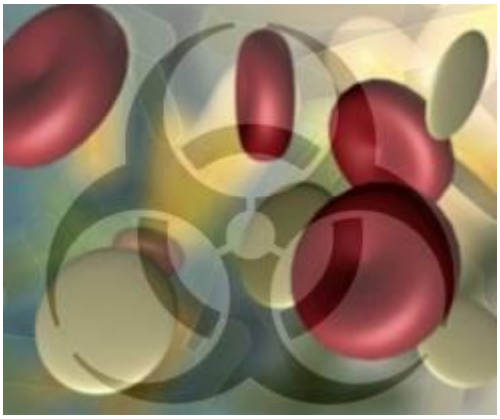
Information Article

Aircraft Accident Site & Similar

Blood-borne Pathogens (BBP)

'Universal' Precautions



Note - 'ABCX Airways is a ***fictional*** (international, scheduled passenger) airline. It has been 'used' (in places) herein, to provide some level of adequate 'aviation context' to the subject of blood-borne pathogens and the associated 'universal precautions' (as might typically be associated with the 'catastrophic aircraft accident' type scenario) to be used / observed

Aircraft Accident Site & Similar **- Blood-borne Pathogen** (BBP) **Risks - Universal Precautions**

NB: All relevant and valid 'BBP training' certificates are to be carried by "blood-borne pathogen qualified" personnel, when deploying with the ABCX Airways GO Team, in support of a major aircraft accident

Biohazard - ***Exposure Control Plan*** (**ECP**) - for Prevention of Blood-borne Pathogen Infection

Purpose

An 'Exposure Control Plan' (**ECP**) describes the methods required to protect appropriate ABCX Airways personnel from blood borne pathogen (**BBP**) type infections, typically encountered during the course of participating in any air accident investigation 'in the field' (i.e. typically at the accident site itself) and / or during examination of wreckage and other specimens elsewhere (i.e. at 'non-field' locations)

Such protection will typically be accomplished by mandating the use of * '***universal precautions***' - the latter usually being implemented by means of:

- Appropriate (standardised) work practices
- ** '***Engineering***' Controls
- Possession (and effective use) of the required personal protective equipment (**PPE**)
- Good 'housekeeping' ..... and
- Using the correct procedures for biohazard collection, labelling, safe storage and destruction

* "**Universal Precautions**" is the term used herein to describe a ***prevention strategy*** in which all blood and other potentially infectious materials are always treated as if / being infectious - regardless of the perceived status of the source / source individual. In other words, whether or not a person believes that associated blood / body fluid is infected with blood-borne pathogens, it ***must*** always be treated /managed etc. as if it is

This latter approach should be used in all situations where exposure to blood and / or other potentially infectious material is possible. This means that certain (associated) work practices and controls etc. must always be implemented / utilised in such situations

** "**Engineering" Controls** refer to ***methods*** used to isolate and / or remove blood-borne pathogen hazards (e.g. sharps and sharps disposal containers, self-sheathing needles, sharps with inherent engineered sharps injury protection, needleless systems, blunt end scissors etc.) from the workplace

Designated airline etc. personnel shall receive training (initial and recurrent) re the health hazards, vaccination requirements, post-exposure evaluation processes etc. - as associated with BBPs. Such training, together with provision of appropriate medical services (e.g. appropriate vaccinations, first aid training etc.) and mandated use of appropriate PPE, will typically be provided (or arranged for) by the airline; lead authority present etc. concerned

Re the above, BBP etc. associated training records (for the relevant personnel) shall be maintained by e.g. the ABCX Airways ***Medical*** *OR* ***Occupational Health & Safety*** *OR* ***Flight Safety Department*** etc. Appropriate / associated vaccination records and 'consent / declined' form, post-exposure evaluation records etc. shall also be maintained

This ECP complies with the U.S. A. Department of Labour Occupational Safety and Health Administration Regulation (OSHA) - 29 CFR Part 1910.1030:

'Occupational Exposure to Blood Borne Pathogens'

In the event of any discrepancy between what is contained in this information article (the document you are now reading) and the above, referred to OSHA standard, the latter shall take precedence

For a more in-depth explanation of some of the appropriate terminology used in this info article - follow the link below and see paragraph 1910.1030 (b) (OSHA Regulation (Standards - 29 CFR))

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10051

For an abstracted explanation of the BBP concept (including guidance on 'post-exposure evaluation') - follow the link below (USA Department of Labour / OHSA Directive)

https://www.stericycle.com/en-us/resource-center/blog/osha-bbp-standards-post-exposure-procedures-for-healthcare-safety

For an overview of the blood-borne pathogen aspects of air accident investigation - follow the link below

https://www.faa.gov/documentLibrary/media/Order/IR_3900.73A.pdf

Programme Management

ABCX Airways departments / business units / individuals central to the effective implementation and management of an ECP typically include:

- Flight Safety Department - (including those nominated [directly or indirectly] as potential 'advisors' to * 'accredited representatives')
- Medical Services (and / or Occupational Health & Safety department / business unit / contracted third party)
- Airline's Training Department / business unit (if training not already covered by any of the above)
- Other designated departments / business unit heads & their ** Crisis Support Unit reps

* For more on '***accredited representative***' and '***advisors***' - see our (***separate***) information article **'Air Accident Investigation'**

** For more on 'Crisis Support Units - CSU' - see our (***separate***) information article **'Crisis Support Units - Typical Roles, Responsibilities & Accountabilities'**

Determination of Those Persons Most Likely to Encounter BBP Exposure

ABCX Airways staff most likely to encounter BBP exposure (due e.g. to risk of 'contact' with blood and / or other potentially infectious materials) typically comprise those persons responsible for participating in appropriate aspects of 'on-site' air accident investigation and / or during examination of wreckage and other specimens at 'off-site' locations

The exposure determination shall be made ***without*** regard to the use of PPE (i.e. assuming that PPE is ***not*** available / is ***not*** used)

Methods of Compliance

See bullet point list about half way down page 2 above

Universal Precautions

Already described on page 2 above

Work Practice Controls

The following are examples of work practice controls associated with BBP risk:

- ***Washing***. Following direct contact with blood, body fluids and / or other potentially infectious material - thoroughly wash hands and any other exposed skin areas with soap (or equivalent) and water immediately or otherwise as soon as possible (also flush mucous membranes [e.g. eyes and nose] with water, if appropriate)

  As available, substitute washing of exposed body parts with a full body shower (including hair)

  Use a soft, anti-bacterial soap if possible. Avoid harsh, abrasive soaps as these may open fragile scabs or other sores

  Nominated staff shall be trained / instructed / rehearsed in the above practices; be aware of the location of the wash / shower facilities etc. In the field, cleanse by use of antiseptic wipes - followed by thorough washing / showering as per above, as soon as appropriate facilities become available

- ***Handling of Specimens***. After examination, all contaminated specimens are to be placed in appropriately marked and safeguarded receptacles, for disposal or archiving

- ***Personal Prohibitions + Decontamination Practices***. The appropriate PPE is to be worn at all times when carrying out duties within a delineated (or otherwise identifiable) biohazard accident site (or a site suspected of being so contaminated). Replace PPE which is torn or punctured - or otherwise considered not fit for purpose

Do not eat, drink, smoke, apply cosmetics or lip balm, touch any mucous membrane (e.g. by inserting / removing contact lenses) etc.

In the event that there is a need to leave the site, follow the below procedure:

- Exit the accident site via the defined entry / exit point
- Remove & disinfect outer work gear e.g. gloves, goggles, full face mask, boots etc.
- Remove waterproof inner gloves and re-glove (put on clean [new] inner gloves)
- Remove contaminated PPE as per 'trained practice'
- Place disposable PPE in clearly labelled (leak-proof) biohazard bags / containers
- Immediately after removal of PPE, follow 'washing' practice as described on previous page

Normal clothing contaminated with blood and / or body fluids should be removed and ***safely*** disposed of (e.g. for appropriate laundering) as soon as possible - as such fluids can seep through the cloth and come into contact with skin

Contaminated / potentially contaminated (non-disposable) PPE and equipment (boots, goggles, instruments, tools etc.) are to be decontaminated after each use by using an approved disinfectant - and by following the appropriate (trained for) practice

If material cannot be decontaminated before further use or storage, it shall be placed in identified and clearly labelled (leak-proof) biohazard bags and / or containers. Specified equipment may also require sterilisation after being decontaminated

Appropriate and clearly labelled boxes for 'sharps' (needles etc.) shall be provided

Appropriate (specialist) laundry facilities should be available / made available

Appropriate facilities should be in place for removal, storage or disposal (destruction) of biohazard and other waste

Storage of food and drink is prohibited in places where infected or potentially infected materials are kept and / or when being transported. This also applies to associated refrigerators, shelves, cabinets, countertops, vehicle storage compartments etc.

Engineering Controls

Already described as a 'concept' on page 2 further above

Personal Protective Equipment (PPE)

The following considerations should be applied in the selection, care and use of PPE:

- Appropriate non-disposable and disposable PPE is to be available for all at risk of exposure - and is provided as part of the ABCX Airways air accident investigation 'Forward GO Kit'

  Appropriate PPE must be used whenever exposure to infectious material is possible - as stipulated in "Universal Precautions"

  ABCX Airways' Medical or Occupational Health & Safety or Flight Safety Department(s) will establish methods and means for re-supply of PPE and ensure a readily accessible location for storage of same

- ***Disposable*** PPE (e.g. biohazard suits and overshoes) must be discarded whenever removed or damaged and immediately placed in biohazard waste containers

- ***Non-disposable PPE*** (e.g. boots, helmets, goggles etc.) is to be used whenever disposable PPE does not provide adequate protection from puncture, airborne debris (particles, droplets) etc. If non-disposable PPE remains usable, it must be disinfected (e.g. with a bleach solution) upon exit from the exposure condition and cleaned ready for re-use

- Face protection (including eye shields / goggles, full face protectors etc.) must be used when the risk of splatter or minute (air borne) droplets of contaminated material might be a present factor

'Housekeeping'

The following 'housekeeping' procedures are generally applicable - both on and / or off the accident site - and also for the storage of accident investigation specimens which may be contaminated:

- Housekeeping procedures for cleaning and decontaminating work stations, non-disposable PPE and accident investigation equipment are to be carried out by nominated (trained) personnel - who shall wear the appropriate PPE whilst conducting such tasks

- Personnel are responsible for ensuring that equipment or surfaces are cleaned with an appropriate disinfectant, such as 10 % solution of household chlorine bleach, following contact with a contaminant - and also at the end of each working shift

- Personnel are to clean re-usable receptacles which have a reasonable likelihood of being contaminated, with an appropriate disinfectant and replace protective coverings for surfaces and equipment, after decontamination, at the end of the work shift

- Broken glass from specimens which may be contaminated is to be picked up using a brush and dust pan, forceps, tongs etc. Non-disposable implements used for cleaning must also be cleaned and de-contaminated if necessary

- Containers for contaminated material must be closable, puncture proof and leak proof
- Appropriately colour coded and labelled (leak-proof) bags / containers are to be available for laundry storage prior to cleaning. Bags containing contaminated items for laundering are to be handled as little as possible
- Contaminated laundry which is wet and presents a reasonable likelihood of soak-through or leakage from the bag or container is to be disposed of in containers which prevent soak-through and / or leakage of fluids to the exterior. Protective gloves must be used by all workers who have contact with contaminated laundry. Other appropriate protective equipment is to be available and used - as required
- In the event of a requirement to examine contaminated accident wreckage specimens, the examination must be conducted in an area suitably isolated from normal work areas - and precautions taken to ensure that all contact with the specimen(s) is amenable to disinfection

Labels and Signs

Contaminated areas at the accident site etc. must be appropriately marked with warning biohazard labels, placards etc.

Red colour coding and / or biohazard labels are to be used to mark all hazardous items

Hazardous items to be marked with red colour coding and / or biohazard labels include e.g. sharps & sharp object containers, containers of other regulated waste (laundry and used gloves), refrigerators or freezers which hold potentially infectious materials etc.

Containers which are used to transport, ship or store potentially infectious materials are also to be marked with red colour coding and/or biohazard labels.

Hepatitis B Vaccine

The Hepatitis B (and / or other appropriate) vaccine(s) is / are available from or via ABCX Airways Medical or Occupational Health & Safety Department for airline staff who may be potentially exposed to biohazards at an air accident site i.e. those staff potentially involved with the air accident investigation process

All such potential air accident investigation staff will be offered the Hepatitis B Virus (HBV) vaccination series accordingly

Immunity to Hepatitis B should be checked every 10 years

Any investigator / similar person who declines Hepatitis B vaccination or is advised that they are no longer Hepatitis B immune shall advise the appropriate line manager **immediately**

Exposure Incident Evaluation and Follow-up

An exposure incident is defined as "contact with blood or other potentially infectious materials which results from a worker's (ABCX Airways staff) job / duties / employment - creating potential for infection"

Such incidents may include injection / puncture wounds; cutting through the skin; contact with the eyes, mouth, other mucous membrane or non-intact skin. Where such exposure occurs, the following procedures must be followed (an airline 'GO Team' deployment situation has been assumed here):

- The worker shall inform the senior airline Go Team staff member on site (typically the 'Investigation Manager') as soon as possible of an obvious or apparent exposure incident. The GO Team medical consultant or equivalent person is to be notified in turn, without delay
- The medical consultant conducts an evaluation of the circumstances of the exposure and determines whether or not an 'exposure incident' has occurred
- If an exposure incident is determined, the medical consultant is to initiate a request to the worker's health care provider to evaluate and treat him / her accordingly
- A licensed physician(s) and / or appropriate health care professional(s) will perform the evaluation and medical follow-up for the exposed worker. All required laboratory tests will be accomplished by an accredited laboratory
- Where practicable / possible, the ***source*** (of the exposure / infection) is to be identified
- With the source individual's consent (if appropriate / relevant / possible i.e. ***if*** the source is a living, competent person), source blood and / or specimens will be collected and tested as soon as possible (unless the source is already known to be infected with HIV or HBV)
- The 'exposed' worker is to be informed of test results and of applicable laws etc. governing disclosure of this information
- Said worker is to be offered blood collection and / or testing services. He / she may refuse either or both. However, if he / she consents to blood collection but not HIV testing, the blood shall be kept for 90 days during which time he / she can choose to have the sample so tested
- Appropriate post-exposure prophylaxis will be offered to the exposed worker including e.g. immune globulin or other treatment for Hepatitis B; treatment for HIV etc.
- Counselling and evaluation of any reported illness will be provided to the exposed worker
- The worker's parent airline should meet all costs associated with enacting all of the above
- A written report by the evaluating health care professional stating that the exposed employee has been informed of the results of the evaluation (and about any exposure-related conditions requiring further evaluation and treatment) is to be included in the employee's medical record

Information and Training

All ABCX Airways employees with occupational exposure risk to blood-borne pathogens shall participate in an airline (or airline arranged) BBP training programme (initial and recurrent) - to be at no cost to the employees and delivered during working hours only. Training will be provided on initial assignment to a job / task where occupational exposure may occur - and annually thereafter

Each airline head of department / business unit charged with air accident investigation response / participation and / or similar, shall ensure that training is scheduled for and attended by his / her nominated staff - via the ABCX Airways Flight Safety Department - and as also co-ordinated with the airline's Medical Centre / Occupational Health & Safety Unit / equivalent department

The training program shall include at least the following:

- An explanation of the appropriate standards / regulations / best practice re BBPs
- A general explanation of the epidemiology and symptoms of BBPs
- An explanation of the modes of transmission of BBPs
- An explanation of the methods for recognising tasks and other activities which may involve exposure to blood and other potentially infectious materials
- An explanation of the use and limitations of methods that will prevent or reduce exposure
- An explanation of the basis for selection of PPE
- Information on the types, proper use, location, donning, removal, handling, decontamination, and disposal of PPE
- Information on the Hepatitis B vaccine, including its efficiency, safety, method of administration, benefits and how (where appropriate) the employee will be reimbursed for the cost of the vaccination
- An explanation of the procedure to follow if an exposure incident occurs - including persons to contact, the methods of reporting the incident and medical follow-up which will be made available
- Information on the exposure incident evaluation and follow-up that the employer is required to provide for the employee following an exposure incident
- An explanation of the signs and labels and / or colour coding required by the appropriate standards / regulations / best practice
- An opportunity for questions and answers with the person conducting the training session

Note - A trainer conducting such training (as per above) shall be 'adequately knowledgeable' in the subject matter being presented

Record Keeping

Vaccination, medical and training records are to be maintained and retained for all employees at risk of occupational exposure to BBP related health hazards

Task Analysis for Personnel designated to Work at an Air Accident Site

Each air accident scene will be unique and, by its nature, disorderly. Thus the actual tasks required to be carried out 'on the day' cannot be pre-itemised as precisely as those in the clinical or laboratory setting

The biohazard nature of the accident site can range from no readily apparent evidence of blood, body fluids etc. - to an obvious (or even overwhelming) presence of same

As a minimum - outer work gloves, inner latex gloves, appropriate eye protection and helmets (hard hats) should be used during the initial site survey task (adverse weather conditions may require additional PPE here). If it is determined that blood and / or other body fluids are present, additional PPE will be required, as directed by the appropriate person 'in charge'

Areas grossly contaminated with blood / body fluids must be approached with full PPE donned

If contaminated specimens are brought back to the office / field HQ etc. for further examination, gloves must be worn while working with same. Either waterproof latex type gloves and / or utility gloves are to be used depending on the condition of the specimens. Additional PPE measures may be required e.g. use of mouth and nose masks, wearing of protective goggles etc.

The following additional tasks in the conduct of an air accident investigation, along with the use of appropriate PPE, may be applied to control the potential exposure to blood-borne pathogens. The list (as shown below) of said tasks is not exhaustive

It is the responsibility of the person in charge to apply appropriate measures consistent with the objective of controlling the exposure to blood-borne pathogens and avoiding personal injury / infection:

On-Scene Tasks

- Survey the site and wreckage (as appropriate) for potential biohazard risks
- If a biohazard risk exists (actually or potentially), communicate the nature of the biohazard risk to others present and also to the responsible manager
- Secure the site and establish a point(s) of entry / exit
- The area(s) of potential contamination is to be determined, marked out and appropriately prominent biohazard placards placed. Similar placards should be displayed at entry / exit point(s)
- Identify investigative tasks which require use of PPE
- Decide on the type(s) of PPE to be worn

- Decide and communicate personal prohibitions as related to the conduct of the accident investigation (e.g. no eating, drinking etc.)
- Decide and communicate arrangements made for the disposal of hazardous and non-hazardous waste
- Whilst wearing appropriate PPE - the handling of contaminated items is to be conducted using common sense techniques in order to avoid unnecessary contamination of said PPE
- If practical, record keeping will be assigned to personnel located outside of the biohazard areas - so as to minimise contamination of e.g. recording equipment

  If this is not practicable, procedures should be used to ensure personnel handling wreckage etc. are not responsible for manipulating recording equipment etc. - thereby minimising the potential for contamination

- Proper practices must be followed in decontamination, cleaning and disposal of PPE, equipment etc.
- When exiting an accident site for any reason, disinfect non-disposable PPE such as boot covers, goggles, re-usable masks and work gloves with 10 % bleach solution or equivalent. Remove inner gloves, re-glove, and then remove PPE and equipment covers as per your associated training. Place all disposable items in biohazard bags
- Immediately following the procedures in the point just above (and assuming that immediate re-entry to the accident site is not required) re-glove (again) and place non-disposable PPE in containers marked as 'suitable for disinfected PPE'
- Clean recording equipment and tools with disinfectant wipes then remove and dispose of the inner gloves. Wash hands and face with disinfectant wipes as soon as practicable thereafter
- Non-disposable items that have been decontaminated may require further cleaning before reuse

Off-Site Accident Investigation Tasks

In the event that wreckage etc. is to be moved to a different location - and it has not been clearly demonstrated to the person in charge that the wreckage has been decontaminated - the on-site procedures described just above shall be followed

If the wreckage is not contaminated or has been declared decontaminated, normal (non-biohazard) procedures should be followed in the conduct of the accident investigation

Requirements for Moving / Transporting Wreckage and Specimens

Ideally, all objects / parts etc. which are examined away from the accident site will have been cleaned and disinfected before being transported. However, if cleaning / disinfecting etc. might destroy evidence and / or damage parts, it will be necessary (using the appropriate / recommended precautions) to transport parts that are so contaminated

Appropriate PPE will be used in preparing parts for transport. All sharp edged parts will be padded to protect personnel and preserve evidence. Depending on the size of the part and environmental conditions, PPE over and above waterproof latex-type gloves and work gloves may be required as determined by the person in charge. Contaminated sharp objects to be transported should be put in appropriate containers - separate from non-sharp contaminated objects

After disinfecting contaminated parts a minimum of 30 minutes should elapse (or otherwise as prescribed by the manufacturer of the disinfectant etc.) before handling same with uncontaminated gloves

Approved shipping containers etc. should be utilised as appropriate and labelled as biohazard, if containing contaminated parts

Security of the Accident Site

During typical air accident investigations, local officials (possibly in conjunction with airline security staff and / or locally engaged security support) will be requested (if not already provided) to establish and maintain security of the accident site. The 'official' investigating agency and the local authorities are expected to establish the delineation of the secured area

Security should be particularly maintained to prevent entry into any air accident related area which poses a biohazard and / or personal hazard

In most cases the biohazard area will be located within the secured area. Secured area biohazard zones will be identified separately from non-biohazard zones, with appropriate markers and signs

Spectators, families, news media etc. will not be permitted to enter biohazard zones under any circumstances

Remote Area Accidents

In remote areas where spectators, families, news media etc. are unlikely to be a factor - the 'person in charge' is to take reasonable precautions to avoid the possibility of anyone unknowingly entering the accident site. However, biohazard zones should still be provided with extra security measures. Airline Security elements of the ABCX Airways GO Team (and / or locally engaged security support) are expected to assist in this task

Hazards from Penetrating Injuries involving Blood (or other body fluids) of Accident Victims

On rare occasions, personnel may be exposed to biohazards at an accident site via penetrating injuries from sharp objects contaminated with relatively fresh blood / body fluids. (If the blood / fluids have weathered and dried, the risks are lower). In such circumstances, prompt treatment may reduce the risks of blood-borne infections

Hepatitis B

Hepatitis B is more infectious than the other blood-borne diseases described further below and is more persistent (the virus may still be alive for up to a month in pools of blood that have not dried up - and for shorter periods in dry blood)

All relevant personnel (e.g. potential Air Accident Investigation element of GO Team staff etc.) should be vaccinated against Hepatitis B infection and immunity should be checked at least 10 yearly

Hepatitis C

Hepatitis C may be transmitted in infected blood / body fluids - and specimen should be checked in the same way as for HIV

Human Immunodeficiency Virus HIV / AIDS

HIV transmission is now largely preventable through effective disease control measures

Firstly, any penetrating injuries should be swabbed with alcohol pads - this will kill most if not all viruses on the skin surface. Thereafter, effective treatment using powerful drugs, such as AZT, can reduce the likelihood of infection from viruses injected into the body from a penetrating injury e.g. from a surface contaminated with blood

Immediate Measures Required:

- Routine decontamination with alcohol swabs
- Identify (if possible) the victim whose blood is present on the penetrating hazard
- Advise the on-site Medical Consultant immediately of the injury, identifying the possible sources (if possible) so that their HIV and Hepatitis antigen status can be established
- Arrange for blood specimens from the area of contamination to be taken and tested for infectious disease hazards under the advice of the 'Medical Consultant'
- The Medical Consultant will arrange a specialist assessment where appropriate and for preventive therapy to be offered to the affected person(s)

Reminder - all relevant and current certificates are to be carried by "blood borne pathogen qualified" personnel - when deploying in support of an air accident investigation

Ends