

substance misuse at which it occurs, its duration and its severity. The task is complex. Several currently used harm reduction strategies were introduced as pragmatic responses before evidence of their efficacy was available. In this paper the concept of harms and benefits along the above five dimensions is applied to considering the extent to which both well-established strategies, including needle exchange and methadone maintenance, and novel or potential strategies including the use of fluoxetine for ecstasy users are supported by evidence. It is concluded that many fall well short of comprehensive evidence of efficacy. Where the weight of evidence is sufficiently favourable, novel harm reduction strategies should continue to be adopted and the outcome be subject to long-term comprehensive assessment of benefit and harm.

Gay Sutherland

Biological markers of smoke and nicotine intake and their role in the treatment of smokers

There are several objective biological markers which can be used to provide quantitative measures of smoke inhalation and nicotine intake. These measures provide a more accurate estimate of the extent of smoking than can be gained by knowing simply how many cigarettes an individual smokes. They also have an invaluable role in validating self reports of tobacco abstinence. There are four main biochemical indicators: nicotine, cotinine, carbon monoxide (CO) and thiocyanate (SCN). About 90% of inhaled nicotine is subsequently metabolized to cotinine, which can be reliably measured in blood, saliva or urine. Like nicotine, cotinine is a highly specific marker of tobacco intake and provides a precise quantitative measure of exposure, sensitive enough to detect passive smoking levels. With a half-life of 16-20 hours, compared to 2 hours for nicotine, sampling time is less critical than with nicotine assays, although both measures have the drawbacks of being time-consuming, and relatively expensive. Carbon monoxide in expired air is the most widely used and useful marker in clinical settings, correlating highly with blood nicotine and carboxyhaemoglobin (COHb). Measuring CO is non-invasive, fast and simple and provides immediate feedback of results to clinician and patient. The main disadvantages are that it is not completely specific to smoking, and the relatively short half-life of COHb (4-7 hours) means that only very recent smoking is detectable. Hydrogen cyanide is present in high concentrations in tobacco smoke and is metabolized to thiocyanate (SCN) by the liver. SCN has a long half-life (10-14 days), useful for validating smoking abstinence, but low sensitivity and specificity, and has been overtaken by cotinine as the marker of choice in recent years. Baseline levels of nicotine, cotinine and CO, all correlate with questionnaire measures of nicotine dependence, and have been shown to predict outcome in smoking cessation trials.

Kim Wolff

Biological markers of drug misuse and the relative utility of their clinical application

Aims: This review discusses a range of biological indicators including blood, urine, hair and saliva, covering both technological and practical considerations for their application and interpretation. Measurements: Various immunological and chromatographic procedures used for drug screening are discussed within a clinical context. Findings: Urine remains currently the biological tool of choice for qualitative detection of illicit drug use, although increasingly the use of hair sampling has provided a much longer time frame for assessment. Quantitative accuracy remains strictly the domain of blood. The growing sophistication of laboratory analysis may additionally make possible the routine use of breath, saliva, sweat or breast milk for drug screening in the future. Conclusions: Clinical awareness of the need for effective testing for psychoactive substances has never been greater. This probably reflects the multiplicity of tools available for screening today both at the laboratory and within clinical environments. Advances and modifications to standard technology has eased the way for less intrusive testing using hair and breath samples, though to date, urine remains the biological fluid of choice for routine screening. Accurate interpretation of the screening tests within a clinical setting alongside other relevant information remains the key to usefulness of any test.