

# *Fentanyl-Laced Heroin*

Overview from the Philadelphia MEO  
Toxicology Laboratory

Bill Wingert, Ph.D.  
Chief Toxicologist



EMERGENCY READINESS | EMPLOYEE NOTICES/OFFERS | APPLICATIONS | Web links go to:



Wednesday, March 2nd 8:24:47 AM

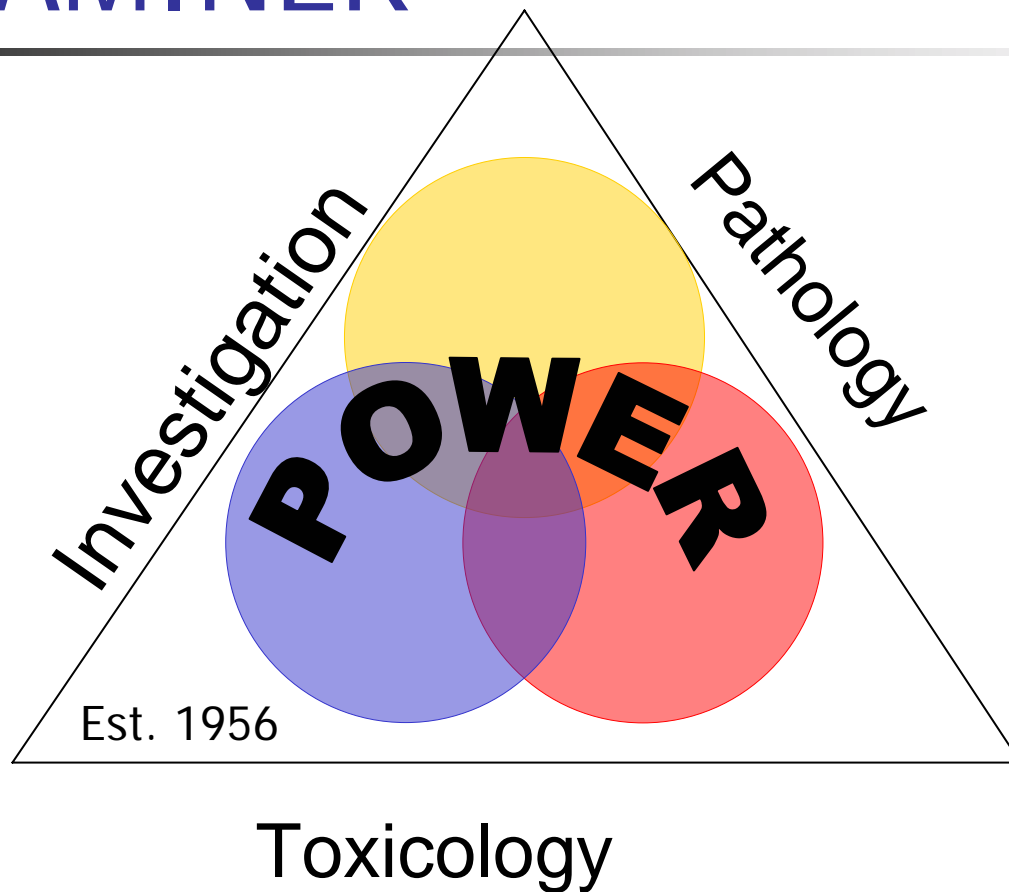
# Department of Public Health

For more information, please visit the [Health Department's Intranet Site](#).

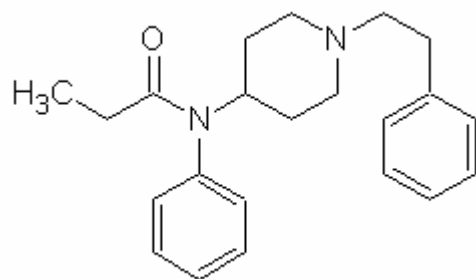
## Mission

The mission of the City of Philadelphia Department of Public Health (PDPH) is short and simple: to protect the public's health.

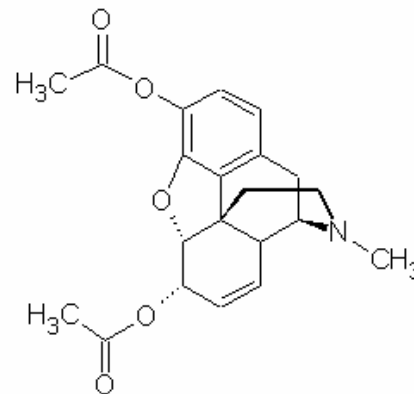
# OFFICE OF THE MEDICAL EXAMINER



# Our common scenario



+



=



# When did we become aware of problem?



---

- We first became aware of problem around 3<sup>rd</sup> week in April
- May have taken about a week or so after date of death before we recognized it
- Reason for delay should be apparent when we talk about the type of testing that was done



# Numbers numbers numbers!!

---

- **Since mid-April** we have seen **more than 70 (74)** confirmed deaths that are due to illicit fentanyl
- This does not include case where fentanyl was present but was incidental to death such as cases when prescribed use for pain or homicides/suicides etc.
- There are **still about 40** more cases still being tested that are positive for fentanyl by preliminary screen but have not been confirmed and reported. **THE VAST MAJORITY OF THESE WILL BE CONFIRMED AS DRUG DEATHS DUE TO ILLICIT FENTANYL**
- We are predicting **more than 100 deaths**

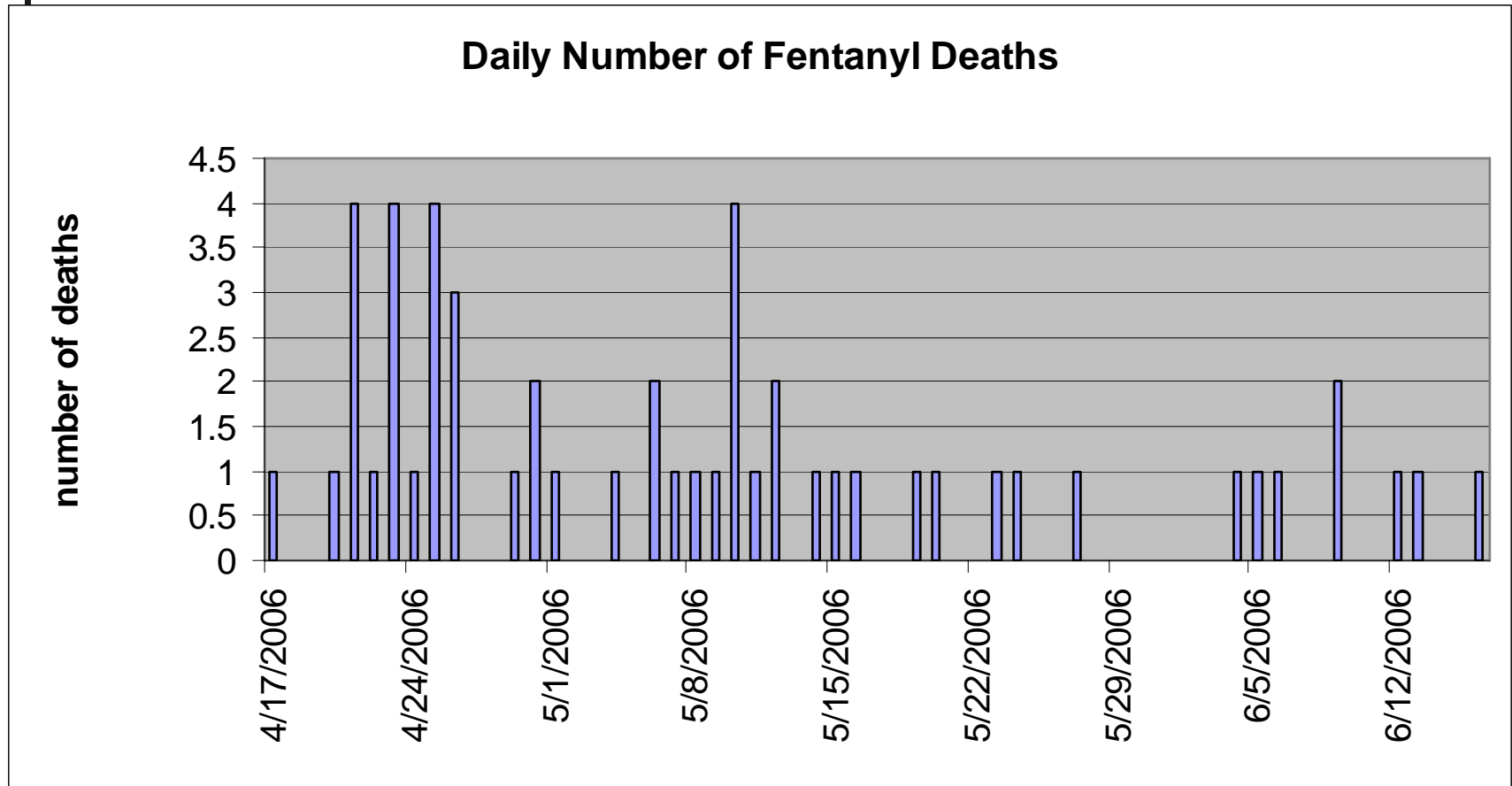


# Total Monthly Drug Deaths at Philly MEO- More numbers

---

- January 2006—30
- February 2006---31
- March 2006 ---34
- April 2006---61
- May 2006—41 (so far)

# Daily Numbers- 4/17 thru 6/12





# Testing for fentanyl at Philly MEO



---

- Who does **not** get routinely tested: Children 12 and younger and the elderly 70 and older
- Everyone else is tested in our lab by:
  1. Gas chromatograph/mass spectrometry (GC/MS) on either urine (preferred) or blood for broad range of drugs including fentanyl
  2. Immunoassay screen for fentanyl for all suspected drug cases. We use specific method ELISA

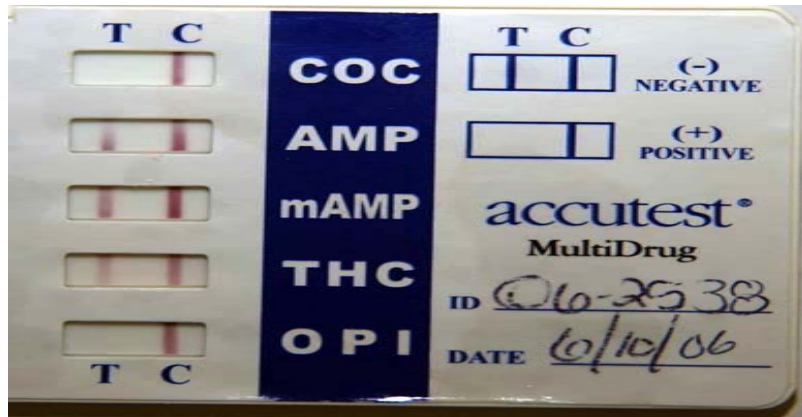


# Notes concerning our testing

---

- Cocaine and opiates are often screened by triage during autopsy but our triage testing does **not** include fentanyl
- GC/MS is the gold standard for forensic drug testing very sensitive and specific.. We do not report fentanyl) without confirmation by GC/MS. NO FALSE POSITIVES
- ELISA immunoassay is also very sensitive but there is possibility of cross reactivity with other substances (false + possible)

# Prelim screening & final confirmation methods





# Quantifying fentanyl

---

- Fentanyl positive by initial GC/MS broad screen or ELISA immunoassay are quantified in blood (rarely tissue) by a GC/MS method specific for fentanyl
- Limit of quantitation (lowest standard used in assay) is ~ 1 ng/mL
- Upper end of assay where linearity of method lost ~ 60 ng/mL. Values reported as “greater than”
- Fentanyl positives found only in urine by GC/MS are reported but not quantified



# Illicit Fentanyl Case Results

---

- Blood concentrations range from 5.1 ng/mL to > 60 ng/mL (we do not quantify above this highest standard concentration)
- Typical fentanyl = 20 – 30 ng/mL
- Case where fentanyl = 5.1 ng/mL was also + for cocaine, codeine, morphine oxycodone, promethazine and enalapril
- 69 males and 5 females
- Ages 20 to 64 with mean = 38.5 years



# These drug users are using multiple drugs

---

- 74 total fentanyl related deaths so far
- Morphine detected in 57 (77%)—NOT FROM PRESCRIPTIONS!
- 6-acetyl morphine (definitive marker for heroin) detected in 28 (49% of morphine +s)
- Cocaine or metabolite detected in 45 (61%)
- Methadone detected in 13 (18%)
- Benzodiazepines detected in 20 (27%)
- Ethanol detected in 12 (16%)
- PCP detected in 7 (9%)
- Antidepressants such as sertraline and mirtazapine seen occasionally



# Lab Turnaround Time (in defense of)

---

- Depends on # drugs found and how the analyses are scheduled.
- Initial ELISA and GC/MS screening are done quickly (7-10 days) but additional quantifying of various drugs takes longer
- Typically on these fentanyl cases turnaround has been 4-5 weeks (some longer)



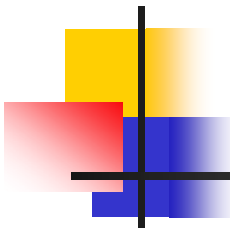
# Other findings

---

- A few cases have significant fentanyl blood concentrations but fentanyl was not detected in urine (quick death?). Don't have a count because the lab did not receive urine in some of the cases.
- A few cases have fentanyl positive in urine but negative in blood (decedent died from other drug(s) but earlier ingested fentanyl?). 2 cases seen.



# Potential problems with our testing— Could we be missing some of the fentanyl?



---

- Both the GC/MS and ELISA immunoassay testing are very sensitive and should pickup the typical overdoses seen
- Potential problem is with unsuspected drug deaths such as known disease states or homicides/suicides where fentanyl concentration is low and GC/MS does not detect fentanyl. ELISA testing would not be assigned.
- This is probably very rare. Our tests are sensitive and the case investigation provides substantial evidence of drug use so ELISA testing would then be assigned.



# Markings on packet evidence

---

- Note: we do not routinely test evidence
- Markings include: FE FE, White Powder, Rolex, Timberland 2006, D-Boy, New York, Sky High, One Way, Rest in Peace, New Life, Teflon, Sailboat 2, Super Buick, Q-45, Makeum Sweat, Pathmark, White House, Killer, A1, Mortal
- Note: These markings may not all be fentanyl-laced heroin packets

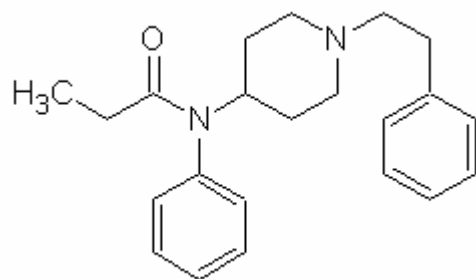


# Summary

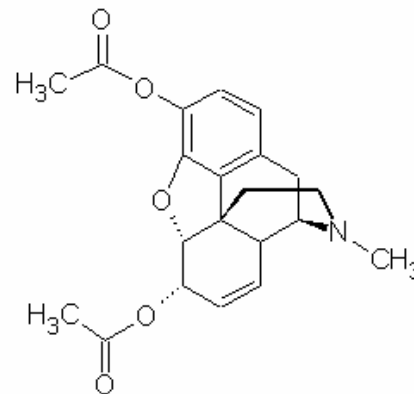
---

- Philadelphia has seen > 70 deaths due to fentanyl-tainted heroin so far with another 40 still being tested.
- This is clearly a major problem that has also been seen in other major cities such as Detroit and Chicago.
- The problem has slowed down here since April but has not disappeared.

# Our common scenario



+



=

