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Table 1. Estimated Number of ED Drug Episodes and Drug mentions, January-June, 1998.[a]

Drug or class	% of total ED visits
Alcohol-in-combination	0.204
Cocaine	0.191
Heroin/morphine	0.086
Analgesics (acetaminophen, aspirin, ibuprofen, propoxyphene, oxycodone, hydrocodone	0.108
Benzodiazepines (alprazolam, diazepam, lorazepam, clonazpema, triazolam)	0.067
Marijuana/hashish	0.084
Tricyclic antidepressants (amitriptyline, doxepine, imipramine)	0.011
Barbiturates (phenobarbital, over-the-counter sleep aids)	0.013
Amphetamines (amphetamine and methamphetamine)	0.026
Phencyclidine	0.005
Lithium	0.004
Lysergic acid diethylamide	0.004

[a]From the Office of Applied Statistics, the Drug Abuse Warning Network, 1998. Total ED visits: 44,836,000; number of drug episodes: 272,770 (0.61%) , drug mentions: 493,096 (1.1%).

Table 2. Stat Quantitative Serum Toxicology Assays Required to Support an Emergency Department

Acetaminophen

Lithium

Salicylate

Co-oximetry for oxygen saturation, carboxyhemoglobin and methemoglobin

Theophylline

Valproic acid

Carbamazepine

Digoxin

Phenobarbital (if urine barbiturates positive)

Iron

Transferrin (or unsaturated iron binding capacity assay if transferrin not available)

Ethyl alcohol

Methyl alcohol*

Ethylene glycol*

[a]Turnaround time of 1 hours or less.

*More realistic turnaround times for these assays is 2-4 hours. These tests are largely unnecessary in countries where these agents are not widely available.

Table 3. Stat Qualitative Urine Toxicology Assays Required to Support an Emergency Department[a]

Cocaine

Opiates

Barbiturates

Amphetamines[b]

Propoxyphene[b]

Phencyclidine[b]

Tricyclic antidepressants[c]

[a]In general, urine toxicology screens such as these have a lower urgency and utility when compared to serum assays. They do not correlate well with clinical effects and suffer from problems with sensitivity and specificity, as discussed in the text. While widely available, these assays (with the exception of that for the cocaine metabolite) require clinical interpretation.

[b]Need for these assays may be based on prevalence of drug use that may vary from region to region. Regular review of drug usage is important.

[c]Recommended only if the house staff fully understands the specificity limitations of this assay, i.e., results are used in conjunction with the electrocardiograph to support a clinical suspicion of TCA toxicity, but not in cases where a positive urine drug test is the sole evidence for this suspicion.

Table 4. Essential Operator Procedures for Breath Alcohol Analysis

- Use of test device under manufacturer recommended environmental conditions
- Use of a properly calibrated device
- Verification that the blank and alcohol accuracy (QC) recoveries are within specifications.
- Use of an air check or blank breath test immediately prior to the patient test
- Confirmation of patient identification
- Observation of the patient to ascertain that residual alcohol and foreign objects are cleared from the mouth
- Instruction of patient on proper delivery of a deep-lung sample
- Documentation of test date, time, device, QC result, patient ID and results
- Prompt and accurate reporting of results.

Table 5. Device Specifications and Desirable Attributes for Point-of-Care Breath Alcohol Analysis

Device specifications

- Accuracy and precision should meet or exceed performance required for intended clinical use
- Prevents false positive results from acetone (up to 0.02% wv).
- Clinically appropriate analytical (reportable range in units of grams alcohol/100 mL of blood
- Environmental conditions appropriate for operation

Desirable attributes

- Mistake-proof for ease of use by non-laboratory personnel
- Procedural controls that monitor requisite operator steps and specimen delivery
- Function checks that monitor components performance
- Data logging capability
- Printer and/or laboratory information management system interface
- Battery operated devices should have a “low battery” indicator

Figure captions

Fig. 1. The diagnostic outcome of a test that has an accuracy of 99% and is used on a population with a prevalence of 0.1%. Of 10,000 subjects screened, there will be 10 subjects with the drug in question present, and all 10 will have a positive result for the assay (99% accuracy). Of the remaining 9990 drug negative individuals, 100 will have a falsely positive result (99% accuracy). Given these pretest assumptions, only 9% of positive drug screen results will be from an individual who actually has the drug in question present.

Fig. 2. Histogram of serum acetaminophen testing results at Hartford Hospital for 6 months.

Fig. 3. Increasing utilization of toxic alcohols vs. laboratory testing policy at Hartford Hospital. In 1994, chromatographic testing required approval by the toxicologist on-call. In 1996, the enzymatic assays for methanol and ethylene glycols were introduced. In 1998, the consult approval requirement was waived. Although the incidence of positive results have not increased during this period, these steps have led to substantially increased test utilization. (♦) ethylene glycol, (■) methanol.

Fig. 4. Distribution of osmolal gaps from an ED patient population. Used with permission from Hoffman et al. J Toxicol Clin Toxicol 1993;31:81-93.