

How pesticides enter our bodies?

Pesticides are designed to kill pest. However, it can also pose serious impact on human health if mishandled. There are three common ways that pesticides may enter our bodies: by mouth (oral), through the skin (dermal) or through the lungs (inhalation). It may result in different effects or severity depending on the length and route of exposure, the type, amount, concentration and formulation of pesticides involved, and the age and health condition of the exposed person.

Inhalation

When pesticides are inhaled, they will enter the blood through the throat, nasal passage and lungs. The blood with pesticides is then pumped to the heart where it then circulates throughout the whole body. Aerosols, dusts, mists, smokes and ultra-low-volume particles are common formulations that offer the most hazardous poisoning through respiratory exposure as they are small enough to enter the thin lung tissues directly.

Oral

Exposure to pesticides mainly occurs through smoking, drinking water and eating food contaminated with pesticides. The most tragic accidental poisoning of pesticide is caused by storing pesticides in drink or food containers. While ingestion is a less common way to be exposed, it can result in the most severe poisonings.

Dermal

Contamination of the body by absorption through the skin is the most common route amongst all. All pesticides can penetrate through damaged skin and some pesticides can also penetrate easily through intact skin. Besides, certain areas of our bodies are more sensitive to pesticide penetration like eyes and genital areas. Once the pesticides are absorbed through skin, they can enter the blood stream and then carried to the whole body.

The degree of dermal absorption depends on the pesticide formulation. Oil soluble pesticides enter the skin more readily than those that are water soluble, while liquid formulations usually penetrate skin faster than dusts, wettable powders and granular pesticides.

Symptoms of pesticide poisoning

The presence and severity of symptoms is usually proportional to the amount of pesticide entered your body. Symptoms of mild poisoning include eyes / nose / throat irritation, skin rash, dizziness, thirst, nausea, sweating and headache. Severe symptoms which might due to higher level of pesticide exposure include vomiting, blurred vision, rapid pulse, breathlessness, chemical burns on skin and unconsciousness.

How to minimize your risk of exposure?

1. Select pesticides that have been registered in Hong Kong and are clearly labelled in accordance with the law.
2. Read and follow the instructions on the pesticide label.
3. Wash hands, face and clothing after pesticide application.
4. Use appropriate personal protective equipment (PPE) as stated in the pesticide label like gloves, face shield, protective clothing, rubber boots, etc.
5. Clean and maintain the PPE in good condition.
6. Maintain good personal hygiene when handling pesticide.
7. Wash the contaminated body parts immediately with plenty of water.
8. Store pesticide properly, especially away from children.



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Urban Pests and Environmental Problems

Occurrence of pests in urban area is a headache to many people. The unwanted organisms that live close to human inhabitations are termed as urban pests. Mosquitoes, rodents, cockroaches and flies are common examples of urban pests. Using chemical to kill those pests is sometimes the first method people come up with when facing pest problems. However, it is a general misconception that pesticides are a magic bullet and can solve the complex pest infestations easily.

It is true that some types of pesticides can offer a quick knockdown effect on certain pests. Those formulated products are often tailor-made to kill insect pests or rodents in a short time. However, there are several drawbacks for using chemicals to kill pests, for example, the costs and labor on pesticide application, concerns about the residual effect of chemical pesticides in the environment and the risk of development of pesticides resistance in those pests. Most importantly, application of chemicals can never address the root causes of pest problems.

Like all living organisms, pests need food and space to survive. For example, some common urban pests like rodents, cockroaches and flies feed on the improperly disposed food waste to survive. Easily accessible food in urban environment favors their survival. Apart from food, pests also need places to live and breed. Rodents and cockroaches prefer nesting in dark places that are warm and moist. Rodents also breed and rear their young in the nesting sites. For example, House mouse (*Mus domesticus*) can use the gap under discarded furniture as a nesting site. For mosquito, standing water bodies are their breeding sites. For example, *Aedes albopictus* lay eggs near tiny water bodies and their immatures (the mosquito larvae) will live inside that small pool of water after hatching. In short, it is the presence of food sources and harborage sites inside urban area which enable those pests to survive

near us. Once those pests colonize a favorable area, their populations can increase drastically within a short period of time.

The effect of chemical pesticides is always temporarily and requires frequent re-application. To have a long lasting control of pest problems, we should target at their food sources, shelters and breeding places. After knowing the locations of those places, we have to modify the environment so as to make the infested places less attractive for the pests to live in. For example, properly storing all food items and dispose refuse inside covered refuse collection bins will greatly reduce the amount of food for rodents, cockroaches and flies. It will be tougher for those pests to survive. Starved urban pests may die or be forced to leave the environment if food sources are not easily available. Apart from that, without a shelter or breeding places, those pests also will not stay in an area for long.

When facing pest problems, instead of mistakenly relying too much on chemical pesticides, we should find out the sources of pests in the environment. It may take some time to modify the environment so as to make it less suitable for the pests to survive. However, environmental controls are the ultimate and long-term solutions. Modern pest control does not solely rely on chemical pesticides, but integrating different approaches with the use of pesticides as the last resort (also known as Integrated Pest Management). Proper management of the environment and maintenance of good hygienic conditions are more effective than applying pesticides. Keeping environment clean and tidy can make an environment unfavorable to the pests. Only by targeting the roots of pest problems (i.e. environmental problems) can the pest problems be improved.

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