

# MIRACLE Academy

سموم  
زميلتكم نهى حسن



لجان الرفعات

قال تعالى (يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ)

# Pesticide Toxicity



# Definition of Pesticide

هي الأشياء القاتله ل

- ✓ **Pest** = unwanted creature or living,
  - ✓ **Cide** = killing or elimination.
  - ✓ Any substance or mixture of substances deliberately added to the environment and intended for **preventing, destroying, repelling, or mitigating pests**
  - ✓ Pesticides may be more specifically identified **insecticides** (insects), **herbicides** (weeds), **fungicides** (fungi and molds), **rodenticides** (rodents), **acaricides** (mites), **molluscides** (snails and other mollusks), **miticides** (mites), **larvicides** (larvae), and **pediculocides** (lice)
- القراد
- قوارض
- تبع الحلزونات
- تبع القمل
- تبع اليراقات

# Use of pesticides

- ✓ Pesticides are often, if not always, used as multi-agent formulations, in which the active ingredient is present together with other ingredients to allow mixing, dilution, application, and stability...."inert" or "other" (e.g., formaldehyde, sulfuric acid, benzene, toluene, other organic solvents )

هسا بكون عنا الماده الفعاله  
ومعها مواد ثانيه وممكن  
تكون على شكل powder  
كيف بحلهم  
عن طريق ادوبهم بماده  
سامه اسمهم inert  
من الامثله عليهم هيه  
باللون الازرق

Active Ingredient:	
Abamectin (CAS No. 65195-56-4 and 65195-55-3) .....	1.9%*
Other Ingredients:	98.1%
Total:	100.0%
*1 gal. contains 0.15 lb. abamectin	
EPA Reg. No. 100-897	
EPA Est. 39578-TX-001	
NCP 897A-L1A 1297	

# “Others”

- ✓ “Others”: Though they do not have pesticidal action, such **inert ingredients** may not always be devoid of toxicity, thus, an ongoing task of manufacturers and regulatory agencies is to assure that inert ingredients do not pose any unreasonable risk of adverse health effects

هسا هاي inert تاثير هم كثير  
سام علينا لذلك استخدامهم  
محدود بس للاخصائيين

# US Pesticide Use

- 4.5 billion pounds chemicals per year
  - 890 active ingredients, 30,000 formulations
  - Uses
    - 75% agricultural
    - 25% home, garden

75% منهم للحدائق او  
المزارع  
25% منهم اشي يكون عند  
البيت وحواليه





ممکن يكون الواحد معرض لتسمم  
منهم حتى وهو مش قاصد كيف عن  
طريق لمس مكان كان مرشوش فيه  
او او اجا على جلده او حتى تنفسه

# Exposure

- ✓ Exposure to pesticides can occur via the oral or dermal routes or by inhalation
- ✓ High oral doses, leading to severe poisoning and death, are achieved as a result of pesticide ingestion for suicidal intent, or of accidental ingestion, commonly due to storage of pesticides in improper containers

يا بيكون ناويه ينتحر المحترم او العيله لما تعمله بتحطه بدلو بدون ما يتسكر ولأنه باودر رح يتطاير ويدخل للحلق (تعرفو العصير الحلال لما نخط عليه مي كيف يتطاير نفسه) وفي ناس تحله بعلبه عصير وتخیلو الأطفال يشوفه ويشربوه يا لهوي

- ✓ Chronic low doses, on the other hand, are consumed by the general population as pesticide residues in food or as contaminants in drinking water

ممکن أكون جنب مزرعه ونرش دايمًا او جنب مجرى ماء  
عنا بالاردن مهم يسحبو المي من المياه الجوفيه الي يكون ذايب فيها هاي  
المبيدات وسلامتكم

أكثر الناس معرضين للتسمم فيهم هم  
التي يصنعونهم والتي بحلهم والتي  
برش فيهم والتي يلقط المنتج بعد

# Exposure

- ✓ **Workers involved** <sup>رشه</sup> in the production, transport, mixing and loading, and application of pesticides, as well as in harvesting of pesticide-sprayed crops, are at the highest risk for pesticide exposure

هنا صح هو ممكن ما بلعه ولكن شم كميات  
كبيرة منهم او لما لقطهم مسك كميات كبيرة

- ✓ **Dermal exposure during normal handling or application of pesticides**, or in case of accidental spillings, occurs in body areas not covered by protective clothing, such as the face or the hands, or by inhalation

وممكن اذا اجا على او اعينهم يصير العن والعن لاني  
الامتصاص رح يكون كثير

- ✓ Furthermore, pesticides deposited on **clothing may penetrate the skin** and/or potentially expose others, if clothes are not changed and washed on termination of exposure



# Human Poisoning

- ✓ Pesticides are **not always selective** for their intended target species.....adverse health effects can occur in non-target species, including humans
- ✓ Several million poisonings and a couple hundred thousand of deaths....World Health Organization (WHO) classified pesticides by hazard, where acute oral or dermal toxicities in rats were considered

Table 22–1 WHO-recommended classification of pesticides by hazard (2009).

ما جابت الدكتورہ سیرہ  
للحفظ او لا بس احفظهم  
احتمال یجو

WHO Class		LD50 for the rat (mg/kg body weight)	
		Oral	Dermal
Ia	Extremely hazardous	< 5	< 50
Ib	Highly hazardous	5–50	50–200
II	Moderately hazardous	50–2000	200–2000
III	Slightly hazardous	Over 2000	Over 2000
U	Unlikely to present acute hazard	5000 or higher	

# Diagnosis of Pesticide Toxicity

## ■ Exposure history (most important)

- Occupational and environmental history
- Duration, dose, route of potential exposure
- information about the patient's job, home use of chemicals, and proximity of residence to industrial sites, including agriculture

بدي اساله انت وين ساكن في  
جواليك مزارع اذا كان  
بمصنع بساله اكم الوقت الي  
تعرض له للمبيد وشو  
الكميات الي يحلهم وهل مسك  
المبيد  
ممکن هسا يكون بالبيت الي  
يعملو المبيد بالبيت

## ■ Symptom review

- Important to remember that symptoms may be caused by “**inert**” ingredients and therefore may not be typical of the active pesticidal ingredient in a formulation

هسا بدنا ننتبه انو ممكن  
symptom review ما تكون من  
active ingredient وانما من  
الماده السامه الي ذوبتها فيه مثل فورم الدهايد  
ممکن هالمحترم يكون بطل يشوف

## ■ Physical exam and lab findings

**Table 1** The main groups of pesticides.

Group	Subgroups	Examples
Organochlorines (OCs)		DDT Endrin Aldrin Dieldrin Endosulfan $\gamma$ -Hexachlorocyclohexane (lindane)
Anticholinesterases	Organophosphates (OPs) Carbamates	Malathion Fenitrothion Dichlorvos Diazinon Carbaryl Aldicarb
Pyrethrins and synthetic pyrethroids		Pyrethrum Permethrin Cypermethrin Flumethrin
Natural compounds, other than pyrethrins		Abamectin Ivermectin Rotenone Nicotine
Substances which interfere with systems specific to insects	Juvenile hormone analogues Chitin synthesis inhibitors Ecdysone agonists	Cyromazine Diflubenzuron Tebufenozide
Miscellaneous synthetic insecticides	Formamidine GABA <sub>A</sub> blocker	Amitraz Fipronil

هاد الجدول رح  
يتم شرحه  
بالسلايدات  
لقدام

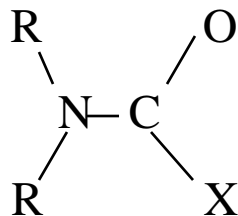
# Insecticides

- All of the chemical insecticides in use today are **neurotoxicants**, and act by poisoning the nervous systems of the target organisms
- **Cholinesterase Inhibitors**
  - Carbamates
  - Organophosphates
- **Pyrethrins & Pyrethroids**
- **Organochlorines**

# Insecticides: Cholinesterase Inhibitors

## ■ N-methyl Carbamates (carbamic acid)

- Carbaryl, Carbofuran, Aldicarb



Generic structure for N—  
methyl carbamates

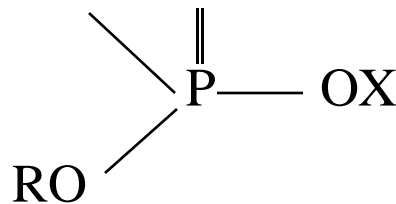
- Dermal **skin penetration** by carbamates is **increased by organic solvents and emulsifiers** present in most formulations
- Carbamates inhibit AChE **reversibly**.....susceptible to a variety of enzyme-catalyzed biotransformation reactions, (oxidation and hydrolysis)



# Insecticides: Cholinesterase Inhibitors

- Organophosphates (OPs)
  - Chlorpyrifos, Diazinon, Malathion

R هي الي تحكم عنا هاي لما ترتبط مع  
AChE رح يصير الها aging يعني  
اذا تاخرنا لنعطي antidot  
او compatative antidote  
رح تثبت وتصير , irreversible و يثبط  
AChE



- Compounds that contain a sulfur bound to the phosphorus, metabolic bioactivation is necessary for their biological activity to be manifest.....only compounds with a P=O moiety are effective inhibitors of AChE