clothes bearing the shot hole should be carefully folded and handed over for transmission in separate sealed packages to Ballistic Expert bearing in mind to retain all the powder particles if present, and not to contaminate other portions of the clothing by the powder residues that may be around the shot hole.

**Examination of Firearm Injuries** - The description of the wounds on the postmortem report Column NO.17, should not only-be clear and precise but should preferably be accompanied by a sketch, illustrating the relative disposition of the wounds. It is desirable to have the firearms injuries photographed. with a scale attached. Particular care should be taken to record observations about charring, tattooing, blackening on or around the firearm wound. It must be consistent with the observation on the corresponding" garment, if any. It must be borne in mind that these are observed only in close distance firing and not, otherwise. Care should also be taken not to confuse blackening with a dirt collar or a lead mark due to unjacketed projectile. The path of the bullet in the body should be traced by careful dissection and not by probing. The path inside the body may be straight or deflected.

X-ray plates together with post-mortem or injury reports in legible handwriting (or preferably typed), should be sent.

In the case of the shot hole directly on the body, when the corresponding shot hole is not available on the clothing for examination by the Ballistic Expert, a portion of skin bearing the shot hole should be submitted for examination. The piece of skin should be kept between two plain white papers stapled / pinned to a thick card-board and tied to another card-board appropriately. It should neither be put in bottle nor any preservative used.

**Collection and transmission of bullet, pellets, wads etc.** - Before looking for the bullet! or pellets ' inside the body, it is desirable to have the body X-rayed. The pellets or fragments of a bullet(s) as many as possible, plus any other projectile like wad etc. if present, should be recovered during the autopsy and dried in the air and put in a bottle properly labelled and sealed. In the case of a bullet(s) which requires very , careful microscopic examination by the Ballistic Expert for opinion on the weapon that fired it, such bullet(s) should not be pried or handled with forceps generally having serrated metallic tips. They should be removed with the fingers or rubber tipped forceps if necessary. The recovered bullet(s) should be dried, wrapped in cotton and put in a suitable container (each bullet in a separate container) appropriately labelled and sealed, after putting an identification mark on the base. It should never be marked on the side or nose. The general description with regard to its size, weight, kind of metal it is made of like lead, cupronickel jacket, etc. deformity, if any, of the bullet for subsequent identification in the Court should be recorded.

Viscera should not be submitted for examination in the above context.

**Examination of alleged firer** - In cases an alleged firer is to be examined, for having recently discharged a firearm, his both hands should be carefully swabbed. The swabs especially form the web and Fingers should be collected separately for both hands. Swab with good clean cotton wool just moistened With distilled water should be taken by rubbing the residues, if any, off the web, back of hand and fingers. This may be followed by a similar swab with approx.5 percent nitric acid (A.R: grade). A control sample of these (cotton, distilled water and acid) should also be sent.

Any injury such as contusion or pinch mark ect. should carefully be looked for on his band which may have resulted due to a country-made firearm with a heavy recoil or semi-automatic pistol.

All the exhibits must be forwarded through the Police, and must bear name of the victim and C.R. number of the Police Station concerned.

**13.5 (D) Prohibition** - The instructions given below should be followed for sending blood samples of suspects under the Bombay Prohibition Act.

(a) The Medical Officers should use empty penicillin phials after thoroughly cleaning them with water, drying and putting in each 5mg of sodium fluoride and 15 gm of potassium oxalate as anti-coagulant for 5 ml of blood to be collected in it.

(S.G.'s Circular Memorandum No. PML.467/30962/B. dated 13th October 1967).

b) Immediately after putting 5 ml of blood in a phial, it should be thoroughly shaken; sealed with the device of the Medical Officer. Arrange to submit it along with the prescribed 'B' form, to the respective Forensic. Science Laboratory without any delay so as to reach the laboratory within seven days from the Date of its collection [Rule 4(2) of Bombay Prohibition (Medical Examination and Blood Test) Rules 1959]. The phial should be labeled indicating the name of the person whose blood is collected, date and time of collection and signature of the Medical Officer. Form 'N' indicating signs and symptoms should be sent along with 'B' form. The forms of certification and dispatch letter are given in Chapter.20.

**13.6.** Articles like viscera, vomit, blood, urine, hair, etc. are used up in analysis and are never returned. Articles other than these should be removed from the laboratory within 15 days from the date of the issue of the report by the Laboratory.

**13.7, General-** The headquarters Forensic Science Laboratory, Bombay caters for Greater Bombay and 2 districts viz. Thane and Raigad (Ballistics work for the whole State); the Regional Forensic Science Laboratory, Nagpur caters for 9 districts viz. 1) Nagpur, 2) Buldana, 3) Akola, 4) Amravati, 5) Yavatmal, 6) Wardha, 7) Bhandara, 8) Chandrapur, 6) Gadchiroli; the Regional Forensic Science Laboratory, Pune caters for 7 districts viz. 1) Pune, 2) Satara, 3) Sangli, 4) Solapur, 5) Kolliapur, 6) Ratnagiri, 7) Sindhudurg And the Regional Forensic Science Laboratory, Aurangabad, caters for 11 districts viz. 1) Aurangabad, 2) Jalna, 3) Beed, 4) Parbhani, 5) Nanded, 6) Osmanabad, 7) Latur, 8) Nashik, 9) Dhule, 10) Jalgaon, 11) Ahmednagar.

(L.G.'s Memo No. G/6162, dated 5th November 1966)

(I.G.'s Memo No. 29/6162n9 dated 19<sup>th</sup> December 1979)

(L.G.'s Memo Nos. XXIX/6162/8 I dated 22<sup>nd</sup> July 1981 and I<sup>st</sup> December 1981).

Ballistics work and other articles in firearm cases should not be sent to the Regional Forensic Science Laboratories, Nagpur, Pune or Aurangabad.

(L.G.'s Memorandum No. G/6162, dated 10<sup>th</sup> May 1967, and Circular Memorandum No. G/6162, dated 10<sup>th</sup> September 1969).

## **OBSERVATION MADE BY THE DIRECTORATE OF FORENSIC LABORATORY**

### **1. Toxicology:**

(Materials submitted in homicidal /suicidal /accidental poisoning):-

(i) *Quantity of Viscera* - As against the requirement of 500 gram of each EX.1 (stomach, intestine and consents) and Ex.2 (Liver, spleen, Kidney), occasionally as low as 50 ml or less are sent. This severely

Affects the chances of detection of the poison.

(ii) *Quantity of post-mortem blood* - As against the normal requirement of 50ml as little as 2-5ml is often sent. This puts severe constraint on positive detection.

(iii) *Quantity of vomit/stomach wash*- As little as around 2-3 ml is not an exception, when this would render the analytical exercise questionably worthwhile.

(iv) *improper preservative*- Ordinarily saturated saline (Rect. Spirit in acid poisoning) is required to be used. Occasionally, formalin rectified spirit when not permissible, is used.

(v) *Careless dispatch*. On occasions; mercifully rare, 2 viscera samples (EX.1 and EX. 2 on each occasion) are forwarded. Purported to be or the same deceased.

(vi) *Rash opinion*- Cause Of death due to poisoning say, by " organochloro ", "organophorous', insecticide or by specific agent like Tik.20" '.;Baygon" etc., is recorded even before the material is analysed' and analytical report is available to the Medical Officer. On many occasions the analytical finding reveals a poison different from that unjustifiably already recorded on Form 23e.

(vii) *Viscera held up unduly* - Very late submission as much as 6 months to 1 year have from time to time been met with.

(viii) *Vehicle accidents*. Victim's visceral post-mortem blood have been found to have absurdly High alcohol levels, say 3-4 thousand mg percent as against usual fatal levels of, say, up to 500 mg percent. This carelessness (or possibly mischief?) from the few specified medical centers has been brought to the notice of concerned authorities (when recurrently observed).

(ix) *snake-bite cases* - Tissue around the site of alleged bite not sent. As against this, viscera is sent, as a routine manner which is not helpful.

(x) *Mandatory Form 23e* not used while for Warding viscera.

(xi) Description on Form 23e and actual exhibits varying. Causes complications in investigation of crime cases.

(xii) Viscera occasionally submitted in narrow mouthed bottles in place of wide mouthed jars.

(xiii) Ex 1 and EX.2 sent in the same bottle instead of separately in two jars. Toxicological significance of positive results is adversely affected. (xiv) Unwanted samples sent e.g. Uterus for products of conception; kidney stone; blood for sugar / calcium; samples for histopathological examination etc.

## **2. Biology-Serology:**

(Materials submitted in murder, attempt to murder, assault, rape, disputed paternity etc.)

(i) *Post-mortem blood samples* as reference material. for victim's blood-grouping. Not properly' preserved. Haemolysed and unsuitable for grouping. Generally excess of formalin used..Proper preservative. is an equal volume of 5 percent sodium citrate in 0.25 percent w/v of formalin solution. '

(ii) *Postmortem~ blood stain .on cloth (dried)not sent*. This can be grouped even if the post-! mortem blood sample IS not received In good condition. ",

(iii) *When post-mortem blood not available*, a piece of muscle preserved in saturated saline 1'1 Molar or, premolar tooth not sent as reference grouping materials.

(iv) *Plucked hair* (roots intact) not sent for iso-enzyme blood grouping.

(v) *Disputed paternity cases* blood of concerned persons not collected at Police Hospital, Nagpada, Bombay for proper preservation and, immediate dispatch to Forensic Science Laboratory, Vidyanaigari, Bombay for extensive blood grouping, (other than ABO system).

(vi) *Rape cases* \_Vaginal swabs not usually sent (Smears on slides sent). Swabs, if sent, not properly preserved (swabs on sterile gauze / cloth required to be dried before dispatch\in a sterile test tube,) properly , labeled.

(vii) *Rape cases* -Accuser's semen sample sent as reference sample rather than blood sample for grouping. The former is unnecessary and successful grouping is better with properly preserved blood sample along with its stain prepared by Medical Officer.

(viii) *Rape cases* \_Properly preserved saliva sample or its stain (dried) not sent for determining Secretor status,

(ix) *Rape cases* \_Unusual delay in collecting / sending swabs /smears. Usually 2 weeks, when they should preferably be sent within 2-3 days, Rarely though, as much as 6 months delay observed.

(x) *Hair samples* \_Cut hair of short length as against the requirement of full length plucked their for "Hair comparison for individualization."

(xi) *Transfer of Hair in rape cases* - S\aven pubic hair, messedilp, sent as against combed loose hair, with control hair, plucked from the victim and accused.

(xii) *Dried blood stain on person of*, say, accused; washing sent as against transferred stain on wet clean cloth (wetted with nominal saline) and dried before dispatch.

(xiii) *Forwarding letter* not giving reference to CR. No / Police Station for properly connecting it with and assessing the results vis-a-vis the main police case referred to Forensic Science Laboratory.

### **3. Ballistics:**

(Material referred in firearms cases)

(i) *Legible injury / post-mortem report* depicting the obeserved entrance/exit shot holes, preferably Diagrammatic representation, usually lacking .

ii) *Skin around the shot hole* not sent as per instructions, Whenever necessary

(iii) *Visceral material sent* for finding bullet shot fragments thereof. This is useless. ~e tissue around the wound track may be sent if at all necessary. Better, check by X-ray.

### **4. Prohibition:**

( Accused's blood sample for blood- alcohol level)

(i) *Sending more than one blood phial, variously and incorrectly preserved*—required one sample only, Properly preserved (5 mg sodium fluoride +15 mg potassium oxalate for 5 ml blood).

(ii) *Not using official seal/not supplying copy of seal* ill the forwarding letter "B". form / not Supplying "A" and "B" forms.

(iii) *Abnormal delay in collecting blood* - The blood alcohol level falling as 15- 20 mg percent per hour, renders a blood sample useless if collected after undue, delay such as 8-12 hours.

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## FEW INSTRUCTIONS TO THE MEDICAL / VETERINARY OFFICER / INVESTIGATING POLICE OFFICERS.

1. Biological materials such as viscera, blood, stomach wash, urine etc. are never returned. Non-biological exhibits should be removed from this laboratory, within 15 days from the date of receipt of certificate or else the laboratory will not be responsible.

(Ref: police manual 1959; Volume – III, appendix IV, para IS)

2. Preservative used for. Viscera/ blood and its quantity added is not clearly stated on the bottles and in the forwarding letter.

3. Separate Viscera bottles with proper labeling should be sent for chemical examination such as: -

Bottle No.1:- Stomach wash.

Bottle No.2:- Stomach, Intestines with their contents.

Bottle No.3:- Liver, Spleen, kidney.

Bottle No.4:- Blood (postmortem blood preferably more than 50-100 ml if available).

Bottle No.5:- Urine.

Bottle No.6:- Skin piece along with tissue beneath.

Bottle No.7:- Control Skin piece.

Bottle No.8:- Preservative sample used

4. Sufficient quantity of postmortem blood (preferably more than 100 ml if available) and viscera (600 to 800 gms each) should be sent for chemical examination.

5. Only wide mouth bottles should be used for sending viscera. Narrow mouth saline bottles and plastic bottles should not be used for preserving the viscera.

6. Histopathological examination of tissues: detection of diatoms; ascertaining age, sex etc. from bones pathological examination, fingerprint examination are not done in this laboratory

7. In dog-bite cases brain samples should be sent, to the Director, Haffkin Institute, Parel, Mumbai-12.

8. In snake-bite / scorpion bite cases skin piece at the site of bite and the venous blood sample should invariably be sent for chemical analysis: Viscera is not the proper sample for the same.

9. Date of incidence, date of admission in the hospital, date of death and date of post-mortem should be mentioned in the forwarding letter so as to enable to evaluate the report.

10. In food poisoning (i.e. bacterial poisoning) cases food materials and only stomach wash of the deceased should be sent for chemical analysis as viscera is not proper sample for the same.

### II. GENERAL GUIDELINES TO MEDICAL OFFICERS FOR PRESERVATION OF VISCERA

	Cases with History of	Materials to be sent	Preservative to be used	Should not be used as Preservative
A)	Normal Cases	Viscera 1 & 2 Blood	Common salt or its saturated solution Potassium Oxalate +Sodium fluoride	Rectified spirit Formalin Rectified spirit, Formalin

B)	Acid poisoning cases	Viscera I & 2	Rectified spirit	Common salt or its saturated solution
C)	Alcohol poisoning Cases	Viscera I & 2 Blood	Common salt or its solution Sodium Fluoride.	Rectified spirit, Formalin
D)	Cyanide poisoning cases	Viscera I & 2 and lungs blood	Common salt or its saturated solution Potassium Oxalate+ Sodium Fluoride	Formalin
E)	Carbon monoxide & other gas poisoning cases	Blood  Lung	Potassium Oxalate + Sodium Fluoride with a layer of liquid paraffin above common salt or its saturated solution	-----
F)	Arsenic poisoning cases	Viscera I & 2 Nails, bones, hair	Common salt or its saturated solution Nil	_____
G)	Snake bite and Injection cases	Blood Skin piece at site of bite or injection	Potassium Oxalate + Sodium Fluoride Common salt	____------
H)	Bleaching powder	Viscera I & 2	Rectified spirit	Common salt or its saturated solution
I)	Blood for Grouping	Blood	Equal volume of 5% sodium citrate + 0.25 ml Formalin	-----

Sd/-  
05.04.1991  
Deputy Director  
Forensic Science Laboratory  
State of Maharashtra, Bombay