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SYMPOSIUM: STRUCTURAL COMPETENCY

Treating Addictions: Harm Reduction in Clinical Care and Prevention

Ernest Drucker · Kenneth Anderson · Robert Haemmig · Robert Heimer · Dan Small · Alex Walley · Evan Wood · Ingrid van Beek

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Abstract This paper examines the role of clinical practitioners and clinical researchers internationally in establishing the utility of harm-reduction approaches to substance use. It thus illustrates the potential for clinicians to play a pivotal role in health promoting structural interventions based on harm-reduction goals and public health models. Popular media images of drug use as uniformly damaging, and abstinence as the only acceptable goal of treatment, threaten to distort clinical care away from a basis in evidence, which shows that some ways of using drugs are far more harmful than others and that punitive approaches and insistence on total abstinence as the only goal of treatment often increases the harms of drug use rather than reducing drug use. Therefore the leadership and scientific authority of clinicians who understand the health impact of harm-reduction strategies is needed. Through a review of harm-reduction interventions in Canada, the United Kingdom, the United States, Australia, Switzerland, and the Netherlands, we identify three ways that clinicians have helped to achieve a paradigm shift from punitive approaches to harm-reduction principles in clinical care and in drug policy: (1) through clinical research to provide data establishing the effectiveness and feasibility of harm-reduction approaches, (2) by developing innovative clinical programmes that employ harm reduction, and thereby (3) changing the standard of care to include routine use of these evidence-based (but often misunderstood) approaches in their practices. We argue that through promotion of harm-reduction goals and methods, clinicians have unique opportunities to improve the health outcomes of vulnerable populations.

Keywords Addiction · Substance use · Harm reduction · Structural interventions · Drug policy

E. Drucker
John Jay College of Criminal Justice, City University of New York, New York, USA

E. Drucker (✉)
Department of Anthropology, 524W. 59th St., New York, NY 10019, USA
e-mail: emdrucker@earthlink.net

K. Anderson
HAMS Harm Reduction Network, Denver, CO, USA

R. Haemmig
Leitender Arzt bei University Psychiatric Services, Berne, Switzerland

R. Heimer
Yale University, New Haven, USA

D. Small
University of British Columbia, Vancouver, Canada

A. Walley
Boston University Medical Center, Boston, USA

E. Wood
St. Paul's Hospital, Vancouver, Canada

I. van Beek
Sydney Medically Supervised Injection Centre, Sydney, Australia

Introduction

This paper presents the recent history of global harm-reduction drug policies from the point of view of the roles and broader conception of the responsibilities of clinicians, who have a unique opportunity to act both as practitioners treating (and educating) affected individuals and their families and as advocates who are empowered to act within their own communities to draw on their clinical experiences, which also grounds and legitimates their actions in the broader interests of public health and the reform of health policies and practices. This opens the way towards practitioners affecting both clinical and population outcomes as well as helping to shape prevailing public beliefs and attitudes that form the wider context for public understanding and gaining acceptance for the advancement of more compassionate and effective approaches to a very wide set of social and healthcare challenges.

Structural Determinants of Health Risks From Drug Use

The unprecedented commodification and growth of global markets for psychoactive drugs (both licit and illicit) in the last forty years confronts us with new and potent versions of drugs and their addictions (Drucker et al. 2011). The adverse medical impact of some of these drugs has grown along with their distribution, including HIV and hepatitis C infections. In addition, drug markets and their criminalization have led to increased violence, homicide, suicide, and overdose deaths, each of which has produced a broad spectrum of traumatic social, psychological, and family health effects (Drucker 2013). In this context, neurobiological models of addiction (based solely on brain imaging or molecular studies) offer little to the frontline practitioner's needs in managing such patients. And criminal justice efforts to reduce drug use through supply side interdictions and arrests of drug users often intensify their health risks and reduce their access to clinical care (Stone 2014). In contrast, harm-reduction approaches are informed by the social and structural realities of drug use and offer practical ways to minimize the negative health consequences of drug use, enabling people to lead productive lives and improving the attractiveness and accessibility of treatment and rehabilitation services.

The United States, whose drug policies have played an outsized and dominant role in determining global drug policies and practices for almost a century, is now undergoing a sea change in the foundation concepts of its drug policies—moving from the criminalization of drugs and drug use to a public health approach. Much of this change is due to the U.S. experience of the failure of its exclusively punitive approach that has resulted in use of mass incarceration—building the world's largest prison system with over two million behind bars and over twenty-five million with histories of arrest and jail. The lessons of this failure are now evident and widely acknowledged by a broad spectrum of political actors, now serving as a model of what *not to do* for the rest of the world (Drucker 2013, 2014, 2015).

What Is Harm Reduction?

> "Harm Reduction" refers to policies, programmes, and practices that aim primarily to reduce the adverse health, social, and economic consequences of the use of legal and illegal psychoactive drugs without necessarily reducing drug consumption. Harm reduction benefits people who use drugs, their families and the community.

This definition of harm reduction (HR) by the International Harm Reduction Association (http://www.ihra.net/what-is-harm-reduction) includes activities already widely accepted, such as seat belts for cars or helmets for motorcycles and bicycles. The defining features are the focus on the prevention of harm, rather than on the prevention of drug use itself, and the focus on the well-being of those people who continue to use drugs. Harm reduction began to be discussed frequently after the threat of HIV spreading among and from injecting drug users was first recognized (O'Hare et al. 1992). It is based on the recognition that many people throughout the world wish to continue to use psychoactive drugs despite even the strongest efforts to prevent the initiation or continued use of drugs. Harm reduction accepts that many people who use drugs believe they are helpful to them (i.e., as self-medication) and are unwilling to stop using them. Access to good treatment is important for those with drug problems, but many are unable or unwilling to get

treatment, as it is currently practiced—i.e., with the sole goal of abstinence. Furthermore, the majority of people who use drugs do not need (or want) treatment. There is a need to provide such people who use drugs with options that help minimize risks from continuing to use drugs and of harming themselves or others—especially the harms associated with involvement in their nation's criminal justice systems. It is therefore essential that harm-reduction information, services, and other interventions function to help keep people who choose to use drugs healthy and safe. Allowing people to suffer or die from preventable causes of drug use as well as punitive drug polices is not an option. Many people who use drugs prefer to use informal and non-clinical methods to reduce their drug consumption or reduce the risks associated with their drug use. Readers can refer to the Harm Reduction International website (www.ihra.net) for more detailed guidance on harm-reduction interventions.

Harm-reduction approaches are an important alternative to abstinence-based addiction treatment, which today dominates the field of addiction. It is clear that devoting more resources to conventional treatment, with abstinence as the only goal, does not necessarily increase its utilization (Anderson 2014). Many drug users do not want traditional drug treatment, out of fear that they will be disrespected by healthcare providers, or that a model based on religious belief will be forced upon them, or because they do not seek total abstinence as a goal (Riggs et al. 2014). In response, a new treatment paradigm, harm reduction-oriented psychotherapy, meets drug users "where they are," working with drug users collaboratively to help them set their own goals—an approach that has been shown to be effective with clients who have been resistant to traditional forms of treatment (Tatarsky 2002).

Indeed, it appears that many drug users find ways of bringing their drug use under control without ever going to formal treatment. This may reflect a natural history of substance use that has more to do with the maturing brain and the growing social responsibilities of adulthood (family and work) than with the drugs themselves. According to the U.S. National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), which included some 43,000 people and was conducted between 2001 and 2005, only 11.8 per cent of people with an alcohol use disorder ever received specialty treatment. If Alcoholics Anonymous (AA) attendance is included as a form of help seeking, that percentage only increases to 14.6 per cent. However, in spite of this, the NESARC data also shows that the lifetime recovery rate for Alcohol Dependence is over 90 per cent. NESARC also shows that the lifetime rates of treatment utilization (including AA) for *any* drug use disorder are 8.1 per cent for abuse and 37.9 per cent for dependence. Lifetime treatment utilization (including AA) for Drug Use Disorders, versus the lifetime remission rate by drug category is listed in Table 1.

These comparisons of substance use data suggest that even though the majority of people with problematic substance use never get treatment, most stop their drug use with time. A number of studies, including Lee Robins' classic study of Vietnam War veterans in the early 1970s, have shown that recovery from heroin addiction without treatment is common. Robbins' findings, showed a relapse rate of 5 per cent after one year and 12 per cent after three years. For such individuals, the key is to reduce their risks of irreversible damage to their health during their years of problematic use. As the multinational data below suggest, informed clinical practitioners can be effective advocates for systemic adoption of evidence based harm-reduction strategies such as opioid maintenance treatment, needle and syringe exchange, safe injection facilities, and overdose prevention.

Cases: Overcoming Structural Barriers to Health

Drug Substitution and Maintenance Approaches to Opiates

Drug substitution and maintenance treatment using methadone and buprenorphine are pillars of a harm-reduction approach to opiate abuse—after alcohol, the most dangerous and destructive class of drug use in the United States and Europe. The right of physicians to prescribe maintenance drugs for their opiate-addicted patients, was blocked in the United States early in the last century but successfully implemented in Great Britain (United Nations Office on Drugs and Crime 2012), where doctors had the authority to gradually detoxify or maintain addicts by prescribing their drugs of choice, including opiates.

The United States had a history of morphine maintenance in the 1920s, as did the United Kingdom (Musto 1999), but unlike Britain, American authorities and the American Medical Association were hostile to this

Table 1 Drug use disorder treatment and remission rates, by substance (Anderson 2014)

Lifetime Treatment Rates for Drug Abuse (%)	8.1					
Lifetime Treatment Rates for Drug Dependence (%)	37.9					
	Tranquilizers (%)	**Stimulants (%)**	**Sedatives (%)**	**Opioids (%)**	**Cannabis (%)**	**Cocaine (%)**
Lifetime Treatment Utilization (including AA)	38.6	28.6	35.7	31.9	–	–
Lifetime Remission Rates	98.3	99.0	98.7	96.1	–	–
Lifetime Remission Rates for illicit Drugs	–	–	–	–	97.2	99.2

approach and shut down these programmes in 1926 (Waldorf, Orlick, and Reinarman 1974). This occurred even as the U.K. Rolleston Committee was reaffirming British doctors' ethical responsibilities to provide opiate maintenance treatment to addicted patients using morphine and heroin; a right British physicians still retain, albeit in the context of greater regulation (Berridge and Edwards 1987).

Yet despite this adverse early history in the United States, Drs. Vincent Dole and Marie Lysander were able to use their professional positions to relaunch the use of maintenance opiates as treatment in the United States. Dr. Dole, a metabolic research scientist at Rockefeller University and his wife, Dr. Nyswander, a psychiatrist with a Harlem-based practice that included many heroin users in the jazz scene of the 1950s, were able to gain support for the first large-scale trial of methadone treatment in New York City beginning in 1964. Within a decade their work led directly to the establishment of a large methadone treatment programme under the auspices of the New York City Department of Health, with over forty thousand patients in care by 1976 in a large network of funded clinics allied with the best teaching hospitals in the city. They received public recognition for their accomplishments with the highly coveted Lasker Prize—the U.S. "Nobel Prize" for Medicine. Today, as a consequence of physician support and advocacy, substitution opiate treatment with methadone and buprenorphine is the preeminent harm-reduction approach to opiate addiction (Ruiz, Strain, and Lowinson 2011). Positive outcomes include decreases in heroin use and injecting (with associated reduction of risk for HIV), reduction in criminal behaviour and arrests, reductions in death rates, increased employment, and improved access to and utilization of other health and social services. It is crucial for clinicians caring for addicted patients to have the skills and knowledge to effectively engage the agents of this drug policy and recapture control of addiction medicine practice in their own localities.

The U.S. Institute of Medicine (IOM) is an influential government body that consists primarily of clinicians, many of whom have lobbied effectively for practice and policy changes. In 1996, the IOM (Doe-Simkins et al. 2009) issued a series of studies and a report calling for the expansion and modification of methadone treatment. Further, in 1997, an NIH Consensus Conference reasserted the conceptualization of opiate addiction as a medical disorder (National Institutes of Health 1997). It called for "Effective Medical Treatment of Opiate Addiction" through the reduction of "misperceptions and stigma," improved medical training, assurance of greater access to methadone, and the reduction of "unnecessary regulations" that restrict the availability and quality of methadone treatment.

Buprenorphine maintenance for opiate dependence was adopted as a core HIV prevention intervention by the mid-1990s in many European countries and was particularly widely used by primary care doctors in France whose vocal support for buprenorphine led to an 80 per cent decrease in opiate overdose deaths in France in the first seven years since its adoption (Fatseas and Auriacombe 2007). In the United States, physician-led lobbying for legal changes to permit buprenorphine use in office-based settings culminated in passage of the Drug Abuse Treatment Act (DATA) by Congress in 2000, expanding the availability of buprenorphine via general physicians. In addition International Narcotic Control Board, the United Nations agency responsible for drug policies (Degenhardt et al. 2008), has recently

added methadone to its list of "essential medications"—again, in response to active international advocacy by clinicians.

Heroin-Assisted Treatment

Several countries have expanded drug maintenance programmes and practices beyond oral methadone and buprenorphine to include medical use of heroin-assisted treatment (HAT) with heroin made available at clinics in injectable and smokable forms.

The first Swiss programme of HAT was based in a Berne hospital, where a young psychiatrist Robert Haemmig, who had been treating heroin users with oral methadone and doing routine consultations in the hospital emergency department (often for overdoses), took the lead in advocating for the use of injectable heroin for those of his patients who were not responding to methadone, arguing that a pressing problem associated with high rates of HIV existed due to unsterile injecting. He was able to convince his department head to advocate with him for permission from the municipal and federal health departments to allow a pilot trial of injectable heroin on site at their hospital, leading within three years to the first national programme in Europe, and eventually spreading to clinics in all major cities, including even a farm-based prison programme employing heroin.

The three-year, multi-site Swiss study (1994–1997) provided injectable opioids to over 1,000 opioid-dependent individuals with multiple previously unsuccessful treatment attempts. Analysis showed that twelve-month retention rates were twice that of either methadone maintenance or residential drug-free treatment in Switzerland while all illicit drug use decreased dramatically (up to 94 per cent) among those who remained in treatment (Uchtenhagen, Gutzwiller, and Dobler-Mikola 1998). HAT participants in Switzerland also experienced marked improvements in physical and social health and functioning, housing, employment, and decreases in illegal activities. A subsequent cost-benefit analysis of the study (Ali et al. 1999) suggested that, despite the considerable research and treatment costs of the trial, the outcomes were cost-effective at a ratio of almost two to one.

Furthermore, the study demonstrated the feasibility of implementing and operating a heroin-assisted therapy programme without disorder, misconduct, and/or diversion of heroin supply. Crucially, physician leadership in advocacy and publicity about these clinical successes translated into new laws supporting the use of HAT as part of the spectrum of routine treatment, first in Switzerland and eventually in several other countries in Europe and the United Kingdom. In two 1997 referenda, 71 per cent of the Swiss voted in favour of continuing the heroin trials as ongoing programmes for over 1,000 patients.

Medical prescription of heroin yields health gains among chronic, treatment-resistant heroin addicts who did not profit sufficiently from existing treatments. Similarly, in The Netherlands, The Central Committee on the Treatment of Heroin Addicts (CCBH), under the auspices of the Netherlands Minister of Health, completed a large-scale study focusing on the effect of medical prescription of heroin to chronic, treatment-resistant heroin users (Blanken et al. 2010). These addicted individuals were in bad physical and psychological health, and most of them were highly dysfunctional in spite of long-term treatment in a methadone maintenance programme. The committee concluded that a twelve-month treatment of these patients with a combination of heroin and methadone was more advantageous to their medical and social condition than a twelve-month treatment with methadone alone (Blanken et al. 2010). Further, these gains are lost very soon after discontinuation of the treatment with heroin (Blanken et al. 2010). This led the committee to recommend the introduction (under stringent conditions) of supervised medical prescription of methadone plus heroin to chronic, treatment-resistant heroin dependent patients as a routine pharmacotherapeutic option. The role of physician leadership by a well-respected research professor of medicine in the Utrecht University persuaded a sceptical parliamentary health committee to sponsor a large randomized HAT trial, which again led to the acceptance of heroin treatment as a regular element of the Dutch national drug treatment system. Subsequently Dutch government trials of heroin-assisted therapy examining injectable and smoked heroin (the most common mode of use in the Netherlands) found significant improvements in drug use, physical and mental health, and social functioning in those receiving heroin prescriptions—in some cases in combination with methadone—allowing more practitioners to employ heroin-assisted therapy suited to their own settings. In consequence of this work, Germany and Spain also started heroin trials under Federal and municipal health department auspices, with similar positive results and alterations of national drug polices to allow HAT.

In 1998, the drive to employ heroin as a maintenance treatment in Canada was once again led by physician advocates, including then President of the Canadian Association of Addiction Medicine, Dr. David Marsh, the head of the public health programme at the University of British Columbia, Dr. Martin Schecter, and two physicians specializing in addiction medicine in Quebec. Canada's Health Research Council (the equivalent of the U.S. National Institutes of Health) funded a large study of HAT in Vancouver and Montreal that went on to become the foundation for many other innovations in HR practice, including the establishment of Insite—the world's first large-scale, medically-supervised injecting facility (SIF) (Wood et al. 2004). This programme had similar positive results but, due to a change in the federal government, was unable to extend these successes to available treatment services (see below for more on SIFs). However, recent changes in Canada's government promise to reverse this position and plans are in place to resume the expansion of HR services there.

But political objections to heroin-based treatment are still the norm and often trump medical or public health considerations. Thus in the 1990s, Australian addiction specialists and academic public health professionals organized systematic efforts to allow heroin maintenance in that country, starting with a series of detailed feasibility studies that included all the stakeholders. Eventually this approach succeeded in getting approval for a HAT trial in the ACT Canberra and support from the majority of the state health ministries. Although they had the jurisdictional authority to do so, a HAT programme still required federal approval—but this was denied for political reasons in the face of strong opposition from Australia's most powerful ally, the United States.

However, the same group of activist doctors went on to lead Australia in the development of other programmes for AIDS prevention that included greatly expanded widespread NSP's, the large safe injecting sites linked to community health services in Sydney. These HR programmes effectively prevented an epidemic of HIV/AIDS among the nation's drug injectors and earned national recognition with the award of Order of Australia (the nation's equivalent of Knighthood) for Drs. Ingrid van Beek and Alex Wodak, the two physician leaders of these movements.

Needle and Syringe Programmes and Safe Injecting Facilities

Early in the AIDS epidemic, the sharing of syringes was clearly linked to HIV transmission among injecting drug users (IDUs) and from them to sexual partners and their foetuses (Drucker et al. 2008). By 1995, most new cases of HIV in the United States were attributed directly or indirectly to drug use; today, more than a third of newly reported AIDS cases in the United States and Europe are still occurring among IDUs or their sexual partners—but with perinatal transmission almost eliminated in populations with access to medical care. The creation of needle and syringe programmes (NSPs) in the early years of the AIDS epidemic was the first well organized and explicit harm-reduction programme in the United States and in many European countries (Drucker et al. 2011). NSPs recognize that, despite all efforts to reduce the supply and demand for drugs, many will continue to inject drugs. The positive effects of NSPs on syringe sharing and a wide range of other behaviours linked to HIV/AIDS risk were well documented in the United States, Great Britain, the Netherlands, and Australia by the early 1990s. However NSPs have frequently been met with strong political opposition and (in most countries) are still not implemented at levels adequate to reduce the spread of blood-borne pathogens.

The spread of NSPs often ignites heated public debate as to whether addressing the imminent global threat of HIV would undermine existing efforts to address drug dependence among people who inject drugs. This debate continues today despite evidence that NSPs have not led to increased rates of injecting drug use as initially feared (Wodak and Cooney 2006). Indeed NSPs are now widely recognized to be the cornerstone of HIV prevention among people who inject drugs. This is a place where local physician advocacy can have important consequences. The process in Sydney, Australia relied on the advocacy and national prestige of clinicians to mobilize public and governmental support (Van Beek 2004).

By 2010, there were at least eighty-two countries with some level of needle syringe programming worldwide; ten of these countries had also established NSPs in custodial settings and prisons. The World Health Organization recommends that NSPs should be a part of more inclusive HIV prevention, treatment, and healthcare services and integrated with other services such as sexual health, TB, and addiction treatment (World Health Organization 2010). In Australia and

the United States today, most NSPs are integrated with other relevant health services in harm-reduction programmes, where comprehensive implementation of NSPs has been linked to improved health care such that its collateral benefits increase over the longer time horizon.

Supervised Injecting Facilities

Supervised Injecting Facilities (SIFs) are legally sanctioned places where people can inject various drugs (not only heroin) in relative safety. Appropriately trained staff members are on hand to provide life support measures in the event of overdose or other medical emergency. SIFs aim to reduce injecting-related harms, appreciating that apart from the drug class being used, injecting is an inherently riskier mode of drug administration compared to others. Like NSPs, they provide clean injecting equipment and connections to health personnel who can assist with referrals to drug treatment and other services. But unlike NSPs, SIFs also allow people to inject their own drugs on the premises instead of public places with negative effects on both drug users' health and adverse public attitudes. Once again, clinicians experienced in the care of opioid-dependent patients helped to develop these interventions and advocated for their systemic adoption in the United States, Canada, the United Kingdom, and Australia.

The first government sponsored SIF was established in Bern, Switzerland in 1986, in response to problems arising from its rapidly expanding "Open Drug Scene." SIFs have since been shown to reduce high visibility drug injecting in public places. The majority of the approximately ninety SIFs operating worldwide in 2012 were in highly urbanized cities in European countries where open drug scenes similar to Bern's had developed. These include Switzerland, the Netherlands, Germany, Spain, Luxembourg, Norway, and most recently Denmark. Formal evaluations of the Sydney and Vancouver SIFs, despite being relative latecomers compared to the European programmes (Hedrich, Kerr, and Dubois-Arber 2010) have all been positive for meeting all of its public health and public order objectives across a nine year period, i.e., reducing the morbidity and mortality associated with drug overdose; reducing the transmission of blood-borne infections; "widening the net" in terms of putting people who inject drugs in contact with health services; providing a "gateway" to drug treatment and other relevant services; and improving public amenity in the local area.

Overdose Prevention and Rescue Programmes

Opioid overdose is a major cause of death in North America, Europe (European Monitoring Centre for Drugs and Drug Addiction 2011), Asia (Quan et al. 2011; Coffin 2008), and Australia (World Health Organization 2010). Related poisonings or overdoses were (by 2012) responsible for up to 253,000 deaths worldwide and more than 38,000 deaths in the United States (Jones, Mack, and Paulozzi 2013; World Health Organization 2010). And they are on the rise in many countries due to the expansion of unsafe injecting associated with new heroin markets stemming from the widespread (and poorly managed) prescription of OxyContin and other opioid pain medications. The U.S. toll of all drug overdose deaths in 2015 was 47,055, of which 81 per cent involved opioids.

Because the increase in overdoses has been linked to increased availability of prescription pain medication, strategies have been implemented to reduce opioid misuse and diversion to people who do not have prescriptions, include prescription drug monitoring programmes (Jones, Mack, and Paulozzi 2013), prescription drug take back events (Gray and Hagemeier 2012), safe opioid prescribing guidelines, and education programmes (Gudin 2012).

While these strategies are promising, none has been demonstrated in clinical trials or controlled observational studies to reduce overdose rates. Furthermore, they are targeted towards people taking prescription opioids but not heroin. Methadone maintenance treatment and supervised injection facilities (Marshall et al. 2011; Cornish et al. 2010) are strategies associated with decreased fatalities from overdose.

Naloxone, an opioid antagonist produced since the 1960s, reverses the effects of opioid overdose by displacing opioid agonists, like heroin and oxycodone, from opioid receptors. It is a standard overdose treatment used by emergency medical personnel and has no abuse potential or adverse effects, except precipitated opioid withdrawal. Community distribution of naloxone rescue kits to people at risk for overdose and their social networks began as a harm-reduction effort to address opioid overdose in the 1990s (Darke and Hall 1997). Community harm-reduction programmes package

naloxone in a rescue kit with a syringe and either muscle needle or nasal atomizer. They distribute rescue kits along with overdose prevention education, which teaches people how to recognize and respond to an overdose. Overdose response includes how to recognize signs of overdose, seek help, rescue breathe, administer naloxone, and stay with the person who is overdosing. From 1996 through 2010, naloxone programmes in the United States trained more than 50,000 potential bystanders, resulting in more than 10,000 opioid overdose rescues with naloxone (Wheeler et al. 2012). Studies of naloxone programmes have demonstrated feasibility (Bennett et al. 2011; Enteen et al. 2010; Doe-Simkins et al. 2009; Piper et al. 2008), increased knowledge and skills (Wagner et al. 2010; Tobin et al. 2009; Green, Heimer, and Grau 2008; Strang et al. 2008), and reduction in fatal overdoses after initiation of community naloxone rescue programmes (Evans et al. 2012; Maxwell et al. 2006). In a population-based, interrupted-time series analysis in Massachusetts, in communities that implemented community naloxone programmes, opioid-related overdose death rates were 27–46 per cent lower than in those communities that had not implemented programmes (Walley et al. 2013b). Naloxone rescue kit distribution has also been found to be cost-effective with estimated incremental cost per quality-adjusted life-years gained ranging from USD$438 to USD$14,000 in a conservative model (Coffin and Sullivan 2013).

Community naloxone programmes distribute rescue kits to *various community members*, such as active opioid users, people in treatment, friends and family of opioid users, and recently released jail inmates—a group at particular risk for fatal overdose (Binswanger et al. 2007). Recently in the United States, many police, fire, and emergency medicine first responders have become enthusiastic advocates for widening access to life saving antagonists and helping to extend it to many venues, including syringe access programmes, HIV prevention outreach programmes, methadone maintenance clinics, inpatient detoxification programmes, emergency department settings, and community meetings (Walley et al. 2013a). There are two ways that medical providers can incorporate naloxone into their practices: (a) collaborate with an existing community-based naloxone programme or (b) prescribe naloxone rescue kits to patients. The reach of community naloxone programmes is limited because of increasing costs, lack of funding, and limited geographic reach of existing programmes, whereas the geographic reach and resources of the medical system is much greater.

Licenced physicians, nurse practitioners, and physician's assistants may prescribe naloxone rescue kits to patients at risk for overdose either due to illicit opioid use or due to opioids prescribed for pain, but most were not trained to do so and therefore are neither knowledgeable nor comfortable doing so. In addition to prescriber knowledge and comfort, lack of insurance coverage and pharmacy supply of kits can be barriers that prevent more widespread prescribing in medical settings and must therefore be addressed. However, with increasing public health attention on the opioid overdose epidemic, major efforts are being made to surmount these barriers, such as laws in many states that limit the liability of naloxone prescribers and overdose responders, collaborative practice agreements that allow pharmacies to dispense naloxone kits under a prescriber's standing order.

Next Steps for Clinicians

The history of successful implementation of harm reduction in practice in many nations over the last twenty-five years has taught us that social change of clinical and public health practices is often driven from the ground up rather than the top down. Policy papers and the scientific evidence base alone, are not enough—we need active engagement from practitioners—both in the provision of evidence-based clinical care and in the active social role of experts who engage in professional and public advocacy. Harm reduction is not just a social intervention and it must also focus on clinical engagement and the care of patients. For example, one infectious disease treatment programme in Vancouver tolerated concurrent drug use by patients in an intravenous antibiotic treatment programme for infectious heart disease (endocarditis) that had the effect of modifying hospital practices to encompass harm-reduction models with striking results—a three-fold increase in retention and successful treatment.

However the historical antagonism to drug users and continued misunderstanding of harm reduction has added to the difficult environment facing addiction medicine in many societies. Clinical and public health imperatives determine ethical duties for medical professionals and sometimes affect public policy for the better. In Vancouver, Canada, five successive mayors were

elected on platforms that featured explicit support for a wide array of harm-reduction services. This broad support enabled the city's leading academic physicians to open Vancouver's supervised injection facility Insite. With over 200,000 visits per year Insite is perhaps the most significant example of harm reduction in North America—and it is the existence of this clinical intervention that continues to drive the pressure for change in public health policies in Canada and elsewhere. In the downtown Eastside of Vancouver, hub of the cities street drug scene and its most prominent HR services, it was, to a large extent, the clinical practice of providing unlimited access to sterile injecting equipment and a safe place to use drugs for this large and highly visible population during the cocaine and crack epidemics that changed public policy.

Finally it is the peer to peer practice of clinicians that ultimately drives change in policy. Dan Small, a leader in HR and housing programmes in Vancouver during the period in which these pioneering harm-reduction programs were initiated, put it well: "Although as I think about it, in some ways we don't really change policy at the large level so much as lead by our practice on the ground" (Dan Small, pers. comm.). Practitioners have the power to make a difference one programme at time. It is the very existence of Insite, the clinical intervention itself, that drives real change in policy and therefore broader practice.

Any clinical practitioner caring for patients with addiction inevitably must deal with three interconnected universes that are always affecting their patients—even in Vancouver and other locations sympathetic to HR: (1) the use of innovative clinical interventions (e.g., NAOMI, Insite, Community Transitional Care Team, etc.), (2) institutional reforms of clinical policy (HR informed practice and standards in Regional Health Authority), and (3) the articulation of addiction problems with new formal social policy (politics). These constitute the set of important contexts in which drug use and addiction always exist, i.e., the realm of official rules and governmental policies, whereas the academic realm (peer-reviewed literature and the related medical conference circuit) and its culture of professional authority and legitimation are perhaps less relevant to the political world's formal decision-making process and are a necessary condition for change nonetheless. But it is on the ground that the world of actual people who use drugs can either get a clean needle, or not, or get a crack pipe, or not, get a condom or not, get clean water, or not, get a colonoscopy or not. It is this empiricism, the lived experience of clinical action, that guides social change, and it is in the lived experience of clinical practice and improved patient outcomes through HR programme development and availability where we must make these changes.

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