Facts About Drug Misuse in Ireland

Health
Promotion
Unit

Chapter

Facts About Drug Misuse in Ireland

Health Promotion Unit

Compiled by
Dr Desmond Corrigan
School of Pharmacy, Trinity College

ISBN 0 86387 040 6
First Published 1985
Second Edition 1987
Third Edition 1991
Revised Third Edition 1994
Fourth Edition 2003

Contents

Facts about Drug Misuse in Ireland

Preface to the 4th Edition

It is now eight years since the last edition of this booklet and this new version is a substantial revision of that earlier material. Two new chapters have been included; a separate one on MDMA ('Ecstasy') and a totally new entry on Methadone reflecting the increased importance of these two drugs. Some chapters are merely updates of previous versions because there is little new data or information to be included, while for others e.g. on the Cannabis drugs, there has been a substantial revision reflecting new scientific knowledge and data.

The aim, as always, has been to provide the non-technical reader with jargon-free (well almost!) background information on legal, medical, social and historical facts about drugs used for non-medical purposes in Ireland. The title was deliberately phrased to indicate that the booklet does not represent "the" facts about drug misuse but rather that it presents as much of the available information as possible. It is not encyclopaedic in nature because all of the information on drug use in Ireland is not available. It has been pointed out previously, that much drug use is illicit in nature and thus hidden. The fact that the drug scene changes on a regular but unpredictable basis also creates difficulty, as does the complexity of the phenomena that underpin drug misuse by human beings. This booklet is about just one aspect of problem drug use, namely the role of the drug, even though it is recognised that the role of the individual and of the social environment in which they find themselves are also key influences on drug use.

This briefing has been written so as to be a background resource for those such as teachers, healthcare and welfare professionals, community and other voluntary groups who seek basic factual information about the effects of the chemicals we call drugs on the human body. It is a compilation of a vast amount of information published in official reports, textbooks, research journals and documents from various individuals, groups and agencies. Normal academic practice and courtesy requires that I acknowledge the immense debt owed to many different individuals and I am glad to be able to record my appreciation of the skill, dedication and efforts of all those who work has been drawn upon to create this publication. A purely academic approach would be to cite each and every reference within the text but this would, I believe, result in a text which would be less than friendly for the non-academic, non-technical reader. Therefore, in this new edition, I have included for the first time, a bibliography of the most important print and electronic sources of information upon which this compilation is based. This in no way diminishes my feeling of indebtedness to my colleagues in the laboratory and non-laboratory sciences all over the world whose research work and scholarship I have attempted to incorporate into this publication.

Chapter 1 - The Place of Drug Information in Drug Prevention Programmes

The Place of Drug Information in Drug Prevention Programmes

A significant proportion of the information in this briefing was compiled as part of training programmes for key drug education workers such as 1st and 2nd level teachers, who are involved in Drug Prevention activities. Prevention efforts aimed at minimising experimental drug use, or at reducing the progression to regular use and thereby lowering the number of individuals who develop problematic dependent patterns of drug use, are a crucial part of society's response to the misuse of drugs.

School-based programmes are a key element in these prevention approaches and the Government's National Advisory Committee on Drugs (NACD) recently published a report on these programmes, the Executive Summary of which is reproduced below by kind permission. Entitled "Drug Use Prevention. An Overview of Research" the report highlighted the fact that many of the Irish school based programmes such as the "Walk Tall" programme for primary schools and the "On My Own Two Feet" programme at second level were consistent with best practice in the area. The report cautions that having experts warn young people about the dangers of drug use is quite ineffective in preventing subsequent experimentation. Therefore merely providing copies of this booklet to young people will not constitute effective drug education. However, it must also be pointed out that a number of surveys of drug users (e.g. the 1995 ESPAD study and the 1997 Keogh Report) highlighted that a worryingly large number of young Irish people had very little knowledge of the consequences of drug taking when they started to experiment. If young people are to make informed responsible choices about drugs through the school and community based programmes now available, then those choices must be based on a full knowledge of the consequences of decisions to use drugs. The information of drug taking in general and on the individual drugs included in this booklet can help provide that basic knowledge, which can be included as part of, **but not instead of** a comprehensive prevention programme. Previous editions have been used as a resource for pupils undertaking small projects on drugs and this may be a worthwhile approach because the NACD report recognises that children should be actively involved rather than merely passive recipients of information. The report also highlights the need to include legal drugs since it is known that an exclusive focus on illegal drugs has limited effectiveness. This important fact has been borne in mind in the preparation of this publication.

Drug Use Prevention - An Overview of Research - Executive Summary

This report summarises the main findings of research in Ireland and abroad relating to drug use prevention. The main risk factors for drug use are identified and several approaches and strategies for preventing use and misuse are examined. Based on the evidence presented here, a number of conclusions and recommendations are put forward.

The main conclusion is that there is no single 'drug problem' with one dramatic solution. Rather, what is called the drug problem is comprised of varying degrees of involvement with a variety of substances, arising from several influences many of which are unrelated to each other. For these reasons, the main recommendation is that there is a need to target and prevent use of the most dangerous substances.

The most serious drug problems involve opiates and are largely associated with deprivation. Addressing this problem requires a comprehensive approach involving not only family and community factors but also broad socio-political influences, especially educational opportunities. Targeted initiatives to tackle the social origins of these drugs problems should involve inter-agency co-operation and have community involvement. Particular attention should be given to the structural planning of inter-agency co-operation on a scale and intensity that is commensurate with the gravity of the problem. There is also a need to continue with supply reduction measures particularly as these have an important influence on the perception of what is acceptable. Furthermore, there is a need

to include legal drugs as part of the policy since experience has shown that an exclusive focus on illegal drugs has limited effectiveness.

There is a need to raise public awareness of the importance of deprivation as a predisposing factor for the most damaging forms of drug misuse. This will act as a prelude to widespread acceptance of the necessity for the major resources that will be needed to deal with these problems. In this context, there is a major need to help vulnerable families in order to prevent their children's drug misuse. It is also essential that prevention of early school leaving should be at the core of intervention. Attention should also be given to how life and employment skills can contribute. It is also recommended that drug prevention becomes a central feature of initiatives to address Health Inequalities in the context of the National Anti-Poverty Strategy as well as integrating programmes that attempt to address social exclusion, especially those that focus on school (Breaking the Cycle) and on families (Springboard).

Notwithstanding the targeted programmes to deal with the causes of the most damaging forms of drug misuse, there is also a need for broadly based programmes focusing on the experimental drug use that is not uncommon among young people from all social backgrounds. The evidence reviewed here shows that fear based messages are not appropriate in programmes including classroom programmes. While it seems plausible to have experts warn young people about the 'real facts' of the dangers of drug use, the indications are that this is quite ineffective in preventing subsequent experimentation.

Instead there should be a continued investment in approaches that emphasise personal and social development, stress social skills and enhance decision-making. In particular, school programmes should ensure that children are actively involved rather than merely passive recipients of information. It should be noted that many of the Irish school based programmes to address drug misuse have been consistent with best practice in this regard. The developments in Social Personal and Health Education are especially to be welcomed.

There is considerable evidence that school programmes on their own are unlikely to have a major impact without community backing. There is a need to take into account the views of parents and other interested parties as well as having innovative strategies to reach marginalised young people who may have left school. Drug prevention should take place in community settings such as youth clubs, community centres, and sports clubs and in workplaces where additional skills and knowledge are needed. Within school programmes, the regular classroom teacher should take the primary role in drug prevention education, with appropriate input from others including professionals as well as people from the local community with relevant expertise. Schools need to develop policies with regard to drug prevention. Such policies should include not only illegal drugs but also legal drugs and may be most effective if they involve groups of schools and are holistic in nature, rather than simply indicating sanctions for drug use.

The evidence reviewed in this report suggests that the mass media have until now, had a relatively limited role in prevention. It would seem that there is very little value in drawing attention to the dangers of drug use in media promotions since, they may only convince those people who are already disposed to believe the message. Furthermore, they can create an impression that 'something is happening' in relation to prevention. There is a need to explore new ways of using the mass media more effectively, in the context of the statement of the National Drugs Strategy.

Source: Dr. M. Morgan (2001) ***Drug Use Prevention; overview of research*** *National Advisory Committee on Drugs*

Chapter 2 - Drugs and Drug Related Problems

Introduction
This section is designed to provide you with background information on the legal, medical, social and historical facts about drugs used for non-medical purposes in Ireland. It is not intended to be a definitive study of problem drug use in Ireland.

Definition of a drug
A drug can be defined as a chemical that causes changes in the way the human body functions mentally, physically or emotionally. This description includes many materials we normally think of as drugs, as well as things we might not usually consider to be drugs, such as coffee, tea, alcohol, solvents and tobacco.

Where drugs come from
Drugs may be obtained in a number of ways:
- they may be extracted naturally from plants such as opium, cannabis and coca
- they may be prepared from natural materials by semi synthesis such as heroin which is easily made from the morphine extracted from opium
- they may be totally man-made such as amphetamines and the tranquillisers.

The most widely used drugs, both legal and illegal, are plant products or easily prepared from plants, many of which grow readily in different parts of the world. Many of these plants have long been used by humans and formed the basis of medicine for centuries. Today we still use medicinal or drug plants but in addition we have available an increasing list of very powerful synthetic medicines produced by pharmaceutical companies all over the world and an increasing number of synthetic drugs produced by underground designer drug chemists.

How drugs are used
We use these drugs in different ways, such as in medicines to relieve pain, to treat cancers, to alleviate heart disease or to cure infections. Some drugs are used to help us cope with the anxiety and stresses of life, while others are used for recreational purposes, to help us relax and enjoy ourselves. Drugs, when properly used, can be of enormous benefit in the treatment and prevention of disease in both humans and animals.

There is, however, a price to be paid for the benefits, which are often short lived, of the drugs we consume. This is because of one fundamental fact - there is no such thing as a safe drug; all drug taking involves an element of risk, harm and disease. Unfortunately drugs are frequently misused, leading to a variety of medical, social and economic problems.

Definition of drug misuse
Drug misuse can be defined in a number of ways. In this publication the term is taken to mean the use of any drug, legal or illegal, which damages some aspect of the user's life; whether it is their mental or physical health, their relationship with their family, friends or society in general or their vocational functioning as students or as workers both inside and outside the home.

This definition includes not only the use of illegal drugs but also the dangerous use of legal drugs such as alcohol, the use of tobacco, the harmful use of prescribed medicines by exceeding the recommended prescribed dose and the illegal use of legal drugs such as drinking and driving or smoking cigarettes in a no-smoking area.

The fact that a drug is legal and socially acceptable does not mean that it causes less harm or damage than an illegal drug. Indeed, it appears that as the use of a particular drug becomes more acceptable, it is used by people more often and in greater amounts, with greater adverse consequences for the user's health and well being.

How drugs work
Many drugs are believed to work by fitting in to receptor sites within the cells of the body. This works similar to how a key fits into a lock. At this site a drug can either cause an effect or it can block an effect.

Different receptors have been identified for different classes of drugs for example the opiate receptors, a benzodiazepine receptor and a number of cannabinoid (cannabis) receptors. The interaction between a drug and its site of action depends on how well it fits the shape of the receptor as well as by the amount of the drug taken.

Types of drugs
Some of the large numbers of psychoactive drugs calm the mind, others cause excitement, while others can offer complex mental experiences. It

is, however, possible to catalogue these different drugs into a small number of separate classes or types. While each individual drug will be different, its overall effects will be those of its class, producing these by attachment to the same type of 'receptor sites' in the brain. They will produce much the same type of withdrawal symptoms and different drugs within the same group can be effectively substituted for one another and thus relieve the withdrawal symptoms which occur with the other drug.

Most mood altering drugs can be placed in one of five main categories. Although some, such as cannabis, tobacco and solvents, must be considered separately as they do not easily fit into the following classification:

Opiates – these are described as narcotic analgesics because they are strong painkillers and because they produce a feeling of euphoria and sleepiness. Included are opium and its derivatives: morphine, codeine and heroin, as well as the synthetic opiates such as methadone, buprenorphine and pethidine.

Depressants – are also known as sedatives and include drugs such as alcohol and barbiturates, which have in common the ability to decrease brain activity causing sleepiness and in some cases relief of anxiety.

Minor tranquillisers – such as Valium® and Ativan® known collectively as Benzodiazepines, have much the same general effects as the depressants but it is now recognized that addiction to tranquillisers is totally different to that which occurs with other depressants.

Stimulants – are drugs that elevate mood, increase wakefulness and give an increased sense of mental and physical energy. Included in this group are cocaine, amphetamines and caffeine.

Hallucinogens – produce a spectrum of strange intense visions and voices referred to as hallucinations. Drugs such as mescaline, LSD and psilocybe mushrooms usually do not give rise to dependence but because of their intense effects on mental functioning they can be extremely hazardous.

Cannabis – drugs such as marijuana or hashish can have actions that are both depressant and euphoriant.

Tobacco – contains the drug nicotine, which can have both stimulant and sedative effects, depending on the user's personality and mood.

How drugs are taken

There are many different ways of taking drugs including eating, drinking, chewing, smoking, nasal inhaling, sniffing, injecting into the skin (subcutaneous), injecting into the muscles (intramuscular), and injecting into the veins (intravenous).

The route of administration determines the speed, duration, intensity of action and also the safety of the drug. This is because the amount of drug absorbed and distributed within the body depends on the way the drug is taken. This in turn affects the amount of drug arriving at the site of action. The onset of drug action is rapid if the drug is taken by smoking, nasal inhalation or by intravenous injection and slower if it is by chewing, eating or subcutaneous injection.

The type of drug also determines the route of administration. For example, alcohol is taken by drinking, whereas, heroin is usually taken by injection or smoking. Cocaine and cannabis may be taken by several routes. Injection of drugs is the most dangerous route of drug taking partly because of the risk of a fatal overdose associated with the higher concentrations of drug that can be achieved, particularly with intravenous injection. Also proper injections need technical skill and many self-injectors are at risk because their lack of hygiene and use of non-sterile injection technique results in the spread of diseases when more than one person shares the same needle and syringe. These diseases include Hepatitis and the Acquired Immune Deficiency Syndrome (AIDS).

The effects of drug use

Most people who use drugs on an occasional basis suffer no permanent ill effects from the drugs they use. Many benefit when they use medicinal drugs in the correct way. There are, however, very serious risks in using drugs and a large part of this publication is about these and how they arise. Risks apply to all or most of the drugs described in this booklet, though each drug has its own particular set of risks.

Most of these drugs are mind or mood altering, psychoactive drugs, but they affect not only the brain but also other parts of the body. Thus physical as well as mental effects have to be considered.

Statements about the effects of a particular drug are statements about what usually happens with most people when they take that particular drug. But the effect of any drug on the human body is difficult to predict because it depends on a number of different factors such as:

- the type of drug
- the dose or amount of drug taken
- the physical and mental condition of the drug taker
- the environment in which the drug is being used
- the mechanisms controlling the entry and removal of the drug from the body
- the use of other drugs at the same time.

Drug Doses

The interaction between a drug and its site of action depends on how well it fits the shape of the receptor as well as the amount of the drug taken. As this amount or dose is increased, new unwanted and often damaging effects begin to occur.

Many of the problems caused by drugs are directly related to the effects of increased dosage. By taking too much of a drug you run the risk of a frightening experience such as the panic/anxiety reaction to high strength cannabis, or more seriously you are at risk of a fatal overdose. For example, the use of cocaine by South American Indians in small amounts as a result of the chewing of coca leaves is generally believed not to be particularly harmful. However, the smoking of highly purified and concentrated cocaine in the form of 'crack' can result in sudden death or rapid development of a serious addiction problem.

If you take a mood-altering drug frequently, in high doses, for a long time, it is likely to destroy your perception of reality so much that normal functioning and development is damaged. Finding and keeping a job may be difficult and normal desires for food, sex and warmth may be dulled. Reactions to pain, fatigue and discomfort may also become muted, leading to self-neglect and malnutrition which is often damaging to health.

The importance of the dose of drug cannot be overemphasized in understanding some of the controversies associated with drug use. Repeatedly there are reports of a new drug fad or craze suggesting that the drug causes little harm. It is only when the drug becomes more popular and it is used more often and at higher doses that the harmful effects begin to appear.

Individual Reactions to Drugs

Individuals react to drugs in different ways because the effectiveness of the mechanisms controlling the arrival and departure of the drug at the target site in the body differ. This effectiveness varies due to age, gender, body weight and nutritional status. Exposure to cigarette smoke and other environmental pollutants can also alter the body's responses to drugs as can interactions with other drugs and food.

In the young, absorption of drugs and their circulation in the bloodstream is less effective than in adults. Similarly, elderly people react to drugs in a different way to younger people and usually require lower doses of drugs.

Lighter people tend to experience greater effects and greater dangers from the same amount of drug than heavier people. Malnourished drug users are likely to have abnormally high levels of drugs in their blood because of a reduced level of fat to store the drug. Drug abusers who neglect their diet are also more likely to suffer poisonous reactions to the drug. Those that are dependent on alcohol or heroin and whose compulsive drug use results in self-neglect may be particularly at risk from drug overdoses.

Men and women also react differently to drugs. For example men and women differ in their reaction to alcohol. This is because men are heavier on average than women and their higher muscle content is associated with higher body water content. When men consume alcohol there is therefore a dilution in blood alcohol concentration (BAC). Women however tend to have a higher BAC because they have lower body water content resulting from their lower muscle content and higher ratio of fat. They also appear to differ in the speed with which they break down alcohol in the lining of the stomach. For these reasons the same dose of alcohol will

produce a 25-30% higher BAC in an average woman than in a man so that, if a man drinks six standard drinks (3 'pints') of alcohol and a woman four standard drinks, they will both have similar blood alcohol levels. Women therefore given similar levels of consumption get drunk faster and are more vulnerable to alcohol-related problems such as liver, brain, heart disease and alcohol dependence than men. Conversely a high food intake, particularly of protein, can slow down the absorption of alcohol and result in lower BAC levels.

Interactions With Other Drugs

Studies of drug misusers in Ireland show that many take a variety of different drugs in what is known as polydrug abuse. This polydrug abuse makes it difficult to assess the likely effects of any one particular drug on an individual. This is because, if two drugs are taken together, it is possible that their combined effects could be the same as, smaller than, or greater than the sum of the effects of the individual drugs.

The commonest drug taken in combination with others is alcohol. The risks of a fatal overdose are very high with drug and alcohol combinations, whether it is methadone and alcohol or other mixtures. Another common mixture is alcohol and cannabis, in this case the depressant sleep-inducing effects of alcohol are increased by cannabis and this has implications for work and traffic safety. Since drugs remain in the body for varying periods, often hours or days, the two substances don't even have to be taken at the same time.

In general terms the effects of combinations of drugs are little understood and uninvestigated, therefore the advice to any drug user must be to avoid mixing drugs.

A Drug's Actions Depend on More Than the Drug

A drug's actions on the brain are influenced not only by the nature of the drug, but also by the personal characteristics of the individual, by the immediate setting in which the drug use occurs, by the expectations of the user and by larger cultural influences surrounding the drug use. For example, a mild drug experience with hallucinogenic mushrooms for one user may turn out to be a nightmare for an individual who is mentally unstable and who may be pushed over the brink into mental illness.

The surroundings in which the drug is consumed also influences the effects. For example, a person using alcohol in a quiet relaxed atmosphere may become sleepy, whereas if they drink the same amount in a cheerful exuberant atmosphere they may feel stimulated and more extroverted. All of these factors contribute to the unpredictability of the effects of, and damage from, the use of drugs and can be a source of confusion about the actual risks associated with a particular drug.

The Hazards of Drug Misuse

Introduction
The hazards associated with drug abuse have traditionally been described in terms of the risk of a fatal overdose combined with the risk of addiction and these are very significant dangers with many drugs. In addition, attention is being increasingly paid to a range of other drug-related medical, social and financial problems.

Overdoses
It is usual to assess the hazards of a given drug in terms of physical toxicity with the associated risks of fatal overdoses. Many drugs have a high overdose potential, for example:

Heroin and other opiates,
Cocaine,
Alcohol,
Solvents,
Alcohol and tranquilliser combinations.

However, many other harmful drugs such as LSD and cannabis are not lethal poisons.

Adulteration and Fake Drugs
When people buy a legally prescribed drug or medicine, they are virtually guaranteed that the medicine supplied is the right amount of the right drug, because of strictly enforced controls and scrutiny. On the other hand, anyone who buys a drug on the 'street' (the illegal black market) has no guarantee that what is bought is what they think they are buying and the resulting risk of an overdose is great.

The sale of fake, contaminated and misrepresented drugs is common. Some of the fakes are ingenious and comic, such as henna sold as cannabis resin or lentils sold as L.S.D. Others are a hoax, such as roasted banana skins called 'mello yello'. Others are dangerous such as the selling of the anaesthetic Ketamine as ecstasy. The misrepresentation of drugs means that many drug users are taking drugs they would not normally take or wish to take.

The most serious case of substitution we have had in Ireland is the case where strychnine was mistakenly used as cocaine, resulting in one death and seven cases of strychnine poisoning. Contamination of street drugs especially of heroin and cocaine is common. Other drugs as well as non-drug materials are all used to 'cut' or increase the bulk and thus the profitability of the merchandise. These 'cuts' or diluents can cause damage when injected into veins, and in America it is believed that many heroin deaths were really due to a reaction to quinine used to dilute the heroin.

These factors add greatly to the unpredictability of the effects of, and damage from, the use of drugs without medical supervision. In general, therefore, it cannot be predicted that the effect of a drug on a given individual will match those described in a briefing such as this, especially if the person is particularly vulnerable due to existing mental or physical conditions.

Dependence and Addiction
Another well recognized hazard is the risk of 'addiction' or more properly dependence. The World Health Organisation (WHO) introduced the term 'drug dependence' in 1964 in an attempt to break away from a narrow extreme view of addiction centred almost exclusively on morphine and where other forms of drug addiction were downgraded in importance.

The 1964 approach proposed that each drug type should be seen as giving rise to its own particular type of dependence, such as dependence of the opiate-type and dependence of the cocaine-type among others.

The 1964 definition of drug dependence was as follows:

"A state psychic and sometimes also physical resulting from the interaction between a living organism and a drug, characterized by behavioural and other responses that always include a compulsion to take the drug on a continuous basis in order to experience its psychic effects, and sometimes to avoid the discomfort of its absence. Tolerance may or may not be present."

Physical dependence may result from the body's adaptation to the repeated use of the drug and if the drug is abruptly stopped there is a rebound effect resulting in physical symptoms of illness commonly called 'withdrawal'.

Psychological factors play a very important role in dependence through the reinforcing nature of many drugs, this means the reward in terms of

pleasure, the feeling of well being or calmness which may be obtained when the drug is taken.

Many drugs are known to result in compulsive drug use after repeated and sometimes even occasional use, such as heroin and other opiates, alcohol, minor tranquillisers, nicotine, cocaine, amphetamine and cannabis.

Dependence is more likely when a drug is injected than when taken in other ways. This is due to a combination of factors including the regular use of high doses, the 'rush' with the experience of immediate satisfaction, and the meaning of the injection ritual to the user. For some, the injection routine may become as important as the effect of the drug, and if no drugs are available almost anything will be injected. Nevertheless, dependence can occur with any method of drug use. Dependence does not always occur or may take some time to develop.

It is increasingly recognized that all embracing terms such as 'addiction' or 'dependence' are too broad to adequately describe the variety of compulsive drug using behaviours. Instead, attempts have been made to describe a series of 'Drug Dependence Syndromes' that may include some or all of the following elements:

- Tolerance
- Withdrawal symptoms
- Withdrawal relief
- Subjective awareness of compulsion to continue use
- Salience of drug taking relative to other activities
- Relapse

- Tolerance

As a result of repeated drug use, the human body adapts to the drug in different ways. It could eliminate the drug more quickly or the cells of the brain could adapt to the drug with the result that it is necessary to increase the amount of drug consumed to obtain the same level of drug effect. As a result of this tolerance to the drug, a heroin addict can take up to 100 mg or more in one injection, which is 10 times the normal medical dose and is a dose which would undoubtedly kill a non drug user.

- Withdrawal Symptoms.

These are the body's reactions to the sudden absence of a drug to which it has adapted. Withdrawal symptoms tend to be the opposite of the effects of the drug itself; for example, withdrawal of a depressant drug can cause excitement, whereas withdrawal from a stimulant may result in depression. Such effects vary from the alcohol 'hangover' to the fatigue and depression associated with stimulants and the chills, pains and influenza-like symptoms of heroin withdrawal. With some drugs, such as barbiturates, there is the risk of convulsions and even sudden death during withdrawal.

- Withdrawal Relief.

There are three ways of abolishing withdrawal symptoms. One is time, as the body returns to normal functioning without the drug. The second is to take another dose of the drug such as the use of alcohol in the form of the so-called 'hair of the dog' to cure a hangover or the smoking of an early morning cigarette to abolish the irritability and mild agitation associated with nicotine withdrawal. In the case of opiates, the use of the next 'fix' of heroin to abolish withdrawal is a key-reinforcing element in the addiction process. The third approach is to substitute a related drug, for example methadone for heroin.

- Subjective Awareness of Compulsion to Continue Use.

This is where an individual becomes aware that they are using a drug continually either because of the need to avoid withdrawal or because of external cues such as television commercials and pictures of syringes or because of anger, frustration and anxiety.

- Salience of Drug Taking Relative To Other Activities.

This is where the compulsion to continue using the drug overcomes all other considerations, be they legal, family, health, moral or financial. One example would be a cigarette smoker who continues to smoke despite a heart attack or other serious health problems. In the case of a heroin addict this salience would manifest itself in a total preoccupation with drugs, where the whole day is spent looking for drugs to buy, selling drugs, and stealing from friends, family, employers, in order to get money for the next 'fix'.

- Relapse.

The tendency for drug dependent persons who have abstained from drug use for a period of time to resume drug taking after treatment is extremely high. This is one of the reasons why treatment of addiction is so difficult. Increasingly it is being recognized that drug dependent persons will require treatment and rehabilitation on several occasions during their drug-using careers.

Newer Concepts

In more recent times a broader view of dependence has placed less emphasis on physiological factors such as tolerance and withdrawal and more emphasis on drug related behavioural changes such as loss of control over drug use, being unable to stop using the drug when the user wishes, as well as continuation of use despite clear evidence of harmful health or personal consequences. These concepts have now been incorporated into the International Classification of Diseases (ICD-10) criteria for drug dependence and also into the nine criteria in the Diagnostic and Statistical Manual on Mental Disorders (DSM IV) for drug dependence. On this basis it is likely that most pleasure-inducing psychoactive drugs can result in compulsive dependent use. The risk of dependence developing does however vary from drug to drug. For example studies in heroin users show that many can give up heroin easier than they can give up nicotine.

Drug-related Problems

Introduction

Drug dependence and drug misuse are not synonymous. Drug dependence is only one feature of drug misuse; other aspects are important in their own right. Drug problems can occur in the absence of dependence. A dangerous drug such as LSD can cause serious problems and yet has low dependence potential. It is also possible for individuals to suffer harm even though they are not dependent on the drug. On the other hand, some individuals may be dependent on drugs but because of the circumstance of the drug use may not necessarily come to serious physical harm, e.g. a doctor or nurse using sterile pharmaceutical grade opiates.

In assessing the damage that drugs cause it is essential to look beyond dependence per se and carefully analyse how individuals are actually harmed by their drug use. An overemphasis on dependence, which is difficult to treat, may result in the neglect of more effective ways of preventing and treating much of the problems caused by drugs. Therefore a broad view of problem drug use must take into consideration, not only the harm from dependence and overdoses but also the following aspects –

- Drug use and crime
- Drug related diseases
- Drug use and pregnancy
- Behavioural changes
- Family disruption

- Drugs and Crime.

There is a general perception that drug use is associated with crime. There is no clear-cut explanation for this because on the one hand it is generally recognized that no drug has inherent crime-causing properties, yet on the other it is beyond dispute that many opiate dependents are heavily involved in crime.

One survey that compared heroin users with non-users in Dublin reported that heroin users were about three times more likely than non-users to have been arrested for robbery and/or assault. In another Irish study, approximately 60% of the heroin users had been arrested for robbery, although the majority of those arrested reported that their first arrest occurred before they began to use drugs. A recent study in Dublin reported that 58% of heroin addicts had been in trouble with the law before they ever used heroin.

It is highly probable that it is the high cost of a drug like heroin on the black-market which influences the amount of crime against property, so-called acquisitive crime, commonly associated with heroin users. In Ireland, for example, it has been estimated that a heroin user with an established dependency could be using between €25 and €250 worth of drugs every day. It is not surprising therefore that many such dependants are forced into a life of crime involving male or female prostitution, burglary, petty theft, shoplifting and particularly drug 'pushing' in order to pay for their drugs.

However, the perception that virtually all acquisitive crime is drug related is at odds with international and Irish studies that show that drug related robberies are significantly lower than generally recognized. A report by the Gardaí in 1997 estimated that while drug users committed 66% of detected crime, the percentage actually committed to buy heroin was 43%. This figure is approximately double the figures for the Netherlands, Norway or the U.K. There is little or no evidence that the majority of cannabis or ecstasy users commit such crimes to pay for their drugs of choice.

In general heroin users tend not to commit violent crimes, partly because of the sedative effect of the drug. The Garda report confirms this, showing that non-heroin users committed most violent crime. In some cases addicts in withdrawal may use violence or the threat of violence in the course of a robbery in their desperation for drugs and/or money.

There are other drugs whose effect on mental functioning may lead to violent crime against individuals. Angel Dust or PCP is a drug that can cause frightening violent homicidal attacks. The paranoia associated with amphetamine and cocaine use could also result in physical violence. However, the drug most often implicated in violent crimes is alcohol. It is now widely accepted that alcohol has a direct effect on aggression in humans. International research into 9,000 violent crimes reported from 11 different countries found that nearly two thirds of violent offenders were drinking at the time of the crime. In other countries it has been estimated that alcohol may be involved in up to 30-50% of burglaries; up to 70% of violent incidents; up to 50% of murders, up to 27% of road traffic deaths and may have a role to play in many cases of football hooliganism.

- Drug-related Diseases.

Illness and diseases due to drug use can be due to the direct poisonous effect of the drug on various parts of the body, called substance-specific harm, or it can be due to the way the drug is taken, called technique-specific harm.

Examples of substance-specific harm include brain and liver damage caused by alcohol, as well as lung and cardiovascular disease caused by tobacco smoke and also by cannabis. Depression and other nervous problems may occur leading to admission to psychiatric hospitals. Many drugs can initiate attacks of pre-existing mental illness, for example cannabis may trigger off attacks of schizophrenia although there is no strong scientific consensus that cannabis 'causes' long term mental illness.

In contrast to alcohol and tobacco, heroin has few physically damaging effects on the body apart from the obvious risk of an overdose. Chronic opiate use is likely to result in constipation and loss of libido but it does not cause harm to the liver, heart or lungs. The major disease risk from heroin is from the infections associated with unhygienic practices when the drug is injected.

The problems associated with the injection of heroin or of any other drug can include:

Bacterial endocarditis is a potentially fatal infection of the valves of the heart resulting in damage to the valve and subsequent heart problems.

Septicaemia, abscesses or generalized blood poisoning because of bacterial contamination of the needle and syringe by bacteria normally found on the skin or in the mouth or present in unsterile water used to make an injection. In summer 2000, eight heroin users died in Dublin after injecting heroin intramuscularly, 'skin popping'. This was part of a larger outbreak of illness in Ireland, Scotland, England and Wales affecting 104 people and causing 35 deaths in all. The cause of death is believed to be infection by a type of bacterium (Clostridium novyi). The bacteria are believed to have been a contaminant in the heroin but the origin of that contamination is not yet known.

Gangrene cases have been reported when tablet forms of drugs, such as synthetic opiates are crushed, mixed with water and injected into the body. Ireland has the doubtful distinction of being the first country to report misuse of a product called Diconal® which was a tablet containing a mixture of the synthetic opiate, Dipipanone, and an anti-vomiting drug Cyclizine. A number of young Irish addicts lost fingers, hands and legs through amputation when gangrene developed. This occurred because of the presence of various additives in the tablet as well as the two drugs. These additives clogged

blood vessels leading to gangrene.

Blindness due to fungal disease has been reported from countries such as France and Australia. The problem arose from the availability of a smoking grade of heroin, probably Chinese no.3, which did not dissolve in water. In order to inject it, addicts used a variety of acid solutions such as vinegar, citric acid, car battery acid or lemon juice. The blindness occurred because some addicts used fresh lemons that were contaminated with mould. The mould was injected into the body and caused blindness.

Hepatitis is an acute illness caused by a virus resulting in an inflammation of the liver. The virus is spread via blood, saliva, body excretions, by sexual contact and through shared needles and syringes. Prior to 1980 there were very few cases but the numbers then began to rise rapidly as the number of heroin users in Dublin increased.

According to figures complied by Dr Alan Shattock of the Department of Medical Microbiology, U.C.D., the overall incidence of one type of hepatitis HBV (hepatitis B) in Ireland quadrupled in the years immediately after 1980, largely due to a 15-fold increase in infections in intravenous drug abusers. Prior to 1980 only 20% of positive individuals were drug misusers, whereas since 1980, 72% of positives were associated with drug misuse. There had been a reduction in recent years in the number of cases detected among drug users but studies among intravenous drug users (IDU's) in Irish prisons report prevalence rates of approximately 18%. It has also been reported that 36% of IDU's with hepatitis infections were also infected with the hepatitis D virus (HDV). Such patients are likely to suffer from more severe forms of the disease and are more likely to need hospitalisation because the risk of death from the acute form of the disease is increased by HDV, as is the risk of chronic active hepatitis and cirrhosis. Hepatitis B is believed to be 100 times more infectious than HIV. Most cases resolve spontaneously but up to 8% of positive adults and 15% of positive adolescents develop chronic infections which have a high mortality rate because they will develop either cirrhosis of the liver or liver cancer over the next 20-30 years.

International trends suggest that 22% to 44% of intravenous drug users test positive for HBV, while 60% to 85% are infected with a related virus Hepatitis C (HCV). Figures for Dublin show that HCV positivity ranged from 52% to 89% among drug users in treatment compared to a seropositivity rate of 5.8% for HIV. Hepatitis C is much more easily transmitted through blood than HIV, which may explain why levels of HCV are much higher in drug users. Sharing of 'works' other than needles and syringes such as spoons, filters, swabs, tourniquets, is seen as a factor in the high levels of HCV transmission as is the technique of 'front' or 'back-loading' of one syringe from a second to measure equal shares of drug. In 80% to 85% of cases, the infection persists and usually leads to chronic hepatitis that can result in cirrhosis and liver cancer. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) reports that 5% to 10% of those chronically infected with HCV will develop serious health problems. Co-infection with HBV, HIV and the use of liver damaging drugs, such as alcohol, speed up the progression of cirrhosis. Immunisation against Hepatitis B may help slow down the later stages of the disease.

HIV and **AIDS**, the sharing of needles and syringes also increases the risk of HIV (Human Immunodeficiency Virus) infection and the subsequent development of AIDS (Acquired Immune Deficiency Syndrome). HIV attacks the body's immune system. By damaging or destroying the body's ability to fight infections and disease, HIV makes an individual vulnerable to various infections and forms of cancer that are invariably fatal.

HIV infection can be spread in a number of ways including -

(i) sharing injection needles with an infected person
(ii) unprotected heterosexual or homosexual intercourse with an infected person
(iii) from an infected mother to her baby
(iv) through the use of blood and blood products from an infected person– N.B there is no risk of infection through this route in Ireland

Intravenous drug abuse is a particularly high-risk activity because the virus can be transmitted through infected needles, syringes, bowls or containers used to dissolve drugs and other

infected paraphernalia which are often shared by other drug users. A total of 2364 individuals were diagnosed as HIV positive in Ireland between 1986 and early 2001. The major risk group is clearly intravenous drug users (IDUs) because 41% of all cases (numbering 970 individuals), were detected in this group. The proportion of positive cases among IDUs relative to other risk categories such as homosexuals and heterosexuals, has fallen in recent years. This is probably due to the increased availability of programmes designed to reduce the spread of the virus in IDUs. However, there seems to have been an upward trend since 1995. The overall levels of HIV infection among IDUs tested for the virus range from 1.2% to 65% depending on when and among whom the study was conducted. The most recent studies on IDUs in prisons reported that 5.8% of those tested were infected. However, HIV is not as infectious as many other viruses such as Hepatitis, and normal social contact with a person with HIV or AIDS will not lead to infection. Cases of AIDS in drug users account for nearly half (48%) of those who have died from AIDS since 1982. Since then 691 cases have been reported among all risk groups of whom 349 have died.

The infections associated with AIDS usually result in death as there is no complete cure available, although new medication combinations have lead to improvements in life expectancy. In recent years there has been growing concern about levels of Tuberculosis (TB) linked to HIV and AIDS sufferers.

- Drug use and Pregnancy.

Increasing numbers of girls and women are becoming heavy users of all types of drugs. The disinhibiting effects of drugs such as alcohol and cannabis may lead to unwanted pregnancies.

Sometimes drug use is continued during pregnancy. The developing foetus will be exposed to significant quantities of drugs and because its ability to eliminate drugs such as heroin, alcohol, cannabis and others is incompletely developed, such exposure could be more prolonged than in an adult. In rare extreme cases, the drug may interfere with the rapid changes taking place in the foetus leading to malformations. This risk is often greatest in the first three months of pregnancy.

The drug can also affect the unborn baby in exactly the same way as it affects the mother, but the baby's immature body is less well able to cope. For example alcohol, sedatives and tranquillisers, which depress an adult's ability to breathe, will also depress this function in the foetus and also in the newborn baby. In a minority of cases, the baby may become dependent on a drug such as heroin while in the womb, if the mother is taking the drug continually during pregnancy. The baby will need medical care immediately after being born to avoid withdrawal symptoms. This is a serious problem in Dublin, where, prior to 1980, only one or two pregnant girls sought treatment for addiction during pregnancy. By 1984, however, this had risen to 54. A study of 45 such mothers revealed that 105 children have been born to the members of the group.

The risks in pregnancy are not the same for all drugs. They are most established for drugs with depressant effects. In general, heavy drug use during pregnancy is associated with an increased risk of losing the baby at birth. This may be due to the direct effect of the drug, or it may be indirect because of the effect of drug use on the health of the mother such as self-neglect and poor nutrition. Apart from anything else, heavy drug users are less likely to attend antenatal clinics early in their pregnancy. The evidence for the effects of moderate use of many drugs during pregnancy is inconclusive; the best advice must be not to take any drug, including alcohol and tobacco and perhaps coffee during pregnancy without consulting a general practitioner.

- Behavioural Changes.

For some drugs the effect on behaviour is often the most dangerous feature, for example the case of a 16-year-old in London who consumed magic mushrooms and was killed when he tried to walk between two underground train stations.

Many drugs change behaviour by releasing pre-existing aggressive tendencies, for example alcohol may reduce the normal inhibitions, which control an individual's violent attitudes leading to violence. Behavioural effects are also a significant feature of solvent misuse where the intoxication caused by the fumes from aerosols, glues and butane gas can release aggressive tendencies resulting in anti-social violence and vandalism.

Other hazards are due more to the sort of life heavy drug users lead and the behaviour it involves. Their health may be damaged by living rough, eating insufficient food and having no sense of purpose or belonging outside of their drug taking. Drug misusers are believed to have a mortality rate much higher than the general population, not only from acute overdoses but also because of HIV infection, accidents and suicide. The full extent of the deaths from all such causes in Ireland is not yet fully known but it is known from detailed investigations of coroners' inquest reports that between 1998 and 2000 in the greater Dublin area at least 254 deaths were detected that were opiate-related. Men were 8 times more likely to have died than women. The most frequent drug found was a Benzodiazepine-type tranquilliser followed by heroin, then methadone and then alcohol. Most of the deaths involved polydrug abuse in which opiates, benzodiazepines and alcohol were the main contributory causes of death.

Internationally the EMCDDA reports that opiate injectors have a 20-30 times higher risk of death than non-drug users of the same age. Among females the rate can be over 30 times higher than in males. There is no information as yet on the mortality rate among Irish opiate users. Internationally it is recognized that most deaths occur among injectors in their late 20's or 30's.

The presence of other drugs such as alcohol and benzodiazepines increases the risk of death and the rate among injectors is 2-4 times higher than in non-injecting drug users. The risk of death among addicts is probably due to the lifestyle involving as it often does, crime, prostitution and drug pushing in order to maintain an expensive drug habit combined with malnutrition, self neglect, disease and over dosage, as well as the actual drug dependence itself.

- Family Disruption.

It is not just the drug user who suffers harm. The strain and tension arising from the deceit, lies and manipulation associated with dependence often leads to the break-up of families and friendships.

Income required for food, clothing and shelter, might be wasted on drugs and alcohol. Decreased productivity may further reduce family income. Other family obligations such as childcare may be neglected and sexual problems between husband and wife may occur. Alcohol is known to be a major factor in over 30% of broken marriages in Britain and 52% of cases of wife battering are said to be alcohol-related.

Families of young people involved in solvent abuse are particularly at risk. This is due to the difficulty of having to deal with an adolescent intoxicated with solvents, assaults on members of family, legal difficulties resulting from the abuse and failure of the child to return home at night. Many parents are also frightened that their other children may imitate the abuser and start experimenting with solvents or other drugs.

Even with drugs, where the medical dangers from very occasional use of low strength products may appear slight, legal dangers remain. Being arrested, prosecuted and convicted can be enough to cause great distress to the drug user and their family, and may have lifelong consequences.

Effects on Society in General

Introduction
The harm caused by drugs can also arise in other ways; because they are frequently involved in illegal activity, many drug addicts become isolated from ordinary life, only having contact with a small sub-group of drug using friends. They thus find it harder to obtain or retain a job and to find a place to live. Increasingly they find themselves 'marginalized', ostracized from society and form an alienated minority. As a result, a large amount of government funds must be spent on law enforcement and on medical care. The whole community pays a heavy price for drug related crime through increased taxes and through increased insurance premiums. The community also loses out because of lost productivity due to absenteeism, unemployment and loss of earnings.

In some Latin American countries the huge profits amassed by drug producers and traffickers have had a destabilizing effect on the local economy. As a result, some cocaine 'barons' have more wealth than the State and have attempted to use this wealth and the arms it can buy, to blackmail and terrorise the organs of government into silence and tolerance of their illegal activities. The use of private armies developed from drug money has coined the term 'Narcoterrorism' and a number of countries are now almost completely outside the control of their governments and in the grip of the powerful drug barons.

Wrong time, wrong place
Even in moderate amounts most of the drugs mentioned in this publication damage co-ordination, reaction time and the ability to maintain attention, effects which can last for hours. No matter how the person feels, they are not as capable as before and activities such as driving, operating machinery, even crossing the road become more dangerous, both to themselves and to others.

While there is a general awareness of the link between alcohol consumption and road traffic accidents, there is less appreciation of the damaging effect of cannabis and tranquillisers on the skills required to drive safely. There is increasing evidence from other countries of the role of cannabis in particular, in road traffic accidents and fatal train crashes. In some studies the percentage of those killed and injured in crashes, who had been using cannabis, is the same as the percentage who had been drinking alcohol.

The impairment caused by many drugs may last for hours after the sought after effects have worn off. For example, the effect of cannabis on driving ability persists for three to four hours after the 'high'. It is claimed that even single doses of some minor tranquillisers taken the night before, can impair driving ability the following morning.

Drugs in the workplace
Drugs such as cannabis, alcohol, ecstasy and tranquillisers can also impair intellectual performance, memory and learning ability. Therefore individuals who misuse drugs frequently and / or during the day will be less effective at work. There is concern that the costs are being paid for in terms of workplace performance and safety.

The harm caused to an individual's ability to learn and remember vital skills damages their ability to gain employment and the ability to perform a job efficiently and with due regard to the safety of themselves, their fellow workers and the general public. Drug misuse in the workplace leads to problems such as –

- increased absenteeism - drugs misusers are missing from work up to 2.5 times more often than non-users,
- ill-health - drugs misusers are believed to lose 10 times more sick days than non-users,
- work accidents – 2 - 3 times higher in misusers,
- lower productivity – 24 - 33% lower in drug users,
- thefts of products, raw materials, tools or embezzlement by white collar 'management',
- decreased quality of work,
- management/employee difficulties due to personality changes.

As a result, drug misuse in the workplace results in large financial losses, such as the estimated €360 million in lost output in Ireland due to alcohol misuse, not to mention the huge loss of human potential.

Designer Drugs
These are chemicals in which the psychoactive properties of controlled drugs have been retained, but the chemical structure has been deliberately changed by 'design' in order to avoid prosecution under existing drug laws. Illegally developed 'relatives' of such drugs as Fentanyl (Sublimaze®), Phencyclidine (PCP) and Pethidine are defined as 'designer drugs'.

Alpha methylfentanyl (AMF) was the first such drug prepared from fentanyl which is a fast-acting powerful painkiller. AMF, sold as 'China White' or synthetic heroin in the US, is reported to be 1,000 times more potent than morphine. Other fentanyl derivatives are even more potent with doses being measured in microgram's rather than milligrams. Reports from the US suggest that these drugs are proliferating and represent a serious health hazard with over 100 overdose deaths believed to be due to fentanyl derivatives.

Another designer drug with devastating effects is MPPP derived from pethidine, which because of shoddy chemistry contains an impurity called MPTP. When taken, MPTP can cause permanent Parkinson's disease by destroying neurotransmitters at the base of the brain. Symptoms include seizures, inability to speak, rigidity of the body and eventually total paralysis. The brain damage caused appears to be irreversible although it may be possible to provide temporary relief of symptoms.

A number of derivatives of Angel Dust (phencyclidine) have appeared on the American black market. Drugs such as eticyclidine, rolicyclidine, tenocyclidine, have been controlled in Ireland since 1987, as have various fentanyl and pethidine derivatives.

All these designer drugs are produced in illegal underground laboratories using 'recipes' passed on through the grapevine and over the Internet. The increasing sophistication of the back street chemists represents a new danger to drug users. Because there is little or no control on the quality of the drugs, there is no way of preventing disasters such as the paralysis caused by MPPP or the overdoses caused by 'super potent' derivatives of fentanyl.

Drugs and Sport
The misuse of drugs not only permeates our leisure and working lives but has also affected sporting activities in recent years. The increasing competitiveness and professionalism of modern sport with its emphasis on huge financial incentives has led to an unwelcome and dangerous use of many different types of drugs to improve sporting performance.

Most sports now prohibit the use of drugs that are likely to give one individual an unfair advantage over another. The Olympic Council of Ireland has published a list of drugs that are restricted. This list includes stimulants such as amphetamine, ephedrine and pseudoephedrine found in some cough bottles as well as narcotic analgesics such as codeine and morphine. Other prohibited drugs include diuretics such as frusemide, which increase the flow of urine and thus fluid loss leading to a reduction in body weight. In addition diuretics, by increasing the volume of urine, can reduce the concentration of banned drugs close to or below detectable levels through dilution. Some drugs block excretion of drugs through the kidney and can be used to mask the presence of prohibited chemicals such as probenicid. Other drugs such as the beta-blockers used medically for high blood pressure can be misused to reduce nervous tremor in sports such as shooting and archery.

A major prohibited group of drugs are the anabolic steroids such as nandrolone, stanozolol and testosterone among others. They are used to increase body weight and muscle mass and reduce fat in athletes and body builders and also to increase competitiveness. The dosages used are often many times higher than the recommended medical doses. Steroids can be taken orally as tablets that are swallowed or through tablets that dissolve under the tongue, by intramuscular injection or through patches applied to the scrotum. Anabolic steroids have a number of potentially serious side effects such as, high blood pressure, increased cholesterol levels, breast enlargement and shrinkage of the testes in males, menstrual irregularities and the development of male characteristics in women, acne, baldness and water retention. Teenagers are particularly at risk because of the drugs stunting effect on their growth.

Increasing use is being made of hormones such as Human Growth Hormone and Erythropoeitin (EPO), in the former case for its anabolic effects

and in the latter case to increase the number of red blood cells and as a result the oxygen-carrying capacity of the blood. This is a major help in endurance competitions such as long distance running or cycling stage races.

The testing of blood and urine samples is used to detect this type of cheating. In the case of steroids this is particularly difficult because the body also produces natural steroids. Normally the ratio of testosterone to its related epitestosterone in the body is 1:1. The use of additional testosterone would increase this above 6:1 which is the maximum permitted ratio.

Further information on prohibited drugs in sport may be obtained from the Olympic Council of Ireland. Athletes seriously interested in their sport should contact their medical practitioner, pharmacist or sporting body for advice before they take any prescription medicine or supplement as well as supplements or medicines bought without a prescription called over the counter medication (OTC).

The Extent of the Problem

There is no satisfactory answer to a question such as "how many people use drugs in Ireland?" Not surprisingly, facts and figures are more readily available about the use of drugs such as alcohol and tobacco that are legal. It is much more difficult to determine the number of Irish people using, misusing or dependent on the various illegal drugs such as opiates, cocaine and cannabis. This is in part due to the difficulty of measuring the extent of any illegal activity. Information on this sector of the drug scene depends on users of illegal drugs coming to the attention of the legal system, health services or social workers.

A variety of indirect and often imprecise indicators must be collated in order to develop an overall picture of the extent of the "drug problem". However, none of these indicators, either on their own or collectively can give an absolute measure of the extent of the problem, but merely give a relative measure of changing trends over a period of time. The indicators most often used include the results of surveys of self-reported drug taking among selected groups of the population, law enforcement statistics relating to prosecutions and seizures of drugs, and health service data such as admissions to treatment, HIV and hepatitis cases and drug-related deaths. The information is collected by the Health Research Board for national purposes and for transmission to the European Monitoring Centre for Drugs and Drug Addiction which publishes an annual report on the state of the drugs problem in the European Union.

In addition to data on illicit drugs, the extent of legal consumption of medicines, alcohol and tobacco is often indirectly relevant to the use of illegal drugs because the use of 'legal' and 'illegal' drugs is interconnected at several levels. At one level, it is often the case that widespread socially acceptable drug use encourages people to see drug use as an appropriate way of responding to personal or social difficulties or simply to alter mood. On another level, the same people who use alcohol, may also use medicines or alcohol as part of their overall pattern of drug use, depending on what drugs are available on the black market at a given time. Also it is believed that early involvement by young people with legal drugs is a predictor of subsequent involvement with illegal drugs.

A major difficulty with much of the available information is that it is retrospective and merely confirms what we know has happened months or even years ago. On the basis of the indicators at present available, imprecise though they are, it can be stated with certainty that there was a rapid increase in illegal drug use in Ireland since 1979. The 1990's saw the emergence of the ecstasy phenomenon while the heroin problem worsened. Various estimates of the extent of heroin use have been put forward but we have no accurate way of knowing how many people use heroin or how many are dependent on it and related opiates. All that can be stated with certainty is that between 1990 and 1999, 12,357 people sought treatment for the first time for

drug related problems. Heroin or opiate users accounted for 61.1% of those seeking treatment (n=7,559). There is no way of knowing what proportion of the total opiate-using population is represented by this number. It is known that currently opiate misuse is largely confined to the greater Dublin area.

The survey data indicates that experimentation with drugs has increased. A 1995 survey among 16 year olds reported that 37% had used cannabis and 9% ecstasy. The figure for cannabis was three times the average for other European countries in the study, however it did not include data from France, Germany or the Netherlands. The corresponding 1999 European School Project on Alcohol and Drugs (ESPAD) study shows a welcome drop in the experimentation rate to 32%. A feature of the earlier ESPAD report was the fact that Irish 16 year olds were below the European average in their perception of the risks associated with the use of illegal drugs, cigarettes and alcohol. The 1999 report suggests that this is no longer the case except for solvents. Allowing for under-reporting, which is inevitable with the survey approach, survey data shows that young Irish people use or experiment with illegal drugs at much the same level as their counterparts in other developed countries, except the USA where levels of reported drug use are higher than in Europe. Most surveys, although difficult to compare, suggest that about 25% of young Irish adults (18-34) have tried illegal drugs at least once. The vast majority of them, therefore, do not use or experiment with illegal drugs.

However, there are grounds for concern about the numbers of young people using cigarettes and alcohol. In this, of course, they are merely following in the footsteps of their adult fellow countrymen and women who spend over €5,400 million on legal drugs such as alcohol and tobacco each year. Many pay a high price for this drug consumption in terms of dependence, ill health and premature death. With approximately 95,000 alcohol dependants, 840,000 nicotine dependants and an estimated 22,000 at risk from tranquilliser dependence, it is difficult not to agree with the suggestion that most Irish people have more to fear from legal drugs and medicines than from illegal drugs.

Chapter 3 - Drug Laws

Introduction
The availability of drugs in Ireland is legally controlled through a number of statutes. This chapter will give you an overview of the key statutes and their provisions.

The 1961 Poisons Act
The 1961 Poisons Act controls the sale of poisons by confining their sale to authorised sellers, which are mainly pharmacists. Most recognised drugs of misuse are controlled in this way, but are also subject to further more stringent legal controls

The 1947 Health Act
The 1947 Health Act permits the Minister for Health to make regulations to control the sale of medical preparations. Several such regulations exist.

The Medical Preparations (Control of Sale) Regulations restrict the sale of a wide range of drugs to pharmacists only. The regulations are comprised of five schedules. Drugs listed in either part of the first schedule may only be made available by retail sale on medical, dental or veterinary prescription. This schedule includes amphetamine-type stimulants and barbiturate sedatives, as well as various minor tranquillisers of the diazepam type, all of which are also subjected to other far more stringent controls. The second schedule lists substances such as oral contraceptives. The third schedule includes medicines that a pharmacist may not supply under the 'emergency supply' regulations for example barbiturates, which are controlled by the Misuse of Drugs Acts. The fourth schedule lists cautionary warning notices that should appear on dispensed medicines. For example, various anti-histamine drugs used to combat hay fever, prevent travel sickness and included in some cough bottles may cause drowsiness. Accordingly, the latter type of product must bear a warning that 'this may cause drowsiness'. The fifth schedule contains substances which cannot be supplied by a pharmacist in an emergency at a patient's request but which may be supplied at the request of a G.P.

Medical Preparations (Control of Amphetamines) Regulations 1970
The Medical Preparations (Control of Amphetamines) Regulations 1970 prohibit the manufacture, preparation, importation, sale or distribution of seven scheduled amphetamine ('speed') type drugs. The Minister for Health may grant licences for the manufacture, importation or sale of a specified quantity of a controlled preparation when it is needed for certain medical conditions.

Misuse of Drugs Acts 1977 & 1984
The Misuse of Drugs Acts are intended to prevent the non-medical use of drugs. For this reason, they control not just medicinal drugs but also drugs with no current medical use. Offences involving the general public are covered under these Acts. The drugs to which the Acts apply are specified in the schedules to the Act and are known as controlled drugs. The list includes, in addition to opiates such as heroin, other substances such as sedatives, stimulants and hallucinogenic drugs which are liable to misuse.

The Acts define a series of offences relating to controlled drugs including –
- unlawful supply
- intent to supply
- the import or export
- the unlawful production
- the growing of opium poppies, cannabis and coca plants
- the forging of prescriptions
- the occupiers of premises knowingly allowing illicit traffic in drugs
- the occupiers of premises permitting the use of controlled drugs on their premises.

The Acts also prohibit the unlawful possession of drugs, but makes a distinction between possession for one's own personal use and possession for illegal supply to another person ('pushing'). This latter offence carries much heavier penalties.

To enforce this law, the Gardaí have special search powers to stop, detain and search people and vehicles without a warrant if they have 'reasonable' cause to believe that someone is in possession of a controlled drug. Customs and Excise officers have similar powers under the Customs and Excise (Miscellaneous Provisions) (No.2) Act 1988 which also permits intimate body searches by a medical practitioner acting at the request of a Customs Officer, in order to detect smuggling of drugs in body cavities by so-called 'stuffers and swallowers'.

The Misuse of Drugs Act 1984 prohibits the printing, or sale of books or magazines that encourage the use of drugs proscribed in the Act, or which contain advertisements for drug equipment, pipes or cocaine kits.

Maximum sentences differ according to the nature of the offence. Sentences are greater for pushing, illegal production or for allowing premises to be used for producing or supplying drugs, but are less for possession for one's own use. For the more serious offences, maximum penalties include life imprisonment or an open-ended fine.

In the case of cannabis, on the other hand, the maximum penalty for possession for personal use is restricted to a €381 fine for a first offence tried in the District Court, or €635 fine on indictment, €508 fine for a second offence with no option of imprisonment. If this second offence is tried before a judge and jury, the maximum fine is €1,270. For third and subsequent offences the fine is €1,270 or 12 months in jail or both. The penalty for a third offence tried by judge and jury is an open-ended fine or three years in jail, or both.

The penalty for possession of all other drugs depends on the type of court. In the District Court, the penalty is a maximum fine of €1,270 or 12 months in jail, or both. In the case of a person found guilty before a judge and jury, the maximum fine for possession is left to discretion of the court, which may also impose a seven-year jail sentence, or both.

Over 70% of drug convictions involve the possession of drugs while convictions for 'pushing' or trafficking account for about 10% of cases before the courts.

When a person is convicted of an offence under these Acts the Court may decide to obtain a written medical report on the convicted person, with recommendations about medical treatment which the person might require arising from his or her dependency on drugs, and also a report on the person's social background, vocational and educational circumstances. On the basis of these reports the Court may decide not to impose the appropriate penalty. It can decide to have the person detained in a custodial treatment centre or require them to undergo a course of medical treatment, a course of education and training or both to improve their social and educational background with a view to facilitating social rehabilitation.

This concept has rarely been implemented. A refinement was introduced on a pilot basis in 2001 with the introduction of a Drugs Court system under the aegis of the District Court. The idea is that these Courts would be treatment focussed and that problem drug users charged with non-violent offences could be diverted to treatment programmes rather than being sent to jail.

Regulations made under the Misuse of Drugs Acts divide the controlled drugs into five separate schedules to take account of medical practice. These schedules allow exceptions to the general prohibitions on the possession, supply and use of controlled drugs.

Schedule 1. lists mainly hallucinogenic drugs that have no medical use at present. It also includes some of the 'designer drugs'. The drugs in this schedule cannot be prescribed by doctors or sold in pharmacies. The use of these drugs is limited to scientific research or forensic analysis. Production, supply, import and possession are subject to special licensing.

Schedule 2. lists those drugs which may be used for medical purposes but which are regarded as particularly dangerous if misused. The list consists mainly of the opiates, both naturally occurring ones such as morphine and synthetic ones such as pethidine. It also includes amphetamines and related stimulants. Any of these drugs can only be legally obtained when prescribed by a doctor, dentist or veterinary surgeon and supplied by a pharmacist. All aspects of the production and supply of Schedule 2 drugs are strictly controlled and licensed. These drugs are further subject to stringent storage conditions in pharmacies and to strict record keeping requirements.

Schedule 3. lists drugs to which less stringent controls and no record keeping requirements apply. It contains certain dependence-producing sedatives such as barbiturates, some painkillers and some appetite suppressants.

Schedule 4. lists various minor tranquillisers and preparations of phenobarbitone containing less

than 100 milligrams. There are minimal misuse of drugs controls applied, since these medicines are already controlled under the Medical Preparations (Control of Sale) Regulations made under the 1947 Health Act.

Schedule 5. lists certain preparations of controlled drugs to which the restrictions on possession do not apply. These are usually very dilute non-injectable products some of which can be bought over the counter (OTC) without a prescription only from a pharmacy, for example some cough bottles and anti-diarrhoea products that contain opiates.

The Acts give the Minister for Health the power to give a direction prohibiting the prescribing of controlled drugs by a doctor, dentist or veterinary surgeon, who has been found, after investigation by a committee of inquiry, to have been prescribing, administering or supplying such drugs in an irresponsible manner. A doctor, dentist or veterinary surgeon against whom such a direction is made is given an opportunity to answer the case made against them and also has the right of appeal to the Courts. The Minister for Health has served seven doctors with such directions, since 1979 when the Misuse of Drugs Act became law.

There is a special procedure allowing the Minister to give a temporary direction in a case of urgency. A prohibition on prescribing under such a direction lasts for four weeks but may be extended for periods of 28 days at a time while a committee of inquiry investigates the case.

International and E.U. regulations

The processing of drugs from plants such as the Opium poppy and the Coca plant, as well as the synthesis of L.S.D., Ecstasy, Amphetamines and the so-called 'designer drugs' requires the availability of various chemicals needed in different stages of their production. Article 12 of the 1988 United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances attempts to limit the supply of precursor and processing chemicals to illegal drugs producers. Within the E.U., a number of Council Regulations and a Directive (92/109/EEC) have been introduced to give force to the provisions of the U.N. Convention.

In Ireland, the E.U. provisions have been implemented by means of the European Communities (Monitoring of External Trade in Scheduled Substances) Regulations 1993. The controls in the Regulations require producers, importers, distributors and users of 22 different chemicals to maintain records of stock. Government authorisation is required before some chemicals can be exported, while for others, such authorisation is only required if they are being exported to certain key countries such as Colombia, Lebanon and Myanmar (Burma).

Advance notification of sales of chemicals such as Ergotamine used to produce L.S.D. or Safrole used to produce Ecstasy, allow governments an opportunity to delay consignments pending investigation or to veto deliveries altogether.

A person who commits an offence under these Regulations may be fined up to €1,270 or imprisoned for up to 1 year or may be fined and imprisoned. The Government has further strengthened the controls on these 22 precursor chemicals by designating them as controlled drugs under the Misuse of Drugs Acts.

Criminal Justice Act 1994

The Criminal Justice Act of 1994 made provision for the recovery of the proceeds of drug trafficking by making it possible for the Director of Public Prosecutions to ask a court, which has found a defendant guilty of such a charge, to determine whether the person has benefited from drug trafficking. If the court so determines, a confiscation order shall be made to recover the amount of money determined by the court.

The Act defines drug trafficking offences as including those under the Misuse of Drug Act 1977 (sections 5,15 and 20), offences under the Customs Acts as well as the planning of the production, supply, transportation, storage, import or export of a controlled drug both inside the State and elsewhere.

The Act requires that a mandatory minimum sentence of 10 years imprisonment be imposed on individuals found guilty of an offence under Section 15 of the Misuse of Drugs Act where the offence is considered to be drug dealing and the value of the drug or drugs amount to €12,700 or more. In the case of individuals who are addicted to drugs and where their addiction was a substantial factor in their drug dealing, the sentence may be reviewed after five years.

This Act also created the offence of money laundering which involves concealing or disguising property representing the proceeds of drug trafficking, transferring or removing it from the State. Individuals who help drug traffickers and other criminals to launder money likewise come within the scope of this Act. Once found guilty, they may be fined €1,270 or sent to jail for 12 months (District Court). If tried in a higher court they are liable to penalties of a fine, 14 years in jail or both. Designated bodies such as financial institutions and their staff must establish the identity of those seeking to use their services, particularly where it involves sums of at least €12,700 and must report to the Gardaí where they suspect that a money laundering offence is involved.

The Criminal Assets Bureau Act 1996
The Government established the Criminal Assets Bureau after the enactment of the Criminal Assets Bureau Act 1996. The Criminal Assets Bureau identifies assets derived directly or indirectly from criminal activity and aims to deprive individuals of these assets by means of confiscation, restraint of use, freezing, preservation or seizure of all assets identified as deriving or suspected to derive from such activity. In addition, the Bureau aims to ensure that such individuals and their assets are subjected to the full rigours of the Revenue Acts including taxation. The profits arising from drug dealing as defined in the Misuse of Drugs Acts are a major target for the Criminal Assets Bureau.

The Bureau consists of members of the Garda Síochána, Revenue Commissioners and of the Department of Social and Family Affairs, nominated by the respective organisations as well as legal and technical experts. Their identities cannot be revealed so as to protect them and their families from threats and intimidation. Any such attempt is punishable by means of a fine of €1,905 or 12 months in jail imposed by the District Court. Higher courts may impose fines of €127,000 or 10 years imprisonment or both.

The Criminal Justice (Drug Trafficking) Act 1996
The Criminal Justice (Drug Trafficking) Act 1996 gave Gardaí additional powers of detention where they suspected someone was involved in drug trafficking or where they were suspected of concealing drugs within their body. Under the provision of the Act a person can be detained for up to 1 week (168 hours) initially upon the authority of a Chief Superintendent but subsequently by way of a warrant from a District or Circuit Court judge. The aim is to provide time for the Gardaí to fully investigate any alleged trafficking offences. The Act further allows courts to draw inferences from the failure of an individual to mention facts to be relied on in their defence, either before or when being charged. It also gives Gardaí power to enter and search dance halls.

Licensing (Combating Drug Abuse) Act 1997
The power to enter dance halls was extended further by the Licensing (Combating Drug Abuse) Act 1997 which made provision for measures to combat drug misuse in places used for public dancing in licensed premises and other entertainment venues. It also provided the Gardaí with the power to prevent unlicensed dances such as open-air 'raves'.

In the case of a 'rave' individuals involved in organising it can be directed to leave an area and remove any sound or lighting equipment. Failure to comply leads to a fine of up to €1,905 or 3 months imprisonment. The Gardaí can also stop and turn back individuals planning to attend such an unlicensed dance. Gardaí can seize sound equipment they suspect is to be used at an unlicensed dance and a court may order the confiscation of the sound equipment subsequently.

In relation to pub and dance hall licences, any person who has been convicted of a drug trafficking offence is disqualified from ever holding such a licence. A licence holder who permits the use of the licensed premises for the sale, supply or distribution of a controlled drug is likely to have the licence immediately revoked by Court Order and neither they nor the premises may obtain a licence for five years. The licence-holder must have been previously warned by a member of the Gardaí Síochána about the suspicion that the premises was being used for trafficking in drugs and the need to prevent such activity and have been given not less than 4 weeks to take appropriate action.

Housing (Miscellaneous Provisions) Act 1997
The Housing (Miscellaneous Provisions) Act 1997 allows housing authorities or their tenants to

apply to the District Court for an excluding order against an individual engaged in anti-social behaviour. Such behaviour is defined as drug dealing and/or serious violence and intimidation. It should be noted that simple possession of drugs for personal use does not come under this heading.

In such circumstances the District Court may order an individual to leave the house in question and not to enter or be in the vicinity of the house or housing estate. Such excluding orders may be made on an interim basis and allow a more targeted approach than the eviction of an entire household in cases of anti-social behaviour. Orders may be made for a maximum period of three years but can be renewed or varied in length. Individuals who disobey the order may be fined a maximum of €1,905 or sentenced to 12 months in jail or to both a fine and jail by the Court.

The Act also permits the housing authority to refuse to let or sell a dwelling to a person where the authority considers that the person is engaged in anti-social behaviour or that the letting would not be in the interest of good estate management. Health Boards may also refuse or withdraw rent and mortgage assistance to individuals who have been evicted, excluded or refused housing on grounds of anti-social behaviour.

Non Fatal Offences Against the Person Act 1992
The Non Fatal Offences Against the Person Act 1992, made it an offence to attack someone with a syringe or to threaten them with a syringe. On conviction, the District Court may impose a fine of €1,905 or 12 months imprisonment or both. In higher courts someone found guilty may be fined or sentenced up to 10 years in jail.

This Act also permits Gardaí to seize syringes and penalise individuals who abandon syringes where others are likely to be endangered. In these cases the District Court penalties are the same as for attacks but on indictment the maximum jail sentence is 7 years.

Section 12 of this Act involves poisoning offences of relevance to 'spiking' of drinks as well as to cases of drug-assisted sexual assault, so-called 'date-rape'. Poisoning is interpreted as knowingly administering a substance to another person without their consent, which is capable of interfering substantially with the person's bodily functions. Such a substance may be one that is capable of causing unconsciousness or sleep. The penalty for someone found guilty in the District Court is a fine of €1,905 or 12 months or both. On indictment such as in the Circuit Court, there may be a fine or 3 years in jail or both fine and jail sentence.

Criminal Justice (Public Order) Act 1994
The Criminal Justice (Public Order) Act 1994 makes it an offence for a person to be intoxicated in a public place to such an extent as to be a danger to themselves or others. The penalty for such an offence is a fine of not more than €508. While the word 'intoxicated' mainly relates to drunkenness, the Act makes clear that it also refers to other drugs, to solvents or other substances or to combinations of substances. The Act also allows Gardaí to seize any bottle or container that they have reasonable cause to suspect contains an intoxicating substance. They can also indicate, in relation to certain events, that those in possession of intoxicating liquor are liable to have that alcohol confiscated.

Road Traffic (Amendment) Act 1978
The Road Traffic (Amendment) Act 1978 makes it an offence to drive a car, motor bike, truck, pedal cycle or animal drawn vehicle while 'under the influence of an intoxicant to such an extent as to be incapable of having control of the vehicle'. Intoxicants include alcohol and drugs and any combination of drugs and alcohol. The word 'drugs' here includes prescribed and over the counter (OTC) medicines.

Merchant Shipping Act 1992
The Merchant Shipping Act 1992 (Section 24 Subsection 2) makes it an offence for the master or a crew member of a ship to be under the influence of alcohol or any other drug while on duty, to such an extent that his ability to discharge his duties is impaired. The penalty is a maximum fine of €1,270.

Intoxicating Liquor Acts 1988 & 2000
The supply, possession and consumption of alcohol and tobacco by adults is permitted, but at the same time availability is affected by taxation and various laws, some of which are designed to discourage young people from drinking and smoking. The Intoxicating Liquor Act 1988 not

only prohibits the sale of alcohol to those under 18, but also makes it an offence for a person under 18 to buy alcohol or to drink alcohol in a public place. In an amendment to the 1988 Act the Intoxicating Liquor Act 2000 allows District Court Justices to order the temporary closure of licensed premises where an offence of illegal supply to a person under 18 is proven. The closure can be of 7 days for a first offence and up to a month for a second offence.

Tobacco (Health Promotion and Protection) Act 1988

The Tobacco (Health Promotion and Protection) Act 1988 reinforces the prohibition on the sale of cigarettes to those under 16. This Act also bans the sale of smokeless tobacco products such as Skoal Bandits® and enabled the Minister for Health to introduce Regulations in 1990 prohibiting or restricting the use of tobacco in a large number of public areas including cinemas, theatres, trains, schools and public buildings. The Health (Miscellaneous Provisions) Act 2000 amended the 1988 Act by increasing the age limit of those to whom tobacco may be sold from 16 to 18 and increases the fine to €1,905.

Unrestricted Drugs

There are some 'drugs' that we often don't think of as drugs, whose availability is not subject to any legal controls on sale or consumption. Included in this group is caffeine contained in drinks such as tea, coffee and cola.

The supply of organic solvents in the form of glues and aerosols is prohibited under Section 74 of the Child Care Act 1991, where there is reasonable cause to believe the substance will be inhaled by a person under 18 for the purpose of causing intoxication. The actual possession and misuse of these products is not an offence, however a member of the Gardaí Siochana may seize a substance that is being inhaled by a person under 18. The penalty for supplying such products to those under 18 may include a fine of up to €1,270 or 12 months in jail.

Informal Controls

It is said that the non-medical use of all drugs is subject to informal controls arising from custom and culture and from the requirements of everyday life. These controls are more likely to be effective with drugs that are a familiar part of the culture. This may explain why coffee and tea are made available during the working day, while alcohol is generally reserved for after work. However, it has often been pointed out that the level of acceptance of excessive alcohol consumption is very high in Ireland. Strengthening of informal controls such as the increasing unacceptability of drunken driving or the hardening of attitudes to incompetence at work due to alcohol, may be as important as legal controls in preventing excessive, harmful or inappropriate use of drugs.

Chapter 4 - Alcohol

Introduction

Alcohol is almost certainly the oldest mood-altering drug used by man, and has been regarded as a food, a medicine and a drug. The use of beer, wine and mead was well established before the process of distilling spirits was invented about 800 A.D. in Arabia.

Alcoholic drinks consist chiefly of water and ethanol (ethylalcohol) produced as the result of fermentation by yeasts of sugars from fruits, vegetables or grain. Beer contains about 5 parts ethanol to 100 parts of water, wine is about twice as strong, sherry is four times as strong, while distilled spirits such as whiskey, vodka or gin consist of almost half ethanol and the rest water.

Methanol (methylalcohol) is a different type of alcohol produced from wood and is used in methylated spirits and surgical spirit. A very small number of homeless alcohol dependent drinkers may drink 'meths', because it is cheap. Methanol is very poisonous and frequently causes blindness, coma and death.

Ethanol, as in beer, wine and spirits, is unusual in that it supplies calories. Ethanol provides 7 calories per gram, whereas carbohydrates and protein provide about 4 calories per gram. Alcohol drinks thus provide energy but little other nourishment and for this reason are often referred to as providing 'empty calories'.

Legal Controls

Because alcohol is a potent drug its use has always been regulated by society in different ways. Thus, licensing laws lay down when, where and to whom alcohol can be sold, but do not make the possession or drinking of alcohol by adults an offence. Other legal controls on the use of alcohol relate to drunkenness, drunken driving and age restrictions on the purchase and consumption of alcohol by young people. The system of taxation via excise duty and VAT also has a role to play in influencing consumption of alcohol. Home brewing of beer and the making of wine, but not the distillation of spirits such as potín is permitted, provided the beverages are not sold. The Government raised over €880 million from excise duty on alcohol during 2000.

Alcoholic drinks may be sold for consumption on the premises in public houses, in restaurants, hotels and sports or social clubs, all of which must be licensed by a District Justice. Licensed off-licences sell alcoholic drinks, which cannot be consumed on the premises. One industry source suggests that there are 10,000 licensed premises, 80% of which are public houses.

Licensing laws restrict the hours during which alcohol may be sold. Under the Intoxicating Liquor Act 2000 public houses may open from –

- 10.30am to 11.30pm from Monday to Wednesday and Sunday
- 10.30am to 12.30am on Thursday, Friday and Saturday.

Late opening to 12.30am is also permitted on St. Patrick's Day and on the eve of Public Holidays. In addition to the above opening hours, a 'drinking up' period of 30 minutes, during which time alcohol may not be purchased, is permitted. All public houses must close on Christmas Day and Good Friday. Clubs, hotels and restaurants are permitted to serve alcoholic drinks to members or guests until much later than public houses provided that a substantial meal is provided at the same time. The number of licence 'extensions', which allows late drinking during dances and festivals, being granted is on the increase.

The Criminal Justice (Public Order) Act 1994 makes it an offence for a person to be intoxicated in a public place to such an extent as to be a danger to themselves or others. The penalty for such an offence is a fine of not more than €508. While the word 'intoxicated' mainly relates to drunkenness, the Act makes clear that it also refers to other drugs, to solvents or other substances or to combinations of substances. The Act also allows Gardaí to seize any bottle or container that they have reasonable cause to suspect contains an intoxicating substance. They can also indicate, in relation to certain events, that those in possession of intoxicating liquor are liable to have that alcohol confiscated.

It is an offence to drive under the influence of alcohol. This prohibition applies to motor cars, trucks, motor bikes, push bikes and animal drawn vehicles. Since January 1994, it is also an offence to drive with more than 80 milligrams (mgs) of alcohol per 100 millilitres (mls) of blood. The equivalent level in urine is 107 mg/100 ml and in breath it is 35 microgrammes/100 ml.

The 1988 Intoxicating Liquor Act brought in new restrictions concerning the presence of people under 18 years of age on licensed premises and also the sale of alcohol to such young people in both on-and off-licensed premises.

It is an offence to sell alcohol to a person under 18 either on or off the premises by a licence holder or any other individual. The penalty for a first offence is a €1,270 fine, rising to €1,900 for subsequent offences and the licence may also be endorsed. If a publican is found guilty of such an offence the District Court may impose a 'temporary closure order' on the premises for up to 7 days for a first offence and from 7- 10 days for second or subsequent offences. Since the introduction of the new Act, there has been an increase in the number of convictions for selling alcohol to young people from 11 in 1987 to 212 in 2000.

It is an offence for someone under 18 to buy or attempt to buy alcohol or to represent themselves as being over 18 years in an attempt to consume or be in possession of alcohol in any public place other than a private residence.

Children under 15 years are allowed into a bar during permitted hours only if accompanied by a parent or guardian. It is an offence to give alcohol to a child under five years old.

A Garda who suspects 'with reasonable cause' an offence relating to alcohol involving young people has been committed, may request the name, address and age of the people involved. Failure to comply or the giving of false details can result in arrest without warrant and a €64 fine. The Gardaí also have the power to seize, detain and remove without warrant, any bottle or container suspected of containing alcohol which is in the possession of an under-18 who is in a public place. There were 31 such instances reported by the Gardaí in 2000.

The 1988 Act also prohibits a licence holder employing anyone under the age of 16 to sell alcohol. A licence holder may only employ people between the ages of 16 and 18 if they are relatives or apprentices.

The Act also permits the Minister for Justice to make regulations concerning the issue of an 'age card', specifying the age of the person, to those over 18 years old. It is an offence to forge or alter such an age card or to use such a forged card with intent to deceive. The penalty for such an offence could be a fine of up to €1,270 or imprisonment for up to 12 months or both.

Prevalence and Availability

The consumption of alcohol in Ireland increased at a greater rate than that of any other European country, with the exception of the Netherlands, in the ten years to 1980. The sales of alcoholic drinks then declined for some years but overall there has been a 41% increase in alcohol consumption in the ten years between 1989 and 1999.

In 1990 we managed to consume 54.89 litres of pure alcohol in the form of –

spirits - 5.99 million litres spirits
beer - 19.40 million litres
wine - 15.54 million litres
cider - 13.95 million litres.

By 2000 the amount of alcohol consumed had risen to –

spirits - 8.99 million litres
beer - 23.84 million litres
wine - 44.29 million litres (up almost 300%)
cider - 74.56 million litres (up by more than 500%).

In real terms the price of a pint has decreased since 1950 and this, combined with its increased availability in off-licences and supermarkets, is behind the increase in alcohol consumption since that time. The Irish people spent €4,210 million on alcoholic beverages compared to €2,284 million in 1990, with the average household spending 5.48% of its total budget on alcohol.

In Ireland approximately 1.9 million people, aged 15 years and over, drink alcohol. Among EU countries, Ireland has the highest percentage, at 25%, of people aged 15 years and over who abstain from alcohol. Statistics for 1999, based on consumption, per head of population show that we were the 3rd highest nation of alcohol drinkers in the EU, with a total consumption per head of 10.7 litres of pure alcohol. However, given the large number of total abstainers in the population these figures may not give an accurate picture of alcohol consumption in Ireland. Based on consumption by those over 15, the amount of alcohol consumed by each adult rose from 11.21

litres per year in 1990 to 14.2 litres in 2000.

Alcohol-related offences have increased from 22,482 prosecutions for all types of offences involving alcohol in 1992 to 34,887 prosecutions in 2000. This figure includes 10,269 prosecutions relating to drunken driving, 2,045 prosecutions for drunkenness, and at least 14,687 prosecutions for being intoxicated in a public place contrary to the Criminal Justice (Public Order) Act 1994.

These figures do not include assaults and murders, many of which are alcohol-related. Garda sources suggest that 88% of public order cases, 54% of criminal damage and 48% of cases of offences against the person, are alcohol related.

The advertising of alcoholic drinks is not as strictly controlled as the advertising of tobacco. 'Voluntary' codes of practice are in operation. Spirits are not advertised on television. Advertisements must use models aged 25 and over and should not create the impression that alcohol consumption contributes to social or sexual success. Excessive use must not be encouraged, nor can the advertisements link drinking and driving, or drinking and sexual attractiveness.

Mood Altering Effects

Alcohol is absorbed very quickly from the stomach into the blood stream and starts to have an effect within five to ten minutes. How much effect a drink has depends on:

- the type of drink
- how quickly it is drunk
- when food was last eaten
- bodyweight or build of the individual
- the surroundings of the drinker.

The type of drinker is also important, since tolerance develops, therefore, a frequent heavy drinker will absorb alcohol more rapidly.

A major factor is the amount of alcohol consumed, which is expressed nowadays in terms of "standard drink". 1 standard drink (10 gms of pure alcohol) is the equivalent of half a pint of normal strength beer, or 1 glass of wine or one single measure of spirits. Some stronger beers, however, may contain up to 6% alcohol and a 500-ml can could easily contain 3 standard drinks of alcohol. A flagon of cider contains up to 10 standard drinks. The Royal College of Psychiatrists published guidelines for what is considered low risk drinking on a weekly basis. For men the upper recommended limit is 21 standard drinks a week, while for women it is 14 standard drinks a week. Above these limits varying types of harm can be expected. The SLÁN survey in 1998 reported that 27% of males and 21% of females drank more than these recommended limits and that younger drinkers were more likely to exceed them.

After the equivalent of about 2 standard drinks a person feels relaxed, less inhibited and more talkative. After 3 standard drinks co-ordination begins to diminish, as does judgement and decision-making skills. More drinks, and increasing blood alcohol concentrations, can result in staggering, double vision and obvious drunkenness, followed by unconsciousness. Just a few drinks impair concentration and co-ordination, with driving skills severely affected. Most drinkers could reach a blood alcohol level of 80 mg/100 mls after only 4 standard drinks of alcohol. At that level studies show that there is a 10 fold risk of an accident and a 17 year old male with a blood alcohol level between 70 mgs and 100 mgs/100mls has 40 times more risk of an accident than a youth who has not been drinking.

Adverse Effects of Use

The effects of heavy and long-term use of alcohol range from the development of alcohol dependence syndrome to detrimental physical effects on an individual's health.

Heavy drinking affects the heart, causes gastric disorders and inflammation of the pancreas. Cancers of the upper airways and digestive tract (mouth, throat and oesophagus) are alcohol-related and the death rate per 100,000 from these cancers is still around 16 per year.

Alcohol supplies calories; as a result heavy drinking may cause obesity with its attendant health dangers. This inadequate diet can result in protein and vitamin deficiencies, damage to the nervous system, both in the limbs causing loss of power and sensation and in the brain causing impairment and poor concentration.

Deaths from suicide, drug overdoses, accidents, and cirrhosis of the liver are common among alcohol dependants, as is permanent brain damage. Studies in other countries indicate that

the risk of suicide is 5-10 times higher in heavy drinkers and that up to 20% of all suicides are committed by heavy drinkers. Deaths from cirrhosis of the liver have increased in Ireland during the 1990's, as have deaths from alcohol poisoning, alcoholic psychosis, alcoholism and alcohol abuse, according to official statistics.

The total cost of alcohol related problems in Ireland is estimated to be €2.4 billion per year.

Dependence

Prolonged heavy drinking over many years usually leads to the development of an alcohol dependence syndrome. Alcohol dependence syndrome involves a compulsion to continue drinking, increasing tolerance to the effects of the drug and drinking to avoid withdrawal symptoms. It is not possible to estimate the total number of alcohol dependants in Ireland, but one source suggests that as many as 95,000 of the estimated 1.9 million drinkers will go on to develop a problem with alcohol. Alcohol disorders still account for approximately 20% of all admissions to psychiatric hospitals, although it is recognised that as psychiatric hospital admission policies have changed, statistics relating to such admissions may not be a true indicator of the problem. In 1999, 4,859 people were admitted to psychiatric hospitals with a diagnosis of alcohol abuse or alcohol psychosis. For men, alcohol disorders were the main cause of admissions, accounting for 26% of all male admissions. The highest rate of admission is in the age group 35-44 years whereas a few years ago it was in the 45 - 55 age group.

Sudden withdrawal from alcohol after heavy use produces sweating, anxiety, trembling and hallucinations known as the DT's.

Alcohol and driving

Alcohol is implicated in many road accidents. One 1997 report indicated that 25% of all road accidents and 33% of deaths were alcohol related. The number of persons killed and injured between 9 p.m. and 4 a.m. provides a rough indicator of alcohol-related deaths. In 2000, 147 people were killed during these hours. When account is taken of the fact that only about 13% of road travel is undertaken during these hours and that 35% of road deaths and 21% of road injuries in 2000 occurred during these hours there is, as stated in the Environmental Research Unit's Road Accident Facts and Statistics (1989) "little room for doubt but that the combination of alcohol and driving in the darkness are significant contributory factors in road accidents". An accident involving a driver who fails the breath test has been shown to be three times more likely to be fatal than an accident involving a driver reported to be sober.

Alcohol and Young People

The SLÁN survey (1999) showed that nearly 90% of 18-24 year olds are regular drinkers. Younger drinkers are more likely to drink at high risk levels, 5 - 7 standard drinks depending on gender, per drinking session; to drink more than the recommended weekly limits and to report more alcohol related problems such as assaults, family difficulties and financial trouble compared to other age groups.

This pattern of alcohol consumption seems to develop at an early age since the Health Behaviours in School Children (HBSC) survey reported that 50% of children have consumed alcohol before the age of 9. Approximately 17% of 9 - 11 year old boys and more than 50% of all 15 - 17 year olds reported that they were current drinkers.

There is a difference in the overall percentage of young people in the HBSC study who reported current drinking (29%) and the levels reported in the 1999 ESPAD study, which showed that 16% of Irish 15 - 16 year olds surveyed were regular drinkers. Since the HBSC included 17 year olds this may explain the difference. The ESPAD study highlights that there has been an increase in the proportion of Irish students who had consumed alcohol 40 times or more to 40%, as compared to a similar survey published in 1995 where the percentage was 34%. 72% of Irish students had been drunk at least once and worryingly 23% of girls and 27% of boys were drunk three times or more in the month prior to the survey, which represents a significant increase in the 5 years between the studies conducted in 1999 and 1994. The HBSC study reported that 1% of 9 - 11 year olds had been drunk 10 or more times, this rose to 13% of those in the 15 - 17 year old age group.

A pattern of early involvement in heavy binge drinking leading to drunkenness is reflected in the ESPAD figure of 25% of Irish 15 - 16 year olds reporting they had been drunk by the time they were 13 years old. Irish adolescents were much

less likely than their European counterparts to expect negative consequences from their drinking and less likely to consider binge drinking, 5 or more drinks at a time, risky for them. They were also more likely to combine alcohol with other drugs.

In addition to the behavioural and health consequences of this drinking many Irish adolescents face legal difficulties arising from their attempts to buy and drink alcohol before they are legally entitled to do so. In 2000, it has been reported, 44 young people under the age of 18 were prosecuted for buying alcohol, 205 for drinking alcohol in a public place and 24 for using false identification or pretending to be over 18 in order to buy alcohol.

Alcohol and Women

Studies show that the majority of women will have higher blood alcohol concentrations (BAC) and become more intoxicated than men on a given quantity of alcohol. Women tend to have a higher BAC because they have lower body water content resulting from their lower muscle content and higher ratio of fat. They also appear to differ in the speed with which they break down alcohol because of having less of an enzyme or catalyst in the lining of the stomach. For these reasons the same dose of alcohol will produce a 25-30 percent higher BAC in an average woman than in a man so that, if a man drinks six standard drinks (3 'pints') of alcohol and a woman four standard drinks, they will both have similar blood alcohol concentrations. Women therefore given similar levels of consumption get drunk faster and are more vulnerable to alcohol-related problems such as liver, brain, heart disease and alcohol dependence than men.

Alcohol in Pregnancy

Alcohol from a woman's blood stream can pass through the placenta to reach her baby in the womb. Drinking alcohol during pregnancy is associated with a spectrum of abnormalities ranging from minor retardation of growth to the fully developed Foetal Alcohol Syndrome (FAS). FAS is found in a proportion of babies born to alcohol dependent mothers. Studies in other countries indicate a level of 1-2 per thousand births. FAS involves three main features:

- reduced birth weight
- nervous system abnormalities which are seen as exaggerated tremors and irritability and borderline to retarded intelligence
- distorted facial features such as small head, small eye slits and a thin upper lip.

Many factors as well as alcohol affect the likelihood of FAS including maternal age, socio-economic status, nutritional status, as well as heavy smoking of tobacco and the use of cannabis.

Even moderate drinking, such as 1 - 2 drinks per day, may increase the risk of miscarriages and stillbirths. Some long-term studies have established that pre-natal exposure to alcohol can result in a reduction in I.Q. at age four, and deficits in attention and reaction time at the age of seven. The minimum dose of alcohol necessary to produce damage and the most dangerous time in the pregnancy has not been established.

Although the message to pregnant women is 'the less you drink, the better for you and your baby', a study in one Dublin maternity hospital revealed that of 100 women who had given birth, only 58 were aware of the harmful effects of alcohol, compared to 93 who knew smoking was dangerous during pregnancy. The study found that only 11 stopped drinking when they became pregnant and a number did not reduce their consumption of alcohol at all.

Alcohol and other drugs

If alcohol is taken at the same time as other depressant drugs, then the effects of both will be exaggerated, including the risk of overdose. The drugs involved include:

Benzodiazepines
other sedatives and tranquillisers
cough and cold remedies
allergy medicines
solvents
heroin and methadone.

Most overdose deaths in opiate users appear to involve alcohol in addition to the opiate. Recent studies also indicate that when alcohol is taken at the same time as cannabis that blood levels of THC from the cannabis are increased.

Chapter 5 - Tobacco

Introduction

Tobacco comes from the dried leaves of Nicotiana tabacum, a plant that can be grown in most parts of the world including Ireland. Most of the tobacco used in this country comes from the U.S.A., and almost 93% of it is used in the form of cigarettes. Tobacco is grown in many EU countries, chiefly Greece, Spain, France and Italy. This tobacco industry was supported by EU subsidies of €870 million in 1998, a reduction from the 1991 figure of €1,351 million.

Cigars are made from darker tobacco rolled up in tobacco leaves. This darker stronger tobacco can also be smoked in a pipe. Indeed this was the way tobacco was first introduced into Ireland at the end of the 16th century, from America. The American Indians used tobacco for medicinal and religious purposes. Despite warnings about its effects on health, the use of tobacco spread quickly. Up to the 18th century pipe smoking predominated until it was replaced in popularity by snuff taking. Cigarette smoking became a truly popular activity with the advent of mass production.

In 1590 a tax was imposed on tobacco, a precedent that continues to the present day. The fact that tobacco taxes are a convenient and lucrative way of raising State revenue tends to temper reaction to the health consequences of long-term use of tobacco. However, more recently these health consequences have been acknowledged and efforts to promote a tobacco-free society have begun.

Legal Status

The 1908 Childrens Act prohibited the sale of tobacco to children under sixteen, but did not prohibit children from buying, possessing or smoking tobacco.

The 1908 Act was updated by means of the Tobacco (Health Promotion and Protection) Act 1988 which reiterated the ban on sales of tobacco to under 16's and increased the penalty from £2 to £500 (€635). This was further amended by the Health Act 2001 which raised the age from 16 to 18 years and increased the maximum fine to €1,905. The sale of cigarettes in packets containing less than 10 cigarettes also attracts a €635 maximum fine.

Under the new legislation the Minister for Health brought in the Tobacco (Health Promotion and Protection) Regulations 1990 to prohibit or restrict the smoking of tobacco in designated areas such as aircraft, trains, public service vehicles, hospitals & clinics, schools, public buildings belonging to or occupied by the State, cinemas, theatres, concert halls, the kitchens of hotels, restaurants, as well as supermarkets and grocery shops. The penalty for an individual who commits an offence under these regulations is a €127 fine. The owner or person in charge of a premises who permits smoking in a designated area, faces a €635 fine, 6 months in jail or both. Similar regulations introduced in 1995 extended the prohibition on smoking to other areas including third-level colleges, TV studios, bingo halls, amusement arcades, pharmacies, banks and building societies.

The 1988 Act also prohibits the import, manufacture, sale or advertising of smokeless tobacco products such as Skoal Bandits designed for oral use. The commercial manufacture of tobacco requires a licence and the maximum content of 'tar' is legally limited to 12 mgs per cigarette.

However, the main legislative control over the availability of tobacco is exercised by the levying of excise duty and Value Added Tax (VAT). Currently taxes account for nearly 80% of the price of a packet of twenty cigarettes. The revenue generated from excise duty on tobacco came to over €958 million in 2000. Smuggling of tobacco products has increased in recent years. In 2001 over 120 million smuggled cigarettes destined for the illegal tobacco trade were seized, representing approximately €24 million in potential tax lost to the Revenue Commissioners.

The advertising of tobacco is controlled by regulations under the 1978 Tobacco Products (Control of Advertising: Sponsorship and Sales Promotion) Act. As a result the advertising of tobacco is almost totally confined to adult newspapers and magazines. The Government can curtail and control the amount of money spent on sponsorship of sporting and cultural events by tobacco companies. The content of the advertising is also controlled with a requirement that a health warning be included on both the packet and on advertising. Young people are protected because advertising is prohibited in publications directed primarily at those under

eighteen and sponsorship of youth events is banned. From December 1st 1987 cigarette advertising on shop fronts was prohibited; tougher health warnings are required to be used in rotation on the packs while all point-of-sale promotional material in shops are required carry a health warning. The EU Directive (98/43/EU) banned general tobacco advertising from August 2001 and newspaper advertisements from July 2002. Sponsorship by tobacco companies must end by August 2003 or by August 2006 for Formula 1 Motor Racing. The Irish government decided to implement the directive from July 2000.

Prevalence and Availability

Cigarettes became widely used in most countries during and after World War I, however in Ireland they only became really popular during the Second World War. The number of cigarettes smoked in Ireland peaked at 7.7 billion in 1978. The figure has declined since then to less than 6 billion per year during the late 1980's and early 1990's. However, the downward trend was reversed in recent years with consumption reaching 6.7 billion in 1997.

Much more significant has been the change in the relative proportion of men and women who smoke. In 1973, 49% of men and 37% of women smoked. In the 1999 SLÁN survey, it emerged that rates for men and women are now comparable, at 32% and 31% respectively. According to WHO the percentage of Irish women that smoke is among the highest in the EU.

The SLÁN survey showed that 31% of adults smoke cigarettes while a further 7% smoke cigars or pipes. This is a slight increase on the 1993 figure of 28% but remains considerably lower that the 1973 figures of 43%. The highest levels of 39% were reported in the 18 - 34 year age group. It was reported that while smoking was a problem for all social classes, young people with low incomes were more likely to smoke than any other group.

Among children, the SLÁN survey reports that up to 13% of 9 -11 year olds are smokers, with boys starting to smoke earlier than girls. By the age of 15 - 17 girls are more likely to smoke than boys of the same age, 30% of boys versus 36% of girls. A report from a 1999 survey indicated that 74% of 16 year olds had smoked at least once, that another 37% were regular smokers and that 18% were daily smokers by the age of 13. This high level is confirmed by the SLÁN survey, which showed that approximately one in five 14 year olds smoke. These figures support the view that smoking behaviour starts while smokers are below the present legal age at which they can buy cigarettes.

Mood Altering Effects

Nicotine gives a feeling of relaxation, allows a smoker to face stressful situations more easily and to carry out boring tasks efficiently. Heart rate and blood pressure are increased and appetite is reduced. First time smokers often suffer from nausea and vomiting.

Adverse Effects of Use

Tobacco smoke contains more than 1,200 different chemicals including carbon monoxide, nicotine and tar. All the carbon monoxide, 90% of the nicotine and 70% of the tar is retained in the lungs when smoke is inhaled.

Nicotine is a very poisonous drug that affects the heart, blood vessels, stomach, kidneys and the central nervous system. Smoking increases an individuals risk of heart disease, heart attacks, blood clots, strokes, bad circulation, ulcers, lung infection, bronchitis, emphysema, and cancers of the lung, mouth and throat. 90% of lung cancers are believed to be caused by the cancer-inducing chemicals of cigarette tar such as benz-alpha-pyrene. According to WHO, cigarettes are responsible for 30% of all cancer deaths, 20% of deaths from heart disease and strokes and 80% of chronic lung diseases. WHO have stated that the annual worldwide toll of premature deaths caused by tobacco is around 3 million and will continue to rise.

There have been no studies of the causes of death among smokers in Ireland, but the Department of Health estimates that over 6,000 deaths each year are directly attributable to smoking. Life expectancy in Ireland is significantly below the EU average because of our deaths rates from heart disease and cancers. Tobacco related deaths among women have increased as the use of tobacco by women has increased. In most affluent countries heart disease is now the most frequent cause of death in women as well as in men. Lung cancer death rates in affluent

countries are now rising much faster in women than in men.

From studies carried out in other countries it is known that on average each cigarette smoked shortens the life of a habitual smoker by five and a half minutes. Heart attacks are three times as frequent in American middle-aged men who smoke more than 15 cigarettes per day as in non-smokers. A smoker consuming up to ten cigarettes per day can expect at least a 3 to 10-fold increase in their risk of a tumour, a risk which rises steeply as the number of cigarettes smoked per day increases.

Dependence

Tolerance rapidly develops to the effects of nicotine and people who begin to smoke tend to increase their consumption until they smoke regularly. If they stop, they experience withdrawal symptoms such as restlessness, irritability, depression and anxiety, which can be suppressed with nicotine. The W.H.O. and the U.S. Surgeon General have concluded that cigarettes and other forms of tobacco are addictive, that nicotine is the drug which causes dependence and that the pharmacological and behavioural processes that determine tobacco dependence are the same as those that determine dependence to drugs such as heroin and cocaine and amphetamines. Indeed, W.H.O. ranks nicotine as being more addictive than heroin, cocaine, alcohol, cannabis and caffeine. Many heroin dependants state that it is easier to give up heroin than it is to give up smoking. However, the fact that replacement products such as gum, patches, sprays and inhalers help many but not all those who use them to stop smoking, indicates that there is more to the smoking habit than simply nicotine dependence.

Smoking and Pregnancy

Research suggests that smoking can affect fertility. A recent study found that decreased fertility among women who wished to start a family was associated with cigarette smoking. In addition research suggests that the risk of impotence in men who smoke is 50% higher than in non-smokers.

The health effect on the foetus of maternal smoking has been extensively studied. Infants born to mothers who smoke during pregnancy weigh, on average, 200g less than those born to non-smokers. There is also evidence of an increased risk of premature births, stillbirths and early death of the newborn baby where the mother smokes more than 5 cigarettes per day.

In long-term follow-up studies, children of cigarette smokers have been shown to be smaller and to develop less well intellectually and emotionally compared to children born to non-smokers. Children under 2 exposed to parental smoking have a higher risk of developing bronchitis and pneumonia and are at a greater risk of Sudden Infant Death Syndrome (Cot Death).

Passive Smoking

The smoke that smokers take into their lungs is called mainstream smoke. The smoke from the burning tobacco in a cigarette lying on an ashtray or held between the fingers is called the sidestream smoke. This is environmental tobacco smoke (ETS) inhaled by non-smokers who are exposed to cigarette smoke at home, at work and in leisure environments. Because of this 'passive' smoking, almost all non-smokers including many babies have traces of nicotine in their bodies. Some children may be exposed to the equivalent of 150 cigarettes a year through this form of pollution. Sidestream smoke is different to the smoke inhaled by active smokers because it is essentially unfiltered and as a result it has 70% more tar, 2.5 times more carbon monoxide, 2.7 times more nicotine and up to 100 times more carcinogenic compounds. In the case of one, nitrosamine, its content can be up to 830 times higher in sidestream smoke compared to mainstream smoke.

There is increasing evidence that passive smoking is a major cause of premature death in non-smokers. One estimate from the US puts the figure at about 47,000 per year. Many reports show that non-smokers exposed to ETS are at increased risk of developing lung and other cancers, chronic lung disease and strokes. A study of children exposed to passive smoking by their parents has indicated that they have a much greater chance of suffering from the middle ear disease 'glue ear' as well as asthma and other respiratory illness.

Smokeless tobacco

Smokeless tobacco products include chewing tobacco and snuff consist of tobacco mixed with

sweeteners, flavourings and scents. In Ireland snuff is usually sniffed, but in the U.S.A. it is 'dipped', that is, held in the mouth between the lip and gum. In the U.S.A., sales of moist snuff have increased recently. It is believed that 16% of teenage boys use snuff. In some parts more boys use snuff than smoke cigarettes regularly.

One form is marketed in sachets, designed to be held in the mouth (Skoal Bandits´®). There is strong evidence that such tobacco products cause cancer of the mouth. It is also believed that use of moist snuff increases the frequency of gum recession leading to loss of teeth and of leukoplakia, white patches in the mouth, 10 - 30% of which have potential to become malignant. It is known that nicotine is released into the blood at levels comparable to smoking cigarettes leading to long-term nicotine dependence. These tobacco products also contain nitrosamine-type carcinogens at levels higher than permitted in food. Lead and cadmium levels are also high and could potentially harm a baby if the product were used during pregnancy. Because of concern about the health effects of these products their importation and distribution is banned under Section 6 of the Tobacco (Health Promotion and Protection) Act 1988.

Chapter 6 - Caffeine

Introduction

Caffeine is the most widely used drug worldwide. Some 120,000 tons are used every year representing over 1,300 billion cups of tea and coffee per year all over the world. Caffeine is a stimulant found in coffee, tea, guarana, maté, and cola drinks, in some tonic preparations and in many analgesic capsules and tablets. A chemically similar drug is found in cocoa and chocolate.

Coffee is made from the roasted beans of the coffee bush, which was first cultivated in the Yemen in the 9th century. It was introduced into Western Europe at the end of the 16th century and soon spread rapidly in popularity. Approximately half of the world's coffee production is used in the U.S.A. Coffee is the strongest of the beverages. One cup of 'real' coffee, that is freshly ground beans as opposed to 'instant', may contain caffeine equivalent to the minimum dose for stimulation. Coffee beans contain 1-2% of caffeine and a cup of 'real' coffee contains 80-100 mgs of caffeine.

Tea consists of the dried leaves of a shrub grown in China, India, Sri Lanka, Kenya and other East African countries. It was introduced into Europe in the 16th century initially as medicine, but soon became a popular pick me up. Several types of tea-leafs are processed. The bulk of the annual production of 2.5 million metric tonnes of leaves goes to make Black Tea at 78%, with 20% used for Green Tea and the rest used as Oolong Tea. Green Tea, which is increasingly valued for its antioxidant properties linked to protective effects against heart disease and cancer, is rapidly steamed or fried to prevent any fermentation. Black Tea is the form usually used in Ireland and is fermented or 'cured' to give the characteristic aroma, taste and colour of tea. It has three times the caffeine content of Green Tea. Oolong Tea is partially fermented with about 50% more caffeine than Green Tea and is used in China and Taiwan. A cup of tea contains 40-60 mgs of caffeine even though tea-leaves contain only 3% caffeine. Differences in the way the coffee and tea are processed accounts for the final caffeine content.

Guarana and Maté leaf are prepared from South American plants and are also used to make beverages. Guarana, is a dried paste made from the seeds of a Brazilian plant, it can be incorporated into fizzy drinks, into capsules or tablets or chewing gum. It has the highest known natural content of caffeine, up to 5%, sometimes mistakenly referred to as Guaranine. Some Guarana tablets, capsules and drinks are marketed with allusions to energy giving properties. Based on the estimated caffeine content of 5%, most products would deliver between 45-80 mgs of drug per usual dose. Maté is used because it allegedly has a lower tannin content than ordinary tea. It has caffeine content of up to 2%.

Cola drinks contain caffeine from two sources; some is present in the form of an extract of cola seeds, grown in West Africa and some is added during manufacture. The added caffeine is produced during the process of decaffeinating coffee. Cola drinks generally contain much less caffeine than coffee, but small children could be consuming stimulatory amounts. Parents who discourage young children from drinking tea or coffee should also discourage them from various forms of fizzy drinks containing caffeine.

Caffeine is also an additive in a range of 'high energy' or 'stimulant' drinks that also contain sugar or glucose, an amino acid called taurine and also glucuronolactone. The health effects of these chemicals are largely unknown, however concerns have been raised about their inclusion in these products. The labelled caffeine content of these drinks ranges from 50-80 mgs per 250 ml can, on this basis one can may provide the same amount of caffeine as a cup of strong coffee. A recent report by the Food Safety Promotion Board found that more than half of 11-35 year olds had consumed one of these drinks at least once. Over 34 million cans are sold all over Ireland in an average year, representing 8.5 million litres of drink. The average weekly consumption was 3 cans but some consumed 8 cans per week. The Food Safety Promotion Board recommend that these products should not be consumed with alcohol and that those involved in exercise and sport should not use them as thirst quenchers because the caffeine acts as a diuretic which increases the flow of urine from the body thus adding to the risks of dehydration. It is also recommended that the labelling should state that they are unsuitable for children under 16, pregnant women and individuals sensitive to caffeine.

Chocolate is prepared from the cocoa bean grown

in the tropics, particularly on the West African Ivory Coast. Cocoa contains between 2-3% of theobromine which is chemically related to caffeine, as well as containing a small amount of caffeine (0.2%).

Caffeine itself is a white power used as a mild stimulant in some medical products. It is used in some analgesic products, particularly for migraine. Caffeine is also an ingredient of some cocaine and amphetamine substitutes sold as stimulants and slimming aids.

Legal Status
Caffeine is subject to few legal prohibitions on its manufacture, sale, distribution or possession in Ireland.

EU regulations restrict the use of the term 'decaffeinated' to coffee extracts containing less than 0.3% by weight of caffeine. Coffee is decaffeinated when the beans are still green. They are usually treated with steam to make them swell, at which stage they are treated with chemical solvents such as methylene dichloride, steam or carbon dioxide to remove the caffeine. The beans may be steamed to remove any residual solvent that could be toxic or carcinogenic, and then roasted to produce the typical coffee aroma and taste.

Member States of the EU have recently agreed that foods containing caffeine as an ingredient must be labelled as containing caffeine. Products containing levels of more than 150 mgs caffeine per litre will, by July 2004, have to be labelled 'high caffeine content' and the exact amount present stated on the label. Thus 'high energy' or 'stimulant' drinks that usually contain 320 mgs per litre will need to be labelled as 'high caffeine content'.

The International Olympic Committee lists caffeine as a stimulant and athletes may be disqualified if the level in urine is greater than 12 mgs per litre of urine.

Prevalence and Availability
Caffeinated drinks are sold without restriction in grocery shops, supermarkets and vending machines. They are widely used at rest breaks during the working day. It is usual for tea or coffee to be offered as hospitality to visitors and virtually every restaurant or café in Ireland offers a choice of tea or coffee.

The annual consumption of caffeine worldwide is equivalent to 70 mgs per person. This overall level of course masks much higher consumption figures in different countries depending on the preferred beverage. A recent survey of food consumption in the Republic and in Northern Ireland showed that 91% of those surveyed drank tea and 55% coffee.

Imports of tea into Ireland are believed to have remained relatively constant over the past 10 years at approximately 10, 595 metric tonnes. Net imports of coffee beans are thought to amount to 7.7 metric tonnes. Irish people spent the equivalent of €145 million on coffee, tea and cocoa in 2000 compared to the equivalent of €103 million in 1991.

It is believed that the average Irish person drinks 5 cups of tea per day. It is not known how much coffee, either from freshly ground beans or as 'instant', Irish people now drink. Also since average consumption of cola drinks cannot be established with certainty, it is difficult to estimate the average daily consumption of caffeine. On the basis of tea consumption the average Irish person probably consumes about 250 mgs of caffeine per day. To this figure must be added an individual's caffeine intake from:

- freshly made coffee, 75-150 mgs per cup, depending on whether it is percolated espresso
- instant coffee, 70 mgs or more per cup depending on the size of the cup and the amount of powder used
- 330 ml can of cola, 17-55 mgs depending on the brand
- milk chocolate, 6 mgs per bar in addition to 40 mgs theobromine
- hot cocoa, similar content to milk chocolate
- caffeine-containing analgesics, 50 mgs per tablet
- caffeine-containing tonics, variable amounts.

According to a Food Safety Promotion Board Report, caffeine consumption in 1995 was approximately 214 mgs per day for a typical male. Given the consumption of caffeine containing beverages in addition to other products this figure appears to be an underestimate. Reported intakes in Britain and the U.S.A. are 278 mgs per day and 380 mgs

respectively. All these levels should be compared with the standard pharmacologically active stimulant dose for caffeine of 200 mgs.

Mood Altering Effects

Caffeine stimulates the nervous system. In moderate amounts, 150-250 mgs or two cups of coffee, the drug increases wakefulness, reduces fatigue and postpones the onset of sleep. Mental activity is increased and people can perform physically exhausting work for longer. At higher doses the heart muscles are stimulated, blood vessels in the brain narrow, and more air is drawn into the lungs. Caffeine is also a weak diuretic, therefore it increases the excretion of urine. Theobromine is a stronger diuretic than caffeine.

Adverse Effects of Use

People who drink seven or more cups of strong coffee a day may feel anxious and irritable, and have muscle tremors and headaches. The stimulant effect may also cause chronic insomnia, but all these disturbances will clear up once caffeine intake is reduced.

It has been claimed that gastric secretion is increased by caffeine, raising stomach acidity, thereby increasing the risk of peptic ulcers. Doubt has recently been cast on this belief because decaffeinated coffee can produce similar effects.

The reported link between heavy coffee consumption and heart disease may be due more to other aspects of the user's lifestyle, such as cigarette smoking, rather than to coffee. Cigarette smokers eliminate caffeine from the body more quickly than non-smokers, they must consume more caffeine to achieve the same effects as non-smokers. As a result smokers tend to drink more coffee than non-smokers. Most recent studies appear to show that there is no reason to implicate caffeine as a risk factor for heart attacks.

There is an association between coffee consumption and increased cholesterol levels although results vary between different studies. There is strong evidence to suggest that methods of preparing fresh coffee which involve boiling the beans for a long period rather than using a filter are more likely to cause an increase in cholesterol levels. The chemicals responsible appear to be two compounds, cafestol and kahweol, which are different to caffeine.

A number of studies have been carried out to establish whether there is any association between caffeine consumption and problems during pregnancy. It is known that caffeine can cross the placenta and so the foetus and newborn baby are exposed to the drug. The results of the research are reassuring in general. Studies of over 32,000 mothers indicate that any problems in their babies are largely due to the smoking habits of women who were heavy coffee drinkers. It appears that there is no acceptable evidence that caffeine causes birth defects in humans at current levels of use. Data from tests on animals indicate birth defects due to caffeine consumption during pregnancy. Despite the fact that these findings are not conclusive, concern over the effects of the drug on unborn babies led the U.S.A. authorities to advise pregnant women to limit their caffeine intake. The breakdown and elimination of caffeine is reduced threefold in the mother during the late stages of pregnancy. Unpleasant symptoms of jitteriness and nervousness may occur when a pregnant woman continues a level of caffeine consumption that would have had no effect at other times. This does not appear to have any short or long-term effects on the babies in such cases. In Ireland it is generally recommended that consumption of caffeine in excess of 300 mg per day during pregnancy or while breastfeeding, should be discouraged. This would involve drinking no more than 4 cups of regular coffee, or 6 cups of tea, or 8 cans of cola or 4 cans of a 'high energy' or 'stimulant' drink per day.

In children small single doses of caffeine have either no effect or small inconsistent effects on mood, learning and co-ordination. High levels, such as the equivalent of 4-5 cans of a cola drink or 150 mg per day for a 10 year old, can increase irritability, nervousness and anxiety.

The effects of more than 1g of caffeine (or 15 cups of coffee) taken at one time, include disturbances of the senses, such as ringing in the ear, together with insomnia, tremors, increased heartbeat and gastric irritation. Restlessness and excitement may progress to delirium. Approximately 10gs is the lethal dose. Deaths due to caffeine poisoning from coffee, tea or soft drinks are unlikely, as they would involve the consumption of approximately

75 cups of coffee, 125 cups of tea or 200 cola drinks at one time. However, eleven deaths due to overdoses, suicidal and accidental, following the consumption of appetite suppressants and 'pick-me-ups' containing large amounts of pure caffeine have been reported in the medical literature.

Caffeine is known to be mutagenic, it produces changes to the genetic material in cells so that they are permanently different to their predecessors. These changes are linked to the subsequent development of cancer. Other chemicals produced during the roasting of coffee beans may also have cancer-inducing effects when tested on cells. However, most of the studies in animals and in humans indicate that caffeine use is not linked with cancer of the mouth, oesophagus, stomach, liver, breast, nor does it cause leukaemia. Some studies have indicated an increased likelihood of women developing benign fibrous lumps in the breast (fibrocystic disease) if they consume more than 250 mg caffeine per day as coffee.

All types of tea contain antioxidants, which compensate for the presence of caffeine. Green Tea is particularly rich in these chemicals and for this reason is promoted for prevention of cancer. Evidence from some animal studies supports this, but while there is some evidence of benefit in humans, a direct causal relationship remains to be established by research. Studies in animals and in humans also suggest a relationship between lower cholesterol levels and increased Green Tea drinking. Given the lower life expectancy in Ireland linked to high rates of death from heart disease, it is difficult to see much evidence to support a beneficial effect of Black Tea in protecting from heart disease, particularly when average consumption of 5 cups per day is so high.

Dependence

Tolerance to the effects of caffeine develops and there is a well-established caffeine withdrawal syndrome, which can be noticed after regular use of about 300 mgs a day. After stopping caffeine intake the long-term user feels less alert and relaxed, more irritable and drowsy, and suffers from headaches, which can often be severe. This tiredness and irritability can be experienced if people miss their morning coffee. Psychological dependence can develop to the extent that people find it hard to stop drinking coffee even for medical reasons.

Caffeine and Other Drugs

Combining caffeine with alcohol does not reduce breath alcohol levels nor does the caffeine completely counteract the impairment of driving ability caused by alcohol. Medically, caffeine is often incorporated with analgesics to increase their effectiveness. A recent study conducted at U.C.D. has suggested that caffeine combined with MDMA ('ecstasy') worsens the hyperthermia (overheating) caused by MDMA, by contributing to dehydration and may aggravate the neurotoxicity of MDMA to serotonin producing nerve cells.

Chapter 7 - Solvents

Introduction

The misuse of volatile solvents by young children and teenagers is a recent worrying trend, although the use of chemical vapours and fumes to obtain a mood altering experience is believed to go back to pre-historic times.

Solvents are chemicals, which change from liquid form into gases or vapours at ordinary room temperatures. Solvent misuse is the deliberate inhalation of gases, chemical fumes or vapours in order to get a 'high' or 'buzz' similar to the intoxication produced by alcohol.

A variety of terms are used to describe the practice, such as 'glue-sniffing', 'solvents abuse' or technically 'volatile substance abuse' (VSA). The term, 'glue sniffing', has been widely used in the media but it is inaccurate for two reasons; firstly a wide range of common household materials, apart from glues, give off gases or vapours which can produce mood altering effects and secondly, the material is actually deeply inhaled through the mouth rather than sniffed.

The range of products that can be misused is very large. The four main categories are:

- adhesives and thinners such as glues, model cement, paint thinners, nail polish remover
- dry cleaning products such as dry cleaning fluids, paint stripper, typewriter correcting fluid and thinners, fire extinguishers, printing industry solvents, shoe dyes and conditioners
- aerosols such as hair lacquer, room and body deodorant sprays, paints, painkilling and inspect sprays, plaster removers
- fuels such as petrol, lighter fuel, domestic and camping gas cylinders.

Amyl and butyl nitrite are often sold as 'poppers' in clubs, discos and 'sex shops' to individuals who believe that inhaling them expands creativity, stimulates music appreciation, promotes a sense of abandon in dancing and intensifies sexual experiences. Amyl nitrite is used medically to treat cyanide poisoning and because it dilates blood vessels it is used in angina attacks.

Solvent users employ a variety of techniques and devices to heighten the mood altering effect from these products by increasing the concentration of vapour and/or excluding air, for example by using a plastic bag over the head. Misusers may inhale the product from a soaked rag, a coat sleeve or lapel, a handkerchief, cotton wool, pillow or from a bottle.

For many products it is the vapour given off by the product that is used and the product itself is not ingested into the body, for example glue. However, the reverse is often the case with gas fuels and aerosols that are sprayed or released from the container directly into the mouth and lungs.

Legal Status

It is an offence for any person to sell, offer or make available any substance to persons under 18, which they know or have reasonable cause to believe is likely to be inhaled for the purposes of causing intoxication. Persons found guilty of this offence under Section 74 of the Child Care Act 1991 are liable to penalties of a fine of up to €1,270, 12 months imprisonment or both. This section of the Act also permits a Garda to seize any substance in the possession of a child in a public place which the Garda has reasonable cause to believe is being abused by the child. Any product seized in this way may be destroyed on the instructions of a Garda Superintendent.

The Criminal Justice (Public Order) Act 1994 makes it an offence for someone to be intoxicated in a public place to such an extent that they are a danger to themselves or to others. The word 'intoxicated' refers to solvents or other substances as well as to alcohol and other drugs. The fine for such an offence is not more than €508.

Prevalence and Availability

There are no statistics on the full extent of solvent misuse in this country. It is known to be primarily an adolescent phenomenon although it has also been reported in younger children and in adults. Studies of large numbers of users show that children from every social class and family background can become involved.

Surveys indicate that the highest levels of experimentation with solvents are in 15 and 16 years old age group. The SLÁN survey reported that only 0.3% of adults (18-64 yrs) had used solvents in the past year but that in young adults the figure was 1.4%. Experimentation with solvents by young Irish adolescents remains very high with different surveys reporting various rates of use. A rate of 10-22% was reported in the

HBSC survey. A significant number of young people are regular users because in the same survey over 5% had reported use within the month preceding the survey. Studies of Dublin based young people show figures of 7% for recent use among 14-15 year olds. The ESPAD Study reported that 9% of the 15-16 years olds surveyed had used solvents by the time they were 13, there was no difference between the rates for boys and girls.

Given such high levels of use, it is worrying that young Irish teenagers are less likely than other European teenagers to see any great risk in using solvents once or twice and over one fifth saw no risk in the regular use of solvents.

Many of the products misused are readily available in shops and in the home. One study suggested that the average home could contain up to 30 of these products. Many products are cheap to buy or easy to steal. If one product or brand is unavailable then another can be easily substituted. For many young teenagers, solvents are more easily available than alcohol.

Mood Altering Effects

Inhaled solvent vapours are absorbed through the lungs into the blood stream and rapidly reach the brain. The early effects are very similar to those of alcohol, involving stimulation of the nervous system followed by depression and if enough is taken, unconsciousness. The solvent user displays many of the signs of drunkenness such as slurred speech, unsteady gait and lack of control.

Other effects are distinct to solvent misuse. The mood altering effect is felt very quickly, and once the misuse has stopped, disappears within a few minutes to a half an hour. Distorted vision and faulty judgement of space occurs, this frequently involves visual and auditory hallucinations, which may be pleasant, but which can also be very frightening. Judgement becomes impaired, leading to aggressive and uncharacteristic behaviour, particularly if alcohol is used at the same time. The hangover involves headaches and poor concentration, and has been described as being less severe than the alcohol hangover.

The fact that the effects are short-lived allows solvent users to conceal their activities even though the smell of solvent may last on their breath for up to a day.

Adverse Effects of Use

Deaths from solvent misuse are rare in relation to the numbers thought to be engaging in the behaviour, but the risk is always present. A major concern in relation to the sudden solvent misuse deaths that occur is their unpredictability. Death can occur even the first time solvents are used. The average age of those known to have died was 15 although the ages of those who died have ranged from 10 to 26 years. It is difficult to determine the exact number of deaths due to solvent misuse that occur each year.

It is known from a survey of newspaper reports that butane gas has been involved in most of the recorded deaths, followed by aerosols and typewriter correcting fluid. Glue has apparently been implicated in only one death in the past few years. Misuse of gas, aerosols and typewriter correcting fluid may cause heart failure if the user becomes stressed or engages in strenuous physical activity such as running away from an adult. The direct spraying of aerosols and butane gas resulting in the freezing of the larynx and airways seems to be a particularly dangerous practice. It would appear that glue is less hazardous, possibly because it is solid and is therefore not ingested directly the way that aerosols are.

Many deaths are accidental and are related to the intoxication associated with the practice. Some users become unconscious and choke when they inhale vomit. Others have been suffocated when they placed a plastic bag over their heads and were unable to remove it due to being either too intoxicated or unconscious. The risk of fatal accidents increases when solvents are misused in dangerous locations such as high buildings, derelict sites, railway embankments, river or canal banks. Such accidents are more likely to happen if the user is alone, because no one is available to summon help in an emergency.

The side effects of the nitrite poppers include severe headache, rapid heartbeat, low blood pressure, acute psychosis, coma and in rare cases sudden death.

Studies of industrial workers continuously exposed to low concentrations of solvents suggest that the liver, kidneys and brain can be damaged. Although the medical evidence is inconclusive at

present, it is known that some chronic users do suffer physical damage to their heart, brain, kidneys and liver. The extent and duration of misuse required to produce such harm is unknown.

Dependence

For most children solvent use is a group activity and usually a passing fad. A very small minority of these go on to become solitary users. Solitary users find it difficult to give up the habit. Whether this dependence is psychological or physical in origin is largely unknown.

Most habitual users develop tolerance to solvents and must inhale larger quantities to get the 'buzz'. Withdrawal symptoms, which include sleep disturbance, nausea, stomach cramps, general irritability and facial tics, may take some weeks to occur.

There is no firm evidence to suggest that solvent misuse leads to the misuse of illegal drugs such as cannabis or heroin. Solvent users are more likely to move onto misuse of alcohol than illegal drugs.

Behavioural Problems associated with Solvent Misuse

A range of anti-social activity and behavioural problems can arise from solvent misuse. Solvents, like alcohol, depress the part of the brain that controls judgement and self-control. It is easy to understand therefore that any existing violent tendencies could be released under the influence of solvents in the same way that some adults can become aggressive and violent after a few drinks.

Shoplifting, other thefts and burglary are used to obtain money to buy solvents or more frequently the products themselves are stolen.

Family disruption is a common problem. This is frequently due to having to deal with a child intoxicated with solvents, assaults on members of the family and the failure of the child to return at night. Legal difficulties resulting from involvement in anti-social behaviour can also cause problems. Many parents are also frightened that their other children may imitate the behaviour and become involved in solvent misuse.

Other effects from solvent misuse include absenteeism from school ('mitching'), followed by a deterioration in their school performance with many chronic misusers dropping out of school altogether. When solvents are misused regularly, sleep patterns are disturbed and there is loss of appetite and weight. 'Glue sniffer rash' is frequently found as a result of repeated application of plastic bags to the nose.

Long-term misusers may become depressed, moody and suspicious, forgetful and lose concentration, with a consequent deterioration in their ability to function normally in school, at home or in the community. These problems clear up in most children a short while after the sniffing stops.

Chapter 8 - Cannabis

Introduction

Cannabis is one of the oldest plants cultivated by humans. Archaeological evidence from excavations of a Stone Age village on Taiwan suggests that the plant Cannabis sativa has been used from earliest times.

The Cannabis plant is a very adaptable annual, which can grow in most parts of the world including Ireland. In its chequered career, it has been grown for its long fibres known as hemp fibre and used to make ropes, clothing and paper, for its seed (hempseed), used as a source of oil (for hemp cosmetics) and most notably for the intoxicating resin produced in glandular hairs found predominantly on the leaves surrounding the flowers and fruits.

The Cannabis plant produces over 400 different chemicals, the most characteristic of which are the 60 known cannabinoids. The most important of the cannabinoids are the Tetrahydrocannabinols usually referred to simply as THC. The other important cannabinoid is Cannabidiol referred to as CBD. The potency of cannabis is usually expressed in terms of its THC content because this is the main psychoactive component responsible for the desired euphoric effects. However, other cannabinoids can modify the effects of THC by either influencing its absorption or as in the case of CBD, its calmative effects balance the euphoric effects of THC.

The cannabinoid content of a plant is influenced by a number of factors such as the type of cannabis plant; its gender (female plants produce more THC than males); how and where it has been grown and harvested and how it has been stored. Three types or varieties of cannabis plants are usually recognised, all of which are similar in appearance, these are:

- the drug type in which THC predominates at more than 1% and CBD is virtually absent
- the fibre or hemp type in which CBD predominates at more than 0.5% and THC is virtually absent. EU Regulations governing growth of hemp state that the THC content must be less than 0.3%. In 1999 there was 45,000 hectares of hemp grown under license and subsidy throughout Ireland and the EU.
- an intermediate type where equal amounts of THC and CBD are found.

Drug products made from these plants fall into three types that vary enormously in THC content. The three types are herbal cannabis, hash and hash oil.

Herbal Cannabis- This is the simplest product and is frequently known as 'marijuana', 'grass', 'weed', or 'ganja'. According to international studies it contains between 0.5-5.0% of THC. Stronger forms of herbal cannabis have been developed using different methods. Selective breeding and special growing techniques have resulted in the development of high yielding strains such as 'skunk', 'purple haze' among others. The Sinsemilla technique, where low THC-yielding male plants are culled, allowing unfertilised female plants devote their energy to producing THC, is also used to increase potency. This type of cannabis, also called 'nederwiet' or 'Dutch weed' because it was developed largely in the Netherlands, contains up to 20% THC; it has become available in Ireland in recent years.

Analysis of a small number of herbal samples at the Department of Pharmacognosy, T.C.D, has shown that their THC content has increased from 1.4% in 1981 to an average of 6.2% in 2000. This is high by international standards, for example marijuana in the USA averaged 4.2% THC content in 1997. The highest percentage recorded in Dublin was 9.5%, which is similar to the UK figure and slightly above the average Dutch value of 7.5%.

Hashish - Based on Garda seizure data, Herbal Cannabis is less widely used in Ireland than the second form of cannabis, namely Hashish or Hash. This is a resinous material, which is squeezed or scraped from the flowering tops of the plant and then compressed into blocks, slabs or bars and allowed to solidify. Nowadays most hashish comes across from Morocco but it can also come from the Middle East and the Indian sub-Continent. Internationally hashish is reported to contain between 7 and 14% THC although amounts up to 20% have been encountered. Hashish samples analysed at the Department of Pharmacognosy, T.C.D, had THC content ranging from a very weak 0.2% up to 6.3% with an average content of 4.2% THC. This compares with 7% in the USA and 5% in UK samples. However, the average Irish content has almost doubled since 1981 when values of 2.3% were recorded.

Liquid Hashish - The third product is more rarely seen and is prepared by solvent extraction and distillation. This 'hash oil' or 'liquid hashish' varies in THC content from 15-50% and is the most potent of all of the cannabis drugs.

The way in which cannabis is stored and the length of time it is stored also affects the content of THC. THC is unstable in the presence of air and light, which break it down to inactive chemicals. Cannabis that is more than two years old is usually very low in THC.

It has been said that no two samples of a cannabis drug are similar because of its chemical variability. To this variability must be added that of the varying amounts of drug consumed in a typical 'joint' or 'spliff'. Based on data from the Garda Forensic Science Laboratory on the amount of resin or herb in a typical 'joint', the THC content could vary from 3.5-–21.8 mgs with an average of 16.2 mg for a 'herb joint' and from 0.4-8.2 mgs with an average of 4.3 mg for a 'resin joint'. The significance of this range is that a dose of 2-5 mg of THC is believed to be the minimum required to produce psychoactive effects in humans.

Legal Status

All cannabis products are controlled by the Misuse of Drugs Act 1977. Cannabis is included in Schedule 1, which prohibits its medical and non-medical use. It is therefore illegal to grow, produce, supply or possess any of the drugs except in accordance with a licence from the Minister for Health for research or analysis. It is also an offence to allow premises to be used for cultivating, supplying or smoking cannabis.

The penalties for possession of small amounts of cannabis herb and cannabis resin for personal use in Ireland are less than for drugs such as heroin and cocaine. The penalties are for a first offence, a fine of up to €381 imposed by the District Court or up to €635 in the Circuit Court. For a second offence, the District Court can impose a fine of up to €508, which rises to €1,270 if imposed by the Circuit Court. It is only in the case of a third or subsequent offence that the District Court can impose a jail sentence of 12 months or a fine of €1,270 or both. If the case is heard before a judge and jury, the maximum penalty can be an open-ended fine, 3 months imprisonment, or both fine and prison sentence. Cultivation, supply and possession of the isolated chemicals (cannabinoids) are treated more severely.

Prevalence and availability

Cannabis is the most widely used of the illegal drugs in Ireland. Information from the SLÁN survey of 6,539 adults aged 18 years and older shows that 20% of those surveyed reported ever having used cannabis. This is higher than the 14% reported by the Health Research Board in its Knowledge, Attitudes and Beliefs (KABI) study.

Age has a major effect on reported use of cannabis because 33% of 18- 24 year olds said they had ever used the drug. They are also more likely to use the drug more frequently, 15% in the month prior to the survey compared to 5% for all adults. Use rates by schoolchildren mirror those of adults. The 1995 ESPAD Study of substance use by 15-16 year olds reported that 37% of Irish children reported ever using cannabis though this had dropped to 32% in the 1999 survey. The Health Behaviours in School Children Study reported that 29% of 17 year olds had ever used cannabis. Other studies indicate rates ranging from 16-26% of school children having experienced the drug at least once. Some of the differences in the figures are probably due to differences in the way the studies were carried out.

Frequent use indicated by use within the month preceding the survey, shows that a significant number of people use the drug frequently. The lowest value was 9% in 13-18 year olds in a Western Health Board study in 1994 rising to 19% in the 1995 ESPAD study. Other surveys record frequent use in 11-15% of those surveyed. The 1999 ESPAD study shows that among 15 year olds, 7% used the drug once or twice in the month, while 3% used three to five times and 5% used it six times or more. There were slightly different percentages for boys and girls with other studies contradicting one another in that one suggested that males under 25 were twice as likely as females to have used in the past month while another reported little gender differentiation. No information is available on the number of Irish people dependent on cannabis.

Prosecutions relating to cannabis, cannabis resin and growing cannabis plants have been reported from all Garda Divisions and still account for approximately 60% of prosecutions under the

Misuse of Drugs Acts. The price for different cannabis products ranges from €120 - 130 per ounce (30 gm) of South African herb to between €5 -10 per gm of Moroccan hash. A gramme of herb might be expected to give approximately four 'joints' while a gramme of resin would probably be enough for eight or nine 'joints' based on the average content reported by forensic scientists.

Mood Altering Effects

Research in the 1990's showed that cannabinoids act by binding to specific receptors found on the surface of certain cells located chiefly in the brain and in the immune system. These cannabinoid receptors have been named as CB1 and CB2. CB1 receptors are found in the parts of the brain that control movement, memory, stress responses and complex thought as well as pain perception, control of nausea and vomiting. CB2 receptors are found predominately in the spleen, in white blood cells and in other parts of the immune system, although it is not yet clear what role they play in immune responses. This is because an 'endocannabinoid' that binds to the CB2 receptor has not yet been found in the human body.

Endocannabinoids occur naturally in the human body but are much less active than THC. Anandamide (from the Sanskrit word for bliss – ananda) is found in large amounts in areas of the brain that control learning, memory, movement and co-ordination as well as other parts of the body like the spleen and heart. Anandamide binds to the CB1 receptors. These endocannabinoids are the object of much research at present as scientists try to find out how and why they act as they do and as they seek to produce new medicines, which provide the benefits of the cannabinoids without the harmful side effects.

The mood altering effects of the cannabis drugs depend on a number of factors including the strength of the cannabis, the length it has been stored, the amount used, the way it is taken and the experience, mood and expectations of the user.

When smoked, cannabis exerts effects within minutes and these last for up to two hours. When eaten in the form of 'space cake' or drunk as a tea, it takes one to two hours to have an effect, however, because the dose of THC is not easily controlled unpleasant reactions are more likely. Inexperienced users may have difficulty recognising the effects particularly of low potency forms.

The mood altering effects sought, referred to as the 'high', include talkativeness, hilarity, euphoria, relaxation and a feeling of slowed time. The major physical effects are increased heart rate and lowered blood pressure. These are likely to have little significance for healthy young people but could constitute a risk for those with existing heart disease or for older adults who are in a high-risk category for heart disease such as tobacco smokers. Cannabis drugs also interfere with short-term memory and learning abilities. Even simple arithmetic skills can be disrupted for 24 hours after a high.

Adverse Effects of Use

Inexperienced cannabis users or experienced smokers using unexpectedly large amounts of high potency cannabis (for example 'skunk), report unpleasant side effects such as fearfulness, confusion, severe panic and anxiety, which while very frightening, rarely require medical attention and usually respond to reassurance. Other symptoms may resemble a psychosis and include, confusion, amnesia, delusions, hallucinations, agitation and hypomania. These may require hospitalisation but usually subside as the THC is excreted from the body. No overdose deaths from cannabis or THC have ever been reported and are not likely to occur.

The ability to carry out complex tasks such as driving or using machinery is impaired by cannabis use. Increased distractibility combined with impairment of motor coordination leads to situations where cannabis is a contributor to road traffic accidents and workplace accidents. Evidence of the negative impact of cannabis on driving ability is available from simulator studies and surveys of US teenagers showing that they were three times more likely to have been involved in an accident if they were cannabis smokers compared to non-smokers. Additional evidence comes from the detection of cannabinoids in drivers involved in fatal accidents or stopped for impaired driving, where either no alcohol was detected or the concentration of alcohol was below the legal limit. Of particular importance is the detection of THC metabolites in blood samples, which would be indicative of more recent use whereas

detection in urine could be due to the slow elimination of drugs consumed 2-3 weeks previously. The World Health Organisation (WHO) recently concluded that "there is sufficient consistency and coherence from experimental studies and studies of cannabinoid levels among accident victims to conclude that there is an increased risk of motor vehicle accidents among persons who drive when intoxicated with cannabis. The risk is magnified when cannabis is combined with intoxicating doses of alcohol".

In Ireland cannabis is, at 32%, the most commonly detected drug other than alcohol in samples from drivers suspected by the Gardaí of impaired driving. In other countries cannabis has also been implicated in train crashes and the evidence points to impairment among train drivers, signal operators, motor cyclists, operators of heavy machinery, air traffic controllers and pilots. In a study with a group of pilots given a cannabis joint and then tested in a flight simulator, the cannabis caused a significant drop in flying performance that persisted for over 24 hours after the 'high' when most of the pilots were unaware that their performance was impaired. The combination of cannabis and alcohol appears to be more damaging to driving ability and co-ordination than either drug alone.

The increasing prevalence of regular use of cannabis drugs by adolescents and young adults and new research on its health hazards have prompted continual concern about the public health impact of long-term use of cannabis. While many studies in animals have consistently demonstrated toxic effects, studies of human cannabis users have frequently provided contradictory and controversial findings. Recent authoritative international reviews point to some of the health problems that can arise when cannabis is smoked on a regular basis.

Researchers report that prolonged and frequent cannabis use leads to subtle and selective impairment of cognitive functioning, which may be apparent as high levels of distractibility in the classroom and poor memory function. Australian research suggests that the use of cannabis three times per week or more frequently, results in a state of chronic intoxication, probably due to the accumulation of cannabinoids which, because they are fat soluble, persist in all parts of the body including the brain for up to four weeks after a single dose. As a result of this chronic intoxication there is a general slowing of information processing leading to sluggish mental performance. It is believed that the use of cannabis for more than three years may lead to long-term changes in brain function. This shows up in the form of memory problems, difficulties with concentration or with distractibility. If users cut down their use or stop altogether then mental proficiency will improve, but according to the WHO may not recover completely. Binge use, for example twice per week, of large amounts of high potency drug or use for five years or more at a rate of even once per month may lead, according to researchers, to a compromised ability to function to an individual's full mental capacity.

When burned, cannabis leaves produce amounts, similar to those found in tobacco, of carbon monoxide believed to be a major contributory factor in the development of heart disease in tobacco smokers. The tar from a cannabis 'joint' contains significantly more cancer-inducing chemicals, 1.5 times more of one key compound, than a standard cigarette. Because of differences in smoking techniques for joints and cigarettes, at least four times more tar and five times more carbon monoxide are inhaled by a cannabis smoker compared to a cigarette smoker. Because the number of cigarettes smoked per day is much greater than the number of joints smoked per day by individuals, exact comparisons of the relative harmfulness of both types of smoking are difficult. The fact that many cannabis users also smoke tobacco on its own or mixed with the cannabis also makes comparisons difficult. What is clear however is that chronic heavy cannabis smoking impairs lung function and causes symptoms of chronic bronchitis such as coughing and wheezing and that such smokers are more than twice as likely to suffer from bronchitis compared to non-smokers.

The smoke and tar from a joint can cause malignancies in isolated human and animal lung cells. Pre-cancerous changes have been detected in lung biopsies from marijuana smokers and at even higher levels among individuals who used both tobacco and cannabis. The medical literature now contains case reports of cancers of the mouth, larynx, tonsils and oesophagus in young adult cannabis smokers including some who never smoked tobacco. Large-scale surveys in the US have given contradictory results with

one study of 1421 cases of cancer in those aged 15-49 showing no increased risk but another case-controlled study found an increased risk of respiratory tract cancers in cannabis smokers. Most recent overviews of the health effects of cannabis emphasise that cannabis smoke is an important risk factor in the development of respiratory diseases, including cancer. Cannabis increases the workload of the heart and people who suffer from heart disease, angina and blood pressure are particularly vulnerable to its effects on the heart.

THC is known to suppress some aspects of the body's immune system and to stimulate other aspects. Cannabis smoke also has damaging effects on a key group of immune cells in the lungs that protect them against bacteria and tumour cells. It is increasingly recognised that those who only smoke cannabis have increased susceptibility to infections, such as pneumonia. This has particularly dangerous consequences for those with compromised immune systems, for example, transplant, AIDS or cancer patients. It is known that HIV positive individuals who use cannabis regularly, appear to be at increased risk of opportunistic infections and of Kaposi's sarcoma and that cannabis use has been associated with increased mortality among men with AIDS.

The general consensus among psychiatrists is that cannabis use does not cause mental illness but that it may trigger schizophrenia in vulnerable individuals and may exacerbate existing symptoms. Therefore, those with pre-existing mental illness may be at particular risk from cannabis use.

Continuous use of cannabis can have an effect on reproductive health such as decreased sperm count, mobility and viability, interference with ovulation and with pre-natal development. The documented short-term reduction of reproductive hormones following cannabis use is likely to decrease fertility at least in the short-term this may be relevant to couples trying to conceive.

Heavy users of cannabis may suffer from apathy and loss of ambition, the so-called 'amotivational' syndrome. However, it is very difficult to establish the exact relationship between this condition and the use of cannabis. Research does highlight that regular cannabis use increases the risk of dropping out of the educational system and of subsequent job instability. The evidence suggests that it is young people whose educational ability is borderline who are most at risk from frequent use of cannabis. It is doubtful if research can ever show that cannabis use causes people to lose motivation, although it does show a link between the two.

Dependence

A cannabis dependence syndrome may occur in long-term regular users of cannabis and internationally it has been suggested that 1 in 10 of those who ever use cannabis will meet the criteria for cannabis dependence. Dependent users report that they have difficulty in controlling their use of the drug, that they continue to use it despite interference with work performance and complaints by significant others about their behaviour and that they experience withdrawal symptoms when they try to stop using the drug. These symptoms include restlessness, anxiety, insomnia, anorexia, depression, muscle tremors, changes in heart rate and blood pressure, sweating and diarrhoea.

It is believed that the risk of cannabis addiction is similar to that for alcohol but much less than for nicotine and heroin. Up until recently it was believed that the dependence on cannabis was psychological and that physical dependence did not feature. However, new research on the cannabinoid receptors has resulted in the development of antagonists which block the effects of THC and which precipitate abrupt withdrawal in animals dosed with the drug. In contrast to the slow elimination of the drug over a 2-3 week period under normal circumstances, which allows the body to adapt without physical symptoms, abrupt withdrawal results in dramatic signs such as hyperactivity and disorganised behaviour. This means that cannabis now meets the criteria for physical dependence as well.

Cannabis and Pregnancy

It is believed that cannabis smoke is as harmful to foetal development as tobacco smoke. The baby is exposed via the placenta, and after it is born via breast milk. Most of the international studies give inconsistent results, but reassuringly there has been no increase in birth defects, the major effect appears to be low birth weight. Evidence does suggest that children exposed to cannabis in the womb may display behavioural and

developmental difficulties during the first few months of life. Between the ages of 4-9 years, such children have shown attention, memory and learning deficits compared to children not exposed. Equally the effects are less than those resulting from exposure to maternal tobacco smoke. Babies born to mothers who smoked cannabis were, according to one report, ten times more likely to develop acute non-lymphoblastic leukaemia than babies whose mothers did not smoke cannabis.

Cannabis as a 'gateway drug'

Cannabis, together with alcohol and tobacco, is recognised as one of the 'gateway' drugs, the use of which predicts subsequent use of other drugs. It is known that most people who experiment with cannabis do not go on to use heroin or cocaine, but statistically, heavy frequent users of cannabis are much more likely to use heroin than those who have never used cannabis.

Most studies have consistently found that there is a regular sequence of drug misuse in which early use of tobacco and alcohol are likely to result in heavy use of those substances. Cannabis use typically follows such heavy use of the legal drugs and it precedes the use of opiates and cocaine. There is some tentative but by no means conclusive pharmacological evidence to support a link in that cannabinoids affect the dopamine reward system in the brain. International experience suggests that those teenagers who become heavy daily cannabis users at an early age are at higher risk of progressing to other drug use because of behavioural, family and school problems which were noticeable before they began to use cannabis.

Cannabis as a medicine

Advances in knowledge of how cannabinoids interact with specific receptors bring about the possibility of designing medicines, which would affect tissues and cells containing those receptors. This has coincided with an upsurge of interest in revising and extending the medical uses historically associated with cannabis.

One medical use that is generally recognised and accepted, is the anti-nausea and anti-vomiting effect of cannabis for patients undergoing cancer chemotherapy. Other potential uses include pain relief in cancer and non malignant intractable pain, relief of the spastic symptoms in multiple sclerosis (MS) and other dystonias, appetite stimulation as a response to wasting in AIDS, and also as medicines for epilepsy and glaucoma.

While there is scientifically valid evidence that cannabis and THC are effective in relieving symptoms in some patients, there is equally valid evidence that they are not effective in other patients with the same conditions, particularly M.S. and pain. Many of the studies have involved too few patients to provide meaningful data. However, new research underway in the UK aims to clarify the exact benefits of cannabis and its chemicals by comparing them to dummy drugs (placebos) and to existing drugs used to treat the same conditions.

Aside from the potential benefits to be gained from relieving the symptoms associated with MS and severe pain, the safety of cannabis drugs and medicines will require careful consideration especially since the side effects reported in some studies appear to be unacceptable to older patients in particular. There would also be concern about the immunosuppressant and carcinogenic effects of smoked cannabis in AIDS and cancer patients. Indeed most of the recent authoritative overviews and commentaries about 'medical marijuana' have drawn attention to the hazards of the smoked drug and much research now centres on ways of delivering cannabis-derived medicines to patients that do not involve the combustion of plant material.

Making either natural or synthetic cannabinoids available to Irish patients would require rescheduling cannabis from Schedule I of the Misuse of Drugs Acts to Schedule II alongside drugs such as morphine and cocaine. The cannabis medicines would also require a Product Authorisation from the Irish Medicines Board based on the standard criteria of Quality, Safety and Efficacy.

Chapter 9 - Amphetamines

Introduction

Amphetamines are synthetic stimulants first produced in 1887, but not used medically until the 1930's. During the Second World War and the Vietnam War, amphetamines such as dexamphetamine (Dexedrine®) were used to increase the performance and endurance of soldiers. Several million people in parts of East Africa and South West Arabia are believed to be dependent on Khat, the fresh leaves of which when chewed, release cathinone, an amphetamine-like drug into the body.

In the 1950's and 1960's amphetamines were widely prescribed as slimming tablets and used to treat mild depression. They are now recommended only for the treatment of narcolepsy (pathological sleepiness) and hyperactivity in children. The non-medical use of amphetamines was very popular among teenagers during the 1960's, when large quantities of 'purple hearts' were taken to stay awake at parties and dances. Another popular drug was methylamphetamine (methamphetamine) or 'speed'. Amphetamines were controlled in 1970 in an attempt to reduce their availability because of diversion of legitimate supplies onto the black market.

Amphetamines may be taken by mouth, dissolved in water and injected, sniffed up the nose or smoked. A new smokeable form of methylamphetamine hydrochloride is called 'Ice' or 'Crystal' or 'Glass' because of its transparent, sheet-like crystals. This very strong form of 'speed' is sufficiently volatile to vaporise in a pipe so that it can be inhaled through the lungs. Ice is manufactured in illegal laboratories either from a chemical called phenylacetone or from ephedrine, a drug chemically related to the amphetamines, used in some cough and cold products. Ephedrine, as a starting material produces the most potent form of Ice, which is why it and phenylacetone are coming under stricter legal control.

A number of other drugs such as methylphenidate (Ritalin®), phenmetrazine (Preludin®) and fenfluramine (Ponderax®) have amphetamine-like effects; the latter two are usually used as slimming agents though exercise and diet may be more effective for losing weight, while methylphenidate is mainly used for narcolepsy and hyperactivity.

Legal Status

The Misuse of Drugs Acts control most of the amphetamine-type drugs. Their unauthorised production, supply or possession is an offence, as is allowing premises to be used for producing or supplying the drugs. The Medical Preparations (Control of Amphetamines) Regulations 1970 also prohibit the manufacture, preparation, importation, sale and distribution of various amphetamines. Amphetamines are not available for normal prescribing by doctors. The Minister for Health has power to grant a licence to allow the supply of amphetamines to a patient who requires it for treatment. Such supplies cannot be obtained from normal pharmacies but only from a central depot. The rationale is to reduce the leakage of legal amphetamines into the black market through forged prescriptions, excessive prescribing or burglaries from pharmacies.

Prevalence and Availability

Prior to the strict control measures, amphetamine misuse was a significant problem in Ireland. One study conducted in 1969/70 indicated that over 11% of boys in a Dublin remand home had taken amphetamines. Six months after the regulations were introduced this had fallen to 0.6% of the boys. It is generally accepted that the non-availability of legal amphetamines had dramatically reduced the misuse of amphetamines in Ireland until recently. The medical use of amphetamines had also declined from over 2,000 prescriptions in 1972 to 339 in 1990.

In recent years there has been a gradual increase in amphetamine use as indicated by surveys which show that 8.8% of 18-24 year olds had used these drugs in the past year. Among school children the experimentation rate varies from 2-5% with up to 3% reporting more frequent use. Demand for treatment has also shown an upward trend from 0.5% of first-time attendees at treatment centres to 2.1% in 1999. Street prices average around €12 per gramme which is enough to prepare 3 'wraps' of powder, although the amount of amphetamine in the powder has dropped from 4-7% in 1995 to 3% in 1999.

Mood Altering Effects

The effects of small doses of amphetamines taken orally are very different to the effects of high doses injected intravenously. A moderate dose of

less than 30mgs stimulates the nervous system, arousing and activating the body in the same way as natural adrenaline prepares the body to face emergencies and stress. Breathing and heart rate speed up, blood pressure increases, the pupils widen and appetite is suppressed. The user feels more active, more alert and energetic. There is a lessening of fatigue and an increase in mental activity, with better concentration and clearer thinking. The change in mood leads to a general feeling of well being. Some people may experience irritability, confusion and dizziness after repeated small doses.

High doses taken by injecting, sniffing or smoking give rise to a 'rush' of pleasurable experience. Some 'speed' users go on a binge or 'run' of injections lasting several days. They become overactive, boastful and indulge in repetitive behaviour such as repeated cleaning of shoes. High doses can produce panic, hallucinations and feelings of being persecuted. The effects, including the adverse effects of methamphetamine, persist for 18-24 hours compared to a few minutes when cocaine is smoked.

Adverse Effects of Use

Regular users of high doses are liable to develop an 'amphetamine psychosis' which resembles schizophrenia with thought disorders, hallucinations and feelings of being persecuted. These latter feelings may lead to hostility, aggression and violence as individuals defend themselves against imaginary enemies. The psychosis usually disappears when drug use stops, but in many people it may persist for some considerable time, unlike the similar psychosis which develops with cocaine. Long-term use can lead to psychotic behaviour involving paranoia, hallucinations and violence. More recently evidence has emerged that methamphetamine is neurotoxic and that brain cells producing dopamine and serotonin are affected.

Injectors of amphetamines are at risk of infection as outlined in Chapter 2.

Methamphetamine has much greater effects on the brain than amphetamine. The immediate effects can include irritability, anxiety, increased body temperature, euphoria, insomnia, anorexia, paranoia and aggressiveness.

One of the catchphrases of the 1970's was 'speed kills', because it was widely believed that long-term use of amphetamines would be fatal. In fact amphetamines have caused very few deaths. Violence rather than toxicity has been the major cause of death among amphetamine users. However, the hazards of injecting, and the lack of sleep and food debilitates the heavy user, lowering resistance to disease and can lead to serious damage to health. Death can occur due to the hyperthermia or from convulsions or from strokes and general cardiovascular collapse.

Dependence

Tolerance to many of the effects of amphetamines develops rapidly, with some users able to take up to 15 gms per day compared to the normal stimulant dose of 10 mgs. When the drug is discontinued a user will feel deeply depressed, fatigued and sleepy and extremely hungry, because the amphetamine has merely postponed fatigue and depleted the body's own reserves of energy. This feeling is called the 'crash'. Severe psychological dependence can develop because of the pleasant effects experienced.

Chapter 10 - MDMA (Ecstasy)

Introduction

MDMA is named after its chemical name MethyleneDioxyMethamphetamine. It is widely known as Ecstasy because of the happy sociable emotionally open feeling it causes in users. MDMA is often labelled a 'designer drug' but it was in fact first synthesised and patented in Germany between 1912 and 1914. The US Army tested it in 1953 as part of its chemical weapons programme. In the mid 1970's an American medicinal chemist called Shulgin rediscovered the drug and after testing it on himself he reported its empathetic effect, this led to its use in psychotherapy where it was used to facilitate communication in relationships. It was also used to create emotional openness in those with suppressed memories of rape or child abuse and in the terminally ill. Media stories highlighting the 'love drug' connotation led to recreational use which was at a low level until the drug became inextricably linked with dance events involving 'Acid house', 'Rave' and 'Techno' music genres which apparently started on the island of Ibiza, which by 1986 was known as XTC island.

It is a difficult drug to classify, being neither a true hallucinogen like LSD nor a true stimulant like amphetamine itself. Some researchers have coined the term 'entactogen' to describe its apparently unique effect including closeness to others, facilitating relationships and creating empathy. MDMA and related entactogens such as MDA, MDEA ('Eve') and MBDB are not available pharmaceutically. All supplies are produced illegally in backstreet laboratories using as starting materials the known carcinogens Safrole and Isosofrole found in a number of plant oils or using Piperonal. Europe is the source of 80% of the MDMA consumed all over the world with the main production sites, according to Europol, found in the Netherlands. Production has also been detected in France, Germany, Spain, the UK and Belgium and those involved were believed to have links to Dutch criminal organisations. Gardai seized one laboratory producing MDA some years ago. The illegal synthesis also brings with it significant environmental hazards since the production of 1 kilo of MDMA results in up to 20 litres of chemical waste.

Legal Status

MDMA and related compounds were included in Schedule 1 of the Misuse of Drugs Acts in 1987. They have no medicinal use and cannot be prescribed by doctors, sold or distributed and it is also illegal to possess them. The chemicals used to produce the drug (precursors) are strictly controlled and monitored under both EU and National Regulations.

Because of concern about the emergence of different types of new synthetic drugs especially those chemically related to MDMA and amphetamine-type stimulants (ATS), the EU adopted a Joint Action on New Synthetic Drugs in 1997. This involves an early warning system, information exchange and risk assessment of any new drug that appears on the market. To date, the Scientific Committee of EMCDDA has conducted five assessments. The first drug called MBDB is controlled in Ireland but not in some other Member States. The risk assessment led to a decision to monitor its presence on the market and it was discovered that it had disappeared so no further EU action was taken. A compound 4-MTA known as 'flatliners' was recommended for common control throughout the EU, as was PMMA. Two further drugs, Ketamine and GHB, were assessed but since they are controlled under medicines legislation in most EU countries no further controls were deemed necessary.

Prevalence and availability

MDMA is sold mainly as tablets with a variety of different logos imprinted on them. Over 200 logos have been observed in Europe, including many Disney characters, $ and € signs. The main 'brands' appear to be those bearing the Mitsubishi triple diamond logo but other popular ones include 'shamrocks' and 'doves'. Some ecstasy tablets may contain MDMA mixed with MDEA or with MDA or the tablets may contain one of those MDMA analogues on their own. Tablets typically cost between €10 and €15 depending on where they are bought.

Concern has been expressed about toxic contaminants in bad batches of ecstasy but there is no scientific evidence that rat poison or heroin have been added to MDMA tablets. Internationally it is known that only a relatively small proportion of the 17 million tablets seized in Europe contained other substances such as the stimulants ephedrine, amphetamine, methamphetamine or caffeine. On occasion hallucinogenic drugs such as DOB and Atropine have been found. More recently some tablets

with a 'Mitsubishi' or 'E' logo have been found to contain a mixture of PMA and PMMA, two amphetamines that have been placed under control. In Ireland it is believed that Ketamine has been found in some ecstasy tablets.

In genuine MDMA the drug content can vary from 30-150 mg, where 100 mg would be considered a 'normal' dose. A study of 100 'Mitsubishi' tablets in Dublin showed a MDMA content of 59-98 mg with an average of 79 mg whereas tablets with a 'bird' or 'dove' logo ranged in content from 98-123 mg, an average of 110 mg. Remarkably, given media descriptions of them as being double strength, some 'shamrock' tablets had only 77 mg of drug in them.

MDMA is an excellent example of the unpredictable nature of the drug scene because in 1990 there were no prosecutions relating to it but now it accounts for about 25% of all prosecutions under the Misuse of Drugs Acts. The 1999 ESPAD survey of substance use reported that MDMA was perceived by Irish 15-16 year olds as being very or fairly easy to obtain although there was a significant drop in the percentage holding that view compared to the 1995 study. That 1999 study also reported that, at 5%, the percentage of European 15-16 year olds who have tried ecstasy was highest in Ireland, although this is approximately half the figure reported in the 1995 report. The SLÁN survey indicates that 2.4% of adults had used MDMA in the year prior to the survey but 18-24 year olds at 8.1% were more likely to have used it.

Mood Altering Effects

The effective dose of MDMA is in the region of 100 mg depending on body weight. The effects start about 30 minutes after swallowing the drug, reach their peak after about 90 minutes and then plateau for 2-3 hours before starting to subside for the next hour or so. After-effects can be experienced for 3-24 hours later. The sought after effect is that of being relaxed but energetic, happy and calm with a warm friendly feeling towards others. Aggressive, violent feelings are suppressed; there may be increased self-awareness and increased perception of visions and music. No true hallucinations occur at 'normal dose' levels and while it is not a true amphetamine type stimulant, it does release energy to allow young people to dance to 'techno' music for long periods of time.

In addition to these effects MDMA causes a rise in blood pressure, heartbeat and body temperature. People with a history of blood pressure, heart disease or asthma, should not use this drug. Other physical effects include a tingling sensation on the skin, jaw stiffness and grinding of the teeth. Many users report experiencing a dry mouth, tremors, palpitations and sweating after using the drug. There are also reports of anxiety, confusion and difficulty in concentrating. Surveys of recreational users indicate that while sexual desire is enhanced, sexual performance in men is impaired. When the effects subside there is frequently feelings of tiredness, drowsiness, lack of energy, heavy legs, insomnia and irritability, which can last from 24 hours to a week.

Adverse Effects of Use

Little is known for certain about the effects of combining MDMA with other drugs. Alcohol, because of its dehydrating effects may increase the risk of overheating and prolongs the duration of the MDMA effects. While ecstasy use reduces subjective feelings of drowsiness after drinking alcohol, it does not reverse the well-known effects of alcohol on driving and other motor skills.

Deaths resulting from MDMA use are relatively rare but since they involve young people they are particularly tragic. Accurate information on the exact number of deaths that have occurred is not available. One scientific paper reported on 15 deaths in Ireland between 1996 and 1997. A study of toxicological reports from coroners inquests conducted in the greater Dublin area from 1998 to 2000 showed that ecstasy was involved in only one death. It should be noted that because the study was focussed on opiate-related deaths, other ecstasy related deaths would not necessarily be included.

Deaths can be due to a variety of causes ranging from delusional behaviour to heart attacks, strokes and asthma attacks. Most deaths have resulted from heatstroke known as hyperthermia. The drug causes a rise in body temperature, it can be up to 41oC in some users. This is aggravated by the heat and overcrowding at many dance events and by the body heat naturally generated by prolonged dancing. Death subsequently occurs due to muscle breakdown, clotting inside the body and kidney failure.

It is not known why some users suffer such an extreme effect and others do not. Initial suggestions that 6-9% of the population who are classifiable as slow metabolisers of drugs generally, were those most susceptible to the hyperthemic risks, have not been supported by research findings. There is a similar lack of knowledge concerning the causes of the reported cases of hepatitis where deaths have occurred due to liver damage and in others where transplantation has been necessary a short time after exposure to the drug.

Attempts to reduce the effect of hyperthermia led to ecstasy users being advised to drink large volumes of fluid. In some instances this has led to death due to water intoxication. This has been linked to a direct effect of MDMA resulting in the increased production of a hormone called Vasopressin or ADH. The effect of Vasopressin is fluid overload after excess water consumption because the kidneys do not function, resulting in cerebral oedema (swelling of the brain), coma and death. Other serious complications of MDMA use include cases of convulsions, stroke and severe chest pains.

Many of the side effects while unpleasant are mild and would be expected from an amphetamine-type drug. Nausea, disorientation, visual distortions and lack of coordination may be caused by larger than normal doses. Since the drug is similar to amphetamine, appetite suppression is common and frequent use linked to frequent dancing is likely to result in anorexia and weight loss.

Many users report feelings of depression after moderate use of the drug with some meeting criteria for clinical depression within 5 days of having used the drug. This effect is the most commonly reported side effect by most users, 83% in one UK study of 469 users said they experienced a mid-week 'low mood'. Reports from psychiatrists indicate that regular MDMA use is associated with chronic psychiatric symptoms such as psychotic episodes, panic disorder and depersonalisation, which continue after drug use has stopped. It is not yet known whether these are pre-existing conditions triggered off or worsened by MDMA or if the drug actually causes the problems.

Because MDMA was never officially used as a medicine and because its frequent widespread use by large numbers of young people is so recent, reliable information on the long-term effects of the drug has only emerged in recent years. Substantial numbers of users have reported unpleasant after effects and compulsive use referring to 'ecstasy fatigue' and a 'crash' involving a dose-related hangover in the form of tiredness, lethargy, feelings of loss, sadness and dread in the days following MDMA use. Evidence is also emerging that repeated use of MDMA causes immune system dysfunction. It is likely that this would increase an individual's susceptibility to infections but the research is still at an early stage.

Studies in rats and in monkeys have shown that doses of MDMA comparable to those used by humans can cause damage to certain brain cells (neurones), which produce a key chemical messenger or neurotransmitter called 5-HT or serotonin. The significance of this for human users is that low levels of serotonin in the brain is linked to depression, which can occur after short-term use. On the basis of the animal evidence MDMA and its relatives have been listed as neurotoxins but until recently human evidence has been largely indirect. Such indirect evidence includes the reported high level of depressive symptoms reported by users and the low levels in the spinal fluid of users of 5-HT breakdown products.

The first direct evidence that MDMA was selectively neurotoxic to serotonin producing brain cells came from studies using PET scans of the brains of 14 individuals who had used MDMA 25 times or more which were compared to similar scans from individuals who had never used the drug. In the user group the scans showed significant reduction in the number of serotonin transporters, which is probably related to damage to serotonin nerve endings, compared to those who never used the drug. A Dutch group, who also indicated that women might be more susceptible than men but why this might be so has not been clarified, has confirmed this US study. Another key unresolved question is how reversible is the damage to the nerve endings. There is both animal and human evidence that the damage is partially reversible with animal studies showing that there is some regrowth of the cells but that it is abnormal and incomplete. The studies also show that decreases in the densities of the brain cells persist for more than

seven years after exposure to MDMA in squirrel monkeys. These same studies led to reports that single doses of MDMA induced signs of neurotoxicity in monkeys. For humans, increasing the dose consumed and use of MDMA in hot crowded dance venues, which increases the risk of hyperthermia, may, on the basis of the animal experiments, increase the neurotoxicity.

Apart from the linkage with the depressed mood reported by many ecstasy users, the effect on the nerve cells has also been linked to memory deficits in users. Most studies of memory and learning in MDMA users have shown significant impairment of verbal and spatial memory, word recall, arithmetic skills, verbal recognition and information processing speed. Ecstasy users themselves describe how daily tasks have been impaired by their drug use. Some of these results have been confounded by the fact that the vast majority of ecstasy users are polydrug users of alcohol, cannabis and amphetamines. Most of the studies have found selective impairment in MDMA users compared to non-users of any drugs but intriguingly some researchers have linked the deficits to the use of cannabis by those MDMA users.

Concern has been expressed about the consequences of MDMA's reputation as a 'love drug'. The emotional openness it creates could be a factor in unsafe sex practices with the attendant risks of Sexually Transmitted Infections and unwanted pregnancy. There is little information available on the effect of MDMA during pregnancy, as the usual studies have never been performed to establish whether it is safe or not. One study reported in the Lancet found an increased risk of congenital abnormalities including heart defects in children born to mothers who had used the drug but these findings need to be confirmed by other studies.

Dependence

While it is generally believed that MDMA is not a drug of addiction, it must be borne in mind that it is an amphetamine and as such has the potential to cause psychological dependence. Tolerance to the effects does develop and in many countries, including Ireland, there are now frequent reports of users having to take several tablets, 10-15 tablets at a time reported in some studies, in order to experience any positive effects. A minority of users can be classified as dependent on MDMA using standard criteria described in Chapter 2.

Other Dance Drugs

These are so-called because of their association with the dance scene and a 'clubbing' lifestyle. MDMA is the major drug but others have included LSD and the general anaesthetic Ketamine.

Ketamine is now used only in veterinary medicine as a tranquilliser and anaesthetic, medical use in humans has been discontinued largely because of the hallucinations and aggressive behaviour that affected patients. Most illicit supplies are diverted from the legitimate pharmaceutical industry. The drug can be recovered from injection vials by removing the water. The powder can then be made into tablets with typical ecstasy logos or it can be 'snorted' or injected. Street names for Ketamine include 'Vitamin K', 'Special K', 'Kit Kat' and these are used when the drug is being promoted in its own right to young people. In addition to the hallucinations, Ketamine can also cause numbness, blackouts and temporary blindness.

Another anaesthetic sold as 'Liquid Ecstasy' is sodium oxybate, known also as GHB from its chemical name Gammahydroxybutyrate. In addition to concern about its misuse potential and the convulsions and deaths that have been reported when it is mixed with alcohol, there is increasing unease about the role of GHB in drug-assisted sexual assault. Because GHB is an odourless colourless slightly salty liquid that causes unconsciousness very rapidly, it is a particularly harmful drug in this context.

Both Ketamine and GHB have been subjected to Risk Assessment by the EMCDDA but common EU controls were not considered because both materials are subject to medicines legislation already.

Chapter 11 - LSD

Introduction

The name LSD, as well as its slang term 'acid' is taken from the chemical name Lysergic Acid Diethylamide. LSD is synthesised from Ergot, a fungus that grows on rye and wild grasses. Ergotism or 'St Anthony's Fire' a disease involving hallucinations, gangrene and death, occurs when flour contaminated with ergot is eaten, outbreaks have occurred sporadically throughout history. Some of the symptoms of ergotism resemble those of an LSD trip. LSD was first synthesised in 1938 in Switzerland, but its hallucinogenic effects were only discovered by accident in 1943. the drug was used at one time in experimental psychiatry, but at present such use is almost non-existent. Nearly all LSD is now prepared by illegal synthesis in back-street laboratories.

In the early 1960's in America and later in the rest of the world, LSD was publicised for non-medical purposes and became the chemical cornerstone of the 'Flower Power' hippy movement, where it was used to precipitate semi-religious mystical experiences. In the late 1980's it became popularly associated with so-called 'Acid-House' music.

LSD is a semi-synthetic product, but ritual use of the seeds of the Morning Glory plant, which contain chemicals closely related to LSD, was part of the religious observances of the Aztecs of Central America. Indeed, many plants containing hallucinogens have been used for centuries for religious purposes by primitive cultures mainly on the American Continent. Many of these drug rituals survive to the present day, including the use of the Peyote cactus, which contains mescaline and the Magic Mushrooms containing psilocybin.

LSD is classed as an hallucinogen, meaning that it causes a 'trip' involving changes in the perception of time and space which result in unreal sensations, the appearance of visions, the hearing of voices and delusions. It is an extremely potent drug and the minute amounts required for a 'trip' can be formed into small tablets (microdots), absorbed onto blotting paper, or peel-off black stars, or cartoon figures. 'Tabs' of LSD are generally pieces of thin cardboard that have been impregnated with the drug and allowed to dry. Various logos appear on these tabs such as 'strawberries', 'planets', 'flyingkeys', and 'batwings'. The strength of these preparations is unpredictable and often materials sold as LSD do not contain any LSD at all. The strength of the LSD 'tabs' available in Ireland is not known but information from the USA suggests that LSD samples there have less than half the drug of samples tested in the 1960's and 1970's.

Modern chemistry has produced a range of synthetic hallucinogens in addition to LSD. These include MDA, DMT and PCP (phencyclidine) or 'angel dust' once used as an anaesthetic, but which now has a bad reputation for releasing violent behaviour or causing prolonged coma. PCP is usually sold as one of the more exotic hallucinogens, such as synthetic THC, mescaline or psilocybin. It is not widely used in Ireland. The name 'Angel Dust' has more recently been used for a different drug, clenbuterol, which is illegally used a growth promoter in cattle. Clenbuterol does not cause hallucinations.

Legal Status

LSD and other hallucinogens such as DMT, mescaline, and psilocybin are controlled in Schedule 1 of the Misuse of Drugs Act, which prohibits medical and non-medical use. This means that they can only be supplied or possessed for research or analysis by a person holding a licence from the Minister for Health. It is an offence to produce, supply or possess these drugs. It is also an offence to allow premises to be used for the production or supply of these drugs.

Prevalence and Availability

It is generally believed that the popularity of LSD declined from the mid 1970's until the late 1980's when it became more popular as part of the acid house music scene. Survey data shows varying rates of experimentation and more regular usage. The SLÁN survey indicated that 1.4% of the adult (18- 64yrs) population had used the drug in the preceding year. Among younger adults (18-24yrs) however the figure was 5.1%. One study of school children nationally showed that 3.7% of 17 year olds had used LSD within the month prior to the study. The 1995 ESPAD study showed that 3-13% of those surveyed had ever used the drug. It is noteworthy that the corresponding figure in the 1999 ESPAD study had fallen to 5%. The number of prosecutions for

possession has fallen significantly in recent years as has the number of doses seized by the Gardaí. It is believed that a single dose ('tab') of LSD costs about €6.

Mood Altering Effects

An LSD trip begins about an hour after swallowing the drug. It peaks 2-3 hours later and the effects usually wear off after 12-15 hours. The effects are difficult to predict because they depend on the experience and expectations of the user and where the drug is taken. The physical effects are less important than the mental and emotional effects and include increased heart rate and blood pressure, widening of the pupils and a rise in temperature. Users generally report changes in body images, distorted shapes and sizes and intensified colours. Users may have the feeling of hearing colours and seeing sounds due to sensory crossover. Distortions in sense of time and of place occur. Psychological tasks such as learning, remembering and concentration are impaired.

Emotional reactions vary, but include heightened self-awareness, mystical experiences and insight into childhood memories. These mood changes may be extremely pleasant or extremely frightening. The latter, known as a 'bad trip' may take the form of severe terrifying thoughts, feelings of loss of control and fear of going mad or dying. A person may have good or bad experiences on different occasions or even during the same trip.

Adverse Effects of Use

It is believed that the ratio of unpleasant 'trips' to pleasant 'trips' is high. Unpleasant reactions are likely if the user is mentally unstable, anxious or depressed and can include anxiety, fear, depersonalisation (feelings of floating outside one's body), depression, disorientation and panic. Serious panic and anxiety or even psychotic reactions can occur, but can be dealt with by reassurance. Occasionally tranquillisers may be required. Prolonged mental illness such as schizophrenia or depression, may be triggered off by an LSD trip.

Good 'trips' are also not without risk, with people being injured because of delusions about being able to fly or walk on water. The exact extent of fatal accidents and suicides caused by LSD is unknown. Fatalities due to overdosage are non-existent.

'Flashbacks', short vivid re-experiences of a previous trip, can occur weeks or even months after the initial trip. These can cause disorientation, anxiety and distress and can be dangerous, in certain circumstances if one is driving, operating machinery, working at heights.

Dependence

No physical dependence or compulsive drug-seeking behaviour occurs, but tolerance develops which may tend to reduce frequent use.

Chapter 12 - Magic Mushrooms

Introduction

The use of mushrooms and other plants for their vision-inducing (hallucinogenic) effects dates back, according to archaeological evidence to about 500 BC in Central America. The Aztecs of Central Mexico consumed sacred mushrooms called Teonanactal (divine flesh). The mushroom-induced visions and voices were their way of communing with the spirit world. When the Spanish conquered Mexico in the 16th century they tried to eliminate the practice, but the cult has survived to the present day. The main mushroom used in Mexico is *Psilocybe mexicana*, which contains the drugs psilocybin and psilocin. Numerous other species of mushroom grown in North America and Europe also contain these chemicals that are related to LSD.

Psilocybin-containing mushrooms do not feature in European history, although witchcraft is believed to have involved hallucinogens from the potato family such as deadly nightshade. The use of mushrooms for 'recreational' drug use has increased gradually since the mid-1960's as a more 'organic' alternative to LSD. At present a number of different types of mushroom are known to produce psilocybe. These are chiefly from the Paneolus and *Psilocybe* families, especially *Psilocybe semilanceata*, known as the Liberty Cap. The ritual medicine men or 'Shamans' of North East Asia and Siberia used Fly Agaric, an unrelated mushroom. In this case the chemical responsible is probably muscimole.

Legal Status

The Misuse of Drugs Acts control the substances psilocybin and psilocin. Because they are recognised as having no use in medicine, they are included in Schedule 1, which prohibits the possession, production, supply and the act of allowing premises to be used for their production or supply by anyone (including doctors) except in accordance with a licence issued by the Minister for Health for research or other special purposes. There are no legal restrictions on harvesting, preparation and use of Fly Agaric.

Prevalence and Availability

There is no way of knowing exactly how many people use, or have used, 'magic mushrooms'. A survey of school children in the Dublin area indicated that 4% had taken them. Relatively small seizures of the drug have been made in recent years. As a result, there have been few prosecutions. In addition, there has been a reduction in the number of Drug Clinic patients reporting use of the drug. Most of the mushrooms are collected from the wild, but botanical records are sketchy on the exact species that grow here. It is believed that it is the Liberty Cap that is the most commonly used. It also has the highest content of Psilocybin.

Psilocybin mushrooms may be eaten raw, cooked or brewed into a tea. Drying may also preserve them. The amount of Psilocybin varies with the species, location, maturity and size. Therefore, dosages are variable, not least because varying amounts of mushrooms (8 - 300) are taken. Thus, while it is believed that 20-30 mushrooms seem to be the usual dose, the actual amount of Psilocybin taken is unknown and the effects therefore difficult to predict.

Mood Altering Effects

The effects of Psilocybin-containing mushrooms are similar to a mild LSD experience. The experience therefore is variable and dependent on the user's mood, environment and intentions. The experience is not as unpleasant as an LSD trip. The effects include euphoria and hilarity, together with dilated pupils, increased pulse rate and high blood pressure. The effects come on quicker, generally after about 30 minutes and start to wear off after about 4 hours, compared to 15 hours for a dose of LSD. The hallucinations are usually visual in nature but auditory hallucinations can also occur. There are reports of people having the sensation of objects changing shape and heightened awareness of sound and colour.

Adverse Effects of Use

Users commonly report nausea, vomiting and abdominal pain, but it is possible that non-psilocybin poisonous mushrooms may have been taken as well as liberty caps.

A number of users in Britain reported bad 'trips' involving feelings of depersonalisation, panic, anxiety and even psychotic reactions. Some users were aggressive and hyperactive, with many of those requiring medical attention reporting their experiences as frightening, and including tingling of the limbs and flushing. Such bad trips can be dealt with by friendly reassurance and generally wear off after about 12 hours with no lasting effects. Some users do have recurrent panic and

anxiety attacks often triggered off by alcohol. A number of users indulge in rash behaviour, such as running in and out of traffic, wandering naked along a railway line, or trying to walk between tube stations. In the latter case a 16 year old boy was killed when struck by a train.

Psilocybin mushrooms are not poisonous, but there is the ever-present possibility of picking poisonous mushrooms by mistake and a number of fatalities have been reported from other countries. Distinguishing hallucinogenic mushrooms from poisonous, often deadly relations is a complicated task, requiring reference to relevant botanical texts and some expertise in the classification of mushrooms, and it is not a task to be performed while hallucinating.

Little is known about the long-term effects of extended, frequent use.

Dependence

As in the case of LSD, tolerance rapidly develops and it may take twice as many mushrooms to repeat the experience. Cross-tolerance occurs between LSD and Psilocybin. There are no significant withdrawal symptoms and no physical dependence, although some people may be psychologically dependent.

Chapter 13 - Sedatives and Minor Tranquillisers*

Introduction

Sedatives are used medically to calm people down and to help them sleep at night. The most important of the older sedative drugs are the barbiturates such as Seconal® and Amytal®. Because they have side effects and because quite small amounts can result in an overdose, they have been largely superseded by the minor tranquillisers. However, one barbiturate, phenobarbitone, is still widely used in the prevention of epilepsy.

Tranquillisers fall into two main groups:

- major tranquillisers, such as Chlorpromazine are used for serious mental illnesses
- minor tranquillisers are used to control anxiety and stress and at night to induce sleep.

Minor tranquillisers are the most frequently prescribed, particularly the benzodiazepine type. Benzodiazepines can be divided into the Anxiolytics (anti-anxiety drugs), such as Diazepam, Loreprazepam and Chlordiazepoxide, and the Hypnotics (sleep-inducing agents) such as Flurazepam, Nitrazepam and Triazolam. The division is not absolute because many of the anxiolytics can also act as hypnotics. Sometimes the benzodiazepines are classified as short acting, such as Triazolam, Temazepam and Loreprazepam or as long acting such as Flurazepam, Nitrazepam and Diazepam.

The benzodiazepines are used to help people cope with disabling distress caused by insomnia, anxiety, panic, epilepsy, muscle spasms and pre-surgical stress. Both the barbiturates and the tranquillisers are usually taken by mouth but some people may inject either dissolved barbiturates or the liquid form of certain benzodiazepines. Newer drugs include Zolipidem and Zopiclone, which though chemically different to the benzodiazepines have many of the same sedative effects and also similar risks of adverse psychiatric effects and of dependence.

Legal Status

All tranquillisers and barbiturates are regulated under the Control of Sale Regulations and as such can only be sold by a pharmacist, in accordance with a doctor's prescription. They are also controlled under the Misuse of Drugs Acts. Therefore it is illegal to possess them without a prescription or to sell them or to give them to someone else.

Flunitrazepam and Temazepam are recognised as being especially liable to misuse, particularly by opiate misusers and as a result are subject to much stricter controls on prescribing and possession.

Prevalence and Availability

The use of barbiturates has declined in medicine. While no exact figures are available, it is known that the prescribing of these drugs almost halved in the five years to 1978 and there is every reason to believe that the decline has continued. While 52 people were charged with the possession of barbiturates in 1981, there have been no such prosecutions since 1985.

There have been no national surveys of the overall use of tranquillisers in Ireland. Most of the information that is available has come from the General Medical Services Scheme, which covers approximately 30% of the population. Between 1995 and 2000 the number prescriptions for benzodiazepines rose from just over 1.2 million to approximately 1.6 million. The WHO uses the concept of Defined Daily Doses (DDD) per 1000 of the population per day as a basis for comparing prescription trends for this group of medicines. The DDD has more than doubled since 1973 when it was estimated to be 50, the corresponding figure in 2000 is believed to be 116. It has been estimated that 11.5% of the adult GMS entitled population are using prescribed benzodiazepines at any one time. In the case of hypnotics the DDD figure is 62, with much of the increase being due to the non-benzodiazepine hypnotics such as Zopiclone. Women are more likely to use these drugs than men and use in age group 60-70 years is much higher than in other age groups. It is believed that prescribing within the GMS accounts for 60-70% of total usage of these medicines in Ireland but no detailed information on the extent of private prescribing of benzodiazepines is available at present. Survey data shows a relatively low level of use, with the SLÁN study reporting that 1.2% of adults having used hypnotics and sedatives in the 12 months prior to the survey. The reported

** Generic drug names are used throughout the chapter. For information, at the end of the chapter a table identifying some common registered trade names is included*

lifetime use in the ESPAD studies was 7% in 1995 and 5% in 1999.

The level of alleged over prescribing of these drugs has been linked to their use by opiate addicts. In this context the emergence of a 'black market' is somewhat surprising. Gardaí seized more than 15,000 tablets, containing benzodiazepines, in 1999. An increasing number of clients attending Drug Treatment Services report using benezodiazepines either as their major drug or as their second drug of choice.

Mood Altering Effects

Barbiturates depress the central nervous system in the same way as alcohol. Small doses may make people feel relaxed and sociable as if they had taken one or two drinks. With larger doses the sedative effects predominate. A person, having taken a moderate to large dose, will often be unsteady, with poor control of speech and body, rendering them liable to injury. They may appear to be drunk without any smell off their breath. Some may become aggressive as can happen with alcohol. The effects last from 3 to 12 hours depending on the dose.

Adverse Effects of Use

Large doses can cause unconsciousness and eventually respiratory failure and death. The fatal dose is very close to the medical dose. Overdose deaths, particularly when alcohol is drunk at the same time, have always been a major medical problem.

Tranquillisers depress mental activity, making people less alert, but the usual dose does not make people as sleepy or impair intellectual function as much as the barbiturates. The most commonly reported side effects are drowsiness, forgetfulness and a decrease in the ability to carry out complicated tasks such as driving because of the sedation, impaired memory and reduced co-ordination.

The benzodiazepines are known to disturb control of steering and reaction time in both laboratory and road tests. In addition, the amnesia produced can cause some drivers to forget routes and impair their ability to read maps. It has been suggested that medical doses may double the risk of a traffic accident. If these drugs are taken with alcohol the damaging effect on co-ordination and performance will be even greater because the combination of the two drugs will magnify the effects of each drug. A review of the literature on Drugs and Driving prepared by the Health Research Board EMCDDA reported that benzodiazepines are the most frequently detected legal drugs in drivers after alcohol. The Medical Bureau of Road Safety's data for Ireland confirms this with 25% of cases testing positive for this group of drugs.

Another problem is the possibility of a hangover effect following a hypnotic, sleep-inducing dose the previous night. The damaging effects tend to disappear after a few days when short-acting drugs are taken. The damaging effects continue for longer when a drug such as Nitrazepam is used. Patients are advised to avoid all those activities which require concentration and co-ordination, such as driving, use of machinery, use of complex automated systems in the chemical, power and other industries, air traffic control systems during the first few days of treatment with Benzodiazepines and with Zopiclone.

Any of the benzodiazepines in a high enough dose can induce sleep. Some long-acting types such as Nitrazepam and Flurazepam can have effects lasting into the following day. Some shorter-acting types have effects that last from 3 to 6 hours.

Use of benzodiazepines may cause confusion and disinhibition in some users leading to a loss of self-control, recklessness and even violence. Falls and fractures are a hazard due to poor co-ordination. One USA study indicated that benzodiazepine users use more healthcare services as a consequence of accidents and injuries than patients who do not use these agents.

The benzodiazepines are safe in the sense that lethal doses are very large. Single large doses of these drugs have been taken on their own with little or no long-term consequences. However, if they are combined with alcohol, then a fatal dose is reached at a much lower level.

Benzodiazepines use may precipitate suicide in depressed patients. In cases of bereavement, psychological adjustment may be inhibited. There is evidence that memory is impaired but this usually relates to the period after the drug is taken, which is why they are used preoperatively

and in dentistry.

While some residual amnesia may occur and some chronic users have lower scores in some psychological tests, it is not yet known for certain whether long-term use impairs intelligence.

Dependence
Tolerance develops to the effects of these drugs and may increase the risk of dependence because of the need to increase the dose. Benzodiazepines are thought to lose their ability to induce sleep after a fortnight's continuous use and may be ineffective against anxiety after four months.

If drug use is suddenly stopped, withdrawal symptoms such as tremor, sweating, headaches, sensitivity to light, sound and touch, insomnia, nausea, vomiting, anxiety, depression, muscle spasms, vertigo and a feeling of continuous movement appear several hours after a short-acting drug. Serious withdrawal effects include psychotic reactions such as hallucinations, depersonalisation and paranoid delusion as well as convulsions. The psychotic reactions are not life threatening as with the convulsions, which cause fatalities when people were withdrawn from the older barbiturate type sedatives, but may be unpredictable in their onset and may last from 2 weeks to a year.

In some cases the withdrawal symptoms may resemble the original pre-treatment complaint and there may be a temptation to continue the treatment. However, many doctors feel that patients should be withdrawn from tranquillisers as soon as possible by gradually reducing the dose, rather than abruptly stopping it altogether. It is now recommended that these drugs should only be used to treat severe disabling anxiety and insomnia using the lowest possible doses and for the shortest possible time which should not exceed 4 weeks. When a benzodiazepine is used to induce sleep its use should be intermittent, for example every third or fourth day over a couple of weeks. In this context it is worrying that information from the General Medical Services (GMS) Payments Board suggests that more than two thirds of those being prescribed benzodiazepines are taking them for much longer than four weeks.

There is no evidence available to suggest that any one drug is more responsible for the development of dependency than another. Dependence is more likely to occur in the elderly whose metabolism is reduced and where there is dependence on other drugs especially alcohol. Dependence is also a risk with Zopiclone particularly when the dose is increased and it is used for longer than four weeks.

Co-Abuse of Benzodiazepines and Opiates
The co-abuse of benzodiazepines ('Benzos') and opiates is linked to much lower success rates in drug treatment programmes and a greater risk of HIV infection. There is much concern about the increasing misuse of these drugs, particularly of Diazepam and Flunitrazepam among opiate addicts in Dublin. In one study involving urinalysis, approximately 50% of all the samples tested positive for benzodiazepines. In many cases the doses being used are up to 20 times normal. Flunitrazepam in combination with opiates, causes disinhibition, leading to unhygienic injection practices and also criminal behaviour resulting from feelings of invincibility and sensations of being invisible. Sometimes drug use is deliberate in order to instil confidence prior to committing acquisitive crimes.

However, the increased risk of death through overdosage when opiates and benzodiazepines are combined is the most worrying aspect of all. Between 1998 and 2000, benzodiazepines were implicated in the highest number of drug related deaths in the greater Dublin area. A detailed investigation of coroners reports by Ray Byrne of the Addiction Research Centre at TCD shows that 179 of the designated drug related deaths in those three years involved either Diazepam, 68% of benzodiazepines cases, or Flurazepam in combination with an opiate such as heroin or methadone. Consumption of alcohol at the same time adds to the risk of death.

Drug-assisted Sexual Assaults
The amnesic effect of benzodiazepines has been highlighted as a factor in many cases of alleged 'date rape', in particular Rohypnol® ('Ro-Ro's or 'Roofies'). Because forensic evidence can be difficult to obtain, there are no statistics on the extent of what is now called drug-assisted sexual assault.

Another drug implicated in drug assisted sexual assaults is the anaesthetic gamma hydroxybutyric acid (GHB). The fact that this is an odourless,

colourless, virtually tasteless liquid has raised concerns internationally that it is a more likely suspect than coloured tablets which need to be dissolved. An EU Scientific Committee on Drugs has recommended to the EU that this problem needs to be studied in much greater detail notwithstanding the fact that most assaults, sexual or otherwise, involve alcohol.

*Table of generic drug names and some registered trade names.

Generic drug names of common sedatives and tranquillisers	**Registered Trade names**
Diazepam	Valium®
Lorazepam	Ativan®
Chlordiazepoxide	Librium®
Flurazepam	Dalmane®
Zolipidem	Stilnoct®
Temazepam	Normison®
Flunitrazepam	Rohypnol ®
Zopiclone	Zimovane ®
Nitrazepam	Mogadon®
Triazolam	Halcion®
Chlorpromazine	Largactil ®

Chapter 14 - Cocaine

Introduction

Cocaine is a powerful stimulant, which is extracted from the leaves of the coca bush. It is similar in effect to amphetamine. Coca leaves have been chewed, at least since the 6th century A.D., by the Indians of the Andean regions of South America to relieve hunger and fatigue, for minor medical complaints and generally to make life and work bearable in the cold inhospitable mountainous regions of Bolivia, Colombia, Ecuador and Peru. The coca leaf contains less than 1% of cocaine and is chewed with a combination of lime and starch. Nine million kilogrammes of legally grown leaves of the plant, once known as "Divine Plant of the Incas" are used every year in Peru alone. At that time coca chewing was a sign of high status in Inca life, but it is now associated with the poorer classes, a direct contrast with the chic jet-set image of cocaine hydrochloride in western societies.

Cocaine was first extracted in 1855 and it became a widely used local anaesthetic, stimulant and tonic. Up until 1910 Coca Cola® contained cocaine, but since then decocainised leaves are used to flavour this popular drink. The extracted cocaine is sold for medical use as an anaesthetic in eye, ear, nose and throat surgery and in Brompton Cocktail, a mixture of cocaine, morphine or heroin, alcohol and syrup, used to relieve the pain of terminal cancer.

Cocaine known as 'coke', 'snow', or 'charlie' has had a reputation as a rich man's drug because of its expense. The raw material is cheap, 1 tonne of coca leaves costing about $2,000 in South America would provide 2 kg of cocaine at a wholesale price of $40,000. The profits from illegal production in some South American countries have a major corrupting influence on those countries. The illegal cocaine industry may employ up to 1 million people from the Andean region in the growing, processing and transport of the coca leaves and the refined cocaine. Columbia produces approximately 75% of the world's cocaine hydrochloride from coca base originating in Peru and Bolivia as well as from local coca bush cultivation, which has increased substantially in recent years.

Legal Status

In America controls were introduced in 1914, partly because of fears about many patent medicines being laced with dangerous cocaine and opiates and partly because of racist-inspired fears. In Britain controls were introduced during the First World War as part of the Defence of the Realm Act in 1916, to protect soldiers on leave.

In Ireland at present cocaine and coca leaf are controlled by the Misuse of Drugs Acts. Coca leaf is included in Schedule 1, because it has no recognised medical use, so it can only be supplied or possessed by persons holding a licence, for research or analysis, from the Minister for Health. Cocaine and its salts are included in Schedule 2. Therefore, they can still be prescribed by doctors and dispensed by pharmacists, but it is illegal to produce, possess or supply the drug, except on prescription. It is also illegal to allow premises to be used for producing or supplying cocaine. It is an offence to grow the coca plant, except under licence from the Minister for Health.

Prevalence and Availability

Cocaine has become less expensive and more available in Europe because of increased production, particularly in Colombia where cultivation has increased by about 20% in recent years compared to significant reductions in Bolivia and Peru. In Bolivia about 12,000 hectares of coca is cultivated legally to meet demand from native chewers of coca leaf. About 2% of leaf production is legally exported to flavour cola drinks and to manufacture pharmaceutical grade cocaine hydrochloride. The bulk of the coca leaf production, approximately 200 million tonnes, is used to produce almost 1,000 tons of cocaine each year of which about 540 tons reaches the black market. Prices in Dublin at €90-100 per gramme appear to be midway between reported European prices of € 24-170 per gramme. The purity is believed to have fallen from 62% to 38% in the past few years. While Customs and Gardaí have seized significant amounts in the last few years, prosecutions under the Misuse of Drugs Acts relating to cocaine account for approximately 2% of all drug prosecutions. The numbers seeking treatment has also remained low, 2% of the total number presenting for drug treatment for the first time in 1998. This reflects the low level of reported experimentation with cocaine that most surveys show is between 1-2% for school children and for adults. Some studies indicate that cocaine use is more prevalent in those individuals who report problem drug taking and whose drug use has extended from opiates to cocaine as well as

benzodiozepines.

Cocaine smoking first became popular in Peru where coca paste containing between 40 and 90% cocaine is readily available. 'Crack' is a cheap high-strength form of cocaine base made by mixing cocaine salt with bread soda, which has attracted enormous attention in recent years. 'Crack', so called because of the noise when lump or 'rock' is heated, is not a new drug but rather a new way of delivering the drug. Because it is the base, it is volatile and can be smoked in cigarettes or in glass pipes. EMCDDA states that there appears to be a clear distinction between the users of cocaine powder and smokers of 'crack' or free- base cocaine. The latter tend to be from marginalized groups such as homeless youths, prostitutes and heroin users whose use of 'crack' is out of control. There is, however, some concern that attempts to rebrand 'crack' cocaine as 'rock' or 'stone' for smoking with tobacco in some EU countries may create a more up-market image and weaken informal social controls which tend to limit crack smoking. 'Crack' has exacerbated the problem of cocaine because of its low cost, ready availability, high doses and speed of action which is comparable to that obtained by intravenous injection.

Street cocaine is usually 'cut' or diluted with lactose (milk sugar), with mannitol or with legal local anaesthetics such as procaine and lignocaine. The powder can be inhaled into the nostrils by snorting through a straw, after 20 - 25 mgs has been laid out in narrow lines on a mirror. Because the material is bought on the black market, it is impossible to know exactly how much cocaine is being taken. Even experienced cocaine users are unable to distinguish the effects of cocaine from lignocaine.

Mood Altering Effects

The effects of intranasal cocaine start very rapidly, after 3 minutes, and last for only about twenty minutes. They include stimulation, reduction in hunger and thirst and a superhuman feeling of great energy and alertness. Many users report an almost orgasmic-like intensity of effects. However, disturbing effects when high doses are taken or when a person doses repeatedly to maintain the short-lived effects replace the pleasurable effects of low doses.

Smoking of 'crack' or free-base cocaine, is a method of use that produces a shorter but more intense high than 'snorting' the drug.

Adverse Effects of Use

Large doses can cause anxiety, depression and fainting. Occasionally a binge or 'run' of cocaine over a period of days can result in bizarre, aggressive and violent behaviour, with severe persecution complexes.

Excessive doses can cause death through heart failure or lung damage. While fatalities have been reported with intranasal use, they are most likely to occur when the drug is smoked or injected or as a result of what has become known as the 'body packer syndrome', where attempts are made to smuggle cocaine packed in condoms and subsequently swallowed. If the condom bursts or stomach juices leach the cocaine out a lethal dose can be absorbed into the blood stream. In a number of such cases the packages, which are also often inserted in the rectum, have had to be removed surgically.

Research into cocaine use in Dublin suggests that alcohol and cocaine is a popular drug 'cocktail'. The combination is converted in the body to cocaethylene, which lasts longer in the brain and is more toxic than either drug alone.

'Crack' and free-base are much more likely to cause fatalities in young, otherwise healthy people, as a result of strokes, heart attacks, clots, damage to the heart muscle or to the lungs. Women are reported to be the heaviest users of 'crack' and it has been reported that many engage in sexual activity with multiple partners while using the drug, thereby increasing the risk of Sexually Transmissible Infections, HIV infections and also unwanted pregnancies.

American studies show that almost one in five pregnant women have used cocaine during pregnancy. Cocaine use during pregnancy puts the baby at risk due to rupture of the womb caused by a sudden rise in blood pressure. Other problems are caused by a lack of oxygen, by premature birth, as well as a low birth weight and smaller size. While the full extent of prenatal exposure to cocaine is unknown, some of the more severe effects, which were predicted in the early 1990's, have not been encountered. It now appears that exposure to cocaine in the womb may lead to subtle developmental defects

relevant to school performance such as effects on concentration.

After discontinuing regular use of any form of cocaine, the user will feel tired and experience a severe depression - the 'crash' - which, together with excessive eating and sleeping, is now believed to be a symptom of withdrawal from the drug. Many cocaine users become so depressed that suicide attempts are a risk. Many cocaine-users try to counteract this 'crash' by using tranquillisers, alcohol or by injecting heroin and cocaine mixtures called a 'speed ball'. With chronic frequent use, increasingly unpleasant effects develop, where the excitement is replaced by restlessness, insomnia, weight loss, developing into a paranoid psychosis with delusions of persecution, violent tendencies, visual disturbances called 'snow lights' and unpleasant skin sensations - called the 'cocaine bugs', where there is a feeling of insects crawling under the skin. These effects generally clear up once use is discontinued.

Because cocaine constricts blood vessels, chronic use could lead to damage to the membranes and lining of the nose. In direct contrast to the harmful consequences of cocaine use, there is little evidence of any physical or psychological harm from coca chewing, possibly because it is released more slowly into the blood stream.

Dependence

Cocaine is not physically addictive in the usual sense of the phrase, as there does not appear to be any physical withdrawal symptoms. Cocaine is described as capable of producing severe psychological dependence because of the strong cravings it produces leading to compulsive patterns of use. Cocaine is known to be the most reinforcing of the commonly available drugs because test animals will self-administer it until they die.

Tolerance develops resulting in higher doses and more frequent use of the drug. Many researchers report that predicting which cocaine users will maintain control over the drug and which will become compulsive and/or dependent users is very difficult.

Smoking 'crack' or free base cocaine involves a much higher risk of dependency and toxicity, because of the higher doses, 100 mgs of free base per 'hit', and the shorter onset of action, less than 10 seconds, leading to almost continual consumption in binges which can last for up to four days. This makes free-base and crack smoking highly addictive and more smokers of cocaine report more dependency problems than intranasal users. However, intranasal cocaine dependence also appears to be an increasing problem where cocaine powder is freely available. The Dublin study suggests that at present cocaine use is intermittent among most users who believe that their use is not problematic for them.

Chapter 15 - Heroin and other Opiates

Introduction

Heroin (diacetylmorphine or diamorphine) and other opiates are a group of strong sleep-inducing painkillers, known as narcotic analgesics, originally extracted from opium. Opium is the dried milky latex extracted from the fruit of the opium poppy. Opium contains morphine and codeine, both very effective painkillers. Heroin is easily manufactured from morphine in even the crudest of laboratories. Freshly made heroin is a white odourless powder but as it gets older it darkens in colour and develops a smell of acetic acid (vinegar).

Heroin was originally developed as a safer substitute for morphine, whose medical uses as a painkiller are limited by its dependence-producing potential. Unfortunately heroin proved to be nearly four times more potent and more addictive than morphine. Both drugs are still used in medicine to treat the severe pain of terminal cancer and of heart attacks. In fact the body rapidly converts heroin back into the parent drug morphine. Heroin for medical use is not available in Ireland though there is nothing in the Misuse of Drugs Acts that prohibits the prescribing of heroin. This is because, in an effort to reduce the availability of heroin, licences are not issued which would allow the drug to be imported into the country.

Heroin often contains other drugs, either produced during manufacture because of a fault in the process, or added deliberately to make a particular grade of heroin, for example some types of Far Eastern heroin made for smoking contain strychnine.

Codeine is widely used for less severe pain, often in combination with aspirin and paracetamol. It is also used in cough mixtures because it suppresses coughing. Concern has been expressed about young peoples misuse of cough mixtures. It is not certain which of the components in these preparations gives the sought-after euphoria. A number of manufacturers have removed codeine from their formulas as a way of helping to reduce the misuse potential of these medicines. Some synthetic opiates are also used to suppress coughs and in anti-diarrhoea preparations. Extracts of opium are also included in various anti-diarrhoea preparations.

A number of synthetic opiates have been developed as painkillers. These include pethidine, often used in childbirth, which was widely abused in the initial stages of the development of the drug scene in Dublin in 1968-69. Dipipanone is another such drug developed to treat severe pain and sold as Diconal® tablets. Ireland had the dubious distinction of being the first country in the world to report cases of Diconal® misuse. Methadone is a synthetic opiate usually used to assist in the treatment of opiate addiction.

Two other synthetic opiates are Dihydrocodeine [DF 118®and DHC Continuous®] and Buprenorphine [Temgesic® or Subutex®]. Dihydrocodeine, used medically to treat moderate to severe pain is chemically related to codeine and it too can give rise to dependence of the morphine type. Buprenorphine has typical morphine-like effects but a longer duration of action. It also blocks some of the effects of morphine and as a result it may cause withdrawal symptoms in some individuals who are taking other opiates. Some studies have shown that buprenorphine reduced self-administration of heroin by addicts and as such it is finding increased use as a 'maintenance' drug in addiction treatment.

Opiates can be swallowed or dissolved in water and injected. Heroin can be sniffed up the nose like cocaine or smoked from aluminium foil called 'Chasing the Dragon'. As with other drugs, injection into a vein maximises the effects and dangers.

Legal Status

The Misuse of Drugs Acts control opiates. It is illegal to possess them, unless prescribed by a doctor and supplied by a pharmacist. It is an offence to import, distribute, produce or sell them. The penalties for unauthorised possession, according to the Misuse of Drugs Acts 1984, are a fine of up to €1,270 and/or 12 months imprisonment if the case is heard in the District Court. If a jury finds a person guilty the penalty can be a fine, the amount of which is at the discretion of the Court, or 7 years in jail, or both. The penalties for illegal supply can be more severe - in the case of a jury trial, a convicted person could be sentenced to a maximum of life imprisonment, or to a lesser period in jail and a fine the amount of which is unlimited and set at

the discretion of the Court. A fine of up to €1,270, 12 months in jail or both can be imposed by the District Court.

It is an offence to smoke opium, the only prohibition on actual use of a drug in the Misuse of Drugs Acts, to possess utensils for smoking or preparing opium, to allow premises to be used for preparing or smoking opium, and to cultivate the opium poppy. All doctors may prescribe opiate drugs for medical use although heroin is no longer available. The other exception is Diconal® whose use is now restricted to hospitals only. Dihydrocodeine in the form of DF 118® tablets are included within the strict requirements of the Misuse of Drugs Acts as is Buprenorphine.

Certain non-injectable mixtures of codeine with other drugs, as well as very dilute opiate mixtures for cough or diarrhoea, are exempt from most of the restrictions of the Misuse of Drugs Acts but can only be purchased from a pharmacist. Because of concern over the abuse of certain cough mixtures, the Pharmaceutical Society of Ireland has issued strict guidelines to all pharmacists in an effort to reduce the availability of these products to young people.

Prevalence and Availability

Because heroin use is illegal, there is no accurate method of determining the true number of addicts. All the indicators available show that since 1980, heroin availability, use and addiction increased rapidly, particularly in Dublin. Estimates of the number of addicts have ranged from 6,000 to 13,000. Between 1990 and 1999, 7,559 Irish people sought treatment for the first time for heroin or other opiate-related problems mostly from the Dublin area. These other opiates could include morphine sulphate tablets ('MST's or 'Napps'), methadone and dihydrocodeine. Virtually all the heroin used is illegally manufactured and imported, mainly from the so-called Golden Crescent of Afghanistan and Pakistan but also the Golden Triangle of Burma, Laos and Thailand. Black market heroin can cost between €200-250 per gramme. At street level it is diluted or 'cut' to increase its profitability using materials such as flour, lactose, talcum powder, glucose and caffeine. It is usually sold in €20 bags of gear which contain 4 doses of drug. The purity of heroin on the Irish market dropped from 45% to 33% between 1995 and 1999. Diconal® tablets are now virtually unavailable due to the effectiveness of the prescribing restrictions and this is reflected in their virtual disappearance from drug statistics.

Mood Altering Effects

Heroin when injected produces a very rapid 'rush' lasting less than a minute, and involving warm flushing of the skin and sexual excitement. There is a mistaken impression that heroin gives a more intense feeling of pleasure than other opiates, but it seems that this reputation is due more to the rapid onset of action compared with the slower action of morphine. The initial rush is followed by a pleasant, dreamlike state of peacefulness and contentment; pain is reduced, as are aggressive tendencies and sexual drives. Much of the euphoria seems to occur early in the addict's career, and those truly addicted experience little euphoria. The side effects of opiates include reduced sex drive, constipation, palpitations, rashes and itching, especially of the nose.

Adverse Effects of Use

Moderate doses of pure opiates produce a range of physical effects, such as analgesia, suppression of coughing, and depression of bowel activity leading to constipation, depression of respiration and dilation of blood vessels giving a feeling of warmth. At higher doses these drugs induce sleep, followed by coma. Death from respiratory depression can occur, especially if the opiate is combined with other depressant drugs such as alcohol and benzodiazepines, if there is a loss of tolerance, or unexpectedly high potency and is more likely to happen when the drug is injected. One hundred and fifty seven deaths have been reported between 1998 and 2000 in which an overdose of heroin was implicated, frequently in combination with alcohol and benzodiazepines. However, this figure does not include deaths from other causes, such as HIV or from suicide. It is believed that opiate users have an overall mortality rate of up to 20 times higher than people of the same age in the general population.

Physical damage from long-term use of opiates is usually associated with unhygienic injection techniques rather than damage to organs in the body. There are no serious diseases attributable to chronic narcotic use that would parallel the damage to the liver and lungs caused by alcohol and tobacco. Studies of a small group of middle-aged addicts who were using pharmaceutical

quality heroin for between 20 and 43 years revealed evidence of brain damage but the exact influence of heroin is as yet unclear. Because opiates suppress the coughing reflex, some chronic users may have lung problems including bronchitis. Some researchers have suggested that opiate dependants are abnormally susceptible to infections due to an effect on their immune systems.

The way the drug is used causes most medical problems, including blood poisoning and infection of the heart valves from using non-sterile water and syringes. Adulterants that do not dissolve can cause abscesses, clots in the lungs, gangrene and loss of limbs. Types of heroin that do not dissolve in water, such as South West Asian type 1 and Chinese no.3, have caused problems when addicts have used lemon juice, vinegar, car battery acid or citric acid in efforts to dissolve the drug. In Australia, France and Scotland fungal infections leading to blindness have resulted from the use of contaminated lemon juice. In summer 2000, 8 people died in Ireland from a gangrene-like condition caused by a germ called Clostridium that contaminated the heroin they dissolved in citric acid and then 'skin popped' into muscle tissue rather than injected into a vein. The sharing of the injection equipment - the 'works' (needle, syringe, filter spoon and tourniquet) by several people can result in the transmission of viral hepatitis such as Hepatitis C, which can cause liver cancer. Hepatitis C can also be passed on through contact with body excretions and by sexual contact. IV opiate misusers ('mainliners') are a high-risk group for HIV infections, which can result in the development of AIDS.

Injection of heroin was the main route of administration in Ireland in the late 1980's with 88% of those seeking treatment in 1990 reporting that they injected. By 1996 that percentage had dropped to 49% as most users reported smoking or 'chasing' the drug but by 1994 the number of those injecting had reportedly risen to 69%, perhaps because those who previously smoked it had developed tolerance to such an extent that the relatively more 'efficient' way of using the drug by injection became inevitable.

Given the high levels of injecting reported by Irish heroin users it is hardly surprising that levels of infectious diseases associated with such injections remain significant. Levels of Hepatitis B among injecting drug users in Irish prisons is reported to be approximately 18%. For Hepatitis C, figures for Dublin show that it ranged from 52-89% among drug users in treatment compared to a seropositivity rate of 5.8% for HIV. Cases of AIDS in drug users account for nearly half of the 349 people who have died from AIDS since 1982. The combination of disease, malnutrition, crime and self-neglect through compulsive involvement with the drug and the risk of overdose creates a serious health risk to add to the social harm and legal problems associated with being an addict.

Dependence

The first experience with heroin is often unpleasant because of nausea and vomiting. This feeling is often sufficient to deter many people from using heroin again. Others continue to use the drug, becoming occasional users. Others become regular users and others become compulsive users. There is evidence that repeated use of heroin does not invariably lead to compulsive daily use. One US study estimated that about 23% of those who experiment with heroin become dependent on it.

Tolerance develops rapidly to the effects of opiates. Heroin dependants are able to take amounts that would kill a non-tolerant person. Some US soldiers in Vietnam were reported as using 2.5 gms of pure heroin daily. It is likely that even the heaviest of heroin users in Dublin are using only a fraction of that amount each day. Tolerance disappears rapidly when use is stopped and overdoses are most likely to occur following this loss of tolerance by a user who has been detoxified in hospital or in prison. They then cannot use the high doses they formerly could tolerate.

Dependence, both physical and psychological, though not inevitable, is a very frequent and likely result of continuous use of opiates, particularly if they are injected. The length of time taken for dependence to develop is affected by the physical and mental make-up of the individual, and by the quality and frequency of drug consumed. Dependence can occur after a few days. More serious dependence can take weeks or months to develop. Withdrawal symptoms, called 'cold turkey' because of the chills and gooseflesh that are part of withdrawal, begin 4-12 hours after the last dose of the drug.

They reach a peak after one and a half to three days and then subside. The seriousness of the symptoms depends on the mental state of the individual and on the extent of drug use. It is likely that most addicts using weak adulterated heroin do not have the full symptoms, and for many the effect would be similar to severe 'flu'. Withdrawal symptoms can include yawning, tears, running nose, sneezing, tremors, headache, sweating, anxiety, irritability, insomnia, spontaneous orgasm, loss of appetite, nausea, vomiting, diarrhoea, cramps and muscle spasms. It is relatively easy to detoxify an opiate dependant but relapse rates are quite high, partly due to the fact that some withdrawal effects last for months with strong feelings of discomfort and loss of well being.

The high relapse rates after withdrawal effects have subsided also suggest that psychological dependence is more important than physical dependence in the compulsion to continue use. Studies of large number of American soldiers who were heavily dependent on heroin while in Vietnam do not seem to support the belief that 'once an addict, always an addict'. The studies indicated that contrary to popular belief these soldiers were able to stop their heroin use and stay off it when they returned to the USA.

Chapter 16 - Methadone

Introduction

Methadone is a synthetic opiate best known for its role in the treatment of opiate dependence either as a detoxification aid or as a maintenance or substitution therapy.

Methadone was first synthesised in Germany between 1937 and 1938 and was patented in 1941 although its painkilling properties were not discovered until 1942. The pharmaceutical company Hoechst developed it as Polamidon®. It was never as popular medically as Pethidine, which had been discovered two years later by the same researchers based in the now notorious I.G. Farbenindustrie. After the Second World War that company was dismantled and its various patents were divided up among British and American pharmaceutical companies, chiefly Eli Lilly. These companies began to commercialise Methadone as an analgesic and as a cough suppressant. In fact Physeptone Linctus® or 'Phy' as it became better known, was actually licensed for medical use in chronic cough rather than as a treatment for opiate dependence. Although it was originally claimed that the drug carried little risk of addiction the first cases of dependence were noted in the mid 1950's.

The use of Methadone in opiate dependence treatment programmes resulted from the pioneering work of Vincent Dole and Marie Nyswander in the USA, based on the fact that Methadone was effective by mouth and that it had a long duration of action. Dole and Nyswander found that once they had stabilised the dose for a given patient they could maintain them on that dose for long periods of time avoiding withdrawal symptoms and the resort to blackmarket opiates. The use of Methadone Maintenance Treatment (MMT) spread within the USA and to the rest of the World. In Ireland Methadone was at first mainly used in the detoxification of opiate users in abstinence based treatment programmes rather than as a maintenance treatment. The rapid spread of HIV among injecting drug users in the 1980's and 1990's resulted in a change of emphasis where MMT became central to strategies to reduce drug injecting and sharing of needles and syringes and as a response to the numbers seeking treatment for their opiate use in more recent years.

Legal Status

Methadone and its various preparations are controlled under the Misuse of Drugs Acts and as a result it is illegal to possess it without a valid medical prescription. Only Pharmacists may dispense those prescriptions, which means that anyone else selling or supplying it is committing an offence.

In October 1998 the Methadone Protocol Scheme was introduced to regulate access to Methadone Maintenance Therapy (MMT). Drug Treatment Centres may only supply methadone under the control of a specialist to individuals on the Central Drug Treatment List. Individuals who have been stabilised in a Treatment Centre and deemed suitable by their specialist, may have their Methadone prescribed by a recognised G.P. and dispensed in a designated Community Pharmacy under the General Medical Service (GMS) Scheme.

Prevalence and Availability

The introduction of the Methadone Protocol Scheme sought to increase access to MMT and at the same time limit the diversion of Methadone onto the blackmarket. Prior to 1998 the most widely prescribed brand of Methadone was Physeptone Linctus® which contained 2 mg Methadone in every 5 ml teaspoonful of brown linctus. After the introduction of the new Protocol, only Methadone mixture 1mg/1ml, which is green in colour, was permitted. The more concentrated green form meant that patients had to swallow much smaller volumes of liquid each day. In order to avail of MMT, individuals must be entered on the Central Drug Treatment List operated by the Eastern Region Health Authority (ERHA); have their treatment started by a specialist in a Drug Treatment Centre and their Methadone dispensed within the Centre. Once they have been stabilised and if considered suitable they may be transferred to the care of a recognised G.P. who will prescribe Methadone for them either at the G.P.'s own surgery or in a Satellite Clinic. That prescription can only be dispensed at a designated Community Pharmacy, which keeps the patient's treatment card bearing their photograph for the duration of the treatment. The Methadone is dispensed free of charge under the General Medical Services (GMS) Scheme.

The number of G.P.s and Pharmacists involved in the Scheme has steadily increased and by the end of 2001 there was 169 G.Ps and 243 Pharmacies. It

is reported that the cost to the GMS of Methadone prescribing and dispensing was € 5.66 million in 2000 and € 3.78 million in 1999. By the end of 2001 it was estimated that 5,865 people were entered on the Central Drug Treatment List. As a result the amount of Methadone required worldwide has according to the International Narcotics Control Board (INCB) increased significantly in recent years to 42,000 kg from 19,500 kg in 1996. The estimated amount for Ireland is 131 kg per year.

There has always been concern over the diversion of prescribed Methadone onto the blackmarket through over-prescribing or through individuals selling their 'take home' doses to obtain money to buy heroin. A study of Methadone-related deaths found that two thirds of the deaths in 1999 in which Methadone was implicated were in individuals who were not on the Central Drug Treatment List. In 2000 there were 19 cases handled by the Gardaí in which not only Methadone mixture but also Methadone tablets, which are not legally available in Ireland, were involved. Blackmarket Methadone is believed to sell for about €125-150 per 500 ml bottle.

Mood Altering Effect

Methadone is described as a Mu opiate receptor agonist. This means that it binds to the same receptor site as heroin and morphine to cause effects such as pain relief, mood alteration, drowsiness, cough suppression, constipation, nausea and vomiting, pinpoint pupils, respiratory depression, tolerance and physical dependence, which are all common to these drugs.

Methadone has a number of advantages compared to Morphine and Heroin in that it is effective when taken by mouth. It has also less severe constipating, sedating and vomiting effects and causes minimal euphoric effects. Withdrawal symptoms are less severe but last longer than with the natural opiates. This is related to the length of time the drug spends in the body. Typically it takes the body 3-4 hours to get rid of half the dose of Morphine and Heroin whereas the corresponding figure for Methadone is 25 hours. This means that an adequate single daily dose of Methadone will 'hold', that is prevent the development of withdrawal symptoms in an addict for up to 24 hours, whereas Morphine and Heroin would have to be used several times a day because they are so short acting. Deciding on what constitutes an adequate dose of Methadone is a difficult and contentious issue and is based on variables such as the amount and purity of the street heroin used, the individual involved, their body weight and on a clinical assessment. In the USA minimum doses of 60-80 mg are recommended but on this side of the Atlantic authoritative sources suggest that a dose between 15 and 45 mg for someone injecting a quarter gramme per day would be appropriate whereas for someone injecting 1 gramme the dose could range from 35-100 mg of Methadone. Some researchers believe that higher doses help retain more people in treatment than lower dose regimes and there is good evidence to suggest that increased time spent in treatment is the best predictor of ultimate success.

Adverse Effects of Use

The most serious risk associated with Methadone is death. As an opiate it causes respiratory depression and the lethal dose for an adult who has not developed tolerance is about 50 mg. For children it is about 10 mg. Symptoms of an overdose include drowsiness, cold clammy skin, breathlessness leading on to blueness of the skin and lack of breathing, fluid in the lungs, convulsions and death. Medically it is suggested that the risk of death is highest during the first two weeks of treatment, which is why careful monitoring of dose levels is so important. The risk then falls significantly after that period Between 1998 and 2000, over 140 deaths were reported in which Methadone was implicated. It is perhaps surprising that less than 4% of those deaths involved Methadone alone. The vast majority involved a combination of Methadone, alcohol and Benzodiazepines. All three drugs can cause respiratory depression, therefore combining them increases the risk. There are many causes of death from Methadone and indeed other opiates including overdosing by taking Methadone prescribed for someone else.

The link between fatalities and combinations of Methadone and other drugs highlights the fact that interactions between Methadone and other drugs may have a significant impact on many of those in MMT. Chief among these is the antibiotic Rifampicin used to treat TB and which increases the speed at which Methadone is broken down and removed from the body, thus lowering blood levels and necessitating an increase in Methadone dosage. Similarly the AIDS drug AZT increases

the metabolism and will affect doses. Conversely Cimetidine used to treat ulcers and possibly to deal with the itching associated with opiate use, may reduce the breakdown of Methadone leading to increased blood levels and signs of overdose. Alcohol and Benzodiazepines are key culprits and it is known that many of those in MMT use Benzodiazepines which have been prescribed for them or which they have bought on the blackmarket. Many of those on MMT report sleep problems and the Benzodiazepines would have been prescribed in response. However, their effectiveness in inducing sleep lasts for no more than 2-4 weeks but the problems they cause last longer. Many Methadone users however use Benzodiazepines such as Diazepam, Temazepam or Flunitrazepam either orally or more dangerously still, by injection, to overcome the low level of euphoria ('turn on') from Methadone. Some are believed to use the tranquillisers to blank out the world or to give them confidence. As a result they became chaotic, aggressive and with a high risk of developing HIV or Hepatitis because of their behaviour. It must also be remembered that dependence will probably develop with the tranquillisers leading to withdrawal symptoms such as panic attacks that may trigger off further drug use.

Co-existing liver disease such as Hepatitis B and C may also affect blood levels of Methadone because it is normally broken down in the liver. It is generally believed that where liver function is impaired but stable no problem should develop. Abrupt changes in liver status could however change blood levels.
One area of concern to many on MMT is that of pain-relief for medical conditions unrelated to their drug use. It is generally recommended that non-opiate analgesic such as aspirin, paracetamol, or non-steroidal anti-inflammatory drugs (NSAIDs) such as Ibuprofen, should be used.

Loss of tolerance is believed to be another key factor because while tolerance builds up very quickly, it also disappears very quickly, possibly within 1-2 weeks of someone being detoxified in hospital or in prison or spontaneously on their own. In such circumstances the individual can no longer take doses of Methadone or any other opiate to which they were accustomed without serious consequences. Deaths have been reported in children who managed to open their parents' Methadone or who drank it from baby bottles used by their parents to measure out their 'take home' dose.

A range of other side effects have been reported, the most distressing of which seems to be excessive sweating, the exact cause of which is unknown. Other side effects include constipation, loss of sexual drive and reduced or absent menstruation. However, despite the lack of a menstrual cycle, pregnancies have occurred while women were on Methadone. Some people, especially asthmatics may be allergic to the tartrazine dye used to colour the Methadone mixture green.

Sedation, 'goofing off' or going 'on the nod', is a common side effect particularly in the early stages of treatment lasting until the dose is properly adjusted and the body develops tolerance to that effect. That drowsiness does have an impact on an individual's ability to drive and to work normally. While 7% of those suspected by the Gardaí as driving while under the influence of a drug tested positive for Methadone, studies in cancer patients given large amounts of opiates for pain relief indicated that they did not represent an increase risk on the road. With Methadone it is known that learning and memory performance can be impaired during the initiation of treatment or if the dose is increased but it is generally believed that neither driving nor the use of heavy machinery or even video programming is impaired once someone is stabilised and tolerant and they are not topping up their prescribed dose with other opiates, tranquillisers or alcohol.

Like most opiates there is no significant evidence of long-term organ or tissue damage arising from Methadone used over long periods of time. For many of those on MMT the most frequent causes for concern are dental problems and weight gain. It is not clear why MMT might contribute to tooth decay. One reason could be the high sugar content of some brands of mixture, although sugar-free forms are also available. The liquid in the mixture may, because of its acidic nature, affect the enamel of the teeth. In addition many opiate users, in general, have poor oral hygiene leading to dental problems and it is felt that using low sugar diets and making sure that traces of the mixture are removed through rinsing or

brushing immediately after use can prevent tooth decay. The high sugar content of some products might contribute to the weight gain experienced by many users but seems unlikely since a 50 ml dose of Methadone mixture provides around 85 calories. It is more likely that the weight gain is due to increased appetite; the availability of money that would previously have been spent on heroin to buy food; poor diet; reduced stress or the reversal of previous malnutrition due to self-neglect while on street drugs. Some low-sugar formulations may contain sorbitol, which could be a contributing factor to the embarrassing flatulence described by some Methadone patients. Risks during pregnancy are a major concern with any drug or medicine. In the case of Methadone, one of the first groups offered MMT in Ireland were pregnant addicts. It is reassuring that no increase in the level of congenital abnormalities has been reported in babies born to women on Methadone while they were pregnant. The major risk seems to be low birth weight and withdrawal symptoms that start within two days of birth. These include irritability, hyperactivity, poor weight gain, sneezing and fist sucking which can be successfully treated.

Dependence

Methadone is an addictive drug like any other opiate. Tolerance develops slower than with other opiates but it does happen. When people stop using Methadone withdrawal symptoms begin about 1-2 days after the last dose and may last for at least 10 days. Typical withdrawal symptoms include yawning, sneezing, sweating, chills, fever, goose bumps, insomnia, diarrhoea, vomiting, deep pain in the back and in bones as well as jerky muscle spasms at night.

A variety of detoxification programmes have been developed, some involving narcotic antagonists that block the effects of opiates. These include Narcan® used in the emergency treatment of overdoses and a longer acting form Nalorex® as well as a drug originally developed to treat high blood pressure called Lofexidine but which can help eliminate many of the withdrawal symptoms.

Effectiveness of Methadone Maintenance Therapy

The use of an addictive drug in people dependent on opiates has been controversial. However, objective reviews and evaluations have consistently shown that MMT leads to reduced heroin and cocaine use, reduced criminal activity, reduced spread of HIV and increased employment levels in a cost effective manner. It has not reduced the spread of Hepatitis. The risks and disadvantages, not least the fact that Methadone is not a 'cure' for heroin addiction, are well recognised and have lead to attempts to develop alternatives to Methadone.

One alternative was a long acting form of Methadone called LAAM, which had the advantage that patients needed to take it only every third day. This would have had a major impact on take home doses and diversion onto the black market. Unfortunately, safety concerns over LAAM's effect on the heart have led to restrictions being placed in its use.

More recently a drug called Buprenorphine has attracted attention as an alternative maintenance drug. It was originally used in low doses as a painkiller under the trade name Temgesic® and misuse of it developed in Dublin. Nowadays much higher doses are used in the USA and France in a product called Subutex®. Buprenorphine is a mixed opiate agonist/antagonist, meaning that it can cause typical opiate effects and block others giving a better safety profile because it causes less respiratory depression. Clinical trials have shown reductions in illicit opiate use; increased retention in treatment and reduced craving. Compared to Methadone there is less sedation and limited withdrawal symptoms though Methadone patients are less likely to test positive for illegal opiates. Buprenorphine patients are more likely to drop out of treatment but find detoxification easier than with Methadone. While French experts suggest that death rates are lower with Buprenorphine than with Methadone, deaths due to Buprenorphine in combination with tranquillisers have been reported, as has an increased level of injection of Buprenorphine in France.

Heroin maintenance has been available in the UK for many years and has recently been studied in Switzerland, with more detailed trials underway in the Netherlands. Evaluation of the Swiss studies were not able to establish if the positive effects recorded by users themselves were due to the heroin or to the intense psycho-social therapy and support provided. It is clear that the effectiveness of maintenance or substitution

programmes, are greatly increased if counselling and other social supports are part of the overall programme.

Bibliography

The information in this booklet has been compiled from a variety of national and international publications, papers and reports. The most important of these are listed below.

General information, statistics etc.

1. Overview of Drug Issues in Ireland 2000.
   R. Moran, M. O'Brien, L. Dillon, E. Farrell and P. Mayock.
   Drug Misuse Research Division
   Health Research Board. Dublin 2001.

2. The National Health and Lifestyle Surveys.
   Results from SLÁN (Survey of Lifestyle, Attitudes and Nutrition) and HBSC
   (Health Behaviour in School-Aged Children).
   Friel S., NicGabhainn S., Kelleher C.
   Health Promotion Unit and Centre for Health Promotion Studies. NUIG 1999.

3. Smoking, Drinking and Drug Taking in the European Region.
   A.M. Harkin, P. Anderson, C. Goos.
   WHO Regional Office for Europe.
   Copenhagen, Denmark 1997.

4. The 1999 ESPAD Report.
   (The European School Survey Project on Alcohol and Other Drugs).
   Alcohol and other drug use among students in 30 European counries.
   B. Hibell, B. Anderson, S. Ahlstrom, O. Balakireva, T. Bjarnasson, A. Kokkevi, M. Morgan.
   CAN (Sweden) and the Council of Europe 2000.

5. The 1995 ESPAD Report.
   Alcohol and other drug use among students in 26 European countries.
   B. Hibell et al.
   CAN (Sweden) and the Council of Europe 1997.

6. Annual Reports on the state of the drugs problem in the European Union.
   1996, 1997, 1998, 1999, 2000, 2001.
   European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Lisbon.

7. Hepatitis B, Hepatitis C and HIV in Irish Prisoners: Prevalence and Risk.
   Allwright S. et al. The Stationery Office. Dublin 1999.
   Part II: Prevalence and Risk in Committal Prisoners 1999.

8. Driving under the influence of an intoxicant in Ireland.
   Flynn K.J. et al.
   Medico- Legal Journal of Ireland. 2002: 7; 86-89.

9. Alcohol and Crime.
   Murdoch et al. International Journal of Addiction. 1990: 25; 1065-1108.

10. Opiate – related deaths in Dublin.
    M. Ward and J. Barry.
    Irish Journal of Medical Science. 2001: 170; 35-37.

General information on the effects of drugs.

1. Drug Scenes – a Report on Drugs and Drug Dependence.
   Royal College of Psychiatrists. London 1987.

2. Drugs of Abuse.
   S. Wills. The Pharmaceutical Press 1997.

Alcohol.

1. Alcohol issues in Ireland 1990-2000.
   A. Hope, presentation at a conference on Alcohol Policy – A Public Health
   Perspective. Dublin. November 2001.

Caffeine.

1. The World of Caffeine.
   A.B. Weinberg, B.K. Bealer.
   Routledge 2001.

2. A Review of the Health Effects of Stimulant Drinks.
   Food Safety Promotion Board. 2002.

Cocaine.

1. "Cocaine" by Paula Mayock in a collection of papers on "Drug issues in Ireland".
   R. Moran et al. Drug Misuse Research Division.
   Health Research Board. 2001.

Cannabis.

1. Cognitive functioning of long term heavy cannabis users seeking treatment.
   Solowij N. et al.
   JAMA 2002: 287; 1123-1131.

2. Cannabis and cognitive functioning.
   Solowij N.
   Cambridge University Press. 1998.

3. Cannabis use and Public Health: assessing the burden.
   Hall W., Babor T.F. Addiction. 2000: 95; 485-490.

4. Cannabis: Pharmacology and toxicology in animals and humans.
   Adams I.B., Martin B.R.
   Addiction. 1996: 91; 1585-1614.

5. Cigarettes, alcohol, marijuana, other risk behaviours and American youth.
   Merrill J.C. et al.
   Drug and Alcohol Dependence. 1999 : 56; 205-212.

6. Cannabis use and cancer.
   Hall W. and MacPhee D.
   Addiction. 2002 : 97; 243-247.

Bibliography

7. Psychiatric effects of Cannabis.
   Johns A.
   Brit. J. Psychiatry. 2001:178; 116-122.

8. Marijuana as medicine.
   - The science beyond the controversy.
   A. Mack and J. Joy.
   National Academy Press.
   Washington DC 2001.

9. Cannabis: a heath perspective and research agenda.
   WHO. Geneva 1997.

Ecstasy.

1. MDMA (Ecstasy) Neurotoxicity: assessing and communicating the risks.
   Boot B.P., McGregor J.S. and Hall W.
   Lancet 2000 : 355; 1818-21.

2. Is MDMA ('Ecstasy') neurotoxic in humans? An overview of evidence and methodological problems in research.
   Curran H.V. Neuropsychobiology 2000: 42; 34-41.

3. Effects of dose, sex and long-term abstention from use, on toxic effects of MDMA (Ecstasy) on brain serotonin neurons.
   Renemann L. et al.
   Lancet 2001: 358; 1864-69.

4. Long term psychiatric and cognitive effects of MDMA use.
   McGuire P.
   Toxicology Letters 2000: 112-113; 153-156.

5. Ecstasy: a common cause of severe acute hepatotoxicity.
   Andreu, V. et al. J. Hepatol. 1998: 29; 394-7.

6. Ecstasy abuse in Ireland.
   Cregg M.T., Tracey J.A. Ir. Med. J. 1993 : 86; 118-20.

7. Pathology of deaths associated with "ecstasy" and "eve" misuse.
   Milroy C.M., Clark J.C., Forrest A.R.
   J. Clin. Pathol. 1996: 49; 149-53.

8. Low dose MDMA ("ecstasy") induces vasopressin secretion.
   Henry J.A. et al.
   Lancet 1998 : 351; 1784.

Methadone.

1. Reviewing current practice in Drug Substitution in the European Union.
   EMCDDA Insights Series 3. EMCDDA. Lisbon 2000.

2. Medications for alcohol, illicit drug and tobacco dependence. An update of research findings.
   Litten R.Z. and Allen J.P.
   J Subst Abuse Treatment 1999: 16; 105-112.

3. The efficacy of Methadone maintenance interventions in reducing illicit opiate use, HIV risk behaviour and criminality: a meta analysis.
   Marsch L.A. Addiction 1998 : 93; 515-532.

4. Role of maintenance treatment in opioid dependence.
   J. Ward et al. Lancet 1999: 353; 221- 226.

5. The Methadone Briefing.
   A. Preston (Editor) 1996.
   Available from Drugscope (+ 44 – 1719281211).

Useful websites for information on drug effects, statistics etc.

www.EMCDDA.org.
www.undcp.org.
www.incb.org.
www.nida.nih.gov.
www.nacd.ie.