



**JANGRO**

# Guide to **Biohazards**



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## Introduction

Sources of biological hazards include bacteria, viruses, insects, plants, birds, animals, and humans. These sources can cause a variety of health effects ranging from skin irritation and allergies to infections (e.g., tuberculosis, AIDS, cancer and so on).

Biological hazards or "biohazards" is the term used to describe any micro-organism, cell culture or human endo-parasite that can cause harm. In simple terms it is the general term for bugs and germs.

Within the cleaning industry, cleaning operatives are exposed to biological hazards, to varying degrees, depending on the nature of the work they undertake. Typically though, they will be required to deal with the physical removal of blood, vomit, semen, faeces and urine, as well as dealing with the disposal of discarded syringes and responding to pest infestations. These types of incidents are most commonly found where cleaners work in the following areas:

- Hospitals and clinics
- Homeless persons accommodation
- Public conveniences
- Prisons
- Police stations
- Schools for children with special needs
- Day centres for people with special needs
- Crime scene clear-up
- Derelict properties
- Environmental clean-up
- Emergency reinstatement

If these types of hazard are not dealt with correctly, the cleaning operatives and other users of the building will be exposed to a serious risk of infection. This Guide aims to provide guidance to staff on identifying biohazards and implementing rigorous, but simple, control measures that will significantly reduce the risk of infection.

## Diseases that can be Transmitted in the Workplace

In order for you to appreciate the importance of effective infection control procedures, it is important that you have an understanding of the nature of the illnesses and diseases that can be caused through the transmission of harmful bacteria. This Guide deals with the characteristics of some of the more serious diseases and infections and provides information on how each is transmitted and prevented.

## ***Methicillin Resistant Staphylococcus Aureus (MRSA)***

Staphylococcus aureus, often referred to simply as "staph," are bacteria commonly carried on the skin or in the nose of healthy people. Occasionally, staph can cause an infection and they are one of the most common causes of skin infections. Most of these infections are minor (such as pimples and boils) and most can be treated without antibiotics (also known as antimicrobials or antibacterials).

### **Where are staph and MRSA found?**

Staph bacteria and MRSA can be found on the skin and in the nose of some people without causing illness.

### **What is the difference between colonisation and infection?**

Colonisation occurs when the bacteria are present on or in the body without causing illness. Approximately 25 to 30% of the population are non-infectious carriers of the bacteria, which is found in the mucous membranes of the nose.

Infection occurs when the bacteria cause disease in the person. People also may be colonised or infected with MRSA, the strain of the staph bacteria that is resistant to many antibiotics.

### **Who gets MRSA?**

Staph bacteria can cause different kinds of illness, including skin infections, bone infections, pneumonia, severe life-threatening bloodstream infections, and others. MRSA occurs more commonly among people in hospitals or other health care facilities.

MRSA infection usually develops in hospitalised patients who are elderly or very sick or who have an open wound (such as a bedsore) or a tube going into their body (such as a urinary catheter or intravenous catheter). MRSA infections acquired in hospitals and healthcare settings can be severe. In addition, certain factors can put some patients at higher risk for MRSA including prolonged hospital stay, receiving broad-spectrum antibiotics, being hospitalised in an intensive care or burn unit, spending time close to other patients with MRSA,

having recent surgery or carrying MRSA in the nose without developing illness.

MRSA causes illness in persons outside of hospitals and health care facilities as well. Cases of MRSA diseases in the community have been associated with antibiotic use, sharing of contaminated items, having active skin diseases, and living in crowded settings.

### **How common is staph and MRSA?**

Staph bacteria are one of the most common causes of skin infection in the United Kingdom and are a common cause of pneumonia and bloodstream infections.

### **How are staph and MRSA spread?**

Staph bacteria and MRSA can spread among people having close contact with infected people. MRSA is almost always spread by direct physical contact, and not through the air. Spread may also occur through indirect contact by touching objects (ie., towels, sheets, wound dressings, clothes, workout areas, sports equipment) contaminated by the infected skin of a person with MRSA or staph bacteria.

### **How can the spread of staph or MRSA infections be prevented?**

Practice good hygiene at all times, specifically:

1. Keep your hands clean by washing thoroughly with soap and water
2. Keep cuts and abrasions clean and covered with a proper dressing (e.g., bandage) until healed
3. Avoid contact with other people's wounds or material contaminated from wounds.

The name "Legionnaires' disease" was coined in 1976 after a respiratory disease affected many delegates attending a convention in Philadelphia held by the American Legion of Pennsylvania. Eventually, the bacteria that was responsible for the disease was isolated and named as *Legionella pneumophila*.

Two distinct illnesses, Legionnaires' disease and Pontiac fever, have been associated with the *Legionella* species. Legionnaires' disease is a severe pneumonia. Pontiac fever is a mild, non-pneumonia influenza-like illness. It is not clear why the same causal agent can produce two distinct illnesses.

## What is the cause of Legionnaires' disease?

The bacterium responsible for Legionnaires' disease belongs to the genus *Legionella*. There are approximately 35 *Legionella* species known to produce the disease. *Legionella* species are commonly found in any aquatic environment. They can survive for several months in a wet environment and multiply in the presence of algae and organic matter.

## How are Legionella bacteria spread in indoor environments?

Cooling towers are part of large modern air-conditioning systems. They are used to cool water and dissipate unwanted heat to the atmosphere through water evaporation. Warm water flows into the top of the cooling tower through spray nozzles. While the water passes through the nozzles, tiny airborne droplets are formed, providing maximum contact between the water and the air moved through the tower by fans. To prevent droplets from fusing into larger ones, splash bars are placed below the nozzles.

While falling through the tower, some of the water evaporates. Because evaporation consumes heat, the remaining water is cooled. Air pushed through the tower by fans also cools the water. Some droplets, known as drift, are carried out of the tower by the air stream produced by the fans. This water loss is reduced by a drift eliminator positioned at the top of the tower. The cool water collects at the bottom of the tower and is pumped back for another cycle.

## How is Legionnaire's Disease Prevented?

The likelihood of *Legionella* infection can be best reduced by good operation and maintenance of air and water handling systems. Cooling towers and evaporative condensers should be inspected and thoroughly cleaned at least once a year.

Corroded parts should be replaced. Algae and accumulated scale should be removed. During cleaning operations in confined spaces, safety procedures for entry into confined spaces should be applied.

Cooling water should be treated constantly. Ideally, an automatic water treatment system should be used that continuously controls the quality of the circulating water.

The disinfectants commonly used in cooling towers are chlorine, dibromonitripropionamide and ammonia derivatives called quaternary ammonium compounds (quats).

Hot water tanks, which might provide ideal conditions for the growth of *Legionella*, should be cleaned regularly. The water system should be flushed out on a regular basis to prevent the water from stagnating.

## Leptospirosis

Leptospirosis is a bacterial disease that affects humans and animals. It is caused by bacteria of the genus *Leptospira*. In humans it causes a wide range of symptoms, and some infected persons may have no symptoms at all. Symptoms of leptospirosis include high fever, severe headache, chills, muscle aches, and vomiting, and may include jaundice (yellow skin and eyes), red eyes, abdominal pain, diarrhoea, or a rash. If the disease is not treated, the patient could develop kidney damage, meningitis (inflammation of the membrane around the brain and spinal cord), liver failure, and respiratory distress. In rare cases death occurs.

Many of these symptoms can be mistaken for other diseases. Leptospirosis is confirmed by laboratory testing of a blood or urine sample.

### How do people get leptospirosis?

Outbreaks of leptospirosis are usually caused by exposure to water contaminated with the urine of infected animals, most commonly, rats. Many different kinds of animals carry the bacterium; they may become sick but sometimes have no symptoms. *Leptospira* organisms have been found in other animals, such as cattle, pigs, horses, dogs, other rodents, and wild animals. Humans become infected through contact with water, food, or soil containing urine from these infected animals. This

may happen by swallowing contaminated food or water or through skin contact, especially with mucosal surfaces, such as the eyes or nose, or with broken skin. The disease is not known to be spread from person to person.

### Where is leptospirosis found?

Leptospirosis occurs worldwide and is an occupational hazard for many people who work outdoors or with animals, for example, farmers, sewer workers, veterinarians, fish workers, dairy farmers, or military personnel. It is a recreational hazard for campers or those who participate in outdoor sports in contaminated areas and has been associated with all types of water-activities in contaminated lakes and rivers. The incidence is also increasing among schoolchildren returning from outward bound field trips.

### How can it be prevented within the workplace?

Incidents of leptospirosis are rare within the workplace. However, given that the main carriers of the disease are rats, if they are gaining access to the workplace via an infected waterway, there is a possibility that the disease could enter the building. Staff should remain vigilant and report any rat infestations immediately to the manager of the building for treatment by a Pest Control Officer.

## Salmonella

Salmonella is an infection caused by a gram-negative bacillus, a germ of the *Salmonella* genus. Infection with these bacteria may involve only the intestinal tract or may spread from the intestines to the blood stream and then to other areas of the body. The source of infection is contaminated food or water, or close contact with other human beings carrying the infection.

### What are the symptoms?

Symptoms can vary greatly from person to person. They usually occur between 12-72 hours after ingestion of contaminated food or water and may last 4-7 days. Most individuals experience two or more of the following symptoms: onset of severe headaches, abdominal cramps, diarrhoea, nausea, vomiting, low grade fever and muscle aches. Some

individuals experience no symptoms but harbour the bacteria in their intestines and are at risk of spreading it to other individuals. A diagnosis of Salmonella infection is made by testing a stool specimen for the presence of the bacteria. This is usually undertaken by an Environmental Health Officer to confirm an outbreak.

## How is it transmitted?

Salmonella live in the intestinal tracts of humans and other animals including birds, and are transmitted by the oral-faecal route. This means eating foods contaminated with animal or human faeces. Contaminated foods usually look and smell normal. They are often of animal origin, such as beef, poultry, milk, or eggs, but all foods, including vegetables, may become contaminated.

Person-to-person transmission can also occur. Individuals who carry Salmonella in their intestines

may transmit Salmonella to another individual if good personal hygiene is not followed. For example, an infected food handler may transmit the Salmonella bacteria if he/she does not wash his/her hands after using the bathroom and before handling or preparing food. Transmission may also occur by handling pet turtles, parrots, chickens, lizards, baby chicks, frogs and snails that harbour the Salmonella bacteria.

## How is it prevented from spreading?

Good personal hygiene and hand washing techniques would prevent the majority of transmissions. Wash hands thoroughly with warm, soapy water after visits to the toilet and before food preparation. Salmonella usually remains in the intestines for up to five weeks - and in some cases for many months. Some individuals can become chronic carriers of Salmonella bacteria and about 2% may develop chronic arthritis.

## Typhus

There are several varieties of typhus all of which cause fever, severe headache and a skin rash and the severity of the illness varies greatly amongst the different types. In the past, outbreaks of typhus fever have been responsible for thousands of deaths.

All forms of typhus fever are caused by tiny organisms called rickettsiae which are passed on to humans by various types of insects including lice (epidemic), fleas (endemic), mites (scrub) and ticks.

The illness exists world-wide is usually associated with tropical areas, where control measures for preventing the spread of the disease are not as rigorous as in more developed countries. Incidents of typhus have virtually disappeared from the UK but there are occasional sporadic outbreaks.

Symptoms of the disease include; severe headache, fever and skin rashes. The severity of the illness depends on the variety of typhus. The disease can be fatal but responds well to antibiotic therapy using tetracyclines if given early enough.

## Hepatitis A

Hepatitis A is an infectious liver disease caused by the hepatitis A virus (HAV). The disease varies in clinical severity from a mild illness lasting 1-2 weeks to a severely disabling disease lasting several months.

There are other kinds of viral hepatitis such as hepatitis B, hepatitis C, hepatitis D, and hepatitis E. These diseases and the viruses that cause them are not related to hepatitis A although they also affect the liver.

### How is hepatitis A transmitted?

The hepatitis A virus is found in the faeces of infected people. The virus is usually spread from person to person by putting something in the mouth that has been contaminated with the faeces of a person with hepatitis A. The virus is more easily spread under poor sanitary conditions and when good personal hygiene is not practiced. The virus can also be transmitted through oral and anal sexual activity.

People can get hepatitis A by drinking contaminated water or eating raw and undercooked shellfish harvested from contaminated water. Fruits and vegetables or other foods can become contaminated during handling.

### How can we prevent hepatitis A in the workplace?

The prevention of hepatitis A in the workplace is based on good hygiene practices and good sanitation procedures.

Education programmes for workers about personal hygiene practices should emphasise that careful hand washing is extremely important in the prevention of disease. Workers should be informed about using appropriate protective clothing and about removing it at the end of the shift. They should also be informed about the necessity of washing hands frequently, and before eating, drinking, or smoking; they should also avoid nail biting.

## Hepatitis B

Hepatitis B is an infectious liver disease. It is caused by the hepatitis B virus (HBV). Infections of hepatitis B occur only if the virus is able to enter the blood stream and reach the liver. Once in the liver, the virus reproduces and releases large numbers of new viruses into the bloodstream.

To combat the disease, the body has several defences. White blood cells, which protect the body from infections, attack and destroy the infected liver cells. The body also produces antibodies which circulate in the blood to destroy the virus and protect against future infections of hepatitis B. During the infection and recovery process, the liver may not function normally causing illness that affects the entire body.

For reasons that are not completely understood, 10 percent of people who develop hepatitis B become carriers of the disease. Their blood remains infected for months, years, sometimes for life. Seventy percent of carriers develop chronic persistent hepatitis B. The remaining 30 percent of carriers experience continuous liver disease. At present, there is no way of curing carriers.

### Where is the hepatitis B virus found and how is it transmitted?

Blood is the major source of the hepatitis B virus in the workplace. It can also be found in other tissues and body fluids, but in much lower concentrations. The risk of transmission varies according to the specific source

## Blood

Direct contact with infected blood can transmit the hepatitis B virus through:

- punctures of the skin with blood-contaminated needles, lancets, scalpels, or other sharps
- splashes to skin bearing minute scratches, abrasions, burns, or even minor rashes
- splashes to mucous membranes in the mouth, nose, or eyes

## Other Body Fluids and Tissues

Hepatitis B is found in semen, vaginal secretions, and breast milk. The virus can be transmitted during unprotected sexual intercourse and from mother to infant during birth and through breast feeding.

Synovial fluid (joint lubricant), amniotic fluid, cerebrospinal fluid, and peritoneal fluid (found in the abdominal cavity) can contain the hepatitis B virus, but the risk of transmission to workers is not known.

Faeces, nasal secretions, sputum, sweat, tears, urine, and vomit have not been implicated in the spread of hepatitis B. Unless they are visibly contaminated with blood, the risk of contracting hepatitis B from these fluids in the workplace is practically nonexistent.

Hepatitis B is not transmitted by casual contact. For example, cleaning operatives who have no contact with blood, blood products, or blood-contaminated fluids are at no greater risk than the general public. However, the virus can spread through intimate contact with carriers in a household setting. Why this happens is not completely understood. Somehow, the virus can find its way into the bloodstream of fellow family members possibly because of frequent physical contact with the small cuts or skin rashes. The virus can also spread through biting and possibly by the sharing of toothbrushes or razors.

## How can the spread of hepatitis B be prevented in the workplace?

The risk of hepatitis B can be significantly reduced by:

- implementing infection control guidelines suitable for the specific workplace
- inoculating workers at risk

## Immunisation

Immunisation provides reliable protection from hepatitis B when used either before or immediately after exposure to the virus. Tests show 90 to 95 percent of vaccinations of healthy people result in the development of resistance against hepatitis B. At present, vaccination is the surest way to avoid acquiring hepatitis B as an occupational disease.

### Immunisation Before Contact

The vaccination of people who are at increased risk of contracting hepatitis B because of exposure to the virus in their work is highly recommended.

Since the risk varies from workplace to workplace, thorough risk assessments for all work situations should be undertaken in order to develop vaccination priorities. Employees who have no contact with blood, blood products, or blood-contaminated body fluids and who are not at risk of needlestick injuries are at no greater risk of hepatitis B than the general public.

### Immunisation After Contact

Workers who experience needlestick injuries, splash exposures to blood from carriers, or bite injuries should immediately seek medical attention. In most cases, your local Environmental Health Officer will provide guidance and procedures for treating these injuries.

If the blood is known to contain the hepatitis B virus, and the exposed worker has not been vaccinated or does not have antibodies against hepatitis B, post-exposure immunisation is strongly recommended to prevent the development of hepatitis B.

Immunisation is recommended when the source of blood is unknown. Vaccination against hepatitis B is usually recommended within seven days of exposure. Depending on the specific circumstance, hepatitis B immunoglobulin is sometimes recommended also.

Immunoglobulin is a preparation containing antibodies which attack the hepatitis B virus. It is usually given as quickly, as possible, preferably within 24 hours of the incident.

## Hepatitis C

Hepatitis C is an infectious liver disease caused by the hepatitis C virus (HCV). Infections of hepatitis C occur only if the virus is able to enter the blood stream and reach the liver.

Approximately half of all people who develop hepatitis C never fully recover and can carry the virus for the rest of their lives.

### How is hepatitis C transmitted?

The hepatitis C virus is spread primarily by exposure to blood. Some people who get hepatitis C do not know how they were infected with the virus.

People may get hepatitis C by sharing needles to inject drugs or through exposure to blood in the workplace. The risk of getting this virus from a blood transfusion has been virtually eliminated through improved screening for a number of diseases including Hepatitis C.

Sneezing, coughing and hugging do not pose the risk for hepatitis C. In addition, there is no evidence that hepatitis C virus is spread by food or water.

### How can we prevent hepatitis C in the workplace?

There is currently no vaccine for hepatitis C. The risk of hepatitis C can be significantly reduced by implementing infection control guidelines suitable for the specific workplace.

Infection control precautions are the first line of defence to protect workers from this virus and other blood-borne diseases.

Most importantly, precautionary procedures must be developed aimed at protecting staff that may come into contact with blood or other bodily fluids that may contain blood. Obviously, cleaners working within a hospital environment are at a higher risk and such procedures should be developed to cope effectively with situations faced within this environment.

When considering the development of such precautionary systems, they should be able to cope with the following types of bodily fluids:

- semen
- vaginal secretions
- synovial fluid
- cerebrospinal fluid
- pleural fluid
- peritoneal fluid
- pericardial fluid
- amniotic fluid.

Such precautions would not normally apply when dealing with the following fluids, unless they contain blood:

- faeces
- nasal secretions
- saliva
- sweat
- tears
- urine
- vomit
- saliva

The purpose of such precautions is to prevent exposure to blood-borne diseases transmitted by needlestick accidents or fluid contact with an open wound, non-intact skin (e.g., cuts or skin rashes), or mucous membranes. They should be used with other control measures. An example is washing hands whenever gloves are removed or whenever the skin contacts potentially infectious fluids.

We would recommend the use of engineering controls, safe work practices, and personal protective equipment to suit the specific task and workplace. Engineering controls include the use of equipment to isolate or contain the hazard, such as puncture-resistant containers for disposing of used sharps.

Safe work practices are required for all tasks involving possible exposure to blood or certain body fluids.

*They include:*

- safe collection of fluids and tissues for disposal in accordance with all relevant guidelines,
- safe removal and disposal or decontamination of protective clothing and equipment,
- procedures to follow in the event of spills or personal exposures such as needlestick injuries, and
- specific and detailed procedures to observe when using and disposing of needles and other sharp objects.

Personal protective equipment provides a barrier to blood and certain body fluids. Equipment we would recommend would be:

- gloves to protect the hands and skin,
- masks and eye protection,
- aprons to protect clothing from splashes with blood

## ***Histoplasmosis***

Histoplasmosis is an infectious disease of the lungs caused by a fungus called *Histoplasma capsulatum*. The infection sometimes can spread to other parts of the body.

This *Histoplasma* organism thrives in moderate temperatures and moist environments. Droppings from chickens, pigeons, starlings, blackbirds, and bats support its growth. Birds are not infected with it because of their high body temperatures, but they do carry it on their feathers. Bats can be infected because they have a lower body temperature than birds and can excrete the organism in their droppings.

To multiply, *Histoplasma capsulatum* produces small spores called conidia. When these conidia are inhaled, they are small enough that they enter the lungs and start an infection. Many of these infections are easily overlooked because they either produce mild symptoms or none at all. However, histoplasmosis can be severe and produce an illness similar to tuberculosis.

### **How can we prevent histoplasmosis?**

Prevention of histoplasmosis relies on avoiding exposure to dust in a contaminated environment. Before anyone cleans bird or animal droppings or other contaminated soil, spraying with water is advisable to reduce dust. Decontamination with 3% formaldehyde has been shown to be effective. However, formaldehyde solutions should be used with caution since this chemical may cause adverse health effects following inhalation, ingestion, or skin or eye contact.

Persons working in contaminated areas should use protective clothing such as gloves and overalls. They should also use a respirator equipped with a high efficiency particulate air (HEPA) filter that is capable of filtering particles down to two microns in size. Such respirators are suitable as long as the occupational exposure limit for formaldehyde is not exceeded. For major clean up operations of prolonged exposure, a powered air purifying or supplied air respirator may be necessary.

## Hantavirus

Hantavirus is a virus that is found in the urine, saliva, or droppings of infected mice and some other wild rodents. It causes a rare but serious lung disease called Hantavirus Pulmonary Syndrome (HPS).

### Preventing Hantavirus infections?

Since human infection occurs through inhalation of contaminated material, clean-up procedures must be performed in a way that limits the amount of airborne dust. People involved in the clean-up should wear rubber gloves, rubber boots and respiratory protective equipment that is equipped with a high-efficiency particulate air (HEPA) filter. Workers involved with general clean-up activities where there are not heavy accumulations of droppings should use a disposable HEPA mask. For cleaning up rodent contaminated areas with heavy accumulations of droppings it is necessary to use powered air-purifying (PARP) or air-supplied respirators.

Dead mice, nests and droppings should be soaked thoroughly with a 1:10 solution of sodium hypochlorite (household bleach). The contaminated material should be placed in a plastic bag and disposed of by burning or burying. Gloves and other equipment used in the cleaning process should be disposed of in the same manner as other contaminated material. Contact your local environmental authorities concerning approved disposal methods.

Thoroughly wash hands with soap and water after removing the gloves.

## Psittacosis

Psittacosis is an infectious disease in humans that has mild, non-specific flu-like symptoms. Psittacosis refers to any infection or disease caused by *Chlamydia psittaci*, one of several micro organisms in the genus *Chlamydia*. This disease can be transmitted from infected birds to humans. Parrot disease, ornithosis, and chlamydiosis are other names for psittacosis.

### How do birds pass on the infection to humans?

Humans can become infected with *Chlamydia psittaci* by breathing in the organism when the urine, respiratory secretion or dried faeces of infected birds is aerosolised (ie. dispersed in the air as very fine droplets or dust particles). Other sources of exposure include handling the plumage and tissues of infected birds.

### Preventing psittacosis infections

Cleaning operatives should be aware of any large concentrations of pigeons nesting in roof-spaces and ceiling voids and be on the look out for accumulated droppings under roosting areas. All such instances should be reported to the manager of the building immediately.

In buildings where birds are kept, cages should be cleaned regularly. Waste material should be removed frequently from the cage after moistening the material with a disinfectant. *Chlamydia psittaci* is susceptible to such disinfectants as quaternary ammonium compounds, isopropyl alcohol, 70% ethanol, glutaraldehyde, formaldehyde and household bleach (diluted to 1 % sodium hypochlorite).

## Aids

AIDS is a condition in which the infection control mechanism of the human body weakens to the point that the body becomes unusually prone to a variety of diseases. It is caused by the human immunodeficiency virus (HIV). There is presently no cure.

The full name for AIDS - Acquired Immune Deficiency Syndrome - describes several of the characteristics of the disease.

**Acquired** indicates that it is not an inherited condition.

**Immune Deficiency** indicates that the body's immune system breaks down.

**Syndrome** indicates that the disease results in a variety of health problems.

AIDS is transmitted from an infected person by body fluids such as blood, semen or other blood-containing secretions. As a result, anyone who is occupationally exposed to these body fluids risks contracting the disease. Preventive measures such as the wearing of protective clothing, gowns, gloves, masks and goggles should be employed to control the spread of AIDS among workers who may be at risk.

### What causes AIDS?

The human immunodeficiency virus (HIV) causes AIDS. The factors that help determine vulnerability to infection and the progression to disease include poor social conditions, malnutrition, drug abuse, infection with hepatitis B virus, and sexually transmitted diseases such as syphilis. Hepatitis B is transmitted by blood contact, as in drug abuse that involves needles. Syphilis and other sexually transmitted diseases affect people who have many sexual partners.

### How is AIDS transmitted?

The AIDS virus can be transmitted from one person to another through:

- unprotected sexual intercourse with infected persons
- contaminated needles
- transfusion of infected blood or blood products
- organ transplant from an infected donor

Unprotected sexual intercourse with infected people poses the single most important risk of infection. The AIDS virus can also be passed from one partner into the bloodstream of the other through tiny cuts or scratches.

Intravenous drug abusers may pick up the AIDS virus if they share needles with infected people. Discarded infected needles and equipment pose the single, most serious threat to cleaning operatives and procedures for their safe disposal must be implemented and strictly adhered to.

The transmission of the AIDS virus occurs only when the virus enters the bloodstream; casual contact with an AIDS victim does not pose a risk. Several studies indicate that sharing telephones, swimming pools, toilets or other household items and facilities with people infected with the AIDS virus poses no risk. The virus is not transmitted during the preparation or serving of food and beverages. The virus is also not known to travel through air.

## Dysentery

Dysentery is a highly contagious disease caused by the shigella bacteria that causes severe inflammation to the lining of the large intestines. The inflammation causes stomach pains and diarrhoea. Some cases involve vomiting and fever. The bacteria enters the body through the mouth in food or water, and also by human faeces and contact with infected people. The diarrhoea causes people suffering from dysentery to lose important salts and fluids from the body.

### How is transmitted in the workplace?

Hand to mouth transfer from person to person or surfaces or articles which have been contaminated by an infected person. It is a common cause of diarrhoea in nurseries and infant schools. Occasionally, by eating or drinking food which has been contaminated. Dysentery is highly contagious.

Flies, in particular, and other pests that disturb foodstuffs and faeces can transmit the bacteria. The bacteria can also be transmitted via infected water.

### How can it be prevented?

Good housekeeping and a thorough cleaning regime are the keys to preventing the spread of bacteria. Special attention should be given to surfaces within sanitary and food preparation areas. Toilet seats, lids, hinges, tap and cistern handles should be kept thoroughly clean, especially when there is a known case of the disease within the building.

## Escherichia coli (E. coli)

E. coli are bacteria that normally live in the intestines of humans and animals. Although, most strains of this bacteria are harmless, several are known to produce toxins that can cause diarrhoea. One particular E. coli strain called 0157: H7 can cause severe diarrhoea and kidney damage.

### How do people become infected?

The bacteria are acquired by eating food containing the bacteria. The bacteria live in the intestines of some healthy cattle, and contamination of the meat may occur in the slaughtering process. Eating meat that is rare or inadequately cooked is the most common way of getting the infection. Person-to-person transmission can occur if infected people do not wash their hands after using the toilet.

### How can infection be prevented?

Do not eat undercooked hamburger or other ground beef products. Cook all ground beef and hamburger thoroughly. Make sure the cooked meat is brown throughout (not pink), and the juices run clear. Drink only pasteurised milk and milk products. Make sure infected people, especially children, wash their hands carefully with soap after using the toilet to reduce the risk of spreading the disease.

Good housekeeping and a thorough cleaning regime are the keys to preventing the spread of bacteria. Special attention should be given to surfaces within sanitary and food preparation areas. Toilet seats, lids, hinges, tap and cistern handles should be kept thoroughly clean, especially when there is a known case of the disease within the building.

## Infection Control

Infection control precautions are the first line of defence to protect workers from blood-borne diseases. For this reason, a uniform precautionary approach should be developed and observed by cleaning operatives at all times.

Originally developed for hospitals, universal precautions have been adapted to a wide range of workplaces. They apply to all situations where workers have risk of exposure to blood or certain body fluids.

The purpose of universal precautions is to prevent exposure to blood-borne diseases transmitted by needlestick accidents or fluid contact with an open wound, non-intact skin, or mucous membranes. Universal precautions are to be used in conjunction with other control measures. An example is washing hands whenever gloves are removed or whenever the skin contacts potentially infectious fluids.

Universal precautions recommend the use of engineering controls, safe work practices, and personal protective equipment to suit the specific task and workplace.

Engineering controls include the use of equipment to isolate or contain the hazard, such as puncture-resistant containers for disposing of used sharps or biological cabinets for certain procedures in laboratories.

Safe work practices are required for all tasks involving possible exposure to blood or certain body fluids. They include:

- safe collection of fluids and tissues for disposal in accordance with local authority regulations
- safe removal and disposal or decontamination of protective clothing and equipment
- procedures to follow in the event of spills or personal exposures such as needlestick injuries
- specific and detailed procedures to observe when using and disposing of needles and other sharp objects

Personal protective equipment provides a barrier to blood and certain body fluids. Equipment recommended by universal precautions include:

- gloves to protect the hands and skin
- masks and eye protection together or a face shield to protect mucous membranes of the eye, nose and mouth in any situation where splashes of blood or body fluids may occur
- aprons to protect clothing from splashes with blood.

Workers in the following areas should observe any such precautions:

- cleaning operatives
- health care workers
- emergency personnel, fire-fighters, and police
- laboratory personnel
- pathology personnel
- dentists and dental assistants
- workers in correctional institutions
- people required to perform CPR
- embalmers and morgue attendants

## Identifying the Risks

It is generally considered that normal cleaning regimes, using the correct materials and procedures, will adequately deal with any disease causing bacteria that may be present. This is particularly true when cleaning washrooms, toilets and foods preparation areas.

However, from time to time, incidents will occur that will require cleaners to react quickly and be aware of the correct procedure needed to deal with it effectively. For instance, if a cleaner comes across a discarded hypodermic syringe, he/she will need to be aware of the correct handling and disposal procedures.

We have dealt with bacteria and infection earlier on in the Guide and by now, you should have a good idea of the way in which bacteria enters the workplace and is transmitted. You will also be aware of the ways in which cleaning operatives can stop the spread of bacteria by using simple but effective control procedures, such as effective colour-coding systems.

The following table has been produced to help you identify some of the most common bacteria and give you some idea of the potential hazards they present and where they can be found.

## Identifying the Hazards

Bacteria/Virus	Hazards	Where Found
<b>Dysentery</b>	A bacterial disease that causes severe food poisoning and other intestinal problems.	Infected faeces and vomit found on surfaces or sanitary dressings (nappies, incontinence pants).  Carried by flies and vermin by transmission from faeces to food.
<b>E-Coli</b>	Diarrhoea, gastro-enteritis, bladder infections, severe food poisoning and in severe cases death.	Infected faeces found on soiled medical dressings, washroom surfaces.  Infected vomit found on surfaces. Can be transmitted via serious ant infestations.
<b>Hepatitis B</b>	A viral disease that attacks the liver and can prove fatal in approx. 25% of chronically infected people.	Infected blood found on surfaces, inside used hypodermic syringes, medical and sanitary dressings.  Infected semen found on surfaces and discarded condoms.

## Identifying the Hazards

Bacteria/Virus	Hazards	Where Found
<b>Hepatitis C</b>	A chronic viral disease that attacks the liver that proves fatal in approx 3% of those infected.	Infected blood found on surfaces, inside used hypodermic syringes, medical and sanitary dressings.
<b>HIV/Aids</b>	Incurable virus that attacks the body's capability to fight infection and disease. Usually proves fatal.	Infected blood found on surfaces, inside used hypodermic syringes, medical and sanitary dressings.  Infected semen found on surfaces and discarded condoms.
<b>Legionellosis</b>	A bacterial air-borne infection that is very similar to pneumonia, attacking the lungs, which can prove fatal.	Infected, poorly maintained water systems. Bacteria is transmitted to surfaces from sprayed sources such as shower heads.
<b>Lice and fleas</b>	Parasitic infestation that causes skin disease and infections.	Transmitted by humans and animals.  Can be found in dirty furniture and carpets and the infestations can be extensive.
<b>Staphylococcus aureus and other food poisoning bacteria.</b>	Bacteria that causes diseases of the intestines, nose and skin.	Infected surfaces, tissues, medical and sanitary dressings, faeces and vomit.  Transmitted by animals and cockroaches and can be passed from raw to cooked foods via hands, containers, equipment etc.  Bird dropping must also be approached with care.
<b>Tuberculosis (and other diseases affecting the lungs)</b>	Disease that affects the lining of the lungs and can prove fatal.	Known to be transmitted by pigeons via a powdery deposit secreted by the feathers.

## Pest Infestations

As you will have noticed from the detail contained within the table, pest infestations are a significant consideration when recognising the way in which bacteria can be transferred. We will deal with such infestations in more detail later in this Guide.

However scrupulous a cleaning regime, however well maintained a building may be, pest control measures are a prudent precaution and need to be carried out as part of a rigorous monitoring regime that provides detailed inspections, expert treatments, and a good reporting system. Guidance in respect to the implementation of these measures is available from your local Environmental Health Office.

In any building, there are a number of potential pests that could infest the whole or part of it. As cleaning operatives, apart from keeping the building hygienically clean, there is not a lot else you can do to prevent such infestations.

Therefore, it is important for you to be aware of the hazards posed to you and others by the various creatures that may infest the building in which you work. It is also important that you report any evidence of significant infestations to the manager of the building. After doing so, you should inform your manager or supervisor, who should liaise with manager of the building on any action that needs to be taken. Typically, following infestations, a qualified Pest Control Officer will advise of any preventative measures that can be taken by all users of the building as well as giving advice on the cleaning regimes to be adopted following treatments or baiting.

Although the majority of this Guide is aimed at identifying the biological hazards present within the workplace, some pest infestations are harmless, in the sense that they pose little or no health hazards. Some pest infestations may cause damage to property. In order for you to assess the types of risks posed by each individual species, we have included all of the relevant information cleaning operatives would require.

*Examples of pests that can infest buildings or cause nuisance are:*

## Rats and Mice

Among the diseases that rats are known to carry are cholera, typhus, bubonic plague and leptospirosis, a bacterial illness spread by their urine contaminating water or food. Rat and mice infestations are common, given that they can gain entry to buildings through wall cavities, sewers, drains etc. Rats are the most dangerous of all pests, given the range of diseases they transmit and their habit of disturbing refuse and foodstuffs, but can be effectively dealt with using anticoagulant rodenticides, due to the fact that they cannot vomit. The key to discouraging rat infestations is good housekeeping; making sure that any waste foodstuffs are disposed of immediately and avoiding the build-up of refuse and litter, so in this sense cleaning operatives play a key role.



**LOOK OUT FOR:**

*Disturbed refuse, damaged food packets, droppings, gnawed furniture and walls, holes in walls, carcasses, noises in walls or ceiling voids*

**WHAT TO DO**

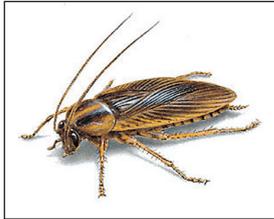
*All rat infestations need to be reported to the local Environmental Health Office immediately. Make sure any suspected infestations are notified to the manager of the building.*

**IMPORTANT**

*Never attempt to handle carcasses under any circumstances, leave it to the Pest Control Officer.*

## Cockroaches

Cockroaches are considered to be the most obnoxious of all pests. There are two main types that infest buildings, the German Cockroach and the American Cockroach.



They are characterised by their leathery appearance and distinctive sickly smell. They are nocturnal and do not like bright light; they will scurry away if a light is switched on.

Infestations can be huge and very difficult to contain and are usually concentrated around warm water pipes inside wall cavities. They can only be treated with strong pesticides that can be administered by a Pest Control Officer. If they remain unchecked, they can cause outbreaks of food-poisoning as they are known to transmit salmonella bacteria and will feed on all types of waste foodstuffs.

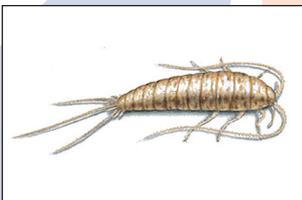
**LOOK OUT FOR:**  
*Discarded exoskeletons, carcasses, scurrying when lights are switched on, distinctive sickly sweet smell, damage to wallpaper and soft furnishings.*

**WHAT TO DO**  
*Cockroach infestations need to be reported to the local Environmental Health Office immediately. Make sure any suspected infestations are notified to the manager of the building.*

**IMPORTANT**  
*Wherever possible, retain a carcass for examination by the Pest Control Officer.*

## Silverfish (*Lapysma Saccharina*)

Silverfish are small wingless insects, silver-grey in appearance and about 1 cm in length. They feed on cellulose,



which is found in all paper products, and starchy material and will seek out discarded starchy foodstuffs and make their homes in cupboards and drawers and behind damaged wallpaper. They require humid and damp conditions; therefore, any paper-based materials present, especially food containers, are at risk of damage.

Infestations are usually small and are usually confined to kitchen cupboards and bathrooms. They can be dealt with relatively easily using insecticidal sprays. The key to avoiding infestations is to keep drawers and cupboards clean and dry.

**LOOK OUT FOR:**  
*Carcasses, scurrying when lights are switched on, damage to wallpaper, paper and cardboard food containers and drawer linings*

**WHAT TO DO**  
*Silverfish infestations do not pose a serious biological hazard, but any evidence of infestation should be reported as they can attack foodstuffs and transfer bacteria present in the area in which they are nesting.*

**IMPORTANT**  
*Wherever possible, retain a carcass for examination by the Pest Control Officer.*

## Flies

The most annoying thing about flies is their mere presence. However, when you look a little closer at their habits, you will realise that they really are disgusting little creatures. This is mainly due to the way they feed; they will feed on any food or waste product and feed by vomiting onto the surface which liquefies the food and sucks it up through a tube. As they feed on faeces, there is an obvious danger of transmission of harmful bacteria to foodstuffs. Flies will also lay eggs in rotting meat, producing maggots which, although relatively harmless in themselves, will produce other flies.



### **LOOK OUT FOR:**

*Maggots and pupa casings will indicate that flies are breeding within the building. These will usually occur in refuse sacks containing waste food.*

### **WHAT TO DO**

*Spray the infected area with JANGRO Fly and Bug Killer and remove any potential nesting sources, ie. dispose of waste promptly and efficiently.*

### **IMPORTANT**

*Dispose of any foodstuffs that come into contact with flies immediately. Make sure that all unattended food is covered at all times.*

## Ants

There are two main varieties of ants that infest buildings: garden ants, which are black and pharaoh's ants, which are light brown.



Garden ants nest outdoors and seek food indoors and present a nuisance in food areas. However, pharaoh's ants will nest in warm buildings and are known to carry harmful bacteria such as e-coli.

Although they feed on sweet and sticky foods, they will crawl over all types of surfaces and present a danger of contamination when they come into contact with foodstuffs.

### **LOOK OUT FOR:**

*They are untroubled by human presence and are easily identified in food storage areas.*

### **WHAT TO DO**

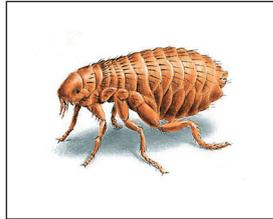
*Although small numbers can be treated with insecticides, boiling water and paraffin, this is ineffective when trying to treat nesting areas. Nesting areas need to be treated systematically by Pest Control Officers.*

### **IMPORTANT**

*Keep all food containers sealed and take care in making sure that all food preparation areas are kept clean and tidy.*

## Fleas

Fleas are parasitic insects that survive by feeding on the blood of their hosts. They infest rats, dogs, cats, pigs, rabbits, pigeons as well as humans. They are considered to be among the most dangerous of all pests.



Rat fleas transmit bubonic plague from rats to humans and they are also known to spread typhus. Also, due to their ability to jump considerable distances, they are easily transferred from host to host. They are most commonly found in areas where pets sleep.

### LOOK OUT FOR:

*Adult fleas are external parasites. They bite leaving characteristic dark red spots. The irritation caused will lead pets to scratch themselves repeatedly.*

### WHAT TO DO

*Most flea infestations of pets can be controlled by the use of proprietary powders, shampoos or collars. Major infestations can be controlled by Pest Control Officers using insecticides.*

### IMPORTANT

*Don't leave remedial action too late. Just because you can't see fleas jumping, it doesn't mean they are not there.*

## Clothes Moths

There are many species of moth that can infest buildings, the most common of which is the clothes moth. Females lay up to 200 eggs that, when hatched, produce grubs wool, fur skin and feathers.



They will attack blankets, bedding, carpets, underlay, curtains and upholstery. Moths will usually rest on soiled areas of fabrics and textiles and prefer shaded areas.

### LOOK OUT FOR:

*Damaged fabrics, usually clothes and curtains, carcasses which are dry and powdery.*

### WHAT TO DO

*They can be controlled with JANGRO Fly and Bug Killer, but prevention is always preferable. Make sure all fabrics are cleaned before being stored and use moth repellent crystals*

### IMPORTANT

*Do not confuse them with butterflies, which are harmless. When at rest a moths wings will close making them easily identifiable.*

## Bees and Wasps

Bees and wasps are more of a nuisance than a hazard. They do not present much in the way of a biological hazard but their presence can lead to painful stings, which can prove very serious to people who have intolerance to them. Bees do not tend to enter buildings; however, wasps will enter in search of food and will attack sweet and sticky foodstuffs.



They nest in buildings causing distress to inhabitants due to the disruption caused by their presence. Bees and wasps will deliver a sting if distressed as a defence mechanism; however, some species of wasps are parasitic and will deliver a sting to modify tissue for egg implantation, though these are rare.

**LOOK OUT FOR:**

*All species are very conspicuous and easily identified. Flaky deposits in roof voids may indicate the presence of a nest. Nests can be huge and look similar to foam wall filler.*

**WHAT TO DO**

*Avoid annoying them as they are likely to sting. If you suspect they are nesting in the building, report this to the manager of the building and it can be removed by Pest Control Officers. Individuals can be treated with JANGRO Fly and Bug Killer.*

**IMPORTANT**

*Unlike bees, wasps do not die when they have delivered a sting; therefore they are harder to control.*

## Carpet Beetles

There are two types of carpet beetle that will attack wool-based fabrics, the black and varied carpet beetle. Their grubs, known as "woolly" are responsible for the damage to carpets and fabrics.



They are non-parasitic and pose no significant biological hazard when infestations occur.

**LOOK OUT FOR:**

*Damage to wool or wool-mix carpets. They can sometimes be seen amongst carpet fibres.*

**WHAT TO DO**

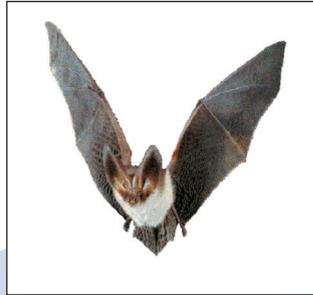
*Their treatment is much the same used for moth infestations and is carried out by Pest Control Officers*

**IMPORTANT**

*Make sure carpets are vacuumed regularly and be on the look out for damage.*

## Bats

Bats infestations are a common problem in both rural and urban buildings. They are nocturnal and rest in the roofs of buildings during the day, making their presence difficult to ascertain. Although bats themselves do not come into contact with humans, their droppings can carry very harmful bacteria and they have been associated with outbreaks of histoplasmosis.



### **LOOK OUT FOR:**

*Unusual noises during the night and droppings in roof spaces and loft, carcasses. Also, at sunset, bats can be seen leaving roof spaces in search of food and will be very active*

### **WHAT TO DO**

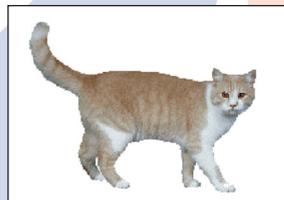
*As all species of bat are protected in the UK their presence needs to be notified to the Environmental Health Officer. It is illegal to attempt to kill or trap bats.*

### **IMPORTANT**

*As bats cannot be disturbed, where they are present, their droppings must be removed regularly.*

## Feral Cats

Feral, or wild cats, infest buildings, out-buildings, waste disposal tips and industrial premises. They are far more aggressive and less hygienic than domestic cats. They are very intelligent and will enter premises in search of food.



Due to their lack of hygiene, they are usually infested with fleas and can easily introduce them into the workplace. On the plus side, they are effective in controlling any rat and mice infestations.

They will only stay in areas where there is a plentiful supply of food and will disturb refuse sacks in search of it.

### **LOOK OUT FOR:**

*They are untroubled by human presence and will not attempt to hide. Disturbed waste sacks and droppings will usually indicate their presence.*

### **WHAT TO DO**

*Report their presence to the manager of the building. They should liaise with the RSPCA for advice on neutering to stop them breeding.*

### **IMPORTANT**

*Do not attempt to handle feral cats and approach them with extreme care. DO not feed them as this will encourage them to stay*

# Pigeons

Pigeons are known in some areas as "flying rats" without justification. They are known to carry numerous diseases on their bodies and via their droppings.



They are carriers of a number of disease-causing bacteria associated with a number of lung disorders such as psittacosis, tuberculosis and pigeon fanciers' lung, all of which can prove fatal.

Their droppings are not only extremely unsightly, they also contain harmful bacteria such as salmonella which can lead to severe food-poisoning.

**LOOK OUT FOR:**  
*Accumulations of droppings under roosting areas, unusual noises in lofts and roof spaces, carcasses.*

**WHAT TO DO**  
*Report any suspected infestations to the manager of the building. Approach droppings in accordance with relevant procedures and avoid breathing any associated dust.*

**IMPORTANT**  
*Do not deliberately feed pigeons and discourage any others in the building from doing so.*

# Pest Infestations That Cause Damage to Building Interiors

## Woodworm

A variety of insects, most of them beetles, are collectively known as woodworm because of the characteristic "flight holes" their grubs leave in timber. They can cause considerable damage to hard woods as well as soft woods. In-situ treatment will eradicate the infestation, as well as preventing future attack - although heavily infested timber may have to be replaced with pre-treated timbers.



**LOOK OUT FOR:**  
*Small holes in furniture, floor boards or wood fittings. There may also be wood dust deposits around the room underneath wood items.*

**WHAT TO DO**  
*Report any suspected infestations to the manager of the building. Immediate treatment of the affected items is required in order for the effects of infestation worsening.*

**IMPORTANT**  
*Be on the lookout for any of the tell-tale signs of infestation. You may see tiny worm-like grubs by the affected items - these are what are causing the damage.*

## Dry Rot

When wet, untreated timber is subject to attack by various fungi. *Serpula Lacymans* is the Latin name for the dry rot fungus. The wood is attacked by the fungus which takes root into the surface, spreading rapidly throughout the building, undermining the whole structure. The fungus will become evident when it "fruits" and large ugly fungus caps will be evident.



### **LOOK OUT FOR:**

*Fibrous roots on wood joists and floor-boards, fruiting fungus protruding from wood and internal decor.*

### **WHAT TO DO**

*The treatment involves creating a toxic box- an isolated area of the affected building which will be treated to make it totally toxic to future fungal attack.*

### **IMPORTANT**

*In affected areas, take care not to walk on affected wood as the spores can be transferred to other buildings, causing the problem to spread.*

## Wet Rot

"Wet rot" is a collective term for various kinds of fungal attack other than dry rot. It causes extensive damage to affected timber which will rapidly deteriorate and become brittle, powdery or soft.



### **LOOK OUT FOR:**

*Damp or rotting wood, particularly floor-boards, window frames, skirting boards etc*

### **WHAT TO DO**

*Wet rot fungi may not need such extensive treatment as dry rot. However, in all cases weakened timber must be removed and replaced with pre-treated timber.*

### **IMPORTANT**

*Take care not to over-wet wooden surfaces and keep unprotected wood floors as dry as possible, using the minimum amount of water.*

## Dealing with Hazardous Material

Now that we have given you some idea of the ways in which bio-hazardous material is introduced into the workplace, we need to look at how we approach dealing with them effectively.

The easiest way to do this is to conduct an assessment of the risks associated with each particular type of incident. (Details of how to do this are provided in the Jangro Guide to Health and Safety).

Once an appropriate risk assessment has been carried out, you can set about adopting the correct procedures for dealing with the disposal of the hazardous waste in question.

The way in which we have approached this subject is by producing the following case studies, each of which outlines a common problem and then take you through the process of dealing with each.

### Case Study 1: Disposing of Discarded Hypodermic Syringes

*Joan is employed as a cleaner in a public convenience that is known to be frequented by drug users. When carrying out her routine cleaning duties, she comes across a toilet cubicle which has been used by drug users. In it she finds two hypodermic syringes, one of which is obviously contaminated with blood; the other appears to be clean.*

#### What should she do?

Luckily, Jean is trained to deal with this situation effectively. Let's see what she does in the order she does it.

She decides that although there is no obvious sign of blood on one of the syringes, it must still be approached with extreme caution and dealt with in line with the "Sharps" disposal procedure she has been trained in.

Firstly, she places an "Out of Order" sign on the cubicle door to restrict access to the area and goes to her cleaning cupboard for the equipment she needs.

*This consists of the following:*

**A "sharps" disposal carton.**

**Plastic tweezers**

**Clean white tissue**

**Antiseptic spray**

**Antiseptic wipes**

**Yellow biohazard waste bag**  
**Disposable apron**  
**Disposable gloves**

*This is the procedure she follows:*

1. Before entering the area she puts on the disposable apron and the gloves.
2. She then places warning signs at the entrance of the cubicle to warn users of the toilet that she is working.
3. She places all of her equipment within easy reach within the work area, making sure that none of it comes into contact with the contaminated items.
4. Jean opens the lid of the disposal carton and places it on the floor next to the first syringe.
5. She takes the tweezers and manoeuvres the syringe into a position where she can grasp it firmly by the body (not by the needle end!)
6. Making sure that she has a firm grip on the syringe, she carefully places it into the carton, taking care to place it in needle first.
7. Once she has done this, she repeats the process for the second syringe.
8. When she is sure that the syringes have been deposited completely inside the carton, she places the tweezers inside and closes the lid, making sure that it is sealed properly and places it to one side.

9. She sprays the infected area with the antiseptic solution and wipes with the clean tissue.
10. Once all of the potentially infected area has been disinfected, she places the used tissue in the biohazard waste bag.
11. She then removes her gloves and apron and places them in the biohazard waste bag.
12. To finish, she wipes her hands with an anti-septic wipe and places it in the biohazard waste bag.
13. She seals the bag and places it in the designated waste area.
14. She takes the sharps disposal carton and arranges for disposal in line with the company's policy.
15. She returns to the cubicle and cleans it thoroughly as normal.
16. She removes the warning sign, returns all equipment to the store and reopens the toilet.
17. She then reports the incident to her manager.

It sounds like a lengthy procedure, but each step has been carefully considered following a risk assessment by her manager, to ensure that the risk of injury and infection is reduced to an absolute minimum. The manager in question would need to take into account that the public convenience in question is known to be frequented by drug users and reflect this in his/her risk assessment.

It should be noted that all operatives should only tackle the disposal of hypodermic syringes in small quantities. Risk assessments should reflect this and make specific recommendations as to what action should be taken to deal with instances involving large quantities.

It is usual in these circumstances to recommend that the issue be reported to the local Environmental Health Office, who should be able to deal with it effectively using specialist equipment and personnel.

## Dealing with Hazardous Material

*Terry works as a cleaner in a youth hostel and his duties include cleaning the accommodation areas within the complex. One morning, when cleaning one of the accommodation rooms, he notices a pool of vomit, which has soaked into the carpet.*

### What Should He Do?

This is a regular occurrence within the hostel and Terry has been trained to deal with it. Again, let's study the correct approach.

Firstly, Terry makes a check of the immediate area to see if the person has been sick in other parts of the room. They haven't so he sets about his job.

Firstly, he places a warning sign on the door to the affected room restricting access to it. He then goes to the cleaning cupboard for the necessary supplies.

*For this task he will need the following:*

- A Body Fluid Spillage Kit consisting of:**
- Absorbent deodorising granules**
- Anti-septic spray**
- Clean white, non-woven cleaning cloths**
- Cardboard scoop and spatula**
- Disposable gloves**
- Disposable apron**
- Biohazard waste bag**

*This is the procedure he follows:*

1. Before entering the work area, he puts on the disposable apron and gloves.
2. He places warning signs at the extremes of the work area to warn people of his presence.
3. He then places all of his equipment within easy reach, taking care that none of it comes into contact with the stain to be cleaned.

4. Standing over the stain, he takes the absorbent granule container and sprinkles it liberally over the stain, making sure it is completely covered.
5. After giving the granules time to absorb the majority of the liquid, Terry checks that it has been drawn from the carpets and is beginning to take a more solid form.
6. Once he is satisfied, he takes the cardboard spatula and agitates the stain. Using the cardboard spatula and working from the outside of the stain in, he scrapes the residue into the scoop and places it into the waste bag. He also places the scoop and spatula in the bag for disposal.
7. After taking as much of the stain up as possible, he takes up the rest of the powder using the dry cleaning cloth and disposes of it in the waste bag.
8. Once the majority of the stain has been removed, he sprays the area liberally with the anti-septic solution and allows a couple of minutes for it to act.
9. Taking another clean cloth he dries the area and disposes of it in the waste bag.
10. Before finishing he places his apron and gloves in the waste bag.
11. He then wipes his hands thoroughly with the ant-septic wipe and places it the waste bag.
12. He seals the waste bag and places it in the designated area ready for collection.
13. He reopens the room and returns all equipment, including the warning sign to the storage area.

These procedures are relatively straight forward and take all of the necessary steps to ensure that both the operative and anyone else using the area are adequately protected. It is also worth noting that this procedure is sufficient in dealing with all major body-fluid spills.

## Dealing with Hazardous Material

*Mary works as a cleaner in a Sheltered Housing Scheme for the elderly. One of her duties is to remove black refuse sacks from the bin rooms for collection by the binmen. One morning, whilst going about her normal duties, she comes across a dead rat in the bin room.*

### What Should She Do?

Although this is not a regular occurrence, Mary has been trained to deal with the situation, following her attendance on a Health and Safety training course.

Firstly, Mary closes the door and marks it with a makeshift sign saying "Do Not Enter"; She knows that under no circumstances should she attempt to handle the rat and telephones the local authority Environmental Health Department and waits for the Pest Control Officer to arrive.

*Whilst waiting, she prepares the following items:*

- A biohazard waste bag**
- Antiseptic spray**
- Disposable gloves**
- Disposable apron**
- Anti-septic hand wipe**
- Neutral cleaning solution and bucket**
- Scrubbing brush**
- Disposable tissue**

The Pest Control Officer arrives and disposes of the carcass. It is only now that Mary sets to work and she follows this procedure.

1. Before entering the work area, she puts on the disposable apron and gloves.
2. She places warning signs at the extremes of the work area to warn people of her presence.

3. She then places all of her equipment within easy reach, taking care that none of it comes into contact with the area from which the rat has been removed.
4. Using a scrubbing brush, she applies neutral cleaning solution to the area, rotationally scrubbing the area where the rat was found.
5. She soaks up the waste solution using absorbent tissue and deposits it in the waste bag.
6. Once the area is relatively dry, she applies the antiseptic solution by spraying the affected area thoroughly and allows to dry naturally, before wiping with absorbent tissue and depositing in the waste bag.
7. She then cleans the whole room thoroughly in the usual way using her normal equipment.
8. Before finishing she places her apron and gloves in the waste bag.
9. She then wipes her hands thoroughly with the ant-septic wipe and places it the waste bag.
10. She seals the waste bag and places it in the designated area ready for collection.
11. She reopens the room and returns all equipment, including the warning sign to the storage area.

## Further Information

Further information and advice in relation to specific biological hazards present in the workplace can be provided by your local Environmental Health Office. Local Authority Pest Control Officers can offer advice and services to deal with all pests mentioned in this section.

The following charts and tables can be found in the Appendices section of the Guide:

Common Disease Causing Bacteria	Appendix I
Pest Infestation Characteristics and Control	Appendix II
Home-made Pest Control Solutions	Appendix III

# Common Disease Causing Bacteria

## Appendix I

Micro-organism and Typical Effects	Source	Method of Transmission
<p><b>Staphylococcus Aureus</b> associated with:</p> <ul style="list-style-type: none"> <li>• food poisoning</li> <li>• nose and throat infections</li> <li>• open wound infections</li> </ul>	<ul style="list-style-type: none"> <li>• Mucous membranes and skin of animals and humans.</li> </ul>	<ul style="list-style-type: none"> <li>• Touching the nose and mouth of infected individuals.</li> <li>• Contact with infected skin and puss from boils, rashes and other conditions.</li> <li>• Contact with infected wounds.</li> <li>• Transferred from raw to cooked foods via hands and infected catering equipment.</li> </ul>
<p><b>E.Coli</b> associated with:</p> <ul style="list-style-type: none"> <li>• food poisoning</li> <li>• diarrhoea</li> <li>• bladder infections</li> <li>• gastro intestinal disorders</li> </ul>	<ul style="list-style-type: none"> <li>• Found in the intestines of humans and animals. The bacteria has many strains, some of which cause infections and disease.</li> <li>• Foul water and sewage.</li> </ul>	<ul style="list-style-type: none"> <li>• Transferred from raw to cooked foods via hands and infected catering equipment.</li> <li>• Infrequent changing of cleaning water or allowed to stand for long periods before being used.</li> <li>• Pests, especially flies can transfer the bacteria from infected excrement to contact surfaces and food.</li> </ul>
<p><b>Shigella Sonnei</b> associated with:</p> <ul style="list-style-type: none"> <li>• dysentery</li> </ul>	<ul style="list-style-type: none"> <li>• Found in human intestines</li> </ul>	<ul style="list-style-type: none"> <li>• Failing to wash hands after using the toilet.</li> <li>• Pests, especially flies can transfer the bacteria from infected excrement to contact surfaces and food.</li> <li>• Contaminated toilet contact surfaces.</li> </ul>
<p><b>Salmonella Group</b> associated with:</p> <ul style="list-style-type: none"> <li>• food poisoning</li> <li>• typhoid</li> <li>• paratyphoid</li> </ul>	<ul style="list-style-type: none"> <li>• Found in human and animal intestines.</li> <li>• Foul water and sewage.</li> <li>• Poultry, shell fish, meat and dairy products.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduced into buildings via infected foodstuffs.</li> <li>• Failing to wash hands after using the toilet.</li> <li>• Water polluted by sewage.</li> <li>• Transferred from raw to cooked foods via hands and infected catering equipment.</li> <li>• Introduced into buildings by birds, insects, vermin and domestic pets.</li> </ul>
<p><b>Pseudomonas Aeruginosa</b> associated with:</p> <ul style="list-style-type: none"> <li>• wound infections</li> </ul>	<ul style="list-style-type: none"> <li>• Soil.</li> <li>• Foul water and sewage.</li> </ul>	<ul style="list-style-type: none"> <li>• Infrequent changing of cleaning water or allowed to stand for long periods before being used.</li> <li>• Dirty water used in cleaning can deposit the bacteria onto surfaces being cleaned.</li> </ul>
<p><b>Clostridium Perfringens</b> associated with:</p> <ul style="list-style-type: none"> <li>• food poisoning</li> <li>• wound infections</li> </ul>	<ul style="list-style-type: none"> <li>• Found in human and animal intestines.</li> <li>• Soil.</li> <li>• Flies.</li> <li>• Meat and dairy products.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduced into buildings via infected foodstuffs.</li> <li>• Transferred from raw to cooked foods via hands and infected catering equipment.</li> <li>• Failing to wash hands after using the toilet.</li> <li>• Introduced into building via soil e.g. root vegetables.</li> </ul>

# Pest Infestation Characteristics and Control Measures

## Appendix II

Description & Characteristics	Evidence of Infestation and Control
<p><b>Cockroach (Insect)</b></p> <ul style="list-style-type: none"> <li>The cockroach is considered the most obnoxious of household pests.</li> <li>They inhabit warm areas and are extremely hardy. They live on a diet of all foodstuffs (vegetable and animal), paper, clothing and other insects, including dead cockroaches.</li> <li>They are nocturnal and feed in the dark using their long antennae to navigate.</li> <li>They have long, powerful legs and can run very fast.</li> <li>Most species have two pairs of wings that are larger in males and span the length of the insect. They are flat and oval in appearance.</li> <li>They live in colonies and infestations are usually large and are usually concentrated around water pipes and wall cavities and enter rooms through drainage holes and ventilation ducts.</li> <li>Most are flightless, but some species are capable of flight. Some can reach lengths of 2-3 inches and can be various colours, although they are usually brown or black.</li> <li>They have an unpleasant odour due to their fouling of their environment.</li> <li>They make up 80% of all reported pest infestations.</li> <li>They are carriers of many human diseases including salmonella.</li> </ul>	<p><b>Signs of Possible Infestation</b></p> <ol style="list-style-type: none"> <li>1. Evidence of Insect carcasses (whole or part).</li> <li>2. They can be seen scurrying or flying away to safety when a light is switched on in a darkened room.</li> <li>3. Damage to wallpaper, soft furnishings, food cartons and labels etc.</li> <li>4. Damage to fabrics and clothing.</li> <li>5. Any unusual, sweet and sickly-smelling odour in rooms where foodstuffs are kept.</li> <li>6. Flaky deposits, which are the discarded exoskeletons of their young.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Ensure high levels of cleanliness.</li> <li>2. Ensure all staff remain vigilant for any sign of infestation.</li> <li>3. Block their access to water.</li> <li>4. Ensure access through wall cavities is kept to a minimum.</li> <li>5. They can be treated with insecticides by suitably trained operatives.</li> <li>6. All infestations should be referred to the Environmental Health Officer.</li> <li>7. Advice can be sought from the Local Authority Pest Control Unit.</li> <li>8. Store waste food correctly and dispose of regularly.</li> </ol>
<p><b>Fleas (insect-parasitic)</b></p> <ul style="list-style-type: none"> <li>The flea is one of the most dangerous of all pests.</li> <li>Fleas infest rats, dogs, cats, pigs, rabbits, pigeons and poultry as well as humans and are indiscriminate in choosing their hosts.</li> <li>Rat fleas transmit bubonic plague from rats to humans. They are also responsible for the spread of typhus fever.</li> <li>They are parasitic and survive by feeding on blood from humans and animals.</li> <li>They prefer warm and dark conditions.</li> <li>They are able to jump considerable distances and are easily transported from host to host.</li> <li>The eggs of the female become scattered where animals sleep in carpets and rugs.</li> <li>Their larvae are worm-like and have biting mouthparts and live in animal tissues and waste.</li> </ul>	<p><b>Signs of Possible Infestation</b></p> <ol style="list-style-type: none"> <li>1. Building occupants may suffer from sudden bites, particularly on the legs and feet, resulting in red blotches on the skin.</li> <li>2. Fleas can sometimes be seen jumping from host to host or from any infested surface.</li> <li>3. Building occupants and animals may become itchy and uncomfortable.</li> <li>4. Dead insects will be difficult to squash due to their armour plating.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Ensure high standards of cleanliness in all areas.</li> <li>2. Control the amount of animals (pets) allowed into the building.</li> <li>3. Ensure all animals are treated regularly with insecticidal treatments.</li> <li>4. Infestation may be dealt with by cleaning, followed by fumigation with formaldehyde and/or heat treatment.</li> <li>5. Advice can be sought from the Local Authority Pest Control Unit.</li> </ol>

# Pest Infestation Characteristics and Control Measures

## Appendix II

Description & Characteristics	Evidence of Infestation and Control
<p><b>Flies (Insect)</b></p> <ul style="list-style-type: none"> <li>There are a number of different types, the most common being the housefly and the blowfly (green and bluebottles).</li> <li>They feed on dead and decaying vegetable and animal matter, excrement etc., by secreting digestive juices onto food and sucking up the partly digested food.</li> <li>Eggs are laid by the female in warm, moist places e.g. waste food, rotting meat and refuse.</li> <li>The life cycle is: Adult - Eggs - Larvae (maggot) - Pupae - Adult.</li> <li>They occur throughout all establishments.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Highly visible and annoying.</li> <li>2. Maggots will be found in waste storage areas.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. As for cockroach.</li> <li>2. Use of insecticidal sprays, but not in food areas. Many sprays contain pyrethins or pyrethroids.</li> <li>3. Covering windows and ventilators with gauze can reduce Numbers.</li> <li>4. Ultra-violet electric insect killers, e.g. Insectocutors.</li> <li>5. Infestation as such is not usually a problem. The number of flies in urban environments has decreased due to improved refuse and sewage disposal</li> </ol>
<p><b>Silverfish (Insect)</b></p> <ul style="list-style-type: none"> <li>Silverfish are wingless insects, silver-grey in appearance and about 1cm long.</li> <li>They feed on cellulose and starchy material e.g. wallpapers, paste, books, cotton or rayon clothing, debris and remains of starchy food.</li> <li>They are nocturnal.</li> <li>They infest drawers, cupboards and around drains and sinks. They are also found behind wallpaper.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Can be found behind damaged wall coverings.</li> <li>2. Live insects or carcasses can be found in infested areas.</li> <li>3. Damage to food containers and drawer linings.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Clean cupboards and drawers regularly.</li> <li>2. Infestation is rarely a problem but can be dealt with by the use of insecticidal sprays.</li> </ol>
<p><b>Moths (Insect)</b></p> <ul style="list-style-type: none"> <li>There are many species that infest all types of buildings.</li> <li>The female lays up to 200 eggs that hatch to produce grubs that attack wool, fur, skin and feathers.</li> <li>The life cycle is: Adult - Egg - Larvae (grub) - Pupae - Adult.</li> <li>Moths prefer shade, a temperature of about 20-30°C and soiled areas of fabric.</li> <li>Moths will attack blankets, bedding, quilts, carpets, underfelt, upholstery, curtains, stuffed animals and birds.</li> </ul>	<p><b>Evidence of Infestation.</b></p> <ol style="list-style-type: none"> <li>1. Damage to curtains, fabrics, clothing and soft furnishing.</li> <li>2. Carcasses can be identified as moths as opposed to butterflies if their wings are closed.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Clean all linen and curtains before storage.</li> <li>2. Regularly inspect stored curtains and linen.</li> <li>3. Use a repellent e.g. paradichlorobenzene crystals.</li> <li>4. Regularly vacuum carpets and upholstery.</li> <li>5. Occasional specialised cleaning may be required on some carpets and soft furnishings.</li> <li>6. If attack occurs, thorough cleaning is required. This involves cleaning both sides of carpets and upholstery. Then subject to heat treatment or a general insecticide.</li> </ol>

# Pest Infestation Characteristics and Control Measures

## Appendix II

Description & Characteristics	Evidence of Infestation and Control
<p><b>Carpet Beetle (Insect)</b></p> <ul style="list-style-type: none"> <li>Two types: black and the varied carpet beetle.</li> <li>Grubs known as 'woolly' are responsible for the damage.</li> <li>Attack woollen carpets.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Damage to woollen and wool-mix carpets.</li> <li>2. Can sometimes be seen amongst carpet fibres or underneath carpets.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Vacuum carpets regularly.</li> <li>2. Specialised cleaning may be required.</li> <li>3. If infestation occurs treat as for moths.</li> </ol>
<p><b>Bed Bugs (Insect - parasitic).</b></p> <ul style="list-style-type: none"> <li>Very small beetles of various species which can be up to 0.5cm long.</li> <li>They feed on the blood of humans and animals, causing severe irritation.</li> <li>Can be introduced via second-hand furniture, bedding, clothing etc.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Wounds on the skin are similar to those inflicted by fleas.</li> <li>2. Itchiness and general skin irritation.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Infestation may be dealt with as for fleas.</li> </ol>
<p><b>Lice (Insect - parasitic)</b></p> <ul style="list-style-type: none"> <li>Human head lice are the most common form encountered and live on the hair of host.</li> <li>Head lice do not discriminate amongst hosts. Clean people are just as likely to become infested as dirty people are.</li> <li>Crab lice infest the bodily or pubic hair of unclean people.</li> <li>They attach themselves to the skin and suck blood.</li> <li>They lay their eggs (nits) on individual strands of hair.</li> <li>All lice can be easily transmitted from host to host through physical contact. Unlike fleas they cannot jump from host to host.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Both forms of lice and their eggs can be seen by the naked eye.</li> <li>2. Areas underneath hair will become extremely itchy and irritable.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Avoid contact with infested individuals.</li> <li>2. Routinely inspect children for head lice and nits.</li> <li>3. Infestations can be treated with specialist shampoos.</li> <li>4. If a child is infested treat immediately and inform his/her school.</li> </ol>

# Pest Infestation Characteristics and Control Measures

## Appendix II

Description & Characteristics	Evidence of Infestation and Control
<p><b>Ants (Insect)</b></p> <ul style="list-style-type: none"> <li>Two varieties of ants occur in buildings: Garden ants and Pharaohs’ ants.</li> <li>Garden ants nest outdoors but seek food indoors. They are not known to be a significant health hazard but are a nuisance in food areas.</li> <li>Pharaohs’ ants nest in warm buildings and can carry organisms that cause disease. They are a health hazard in hospitals, moving from soiled dressings to contaminate sterile dressings or food. They are known to carry <i>Pseudomonas</i> spores and <i>E. Coli</i>.</li> <li>They prefer moist, sweet and sticky foods.</li> </ul>	<p><b>Evidence of Infection</b></p> <ol style="list-style-type: none"> <li>1. They are untroubled by human presence and are easily spotted around food storage areas.</li> <li>2. Disturbance of foodstuffs.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Maintain high levels of cleanliness, especially in food storage areas.</li> <li>2. Dispose of food waste correctly and regularly and avoid crumbs or spills.</li> <li>3. Ensure all food containers are sealed at all times.</li> <li>4. Fill in any cracks and crevices in walls and floors.</li> <li>5. If infestation occurs, treat nests of Garden ants with boiling water, melathion, paraffin or lindane.</li> <li>6. If infestation of Pharaoh’s ants occurs, there will be many nests that need to be treated systematically. Treatment should start beyond the infested area. Bands of insecticide should be applied at the junction of the wall and floor, around pipes and exits, sinks, air vents, cracks, sills and on the underside of cupboard shelves.</li> <li>7. Lacquers containing dieldrin or sprays containing chlordane are suitable. An alternative control method is the use of poison bait e.g. chlordecone mixed with an attractive base such as liver.</li> </ol>
<p><b>Woodworm (Insect - larvae)</b></p> <ul style="list-style-type: none"> <li>The term woodworm refers to the larvae of several species of wood boring beetles (pictured)</li> <li>The adult lays eggs on the rough surface of unpolished wood and in the cracks of woodwork.</li> <li>The grubs that hatch out bore into the timber. There is no sign of entry as the grubs tunnel inside the wood.</li> <li>When ready to pupate (usually after 1-3 years), larvae make a pupal chamber just below the surface of the wood.</li> <li>The adult beetle bites its way out, leaving characteristic “flight holes”.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Piles of wood dust on horizontal surfaces indicate grub activity.</li> <li>2. Close examination of the surface will reveal flight holes.</li> <li>3. Large infestations will create extensive areas of damage to all infested wood.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Regularly polish all wooden surfaces.</li> <li>2. Check for and make good any cracks in the woodwork.</li> <li>3. Carefully select all timber to be used in the building.</li> <li>4. A mild infestation can be dealt with by using a specialist treatment e.g. Cuprinol. It is necessary to thoroughly treat not only the area where holes are visible, but also the adjacent timbers.</li> <li>5. Specialist advice is essential for major infestations.</li> </ol>

# Pest Infestation Characteristics and Control Measures

## Appendix II

Description & Characteristics	Evidence of Infestation and Control
<p><b>Rats (Rodent)</b></p> <ul style="list-style-type: none"> <li>Rats are gregarious and determined pests that will quickly infest buildings.</li> <li>They live and breed in warm, dark corners with plentiful and easily accessible food and little disturbance.</li> <li>They are sensitive to light and are more active at night.</li> <li>They will cut through walls, floors and burrow and eat their way through sacks, bins and packets of food.</li> <li>They contaminate food with droppings that contain harmful bacteria.</li> <li>Rats also carry harmful bacteria on their fur and feet and so transfer them to any surface they travel across.</li> <li>Rats carry bacteria responsible for food poisoning, dysentery and plague.</li> <li>They also transmit fleas to buildings.</li> <li>They are creatures of habit and will use familiar runs.</li> <li>Rats breed prolifically.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Gnawing marks on furniture, skirting boards, doors etc.</li> <li>2. Droppings.</li> <li>3. Feet marks on surfaces and through damaged foodstuffs.</li> <li>4. Damage to food containers.</li> <li>5. A foul smell is produced when a carcass decomposes underneath floorboards or wall cavities.</li> <li>6. A scratching noise indicates rat activity, especially at night.</li> <li>7. They are distinguishable from rats due to their naked feet.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. As for cockroaches.</li> <li>2. Infestation may be dealt with by trapping, gassing or poisoning.</li> <li>3. Poisoning is usually the most effective, if carried out methodically due to their inability to vomit. Warfarin treated grain is suitable bait. This is an anti-coagulant and repeated doses usually result in death after 8-10 days.</li> <li>4. Pest Control Officers should always deal with infestations.</li> </ol>
<p><b>Mice (Rodent)</b></p> <ul style="list-style-type: none"> <li>As for rats, infestation is usually on a lesser extent, but mice are less predictable in their habits. Individual traps may be useful but large scale poisoning can be difficult.</li> <li>Mice are less determined than rats and tend not to infest in colonies as with rats.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. As with rats.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. As with rats.</li> <li>2. Pet cats will keep down numbers and deter infestation.</li> </ol>
<p><b>Feral Cats</b></p> <ul style="list-style-type: none"> <li>Infest outside areas of buildings, discarded buildings, rubbish tips and industrial premises.</li> <li>They carry fleas and are generally less clean than domestic cats.</li> <li>They are intelligent and will enter buildings in search of food.</li> <li>They will disturb refuse sacks in search of food.</li> <li>They will only stay in areas where there is a plentiful supply of food.</li> <li>They are extremely aggressive and will bite and scratch if they are threatened.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Untroubled by the presence of humans and make no attempt to hide.</li> <li>2. Disturbance of food waste and refuse sacks.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Colonies should be reported to the RSPCA who will be able to assist in their removal. They cannot be destroyed or culled.</li> <li>2. Avoid feeding and store all waste securely and dispose of regularly.</li> </ol>

# Pest Infestation Characteristics and Control Measures

## Appendix II

Description & Characteristics	Evidence of Infestation and Control
<p><b>Feral Pigeons</b></p> <ul style="list-style-type: none"> <li>The excreta of pigeons presents a hazard as a result of:</li> <li>The dust produced as it dries out and is blown into buildings.</li> <li>Droppings may contaminate food with organisms of the Salmonella group and other pathogens.</li> <li>It is unsightly and extremely unpleasant.</li> <li>A dust covering their feathers can cause a disease called Pigeon Fanciers Lung that is similar to Tuberculosis.</li> </ul>	<p><b>Evidence of Infestation</b></p> <ol style="list-style-type: none"> <li>1. Droppings.</li> <li>2. As they roost at height, they are generally untroubled by human activity and can be easily seen.</li> <li>3. When roosting in lofts or inside roofs they can be heard quite clearly. They can also be seen entering and exiting roof space through holes in the roof or walls.</li> </ol> <p><b>Control</b></p> <ol style="list-style-type: none"> <li>1. Screens, e.g. netting on windows help to deter roosting.</li> <li>2. They can be trapped using stupefying agents and culled or released as required.</li> <li>3. Tactile repellents applied or fixed to roosting sites. These include pliable substances that give birds a sense of unsure footing.</li> <li>4. Avoid feeding.</li> <li>5. Birds of prey can be used inside buildings.</li> </ol>

## Home - made Pest Control Solutions

### Appendix III

Helpful predators around the home include frogs, spiders, ladybugs, praying mantis, and dragonflies. Keeping these beneficial creatures around can help you reduce pest populations.

### Ants

#### **Vinegar.**

Wash countertops, cabinets, and floor with equal parts vinegar and water to deter ant infestations.

#### **Flour and Borax.**

Mix 1 cup flour and 2 cups borax in a quart jar. Punch holes in the jar lid. Sprinkle the contents around the house foundation. Keep borax out of the reach of children and pets.

#### **Bonemeal or powdered charcoal or lemon.**

Set up barriers where ants are entering. They will generally not cross lines of bonemeal or powdered charcoal. If you can find a hole where ants are entering the house, squeeze the juice of a lemon in the hole or crack. Then slice up the lemon and put the peeling all around the entrance.

#### **Pennyroyal, Spearmint, Southernwood, and Tansy.**

Growing these plants around the border of your home will deter ants and the aphids they carry.

### Fleas

#### **Vacuum.**

Vacuum, remove the vacuum bag, seal it, and dispose of it immediately outside your home.

#### **Vinegar.**

A ratio of 1 teaspoon vinegar to 1 pint of water (per 40 pounds of pet weight) in their drinking water helps to keep your pets free of fleas and ticks.

#### **Fennel, Rosemary, Red Cedar Shavings, Eucalyptus, or Pennyroyal.**

Spread leaves or shavings of these plants under and around the pet's bed.

## Flies

### Appendix III

#### **Prevention:**

Keep waste bags containing food tightly closed. Sprinkle dry soap or borax into rubbish after they've been washed and allowed to dry; it acts as a repellent.

#### **Orange.**

Scratch the skin of an orange and leave it out; the citrus acts as a repellent.

#### **Cloves.**

Hang clusters of cloves to repel flies.

#### **Mint or Basil.**

Mint planted around the home repels flies. A pot of basil set on the windowsill or table helps to repel fleas. Keep basil well-watered from the bottom so that it produces a stronger scent. Dried ground leaves left in small bowls or hung in muslin bags are also effective.

#### **Sugar and Corn Syrup.**

Make your own fly paper by boiling sugar, corn syrup, and water together. Place mixture onto brown paper and hang or set out.

#### **Mashed potato powder or pellets.**

Place instant mashed potato powder or pellets in strategic places with a dish of water close by. After eating the powder or pellets, mice will need water. This causes fatal bloating.

#### **Castor Oil and Liquid Detergent.**

Whip together 1 tablespoon of castor oil and 2 tablespoons liquid detergent in a blender until the mixture is like shaving cream. Add 6 tablespoons water and whip again. Keep this mixture out of the reach of your children and pets. Take a garden sprinkling can and fill with warm water. Add 2 tablespoons of the oil mixture and stir. Sprinkle immediately over the areas of greatest mole infestation. For best results, apply after a rain or thorough watering. If moles are drawn to your lawn because of the grubs feeding in the soil, you

may be able to rid yourself of both pests by spreading milky spore disease to kill the grubs.

#### **Prevention.**

Eliminate pools of stagnant water. Avoid wearing perfume, bright colours, flowery prints, and bright jewellery as these items attract mosquitoes.

#### **Citronella.**

Burn citronella candles to repel insects. Tansy or Basil. Plant tansy or basil around the patio and house to repel mosquitoes.

If you can see moths, these aren't the ones to worry about. Moths that cause damage to clothes are too small to notice. It is the larvae of these moths that eat fabric.

#### **Prevention.**

Store items in a clean condition; moth larvae especially like areas soiled with food stains.

#### **Rosemary, Mint, Thyme, Cloves, and Ginseng (optional).**

Mix together rosemary, lb mint, lb thyme, ginseng (optional), and 2 tablespoons of cloves. Put in cheesecloth bags and place in cupboards, wardrobes or drawers.

#### **Dried Lavender or Rosemary and Mint.**

Make sachets of dried lavender or equal portions of rosemary and mint. Place in cupboards, wardrobes and drawers to mothproof garments.

#### **Rosemary, Sage, Mint, Dried Lemon Peel, and Cinnamon.**

Mix handfuls of first three ingredients. Add a little lemon peel and a pinch of cinnamon. Place in muslin bags.

### **Molasses, Vinegar, and Yellow Container.**

To trap moths, mix 1 spoon molasses with 2 spoons vinegar and place in a yellow container to attract moths. Clean regularly.

### **Clothes Dryer.**

Kill moth eggs by running garment through a warm dryer.

### **Prevention.**

- Close off all gaps around pipes and electric lines where they enter the house by using cement or screening.
- Caulk small cracks along baseboards, walls, cupboards, and around pipes, sinks, and bathtub fixtures.
- Seal food tightly.
- Rinse food off dishes that are left overnight.
- Do not leave pet food out overnight.

## Cockroaches

### **Flour, Cocoa Powder, and Borax.**

Mix together 2 tablespoons flour, 4 tablespoons borax, and 1 tablespoon cocoa. Set the mixture out in dishes. CAUTION: Borax is toxic if eaten. Keep out of reach of children and pets.

### **Borax and Flour.**

Mix 1/2 cup borax and 1/4 cup flour and fill a glass jar. Punch small holes in jar lid. Sprinkle powder along baseboards and doorsills.

Caution: Borax is toxic if eaten.

This recipe may not be for you if there are young children or pets in the house.

### **Oatmeal, Flour, and Plaster of Paris.**

Mix equal amounts and set in dishes. Keep out of reach of children and pets.

## Slugs and Snails

### **Flour, Cocoa Powder, and Borax.**

Mix equal amounts and spread around infested area.

### **Clay Pots.**

Place overturned clay flower pots near the shady side of a plant. Rest one edge on a small twig or make sure that the ground is irregular enough for the slugs and snails to crawl under the rim. They will collect there during the warmest part of the day. Remove slugs and snails regularly and drop in a bucket of soapy water.

### **Sand, Lime or Ashes.**

Snails avoid protective borders of sand, lime or ashes.

### **Tin Can.**

Protect young plants by encircling them with a tin can with both ends removed. Push the bottom end of the can into the soil.