Cholinesterase Testing Protocol Algorithm

Will the worker handle OPs or OPs and N-methyl-carbamates for 30 hours or more in 30 consecutive days?*

- **Yes**: Was there exposure within the past 30 days?
  - **Yes**: Obtain a working baseline. Take one test, then wait at least three days to take another test. Use the highest result as the working baseline.
  - **No**: Test to obtain at least one baseline.

- **No**: Stop

Is the RBC ChE or Plasma ChE greater than or equal to 80% of the baseline?

- **Yes**: Worker can return to handling OPs or OPs and N-methyl-carbamates.
  - **Yes**: Did the worker exceed or reach 30 hours of exposure within 30 days since the baseline or follow-up test?*
    - **Yes**: Within one week, conduct follow-up test, to monitor.
    - **No**: Stop. No testing required.
    - **No**: Retest** and review pesticide handling practices.

- **No**: Repeat testing at scheduled intervals*** to follow recuperation.

Remove the worker from workplace pesticide exposure.

Is the RBC ChE is less than 70%, and/or the Plasma ChE is less than 60% of the baseline?

- **Yes**: Stop. No testing required.
- **No**: Is the RBC ChE or Plasma ChE greater than or equal to 80% of the baseline?
  - **Yes**: Within one week, conduct follow-up test, to monitor.
  - **No**: Stop. No testing required.

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*This is the Washington (WA) state recommendation. California (CA) state recommends follow-up testing if worker reaches 6 days of exposure within a sliding 30-day schedule. At this time, WA and CA are the only states with formal cholinesterase monitoring programs with regard to pesticide exposure. Days of exposure are easier to track than hours of exposure.

**Retesting is strongly recommended but not mandatory.

Threshold exposure level: When the worker exceeds or reaches 30 hours of exposure in a 30-day period.

- **OPs**: Class I or Class II organophosphates.
- **RBC ChE**: Acetylcholinesterase, also known as red blood cell cholinesterase.
- **Plasma ChE**: Butyryl cholinesterase, also known as plasma cholinesterase.

NOTES:

- Obtain baseline prior to pesticide work or after 30 days of worker being exposure free.
- When testing, it is recommended to get both RBC ChE and Plasma ChE. But if only performing one test, then do Plasma ChE.
- A second baseline is recommended for improved precision but not essential.
- N-methyl carbamates do inhibit cholinesterase but the cholinesterase reactivates quickly, making testing unreliable in predicating overexposure.

***Days to repeat test:

- For RBC ChE: (% depression - 20) / 0.83 = number of days to repeat test.
- For Plasma ChE: (% depression - 20) / 1.2 = number of days to repeat test.

*Testing weekly is also acceptable.*

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