

出國報告（出國類別：訪問、考察）

## 臺美心理衛生及物質濫用 防治政策雙邊交流計畫

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派赴國家：美國

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# 目次

摘要.....	1
一、 出國目的.....	3
二、 出國考察人員及行程.....	4
(一) 考察人員 .....	4
(二) 考察人員 .....	5
三、 訪問紀要.....	8
(一) 主要行程單位介紹 .....	8
(二) 行程一：Department of Mental Health, Bloomberg School of Public Health .....	9
(三) 行程二：Department of Health, Behavior and Society, Bloomberg School of Public Health.....	10
(四) 行程三：Addiction Treatment Services .....	11
(五) 行程四：Center for Learning and Health.....	12
(六) 行程五：Behavioral Pharmacology Research Unit (BPRU) .....	14
(七) 行程六：NIDA Intramural Research Program .....	16
(八) 行程七：Office of Global Programs and Policy, Bureau of International Narcotics and Law Enforcement Affairs ....	17
(九) 行程八：美國國家藥物濫用研究所 (National Institute on Drug Abuse, NIDA).....	19
四、 心得及建議.....	24
五、 附件.....	26



## 摘要

心理衛生與物質濫用是臺灣日漸趨增之公共衛生問題，依據世界衛生組織及聯合國毒品控制暨犯罪預防辦公室（United Nations Office on Drugs and Crime, UNODC）指出，吸毒成癮是嚴重的健康問題，對個人、家庭及社會皆造成嚴重負擔，提供好的治療及處遇系統，將使毒癮者個人及其社區，以至整個社會獲得助益。

配合行政院新世代反毒策略行動綱領之戒毒策略與暴力防治處遇計畫之推動，及為透過參與國際考察汲取寶貴經驗，本部心理及口腔健康司協同國立臺灣大學公共衛生學院之代表共 6 人赴美考察。本次訪問單位包括國立藥物濫用研究所（NIDA）及其分部、約翰霍普金森大學（藥癮醫療）及其附屬醫院、美國國務院國際毒品與執法事務局等單位，從官方、學術及民間團體，瞭解該國物質濫用防治政策、人才培訓制度及藥癮治療相關研究之最新進展。

訪問期間，參訪團先後與約翰·霍普金斯大學內所屬藥癮治療相關學系、臨床或研究單位，以及美國國家藥物濫用研究所的研究人員會談，了解到美國對於相關專業人員的訓練模式、目前在藥癮治療研究上最新的成果，以及研究與實務工作的結合等，其中約翰·霍普金斯大學並於其 Weekly Update 刊載我方本次之參訪，增加了我國的能見度。另外，參訪團也與美國國務院國際毒品與執法事務局的官員討論，得知美國是如何與其他國家合作，推動藥物濫用防制實務工作者的認證、從何可以取得相關資源等資訊。這些來自美國的經驗，可做為我國相關防制政策推動的重要參考，為我國未來相關政策的推動尋求專業建議。

本次考察活動特別感謝國立臺灣大學陳為堅教授全力協助安排赴美考察行程，亦感謝臺北市毒品危害防制中心陳亮好副主任熱心居

中協調約翰·霍普金斯大學與民間團體，以及 Prof. Eric Strain 引薦各領域專家與會，使本次考察得以圓滿達成任務。

## 一、出國目的

本計畫過實地參訪及座談，期達成以下目的：

- (一) 瞭解美國政府對於藥癮個案之處遇政策及處遇系統服務之設計，並冀取得最新之研究趨勢與瞭解基本政策方向。
- (二) 瞭解美國政府物質濫用防治業務、人才培訓之發展歷程等寶貴經驗，以作為學習目標。
- (三) 瞭解美國政府與民間單位推動物質濫用防治工作之現況與運作情形，及面臨問題與解決策略，作為臺灣未來物質濫用防治政策之規劃、執行及評值之參考，提升藥癮防治效能。
- (四) 藉由本次交流活動，建立友善互訪機制，並初步建立未來臺美雙方簽訂合作備忘錄之基礎與窗口，促進臺美藥癮防治專業溝通與資源分享，創造卓越之防治績效。

## 二、出國考察人員及行程

### (一) 考察人員

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成員	姓名/從屬關係 (Affiliation)
團長	<p>Dr. Wei J. Chen, MD, ScD</p> <ul style="list-style-type: none"><li>• Professor, Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University</li><li>• Director, Center for Neuropsychiatric Research, National Health Research Institutes (Effective on January 1, 2020)</li><li>• Research area:<ul style="list-style-type: none"><li>• Epidemiology of substance use and schizophrenia</li></ul></li></ul>
成員	<p>Dr. Lian-Yu Chen, MD, PhD</p> <ul style="list-style-type: none"><li>• Deputy Director, Kunming Prevention and Control Center, Taipei City Hospital</li><li>• Assistant Professor, Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University</li><li>• Research area:<ul style="list-style-type: none"><li>• Addiction medicine and epidemiology of substance use</li></ul></li></ul>
成員	<p>Mr. Shang-Chi Wu, MS</p> <ul style="list-style-type: none"><li>• PhD student, Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University</li><li>• Research area:<ul style="list-style-type: none"><li>• Epidemiology of substance use</li></ul></li></ul>
領隊	<p>Ms. Chia-Chi Hung, MS</p> <ul style="list-style-type: none"><li>• Section Chief, Section of Substance Addiction Prevention, Department of Mental and Oral Health, Ministry of Health and Welfare</li></ul>
成員	<p>Mr. Ping-Chang Lee, BS</p> <ul style="list-style-type: none"><li>• Section Chief, Section of Treatment of Groups with Special Needs, Department of Mental and Oral Health, Ministry of Health and Welfare</li></ul>
成員	<p>Mr. Kai-Hsiang Yo, MS</p> <ul style="list-style-type: none"><li>• Technical Specialist, Section of Substance Addiction Prevention, Department of Mental and Oral Health, Ministry of Health and Welfare</li></ul>

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(二) 考察行程表

Date	Time	Meeting	Location
<b>Johns Hopkins Bloomberg School of Public Health Hampton House</b>			
Monday, Dec 16	0900 – 0910	Introductions and Program overview	Conf. Room 845
	0910 – 1100	Drs. Mojtabai, Susukida, and Amin-Esmaeili, Ramin Mojtabai, and Ryoko Susukida	
		Drs. Renee Johnson, Brion Maher, Elizebetg Stuart (who represent training grants, the Department’s substance use epi group, and the Center for Mental Health and Addiction Policy Research), with students and post-docs	
		Walk to Lighthouse Studies	
	1100 – 1230	Dr. Carl Latkin, tour of Lighthouse	at Peer Point
<b>Johns Hopkins Bayview Medical Center</b>			
Monday, Dec 16	1230 – 1330	Lunch with BPRU Faculty/Dr. Eric Strain	Conf. Room 3003
	1330 – 1450	Drs. Robert Brooner and Michael Kidorf Addiction Treatment Services	
	<b>Johns Hopkins Bayview Medical Center Mason F. Lord bldg.</b>		
	1450– 1730	Drs. Ken Silverman and August Holtyn Center for Learning and Health (CLH)	Suit 350
Dr. Alexis Hammond Center for Addiction and Pregnancy (CAP)		Mlf Bldg. 5 <sup>th</sup> East	
<b>Johns Hopkins Bayview Medical Center</b>			

Date	Time	Meeting	Location
<b>Tuesday, Dec 17</b>	0830 – 1200	Dr. Eric Strain	Conf. Room 3003
		Dr. Kelly Dunn and Joe Harrison Behavioral Pharmacology Research Unit (BPRU)	
		BPRU Faculty Group Meeting	
		Dr. Jessica Peirce Tour of the ATS program	Mlf Bldg. 6 <sup>th</sup> East
	1200 – 1330	Lunch with BPRU Post-docs	Conf. Room 3003
<b>NIDA Intramural Research Program</b>			
<b>Tuesday, Dec 17</b>	1330 – 1600	Check-in with security <i>(will need to bring passports)</i>	Conf. Room
		Dr. Michelle Leff and/or Dr. Wendy Marshall meet to the Archway Clinic	
		Drs. Kenzie Preston and Brenda Curtis Tour of the Archway Clinic	
		Dr. Lorenzo Leggio	
		Drs. Yihong Yang and Fedota Tour of neuroimaging suites	
<b>Department of State, United States of America</b>			
<b>Wednesday, Dec 18</b>	0930 – 1430	Brian Morales Introduction of Field Guide to Drug Demand Reduction Program and Development	AIT Conf. Room
 <b>National Institute on Drug Abuse (NIDA)</b>			
<b>Thursday, Dec 19</b>	0830 – 1000	Welcome and Introductions	DESPR Conf. Room
		Helping to End Addiction Long- Term (HEAL)	
	1000 – 1200	Division of Therapeutics and Medical Consequences (DTMC)	

Date	Time	Meeting	Location
	1300 – 1730	Clinical Trials Network (CTN)	Conf. Room
		Division of Epidemiology, Services and Prevention Research (DESPR)	
		Services Research Branch	
		Epidemiology Research Branch	

### 三、 訪問紀要

#### (一) 主要行程單位介紹

##### 1. 約翰·霍普金斯大學 (Johns Hopkins University)

約翰·霍普金斯大學為美國著名的大學，而其附設的約翰·霍普金斯灣景醫學中心 (Johns Hopkins Bayview Medical Center) 設有成癮治療部門，參訪該機構有助於瞭解美國一流學術機構針對藥癮患者的各種治療策略。另外美國國家藥物濫用研究所在約翰·霍普金斯大學內，設有編制內研究計畫設施 (Intramural Research Program)，主要負責研究藥物成癮的機轉，並發展新的治療與預防的方法。本次參訪亦與該單位交流，可以瞭解有關藥物成癮的治療及預防上，最新的研究進展，以做為我國未來推動成癮治療研究的參考。

##### 2. 美國國家藥物濫用研究所 (National Institute on Drug Abuse, NIDA)

美國為進行藥物濫用研究、治療、預防、訓練、資料收集等，於 1974 年成立 NIDA，係隸屬於國家衛生研究院 (National Institutes of Health) 之 27 個研究所 (institute) 與中心 (center) 之一，其主要任務即為領導美國聯邦政府在藥物使用、藥物成癮的成因與後果上，取得科學研究上的進展，並將這些知識應用於提升個人與公眾的健康。透過不同的計畫，美國國家藥物濫用研究所採取策略性的執行或支持藥物相關的基礎與臨床研究，以增進對藥物使用相關的神經學、行為、以及社會行為機轉上的了解。同時再將實證研究的結果，應用到藥物濫用的預防及治療上，並使公眾瞭解到藥物成癮是一個需要治療的腦部疾患。參訪美國國家藥物濫用研究所，與該機構人員交流，以瞭解目前美國對於藥癮患者的處遇政策及處遇服務系統的設計，

可作為發展中文版簡要成癮查核表，與我國未來戒癮系統改善之參考。

此次到約翰·霍普金斯大學，主要是透過學者 Prof. Eric Strain 的安排，參訪了以下幾個藥癮治療相關的單位：

## (二) 行程一：Department of Mental Health, Bloomberg School of Public Health

在 Department of Mental Health 的討論，主要分為兩個場次。在第一個小時中，我們與 Ramin Mojtabai, Ryoko Susukida, Masoumeh Amin-Esmaeili 等 3 位博士，討論了成癮治療的經費來源，以及成癮相關研究專業人員訓練計畫的規劃，他們對於美國、伊朗、日本等國經驗的分享，可作為我國參考。有關人力訓練方面，美國在訓練專業人員上，有較完善的補助架構，並提供許多 pre-doctoral, post-doctoral, clinical 的 training program，一開始也許不容易招募學生，但當有了成功的 role model 之後，往後學生參與的意願自然會提高。而在成癮治療預算方面，以伊朗的例子而言，政府藥癮治療相關的預算可以直接分配給治療中心（大多為公立機構），以補助病人接受治療的相關費用，例如免費藥物、免費清潔針具交換、免費美沙酮替代治療等。另外在日本，雖然藥癮的盛行率較低，但藥癮病人的復發率相當高，相關治療費用是由健保來補助，不過由於日本健保的預算並不像我國採總額管制，因此較不會有需要與其他科別競爭健保費用的情況發生。

在第二個小時中，則是與 Elizabeth A. Stuart, Renee M. Johnson 等人，更深入的討論有關我國個案管理師、或藥癮治療相關研究人力訓練計劃可能的進行方式（圖一）。在這次的討論，Renee 特別提到了她在 Department of Mental Health 開了一些成癮性物質使用相關的線上課程，例如有一門課是 [The](#)

[Epidemiology of Substance Use and Related Problems](#)。若有需要，她也很歡迎進一步的合作，可授權將課程內容中文化供我們使用。而 Department of Mental Health 也有一些心理衛生的課程，以 [OpenCourseWare](#) 或 [MOOCs](#) 的方式公開，讓有興趣的人可以透過網路學習。另外，在這次討論中，我們也得知美國的 National Institute of Health (NIH) 主要透過 T-32 program 來補助專業人員訓練。T-32 program 是 NIH Institutional National Research Service training grant program 的簡稱，主要是補助相關機構中，predoctoral 及 postdoctoral 研究人員的訓練，目標是希望這些研究人員往後的職涯，可以對國家往後健康相關的研究有重要的影響。



圖一、與 Department of Mental Health 的學者合影

### (三) 行程二：Department of Health, Behavior and Society, Bloomberg School of Public Health

結束了與 Department of Mental Health 學者的會議之後，緊接著到由 Carl Latkin 博士所帶領的 [Lighthouse Studies at Peer Point](#) 進行參觀（圖二）。Lighthouse Studies at Peer Point 是 Bloomberg School of Public Health 裡的一個以社區為基礎的研究中心（community-based research center），其任務是針對

不同人口族群，特別是都市地區的弱勢族群，進行有關健康促進與疾病預防的研究。除了透過量性與質性方法收集資料、進行行為監測、行為介入等健康相關研究，該組織也提供他們服務對象有關健康的資訊、減害所需的資源、以及轉介至醫療系統等服務。

針對藥癮者，他們透過組織 同儕團體 (peer groups)，並訓練一些擔任 peer educators/instructors, promoters of behavioral changes 等角色的成員，透過賦予這些成員任務，讓他們認為自己在團體中是重要的，會讓他們更能自我約束。而他們在團體中分享經驗、教導其他成員，也有機會幫助其他更深受藥癮困擾者更有效地接受治療。



圖二、與Carl Latkin (左1) 與Lighthouse Studies at Peer Point成員合影 (實驗室成員中有1位也來自臺灣，左3，令人格外親切)

#### (四) 行程三：Addiction Treatment Services

Addiction Treatment Services 是一個 comprehensive 的藥癮治療中心，並提供有標準門診照護、密集門診照護、藥物輔助治療等醫療服務。當天來與我們討論有關臨床及研究人員訓練的是 Robert K. Brooner 與 Michael S. Kidorf 兩位學者 (圖

三)。在詢問了兩位專家，是否有任何有關人員訓練計畫的建議後，他們同樣提到了 NIH 的 T-32 這個專門為了訓練專業人員所設計的 program。

在美國，T32 Institutional Training Programs 這整個計畫已經進行超過 30 年，而 Behavioral Pharmacology Research Unit (BPRU) 便是透過這個計畫所建立的研究單位，也被認為是一個相當成功的範例，多年來已培養許多在全美各地從事臨床或研究工作的專業人員。兩位學者也建議，透過政府單位持續、穩定補助，在大學或臨床的機構設立相關研究所或中心，將可以更有效地吸引年輕學者或醫師的參與訓練，培育更多相關人才。即使在我國，一個計畫大多不會超過 5 年，但仍可以有一些替代的方式讓整個針對人員訓練的補助持續下去。雖目前在我國尚未有類似計畫進行，惟經過本次訪問與考察後，本部業於新世代反毒策略 2.0 新增「擴大藥癮治療及處遇人才培訓制度，充實處遇人力」之行動方案，以有利國內成癮醫學及處遇政策永續發展，並符國際趨勢與科學實證，據以培植國內藥癮政策轉譯及學術研究人才。



圖三、Robert K. Brooner (左3) 與Michael S. Kidorf (右3)

#### (五) 行程四：Center for Learning and Health

Center for Learning and Health 是由 Ken Silverman 博士所帶領的治療研究單位，主要的目標是發展與評估針對藥癮的



行為介入措施，而其介入的理論，主要是由操作制約的角度出發，當天 Ken 也提供一篇相關的文獻供參考（The Utility of Operant Conditioning to Address Poverty and Drug Addiction, 2019）。這篇研究主要回顧了有關藥物成癮與貧窮的近端與遠端介入（proximal and distal operant interventions）的研究。根據文獻回顧結果，近端介入可以直接促進健康行為，例如戒酒強化（abstinence reinforcement）就是一個常見的有效措施，透過調整操作制約（operant conditioning）的參數，例如提高強度、安排長期暴露等，都可以使介入的效果獲得不同層面的提升。遠端介入則可減少健康的危險因子，例如在貧窮的情況下，遠端介入目的就是使人們擺脫貧困。該文獻也提及，像是治療性工作場所這種場域，除了可以提供患者所需的治療或行為介入外，亦能讓患者透過工作換取工資，即是同時包含了近端與遠端介入，將可幫助患者擺脫藥癮和貧困。

Ken 與我們分享他們的研究時（圖四），令人印象深刻的是他們給予藥癮者（主要是海洛因與古柯鹼使用者）成功停止用藥的獎勵，是以禮券、禮物卡，甚至是現金的形式發放的，且成功停止用藥的比率可達 50% 左右。在我國，鮮少有研究是以現金作為藥癮者參與研究的獎勵，雖然在臺灣也有做很多這樣子的討論，但國情上卻未能讓多數民意接受，可能是因為這樣的政策或舉動，會讓人覺得會給藥癮者多餘的金錢去購買藥物。然而在進一步詢問後，發現在他們的例子中，藥癮者並不會將該些獎勵用於購買藥物，相對的，而是以額外可用花費的角度，用這些獎勵去購買其他物品。若可以將這樣子的研究進行模式引入我國，將可使藥癮相關研究更容易進行。



圖四、與 Ken Silverman (右4) 和August F. Holtyn (左三) 討論

#### (六) 行程五：Behavioral Pharmacology Research Unit (BPRU)

BPRU 是由 Eric Strain 博士所領導，透過 NIH T-32 training program 的補助所設置的物質濫用臨床研究單位 (圖五)。BPRU 多年來取得數個由 National Institute on Drug Abuse (NIDA) 所資助 (funding) 的研究計畫，並有許多重要的研究成果。參訪當天，我們先是參觀了他們進行研究所用的各種設施，其中包括用以進行二手菸或大麻暴露研究，模擬辦公室環境的實驗室 (圖六)。



圖五、與 Eric Strain (左5) 和其他BPRU成員合影 (背景照片為一代大師Brady)



圖六、模擬辦公室環境的實驗室

該實驗室除了擺設模仿一般辦公室的情形，為了避免未進入該房間的研究人員暴露於有害的環境，內部還有獨立的排氣系統。透過這種擬真實驗室環境，讓原本實務上很不容易進行的研究主題或構想，都變成有機會實現。當然，這些硬體設備的建立需要花費大量成本，對目前缺乏這樣研究環境的我國來說，絕對是未來可以努力的方向。

除了參觀硬體設備，最後我們也簡短與其他研究人員，以及在訓練中的博士後研究員，利用午餐時間聊了目前他們進行研究的方向，包括成癮性物質濫用傾向的評估、針對物質濫用的行為、藥物或整合性治療、藥物濫用者的行為與共病、認知、心理運動功能的評估等



圖七、與BPRU的博士後研究員一同用餐，行程相當充實

## (七) 行程六：NIDA Intramural Research Program

NIDA 在 Johns Hopkins University 內，設有編制內的研究單位 ([Intramural Research Program](#))。這個研究單位的任務，主要是進行有關藥物濫用和藥物成癮的基礎機轉有關的最先進的研究，並發展治療藥物成癮的新方法，同時也著重在訓練進行藥癮相關的基礎與臨床研究年輕的學者。當天主要由單位的幕僚長，Michelle Leff 為我們簡介，同時也提供組織架構圖(附件 1)。根據她的介紹，NIDA 有關研究的預算，雖然大部分都是提供給大學或研究型機構申請研究計畫用，但有約 10% 是保留給 Intramural Research Program 的研究人員使用，因為較沒有產出有用的研究成果的壓力，主要是嘗試各種可能的新研究主題，作為學界未來研究方向的探索。

舉例來說，他們近期就利用電子監控配件 (electronic monitoring accessories, EMA)，收集海洛因、美沙酮的使用者的各種資料，如 craving、壓力、情緒、活動情形、環境暴露、GPS 等資訊，以探討影響他們用藥的各種因素。以 EMA 進行的研究，過去可能多是應用在其他領域，但最近也越來越常被用於藥癮者的研究上。在他們的研究中，同樣也是會以禮券、簽帳卡、信用卡等形式給予參與的藥癮者獎勵。針對這些不同的獎勵形式，我們也討論到雖然可以透過限定消費用途的方式，避免藥癮者用於購買非法藥物，但若限制過多，藥癮者仍會將其以較低價格轉賣以換取現金，因此仍要保持適度彈性。

除了 EMA 的應用，因為 NIDA 提倡成癮是慢性腦部疾病，故目前針對藥癮治療的反應，他們也開始更進一步將 brain image 的資訊納入參考。有個正在進行中的研究，就是預計招募 100 名藥癮者，每 2 個月一次地紀錄他們在治療前、中、後，腦部影像的變化，並希望可以利用這個資料，建立一個治療反

應的預測模型。最後，我們也利用一些時間參觀了 Brain image 實驗室（於此也巧遇來自成大醫院的王姿云醫師來此研修），希望未來我國也能比照設立功能完善的實驗室。



圖八、與 NIDA Intramural Research Program 學者合影

#### **(八) 行程七：Office of Global Programs and Policy, Bureau of International Narcotics and Law Enforcement Affairs**

除了 Johns Hopkins University 與 NIDA，本參訪團對原亦有意拜訪相關的聯邦機構，如美國藥物濫用暨心理健康服務署 (Substance Abuse and Mental Health Services Administration, SAMHSA) 和美國聯邦監獄管理局 (Federal Bureau of Prisons, FBP) 等。雖行程安排不易，最終盡能與美國國務院 Office of Global Programs and Policy, Bureau of International Narcotics and Law Enforcement Affairs 的負責人 Brian A. Morales，在 American Institute in Taiwan (AIT) 見面，實屬不易 (圖九)。

當天的會議中，Brian 先是提供了服務單位所出版的一本指引，Field Guide To Drug Demand Reduction Program Development (全文電子檔可至 <http://bit.ly/332M12x> 下載)，該實務工作指引，內容主要包含了四大部分：(1) 發展減少藥物需求的人力、(2) 藥物治療與預防服務的專業化、(3) 建立全球網絡與社區聯盟、(4) 加強對有特殊臨床需求族群的協助，

同時也提供了可以用於評估一個國家減少需求系統 (demand reduction system) 的工具。

當天 Brian 主要介紹了該本指引的幾個重要的內容：例如 Universal Treatment Curriculum (UTC)，乃是包含 8 門基礎課程與 14 門進階課程在內，一共 22 門有關藥癮治療課程的教材，因為是提供給全球使用的教材，因此已有許多國家將其內容翻譯並用於人員的訓練，雖然目前尚未有中文版本，Brian 也很樂意未來有機會可以合作進行翻譯。另外針對藥癮預防工作，則是有 Universal Prevention Curriculum (UPC)，包含 9 門課程的 coordinator series 與 7 門課程的 implementer series 兩個系列的內容（如附件 2），其中 implementer series 是專為實務工作者設計，因此還結合了工作情境的模擬，讓這些提供服務者能具備更多實務技巧。由於我國的個案管理師，目前並沒有一套有系統的教材，經常是邊工作邊學習，而未來幾年，我國剛好有機會擴大對個管師的訓練，若能在參考我國現況，適度地將這些教材的內容本土化之後，相信會成為相當有價值的訓練資源。

之後，他也介紹了藥癮治療與預防工作者的認證，該認證主要是以 Global Centre for Credentialing and Certification (GCCC) 所發展的國際標準，International Credentialed Addictions Professional (ICAP) 為主，目前共分為 ICAP-I, ICAP-II, ICAP-III 等 3 個等級。確保通過認證的提供藥癮相關服務的組織或工作者，可以提供有品質、以實證為基礎 (evidence-based) 的服務。自 2012 年起，每年獲得認證的人數也從不到 100 人，上升到 2017 年的將近 600 人，取得認證的人員也是遍佈全球。之後也許可以透過這套認證系統，提高我國個管師對自己專業的認同感，將有助於他們在工作上有更好的表現。

由於 Brian 主要負責反毒的國際合作計畫，因此常與各國相關單位有密切聯繫。最後他也提到了相關的國際專家學會 International Society of Substance Use Professionals (ISSUP, <https://www.issup.net/>)、由許多大學組成的 consortium，International Consortium of Universities for Drug Demand Reduction (ICUDDR, <https://icuddr.org/>) 等，並建議我們可以將這些學會或組織的年會資訊，提供給我國不管是研究或實務工作上相關人員，以增加吸收新知、與各國專業人員交流的機會。



圖九、與 Brian A. Morales (左3) 於 AIT 辦公室討論

#### (九) 行程八：美國國家藥物濫用研究所 (National Institute on Drug Abuse, NIDA)

NIDA 是美國聯邦政府中隸屬於國家衛生研究院 (National Institutes of Health) 下的機構，其任務主要是在藥物使用、藥物成癮的成因與後果上，取得科學研究上的進展，並將該些知識應用於提升個人與公眾的健康，是美國藥物濫用領域相當重要的機構。此次拜訪 NIDA，主要由其副主任 Wilson Compton (圖十) 安排不同學者與我們進行會議，並介紹他們目前進行中的研究計畫，或在研究上最新的進展。



圖十、由陳為堅教授（右）代表本部致贈感謝狀予NIDA副主任  
Wilson Compton（左）

因為美國近年因藥物過量致死的問題（特別是鴉片類止痛藥）相當嚴重，為了有效降低藥物過量致死的死亡率，他們其中一個單位，Center for Clinical Trials Network（CCTN），最近就開始嘗試以社區為單位，進行名為 Helping to End Addiction Long-Term（HEAL）的臨床試驗。

在該臨床試驗中，針對美國藥物過量問題較嚴重的 4 個州，隨機抽樣了一定數量的郡或社區，以隨機分派的方式分為兩組，進行整合式介入措施效果的估計，整體目標，則是希望可以降低 40% 的藥物過量致死案例。比較特別的是，他們是以類似 cross-over 的概念，將此研究設計為 waitlist-controlled trials。不同於一般的 placebo-controlled trials，研究一開始先是將所有社區分為介入組與未介入組，並透過兩組的比較得到介入的成效。在一段時間過後，研究者不再主動介入原本介入組的社區，讓社區自行維持介入的措施，而針對原本未介入組，則開始提供介入。透過這樣子的研究設計，參與研究的地區最終都可以有介入作為，而研究者不主動介入後，社區得自行維持介入的模式，也較符合實際情況。雖然美國目前所遇到的問題與我國並不完全相同，但這種以科學、實證為基礎的大型研



究，來嘗試解決國家重要公衛問題的運作模式，是相當值得借鏡的（圖十一）。

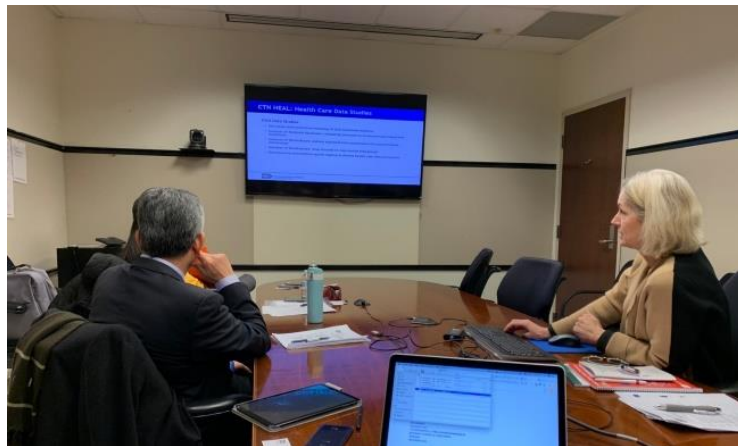


圖十一、Jennifer Villani（左）介紹HEAL study

除了 HEAL 這個研究，也有另一位學者，Kristen Huntley 為我們介紹他們的 Clinical Trials Network。這個 network 除了 NIDA 外，在全美各地還有 18 個合作點，可能是大學、醫院或相關研究組織。透過網絡，參與的單位可以較容易地進行藥癮相關的行為、藥物、或整合性介入的大型多中心臨床試驗。由於可以納入來自不同地區、不同族群的受試者，研究的價值也跟著有所提升。此外，參與這個合作網絡，也有助於資訊的流通，讓參加的學者或臨床醫療人員更容易得知最新的研究結果。Kristen 同時也介紹了這個 network 的資料分享平台 NIDA datashare (<https://datashare.nida.nih.gov/>)，以及他們用於篩檢菸、酒精、處方藥物與其他物質使用的線上工具，The Tobacco, Alcohol, Prescription medication, and other Substance use (TAPS) Tool (<https://www.drugabuse.gov/taps/#/>)。

其中 NIDA datashare 是一個線上分享資料的平台，在 Clinical Trials Network 中完成的臨床試驗資料，都可以透過這個平台提供給合作的研究人員，供進一步分析使用，部分資料

甚至也可以提供給非 network 成員的人申請使用。而 TAPS Tool 的設計，乃是以網頁為平台的問卷，可由病人或醫師來填答。這個工具的排版方式（responsive web design，根據瀏覽器寬度自動調整頁面），以及跳題、答題進度提示等功能設定，皆可作為本部委託臺灣大學團隊開發網頁版「簡要成癮查核表」之參考。



圖十二、Kristen Huntley（右）介紹Clinical Trials Network

最後，我們也與在 NIDA 中負責流行病學研究的兩位學者，Sarah Q. Duffy 與 Peter Hartsock 討論了美國目前海洛因、處方鴉片類藥物、合成鴉片類藥物濫用 epidemic 的情形。在討論過程中，Peter 提出了他的看法，認為這些藥物的濫用，是美國史上最大的”syndemic”（或稱 synergistic epidemic，協同流行），若要對抗這個濫用的疫情，疫苗的發展是必須的（圖十三）。然而針對藥物成癮，目前較有效的藥物，也僅有針對海洛因成癮所使用的美沙酮與丁基原啡因，疫苗的開發勢必更為困難，也有待未來研究上投入更多資源。當天我們也向兩位學者分享了目前我國的問題，由於引進美沙酮後，海洛因濫用情形大幅減少，目前最常被濫用的藥物是以甲基安非他命為主。因針對甲基安非他命成癮，尚未有有效的治療方法，發展有效

的藥物或疫苗將會是值得努力的方向。



圖十三、與Sarah Q. Duffy（右2）和Peter Hartsock（右1）討論

## 四、心得及建議

### (一) 研究與政策並進，強化國內藥癮防治政策實證基礎

此次到美方拜訪，透過與許多學者、專家的討論，瞭解美國在物質濫用最新政策與研究進展，以及他們在面對不同物質濫用問題所做出的應對。作為美國物質濫用防制的主導單位之一，NIDA 認定成癮為一種慢性腦部疾病的同時，也投入大量的研究經費（包括機構內及支持其他研究單位），積極地要找出各種可能有效的治療方式，以減少藥物成癮對病患及對社會所帶來的危害，如頂尖的學術研究單位 BPRU，即可透過向 NIDA 申請研究經費，逐步建立完整的研究環境，進行許多重要、具有高度參考價值的研究。

雖然美國的研究成果相當重要，但其研究方向仍是以解決國內問題為主，例如近年來美國藥物過量致死的問題相當嚴重，相關的研究也就跟著增多。然而，世界各國所面臨的藥物濫用問題並不一定相同，針對不同藥物、不同文化，解決問題的方式也可能會有所差別。各國的研究成果雖然具有參考性，但若仍在我國進行相關研究，將會更有價值。因此，雖然我國在研究人力、預算或硬體設施的完整度上，與美國相比多有所限制，相關單位未來仍值得投入更多經費，以 NIDA、BPRU 的經驗為例，培養更多相關研究人才、建立更完善的研究環境，以加強我國研究與政策轉譯量能，進而解決本土的問題。

### (二) 兼及藥癮處遇及研究人才培植，充實處遇人力

在醫療人員的訓練上，我國成癮學會業推動精神科醫師成癮治療專業能力的認證，未來或可再增加醫學生的臨床、研究交替訓練，以加強藥癮研究人才的培育。另外，因為藥物濫用對身體可能造成許多危害，在針對一般醫學生的訓練上，也應

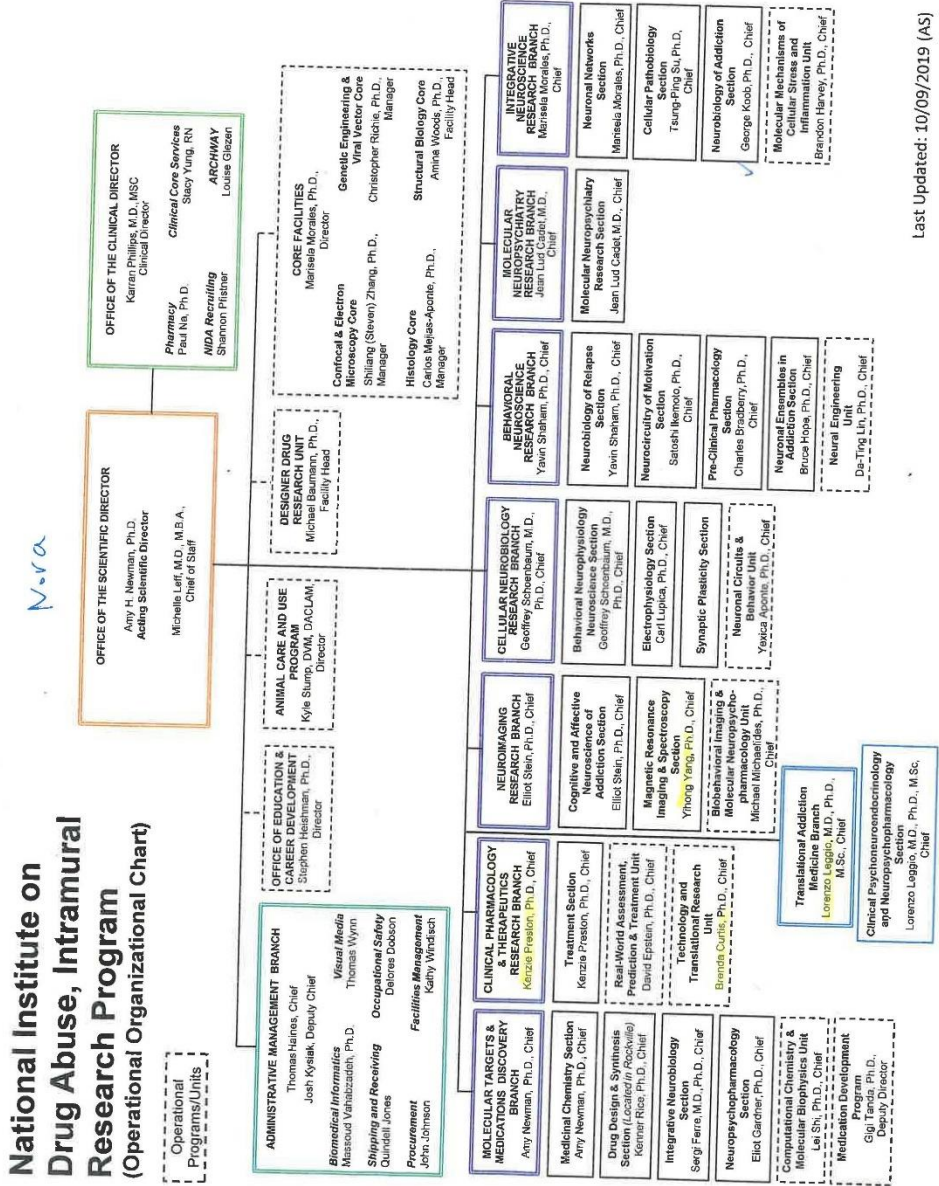
該將成癮是一種疾病的觀念納入到基礎課程當中，才能讓不同科別的醫師們在進行臨床工作時，注意到濫用藥物可能對患者的影響。參考本次的參訪經驗，本部擬於新世代反毒策略 2.0 深化「擴大藥癮治療及處遇人才培訓制度，充實處遇人力」行動方案，除持續深化各相關心理衛生領域人員藥癮識能教育訓練之辦理外，也期建立藥癮治療及處遇人員審認及督導制度，並與國家衛生研究院合作，培植藥癮政策轉譯及學術研究人才，俾利國內成癮醫學及處遇政策永續發展，並符國際趨勢與科學實證。

### **(三) 確立藥癮個案管理師之角色與專業，深化及優化社區個管服務追輔工作**

在社區實務部分，我國用以服務藥癮者之各地方政府毒品危害防制中心之個案管理師，其背景雖然多來自心理、社工、公衛等相關領域，但在就學過程中，他們大多沒有學習過太多藥物濫用防制相關的知識。在成為個管師之後，國內也未有針對藥物濫用防制所設計的教育訓練課程，以及相關的專業認證。缺乏對自己專業的認同感，加上工作繁重、與個案互動不易所帶來的挫折感，也致使國內個管師的流動率相當高。為了加強個管師在防制工作上的角色，相關單位應參考美國或其他國家的課程內容，積極發展本土化的個管師訓練課程，並給予專業能力認證，以吸引更多有興趣的人來投入，讓藥癮防制工作得以更有效地推動。

# 五、附件

## 附件 1、Operational Organizational Chart of NIDA Intramural Research Program





#### WHAT ARE NEW PSYCHOACTIVE SUBSTANCES?

New Psychoactive Substances (NPS), also known as 'synthetic drugs' or 'legal highs' are chemicals that are made to act in a similar way to drugs like cannabis, ecstasy, cocaine or methamphetamine.

They come in different forms including:

- Powders / pills.
- Synthetic cannabis (synthetic chemicals that have been added to herbal or plant material).

Although called 'new' some have been around for decades and are often sold as incense, bath salts, plant food or wrongly marketed as safer or legal alternatives to other drugs.

#### MISCONCEPTION ABOUT THEIR LEGAL STATUS

In attempts to stay ahead of, or get around the law, manufacturers have changed the molecular structure of NPS. NPS have been changed so often and new substances made that it is practically impossible to know what is in what you are taking.

Laws regarding NPS may be different depending on where you are in the world but even NPS bought from regulated licenced sources can be dangerous. Buying them from the internet or from unregulated sources can be very risky as even if it has 'legal' on the packet there is no guarantee what's in the packet is legal or safe.

For example, two products, each sold as synthetic cannabis may be completely different chemicals from each other and have nothing in common with cannabis or even the ingredients written on the packets.

NPS have been linked to deaths in the United Kingdom, Europe, America and Australia.

#### SIGNS OF OVERDOSE

The effects of NPS vary from substance to substance and so may signs of overdose.

Some signs of overdose can include:

##### Physical signs

- Rigid muscles / spasms
- Shaking / shivering
- Fever / overheating
- Nausea or vomiting
- Difficulty / stopped breathing
- Can't be woken up
- Seizure

##### Psychological signs

- Confusion or distress
- Paranoia, fear and panic
- Agitation and aggression

#### OVERDOSE RESPONSE

If you think someone has overdosed, please consider the following:

**Before you act**, check for dangers such as needles.

**Call an ambulance**, tell the operator your location, and stay on the line.

**If confused or panicking**, try to reassure them.

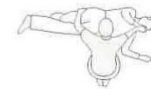
**Maintain calmness** in the area.

**If overheating**, try to cool them down by loosening outer clothing or putting a wet towel on the back of the neck or under their arms.

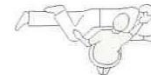
**If you can't get a response**, put them in the recovery position.

#### The Recovery Position

**Support face** Place the arm nearest to you at right angles to the body. Place their other hand against their cheek.



**Lift Leg** Get hold of the far leg just above the knee and pull it up, keeping the foot flat on the ground.




**Roll over** Keep their hand pressed against their cheek and pull on the upper leg to roll them towards you and onto their side.



#### WHAT NOT TO DO IN THE EVENT OF A SUSPECTED OVERDOSE

- Do **NOT** leave the person alone.
- Do **NOT** give the person anything to eat or drink, or try to induce vomiting.

TIME TO  
REMEMBER.  
TIME TO **ACT.**

 International Overdose Awareness Day

A Penington Institute Initiative

For more information visit  
[www.overdoseday.com](http://www.overdoseday.com)



## CALL 911

Call 911 to report an overdose - you won't be arrested! Maryland's Good Samaritan Law protects people assisting in an emergency overdose situation from being arrested or charged for:

- Possessing or using a controlled dangerous substance
- Possessing or using drug paraphernalia
- Providing alcohol to minors

The law also protects the overdose victim if you call 911 to help them. Your parole and probation status also will not be affected.

## MORE INFORMATION

**dontdie.org**  
Naloxone Education and Pharmacy List  
[www.20secondssaves.org](http://www.20secondssaves.org)  
Fentanyl and Naloxone Education  
**Crisis, Information and Referral Line**  
410-433-5175

**Baltimore Needle Exchange**  
See back page for times and locations.

## Naloxone is available at the BALTIMORE CITY NEEDLE EXCHANGE PROGRAM

**Monday 9:30 AM - 11:30 AM**  
Monroe & Ramsey; Fremont & Laurens

**Monday 12:45 PM - 3:30 PM**  
Fulton & Baker; Pontiac & 6th Ave.

**Monday 6:00 PM - 8:00 PM**  
Baltimore & Conkling (Highlandtown)

**Monday 8:30 PM - 10:00 PM**  
Milton & Monument

**Tuesday 9:30 AM - 11:30 AM**  
Montford & Biddle; Pratt & Carey

**Tuesday 12:45 PM - 3:30 PM**  
Fremont & Riggs; Barclay & 23rd

**Wednesday 9:30 AM - 11:30 AM**  
36th & Chestnut Ave. (St. Luke's Church, Hampden)

**Wednesday 6:00 PM - 8:00 PM**  
Baltimore & Conkling (Highlandtown)

**Wednesday 8:30 PM - 10:00 PM**  
Fremont & Laurens

**Thursday 9:30 AM - 11:30 AM**  
Pontiac & 9th Ave.

**Thursday 9:30 AM - 11:30 AM**  
Wallbrook & Dennison

**Thursday 12:45 PM - 3:30 PM**  
Monroe & Ramsey

**Thursday 12:45 PM - 3:30 PM**  
Milton & Monument

**Thursday 7:00 PM - 10:00 PM**  
Baltimore & Gay (The Block)

**Friday 9:30 AM - 11:30 AM**  
Park Heights & Spaulding; Greenmount & Preston

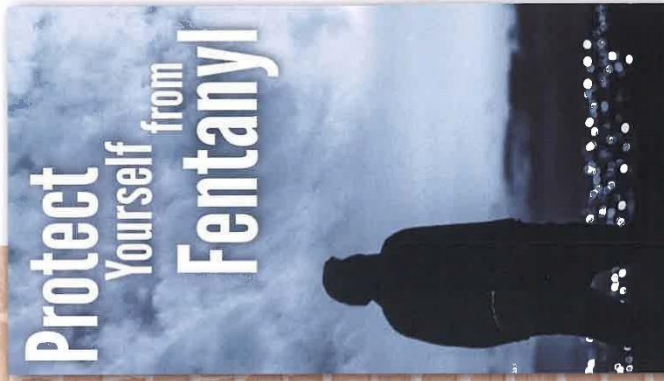
**Friday 12:45 PM - 3:30 PM**  
Fulton & Baker; Barclay & 23rd

**Friday 6:00 PM - 8:00 PM**  
Montford & Biddle

**Friday 8:30 PM - 10:00 PM**  
Monroe & Ramsey

**Saturday 12:00 PM - 4:00 PM**  
Fremont & Riggs

Needle Exchange will be closed on Baltimore City holidays.



GO SLOWLY.  
CARRY NALOXONE.  
DON'T USE ALONE.  
CALL 911.





## FENTANYL

Fentanyl is a drug that is 50-100 times stronger than heroin, so it only takes a tiny amount to cause an overdose. Fentanyl is now often added to heroin and other drugs, making them much more dangerous. Because of fentanyl, deaths from drug overdose have increased dramatically in the last few years.

Whether you know it or not, the heroin you use may contain fentanyl. To protect yourself from overdose, always go slowly, carry naloxone and don't use alone. If you are with someone who is overdosing, give them naloxone if possible, and don't run – call 911!

BALTIMORE 2016

2/3

OF ALL FATAL  
OVERDOSES IN  
BALTIMORE  
INVOLVED FENTANYL

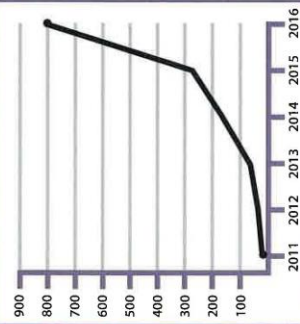


## GO SLOWLY

Look closely at the color and texture at drugs you are planning to use. If they seem different than normal, be extra careful and go slowly!

If you inject drugs, go slowly to make sure the drug isn't stronger than you expect. Do a test by injecting a small amount and waiting 20 seconds to see how strong it is. If it doesn't feel right, don't continue using it or take less than you normally would.

NUMBER OF FENTANYL-RELATED DEATHS IN BALTIMORE 2011-2016



## CARRY NALOXONE

Naloxone (also called Narcan) is a prescription medicine that can stop drug overdoses and save lives. Naloxone is safe and easy to use! If you use heroin or drugs like OxyContin or Percocet, you should learn how to use Naloxone and always carry it with you. The back page of this brochure lists Baltimore City Needle Exchange locations where naloxone is available.



## DON'T USE ALONE

Always use heroin and other drugs with someone else and take turns in case one of you overdoses and needs naloxone. Also, never share needles.



# 211

Maryland

## Need Help? Call 2-1-1

2-1-1 Maryland offers guidance and support to help teens, adults, families, seniors, veterans, caregivers, clergy and professionals find the services they need.

**Free, Confidential & Multi-Lingual  
Information and Referral 24/7 for:**



### **BASIC NEEDS**

Utility assistance, food, housing and shelter, transportation and employment



### **HEALTH CARE**

Health and dental clinics, drug and alcohol programs and mental health



### **FAMILY RESOURCES**

Child care, parenting programs, elder care and literacy



### **AND MORE...**





## Our Call Specialists Listen.

*We provide options and information to help you find the answers you need.*



**Call 2-1-1 or Text your zipcode to 898-211**

In some circumstances, 3 digit dialing does *not* work. If you are unable to connect with us by dialing 2-1-1 on your phone, please contact us at **info@211md.org**

*Normal airtime and other charges apply for cell users.*

# 211

Maryland



### Western Maryland

Mental Health Association of Frederick County  
866-411-6803

### Eastern Shore

Life Crisis Center, Inc.  
866-231-7101

### Southern Maryland and the Capital Region

Community Crisis Services, Inc.  
301-864-7161

### Central Maryland

2-1-1 Maryland United Way Helpline  
800-492-0618

[www.211md.org](http://www.211md.org)



## 附件 3、Syndemic 介紹

DR. PETER I. HARTSOCK  
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[peter.hartsock@nih.gov](mailto:peter.hartsock@nih.gov)

### APPLIED EPIDEMIOLOGY:

1. ACTIVELY SEARCHES FOR AND DETECTS NEW AND RETURNING PROBLEMS.
2. PLAYS A PRINCIPAL ROLE IN DEVELOPING INTERVENTIONS FOR THOSE PROBLEMS.
3. SERVES AS A KEY EVALUATOR OF THE PUBLIC HEALTH (E.G., MORBIDITY AND MORTALITY) IMPACT OF THOSE INTERVENTIONS.

### CURRENT MAJOR DRUG ABUSE CONCERNS IN THE U.S.:

1. GREATEST HEROIN EPIDEMIC IN HISTORY.
2. GREATEST PRESCRIPTION OPIOID MISUSE EPIDEMIC IN HISTORY.
3. GREATEST SYNTHETIC OPIOID EPIDEMIC IN HISTORY.  
[NOTE: OTHER DRUGS, E.G., COCAINE, METHAMPHETAMINE, ARE MAKING RESURGENCES AND THAT CAN ADD TO THE TROUBLE CAUSED BY OPIOIDS.]

### GREATEST “**SYNDEMIC**” OF ALL OF THESE EPIDEMICS IN HISTORY

THESE EPIDEMICS COMBINE, ALONG WITH OTHER PROBLEMS (E.G., OPIOID OVERDOSE, HIV, AND HCV—THE LATTER WHICH KILLS MORE AMERICANS THAN ALL OTHER INFECTIOUS DISEASES COMBINED) TO FORM **SYNDEMICS** WHERE THE SUM OF THE PARTS IS FAR GREATER THAN THE TOTAL. **SYNDEMICS** CAN AND WILL OVERWHELM HEALTH RESOURCES IF NOT CONFRONTED IN A CAREFUL MANNER WHERE INTERVENTIONS ARE CAREFULLY INTEGRATED TO HOPEFULLY CREATE POSITIVE SYNERGY.

DOING SO IS NOT AN EASY MATTER. WE HAVE A LARGE MODELING PROGRAM, ONE OF WHOSE GOALS IS TO MEASURE THE POWER OF **SYNDEMICS** AND ASSIST IN DEVELOPMENT OF INTERVENTIONS. **SYNDEMICS** ARE THE SHAPE OF THINGS TO COME AND WE MUST ACT NOW TO TRY TO HEAD THEM OFF BEFORE THEY OVERWHELM ALL HEALTH RESOURCES (SOMETHING WE’VE ALREADY SEEN IN DEVELOPING COUNTRIES) WE HAVE TO THINK AND WORK ON A MUCH HIGHER LEVEL THAN IN THE PAST.

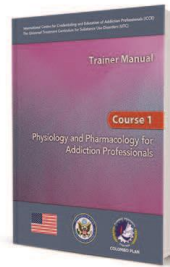
NOTE THAT SOME OF OUR MODELING USES EXTENSIVE AVAILABLE DATA. OTHER MODELING EFFORTS GO AFTER THE “BIG PICTURE” FOR WHICH THERE MAY OR MAY NOT BE EXTENSIVE DATA BUT FOR WHICH IMPORTANT INSIGHTS CAN BE GENERATED (SEE BRANDEAU COMMUNICATION WITH ASSISTANT SECRETARY FOR HEALTH).

- POST ARTICLE ON **SYNDEMICS**.
- BRANDEAU COMMUNICATION WITH ASSISTANT SECRETARY FOR HEALTH ON POLICY MODELING.
- BRANDEAU ARTICLE ON HBV AND CHINA.

## THE UNIVERSAL TREATMENT CURRICULUM (UTC)

The devastating consequences of drug addiction to society's health, welfare, and economic development know no limit; this disease strikes people of all ages, genders, education levels, socioeconomic statuses, and ethnic and national backgrounds. However, over the past 70 years our scientific understanding of the phenomenon of addiction has been nothing short of revolutionary. The scientific research, over 80 percent of which is conducted by the U.S. Government through the National Institute on Drug Abuse (NIDA), indicates that drug treatment and drug prevention work! Success rates at treating the disease are on par with other chronic and relapsing diseases like heart disease and diabetes. Unfortunately, however, in too many cases the scientific research is not being translated into practice. When addiction is misunderstood and non-evidence-based practices are used, treatment fails, clients and families lose hope in rehabilitation and recovery, communities lose confidence in treatment as a viable measure, and governments begin considering policy alternatives that undermine a public health approach.

Recognizing both the challenge - and the necessity - of translating science into practice, INL assembled a panel of curriculum developers who were researchers, university faculty, and practitioners to develop a training series to "unlock" the science into step-by-step



training modules. The resulting series, the *Universal Treatment Curriculum (UTC)*, cover basic and advanced practices for dedicated substance use treatment professionals. The UTC has gained recognition internationally as an up-to-date, comprehensive, definitive, and recognized set of educational materials on substance use treatment. During development and again once every three years, each course within the series undergoes an exhaustive peer-review process and is then reviewed and endorsed by an international expert panel to ensure the materials remain consistent with the latest research and best practices. INL partners with international organizations, governments, universities, and civil society to adapt the materials to country and regional contexts, translate to local languages, and disseminate to the workforce.

## PROGRAM AREA 01

UNIVERSAL TREATMENT CURRICULUM  
BASIC COURSES

The basic level UTC consists of a range of courses that cover the broad spectrum of treatment for substance use disorders. The content and methodology of the UTC training series is designed to ensure that addiction practitioners develop a balanced perspective of the principles relating to both the science and art of treatment. Each course is intended to enhance the knowledge, skills and competencies of treatment professionals, as well as promote evidence-based practice for the enhancement of service delivery and treatment outcomes.


**Course 1: Physiology and Pharmacology for Addiction Professionals**

20 training hours

This course presents a comprehensive overview of addiction; provides an understanding of the physiology of addiction as a brain disease; and describes the pharmacology of psychoactive substances.


**Course 2: Treatment for Substance Use Disorders—The Continuum of Care for Addiction Professionals**

33 training hours

This course provides the foundation for learning about substance use disorder treatment. It gives an overview of recovery and recovery management, stages of change, principles of effective treatment, components of treatment and evidence-based practices.


**Course 3: Common Co-occurring Mental and Medical Disorders - An Overview for Addiction Professionals**

20 training hours

This course offers an overview of the relationship between co-occurring mental and medical disorders and substance use disorder related treatment issues.


**Course 4: Basic Counselling Skills for Addiction Professionals**

33 training hours

This course focuses on an overview of the helping relationship and the opportunity to practice core counselling including basic skills in motivational interviewing, group counselling and implementation of psychoeducation sessions.


**Course 5: Screening, Intake, Assessment, Treatment Planning and Documentation for Addiction Professionals**

33 training hours

This course is a skills-based course that teaches effective and integrated intake, screening, assessment, treatment planning and documentation procedures to addiction professionals.


**Course 6: Case Management for Addiction Professionals**

13 training hours

This course provides a skill-based course that provides an overview of case management in substance use disorder treatment and provides skills practice in case management functions.



**Course 7: Crisis Intervention for Addiction Professionals**

13 training hours

This course addresses the concept of crisis as a part of life and provides guidelines for crisis intervention, including managing suicide risk. It also addresses ways counsellors can avoid personal crisis situations by providing information and exercises about counsellor self-care.



**Course 8: Ethics for Addiction Professionals**

26 training hours

This course focuses on professional conduct and ethical behavior in substance use disorder treatment. It also provides participants with the opportunity to learn and practice the use of an ethical decision making tool.

**UNIVERSAL TREATMENT CURRICULUM  
ADVANCED COURSES**

The advanced level UTC is a set of over fourteen courses which are reviewed on an ongoing basis to ensure that they reflect the latest science and evidence based approaches. These advanced offerings provide a more comprehensive and theoretical foundation in the clinical practice of substance use disorder treatment. It offers a specialized training provision that aims to provide an in-depth continuing education with skills-based activities to further enhance the capacity of the treatment workforce and standardize the quality of care and services they provide for their clients.



**Course 9: Pharmacology and Substance Use Disorders**

33 training hours

This course provides an overview of pharmacology through the identification of the classification of drugs into based on their effects on the central nervous system and addiction potential. It provides an understanding of the role of neurotransmitters in the development of addiction and the psychological implications on substance use disorders.



**Course 10: Managing Medication Assisted Treatment Programs**

33 training hours

This skills-based course is meant to provide an understanding of the importance of medication in substance use disorder treatment and it benefits when used in conjunction with psychosocial interventions.



**Course 11: Enhancing Motivational Interviewing Skills**

20 training hours

This course provides an in-depth understanding of the theory and application of Motivational Interviewing strategies and interventions for substance use disorder treatment.

## PROGRAM AREA 01

**Course 12: Cognitive Behavioral Therapy**

20 training hours

This course offers an overview of Cognitive Behavioral Therapy goals and techniques and its application to treatment of people with substance use disorders and comorbid disorders.

**Course 13: Contingency Management**

20 training hours

This foundation course provides an understanding of the theories and principles of reinforcement-based treatment with a specific focus on the Contingency Management (CM) approach. The course covers the use of behavioral interventions in the treatment of substance use disorders, and the basic components of CM and its application.

**Course 14: Working with Families**

33 training hours

This course provides a comprehensive overview for substance use disorder treatment practitioners working with families dealing with substance use disorders. The discussion covers the impact of substance use disorders on the family, its coping mechanisms, recovery issues and interventions that can be implemented.

**Course 15: Skills for Managing Co-Occurring Disorders**

20 training hours

This skills based course is meant to enhance understanding of co-occurring disorders, substance-related disorders, and mental disorders. It aims to develop skills to identify and provide interventions for people with substance use disorders and other co-occurring medical and mental disorders.

**Course 16: Advanced Clinical Skills and Crisis Management**

33 training hours

This skills based course is meant to enhance understanding of the theories of counseling and the application of its therapeutic techniques in substance use disorder treatment.

**Course 17: Case Management Skills and Practices**

33 training hours

This course is designed to provide the opportunity to enhance competency in case management through a better understanding of the important roles and skills of case managers.

**Course 18: Clinical Supervision for Substance Use Disorder Professionals**

33 training hours

This course provides an overview of the fundamentals, principles, models and methods of clinical supervision. This includes laying out the roles, functions, skills and competencies of clinical supervisors.

**Course 19: Enhancing Group Facilitation Skills**

20 training hours

This course provides practitioners with the knowledge and skills to effectively facilitate group counseling in SUD treatment settings by reviewing the concepts of building, leading and ending a group within a treatment setting.





**Course 20: Populations with Special Clinical Needs**

33 training hours

This course introduces knowledge and concepts important in the provision of treatment services and interventions for individuals with SUD and special clinical needs with an emphasis on the development of skills for use in practice.



**Course 21: Trauma-Informed Care for Adults**

26 training hours

This course presents substance use treatment practitioners with the skills to effectively address trauma in adults with SUD by enhancing the sensitivity and understanding required when dealing with trauma in a treatment setting.



**Course 22: Recovery Management and Relapse Prevention**

33 training hours

This course provides an understanding of the concepts of relapse and recovery by shifting the paradigm for treating substance use disorders from an acute to a chronic illness management model.



附件 5、操作制約之文獻

( Silverman, K., Holtyn, A.F. & Toegel, F. The Utility of Operant Conditioning to Address Poverty and Drug Addiction. *Perspect Behav Sci* 42, 525–546, 2019 )

Perspectives on Behavior Science (2019) 42:525–546  
<https://doi.org/10.1007/s40614-019-00203-4>



SPECIAL ISSUE ON ADDICTIONS



## The Utility of Operant Conditioning to Address Poverty and Drug Addiction

Kenneth Silverman<sup>1</sup> · August F. Holtyn<sup>1</sup> · Forrest Toegel<sup>1</sup>

Published online: 5 June 2019  
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### Abstract

Poverty is associated with poor health. This article reviews research on proximal and distal operant interventions to address drug addiction and poverty. Proximal interventions promote health behaviors directly. Abstinence reinforcement, a common proximal intervention for the treatment of drug addiction, can be effective. Manipulating familiar parameters of operant conditioning can improve the effectiveness of abstinence reinforcement. Increasing reinforcement magnitude can increase the proportion of individuals that respond to abstinence reinforcement, arranging long-term exposure to abstinence reinforcement can prevent relapse, and arranging abstinence reinforcement sequentially across drugs can promote abstinence from multiple drugs. Distal interventions reduce risk factors that underlie poor health and may have an indirect beneficial effect on health. In the case of poverty, distal interventions seek to move people out of poverty. The therapeutic workplace includes both proximal and distal interventions to treat drug addiction and poverty. In the therapeutic workplace, participants earn stipends or wages to work. The therapeutic workplace uses employment-based reinforcement in which participants are required to provide drug-free urine samples or take scheduled doses of addiction medications to work and/or maintain maximum pay. The therapeutic workplace has two phases, a training and an employment phase. Special contingencies appear required to promote skill development during the training phase, employment-based reinforcement can promote abstinence from heroin and cocaine and adherence to naltrexone, and the therapeutic workplace can increase employment. Behavior analysts are well-suited to address both poverty and drug addiction using operant interventions like the therapeutic workplace.

**Keywords** Poverty · Incentives · Operant conditioning · Employment · Therapeutic workplace · Drug addiction

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## **The Utility of Operant Conditioning to Address Poverty and Drug Addiction**

Over 40 million people in the United States, more than 12% of the population, live in poverty (Semega, Fontenot, & Kollar, 2017) and are at increased risk of poor health (Silverman, Holtyn, & Jarvis, 2016a). Relative to the general population, people who live in poverty have higher rates of a variety of health problems including obesity (Drewnowski & Specter, 2004), cigarette smoking (Hiscock, Bauld, Amos, Fidler, & Munafo, 2012), injection drug use (Armstrong, 2007), heart failure (Hawkins, Jhund, McMurray, & Capewell, 2012), stroke (Addo et al., 2012), cancer (Ward et al., 2004), HIV (Oldenburg, Perez-Brumer, & Reischer, 2014), and death (Chetty et al., 2016; Muehlig, Fiscella, Tancredi, & Franks, 2010). We might address poverty-related health disparities in two ways (Silverman, Holtyn et al., 2016a): 1) proximal interventions that directly promote health behaviors in low-income populations, and 2) distal anti-poverty interventions that move people out of poverty. Proximal interventions promote health behaviors directly. Abstinence reinforcement, in which patients receive some kind of desirable consequence for providing objective evidence of drug abstinence (e.g., drug-free urine samples), is a common proximal intervention for the treatment of drug addiction. Distal interventions reduce risk factors that underlie poor health and may have an indirect beneficial effect on health. Poverty is a risk factor for poor health. In the case of poverty, distal interventions seek to move people out of poverty. We will review selective research that we have conducted on proximal and distal operant interventions to address heroin and cocaine use in adults who live in poverty. The research that we review illustrates principles that should apply to the treatment of other drug problems and to a variety of health conditions.

### **Heroin and Cocaine Use in Low-Income Populations**

Heroin and cocaine use are concentrated among people who live in poverty. At the broadest level, data from the *2017 National Survey on Drug Use and Health* (Center for Behavioral Health Statistics & Quality, 2018) show that use of cocaine and opioids in the United States is highest among people who live in poverty and decreases as income level increases. Injection drug use (Armstrong, 2007) increases as the poverty level increases; opioid overdoses (Rosenthal, Bol, & Gabello, 2016) and heroin and cocaine use (Williams & Latkin, 2007) are concentrated in neighborhoods with the highest rates of poverty. Unemployment is concentrated among people who use illicit drugs (Henkel, 2011), but interventions to promote employment in illicit drug users have had limited success (Magura, Staines, Blankertz, & Madison, 2004; Svikis et al., 2012).

### **Proximal Interventions to Promote Heroin and Cocaine Abstinence**

#### **Abstinence Reinforcement**

The principles of operant conditioning have been applied to the treatment of drug addiction in a variety of ways, but they have been applied most effectively in

procedures that arrange for the relatively direct reinforcement of drug abstinence. Abstinence reinforcement interventions are rooted in basic principles of operant conditioning (Silverman, DeFulio, & Everly, 2011a). Under abstinence reinforcement procedures, patients receive some kind of desirable consequence for providing objective evidence of drug abstinence (Bigelow, Stitzer, Griffiths, & Liebson, 1981). One abstinence reinforcement intervention that has shown considerable effectiveness is the voucher-based abstinence reinforcement intervention (Higgins et al., 1991). Under that intervention, patients received monetary vouchers for providing cocaine-free urine samples. Several meta-analyses and reviews suggest that the monetary-based abstinence reinforcement interventions are among the most effective psychosocial treatments for drug addiction (Benishek et al., 2014; Davis et al., 2016; Dutra et al., 2008; Lussier, Heil, Mongeon, Badger, & Higgins, 2006; Pilling, Strang, Gerada, & NICE, 2007; Silverman, Kaminski, Higgins, and Brady, 2011b).

**Effectiveness of voucher-based abstinence reinforcement** The effectiveness of voucher-based abstinence reinforcement is illustrated by a study with methadone patients who injected drugs and continued to use cocaine during methadone treatment (Silverman, Higgins, Brooner, Montoya, Cone, Schuster, and Preston, 1996b). After a 5-week baseline period, participants in that study were randomly assigned to an abstinence reinforcement group or to a yoked control group. Participants in the abstinence reinforcement group could earn up to \$1,155 in vouchers for providing cocaine-free urine samples every Monday, Wednesday, and Friday for 12 weeks. The value of the vouchers increased as the number of consecutive cocaine-free urine samples increased. If a participant ever provided a cocaine-positive urine sample or failed to provide a scheduled sample, the participant did not receive a voucher and the value of the next voucher earned was reset to the initial low value. Control participants received vouchers on a noncontingent basis, yoked in pattern and amount to vouchers received by participants in the abstinence reinforcement group. The voucher-based abstinence reinforcement intervention significantly increased the longest duration of cocaine abstinence that participants achieved during the 12-week period in which the voucher intervention was in effect. Half of the participants in the abstinence reinforcement group achieved between 7 and 12 weeks of sustained cocaine abstinence, but only one participant in the control group achieved more than 2 weeks of sustained abstinence. This study showed clearly that the voucher-based abstinence reinforcement intervention was effective in promoting cocaine abstinence in about half of the participants.

Other studies have shown that voucher-based abstinence reinforcement interventions can promote abstinence from opiates (Robles, Stitzer, Strain, Bigelow, & Silverman, 2002; Silverman, Wong, Higgins, Brooner, Montoya, Contoreggi, et al., 1996c) and cocaine (Robles et al., 2000; Silverman et al., 1998; Silverman, Robles, Mudric, Bigelow, & Stitzer, 2004) among injection drug users enrolled in methadone treatment, as well as in other populations (Benishek et al., 2014; Castells et al., 2009; Davis et al., 2016; Silverman et al., 2011b).

Some studies show that reinforcing abstinence from cocaine increases abstinence from both cocaine and opiates (Silverman et al., 1998; Silverman et al., 2004) and that reinforcing abstinence from opiates increases abstinence from both opiates and cocaine (Robles et al., 2002). Although we do not always see the indirect beneficial effect on

drugs that are not directly targeted by the reinforcement contingency, we have not seen an increase or substitution of drug use not targeted by the abstinence reinforcement contingency.

**Parameters of abstinence-reinforcement interventions** Not all participants respond to abstinence-reinforcement interventions (Silverman et al., 2011b). The study by Silverman, Higgins et al., 1996b) described above provides a good illustration of this point. About half of the participants in that study appeared unresponsive to the intervention, and their results looked similar to the results of the control participants. The effectiveness of reinforcement in initiating drug abstinence depends largely on familiar parameters of reinforcement that are critical to the effectiveness of any reinforcement contingency like magnitude and delay of reinforcement (Davis et al., 2016; Lussier et al., 2006). We know most about reinforcement magnitude and it is clear that the effectiveness of abstinence reinforcement interventions increases as the magnitude increases (Dallery, Silverman, Chutuape, Bigelow, & Stitzer, 2001; Higgins et al., 2007; Silverman, Chutuape, Bigelow, & Stitzer, 1999; Stitzer & Bigelow, 1984).

The effects of increasing the magnitude of abstinence reinforcement are illustrated in a study that focused on a group of treatment-refractory injection drug users who continued to use cocaine during methadone treatment (Silverman et al., 1999). After a 5-week baseline period, participants in that study were exposed to a 12-week voucher intervention in which they could earn up to \$1,155 in vouchers over the 12-week period for providing cocaine-free urine samples similar to the study described above. This study only included individuals who failed to initiate sustained cocaine abstinence when exposed to the voucher intervention. During the baseline period, those participants provided very low rates of cocaine-negative urine samples and they continued to provide very low rates of cocaine-negative urine samples throughout the 12-week voucher period.

Using a within-subject crossover design, participants were then exposed to a zero-, low-, and high-magnitude voucher intervention in counterbalanced order. During the zero-magnitude condition participants received vouchers that had no monetary value; during the low-magnitude condition, they could earn up to \$380 in vouchers for providing cocaine-free urine samples; and during the high-magnitude condition they could earn up to \$3,400 in vouchers for providing cocaine-free urine samples. Each condition was in effect for 9 weeks and followed by a 4-week washout period. The high-magnitude condition was effective in increasing cocaine abstinence: significantly more urine samples provided by participants were cocaine negative in the high-magnitude condition (46%) than in the zero- (8%) and low- (14%) magnitude conditions.

**Preventing relapse after abstinence reinforcement ends** As with other substance abuse treatments (McLellan, Lewis, O'Brien, & Kleber, 2000), we have known for years that many patients relapse to drug use after the abstinence-reinforcement contingencies are discontinued (Heil et al., 2008; Miller, Hersen, Eisler, & Watts, 1974; Shoptaw et al., 2002; Silverman, Wong et al., 1996; Silverman, Higgins et al., 1996b; Silverman et al., 1998; Silverman et al., 1999; Stitzer & Bigelow, 1982). The propensity to relapse after an abstinence-reinforcement intervention is illustrated in the study described above (Silverman et al., 1999). That study used a within-subject, crossover design, which was only possible because participants relapsed to cocaine use during the 4-week washout periods that followed each 9-week abstinence reinforcement condition.

Although it would be ideal if we could apply a treatment for drug addiction that has irreversible effects, that may not be possible. The treatment for drug addiction appears similar to many medical conditions that return after treatment is discontinued (McLellan et al., 2000). Methadone treatment is an excellent example. Methadone is a highly effective treatment for opioid addiction, but relapse to opioid use is common when the methadone dose is gradually reduced (Sees et al., 2000).

Different approaches have been used to prevent relapse after an abstinence reinforcement intervention is discontinued, including combining abstinence reinforcement with different counseling approaches like cognitive behavior relapse prevention therapy, but none of the approaches have been effective (Silverman, Kaminski et al., 2011b). We expect that the best way to prevent partial or full relapse to drug use is to use abstinence reinforcement as a maintenance intervention (Silverman et al., 2002).

We conducted a study to see if we could maintain cocaine abstinence in methadone patients by maintaining the abstinence reinforcement intervention over an extended period of time. The key feature of this study is that we maintained the voucher-based abstinence reinforcement intervention for a full year. Injection drug users enrolled in methadone treatment who continued to use cocaine during the first 10 weeks of methadone treatment were randomly assigned to a Usual Care Control group, a Take-Home Only group, or a Take-Home & Voucher group. Urine samples were collected and tested for opiates and cocaine every Monday, Wednesday, and Friday. Both Take-Home groups earned take-home methadone doses (i.e., if a participant received a take-home methadone dose, that participant did not have to attend the methadone clinic to receive the next daily methadone dose) for providing urine samples negative for both opiates and cocaine. The Take-Home & Voucher group also earned monetary vouchers for providing cocaine-free urine samples over the entire year. In total, they could earn up to about \$5,800 in vouchers over the year. Cocaine abstinence in this group was significantly higher than the other two groups, and that effect was maintained throughout the year-long study. The potential to use abstinence reinforcement as a maintenance intervention was also demonstrated by Kirby et al. (2013), who randomly assigned cocaine-dependent adults in methadone treatment to a standard or extended duration of voucher-based abstinence reinforcement.

### **Distal Interventions to Reduce Poverty**

Research examining the utility of operant conditioning in moving people out of poverty has been limited. Two types of research have been conducted in this area: Large-scale anti-poverty interventions that use incentives to increase education and employment in low-income adults (Holtyn, Jarvis, & Silverman, 2017); and the systematic application of incentives to promote skill development in unemployed adults with long histories of drug addiction (Silverman, Holtyn, and Subramaniam, 2018).

#### **The Use of Incentives in Large-Scale Anti-Poverty Interventions**

Large-scale anti-poverty programs were introduced in the United States in the 1960s, but had only minimal effects on poverty (Bitler & Karoly, 2015). In the 1990s, various

governments in the United States evaluated the role of financial incentives in large-scale anti-poverty programs to promote education and employment in welfare populations (Berlin, 2007; Holtyn et al., 2017). Although some incentive programs increased participation in educational programs or increased employment, they did not consistently promote employment or increase earnings.

Opportunity NYC provides a good example of a large-scale anti-poverty program that employed incentives (Riccio et al., 2013). Under that program, 4,800 families living in high-poverty areas in New York City were randomly assigned to a Family Rewards group or to a Control group. Families in the Family Rewards group could earn financial incentives over 3 years for meeting educational objectives for the children, attending health-care visits, and meeting employment-related goals for the parents. Parents could earn \$300 every 2 months if they worked at least 30 hours per week for 6 out of 8 weeks. Parents could also earn up to \$600 every 2 months if they completed an approved education or job-skills training course and maintained at least 10 hours per week of employment. The Family Rewards program had no effect on parental employment or employment earnings.

In general, the incentive programs used delayed, infrequent, and small reinforcement; they required a substantial amount of responding for reinforcement; they did not ensure that participants possessed the prerequisite skills needed to earn reinforcement; and the incentive systems were not adequately explained to participants (Holtyn et al., 2017). “The incentive-based, antipoverty programs had small or no effects on the target behaviors; they were implemented on large scales from the outset, without systematic development and evaluation of their components; and they did not apply principles of operant conditioning that have been shown to determine the effectiveness of incentive or reinforcement interventions” (Holtyn et al., 2017, p. 9). Although these incentive programs had many inadequacies, they did demonstrate the willingness and capacity of governments to incorporate incentives into their welfare programs (Holtyn et al., 2017).

#### **Systematic Investigations of Incentives for Skill Development in Low-Income Adults**

We have been developing and evaluating an employment-based intervention called “the therapeutic workplace,” which has provided an opportunity to conduct systematic studies on the use of incentives to develop skills that people need for employment (Silverman et al., 2018). In the therapeutic workplace, unemployed adults with histories of drug addiction are hired and paid to work. To promote abstinence, employment-based reinforcement is arranged in which participants are required to provide drug-free urine samples or take addiction-treatment medications to work and/or earn maximum pay. Because we have been treating adults who often have few job skills, the therapeutic workplace is divided into two phases through which participants progress sequentially. In Phase 1, each participant’s job is to engage in job skills training to prepare for employment. In Phase 2, participants perform real jobs. Research on Phase 1 of the therapeutic workplace has allowed us to conduct systematic research on the use of incentives to promote the development of skills in unemployed adults, most of whom live in poverty. That research has been reviewed previously (Silverman et al., 2018), but will be discussed briefly here.

Employment interventions for low-income adults and other unemployed populations follow two broad approaches: quick-entry or education-focused. Quick-entry

approaches seek to promote employment immediately. Education-focused interventions seek to develop skills that participants need to obtain gainful employment, in particular to obtain jobs that pay higher wages. We do not know whether education-focused or quick-entry approaches would better alleviate poverty in unemployed adults with histories of drug addiction, but many unemployed drug users lack the educational credentials and skills needed to obtain higher paying jobs. One analysis examined the reading, math, and spelling skills of 559 participants in six therapeutic workplace studies (Holtyn, DeFulio, & Silverman, 2015). Only a little more than half of these participants completed high school or had a GED. On average, participants read at between 6<sup>th</sup> and 7<sup>th</sup> grade levels, and some participants had very limited reading skills. Their math and spelling skills were similar. To the extent that basic academic skills are important for obtaining and maintaining employment, these data show that many unemployed drug users lack these skills. Other research suggests that therapeutic workplace participants also lack computer knowledge and skills (Sigurdsson, Ring, O'Reilly, & Silverman, 2012).

**Attendance in training depends on stipends** Our data in the therapeutic workplace shows that many unemployed adults with long histories of drug addiction will attend paid training at high rates. In one analysis (Silverman et al., 2018), 169 therapeutic workplace participants from six different studies who could work and earn maximum pay independent of urinalysis or medication adherence attended the therapeutic workplace at relatively high rates. Across all studies, half of the participants attended about 70% or more of the days. Although that analysis showed that therapeutic workplace participants will attend training reliably, two studies suggest that they will do so only when they are paid for attendance (Koffarnus, Wong, Fingerhood, Svikis, Bigelow, and Silverman, 2013b; Silverman, Chutuape et al., 1996a). In one study (Koffarnus et al., 2011; Koffarnus, Koffarnus, Wong et al., 2013b), homeless adults with histories of alcohol addiction were randomly assigned to one of three groups. Two of the groups are most relevant to the current analysis. One group could work in the therapeutic-workplace training program and earn stipends for attendance and performance on the training programs independent of alcohol use. A second group could work in the therapeutic-workplace training program, but participants in that group did not earn stipends. Participants who earned stipends attended significantly more and progressed significantly farther in the training program than participants who could not earn training stipends.

**Training performance depends on stipends** Another study showed that participants would attend therapeutic-workplace training reliably when they can earn stipends for attendance, but most participants work on training programs substantially more when they can earn productivity pay for their performance on training programs than when they do not earn productivity pay (Koffarnus, DeFulio, Sigurdsson, and Silverman, 2013a). In that study, participants worked on two keyboarding programs: one focused on teaching participants to type alphanumeric keys using the standard QWERTY keyboard and the other program taught participants to type numeric keys on the number pad. Participants earned a base pay hourly wage while working on both programs. Some participants earned productivity pay for typing performance on the program that taught the standard QWERTY keyboard, but they only earned base pay when working



on the program that taught participants to type numeric keys using the number pad. Other participants earned productivity pay for performance on the number pad program and base pay only while working on the standard QWERTY keyboard program. Total hourly pay was almost identical across programs. Participants worked significantly more and completed more training steps when they could earn stipends for training performance than when they only earned base pay. Another study replicated those results (Subramaniam, Everly, & Silverman, 2017).

**Stipend-supported computer-based training** These studies show that many of the unemployed adults with long histories of drug addiction that we have served in the therapeutic workplace lack basic academic skills and credentials (e.g., high school diploma or GED). Many participants will attend the therapeutic workplace and progress on training programs, but primarily when they can earn training stipends. Many participants will work and progress on training programs most when some of the training stipends are provided for work on the training programs. These studies suggest that many unemployed adults with histories of drug addiction will work consistently on training programs when at least some incentives are offered for training-program performance. The data on the skill level of participants (Holtyn et al., 2015; Sigurdsson et al., 2012) suggests that these participants may require training on a wide range of skills. Computer-based training may be the most effective and efficient way to provide extensive training to this population. To provide computer-based training with performance incentives, we developed a computer-based training authoring and course presentation system that we have called ATTAIN. The software could be used to teach a wide range of skills. We have used ATTAIN to teach HIV treatment and prevention skills (Getty et al., 2018; Subramaniam et al., 2019), but we hope to use this or similar software to teach a wide range of skills that participants need to become employed using principles we have learned in our prior studies.

### **The Therapeutic Workplace: An Operant Intervention to Promote Drug Abstinence and Reduce Poverty**

The therapeutic workplace was designed to treat poor, unemployed adults with long histories of drug addiction (Silverman, 2004). In addition to potentially serving as an anti-poverty intervention, the therapeutic workplace arranges employment-based reinforcement to promote drug abstinence and adherence to addiction medications. Most of the research we have conducted on the therapeutic workplace has focused on using employment-based reinforcement to promote and maintain abstinence and medication adherence (Silverman et al., 2012).

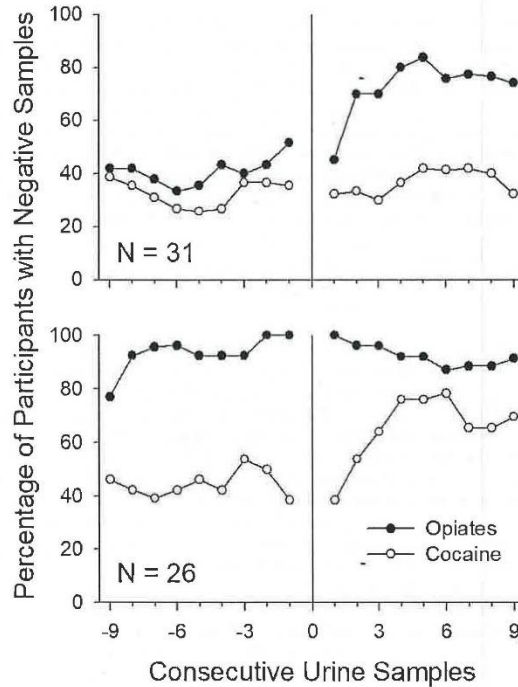
#### **Drug Abstinence**

The therapeutic workplace arranges employment-based reinforcement by requiring that participants provide drug-free urine samples to work and/or maintain maximum pay. Employment-based reinforcement in the therapeutic workplace has been effective in promoting (Silverman, Svikis, Robles, Stitzer, & Bigelow, 2001) and maintaining

(Aklin et al., 2014; Silverman et al., 2002) abstinence from opiates and cocaine among pregnant and postpartum women; promoting abstinence from cocaine in injection drug users enrolled in methadone treatment (Silverman et al., 2007); promoting (Donlin, Knealing, Needham, Wong, & Silverman, 2008) and maintaining (DeFulio, Donlin, Wong, & Silverman, 2009) cocaine abstinence among welfare recipients enrolled in methadone treatment; promoting opiate and cocaine abstinence among out-of-treatment injection drug users (Holtyn, Koffarnus, DeFulio, Sigurdsson, Strain, Schwartz, and Silverman, 2014b; Holtyn, Koffarnus, DeFulio, Sigurdsson, Strain, Schwartz, et al., 2014a); and promoting abstinence from alcohol among homeless, alcohol-dependent adults (Koffarnus et al., 2011). In addition to showing that the therapeutic workplace and employment-based reinforcement can promote drug abstinence, some of these studies have shown that employment alone is not sufficient to promote abstinence: the employment-based abstinence reinforcement contingency is needed (e.g., DeFulio et al., 2009; Silverman et al., 2007).

**Initiating drug abstinence** A study of unemployed, out-of-treatment, opioid-dependent injection drug users provides a good example of the potential of employment-based reinforcement in the therapeutic workplace to promote abstinence among people living in poverty (Holtyn et al., 2014a, b). Participants in that study were invited to attend the therapeutic workplace and referred to methadone treatment. After 4 weeks in the therapeutic workplace, participants were invited to attend the workplace for 26 weeks where they could work and earn stipends for 4 hours every weekday. After 4 weeks, participants were randomly assigned to a Usual Care Control group, a Methadone Reinforcement group, or a Methadone and Abstinence Reinforcement group. Methadone Reinforcement and Methadone and Abstinence Reinforcement participants were required to enroll and remain in methadone treatment to continue attending the therapeutic workplace and to maintain maximum pay. Methadone and Abstinence Reinforcement participants were also required to provide urine samples negative for opiates and cocaine to maintain maximum pay. Methadone and Abstinence Reinforcement participants were exposed to the abstinence requirements sequentially. At first, participants were only required to enroll and continue in methadone treatment to work and maintain maximum pay. After a participant was enrolled in methadone treatment for 3 weeks, that participant was required to provide opiate-negative urine samples to maintain maximum pay. After that participant provided opiate-negative urine samples for 3 consecutive weeks, that participant was required to provide urine samples negative for opiates and cocaine to maintain maximum pay.

Almost all participants in that study (98%) lived in poverty. Figure 1 shows the percentage of urine samples negative for opiates (solid points) and cocaine (open points) for participants in the Methadone and Abstinence Reinforcement group for the nine urine samples before and after the onset of the opiate (top) and cocaine (bottom) employment-based abstinence-reinforcement contingencies. This figure shows clearly that participants maintained stable rates of opiate-negative urine samples prior to the onset of the opiate abstinence reinforcement contingency, but the rates of opiate-negative urine samples increased abruptly after the onset of that contingency. Likewise, participants maintained stable rates of cocaine-negative urine samples prior to the onset of the cocaine abstinence reinforcement contingency, but the rates of cocaine-negative urine samples increased abruptly after the onset of that contingency.



**Fig. 1** The percentage of urine samples negative for opiates (filled circles) and cocaine (unfilled circles) relative to the onset of the opiate (top graph) and cocaine (bottom graph) contingency. Urinalysis results for the nine samples prior to and the nine samples following the onset of the contingency (represented at the 0 point on the x-axis) are shown. All missing values were coded as positive. From "Employment-Based Abstinence Reinforcement Promotes Opiate and Cocaine Abstinence in Out-of-Treatment Injection Drug Users" by A. F. Holtn et al., 2014b, *Journal of Applied Behavior Analysis*, 47, 689. Copyright by Society for the Experimental Analysis of Behavior. Reprinted with permission

**Maintaining drug abstinence** Another study illustrates both the potential and limitations of employment-based reinforcement in the therapeutic workplace to address the long-term problem of drug addiction (DeFulio et al., 2009; DeFulio & Silverman, 2011; Donlin et al., 2008). In that study, unemployed adults who used cocaine, were receiving welfare benefits, and were enrolled in methadone treatment were invited to attend Phase 1 of the therapeutic workplace for 6 months. After an induction period, participants were required to provide urine samples negative for drugs (cocaine and opiates) to gain access to the workplace and maintain maximum pay. Participants who achieved

drug abstinence, attended the workplace, and acquired a minimal level of skills were invited to work in our simulated data-entry business (Phase 2) for 1 year and were randomly assigned to an abstinence-contingent employment group or an employment-only group. All participants could work 6 hours every weekday, earned money based on the hours attended and on data-entry performance, and were paid with standard paychecks every 2 weeks. Urine samples were collected from both groups every Monday, Wednesday, and Friday. Employment-only participants could work independent of urinalysis results; abstinence-contingent-employment participants had to provide drug-negative urine samples to work and to maintain maximum pay. The frequency of required drug-testing gradually decreased across the year for participants in the abstinence-contingent employment group as long as they continued to provide drug-negative urine samples and for employment only participants independent of attendance and urinalysis results.

Figure 2 shows cocaine urinalysis results for participants in the two groups before, during, and after participation in the therapeutic workplace (DeFulio & Silverman, 2011). Cocaine abstinence was very low at intake to the study. At the end of Phase 1, 6 months after enrollment, most participants in both groups were abstinent from cocaine. Participants in the two groups worked in the therapeutic workplace at comparable rates during the year in Phase 2, but the abstinence-contingent employment group provided significantly more cocaine-negative urine samples than participants in the employment-only group during the year of employment in the therapeutic workplace business (DeFulio et al., 2009; DeFulio & Silverman, 2011). At the 24- and 30-month assessments conducted after the end of employment in the therapeutic workplace, the two groups provided similar rates of cocaine-negative urine samples (DeFulio & Silverman, 2011). The study showed that employment-based abstinence reinforcement was effective at initiating (Donlin et al., 2008) and maintaining (DeFulio et al., 2009) cocaine abstinence among study participants for as long as a year; however, the effects of

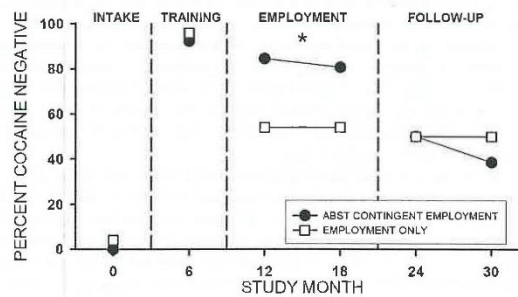


Fig. 2 Percent of cocaine-negative samples collected at intake (Study Month 0), the end of the abstinence initiation and training phase (Study Month 6), during employment (Study Months 12 and 18), and at posttreatment follow-up (Study Months 24 and 30). Missing samples were counted as positive. The asterisk indicates that the groups are significantly different ( $p < .05$ ) based on GEE analysis. From "Employment-Based Abstinence Reinforcement as a Maintenance Intervention for the Treatment of Cocaine Dependence: Post-Intervention Outcomes" by A. DeFulio and Silverman, 2011, *Addiction*. © 2011 The Authors, *Addiction* © 2011 Society for the Study of Addiction. Reprinted with permission

employment-based abstinence reinforcement were not maintained and participants relapsed to cocaine use in the year after the employment-based abstinence-reinforcement contingencies were discontinued (DeFulio & Silverman, 2011).

### Medication Adherence

Naltrexone is an opioid antagonist that could be an effective medication treatment for opioid addiction, but few opioid-dependent adults will take it. A few studies have shown that employment-based reinforcement in the therapeutic workplace can promote adherence to naltrexone in opioid-dependent adults (DeFulio et al., 2012; Dunn et al., 2013; Everly et al., 2011). In those studies, opioid-dependent adults who completed an opioid-detoxification program and were inducted onto oral naltrexone were randomly assigned to a Contingency or Prescription group. Contingency participants were required to take scheduled doses of naltrexone to work and earn wages; Prescription participants were offered naltrexone, but not required to take scheduled doses of naltrexone to work. Those studies showed employment-based reinforcement was effective in promoting adherence to oral (Dunn et al., 2013) and extended-release injectable (DeFulio et al., 2012; Everly et al., 2011) naltrexone. Those studies also showed that many participants continued to use opiates even under naltrexone blockade, in particular when they were also using cocaine.

### Medication Adherence and Drug Abstinence

We conducted another study to determine if we could eliminate opiate use by combining naltrexone and opiate-abstinence reinforcement (Jarvis et al., 2019) using an extended-release formulation of naltrexone that was approved by the FDA for the treatment of opioid dependence (extended-release naltrexone; XR-NTX). In this study, participants completed an opioid-detoxification program and then began taking oral naltrexone. After taking the maintenance dose of oral naltrexone for a week, participants were randomly assigned to four groups. All groups were invited to attend the workplace for 24 weeks. The groups differed as to whether participants received extended-release naltrexone, opiate-abstinence reinforcement, both, or neither. Participants who were offered extended-release naltrexone were required to take scheduled doses to work and maintain maximum pay.

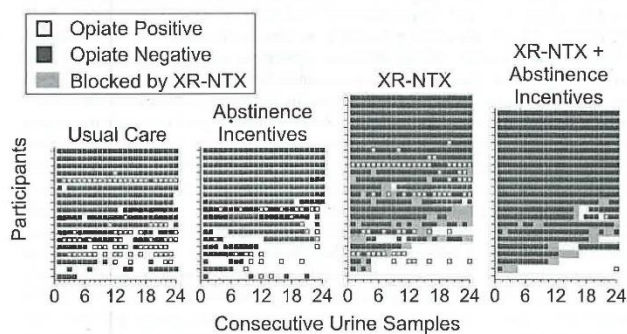
Figure 3 shows the weekly opiate-urinalysis results for participants in this study. The four panels represent the four groups. Within each panel, each row represents data for a different participant. The 24 boxes within each row represent the 24 consecutive weekly urine samples. Each black box shows an opiate-negative urine sample for a given week. Each orange box shows an opiate-positive urine sample for a given week. The grey shaded areas show when participants were under blockade by extended-release naltrexone. The analyses showed that neither opiate-abstinence reinforcement alone nor extended-release naltrexone alone increased the percentage of opiate-negative urine samples compared to the Usual Care Control group. However, opiate-abstinence reinforcement and extended-release naltrexone combined increased opiate abstinence compared to each of the other three groups. Extended-release naltrexone plus opiate-abstinence reinforcement almost eliminated opiate use, at least while participants were

still attending the workplace. Participants in this group only provided two urine samples that were positive for opiates (far right panel in Figure 3).

**Promoting Drug Abstinence and Employment**

We have developed models to promote employment and maintain employment-based abstinence reinforcement over time (Silverman, Hollyn et al., 2016b). In all of these models, we expect that participants would be enrolled in Phase 1 first and then progress to Phase 2. We have examined the Social Business Model and we are in the process of examining the Wage Supplement Model. Under the Social Business Model, people in Phase 2 could be hired into a social business, which is a business that exists to address the needs of people who live in poverty. Under this model, Phase 1 graduates are hired in a social business and required to provide drug-free urine samples to maintain their access to the workplace and to maintain maximum pay. Under the Wage Supplement Model, graduates of Phase 1 of the therapeutic workplace are offered abstinence-contingent wage supplements if they obtain and maintain competitive employment in a community business.

**The Social Business Model** The therapeutic workplace could be created around different types of jobs and businesses. Our initial therapeutic workplace was designed to train and employ participants as data entry operators. To study Phase 2 of the intervention, we established a real data-entry social business called Hopkins Data Services. We evaluated the social business model in a long-term study of pregnant and postpartum women from the Center for Addiction and Pregnancy who were in methadone treatment but continuing to use



**Fig. 3** Within each panel, rows of data represent an individual participant. Urinalysis results were determined a priori to be from the 24 once-weekly assessments completed during the intervention period. Urine samples were considered blocked by extended-release naltrexone (XR-NTX) if they were collected within 31 days of receiving XR-NTX. Empty squares represent missed assessments. Data are arranged within each panel from top to bottom (highest to lowest) first by collection rates and then by rates of opiate abstinence. Abbreviation: XR-NTX, extended-release injectable naltrexone. From “The Effects of Extended-Release Injectable Naltrexone and Incentives for Opiate Abstinence in Heroin-Dependent Adults in a Model Therapeutic Workplace: A Randomized Trial” by B. P. Jarvis et al., 2019, *Drug and Alcohol Dependence*. Copyright 2019 Elsevier, Inc. Reprinted with permission

opiates or cocaine during treatment (Aklin et al., 2014). Participants in this study were randomly assigned to a Usual Care Control and Therapeutic Workplace groups. Successful Therapeutic Workplace participants were hired as data entry operators in our data entry business about 3 years after random assignment when the data entry business opened.

Figure 4 shows the percentages of urine samples that were negative for opiates (top) and cocaine (middle) and the percentage of months that participants reported being employed full time (bottom) for participants in the therapeutic workplace and Usual Care Control groups during months 37–48 after random assignment when Therapeutic Workplace participants could be employed in the data entry business. Employees in the data entry business required and appeared responsive to special contingencies to promote punctuality and complete work shifts (Wong, Dillon, Sylvest, and Silverman, 2004a, 2004b). During the fourth year after random assignment when the data entry business was open, Therapeutic Workplace participants provided significantly more urine samples negative for opiates and cocaine, and they reported being employed full-time significantly more than Usual Care Control participants. The data on employment are particularly important because they show that the women in the Usual Care Control group rarely reported any employment at all. Although most of the employment of Therapeutic Workplace participants was in our data entry business, these data show that these women will work at fairly high rates if given the opportunity. The significant differences between the two groups on drug (opiates or cocaine) abstinence and employment were not maintained in the three years after the data entry business-closed (Aklin et al., 2014).

**The Wage Supplement Model** We are currently conducting a study to evaluate the effectiveness of the Wage Supplement Model in promoting and maintaining opiate and cocaine abstinence and employment in unemployed opioid-dependent adults (R01DA037314). In this study, participants are enrolled in Phase 1 of the therapeutic workplace for 3 months. During this time, participants are required to provide urine samples negative for opiates and cocaine to maintain their maximum pay in the therapeutic workplace. Participants who are still attending the therapeutic workplace at the end of 3 months are invited to attend the workplace for an additional year. Half of the participants are assigned an employment specialist who helps the participants get a job using Individual Placement and Support supported employment or IPS (IPS Only). IPS is a supported employment intervention that has been shown effective in promoting employment in people with severe mental illness (Bond, Drake, & Becker, 2012). The other participants also receive IPS, but in addition, they receive abstinence-contingent wage supplements (IPS Plus Abstinence-Contingent Wage Supplements). Under this wage supplement program, participants can receive up to \$8 per hour for working up to 40 hours per week, but they have to continue to provide urine samples at random times that are negative for opiates and cocaine to continue earning \$8 per hour in wage supplements. Before they become employed, they can also receive abstinence-contingent stipends for working with their IPS employment specialist—but only for a maximum of 20 hours per week.

This study is still ongoing, so we only have preliminary results. However, two things are already clear. First, participants in the IPS Only group stop working with the employment specialist almost immediately, whereas participants in the IPS Plus Abstinence-Contingent Wage Supplements group work relatively consistently with the employment specialist (Silverman et al., 2018). Second, although IPS Plus Abstinence-Contingent Wage Supplements participants may achieve more abstinence

and employment than IPS Only participants (a firm answer to this question will have to wait for all the data to be collected and analyzed), it is clear that even IPS Plus Abstinence-Contingent Wage Supplements participants do not work consistently throughout the year and they do not obtain high-paying jobs. More systematic research will be needed to develop the IPS Plus Abstinence-Contingent Wage Supplements intervention so that it can move people out of poverty.

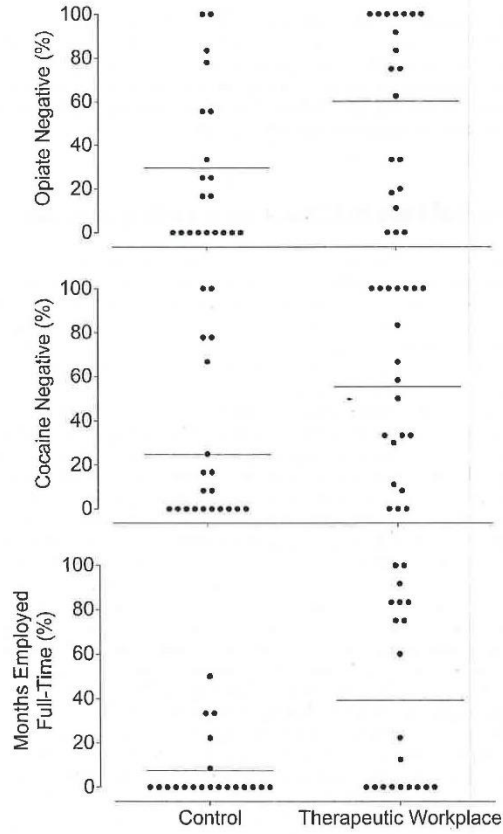
### Remaining Challenges to Address Poverty and Drug Addiction

We have much to learn about promoting sustained health in people who live in poverty. Behavior analysts and others have conducted extensive research on the direct reinforcement of health behaviors in low-income populations. We illustrated the potential therapeutic benefits of direct reinforcement in improving the health of low-income populations by reviewing selected research on the treatment of heroin and cocaine addiction. It is clear that we can treat drug addiction in low-income populations by the direct reinforcement of drug abstinence and medication adherence. Direct reinforcement, whether voucher reinforcement or employment-based reinforcement, can promote abstinence from heroin and cocaine and medication adherence among adults who live in poverty. However, direct reinforcement also has limitations. In particular, not all individuals respond to direct reinforcement interventions, many individuals relapse to unhealthy behaviors (e.g., heroin and cocaine use) after the reinforcement contingencies are discontinued, and reinforcing one health behavior does not necessarily increase other health behaviors (e.g., reinforcing cocaine abstinence does not always lead to increases in opiate abstinence). Although we have not resolved these problems, we have made some progress in addressing these limitations: increasing the reinforcement magnitude can increase the proportion of patients that respond to the reinforcement intervention (e.g., Dallery et al., 2001; Silverman et al., 1999); arranging long-term exposure to reinforcement can prevent relapse, at least as long as the abstinence reinforcement contingency is in effect (e.g., DeFulio & Silverman, 2011; Silverman et al., 2004); and arranging reinforcement sequentially across target health behaviors can promote multiple health behaviors (e.g., Holtyn et al., 2014b).

We know much less about reducing poverty. Large-scale anti-poverty programs (Bitler & Karoly, 2015) and the large-scale application of incentives in government-sponsored welfare-to-work programs like Opportunity NYC (Holtyn et al., 2017) in the United States have had limited effects, possibly because these programs have been applied in large populations without systematic scientific development (Holtyn et al., 2017). Nevertheless, these programs illustrate the interest of governments in the United States in addressing poverty and their willingness and capacity to use incentives to address this problem; however, we are far from effectively resolving the problems of unemployment and poverty.

Research on the therapeutic workplace provides a potential approach to develop an effective anti-poverty program for low-income adults (Silverman et al., 2018). We do not know whether quick-entry or education-focused interventions are better for this population, but our therapeutic workplace research shows that many of the low-income, unemployed adults who have long histories of drug addiction lack the skills that they might need to obtain and maintain good paying jobs (Holtyn et al., 2015; Sigurdsson





et al., 2012). Our research has shown that special contingencies may be required and effective to promote training and work behaviors. In particular, our participants will attend our training program, but primarily when offered financial incentives for attendance (Koffarnus et al., 2011; Koffarnus et al., 2013b; Silverman et al., 1996a); they will work on training programs, but primarily when offered some portion of their pay contingent on performance on training programs (Koffarnus et al., 2013a;

**Fig. 4** Percentage of urine samples negative for opiates (top panel) and cocaine (middle panel) and percentage of months that participants reported being employed full-time (bottom panel) when the data entry business, Hopkins Data Services, was opened during the 4th year after intake. Based on 30-day assessments collected when Hopkins Data Services was opened and between months 37 and 48 after treatment entry. Dots represent data for individual participants and lines represent group means. Missing samples were considered positive for opiates (top) and cocaine (middle) and unemployed (bottom). Because the business opened on a fixed date and participants were enrolled in the study at different dates, participants had different number of 30-day assessments during Year 4 that the business was open. Adapted from “A Therapeutic Workplace for the Long-Term Treatment of Drug Addiction and Unemployment: Eight-Year Outcomes of a Social Business Intervention” by W. M. Aklin et al., 2014, *Journal of Substance Abuse Treatment*, 47, 335. Copyright 2014 Elsevier Inc. Reprinted with permission

Subramaniam et al., 2017); they will work with an employment specialist to look for employment, but primarily when offered stipends for working with the employment specialist (Silverman et al., 2018); and as employees in a therapeutic workplace business, they will arrive to work on time and work complete work shifts, but primarily when special contingencies are arranged to promote punctuality and complete work shifts (Wong et al., 2004a, 2004b). This research has demonstrated both the limitations of the adults who have participated in the therapeutic workplace and potential reinforcement contingencies that could be effective in promoting skill development and employment in this population. These studies suggest that anti-poverty programs may require special and strategic use of reinforcement contingencies to promote skill development, job search behaviors, and employment in low-income, unemployed adults who have long histories of drug addiction. We do not know whether we will need the same kinds of reinforcement contingencies for other groups of people who live in poverty, but research on welfare-to-work programs suggests that these kinds of reinforcement contingencies might be useful (Holtyn et al., 2017).

We have had some limited success in promoting employment. We have promoted employment in our social business that hired therapeutic workplace participants, although some social business employees did not maintain employment after employment in the social business ended (Aklin et al., 2014). Social businesses devoted to employing people who live in poverty may be an effective means of promoting employment in unemployed adults, but they may have limited capacities. We are in the process of evaluating the utility of abstinence-contingent wage supplements in promoting employment. We will not have clear data on employment outcomes of this approach until all the data are collected and analyzed, but it is already clear that abstinence-contingent wage supplements do not promote consistent full-time employment and participants do not consistently obtain high paying jobs.

Moving people out of poverty is considerably more difficult than promoting employment. Moving people out of poverty requires promoting consistent employment in high paying jobs. We suspect that we may achieve that goal best through education-focused interventions that seek to establish needed academic and job skills that might qualify individuals for consistent employment in high paying jobs. If that is true, stipend-supported computer-based training as we have provided using ATTAIN (Getty et al., 2018; Subramaniam et al., 2019) may be a useful approach to establish needed skills.

We do not know whether moving people out of poverty will improve the broad range of health conditions that appear adversely affected by poverty. However, we can only resolve this issue if we develop effective anti-poverty programs so that we can

experimentally move people out of poverty. Developing effective anti-poverty programs might be a means to improve a broad range of poverty-related adverse health conditions. At the very least, developing effective anti-poverty programs could help reduce poverty, which is an important goal in itself.

The therapeutic workplace intervention could serve as a useful program for unemployed adults who have long histories of drug addiction (Silverman, 2004). The therapeutic workplace arranges high-magnitude and long-duration reinforcement for drug abstinence (Silverman et al., 2012) and provides potential ways to maintain exposure to long-term abstinence reinforcement, at least as long as the employment can be maintained (Silverman et al., 2016b). For those in need of academic and job skills training, the therapeutic workplace provides stipend-supported education and job-skills training prior to employment (Silverman et al., 2018). Conducting research on the therapeutic workplace and implementing therapeutic workplace procedures in the society is particularly challenging because neither the substance-abuse treatment nor employment programs include the needed infrastructure. Of course, neither context offers substantial financial incentives for drug abstinence, training performance, or work.

Reducing poverty and promoting sustained drug abstinence are substantial challenges that available interventions have not adequately addressed. The research reviewed in this article suggests that operant conditioning could be useful in addressing poverty and drug addiction. As experts in the principles of operant conditioning, behavior analysts are well-suited to address both poverty and drug addiction. However, most behavior analysts have not focused on this area. In fact, research in this area is only just beginning and has been extremely limited to date, particularly research on reducing poverty. Behavior analysts could make enormous contributions to efforts to address poverty and drug addiction, and improve health.

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#### Compliance with ethical standards

**Conflict of Interest** The authors declare that they have no conflicts of interest related to the material in this manuscript.

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