Appendix B: LABORATORY-BASED REPORTING OF CHOLINESTERASE TESTING

1. Structure of California's Medical Supervision Program

The Program's goals are to monitor agricultural pesticide handlers through periodic measurements of their red blood cell (RBC) and plasma ChE activity, and to identify and prevent exposure resulting in illness/injury of employees who regularly handle OPs/CBs more than six days in a 30-day period.

The Program requires an employer to contract a licensed physician to act as a medical supervisor (Figure B1a (1)). Employers are required to provide the local County Agricultural Commissioner's office with a copy of this contract (Figure B1a (2)). A medical supervisor monitors the ChE activity levels of handlers to ensure their safety. The Program also requires that a medical supervisor possess a copy of, and be aware of, the contents of the *Guidelines for Physicians*. The medical supervisor must also order tests for baseline levels of RBC and plasma ChE performed by a laboratory (Figure B1a (3)). Testing should be conducted before a worker begins handling OPs/CBs. Routine monitoring of RBC and plasma ChE levels of the workers who regularly handle OPs/CBs are required. The medical supervisor compares the routine monitoring test results to the baseline levels to evaluate ChE depression and makes recommendations, based on these results, to the employer. These recommendations may include allowing a worker to continue working with OPs/CBs, re-evaluation of work place practices, or temporarily removing the worker from handling such pesticides.

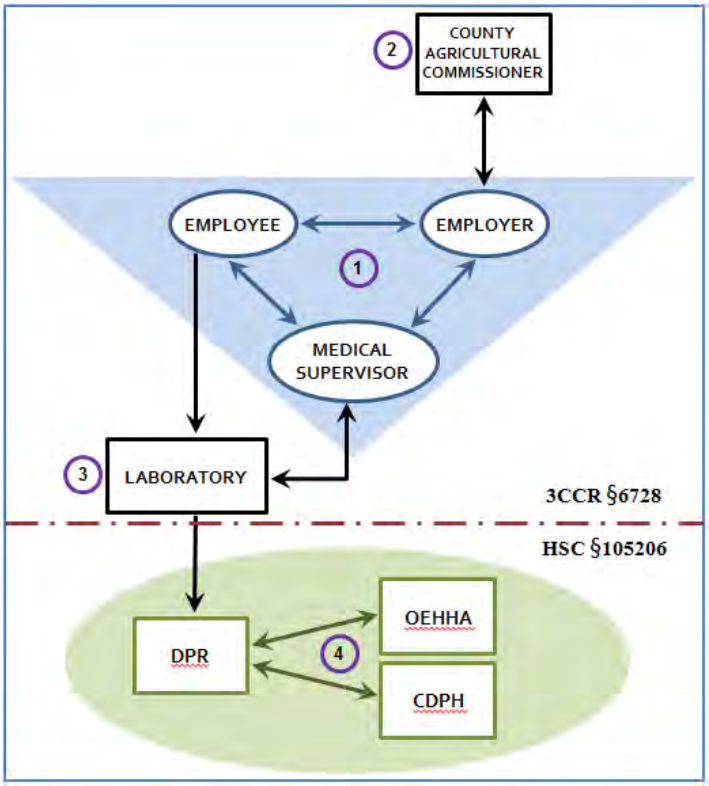

Figure B1a: *Framework of the Medical Supervision Program.*

The Guidelines for Physicians who supervise workers exposed to cholinesterase-inhibiting pesticides (http://www.oehha.ca.gov/pesticides/pdf/docguide2015.pdf).

The *Guidelines for Physicians* specifies recommendations on baseline ChE level calculation, frequency of tests, and interpretation of the test results.

Calculation of the baseline – The baseline is calculated by averaging two tests collected at least 72 hours and less than 14 days apart when a worker has not handled OPs/CBs for at least 30 days. Baselines are required to be verified at least once every two years. If two baseline

tests differ by more than 15%, a third test should be performed and the average of the two closest results should be used as an estimate of baseline ChE level.

Routine monitoring – Routine testing is required of handlers who work with OPs/CBs for more than six days in any 30-day period, beginning with the first day of handling. For additional requirements for periodic testing see Figure B1b.

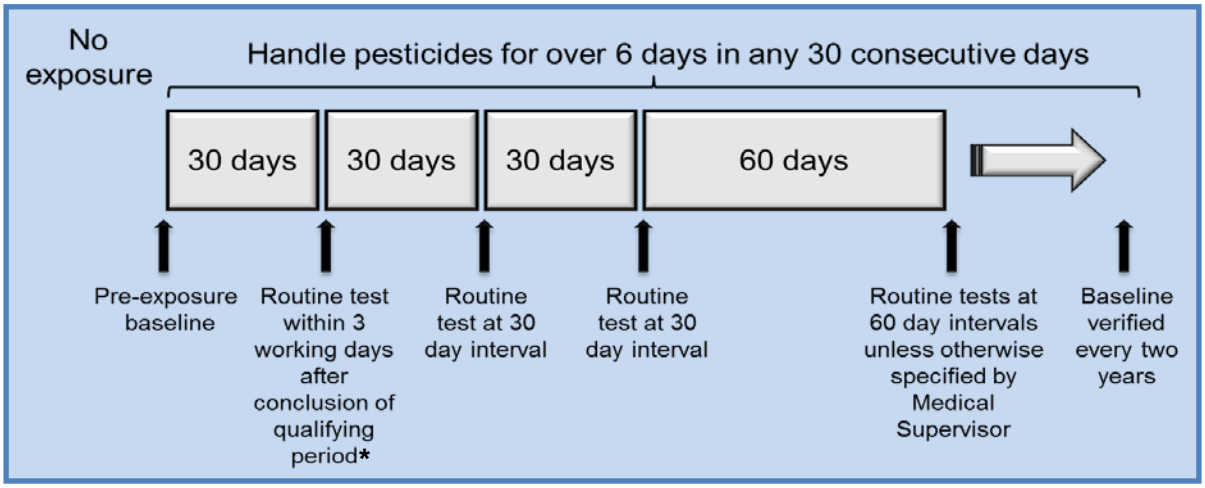

Figure B1b: *Summary diagram on the frequency of ChE activity testing.*
** –Qualifying period: The 30 consecutive day period during employees handle OPs/CBs for more than six days.*

Interpretation of the test results – To assess the degree of RBC and plasma ChE depression, the medical supervisor should calculate the percent change of periodic test results from baseline values. An 80% decline from baseline of either RBC or plasma ChE indicates a need for an investigation of workplace practices (e.g., safety protocols, potential sources of exposure), as well as prompt retesting of the worker. If a worker's ChE value is below 70% of RBC baseline or below 60% of plasma baseline, he/she must be removed from further exposure. The *Guidelines for Physicians* specifies repeated testing until ChE levels return to 80% or greater of baseline.