



*Predictors of poor health and heroin use  
in methadone-treated injecting heroin users:  
The importance of methadone dosage and crack cocaine use*

*Felicia Heidebrecht, Jenny Corless, Mary Bell Macleod and Lynne Dawkins*

# Background

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- dual users (heroin and crack) and IV users → heroin on OST
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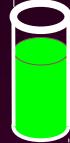
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**Higher doses of MTD → better outcomes (heroin and crack users) ?**

To explore the **physical health**, **hepatitis C** and **heroin use** of **IV drug users** in **methadone** treatment by comparing

**high**  ( $\geq 70$  mg daily) vs.

**low**  ( $<70$  mg daily) dose

and **crack** use.

## Methods

Sample: current/previous IV users of heroin in methadone treatment in two community drug services in London, UK

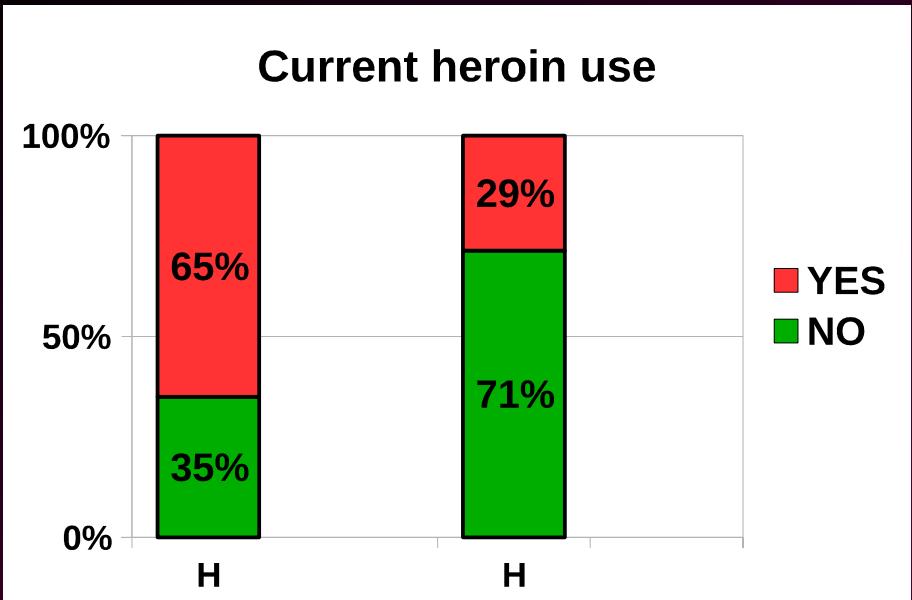
Data collection: Part 1: clinical records (H+C and H-only users), N=255  
Part 2: in-depth interviews (H+C users), N=36

Outcomes: Heroin use  
Hepatitis C infection  
Poor health: medium to severe IV-related events such as septic arthritis, septicaemia, DVT, PE, endocarditis, stroke.

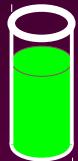
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N=255

# Results – Part 1, N=255

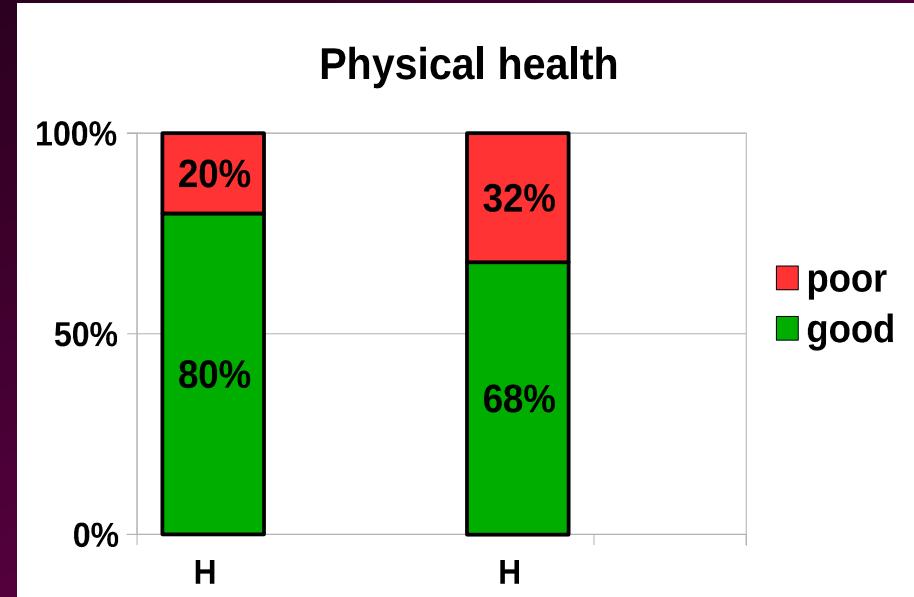
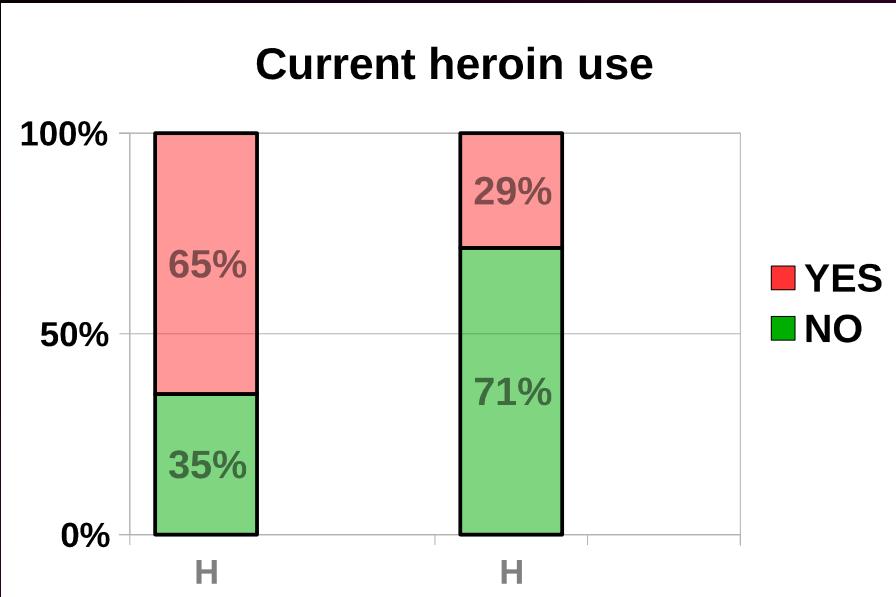


MTD

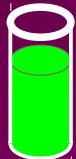
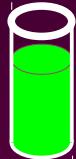


Heroin-only users: High MTD → fewer H users

# Results – Part 1, N=255

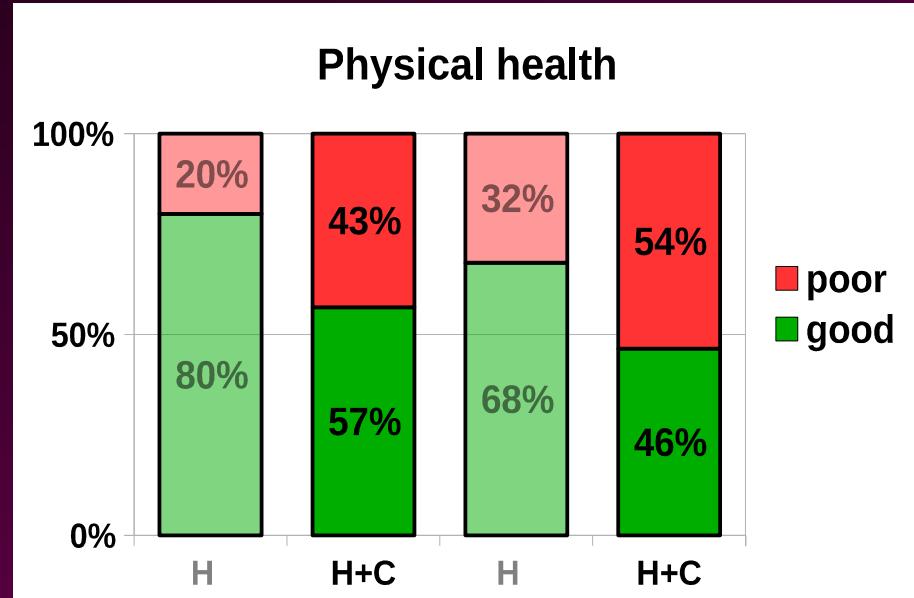
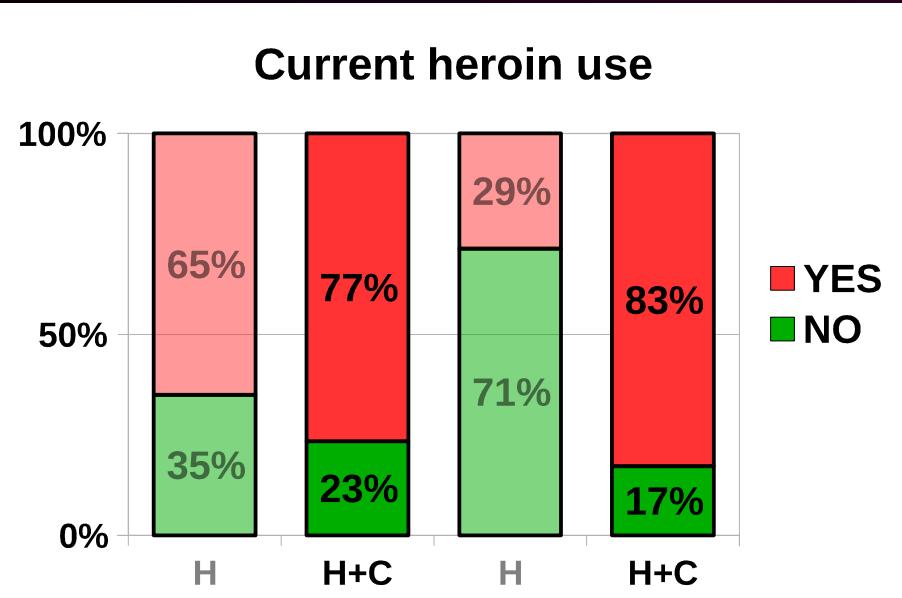


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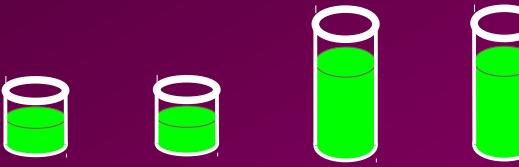
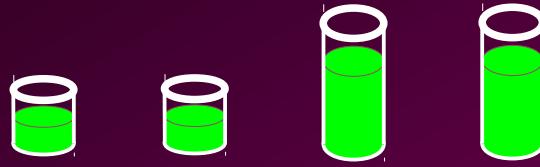


Heroin-only users: High dose of MTD → more people with poor health

# Results – Part 1, N=255



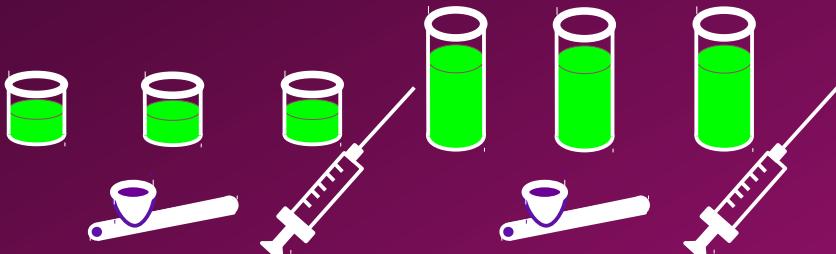
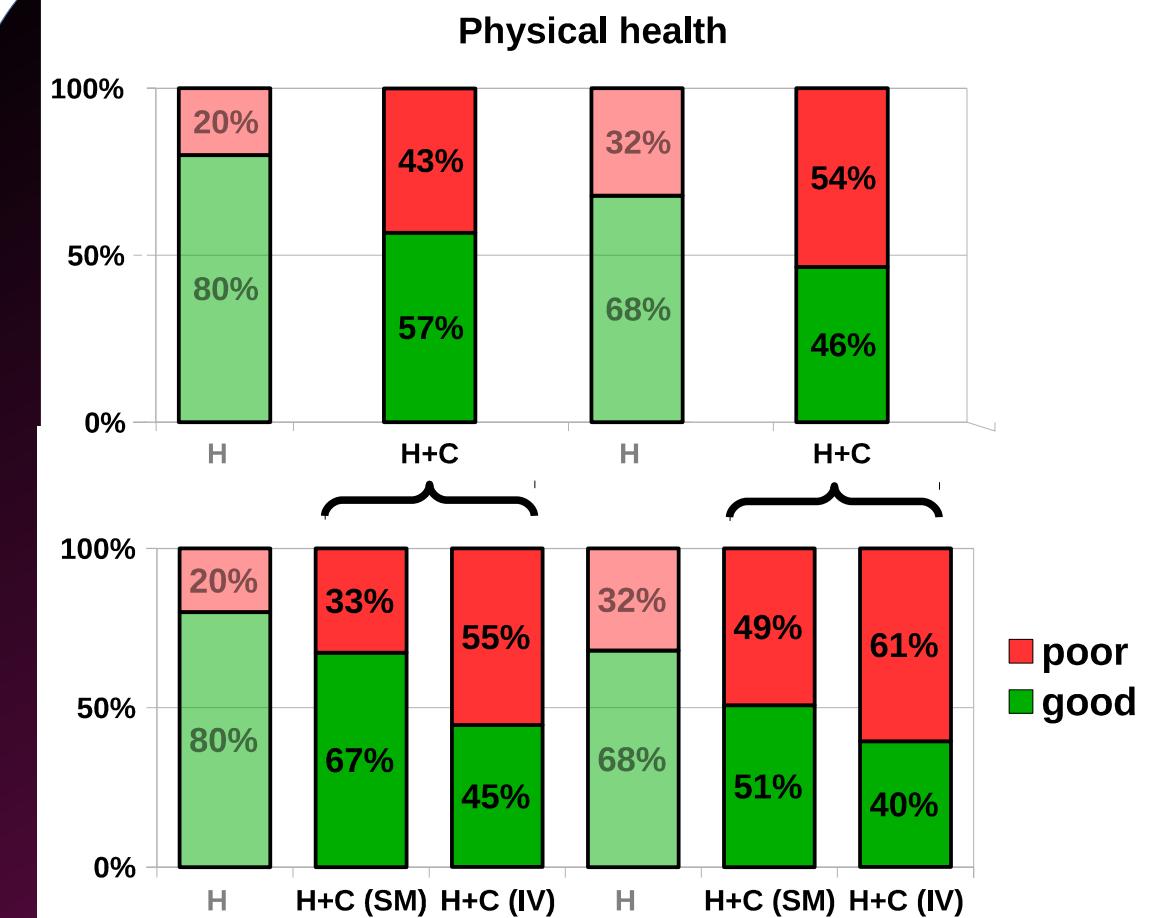
MTD



Dual users: more heroin users and less in good health regardless of dose; effects stronger at high dose

# Results Part 1, N=255

Any crack use but particularly IV use correlates with poor health

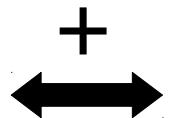


# Results Part 1, N=255

## Logistic regression model predicting physical health

|                                    | p    | OR   | 95% CI for OR |       |
|------------------------------------|------|------|---------------|-------|
|                                    |      |      | Lower         | Upper |
| Ever injected crack                | 0.00 | 3.29 | 1.85          | 5.86  |
| Methadone dose                     | 0.03 | 1.35 | 1.03          | 1.77  |
| Alcohol use                        | 0.04 | 1.38 | 1.01          | 1.90  |
| duration of drug use and treatment | 0.00 | 1.05 | 1.03          | 1.09  |
| Constant                           | 0.00 | 0.29 |               |       |

- high MTD
- duration of use and treatment
- frequent drinking ( $\geq 14$  days/month)
- IV crack



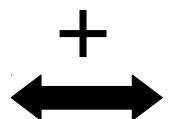
Poor Health

# Results Part 1, N=255

## Logistic regression model predicting current heroin use

|                                  | p    | OR    | 95% CI for OR |       |
|----------------------------------|------|-------|---------------|-------|
|                                  |      |       | Lower         | Upper |
| Ever injected crack              | 0.03 | 2.31  | 1.10          | 4.86  |
| Ever used crack                  | 0.00 | 3.51  | 1.56          | 7.90  |
| Methadone dose                   | 0.71 | 0.87  | 0.40          | 1.87  |
| Mental Health                    | 0.33 | 0.70  | 0.34          | 1.43  |
| Ever used crack x Methadone dose | 0.00 | 11.72 | 2.52          | 54.58 |
| Mental Health x Methadone dose   | 0.00 | 0.08  | 0.02          | 0.36  |
| Constant                         | 0.00 | 2.62  |               |       |

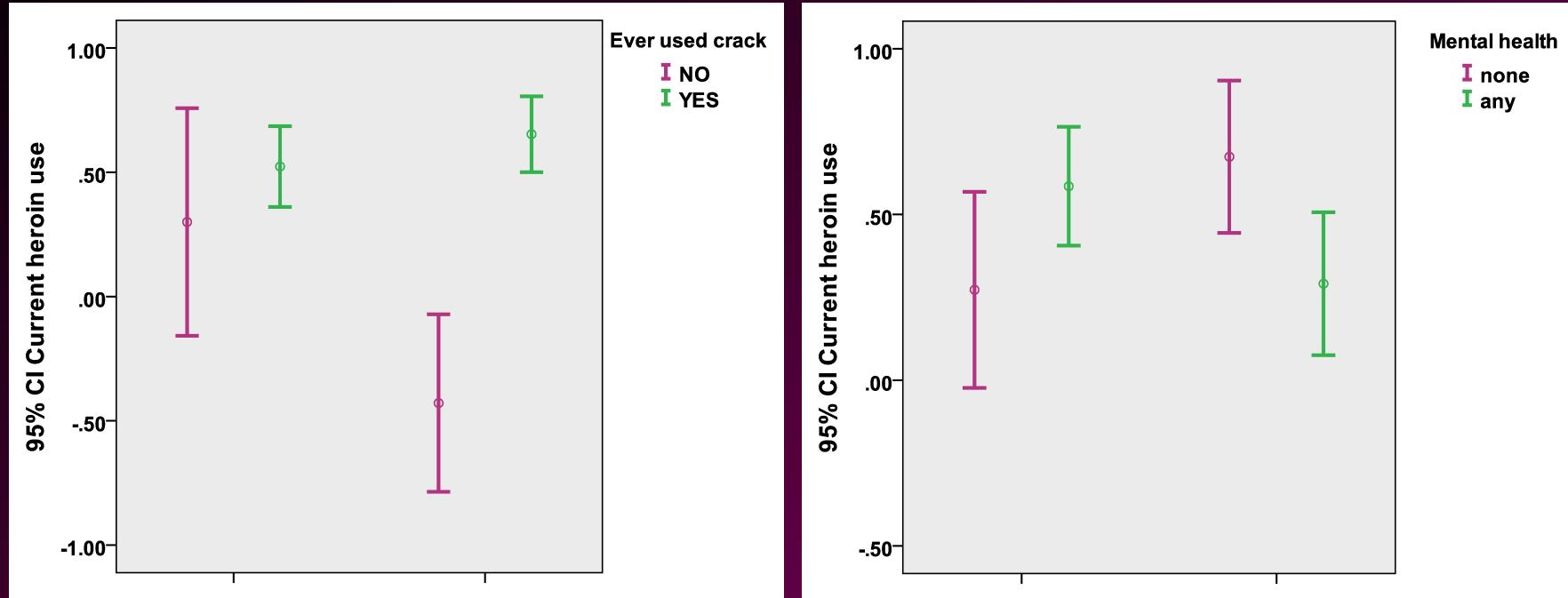
• IV crack



Current heroin use

# Results Part 1, N=255

## Logistic regression model predicting current heroin use - interactions



- High MTD predicted heroin abstinence only for those not using crack
- On high MTD participants with a mental health condition were less likely to use heroin; on low MTD the opposite was found

# Results Part 1, N=255

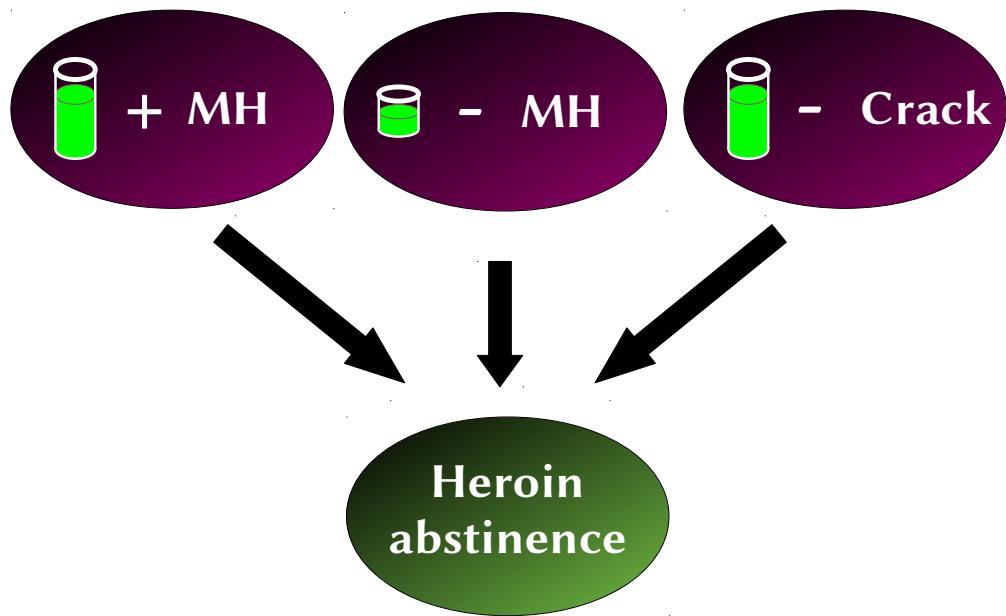
## Logistic regression model predicting Hep C infection

|                                    | p    | OR   | 95% CI for OR |       |
|------------------------------------|------|------|---------------|-------|
|                                    |      |      | Lower         | Upper |
| Ever injected crack                | 0.00 | 2.34 | 1.31          | 4.16  |
| duration of drug use and treatment | 0.00 | 1.06 | 1.03          | 1.09  |
| Constant                           | 0.01 | 0.39 |               |       |

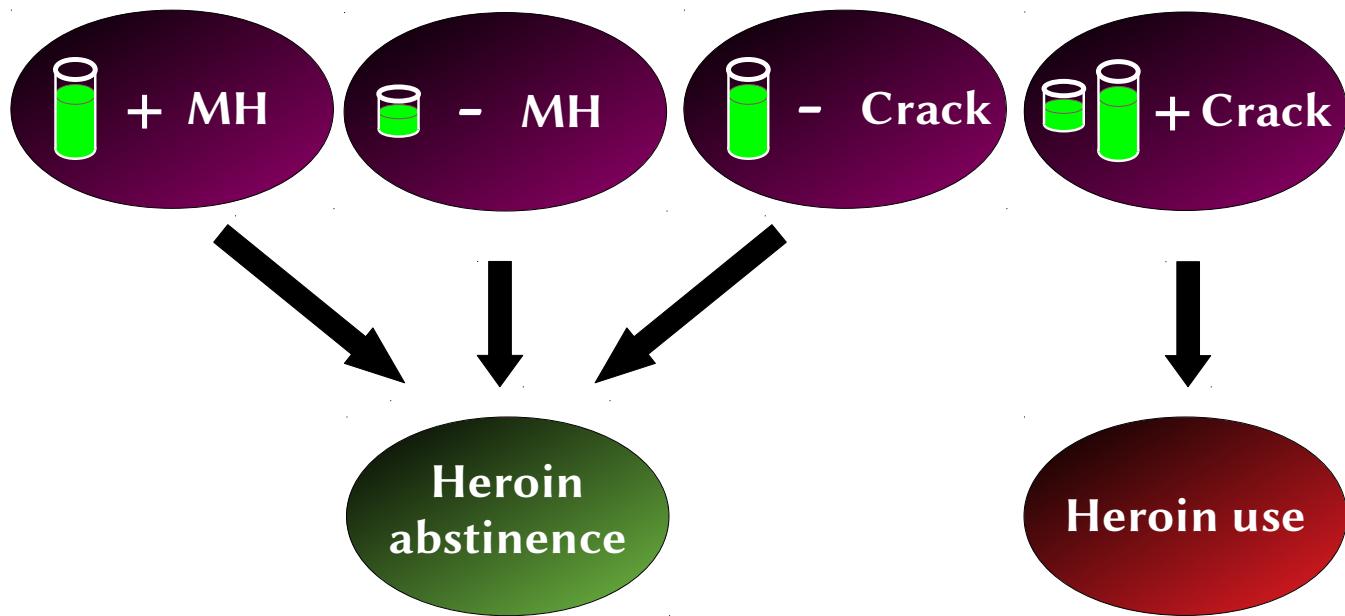
- IV crack
- duration of use and treatment



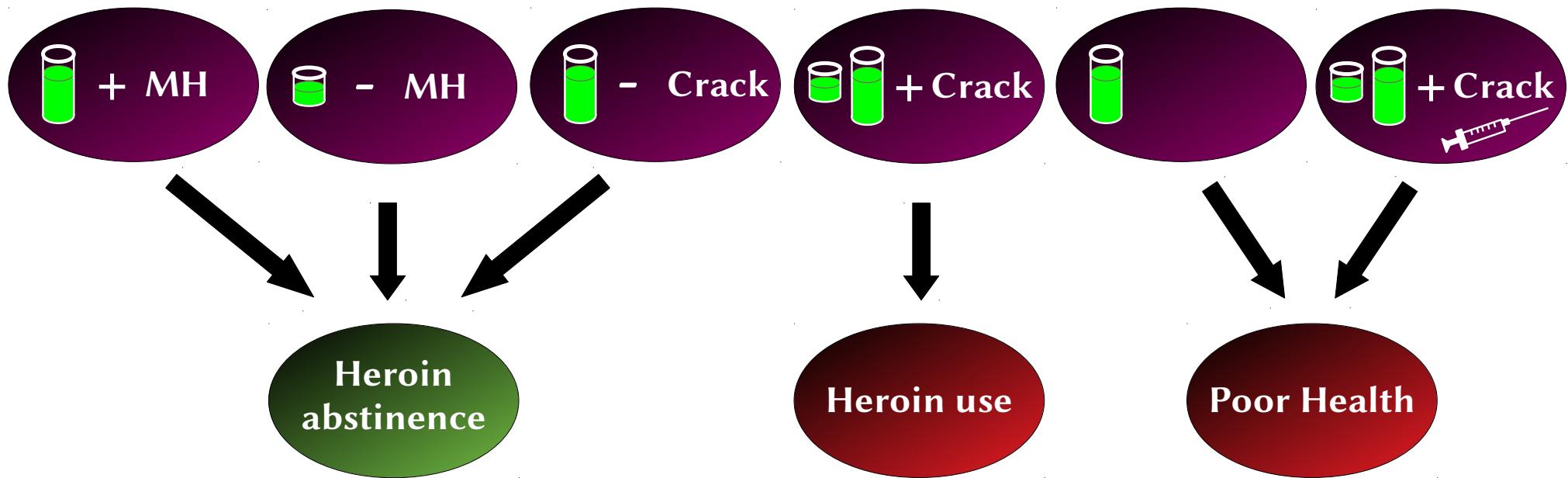
# Summary



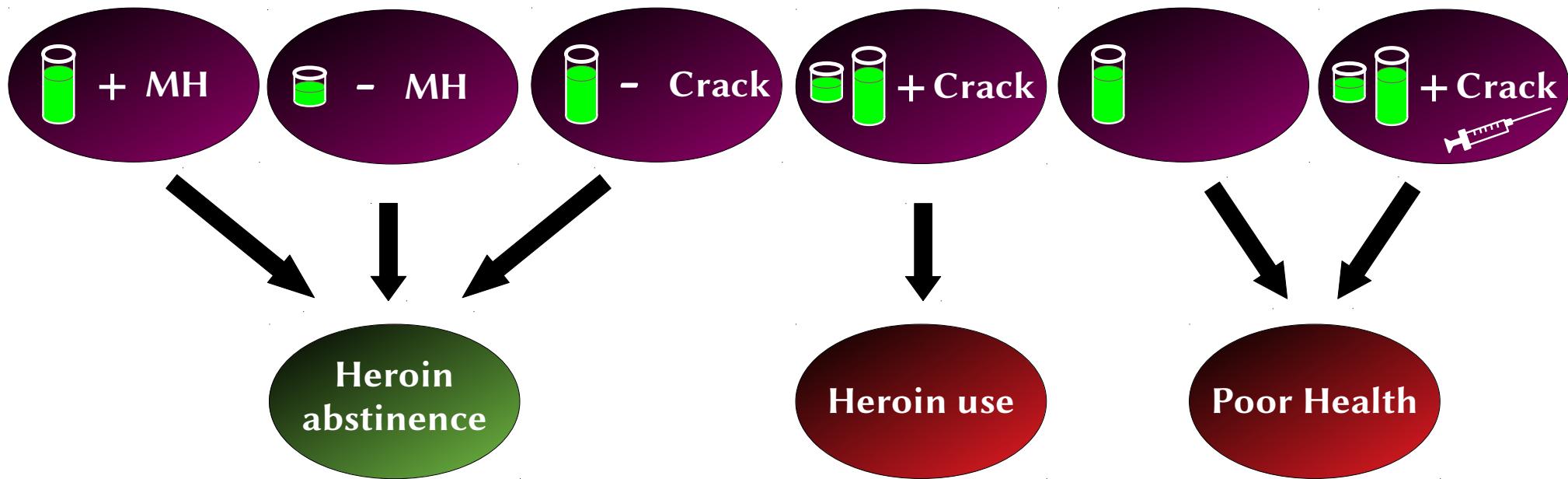
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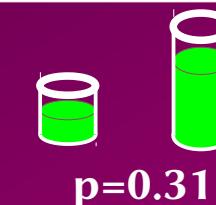
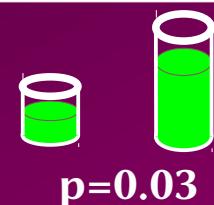
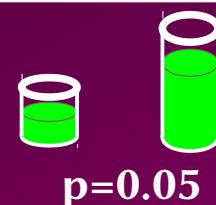
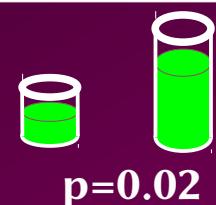
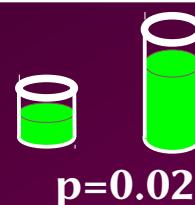
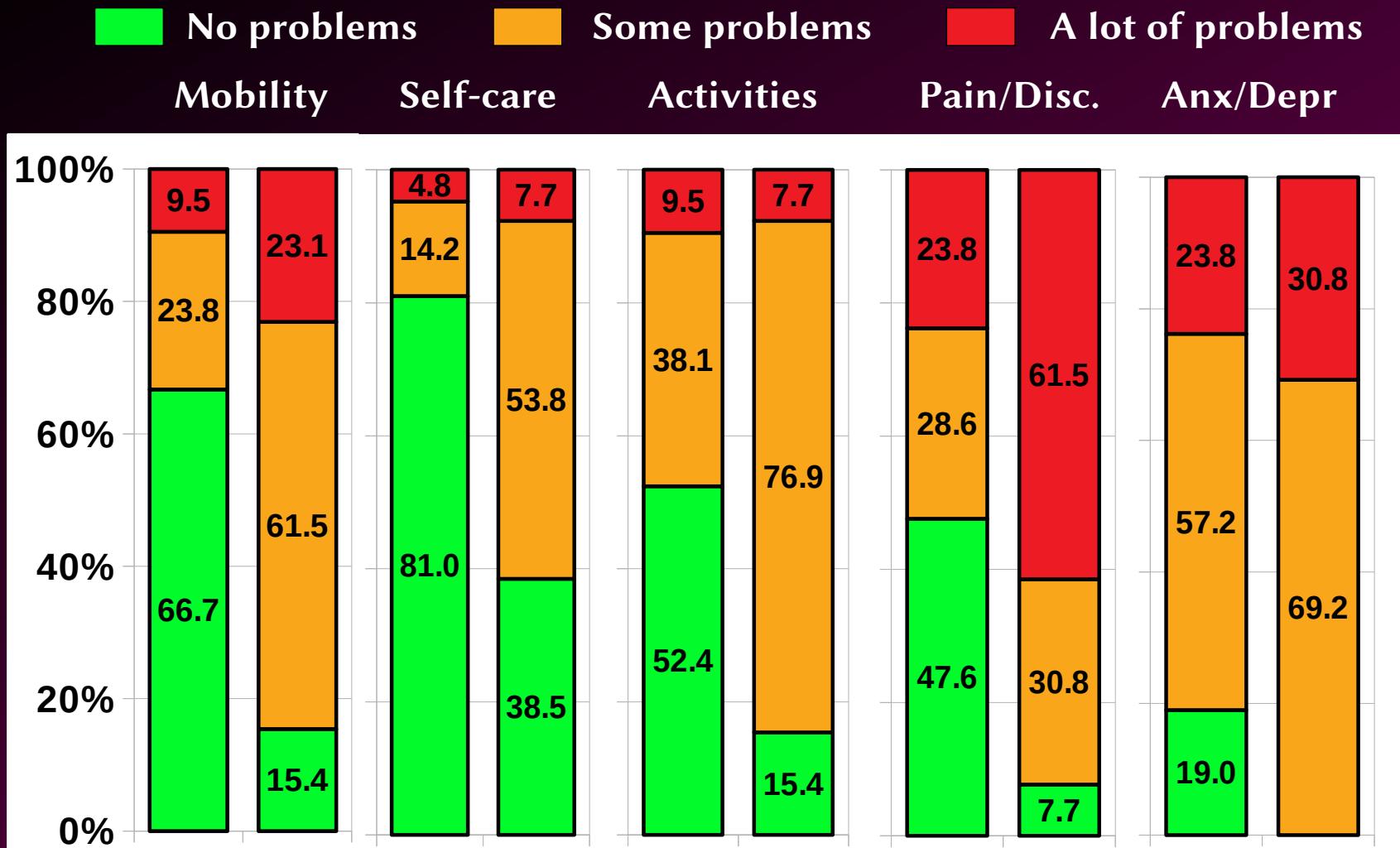


- **Methadone dosage can affect outcomes in different ways**
- **When optimizing methadone dosage it may be important to consider individual differences such as crack use and injecting, and mental health**

In-depth interviews (H+C users)

N=36

# Results – Part 2, N=36 EQ-5D-3L

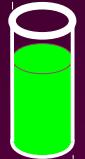


# Results – Part 2, N=36

## Bivariate associations with physical health

|  | p           | OR    | 95% CI for OR |       |
|--|-------------|-------|---------------|-------|
|  |             |       | Lower         | Upper |
| High methadone dose                      | <b>0.05</b> | 4.37  | 1.03          | 18.63 |
| Age                                      | <b>0.03</b> | 1.12  | 1.01          | 1.24  |
| Duration of drug use and treatment       | <b>0.01</b> | 1.16  | 1.03          | 1.29  |
| Duration of methadone treatment          | <b>0.01</b> | 1.16  | 1.04          | 1.29  |
| Duration of crack use                    | 0.49        | 1.02  | 0.96          | 1.10  |
| Duration of heroin use                   | 0.07        | 1.08  | 0.99          | 1.17  |
| Duration of intravenous drug use         | <b>0.02</b> | 1.11  | 1.01          | 1.21  |
| Duration of intravenous drug use on MTD  | <b>0.01</b> | 1.33  | 1.09          | 1.64  |
| Duration of intravenous drug use off MTD | 0.65        | 1.02  | 0.93          | 1.12  |
| Use of high risk injecting sites         | <b>0.00</b> | 10.00 | 2.06          | 48.56 |
| Age of first drug use                    | <b>0.02</b> | 0.82  | 0.69          | 0.97  |
| Injecting technique                      | 0.86        | 1.12  | 0.30          | 4.24  |
| Cardiovascular risk                      | 0.26        | 2.50  | 0.51          | 12.14 |
| Homelessness                             | 0.22        | 0.40  | 0.09          | 1.76  |

## Sample characteristics - Part 2, N=36

|                            |  |  |
|----------------------------|---|---|
| %                          | N=22  | N=14  |
| Frequent OD                | 27  | <b>43</b>   |
| High-risk injecting sites* | 27  | <b>64</b>   |

\* groin, neck

## Results – Part 2

### High risk IV sites and health



| Transition to regular use of high risk site (%) |           |           |
|---|-----------|-----------|
| Never <sup>1</sup>                              | 73        | 36        |
| Before first treatment episode                  | 5         | 0         |
| After or during first maintenance episode       | <b>18</b> | <b>57</b> |
| Could not remember when                         | 4         | 7         |
| Major health event (DVT/stroke) (%)             |           |           |
| Never   | 86        | 50        |
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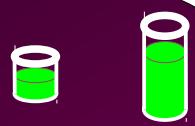
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| Could not remember when                         | 4         | 14        |

Transition to high risk sites and severe health complications took place mainly during or even after first MTD treatment episode

# Results – Part 2, N=36



| Reasons for stopping injecting (%)  |           |           |
|---|-----------|-----------|
| Wanted to improve my health   | <b>62</b> | 18        |
| Can't find veins anymore on low risk site   | 31        | 18        |
| Can't find veins anymore on high risk site  | 15        | 9         |
| Other (specify)   |           |           |
| · Social (e.g. family events they wanted to be fully involved in, children, wanted a different life, relationship with non-IV user) | <b>36</b> | 27        |
| · Overdose event or major IV-related health problem   | 0         | <b>46</b> |
| Switch to heroin smoking (%)  |           |           |
| Never   | 23        | 57        |
| Transition from IV to SM  | <b>77</b> | 43        |

Avg years of MTD treatment: 10.7 15.6

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severe health complication ± no veins at a high-risk site



switch to smoking when no veins at lower-risk sites, high-risk sites = 'no go'

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Not MTD but choices motivated by personal circumstances and beliefs

# Summary

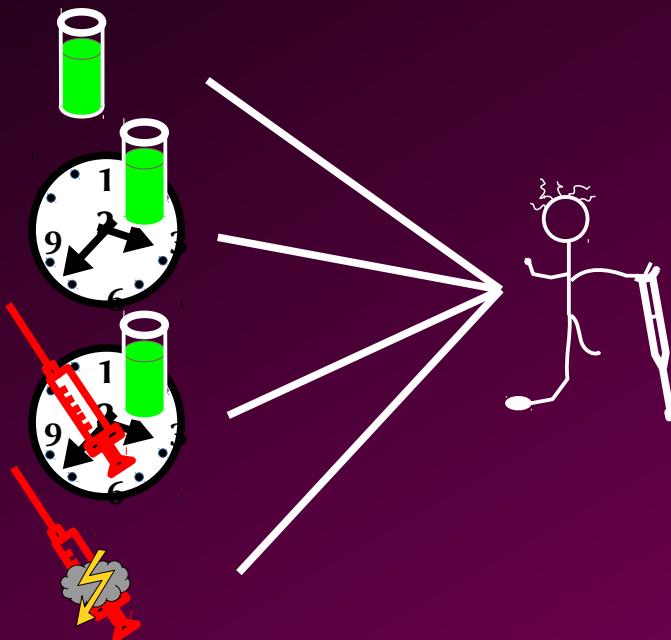
**In a population of users of heroin and crack:**

High MTD dose

Longer times on MTD

Longer IV use on MTD

High-risk IV sites



**Transition to high risk IV sites and severe health complications mainly during or after first MTD maintenance treatment episode**

**Transition from IV to smoking mainly on low MTD dose**

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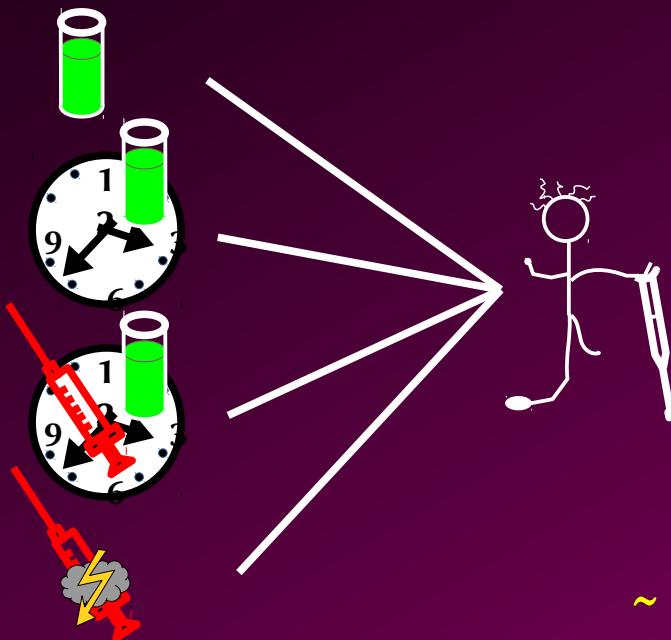
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High MTD dose

Longer times on MTD

Longer IV use on MTD

High-risk IV sites



**36% were 50y+  
~ 60% were 45y+**

**Transition to high risk IV sites and severe health complications  
mainly after or during first MTD maintenance treatment episode**

**Transition from IV to smoking mainly on low MTD dose**

## Possible scenario

MTD

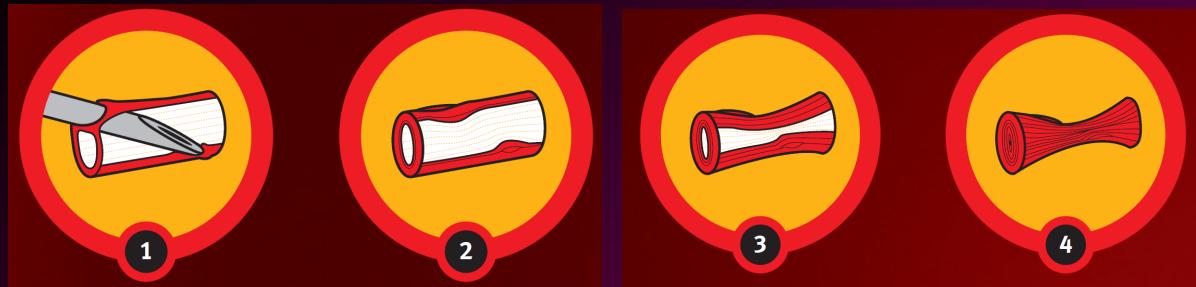
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Vein damage can be a long-term process



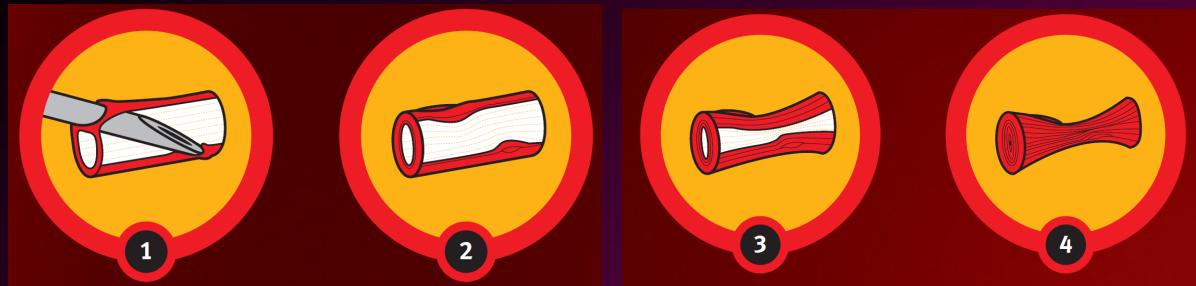
How veins collapse  
[www.exchangesupplies.org](http://www.exchangesupplies.org)

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How veins collapse  
[www.exchangesupplies.org](http://www.exchangesupplies.org)

For people who continue injecting:

MTD minimizes acute IV complications



Doesn't stop chronic vein damage and associated CV events



Why the dose effect?

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MTD stops the withdrawals but does not give people the same 'high'

MTD does not address the cravings for crack or for a *combination* of heroin and crack

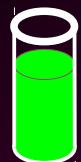
# Why the dose effect?

MTD stops the withdrawals but does not give people the same 'high'

MTD does not address the cravings for crack or for a *combination* of heroin and crack



- lower tolerance
- easier to switch to smoking because smoking → 'high'



- Higher tolerance
- IV use → 'high'  
→ physical health deterioration

## Conclusions

- individual differences might need to be taken into consideration when optimizing methadone dosage
- for dual users, especially when on high dose of methadone, if there is little change in IV, or even progression to high-risk sites:
  - **the risk of overdose needs to be reconsidered**
  - **IV use and crack use need to be addressed to prevent further health deterioration.**

## Final Thoughts

Recent studies that support our findings:

- IV use decrease when MTD + PSI (Wang et al 2014)
- IV on MTD → higher CVR; CVD monitoring (Thylstrup et al 2015)
- higher MTD dose ↔ increased DR deaths in older clients (Gao et al 2016)

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We need more data!

Could treatment monitoring agencies collect data on CVD, injecting sites and transitions, OST dosage → National/European correlates?

# Acknowledgements

- Drs. Francesca and Paola Fanari
- Jean Pender and the Teams in the two London Drug Services
- *Lifeline Project* for partially funding this research
- *Indivior* for sponsoring FH to present this work at EUROPAD

**More on my research:**

Posters P-09 and P-10

[www.lifeinmymind.net](http://www.lifeinmymind.net)