How best to treat drug abusers?

Report for the Winston Churchill Memorial Trust

Marcus Rattray, Churchill Fellow of 2006

Background

Drug abuse affects many millions of lives worldwide, inappropriate use and/or addiction to illicit drugs such as heroin, cocaine, amphetamines, ecstasy and cannabis as well as misuse of legal drugs such as alcohol and tobacco (nicotine), claim hundreds of thousands of lives. Drug use is responsible for considerable costs, both social and economic, to individuals, families and communities. Despite the clear evidence that drug taking can be harmful, a large proportion of the young adult population use illicit drugs regularly, estimates vary but are in the 10-20% range. Some people become drug addicts, addiction is defined scientifically as a "chronic relapsing brain disease", where the user has no control over his or her drug use. While in every society, treatments exist for drug addiction and can be effective, the relapse rate is extraordinarily high, around 70%. Despite much investment world-wide into research into both causes and treatment of drug abuse, there is much scope for improvement of treatment.

As a research scientist and educator at King's College London specialising in Neuroscience, I have worked for nearly 20 years on various aspects of drug abuse, with particular interests in ecstasy and nicotine. My work concerns the brain systems that underlie the neurobiology of addiction, in other words I am interested in understanding the molecular, cellular and neural pathways that are involved in whether people choose to take drugs, how addictions develop, and what has changed in the brains of drug users which make it difficult for people to give up drugs, and underlie behaviours such as withdrawal syndromes and drug craving. This type of research is classified as basic science, and this sort of academic research can be quite far removed from the issues that are important for drug users and their recovery, and for people and societies that are affected by drug use. I therefore used the fellowship to meet and seek the opinions of a number of people who work on different aspects of drug abuse, including other basic scientists, medical practitioners who treat drug users, practitioners who use non-medical models in treatment, drug education specialists and policy makers.

The fellowship allowed me to travel widely to meet people with a range of different perspectives to try to gain a deeper insight into these questions. I was not aiming to provide any simple answers to these complex questions, after all many millions of pages have been written specialists in health care, by advocates and by researchers. I hoped to gain a better personal insight into the following huge and somewhat naïve questions:

Why do people use drugs?

What should be done? What works and what doesn't?

Specifically, as a scientist, I am concerned and intrigued by whether and how the research that is done on the causes and effects of drug abuse, such as my own contributions, will be useful to the drug users themselves.

The trip

The itinerary I planned took me first to the USA mostly staying on the East Coast, starting in Baltimore, then going to Philadelphia, New York City, Atlanta and Jupiter, Florida then onto Honolulu, Hawaii before travelling to Australia where I went to Sydney, Newcastle, Brisbane, Melbourne and Perth and finally to Singapore. I set off in November 2006. Altogether I made 19 short visits during the eight weeks of my fellowship.

I kept a extensive diary and notes during the trip, which I am using as a basis to write a book "Drugs on the brain, the brain on drugs" aiming to shed light on some of the key biological issues in drug abuse, and touch on how these might better inform the development of more effective treatments for drug users, and reduce the impact of drug use on families and society. Below are some very brief extracts from my notes on each of the visits, in the order they occurred.

Center for Substance Abuse Research, College Park, Maryland

My first visit after arriving in Baltimore was with Dr Eric Wish, director of CESAR, located just outside Washington DC. It aims to provide reliable information about substance misuse. The research, much of which is commissioned by the state, informs policy and, ultimately, should improve treatment services. CESAR collects data and statistics on drug misuse, for example the numbers of people taking a particular drug of abuse at a particular time, so that they can monitor trends and Eric gives me an example of concerns about crystal methamphetamine, which is rumoured to have reached epidemic proportions on the west coast of the USA, but despite widespread newspaper coverage has not become widespread in Maryland. This shows that not all the trends in drug use presented in the press are based in fact. The data the centre provides has been helpful to provide an "early warning system" to the state of Maryland, so that law enforcement agencies and treatment centres can anticipate drug "epidemics" and respond to these. The statistical strengths of the centre is also used to evaluate substance abuse treatment programmes and of drug education programmes.

National Institute on Drug Abuse, IRP, Baltimore, Maryland

The National Institute on Drug Abuse (NIDA), representing the US government's research effort to combat drug abuse has nearly a billion dollar budget to spend on research each year (in the UK, there is no equivalent of NIDA, and an almost infinitessimally small amount of money going into basic research on addiction). NIDA funds a wide range of research, all kinds of basic biological research, for example into the brain mechanisms involved in substance abuse, but also research into treatment of drug users, causes of drug abuse, clinical trials and educational initiatives.

NIDA IRP, Baltimore

I go to see George Uhl who I worked for in the late 1980's. The main focus of his research is human genetics, to uncover the genetic factors which make some people more vulnerable to addictions than others. His group has compared the DNA from over a thousand people, comparing drug-using to non-drug using

individuals. Complex techniques are used to uncover where there are variants of genes which associate with lifetime drug abuse (alcohol or other drugs), making use of some powerful technologies that have been developed in the past decade that allow DNA sequences representing all the known gene variants to be deposited by a robot onto a tiny silicon chip about the size of a thumbnail. DNA from the individuals in the study (obtained using a mouthswab or small blood sample) are pooled into groups and then applied to the chip to measure genetic variations. In one of the most recent papers, his group suggests that the subtle variations present in less than 100 genes will determine whether or not someone is vulnerable to addiction. The implications of George's work are huge. One immediate practical use of his findings, he says, is to help physicians design suitable treatments for drug users. For example, if a doctor knew that a nicotine addict had a "bad" set of genes, he or she might recommend a more intensive therapy than if a smoker had a "good" set of genes; thus appropriate care could be given, with savings to the health services.

Baltimore Substance Abuse Systems Incorporated, Baltimore

Baltimore is a heroin city, Adam Brickner tells me. He's the President of the not-for-profit Baltimore Substance Abuse Systems Inc (BSAS), and I meet with him and the director of the BSAS substance abuse programmes, Michael Douglas. BSAS distributes the state and federal funds that go into Baltimore's drug treatment programmes. They evaluate the quality of the services they fund and direct where the funding should go; aiming to provide services informed by research. Since heroin is used by 70% or more of the problem drug users, most services they fund are essentially medical management of addiction , providing a safe opiate-based medicine, either methadone, and more recently a newer drug buprenorphine to help prevent the user from taking a more powerful illegal opiate (heroin). Their criterion of success is mainly the number of people who are in treatment at any one time. There is good short-term success but within six months, 30% have left the programmes and within a year about 70%. Adam and Michael are pragmatic about these retention rates, wishing to see addiction treatment as the ongoing treatment of a chronic relapsing disease. “We see it as a sign of success if people come back to our programmes,” says Adam. They regard treatment programmes such as methadone treatment as encouraging in the drug user an acceptance of the will to change - a step towards a more productive life.

It is hard to know how successful they are at present, they certainly have an uphill battle on their hands. The number of heroin addicts in Baltimore is simply huge, about 50,000 people out of the 500,000 population of Baltimore city are heroin users. The drug taking can be seen as a medical problem for the user, but spills out into other arenas. A high proportion of the arestees in Baltimore test positive for one or more illegal drugs. Baltimore has a high murder rate (about 250 a year) and a relatively high crime rate, much of which is associated with drug use. HIV infection is still high, and BSAS funds a number of needle-exchange programmes, to encourage drug users to expose themselves to less risk of infection.

Altogether BSAS funds about 7,000 treatment slots, allowing well over 20,000 people to come into contact with treatment services each year. They are aiming towards providing "treatment on demand", which would require nearly 45,000 treatment places every year. Since their aim is to increase numbers in the

treatment system, in a climate without vastly increased funding, this ultimately has to mean reducing the cost of treatment for each addict. They see buprenorphine as a way forward, since it can be prescribed by regular physicians rather than in specialised addiction clinics.

Recovery Enhanced by increased ACcess to Healthcare, Baltimore

Baltimore is a heroin city, Joseph Brady tells me. I've driven to the offices of REACH, which he founded in 1990 and meet with him and the Director of Service Programs, Carol Butler. Joseph Brady is over 80 years old, a distinguished behavioural scientist, with a long career in drugs treatment. He describes drug use in the inner city as being like a cancer, metastasing into the community and eating it up. The idea of REARCH was and is very simple, given the lack of methadone clinics in Baltimore, he would take methadone to the parts of the city where the heroin users lived, the idea was tried previously in Amsterdam. He recounts his long battles to get the programme off the ground. Nobody wanted to have methadone treatment in their area. In the end, local clergy were the key - allowing his people to park their van in church parking lots, every day except for Sunday.

They administer the medication from a converted Winnebego manned by a nurse, a nurse assistant and a driver who also doubles as an armed guard. The methadone is consumed under the supervision of the nurse, so none can be taken away from the van. Crucial to the treatment programme is promoting behavioural change; the people in their treatment programme have a weekly one hour counselling session. Through counselling and with the aid of methadone bit by bit they aim to chip away, so that the drug users can achieve change and lead more productive lives. Clients are expected to pay a fee, $79 each week for each client, charged on a sliding scale so most people pay $10 per week or less. Carol sees this payment as an important part of the retention in therapy, paying money every week shows a will to change.

Johns Hopkins Addiction Treatment Services, Baltimore

Dr Van Lewis King is the Director of the Addiction Treatment Services at Hopkins Bayview campus. It is well staffed; they have three psychiatrists, several psychologists and numerous counsellors serving 500 or so clients on two sites, carrying out research as well as treatment. Dr King is clear that he wants to see his patients to be able to be happier and lead more productive lives; he doesn't really comment on the scale of the drug problem in Baltimore or its causes. “We just treat the problems drugs create,” he says. There is a charge to the client for methadone treatment, with most patients pay less than $10 per week, according to their circumstances. He prefers methadone to the more expensive buprenorphine. Also, since buprenorphine is likely to be dispensed from pharmacies upon prescription from the non-specialist general practice doctors, patients may not have the benefit of counselling.

Dr King emphasises the use of contingencies, a graded set of "motivators" to keep their clients in treatment in the clinic. The highest tier is the most intensive type of inpatient treatment, where the users receive methadone daily, and also receive intensive counselling. The lower tiers require less attendance and at the lowest level the patients take home several days or weeks supply of methadone. The main motivation for the patients is seen as continued methadone treatment, so if someone takes heroin or fails to attend counselling, they will be shifted to a

higher tier, and if they still don't comply, they won't get methadone any more. It's efficient, those on lower tiers have minimal contact with the (expensive) physicians, and the time of the most highly trained people is spent with the more difficult cases.

Open Society Initiative, Baltimore

The visits to the methadone clinics and BSAS were set up for my though the offices of OSI-Baltimore, an organisation that is part of the Soros Foundation. The Baltimore Office promotes and funds programmes to tackle the social problems that most affect people in the inner city, including bad housing, poverty, lack of access to opportunity and drugs. Robert Schwartz, the Director of the Drug Addiction Treatment Programme, and also an Academic Psychiatrist with a faculty position at the nearby University of Maryland, Baltimore. He carries out research into service provision, and in the problems of drugs in prisons.

The OSI makes a number of relatively small targeted grants mostly to influence change. They are liberal, seeing drug abuse as a social rather than a moral or medical problem, and see drug abuse treatment as part of a wider spectrum of social issues, addressing one of the factors that blights individuals and communities and limits opportunity. As well as benefiting the individual, decrease in illegal drug use in a community should be manifested by positive social factors such as decreases in HIV rate, arrests and murder rate. For drug treatments, they do not fund directly any of the clinics, but provide funding to individuals and groups who they feel can make a difference in line with their aims, this includes BSAS and also community organisations for example that might to mobilise community support for drug addiction treatment. As well as community action, they are attempting to build a network of influence, to speak to key individuals in the legislature.

Dr Schwartz points out that because the intensive programmes such as inpatient clinics or services with a lot of counselling are relatively expensive, they are ultimately limited to a few people, and argues that it would be better that everyone in need gets access to care. More controversially, he is not sure whether the outcome for clients in model methadone clinics (ie with counselling) is any better than that given by clinics without counselling - he cites retention rates as an argument for this. His ideas are to have addiction health-care reach everyone who needs it; in Baltimore this would mean 45,000 people a year, mostly buprenorphine prescription.

The Baltimore Station, Baltimore

The Baltimore Station is a programme for homeless men who are substance abusers housed in an ex-fire station that nestles under the I-95 overpass close by to the immense Baltimore Ravens football stadium. I meet with Woody Curry, Associate Director of the Centre. His office door is permanently open on the ground floor of the centre where the men in the Station, about 50 altogether, eat lunch and dinner together. Anyone can see him, at any time. It is a therapeutic community, the men live at the Station for up to two years, sleeping in bunk beds in a huge dorm room upstairs. There is no methadone or other maintenance therapies here. He is critical of methadone, subscribing to the view that it does not break the dependency on opiates and so does not allow recovery.

His is a non-medical approach with the goal of rehabilitation. The men who

come have undergone hospital-based detoxification so that when they arrive are not suffering from the severe acute withdrawal symptoms. The goal here is to help the residents gain the skills they need to maintain a drug-free life, and it is this positive motivation that keeps the men drug-free. With the help of the Station, each individual teaches himself to live in a different way than before and to live a drug-free life. It's a slow process, bit by bit the programme is designed to help build the men's self-confidence. There is counselling based on cognitive behavioural therapy, using a blend of Woody's own ideas to help people refocus their lives and rebuild them. They use things that, in Woody's experience work, a mixture of Buddhist philosophy, group work, motivational talks and education. Woody is knowledgeable about the basic science underlying addiction and, uses this to help the clients understand what drugs have done to them. He tells them that the drugs have changed their brains, and the objective of the therapy is for the guys to relearn, find a new way of thinking and reverse the drug-induced changes.

The residents are involved in the community and, he says, are accepted, they seen as a positive influence on the neighbourhood. Ex-residents come back too, I meet with a guy who has a job with an asbestos removal company that takes him all over the country, he's just popping in to hang out with the other guys, and of course to provide support and encouragement to the newer residents. The scientific literature suggests that therapeutic drug-free communities do not work very well, no better than methadone maintenance, anyway. But despite that hard statistic, it is easy to see that the individual successes here are very real.

The Drug Policy Alliance, New York City

In New York City, I meet with the Executive Director of the Drug Policy Alliance, Ethan Nadelman. The DPA is a campaigning organisation, they sell books by mail-order such as "Shattered lives - portraits from America's drug war" and "Commonsense drug policy". It is a departure from discussing addiction treatment. Ethan argues that not only does the USA continue to waste a vast amount of money on prohibitionist programmes which are ineffective and have been unsuccessful, but it is illogical (alcohol and tobacco are legal) and discriminatory – the drug laws target the disadvantaged, and have a disproportionate effect on ethnic minorities. Essentially the laws are racist, he says. He would like the US to come into line with what he regards as European practices, namely a sensible and relatively tolerant view on drug taking with harm-reduction policies in place to promote safe use of drugs by those who choose to use them, and healthcare for all. We talk about drug education, and he mentions research which has shown that anti-drug messages simply harden the attitudes of those people who already believe that drug taking is wrong but doesn't really affect the uptake of drugs by new users. In schools, he says, the children are spoken to either by recovering addicts or the police, i.e. either someone for whom drugs has ruined their life or someone who has never taken drugs (or at least couldn't admit it). People whose lives have been blighted by drug use, he says, are not typical of drug use as a whole.

The Charles O'Brien Center for the Treatment of Addictions, Philadelphia, Pennsylvania

Charles O'Brien is one of the pre-eminent people in addiction research internationally, a physician and researcher who has developed new treatments for addiction. His centre treats drug addicts, several hundred of them at any one time, and they are developing their own new types of research-based treatments, particularly ones which are aimed to prevent relapse in drug-free recovering addicts.

He gives me an overview of the types of research they are doing, which is extensive. Dr O'Brien's treatment discovery programme has been very successful. He has championed the use of new medicines for alcoholism (naltrexone), and found that modafinil, a medicine that can be used to treat narcolepsy, shows promise to reduce craving and relapse in drug-free cocaine addicts. He paints a bright future for addiction medicines which prevent relapse. They have mostly tested medicines which are already being used for other conditions. This approach of screening drugs is proven and successful, but they are mostly working on drugs that have already been made by companies, sometimes invented 30 years ago or more.

He is also a proponent of cognitive behavioural therapy as an adjunct to medical treatment of addicts. He has written extensively on this and published numerous studies which support the idea that therapy when combined with, for example methadone maintenance for heroin addicts, produces the best outcomes which, from his perspective, are not simply retention in a treatment programme but quality of life indicators (being happy, having a job etc) and drug abstinence or reduction in drug consumption.

Emory University, Atlanta, Georgia

I meet Professor Mike Kuhar, who is a distinguished professor in the Neuroscience department. Mike is upbeat. He is a firm believer that basic scientific studies have already been very successful, are going in the right direction and will ultimately lead not only to a better understanding of what drug abuse is, but find better ways of treating it. It's not just an article of faith; he reminds me of the huge advances that have been made through basic research, not only in the drug abuse field but in neuroscience in general. It is not simply an increase in the amount that is known, but there have been huge technical advances in every area of brain science imaginable to allow scientists to unravel complex behaviours such as drug abuse, and – ultimately it is hoped – to find ways to selectively interfere with them.

His own work may help develop medicines to treat cocaine dependence. His group has worked on a natural substance found in the brain called CART that is found in the brain areas that control cocaine consumption; by inventing medicines to modulate CART it might be possible to treat cocaine and other addictions.

The Scripps Research Institute, Jupiter, Florida

Paul Kenny is an Assistant Professor at the brand-new Scripps Research Institute, an enormously influential private institute that has set up a new facility in Florida about 60 miles north of Miami. The Scripps is clear about its ambition, it has set-up that will attract the very best scientists in the world, and to make

new medicines. Quickly. Paul's lab carries out very sophisticated behavioural pharmacology which he is beginning to combine with equally sophisticated molecular biological techniques. He works for the Scripps Institute

Paul is an expert on the mechanisms underlying nicotine addiction and is devising ways to discover new anti-craving drugs. The institute has the facility to help investigators like Paul achieve their goal of creating new medicines. He has to obtain grant funding to pay for the work, but once he has his funding he has access to state-of-the-art resources, including a "library" of nearly a million different chemicals on the shelf – each one a potential new medicine - and a discovery department which works out ways in which to test them. The early screening is done using what are termed "cell-based assays." These are automated, I am shown a huge robotic arm which is at the centre of their high-throughput screening facility, day in, day out, twenty-four hours a day the robot can prepare the chemicals and stick them, thousands at a time, onto the plastic plates to find out which ones are effective in the test that they have. The few chemicals that work in these tests can then be used in more labour-intensive experiments; some may be developed into medicines.

Ka Hoale Ho'ala Hou No Na Wahine, Honolulu, Hawaii

The name translates as the home for reawakening of women, and I meet the executive director, Lorraine Robinson. I have some trouble finding the facility, it is down a small side street with a pretty name, Ka'aahi street. But it's only the name that is pretty, the street is next to an electricity substation in a scruffy part of Honolulu where poverty is evident, in Ka'aahi street there are dozens of women who sit outside on the pavement on blankets, their possessions in shopping trolleys. The facility itself is secure and guarded, the women inside – about 30 of them at any one time – are serving prison sentences, mostly repeat offenders who have committed non-violent crimes. The state prison system sends women to the Home for Reawakening of Women for rehabilitation, and re-integration into society. Many, if not all, have had a drug problem, usually with crystal meth.

"The people here have trashed their lives real bad," says Lorraine as she shows me round the compound. The place operates under strict rules, withdrawal of privileges for breaking the rules and rewards for good behaviour. Of course, there is zero tolerance to drugs, each woman has to provide urine samples for testing, anyone showing a positive test is thrown straight back into prison. The opportunities presented here are a powerful incentive to good behaviour. During the six months they stay in the programme, they learn the skills to take jobs, and to manage their lives. They are being given a second chance. The programme helps get women job placement. In order to leave the programme, and go back out into the community on parole, the women are expected to have saved $2000 from their work, enough to pay a down-payment on an apartment. Lorraine doesn't track all of the women who leave, but reckons from data collected two years ago that about 70% of the women who come through the programme have not re-entered the prison system two years later. There is no data on how many of the women are drug-free, but the assumption is if they are out of jail, then they are likely to be clean.

The rehabilitation programme touches every part of the women's lives, including their past drug use, but Lorraine sees the substance abuse as a minor part of the

problem. Part of this is because the women have been in prison for a year or more before entering the programme and are drug free. Also, Lorraine is not keen on the medical definition of addiction – as a disease; it's not useful to label these women she says. They take drugs as a comfort, as something to turn to. So, relapse prevention is way down the list of priorities for her, and for the women too – they rate "life-balance" as number one.

Australian National Council on Drugs, Sydney, Australia

I have arranged to meet up with Gino Vumbaca, Executive Officer for the Australian National Council on Drugs (ANCD), an advisory panel set up and funded by the federal government. We meet at Coogee beach, near his home. Gino was a Churchill fellow himself some years ago and travelled through the UK and USA researching drug use in prisons. He's at the heart of the operations of the ANCD, a full-time employee involved in organising a committee of people appointed by the federal government to develop and evaluate the country's drug strategy and policies. The overall policy of the Australian Government appears more progressive than the USA, and is defined as "harm minimisation", trying to reduce the demand for drugs, e.g. through education and media campaigns, and reduce supply through law enforcement. They are also involved in enhancing the treatment services available to drug users, and the makeup of the Council, which includes prominent academics from the main drug research centres in Australia, ensures that there is an evidence-base to what they do.

Coogee beach

Alcohol is by far the drug which causes the most harm in Australia, and comes within the remit of the ANCD, even though it is a legal substance. There is also a problem with heroin use, and a high death rate from overdose. In most states there are progressive harm-reduction services available to heroin users such as needle exchange programme, condoms in prisons (reducing the spread of HIV) and methadone maintenance therapy. Like in the USA, there is debate about how to administer the methadone (or buprenorphine), with a potential move to a pharmacy-based system rather than administration in a therapeutic setting. Compared to the USA or UK, use of stimulant drugs, particularly methamphetamine (which is smoked or injected) but also ecstasy is a major problem. There is little cocaine in Australia. Even though the extent of addiction to amphetamines and its impact is likely to be relatively modest compared to the public health impact of heroin use, amphetamines are a major political issue, fuelled by media interest. Cannabis is also a major issue, and the government is considering setting up a national cannabis research centre.

Australia has tough drug laws, and as for the USA, a substantial slice of the government funding on drugs goes to law enforcement. Part of this is international, Australia is involved in reducing heroin trafficking from their near neighbours in the far east, and have tight border controls. Part is internal, too. For example, many states have introduced drug-driving testing; a saliva test that

is used like a breathalyser to test illicit drugs (as well as alcohol). The penalties are severe, loss of license at the least and a custodial sentences a real possibility. For drug or alcohol users facing criminal charges, there is increasing use of "diversion" , in essence drug users are kept out of jail, under the condition that they go through a treatment programme (and provide negative urinalysis). Gino thinks that the partnership of law enforcement services with the other agencies involved in drug abuse (e.g. the health services) as a positive step in building drug-free communities.

Hunter Mental Health Services, Newcastle, New South Wales

I meet up with Amanda Baker at her downtown office in the Officer's Quarters of the James Fletcher Hospital, where the city's mental health services are run. Her speciality is cognitive behavioural therapy. One of her main projects is smoking cessation, and she has been working on ways to improve smoking reduction, particularly in schizophrenics. She tells me that simple psychosocial interventions, essentially talking to the clients about their smoking and suggesting that quitting may be useful to them are very effective.

In Australia the services are often lead by psychologists rather than medically-trained psychiatrists and this flavours the culture in which treatments are done – drug addiction is fundamentally seen as a behavioural issue which can be improved by behaviour rather than as a disease which can be cured. We talk about the use of medicines as a component of drug addiction treatment. As a cognitive behavioural therapist, essentially she sees that relearning and developing new behavioural strategies rather than medicines are the route to a drug free life. Medicines can be useful in preparing people for psychotherapies, especially maintenance-type drugs which help people get through to the maintaining of change. She is less keen on the idea of anti-craving drugs which are aimed to prevent relapse. To quote her "the effects of cognitive behavioural interventions may be more durable than other psychotherapies and hence be more protective against relapse." And psychotherapy alone may be effective, one of her studies on heavy amphetamine users, showed that just a four sessions of cognitive behavioural therapy was effective at getting people either to stop or reduce their drug use.

She tells me about the clinical guidelines that she has helped develop for amphetamine misuse. Although amphetamine use in Australia (particularly in the Newcastle/Hunter Valley area) is huge, the proportion of users who present to treatment clinics seems underrepresented, accounting for 9% (roughly) of all treatment interventions. The guidelines cover all areas from acute emergencies to interventions in people who are habitual amphetamine users. One issue is the acute management of people with amphetamine intoxication, people who may present with severe psychotic symptoms and can be aggressive and uncontrollable. There is the issue of longer term use, too. There is an amphetamine withdrawal syndrome that is poorly understood, and some chronic amphetamine users develop psychoses and other mental illnesses including suicidal thoughts. There are no medicines available specifically for treatment of amphetamine users.

St Lucia Campus, University of Queensland, Brisbane, Queensland

David Kavanagh, Professor of Clinical Psychology at the University of Queensland, works across a range of mental health conditions, including the

addictions. He has recently developed a psychological model of addiction and craving, he refers to recovering addicts using part of their reference memory and part of their working memory in drug craving. His trick to get people to avoid relapse has been using a method derived from Buddhist principles called mindfulness meditation which gets people to learn that the negative thoughts and emotions they experience (e.g. drug craving) are passing phenomena and aren't permanent. He is also testing “correspondence-based” treatment, where clients might not see a therapist at all (or at least not often), but receive letters encouraging them, and giving advice on, how to reduce or eliminate drug use. These, he says, are remarkably successful. He explains that this is because people have in-built mechanisms to quit taking drugs.

Department of Psychiatry, Royal Brisbane Hospital, Brisbane

I meet with Mark Daglish, a psychiatrist who runs the Drug and Alcohol Dependence ward, he has only been in post for two weeks. They mostly do detoxification, getting drug users to a drug free state and minimizing the unpleasant, and life-threatening effects of drug withdrawal. The alcoholics are given a cocktail of drugs, which sedate; the protocols are standard ones and safe. The clients stay for 4-5 days, until they are free from the worst of the withdrawal effects and are discharged from the ward. Often the patients are prescribed an anticraving drug, such as naltrexone or acamprosate when they leave. Since the hospital is smoke free, a major problem for these patients is nicotine withdrawal. Patients are given patches, but will mostly tear them off and light up when they leave the facility.

The patients who leave are referred to outpatient treatment programmes, of which there are a wide range, but none of which are linked to that particular unit. Alcoholics Anonymous operates in the ward, running 4 sessions a week, and patients are encouraged to attend those sessions. Not everyone finds AA helpful, but for those that do it is easier to get them into meetings at that stage compared to after they have left. It isn’t within his remit to follow up the programme over the long term, for example to find out how many become drug free. Often, he says, the alcoholic patients who are discharged are back a few weeks or months later, sometimes using detox. as a respite from an abusive or otherwise difficult home life.

Orygen Research Centre, University of Melbourne, Melbourne, Victoria

Dan Lubman is a psychiatrist who runs the substance abuse services at the Orygen Research Centre and Clinic, treating mostly adolescents and young people who have substance abuse and/or mental health problems. His research suggests that the prefrontal cortex, the part of the brain involved in decision making, is one of the main culprits for maintaining drug use behaviour. He tells me that the prefrontal cortex, he says, is the centre that prevents making decisions that should be predicted to have bad consequences, such as choosing to take a drug that you know may harm you. He believes that this decision making deficit is important, and he puts less weight than others on the power of craving in relapse. Are these deficits he has found a reason why people become addicted to drugs, or a consequence of drug use? He, and nobody else, knows.

We talk about treatments, the main treatments he uses are cognitive behavioural therapy, and he is favour of graded interventions, depending on the needs of the clients. Some people respond well to just one or two interventions, whereas

others might need several, or more intensive type of therapy (e.g. inpatient).

NDRI, Curtin University, Perth, Western Australia

I visit Steve Allsop, the director of the National Drugs Research Institute which is situated in the Perth General Hospital Complex. The speciality of this institute, one of four national drug institutes in Australia, is research and evaluation of drugs education and other drug prevention initiatives. They are also experts in drug use amongst the Aboriginal population, where alcohol (grog) and petrol sniffing have a devastating effect amongst the communities.

I'm keen to get his opinion on how (and whether) anti-drugs messages can be effective. Is drug education a waste of time? Steve does not think this way. He is pragmatic, accepting that some of the anti-drug campaigns verge on propaganda and are doomed to failure, but is of the opinion that anything that might reduce the age of uptake of drugs in an individual, whether legal like alcohol or tobacco or illegal may reduce the later risk of addiction. He genuinely believes that campaigns can be successful, providing they address the target group properly. For example, he cites a campaign aimed at reducing binge drinking in teenagers with a slogan something like "think how you are going to feel tomorrow" as being useless. Teenagers don't care about tomorrow, he says. Instead, campaigns which target the areas relevant to teenagers, perhaps their attractiveness are likely to be more effective. Also, he points out that the effects of such campaigns might not be immediate.

Singapore

I had hoped in Singapore to meet up with some people from the Central Narcotics Bureau who maintain the country's drug policy, based - they say - on drug prohibition with strong legal deterrents, drug education and rehabilitation of people with drug problems. I was keen to find out about how they regard that their education policy, in particular, works in comparison to the rest of the world; and also how successful their rehabilitation programmes are. I was optimistic, having being in contact by email some months before my visit. However, although I followed up their last email several times, my contact had stopped replying and did not answer my request for a specific meeting.

Singapore has just about the most notorious, and amongst the toughest, drugs laws in the world. If you are found with about 25 grammes or more of heroin or other hard drugs, or 500g of cannabis you are automatically classed as a drug trafficker and will be hanged. And more than 400 people have been hanged since 1991. A few days before I arrived, a Nigerian man, Iwuchukwu Amara Tochi was executed. He was 21 years old and a promising footballer, who had come to Singapore to play for one of the football teams (smuggling drugs as he had been asked to do). The number of executions suggests that, despite these tough laws and the ultimate sanction, people in Singapore take illicit drugs. The problem is driven underground.

Lessons learned

It is impossible to tie together so many different strands into a simple summary, this would do a disservice to the people who I met and to the complexity of the issues involved.

These are the main things that I learned:

There is no one current treatment that is effective, and a wide range of opinions and disagreement on what could be effective, and why. Sometimes evidence is used in a contradictory way, e.g. whether buprenorphine is better than methadone; whether methadone with cognitive behavioural therapy is better than methadone alone.

The most striking successes in terms of individual recovery I saw were from the intensive drug-free therapeutic settings (Baltimore Station, Ka Hoale Ho'ala Hou No Na Wahine), but these centres also served people who had fallen the farthest, and also were hugely "expensive" in comparison to clinic-based outpatient services, whether medicine or psychotherapy based.

There could be better integration of the medical/basic science models of addiction into psychological models such as "states of change" there seems to be some misunderstanding of what the medical models can offer. Part of the problem is terminology – to be labelled a sufferer from a disease may not aid recovery in a psychotherapeutic setting.

Politics, cost-benefit and funding are major issues. All the treatment centres and individuals I visited were concerned about their funding, nowhere is addiction a medical (or social) priority of government. Everywhere, drug users are an underclass.

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