

# Human health and Pesticides

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## Outline

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- Pesticides are important!
- Health benefits
- Health dangers
- How people are exposed
- Pesticides and the body
- Specific illnesses/injuries due to pesticides
- How to prevent and identify exposure



## Pesticides are important!

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- Pesticides are a valuable tool in modern agriculture.
- Component of Integrated Pest Management
- Many pesticides can be used safely, but like all tools, care must be taken when using.

## Health benefits

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- Bacteria killed by chlorine in drinking water
- Bacteria spread in hospitals managed by disinfectants
- Disease carrying insects repelled by insecticides

Data from: Whitford, E., Fike, D., Hanger, G., Burroughs, E., Johnson, B., and Blessing, A. The Benefits of Pesticides A Story Worth Telling. Purdue Extension, PDC-70. Purdue University.

## Health dangers

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- There are also dangers associated with pesticides. These include *acute* and *chronic* effects.
- Acute
  - Headache, nausea, skin irritation, rash, etc.
- Chronic
  - Cancer, reproductive and nervous system problems, organ damage

Data from: Whitford, E., Edwards, C. R., Neal, J. J., Martin, A. G., Osman, J., Hollingworth, B. M., and Blessing, A. Pesticides and Personal Safety. PPP-20. Purdue Pesticide Programs, Purdue University Cooperative Extension Service.

## How are people exposed to pesticides?

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- During application
- Preparing for application (mixing)
- Drift
- Consuming foods with residue
- Drinking contaminated water
- Residues brought into the home



## Pesticides and the body

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- Three routes of pesticide entrance into body:
  - Skin
    - Absorbed during contact with skin or eyes
    - Body parts absorb at different rates
  - Mouth
    - May be very serious
    - Can occur when pesticides are stored improperly
  - Lungs
    - Can enter bloodstream quickly, damage respiratory tissue
    - Powders and small droplets/mist inhaled



# Prostate cancer

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- What is prostate cancer?
- Risk factors for prostate cancer include farming.
- Risk increases for pesticide applicators by
  - 41% in commercial applicators
  - 27% in private applicators



Data from: Alwanji, M. C. B., Bati, A., Gassler, D. P., Hapala, J., and Thomas, K. Prostate Cancer and Agricultural Pesticides. *Agricultural Health Study*. 2020.

## Retinal degeneration

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- What is retinal degeneration (RD)?
- RD and fungicide application may be related
- RD and insecticide application may be related



## Parkinson's disease

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- Risk of Parkinson's disease, when a certain combination of pesticides were applied near homes in California, increased 75%.
- Younger people have higher risk when exposed.



From: Cortez, S., Cockburn, M., Bernstein, L., Zhang, H., and Shi, B. Parkinson's Disease and Residential Exposure to Malathion and Paraquat from Agricultural Applications in the Central Valley of California, 2001. *American Journal of Epidemiology*, Vol. 169, No. 8, 2009: 10-10932[pubmed] <http://ajph.aphipub.org/>. Accessed 26 March 2010.

## Thyroid disease

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- Thyroid disease increased in women married to pesticide applicators.
- Certain pesticides correlated with increased risk.



Data from: Goldner, M. S., Gendler, D. P., Yu, E., Higgins, J. A., Kriebel, E., and Lekan, T. D. Pesticide Use and Thyroid Disease Among Women in the Agricultural Health Study. 2010. *American Journal of Epidemiology*, Vol. 172, No. 4. DOI: 10.1093/aje/kwp404.  
<http://aje.aphsp.org/>. Accessed 26 March 2010.

## How to prevent exposure

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- Follow label directions
- Wear personal protective equipment
- Apply pesticides during the right environmental conditions
- Spray only when you need to



# Personal Protective Equipment

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## Pesticide exposure symptoms

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- Dependent upon pesticide, amount, and type of exposure
- Range from skin irritation, headache, and nausea to incontinence, seizures, and death
- Can be confused with other illnesses

## Conclusions

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- Pesticides are an important tool in modern agriculture.
- Consider both the *risks* and *benefits*.
- Caution must be taken when using pesticides.
- Follow the label for correct application.
- Wear personal protective equipment.
- Be safe and watch out for the safety of others!