LITERATURE SEARCH TIPS FOR FORENSIC TOXICOLOGISTS

SOFT Drugs & Driving Committee
Resources for Forensic Toxicology

1. Journal Subscription
2. Public Search Engines & Literature Database
3. Public & University Library Systems
4. Other Resources
1. Journal Subscription - Selected Forensic Toxicology Journals

- Journal of Analytical Toxicology (http://jat.oxfordjournals.org/)
  - The official journal of the SOFT and TIAFT; Included in the SOFT and TIAFT membership
  - The official journal of the AAFS; Included in the AAFS membership
- Forensic Science International (http://www.fsjournal.org/)
- Clinical Chemistry (http://clinchem.aaccjnls.org/)
- Forensic Toxicology (http://link.springer.com/journal/11419)
- Clinical Toxicology (http://www.tandfonline.com/loi/ictx20)
- Human & Experimental Toxicology (http://journals.sagepub.com/home/het)
- Therapeutic Drug Monitoring (http://journals.lww.com/drug-monitoring/pages/default.aspx)
- Journal of Legal Medicine (http://www.tandfonline.com/toc/ulgm20/current)
- Journal of Chromatography B: Biomedical Sciences and Applications (http://www.sciencedirect.com/science/journal/03784347)
- Drug Testing and Analysis (http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1942-7611;jsessionid=9FB1EAE3EBA639309960ED93AC4126CE.f04t02)
- American Journal of Forensic medicine and Pathology (http://journals.lww.com/amjforensicmedicine/Pages/default.aspx)
- Science & Justice (http://www.scienceandjusticejournal.com/)
1. Journal Subscription – Publisher’s Website

- Search within the journal
- Recommended reading
- CE opportunity
2. Public Search Engines & Literature Database - PubMed


Search by keywords
EX) How does the combined intake of cocaine & cannabis affect driving performance?

The logical “AND” is not necessary. “Cocaine cannabis driving” will give the same search results.
2. Public Search Engines & Literature Database - Google

- **Queries**
  - Exact phrase: double quote - “driving under the influence of fentanyl”
  - Site-specific: ‘site:’ – fentanyl `site:nhtsa.gov`
  - Or – fentanyl concentration plasma OR serum
  - File type: ‘filetype:’ – fentanyl-related deaths `filetype:pdf`
2. Public Search Engines & Literature Database - Google

Look for fentanyl-related files in pdf among government sites
2. Public Search Engines & Literature Database – Google Scholar

Click the link labeled [PDF]

Explore similar articles by clicking “Cited by” or “Related articles”

Check out the alternative sources for the full text
3. Public & University Library Systems - WorldCat

http://www.worldcat.org/

Look for books, DVDs, and articles

Nearby libraries

Online copy if available

The list of libraries that have the article
3. Public & University Library Systems – Loansome Doc

- Hosted by the National Library of Medicine for ordering PubMed articles from participating health science libraries

- Users must first establish an agreement with a medical library or libraries that use DOCLINE® (NLM's automated interlibrary loan request and referral system). For more information, visit https://www.nlm.nih.gov/pubs/factsheets/loansome_doc.html
3. Public & University Library Systems

Apply for a local library membership

Visit a local university library
4. Other Resources - Useful Sites

- **SOFT**: [http://www.soft-tox.org/duid_literature](http://www.soft-tox.org/duid_literature)
- **NIDA**: [https://www.drugabuse.gov/publications/drugfacts/drugged-driving](https://www.drugabuse.gov/publications/drugfacts/drugged-driving)
- **NHTSA**: [https://www.nhtsa.gov/risky-driving/drugged-driving](https://www.nhtsa.gov/risky-driving/drugged-driving)
  - Drugs and Human Performance Fact Sheets: [https://one.nhtsa.gov/people/injury/research/job185drugs/technical-page.htm](https://one.nhtsa.gov/people/injury/research/job185drugs/technical-page.htm)
- **DEA-Diversion Control Division**: [https://www.deadiversion.usdoj.gov/drug_chem_info/](https://www.deadiversion.usdoj.gov/drug_chem_info/)
- **NAMSDL**: [http://www.namsdl.org/](http://www.namsdl.org/)
- **AAA Foundation for Traffic Safety**: [https://www.aaafoundation.org/](https://www.aaafoundation.org/)
  - Impaired driving and cannabis: [https://www.aaafoundation.org/impaired-driving-and-cannabis](https://www.aaafoundation.org/impaired-driving-and-cannabis)
NIDA: Drug Facts

Drugs Facts

Use of illicit drugs or misuse of prescription drugs can make driving a car unsafe—just like driving after drinking alcohol. Drugged driving puts the driver, passengers, and others who share the road at risk.

Why is drugged driving dangerous?

The effects of specific drugs differ depending on how they act in the brain. For example, marijuana can slow reaction time, impair judgment of time and distance, and decrease

What is MDMA?

3,4-methylenedioxy-methamphetamine (MDMA) is a synthetic drug that alters mood and perception (awareness of surrounding objects and conditions). It is chemically similar to both stimulants and hallucinogens, producing feelings of increased energy, pleasure, emotional warmth, and distorted sensory and time perception.

MDMA was initially popular in the nightclub scene and at all-night dance parties ("raves"), but the drug now affects a broader range of people who more commonly call the drug Ecstasy or Molly.

How do people use MDMA?

People who use MDMA
NHTSA: Drugs and Human Performance Fact Sheets*

**Cocaine**

Cocaine hydrochloride is a white to light brown crystalline powder, shiny rather than dull in appearance. Cocaine:

**Synonyms:** Methylnorephedrine. Cocaine hydrochloride: coke, snow, blow, crack, blow, coca, blue, spice.

**Source:** Cocaine is a natural stimulant derived from the leaves of the coca plant (Erythroxylon). The leaves are dried, heated, and then "stamped" as part of the process to extract the alkaloid, then converted to cocaine hydrochloride, a Schedule II controlled substance. "Crack" is the street name for cocaine that has been processed into fine, powdery particles.

**Drug Class:** CNS stimulant, local anesthetic.

**Medical and Recreational Uses:** Minor use as a topical local anesthetic for eye, nose, and throat surgery. Traditionally used to increase alertness, relieve fatigue, feel stronger and more decisive, and is abused for its intensity.

**Potency, Purity and Dose:** In eye, nose, and throat surgery cocaine is commercially supplied as the hydrochloride which can range from 20-90% purity. The hydrochloride powder is often diluted with an amphetamine (phenylpropanolamine) or other local anesthetics (lidocaine, procaine, benzocaine). Commonly abused, intense euphoric effects. Cocaine is frequently injected with heroin ("speedb" or "turbo").

**Route of Administration:** Topically applied for use as a local anesthetic. Recreationally, coca leaves can be chewed. Cocaine hydrochloride can be smoked to some extent but this is very inefficient as the powder tends to burn rather than vaporize.

**Pharmacodynamics:** Cocaine is a strong CNS stimulant that interferes with the reabsorption of dopamine in the synaptic cleft by blocking the dopamine transporter. This leads to increased extracellular dopamine, which increases the release of norepinephrine ("adrenaline") from sympathetic nerve terminals. Similarly, cocaine interferes with the uptake of serotonin and norepinephrine in the synaptic cleft. As a local anesthetic, cocaine reversibly blocks the initiation and conduction of the nerve impulse. Cocaine is a strong local anesthetic.

**Pharmacokinetics:** Cocaine is rapidly absorbed following smoking, snorting, and intravenous administration. Blood is extensively metabolized by a variety of compounds: benzoylcgonine, epi-dopamine, and benzoylecgonine. The major metabolites in urine are the major urinary metabolite. Norepinephrine is a minor metabolite, but is active and neurotoxic. Cocaine has a half-life of approximately 0.5 to 2 hours, while the half-life of the metabolite is approximately 0.2 to 0.5 hours.

**Molecular Interactions / Receptor Chemistry:** The cDNA of the P450 3A4 isoenzyme is responsible for the N-de-ethylation of cocaine. The N-de-ethylation of cocaine is a complex reaction involving multiple steps and enzymes.

**Blood to Plasma Concentration Ratio:** averages ~ 1.0

*To be updated
Acetyl fentanyl

*(N-(1-phenethyl)piperidin-4-yl)-N-phenylacetamide*

**Introduction:**

Acetyl fentanyl, similar to the Schedule II opioid fentanyl, is a potent opioid analgesic. Recently, it has been linked to a number of overdose deaths in the United States. Acetyl fentanyl is not a part of most illicit drug screens and may remain undetected in many of these cases. Immunoassays (e.g. ELISA) for fentanyl do not differentiate fentanyl and acetyl fentanyl; confirmatory analysis such as gas chromatography/mass spectrometry (GC/MS) is required to confirm the presence of acetyl fentanyl.

Fentanyl, fentanyl and morphine were 0.021, 0.0081, and 0.33 mg/kg, respectively. Similarly, in another study using tail flick and phenylquinone writhing tests, acetyl fentanyl produced analgesic response in mice. Acetyl fentanyl has been shown to completely suppress the signs of withdrawal in morphine-dependent monkeys.

Besides analgesia, fentanyl-like substances, similar to other opioid analgesics, produce a variety of pharmacological effects including alteration in mood, euphoria, drowsiness, respiratory depression, suppression of cough reflex, constriction of pupils (miosis), and impaired gastrointestinal
AAA Foundation for Traffic Safety

### Completed Projects

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<th>Filter By Category</th>
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<tbody>
<tr>
<td>Impaired Driving</td>
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#### An Evaluation of Data from Drivers Arrested for Driving Under the Influence in Relation to Per Se Limits for Cannabis

*Impaired Driving*

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<th>5/2016</th>
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While the exact relationship between cannabis use and increased risk for crash involvement remains unclear, cognitive and psychomotor effects of cannabis use in the period immediately after use can impact vehicle control and judgment and present some risks for deterioration in driving performance.

- Final Report
- Fact Sheet
- Slide Show

#### Prevalence of Marijuana Use Among Drivers in Fatal Crashes: Washington, 2010-2014

*Impaired Driving*

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<th>5/2016</th>
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This study quantifies the prevalence of marijuana involvement in fatal crashes in the state of Washington in years 2010 - 2014. Also included is an Investigation into whether the prevalence changed after legalization of recreational use of marijuana and creation of a new per se limit for driving under the influence of marijuana which took effect in December 2013.

- Final Report
- Fact Sheet
- Slide Show

#### Driving Under the Influence of Alcohol and Marijuana: Beliefs and Behaviors, United States, 2013-2015

*Impaired Driving*

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The purpose of this study was to provide estimates of the prevalence of self-reported use and driving under the influence of alcohol and marijuana, and related perceptions and beliefs among drivers 16 and older in the United States, and to present an analysis of changes in these behaviors between 2013 and 2015.

- Final Report
- Fact Sheet
- Slide Show
4. Other Resources - Network

- Contact the author of the article directly
  - Author information on the PubMed citation
  - Email address on the author’s other articles
  - Through the author’s affiliation website
  - Organization membership directories (e.g., SOFT, AAFS, AACC)

- Contact colleagues

- Linkedin – Forensic Toxicology Group
# Critical Review of a Journal Article

## CONSIDERATIONS FOR CHOOSING A REFERENCE

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<tr>
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<th>1 Journal Source</th>
<th>2 Study Design</th>
<th>3 Scientific Contents</th>
<th>4 Limitations</th>
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<tr>
<td></td>
<td>Avoid questionable open access journals</td>
<td>Ensure the study design is applicable to interpretation of the case test result</td>
<td>Determine whether the study findings are supported by the data &amp; reproduced by other studies</td>
<td>Give appropriate weight to the findings in consideration of the study design</td>
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- Directory of Open Access Journals (https://doaj.org/)

E.g., If the case blood sample had been stored at 4°C in a gray-top tube, choose a reference evaluating analyte stability under the same storage condition.

Confounding factors, covariance, dose, subject demographics, sample size, location, collection, storage, analytical method, study tasks, control, etc.
Literature Updates

STEPS TO RECEIVE UPDATES IN THE SCIENTIFIC LITERATURE

1. **PubMed Alert**
   - Create a saved search on the topic of interest

2. **Journal Website**
   - Read the recommended article of the month (JAT offers CE credits)

3. **Listserv Update**
   - Sign up for forensic science/toxicology-related listservs

4. **Professional Conference**
   - International (TIAFT), national (SOFT), & regional (SAT) meetings & workshops

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http://www.soft-tox.org/journal-analytical-toxicology-continuing-education

FLSB Library <FLSBLibrary@wsp.wa.gov>
Keep Up with the Scientific Literature

SOFT Drugs & Driving Committee

http://www.soft-tox.org/ddc