

# Abilify MyCite and the Social Control of Digital Pills

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## INTRODUCTION

The assertion of social control over individuals with known medical conditions has been promulgated since the dawn of germ theory in the mid nineteenth century (Newton 2020). As soon as it was realized that people could give or transmit disease to other people, and that illness wasn't caused by supernatural forces (Newton 2020), the public, and public officials, have tried to assert control over those people who were thought to have and spread disease. Sometimes this control was directly a result of public health concerns, such as the incarceration of Mary Mallon, or "Typhoid Mary" (McClay 2020). Mallon was under constant surveillance by medical authority figures and her body was a contested site of illness (Hasian 2000).

The construction of disease risk as knowable and preventable has created a new kind of logic about individual risk and responsibility for others' infection. High risk behaviors, such as HIV-positive individuals having unprotected sex with unknowing others (Yee Chan and Reidpath 2003), have become a moral issue and a foci of personal responsibility. This responsibility is framed in a twofold model: first, protecting other people as part of a public health agenda; and second, as a personal responsibility to one's own health. This is a rather modern notion that we have a moral responsibility to maintain our own health. One need only look at the proliferation of fad diets, supplements, and the explosion in popularity of online psychotherapy to see how individuals are compelled to achieve and maintain health and mental health.

In this paper, I will examine how medical technology in the form of “smart pills” is changing and reinforcing these responsibilities to ourselves and others through the lens of chronic conditions— including HIV, opioid addiction, and severe mental health disorders. I will briefly cover the literature pertaining to smart pills as they relate to HIV/AIDS and opioid addiction but will then turn my gaze to schizophrenia and the smart pill Abilify MyCite (hereafter referred to as MyCite), the first ingestible Bluetooth-enabled pill meant for the surveillance of people with serious mental illness. It has been long established that schizophrenia is not contagious (Hughes 2001). However, people with schizophrenia are socially conditioned to participate in their own care and maintain medication compliance, if indicated and agreed upon by the provider and patient (Treichler and Spaulding 2017). MyCite amounts to technological medical surveillance, which is the modern technologically-enhanced version of the medical surveillance of Mary Mallon (Hasian 2000). Mallon was under constant medical surveillance because of the threat that she posed to others in the form of contagious typhoid fever. This is where the similarities between the surveillance of Mallon and MyCite end: Mallon’s typhus was contagious, and she could endanger the lives of people she encountered. Schizophrenia, and the other severe and persistent mental illnesses for which MyCite is prescribed, is not contagious (Hughes 2001).

We can utilize Talcott Parsons’s concept of the “sick role” to conceptualize the social responsibility of people with severe mental illness to maintaining their medication regimens (Bissell, Traulsen, and Haugbølle 2002; Cockerham 2017). According to Parsons, a sick person has the responsibility to take care of their own health, and if they do so, they are given certain privileges, such as reduced work hours or reduced household or financial responsibilities. The emergence of MyCite and other smart pills seem directly related to Parsonian theory: If one

maintains their medication compliance by engaging in voluntary technological surveillance, they will be granted the privileges inherent in the sick role.

In next sections of this paper, I will provide a brief background about medical social control and technology, then will discuss the development of smart pills, and will briefly cover how smart pills are used for HIV and opioid addiction. I will then dig deeper into the use of MyCite, and will explore the broader implications of digital pills on the concept of the “deviant body.” I will conclude with a discussion about medical surveillance and how it applies to smart pills and will illustrate an arguably dystopian future with the continued development of smart pills.

## MEDICAL SOCIAL CONTROL AND TECHNOLOGY

The study of medical social control frequently falls under the larger umbrella of the study of medicalization (Conrad 1992). Early scholars of medicalization and social control anticipated that medical social control would soon supplant other forms of social control (Zola 1972), and while arguably this has not happened, it certainly has expanded (Conrad 1992). In fact the development of smart pills may have been what Zola (1972) presaged when he said, “It [medicine] is becoming the new repository of truth, the place where absolute and often final judgements are made by supposedly morally neutral and objective experts. And these judgements are made, not in the name of virtue or legitimacy, but in the name of health.” According to Conrad (1992), medical social control is often implemented by health professionals, and that it is aided by powerful forms of medical technology.

Medical surveillance, as a form of medical social control, is when a certain set of conditions or behaviors become to be seen through a “medical gaze” (Conrad 1992), and

physicians lay legitimate claim to all activities concerning the condition. The use of advanced medical technology to help the medical professions engage in medical social control is of the utmost importance. Forms of medical social control include penile implants for male sexual dysfunction (Tiefer 1986) or, more recently, medications for erectile dysfunction (ED) (Potts et al. 2004), hormonal and surgical treatments for people who are transgender (Billings and Urban 1982; Withers 2020), and genetic screening for deafness in infants (Bosteels, Vandebroek, and Van Hove 2017). The pairing of medicine and technology can be deadly. The most horrific examples of medical social control involve German physicians' genocidal collaborations with the Nazis, including carrying out the eradication of the "genetically defective" (Conrad 1992). Fortunately, most forms of medical social control are not as diabolical or lethal, but the case of Nazi doctors exemplifies the extreme end of medical social control. In no way am I suggesting that smart pills are equivalent to Nazi purges, but rather wish to illustrate the power that can be generated by the marrying of technology and medicine.

## THE LANDSCAPE OF SMART PILLS

Smart pills digitally track, via ingestible Bluetooth technology, whether or not a patient has ingested their prescription medication ("Digital Healthcare 101: What Is Digital Medicine?" 2022). They are composed of three components: an ingestible pill with Bluetooth technology imbedded in the tablet; a patch worn on the outside of the body, and a cell phone app. When the 1 mm digital transmitters embedded in the medication interact with stomach chloride, it sends a signal to the patch which subsequently transmits the data to the cell phone application ("Digital Healthcare 101: What Is Digital Medicine?" 2022). The digital signal cannot be activated without contacting these stomach fluids (Chai, Bustamante, et al. 2021; Chai et al. 2017; Chai,

Goodman, et al. 2021; Flore 2021). Once the data about the ingestion of the pill reaches the cell phone application, the data is visible to the patient, and if mutually agreeable, is made available to the healthcare provider (or anyone else to whom the patient has granted access to the application). In the case of HIV/AIDS, schizophrenia and other psychotic disorders, digitally tracking medication events is intended to record if the patient has taken their medication and to encourage medication compliance(MBA 2021; Mill et al. 2011). In the case of smart pills and opioids, the digital pill tracking system is intended to record if the patient has taken only the prescribed amount of the opioid (Chai et al. 2017).

Smart pills may very well be the breakthrough pharmaceutical companies were looking for to leapfrog technology into the future. Patents for smart pills currently exist for a diverse range of health phenomena, including mental health, HIV/AIDS, pain control, cardiovascular disease, diabetes, hepatitis C, oncology, tuberculosis and transplantology (Litvinova et al. 2022). The aim of smart pills is to improve treatment outcomes, increase medication compliance, reduce hospital stays, provide mobile clinical monitoring, have a positive impact on treatment costs and increase patient safety (Litvinova et al. 2022). Advancement in smart pills is especially focused in the fields of mental health and behavioral modification, such as schizophrenia, bipolar I disorder, attention deficit and hyperactivity disorder, drug abuse, smoking, pain, insomnia, and many others (Litvinova et al. 2022).

Like Long-Acting Injectable (LAI) depot medications that are intended to improve medication adherence (Okoli et al. 2022), a primary goal of smart pills is to increase medication compliance (Chai, Bustamante, et al. 2021). Non adherence to medication regimens can cause havoc and even death (Chai et al. 2017; Chai, Goodman, et al. 2021). Smart pills are an excellent choice for enabling medication compliance, especially for conditions in which medication

adherence tends to be problematic because of the stigma of taking certain medications or the side effect profile of medication (Litvinova et al. 2022; Semahegn et al. 2018). The annual costs of nonadherence range from 100-290 billion in the US (Cutler et al. 2018). In addition, 10% of hospitalizations among the elderly are due to treatment nonadherence, with a typical nonadherent patient requiring three additional doctor visits per year, resulting in an annual increase of \$2,000 in treatment costs (Cutler et al. 2018). For mental health conditions alone, the estimated annual cost per patient cost of medication non-adherence in the US ranges from \$2,512 to \$25,920 (Cutler et al. 2018). Clearly, the financial impact of smart pills that increase adherence is enormous, and the adoption of this technology would save health systems and individuals billions.

The first smart pill approved by the FDA in 2017 was Abilify MyCite (Litvinova et al. 2022), an atypical antipsychotic used for the treatment of schizophrenia, schizoaffective disorder, bipolar disorder, and as adjunctive therapy for major depressive disorder (Swartz 2018). Mycite not only tracks drug ingesting patterns, but also mood and activity levels. The five major components of MyCite interact with each other through Bluetooth technology: Aripiprazole (the active medication); an ingestible sensor that transmits information to a patch worn on the rib cage; a mobile app, and an online portal (Litvinova et al. 2022). MyCite is not the only drug equipped with digital sensors to track ingestion. By the end of June 2021, there were 137 digital therapeutic products and 122 personal care products in different stages of development (“Digital Health Trends 2021” 2021). In the next sections of this paper, I will explore how digital medication is used, often experimentally, in the treatment of HIV/AIDS and opiate addiction, and how these uses demonstrate a form of social control. After providing this overview, I will

explore in further detail MyCite and how it is used as a form of medical surveillance and medical social control towards patients with severe and persistent mental illness.

## HIV, OPIOIDS, DIGITAL PILLS, AND SOCIAL CONTROL

People living with HIV and AIDS have long been targets for social control and medical surveillance. For example, in Michigan, people living with HIV are required by law to disclose their HIV positive status to their sexual partners (Hoppe 2013). In the Michigan example, HIV is legally considered a “health threat” (Hoppe 2013) in much the same way as Mary Mallon was considered a threat to others. Medical surveillance like this is a form of social control (Hoppe 2013). There are both formal and informal methods of social control- the formal methods in the case of HIV include epidemiological surveillance such as HIV testing and contact testing, and informal social control is enacted by “third party” phone reports from local residents who accuse people in their community whom they suspect have HIV (Hoppe 2013).

In addition to the concepts of formal and informal social control, there are also forms of positive and negative social control (Fekete, Geaghan, and Druley 2009), which refers to from where the influence comes. Positive social control includes influence from primary network members, and negative social control is enforced behavior change that comes from outside of a patient’s primary support network. In the context of HIV, positive social control is associated with more self-care and fewer depressive symptoms, and negative social control is associated with less self-care and more depression (Fekete, Geaghan, and Druley 2009). I argue that smart pills are a form of negative social control, and therefore will lead to less self-care and more depression in all populations.

Stigmatization acts as a social control mechanism for people living with HIV/AIDS (Mill et al. 2011). Stigmatization contributes to inequity for people living with HIV/AIDS, including within the healthcare setting, and includes such practices as shunning, labeling, and disempowerment (Mill et al. 2011). I argue that the use of digital pills further increases stigma because it implies that people living with conditions treated with digital pills such as HIV/AIDS and severe mental illness can't manage their conditions independently. Patients using digital pills may face additional stigma if they choose to not share their private health information, including whether or not they have taken their medication.

Digital pills are used in the administration of HIV PreEP medication, which is prophylactic medication given to people who may have been exposed to the HIV virus. PrEP is effective for preventing HIV after exposure, but it requires consistent compliance (Chai, Goodman, et al. 2021). In addition, smart pills can be used for behavioral interventions, such as if someone is not regularly taking their HIV medication (Chai, Goodman, et al. 2021). Chai et al. (2021) also showed that men who have sex with men and who use substances are willing to engage in smart medication programs and have their medication compliance information transferred to their doctors (Chai, Goodman, et al. 2021).

In addition to their use with HIV/AIDS patients, digital pills are also used for the monitoring of opioid use in the case of severe or post-operative pain. Because opioids are often prescribed in the ER or on an as-needed basis, the dosing schedule is often left up to the patient (Chai et al. 2017; Chai, Goodman, et al. 2021). Chai (Chai et al. 2017) found that a benefit of digital pills for the prescription of opioids is that real-time interventions could be made if doctors detected that a patient was not taking the medication as prescribed. One of the key findings of this study is that clinical trial participants who used the digital pill technology to track the



ingestion of opioids after a bone fracture that resulted in the prescription of opioids not only accepted the technology, but that many continued to use the digital tracking after the trial period was over (Chai et al. 2017).

## MYCITE AND SOCIAL CONTROL

Among physicians, psychiatrists, infectious disease specialists and public health practitioners are the only doctors charged with managing risk within the community.. Psychiatrists and public health officials have historically been given the exclusive right among physicians to take away patients' liberties and freedoms, in the name of protecting the broader community. Psychiatry has a particular and sometimes dark history in which its use of social control may have pushed the boundaries of what is humane or reasonable (Scull 1991). In consideration of this history, it may be no accident that the first smart pill approved by the FDA to monitor drug compliance was designed to treat severe and persistent mental disorders.

The courts are often involved in compulsory psychiatric social control and treatment (Zetterberg, Sjöström, and Markström 2014), but it is foreseeable that drugs like MyCite will eventually replace court involvement, because it puts the control of the deviant psychiatric patient squarely in the hands of the agents of control such as doctors, and perhaps inevitably, other people in positions of power such as employers, parents, and parole officers. MyCite and other still to-be developed psychiatric smart pills may lead to a diffusion of responsibility of the social control of patients with severe mental illness, shifting responsibility from the court and medical systems to a sociotechnical system comprised of digital technology that is distant from the practice of mental health law and practice. This shift away from court involvement to a sociotechnical system may benefit the psychiatric patient. For example, it is often difficult to

discriminate how the court makes decisions in terms of compulsory medication, or compulsory psychiatric and/or community treatment (Zetterberg, Sjöström, and Markström 2014). In addition, there are regional and local differences between court decisions, leading to lack of consistency across jurisdictions (Zetterberg, Sjöström, and Markström 2014).

The specter of drugs like MyCite giving physicians increased social control of psychiatric patients may not change the landscape for these patients much: doctors are extremely stretched for time, and the likelihood that doctors will be actively monitoring their patients' MyCite records is low. However, parents, bosses, and other agents of social control may in fact have the time and interest to exert the increased social control that MyCite provides. For example, if a parent or parole officer actively monitor's a patient's MyCite records and discovers that the adult patient hasn't been medication compliant, these agents of social control may be able to compel medication adherence by threatening loss of benefits, care, or even, in the case of a parole officer, freedom from incarceration. This increased control could be considered either positive or negative social control (Hoppe 2013). The increased control could either spur the patient into demonstrating better self-care and disorder management, or it could be negative social control, leading to even less compliance and worsening of depression or other symptoms.

It is important to note that social control and power dynamics already exist between a psychiatric patient and their doctor. Conversation analysis research has considered how pressure is applied by psychiatrists to patients in taking antipsychotic medication (Quirk et al. 2012). The Quirk et al. (2012) study is crucial to understanding the power dynamics between a psychiatric patient and the physician, and MyCite represents an additional level of pressure that psychiatrists can leverage when having discussions about antipsychotics with patients. The impression of shared decision making in psychiatric treatment planning is important to psychiatrists because it

mitigates their reputation as merely being agents of social control (Quirk et al. 2012). However, the appearance of MyCite to the psychiatric drug war-chest adds a new wrinkle to the social control of psychiatrists by diffusing the element of control away from the doctor and onto a supposedly neutral sociotechnical system. Ultimately, with traditional medications, the patient can choose whether or not to be medication compliant, but with MyCite, they may lose this autonomy, especially if there are downstream effects or consequences of such monitoring.

## ETHICS, TRUTH TELLING AND MYCITE

Beyond the implications for the doctor-patient relationship and aspects of social control both inside and outside of the medical office, MyCite and other digital pills hold consequences for medical ethics and the ideals of truth telling, trust and autonomy (Klugman et al. 2018). The perceived benefits of the digital medicine sociotechnical system are continuous and remote monitoring, better disease management, self-tracking, self-management of disease and disorder, and improved medication adherence (Klugman et al. 2018). However ethical questions arise (Klugman et al. 2018), and these may be especially important in the three cases examined in this paper of HIV/AIDS, opioid use, and psychiatry. These conditions are often highly stigmatized and patients may have little intrinsic motivation to be honest with their doctors about their adherence to their prescribed medication regimen. In fact, one study showed that 60-80 percent of patients had lied to their doctors (Vogel 2019), most notably about drug use, exercise frequency and mental health conditions (LSW 2022). MyCite and other digital pills may remove the patient's ability to decide whether they want to tell the truth, although some argue that there exists no "right to lie" (Horton 2022). For ethical reasons, informed consent and a user agreement are critical for a doctor and patient who are about to use MyCite and other digital

medication, but these documents raise questions of therapeutic misconception, external influences on decision making, confidentiality and privacy and device dependability (Klugman et al. 2018). With MyCite, doctors or others can “verify” trust and truth telling.

Swartz (2018) acknowledges that smart pills can improve patient safety and health outcomes, but notes that digital medicine is “underpinned by a singular and inflexible set of values: the belief that quantitative data can provide a coherent model of the world, and the efficacy of bio-data to provide us with ways of acting in it” (Swartz 2018, 65). Swartz (2018) argues that smart pills in the context of serious mental illness is even more ethically tricky than their use in HIV/AIDS treatment, opioid use, and other proposed uses such as diabetes control (Swartz 2018), because of its reification as a supposedly “neutral” technology. MyCite’s role as a complex sociotechnical system that involves human actors acting on ethical or unethical premises is lost when patients and agents of social control forget that no technology is neutral.

Mandated treatment and compulsory monitoring are not new nor unique to mental illness. For example, in the United States, convicted sex offenders sometimes have mandated treatment and lifetime monitoring (Walker 2021). Importantly, this mandate and monitoring is done to not only treat the offender, but also to protect the community (Walker 2021). The sex offender model mimics in many ways the sequestering and monitoring of Mary Mallon (McClay 2020). For public health purposes, people with known communicable diseases are often removed from society in order to protect the wider population, such as that which is seen in the case of Tuberculosis (“Isolation | Case Management | State TB Prevention & Control Laws | TB Laws & Policies | Resources & Tools | TB | CDC” 2012). A similar form of monitoring and social control was seen in contact tracing (Yuan et al. 2022), and with the concept of social distancing as was seen at the height of the COVID pandemic (Waterlaus, Spruance, and Patten 2021).

Protecting the safety of others in the community such as in the Mary Mallon case, HIV/AIDS, or in TB or COVID seems like a noble use of digital pills, but where do we draw the line between ethics and intrusion or social control in situations where the safety of the community at large may not be at risk? Does using digital pills for severe and persistent mental illness pass the “ethics test”? Are we protecting the society by enforcing drug compliance? Research has consistently shown that people with severe mental illness, including schizophrenia, schizoaffective disorder, and bipolar disorders are at increased risk for violent ideation and behavior, but that this risk is increased by comorbid substance use disorders (Roché et al. 2021). One study showed that people with first episode psychosis present with severe violence only .6 percent of all cases, although committing any violence in the first episode was 34.5 percent (Large and Nielssen 2011). However, severe violence resulting in permanent injury or illness to the victim was uncommon in this population (Large and Nielssen 2011). Alternatively, the risk of self-harming behaviors in persons with schizophrenia spectrum disorders is an even graver problem: in a systematic review, researchers found that deliberate self-harm occurred in up to 69 percent of people with schizophrenia (Lorentzen, Mors, and Kjaer 2022).

## CONCLUSION

Digital pills clearly offer a lot of benefit and promise in many areas of healthcare and appear to have benefits for both patients and society at large. However much they have to offer patients, however, they also represent a form of medical social control (Conrad 1992). Digital pills are poised to control and manage deviance in a way that previous generations of medications are not capable of. For example, gay and bisexual men and IV drug users, who, in the United States are more likely than others to be HIV positive, are both stigmatized groups

(Courtenay-Quirk C et al. 2006; Crandall 1991) and as a result have deviant bodies (Manning 2015) and as such, are ripe for social control (Shipunova 2016). To take the example of digital pills for the management of opioid use, which is currently a huge priority for United States' social policy (Voon and Kerr 2013), we see again the use of the sociotechnical system of digital medicine acting upon another highly stigmatized group (Wimberly et al. 2022). And of course, the stigma against people with severe and persistent mental illness is well established (Cummings, Lucas, and Druss 2013), and yet again we see digital medicine employed in the management of these deviant and stigmatized bodies.

Taking everything into consideration; protecting the broader community and the patient themselves, digital pills have great promise. However, like the development of all sociotechnical medical systems, unintended consequences and risks may occur (Ash, Berg, and Coiera 2004). For example, digital technology is currently being marketed in the United States for the management of blood sugar levels and insulin delivery in persons with diabetes (“Bionic Pancreas Improves Type 1 Diabetes Management Compared to Standard Insulin Delivery Methods” 2022). Does this use pass the “ethics test” applied to the other cases in this paper? It seems evident and inevitable that digital medicine will permeate every possible medical space in the near future and bioethicists are concerned (Martani et al. 2020). Paranoia and fear about the intrusion of government and business in our bodies is prevalent today in America's communities (Cawkwell and Oshinsky 2015; Sim 2021; “Silencing Debate over Autism” 2007). Are sociotechnical systems like MyCite and other digital pills going to become the newest agents of social control of deviant bodies?

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