Beat Drugs Fund project sharing

BDF 210050: Innovative medical intervention for drug abusers by using TMS- a pilot project

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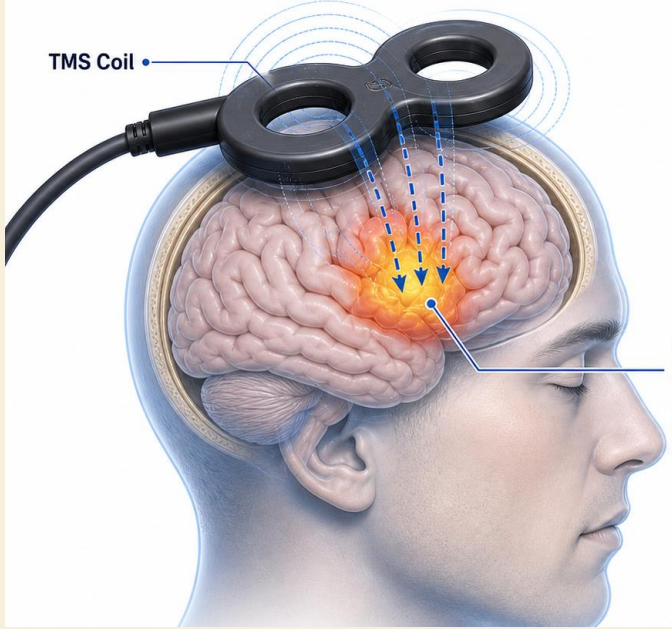
What is rTMS

Transcranial Magnetic Stimulation



Magnetic pulses pass through intact skull
Painless magnetic pulses pass through the skull and reach the brain to stimulate nerve cells.

No surgery needed
Non-invasive, outpatient procedure performed while you are awake. No anesthesia required.

Single pulse = one TMS pulse
A single magnetic pulse delivers one TMS pulse.

Repeated pulses = rTMS
Rapid series of pulses delivered over time is called rTMS (repetitive TMS).

腦部磁力刺激

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History of rTMS

- rTMS was invented in 1980s.
- US FDA cleared to treat depression in 2008.
- Now major authority such as FDA and CE Certification cleared the following uses:

Depression

Substance use disorder

Obsessive compulsive disorder

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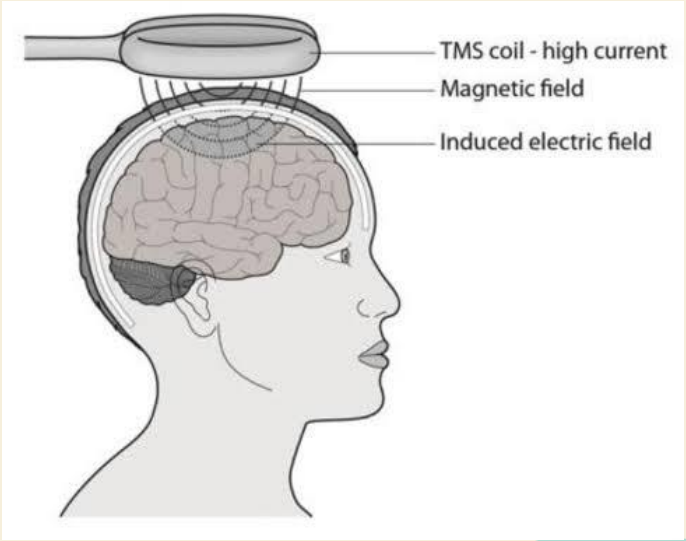
How does rTMS work?

- Faraday's principle
  - Rapidly changing magnetic fields to induce electric currents in cortical tissue.
  - Depolarize neurons.
- Modulate brain excitability and function.



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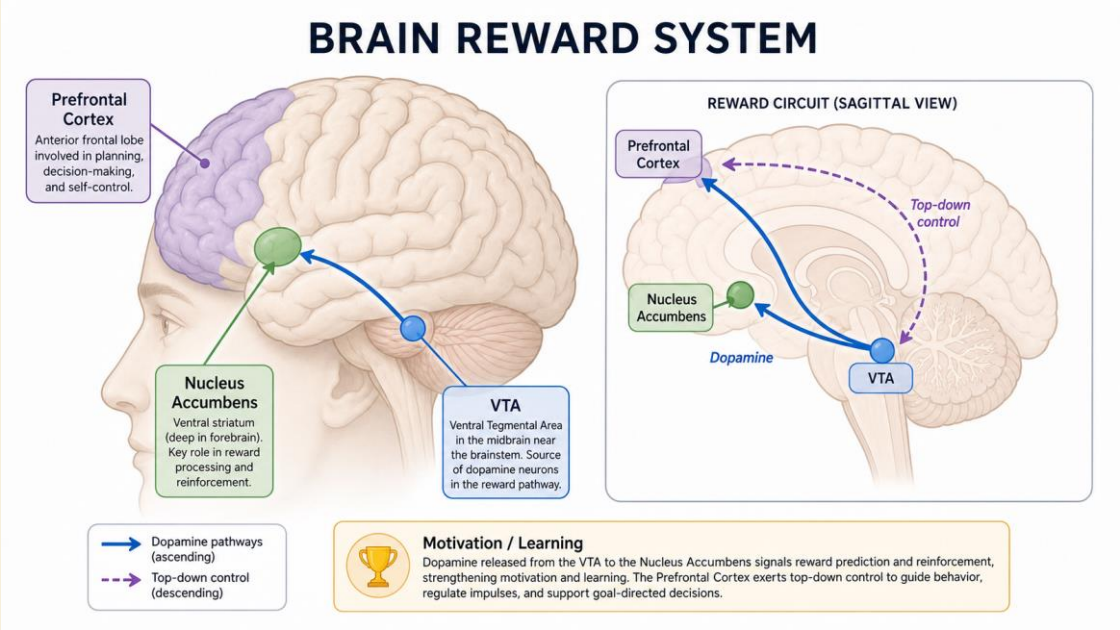
Craving in substance users

- Craving and reward system related in different brain region
  - Pre-frontal cortex.
  - Limbic system.
  - Ventral tegmental area.



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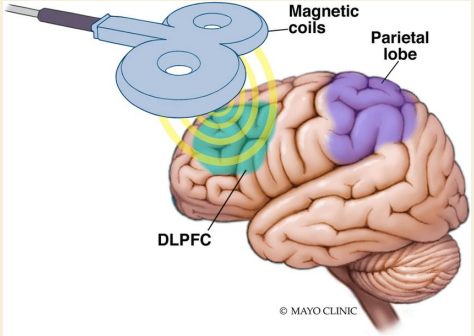
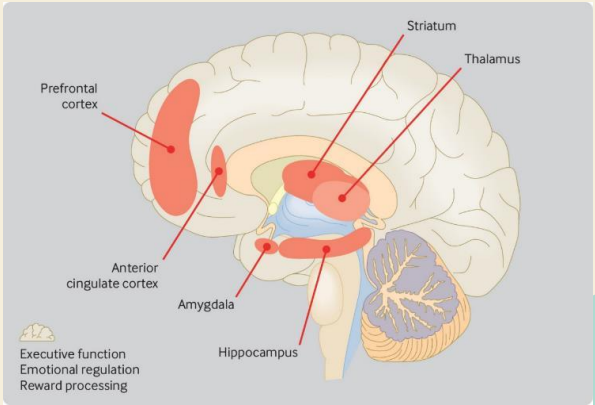
Craving in substance users

- Magnetic pulses can stimulate different cortex.

  In SUD, we use high frequency stimulates dorsolateral prefrontal cortex (DLPFC).



- Craving and relapse are linked to dysregulated functional connectivity among limbic reward regions, sgACC (emotion and impulse) and DLPFC.



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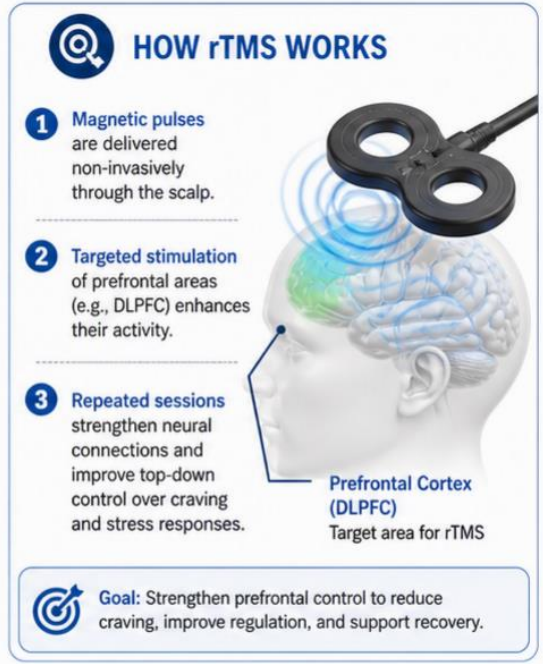
Craving in substance users

- Reductions in craving are associated with increased DLPFC engagement during cognitive control/regulation.

- DLPFC plays a key role in top-down control of craving, emotion and behavior in addiction.



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Common side effects

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- **輕微頭痛、牙痛或刺激位置抽搐**

一般因在電磁圈下的肌肉、面部和頭皮神經受刺激而引致。舒緩方法包括服用止痛藥，調節電磁圈位置，和降低治療刺激能量值。

- **短暫聽覺受損和耳鳴**

配戴耳塞可將此風險減至最低。

Rare side effect

- **癲癇現象**

  接受rTMS的病人，出現癲癇現象的機會率為每一萬次治療有0.31次，和每一千個病人有0.71人。

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Short conclusion

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In more layman term:

- Enhance own control of
  - Emotion.
  - Impulse.
  - Drive.
- Reduce craving
  - Integration of body-mind.
  - 改善 “口裡說不, 身體很誠實”.

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Beat Drugs Fund project in substance abuse clinic

Innovative medical intervention for drug abusers by using TMS- a pilot project

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Project background

- Our substance abuse clinic serves around 100 new patients with substance use disorder (SUD) each year. Near 70% of them experience ongoing craving and lapses.

- Cravings are often triggered by environmental cues and stress. Current medications and cognitive behavioral therapies have limited effect on reducing craving.

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Goal and target

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- To deliver service to 180 high-risk drug abusers in this 3-year project.
- Target on
  - Client aged 15 or above.
  - History of substance abuse (exclude alcohol) in past 12 months.
  - OPD cases under Kowloon East substance abuse clinic.
  - Nil TMS contradiction.

Treatment parameter adopted

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Approved protocol by CE approvals.

Treatment protocol	
Treatment site	DLPFC
Pulse frequency	15
Train duration	4
Inter-train interval	15
No. of trains	40
Total pulses per session	2400
Stimulation power	100%-120% MT

Protocol of the project

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1. Introduction and engagement phase

1 session: Recruitment and introduction of rTMS. Conduct baseline assessment of mental state & substance abuse situation. Doctor would review for suitability and contraindication.

1 session : Assessment of treatment position and all relevant rTMS parameters (intensity, repetition rate, number of pulses in a train, numbers of trains and number of treatment sessions).

Protocol of the project

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2. Treatment phase

10 sessions: TMS therapy (Optional for 5 days treatment and 2 sessions per day).

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Protocol of the project

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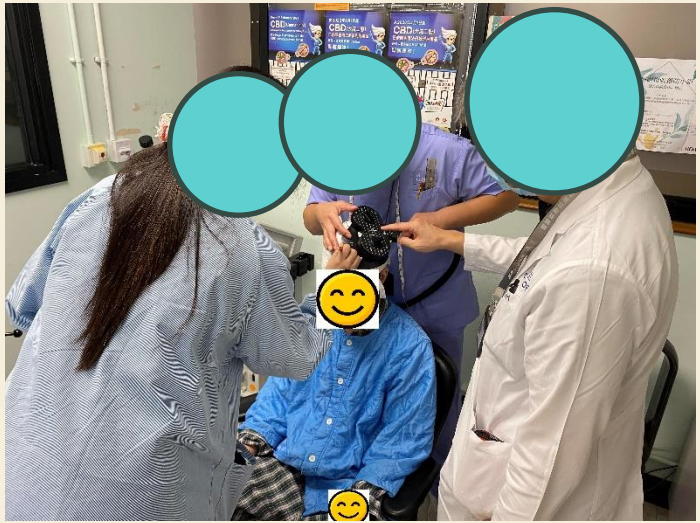
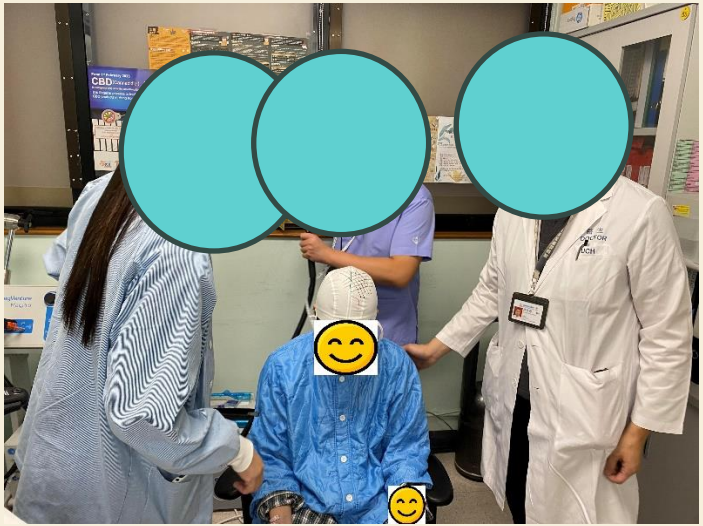
3. Review and assessment phase

2 sessions: Treatment progress review with client and treatment team.

3 sessions: Outcome assessment after treatment.

Locating treatment site





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rTMS demonstration on deciding MT and locating treatment site

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Treatment sessions

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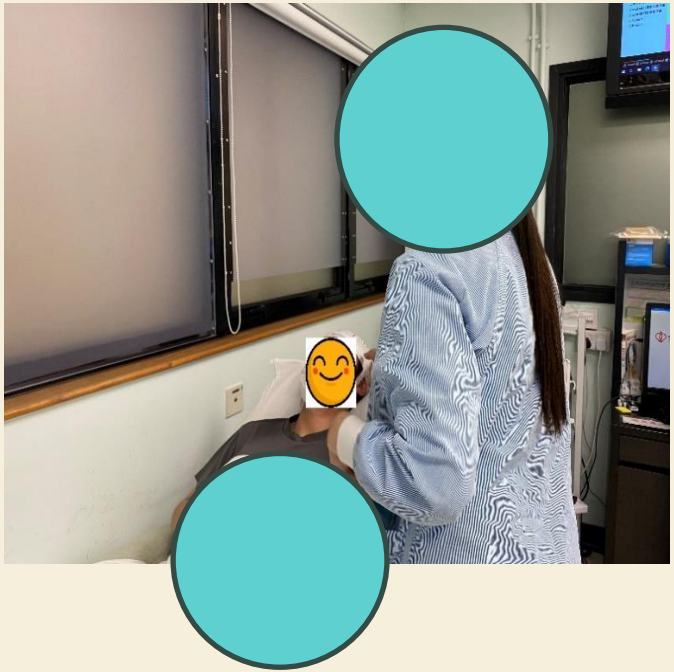
Treatment sessions



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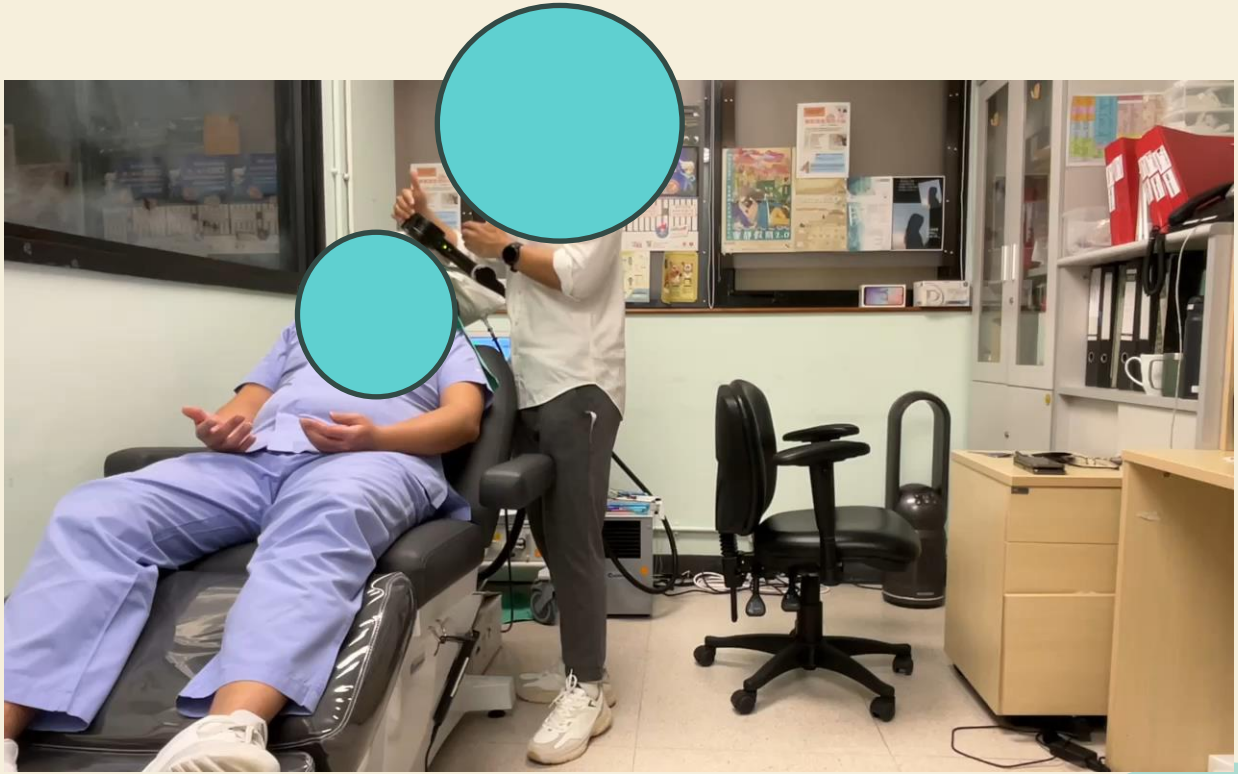
rTMS demonstration on treatment



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Output indicators

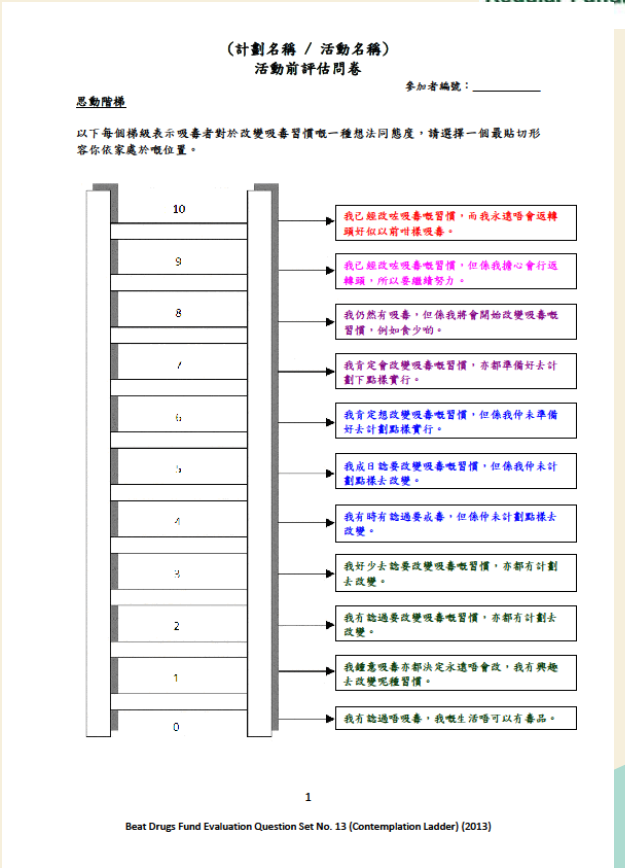
Final project outputs	
Preparatory sessions delivered	360 sessions
Treatment sessions delivered	1542 sessions
Review sessions done	355 sessions
Outcome assessment sessions done	517 sessions
Drug abusers recruited	180 people
Data sets collected	169 sets

Outcome measurement tools

- Motivation and understanding in abstinence:

  BDF question set no. 13 (Contemplation ladder).

Average improvement in motivation score	3.04
91.7% drug abusers show improvement in readiness to quit drugs.	



（計劃名稱 / 活動名稱）
活動前評估問卷

參加者編號：_____

思動階梯

以下每個梯級表示吸毒者對於改變吸毒習慣嘅一種想法同態度，請選擇一個最貼切形容你依家處於嘅位置。

10 我已經改咗吸毒嘅習慣，而我永遠唔會返轉頭好似以前咁樣吸毒。
9 我已經改咗吸毒嘅習慣，但係我擔心會行返轉頭，所以要繼續努力。
8 我仍然有吸毒，但係我將會開始改變吸毒嘅習慣，例如食少啲。
7 我肯定會改變吸毒嘅習慣，亦都準備好去計劃下點樣實行。
6 我肯定想改變吸毒嘅習慣，但係我仲未準備好去計劃點樣實行。
5 我成日諗要改變吸毒嘅習慣，但係我仲未計劃點樣去改變。
4 我有時有諗過要戒毒，但係仲未計劃點樣去改變。
3 我好少去諗要改變吸毒嘅習慣，亦都有計劃去改變。
2 我有諗過要改變吸毒嘅習慣，亦都有計劃去改變。
1 我鍾意吸毒亦都決定永遠唔會改，我有興趣去改變呢種習慣。
0 我有諗過唔吸毒，我嘅生活唔可以有毒品。

1

Beat Drugs Fund Evaluation Question Set No. 13 (Contemplation Ladder) (2013)

Outcome measurement tools

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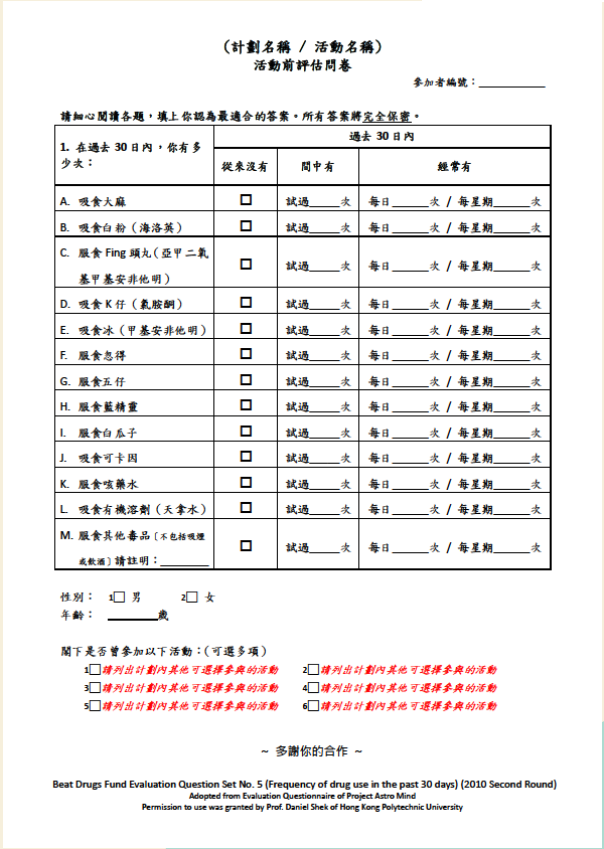
- Change the drug abuser's drug use frequency:

  BDF question set no. 5

  (Drug use frequency in the past one month).

Change the drug abuser's drug use frequency	-15.75
87.0% drug abusers show reduction in drug use frequency.	



（計劃名稱 / 活動名稱）
活動前評估問卷

參加者編號：_____

請細心閱讀各題，填上你認為最適合的答案。所有答案將完全保密。

1. 在過去 30 日內，你有多少次：	過去 30 日內		
	從來沒有	間中有	經常有
A. 吸食大麻	☐	試過____次	每日____次 / 每星期____次
B. 吸食白粉（海洛英）	☐	試過____次	每日____次 / 每星期____次
C. 服食 Fing 頭丸（亞甲二氧基甲基安非他明）	☐	試過____次	每日____次 / 每星期____次
D. 吸食 K 仔（氯胺酮）	☐	試過____次	每日____次 / 每星期____次
E. 吸食冰（甲基安非他明）	☐	試過____次	每日____次 / 每星期____次
F. 服食忽得	☐	試過____次	每日____次 / 每星期____次
G. 服食五仔	☐	試過____次	每日____次 / 每星期____次
H. 服食藍精靈	☐	試過____次	每日____次 / 每星期____次
I. 服食白瓜子	☐	試過____次	每日____次 / 每星期____次
J. 吸食可卡因	☐	試過____次	每日____次 / 每星期____次
K. 服食咳藥水	☐	試過____次	每日____次 / 每星期____次
L. 吸食有機溶劑（天拿水）	☐	試過____次	每日____次 / 每星期____次
M. 服食其他毒品〔不包括吸煙或飲酒〕請註明：_____	☐	試過____次	每日____次 / 每星期____次

性別： 1☐ 男 2☐ 女
年齡： _____歲

閣下是否曾參加以下活動：（可選多項）
1☐ 請列出計劃內其他可選擇參與的活動 2☐ 請列出計劃內其他可選擇參與的活動
3☐ 請列出計劃內其他可選擇參與的活動 4☐ 請列出計劃內其他可選擇參與的活動
5☐ 請列出計劃內其他可選擇參與的活動 6☐ 請列出計劃內其他可選擇參與的活動

~ 多謝你的合作 ~

Beat Drugs Fund Evaluation Question Set No. 5 (Frequency of drug use in the past 30 days) (2010 Second Round)
Adopted from Evaluation Questionnaire of Project Astro Mind
Permission to use was granted by Prof. Daniel Shek of Hong Kong Polytechnic University

Outcome measurement tools

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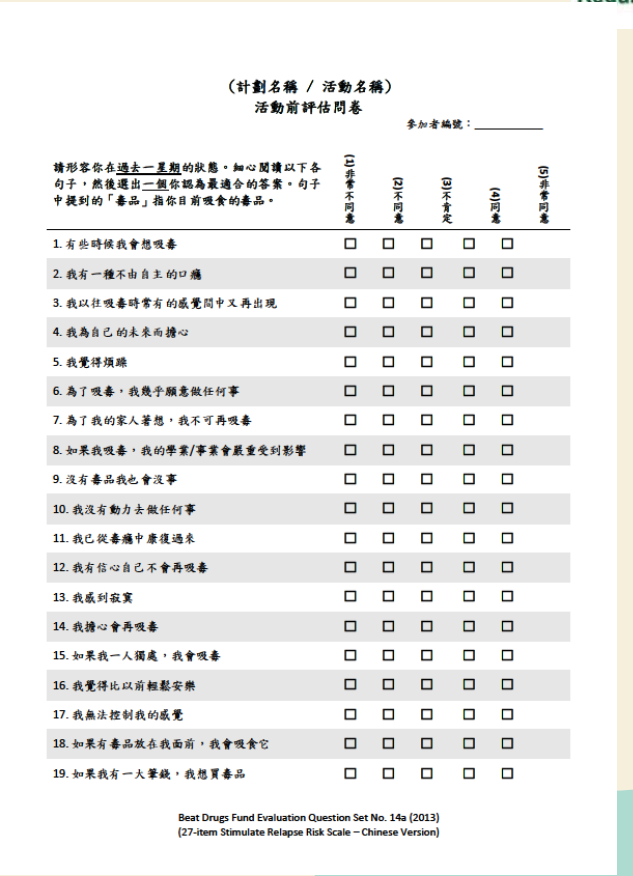
- Reduce client risk of relapse:

  BDF question set no. 14a

  (Stimulant relapse risk scale).

Average improvement in inclination to avoid relapse	2.86
97.6% rehabilitated drug abusers show reduction in their inclination to relapse.	



（計劃名稱 / 活動名稱）
活動前評估問卷

參加者編號：_____

請形容你在過去一星期的狀態。細心閱讀以下各句子，然後選出一個你認為最適合的答案。句子中提到的「毒品」指你目前吸食的毒品。

	(1)非常不同意	(2)不同意	(3)不肯定	(4)同意	(5)非常同意
1. 有些時候我會想吸毒	☐	☐	☐	☐	☐
2. 我有一種不由自主的口癮	☐	☐	☐	☐	☐
3. 我以往吸毒時常有的感覺間中又再出現	☐	☐	☐	☐	☐
4. 我為自己的未來而擔心	☐	☐	☐	☐	☐
5. 我覺得煩躁	☐	☐	☐	☐	☐
6. 為了吸毒，我幾乎願意做任何事	☐	☐	☐	☐	☐
7. 為了我的家人著想，我不可再吸毒	☐	☐	☐	☐	☐
8. 如果我吸毒，我的學業/事業會嚴重受到影響	☐	☐	☐	☐	☐
9. 沒有毒品我也會沒事	☐	☐	☐	☐	☐
10. 我沒有動力去做任何事	☐	☐	☐	☐	☐
11. 我已從毒癮中康復過來	☐	☐	☐	☐	☐
12. 我有信心自己不會再吸毒	☐	☐	☐	☐	☐
13. 我感到寂寞	☐	☐	☐	☐	☐
14. 我擔心會再吸毒	☐	☐	☐	☐	☐
15. 如果我一人獨處，我會吸毒	☐	☐	☐	☐	☐
16. 我覺得比以前輕鬆安樂	☐	☐	☐	☐	☐
17. 我無法控制我的感覺	☐	☐	☐	☐	☐
18. 如果有毒品放在我面前，我會吸食它	☐	☐	☐	☐	☐
19. 如果我有一大筆錢，我想買毒品	☐	☐	☐	☐	☐

Beat Drugs Fund Evaluation Question Set No. 14a (2013)
(27-item Stimulate Relapse Risk Scale – Chinese Version)

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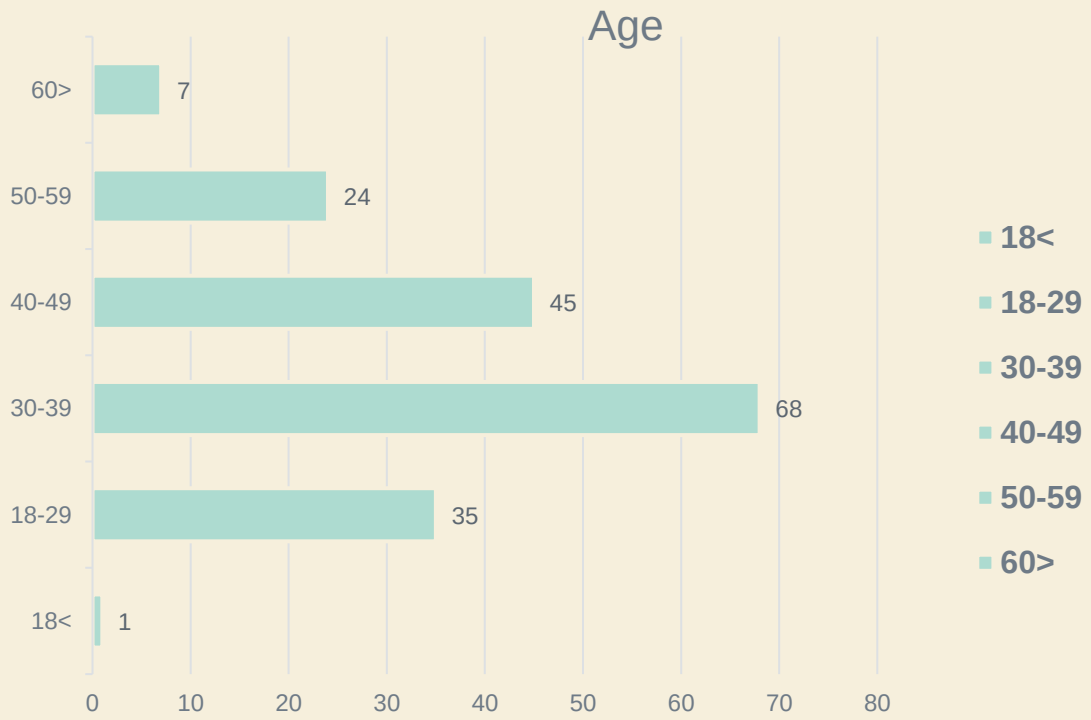
Demographic data



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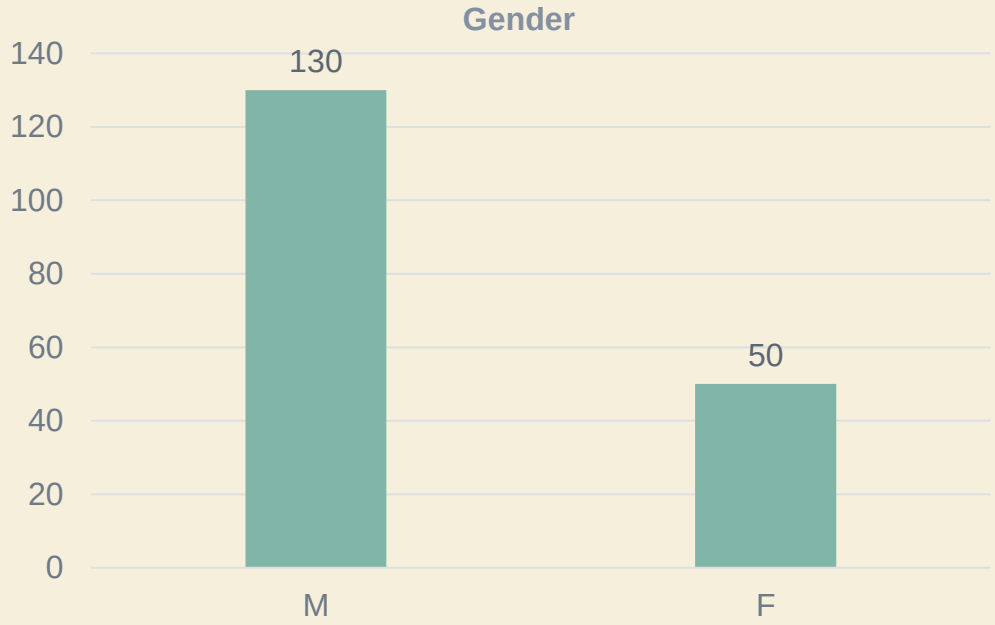
Demographic data



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Client feedbacks to rTMS

Brief background	Feedback from clients
F/18 (stimulant user)	*“我之前想食果陣會心跳加速，坐唔定，坐立不安。做咗之後少咗呢種感覺。”* From daily use → once/twice in a week

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Client feedbacks to rTMS

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Brief background	Feedback from clients
M/38 (Ice + GHB users)	*"好似做完療程之後，多個動力去做其他活動。雖然我依家仲有食，但食少咗，而且好似自己更加控制到。我依家重新開始返自己興趣，會去跑步、行山。"*

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Client feedbacks to rTMS

Brief background	Feedback from clients
M/27 (stimulant user)	*“再同朋友出去果陣，朋友又拎曬出嚟捲煙，仲叫我幫手捲。雖然我有幫手，但我無想主動攞嚟食，最後推推讓讓下，食咗兩支，但我起碼無追落去。”*

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Client feedbacks to rTMS

Brief background	Feedback from clients
F/23 (Cough mixture user)	*“之前有陣時無錢買咳藥水，或者藥房關咗門，就會發癲發脾氣，打爛屋企啲野。但做完之後真係無得食就由佢，無咁心痒痒，飲咳藥水嘅份量大約少咗一半”*

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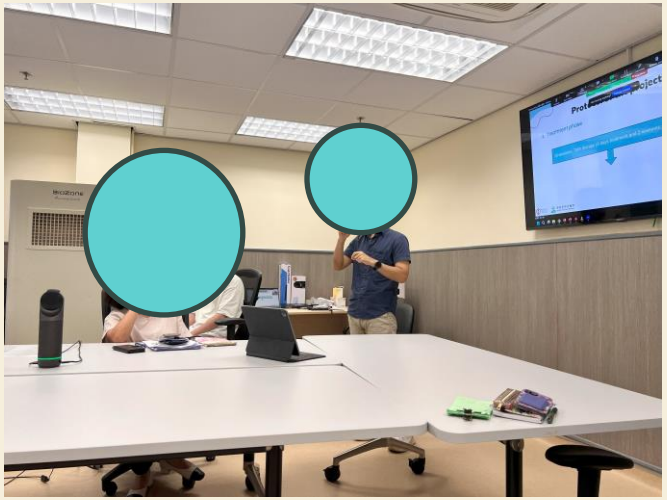
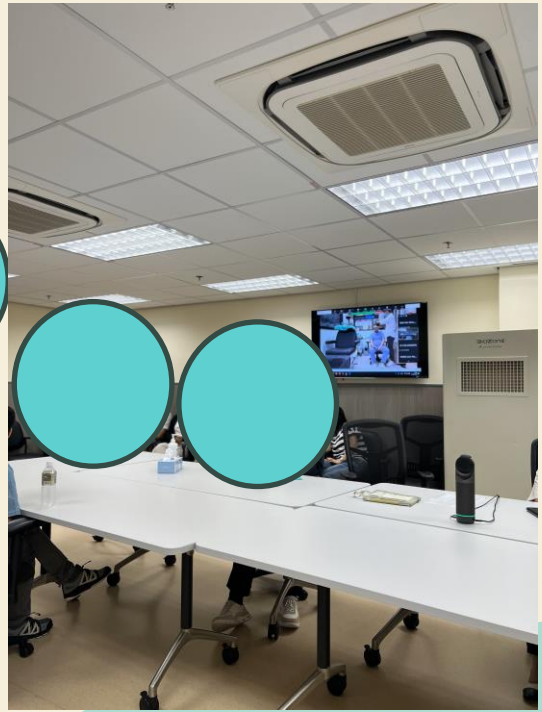
Sharing session to community anti-drug stakeholders





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Conclusion

- It is a new medical way to handle substance use disorder.
- It can supplement the current service gap.
- Collaboration with community stakeholders is needed to provide ongoing support and sustain long-term abstinence.

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