The LRNC: Evolution of a Laboratory Network

APHL 2019, 6/5/2019

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Network Infancy

- Tokyo Subway Sarin Attack, 1995
- CDC initiates testing for chemical agent exposure, 1995
- CDC funding for state labs, 1999
- 4 states awarded support for exposure testing: CA, MI, NY, VA
- NM added in 2000
The Adolescent Years

- 2003, support for Focus Area D
  - All 50 states, minimum packaging & shipment capability

- 50 State Meeting
  - Gaps identified, 46 recommendations

- Exposure testing initiated in additional states
  - Cyanide 2004
  - Urine trace elements 2005 (12 element panel)
Growing Up: Network Expansion

- Focus area D evolves to the LRNC, Level 1, 2, & 3
- 10 L1, 34 L2, 53 total
- 5 addt’l L1 labs added 2006
- Capability steadily expands
- Ever heard of _________?
- 2010 vesicant exposure
- Regular Exercises,
  - ER, surge, COOP, full-scale
  - Fiendish aspects
- Greatly improved resources for all PH/env. work
Evolutionary Changes

• Dual use
  • Enhanced MANY other analyses
• Lab Flexibility for instrument choices
• L1 redundant instrumentation
• Method innovation
  • Great improvements, interlab collegiality
• CLIA certification
  • Many labs established in environmental labs
  • Acknowledged diagnostic use
The LRNC in Action: Fake Dope and Rat Poison

- March 2018: reports of unexplained bleeding
- Linked to synthetic cannabinoid use
- Brodifacoum exposure discovered
- >320 cases, 11 states, 8 fatalities
- Exposure testing limited to 1 lab in U.S.
  - qualitative only, limited sensitivity
Fake Dope and Rat Poison, cont’

- Clinical quantitative test method established
  - First method with CLIA validation
  - $^{13}\text{C}_6$ labeled brodifacoum & support provided by CDC
  - ~135 patient samples tested, 96 patients
  - New data obtained on brodifacoum elimination rate
  - Influenced treatment decisions
  - LRNC resources employed throughout
Looking Ahead

- Shift towards blood, protein adducts
- LIMSi project
- Individualized testing menus??
- Opioids and the LRN
- Non-targeted screening
- Maintaining capability
- New and emergent threats

Thank You!