Behaviour Change in tobacco use: theory and practice to help patients stop smoking

Health Psychology Insights Seminar
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Part 1: State of the art in current practice to help people stop smoking

• Why - the need to help smokers stop
• How – current best treatments for smokers
• Where to – novel treatments for cessation

Part 2: Using theory to improve treatment and design new smoking cessation interventions

• COM-B
• Behaviour change wheel
• Behaviour change techniques
Why theories are important

- One can build a simple bridge on the basis of what seems intuitively sensible (an implicit common sense model) and trial and error.

- But to build increasingly better bridges spanning longer distances and carrying heavier loads one needs an incremental technology based on theory.
Tobacco control as ‘behaviour change’

- Tobacco use is a form of behaviour
- The goal is to achieve sustained ‘behaviour change’
  - prevention of tobacco uptake
  - tobacco cessation
  - changes in use of tobacco products
- Models of behaviour change should provide a scientific basis for developing intervention strategies
Models to be considered

- COM-B model of behaviour in context
  - an overarching model of behaviour and what is needed to achieve behaviour change

- The Behaviour Change Wheel
  - A system for developing theory- and evidence-based behaviour change interventions from COM-B

- Taxonomy of Behaviour Change Techniques
  - A tool to identify effective intervention content
COM-B: A simple model to understand behaviour…

- Psychological or physical ability to enact the behaviour
- Reflective and automatic mechanisms that activate or inhibit behaviour
- Physical and social environment that enables the behaviour

Part 2: Identify determinants of behaviour

Reflective

A Polo is £9,790.
Honestly, a Polo is £9,790.
It’s true, a Polo is £9,790.
No really, a Polo is £9,790.
Trust us, a Polo is £9,790.
Look, a Polo is £9,790.
No joke, a Polo is £9,790.
Seriously, a Polo is £9,790.

Automatic

I AM STRIKING. AGILE. THRILLING. BEAUTIFUL.
I AM HERE.

Emotions, impulses...

Evaluations, plans...
The rider and the elephant

• The rider (our self-conscious reasoning processes) has to communicate with and influence the elephant to get anything done

• The elephant (our emotional and impulsive processes) has its own desires which may conflict with those of the rider

Haidt J (2006) The happiness Hypothesis
Part 2

PRIME Theory: reflective and automatic processes

I will try not to smoke

Smoking is bad for me

Reflective

Need a cigarette

Urge to smoke

www.primetheory.com
The ‘Law of Affect’

We **want** things that we imagine will give us **pleasure or satisfaction**

We **need** things that we imagine will give us **relief** from mental or physical discomfort

**At every moment we act in pursuit of what we most want or need at that moment**

**Beliefs** about what is good or bad, and prior **intentions** have to work through momentary wants and needs
Implication of Prime theory

Motivation not to smoke

Motivation to smoke

Once the lines cross, given the opportunity, smoking occurs
Implication of Prime theory

- Nothing qualitatively distinctive about this form of learned behaviour
- Subject to a moment-to-moment balance of motivational forces

The treatment may have **chronic** or **short-term** effects on either or both curves.
Part 2: Identify determinants of behaviour

COM-B: A simple model to understand behaviour…

- Capability
  - Lack of knowledge of how to stop (psychological)
  - Strong drive to smoke overpowering self-control (physical)

- Motivation
  - Lack of concern about health effects (reflective)
  - Liking being a smoker (automatic)

- Opportunity
  - Ability to smoker anywhere (physical)
  - Exposure to prompts to smoke (social)

- Using this model, we can make the ‘behavioural diagnosis’
- This is the starting point for intervention design...

Part 2: Identify appropriate interventions

Going beyond COM-B: The behaviour change wheel

- Synthesis of 19 frameworks to classify interventions (health, environment, culture change and social marketing)

- **Centre**: COM-B model

Michie et al (2011) *Implementation Science, 6, 42*
Part 2: Identify appropriate interventions

Formal analysis of behaviour change interventions

2. Culture capital framework Knott et al. (2008) Framework of knowledge about culture change, offering practical tools for policymaking
3. EPOC taxonomy of interventions Cochrane Effective Practice and Organisation of Care Review Group (EPOC) (2010) Checklist to guide systematic literature reviewers about the types of information to extract from primary studies
4. RURU: Intervention implementation taxonomy Walter et al. (2003) Taxonomy covering a wide range of policy, practice and organisational targets aimed at increasing impact of research
5. MINDSPACE Institute for Government and Cabinet Office (2010) Checklist for policy-makers aimed at changing or shaping behaviour
6. Taxonomy of behaviour change techniques Abraham et al. (2010) Taxonomy of behaviour change techniques grouped by change targets
8. People and places framework Maibach et al. (2007) Framework that explains how communication and marketing can be used to advance public health
10. Injury control framework Geller et al. (1990) Heuristic framework for categorising and evaluating behaviour change strategies aimed at controlling injuries
13. PETeR White (in prep.) Comprehensive and universally applicable model or taxonomy of health
14. DEFRA’s 4E model DEFRA (2008) Process model for policy makers aimed at promoting pro-environmental behaviours in accordance with social marketing principles
15. STD/ HIV framework Cohen and Scribner (2000) Taxonomy to expand the scope of interventions that can be used to prevent STD and HIV transmission
17. Intervention framework for retail pharmacies Goel et al. (1996) Framework that presents factors that may affect retail pharmacy describing and strategies for behaviour change to improve appropriateness of prescribing
Part 2: Identify appropriate interventions

Going beyond COM-B: The behaviour change wheel

- Synthesis of 19 frameworks to classify interventions (health, environment, culture change and social marketing)

- Centre: COM-B model

- Inner ring: Nine intervention functions (what purpose(s) the intervention serves)
Part 2: Identify appropriate interventions

Intervention functions

- Using rules that limit engagement in the target behaviour or competing or supporting behaviour
- Increasing knowledge or understanding
- Using communication to induce positive or negative feelings or stimulate action
- Creating an expectation of reward
- Creating an expectation of punishment or cost
- Changing the physical or social context
- Provide an example for people to aspire to or emulate
- Increasing means or reducing barriers to increase capability or opportunity
- Imparting skills
- Changing the physical or social context
- Education
- Persuasion
- Incentivisation
- Coercion
- Training
- Motivation
- Opportunity
- Capability
- Environment restructuring
- Modelling
- Enablement
Intervention functions

- Education
- Persuasion
- Incentivisation
- Coercion
- Training
- Restriction
- Environmental restructuring
- Modelling
- Enablement

Physical capability
Psychological capability
Physical opportunity
Social opportunity
Automatic motivation
Reflective motivation

Part 2: Identify appropriate interventions
Part 2: Identify appropriate interventions

Going beyond COM-B: The behaviour change wheel

- Synthesis of 19 frameworks to classify interventions (health, environment, culture change and social marketing)

- Centre: COM-B model

- Inner ring: Nine intervention functions (what purpose(s) the intervention serves)

- Outer ring: Seven policy categories
Part 2: Identify appropriate interventions

Policy categories

- Creating documents that recommend or mandate practice. This includes all changes to service provision.
- Designing and/or controlling the physical or social environment.
- Using the tax system to reduce or increase the financial cost.
- Establishing rules or principles of behaviour or practice.
- Delivering a service.
- Creating an expectation of punishment or cost.
- Using print, electronic, telephonic or broadcast media.

Policy categories include:

- Fiscal measures
- Environmental/social planning
- Guideline
- Regulation
- Service provision
- Legislation
- Communication/marketing

Policy areas are categorized into:

- Capability
- Opportunity
- Motivation
Part 2: Identify appropriate interventions

Selecting appropriate policy categories

<table>
<thead>
<tr>
<th>Actions</th>
<th>Education</th>
<th>Persuasion</th>
<th>Incentivisation</th>
<th>Coercion</th>
<th>Training</th>
<th>Restriction</th>
<th>Environ. restructuring</th>
<th>Modelling</th>
<th>Enablement</th>
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<td>Communication/marketing</td>
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<td>Guidelines</td>
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<td>Fiscal measures</td>
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<td>Regulation</td>
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<tr>
<td>Legislation</td>
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<tr>
<td>Environ./Social planning</td>
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<td>Service provision</td>
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Healthy Lives, Healthy People: A Tobacco Control Plan for England
Part 2: Identify effective intervention content

Populating the content of interventions: Behaviour change techniques (BCTs)

• The problem:
  – Variable terminology
  – Under-reporting of content
  – Therefore can’t understand mechanisms, replicate effective interventions or implement these

• The solution
  – Agreed standard method for intervention description
  – Periodic Table’ or ‘Encyclopaedia’ of BCTs, each described using consistent terminology + clear labels → provides a common language
  – Criteria for operationalisation
  – Organised hierarchically
BCT labels and definitions

• Definition:
  – Active ingredient of intervention aiming to change behaviour
  – Observable, replicable with measurable effect on behaviour
  – Smallest unit with potential to bring about behaviour change

• Should be ...
  – short enough to easily recall and recognise
  – as specific as possible to increase reliability
  – distinct from each other
An early reliable taxonomy to change frequently used behaviours

1. General information
2. Information on consequences
3. Information about approval
4. Prompt intention formation
5. Specific goal setting
6. Graded tasks
7. Barrier identification
8. Behavioural contract
9. Review goals
10. Provide instruction
11. Model/demonstrate
12. Prompt practice
13. Prompt monitoring
14. Provide feedback

15. General encouragement
16. Contingent rewards
17. Teach to use cues
18. Follow up prompts
19. Social comparison
20. Social support/change
21. Role model
22. Prompt self talk
23. Relapse prevention
24. Stress management
25. Motivational interviewing
26. Time management

The person is asked to keep a record of specified behaviour/s. This could e.g. take the form of a diary or completing a questionnaire about their behaviour.

Abraham & Michie, 2008
Further development

• Smoking cessation: 53 BCTs
  Michie et al, Annals behavioural Medicine, 2010
• Physical activity & healthy eating: 40 BCTs
  Michie et al, Psychology & Health, 2011
• Reducing excessive alcohol use: 42 BCTs
  Michie et al, Addiction, 2012
• General behaviour change: 137 BCTs
• Health Behaviour Change Competency Framework: 98 BCTs
  Dixon & Johnston, NHS Health Scotland, 2010
• Sexual behavior: 47 BCTs
  Abraham et al, Psychology & Health, 2011
BCT Taxonomy v1

- Development work 2011-2012:
  - Synthesised 6 published BCT taxonomies
  - Delphi exercise: 14 experts
  - International Advisory Board input: 16 experts
  - Pilot coding and user testing: 6 experts
  - Grouping exercise: 18 experts
  - Total: 54 experts
- 93 BCTs, 16 groupings
  - with labels, definitions and examples

Michie et al. (2013)
<table>
<thead>
<tr>
<th>No.</th>
<th>Label</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material reward</td>
<td>Arrange for the delivery of money, vouchers or other valued objects if and only if there has been effort and/or progress made towards performing the behaviour.</td>
<td>Note: if reward is unspecified, code Non-specific reward.</td>
</tr>
<tr>
<td>2</td>
<td>Information about health consequences</td>
<td>Provide information about health consequences of performing the behaviour.</td>
<td>Explain that not finishing a course of antibiotics can increase susceptibility to future infection. Present the likelihood of contracting a sexually transmitted infection following unprotected sexual behaviour.</td>
</tr>
<tr>
<td>5</td>
<td>Demonstration of the behaviour</td>
<td>Provide an example of the successful performance of the behaviour for the person to aspire to or imitate (includes &quot;Modelling&quot;).</td>
<td>During a training session, demonstrate to nurses how to raise the issue of excessive drinking with patients.</td>
</tr>
<tr>
<td>6</td>
<td>Feedback on behaviour</td>
<td>Provide feedback on performance of the behaviour (e.g. form, frequency, duration, intensity).</td>
<td>Inform participants of how many steps they walked each day (as recorded on an accelerometer) or how many calories they ate each day (based on a food consumption questionnaire).</td>
</tr>
</tbody>
</table>
Applying BCT Taxonomies to identify + characterise BCTs in intervention descriptions:

‘The goal of the intervention is to adopt and maintain a healthier lifestyle, with regard to physical activity. In the intervention, participants will receive £5 for every kilo lost.’

**BCT: Material Reward**

‘Consultants watched a video demonstration showing how to resuscitate a child’

**BCT: Demonstration of the Behaviour**
## Linking BCW intervention functions to BCTs

<table>
<thead>
<tr>
<th>Intervention function</th>
<th>Frequently used BCTs (as identified in Abraham et al. Testing the identification of behavior change techniques (BCTs) defined by the “BCT Taxonomy version 1” (BCTv1) in intervention descriptions. <em>In preparation</em>)</th>
</tr>
</thead>
</table>
| **Incentivisation**   | Feedback on behaviour  
Feedback on outcome(s) of behaviour  
Monitoring of behaviour by others without evidence of feedback  
Monitoring outcome of behaviour by others without evidence of feedback  
Self-monitoring of behaviour |
| **Coercion**          | Feedback on behaviour  
Feedback on outcome(s) of behaviour  
Monitoring of behaviour by others without evidence of feedback  
Monitoring outcome of behaviour by others without evidence of feedback  
Self-monitoring of behaviour |
Part 2: Putting it all together

Take home messages....

1. What behaviour are you trying to change and in what way?
   Selecting and specifying a target behaviour

2. What will it take to bring about the desired change?
   COM-B model

3. What types of intervention are likely to bring about the desired change?
   Behaviour Change Wheel

4. What should be the specific intervention content?
   Behaviour Change Techniques Taxonomy (v1)
Part 2: Identify effective intervention content

Using BCT definition to find out what works and what doesn’t

If delivering the same intervention (beh support +med), shown to be effective in research trials, then why so much variation in outcomes? 0%-59%?
Using BCT definition to find out what works and what doesn’t

- 43 services provided treatment manuals and data coded for number of times mentioned each of a number of BCTs
- likelihood of a smoker achieving 4-week CO-verified abstinence as recorded by the service was predicted by exposure to each of the BCTs using logistic regression
- N=177,064 smokers
### Part 2: Identify effective intervention content

Using BCT definition to find out what works and what doesn’t

<table>
<thead>
<tr>
<th>BCT</th>
<th>Prevalence of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Strengthen ex-smoker identity</td>
<td>37</td>
</tr>
<tr>
<td>2. Elicit client views</td>
<td>88</td>
</tr>
<tr>
<td>3. Measure CO</td>
<td>95</td>
</tr>
<tr>
<td>4. Give options for additional and later support</td>
<td>77</td>
</tr>
<tr>
<td>5. Provide rewards contingent on successfully stopping smoking</td>
<td>67</td>
</tr>
<tr>
<td>6. Advise on changing routine</td>
<td>23</td>
</tr>
<tr>
<td>7. Facilitate relapse prevention and coping</td>
<td>86</td>
</tr>
<tr>
<td>8. Ask about experiences of stop smoking medication that the smoker is using</td>
<td>86</td>
</tr>
<tr>
<td>9. Advise on stop smoking medication</td>
<td>98</td>
</tr>
</tbody>
</table>

West et al. 2010
Getting GPs to deliver brief smoking cessation interventions

• Behavioural target
  – increase the rate at which GPs offer cessation support to smokers from 25% to 50%

• COM-B analysis
  – C: uncertainty about how to do it without embarrassment in the time available; ignorance of available options for support
  – O: limited time; lack of salient cues; limited access to high quality support
  – M: belief that it is a good thing but limited desire because not rewarded and often mildly punished
# Getting GPs to deliver brief smoking cessation interventions

<table>
<thead>
<tr>
<th>Intervention Function</th>
<th>Policy Category</th>
<th>BCT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Training</strong> on how to deliver advice quickly without embarrassment</td>
<td>Service Provision</td>
<td>Demonstration of behaviour Behavioural practice/rehearsal etc.</td>
</tr>
<tr>
<td><strong>Education</strong> on the best methods of brief advice and the benefits</td>
<td>Regulation</td>
<td>Feedback on behaviour; Feedback on outcome(s) of the behaviour</td>
</tr>
<tr>
<td><strong>Environmental restructuring:</strong> provide salient prompts e.g. desktop post-it pads</td>
<td>Environ./ Social planning</td>
<td>Adding objects to the environment Prompts/cues</td>
</tr>
<tr>
<td><strong>Incentivisation:</strong> QOF payments linked to objective evidence of offer of support</td>
<td>Legislation</td>
<td>Reward alternative behaviour Material incentive (outcome)</td>
</tr>
<tr>
<td><strong>Modelling:</strong> show examples that GPs can identify with</td>
<td>Communication / Marketing</td>
<td>Persuasive source Framing/reframing</td>
</tr>
</tbody>
</table>
Conclusions

Progress

• Need an overarching model of behaviour change to develop an ‘incremental technology’

• COM-B and BCW provide a possible approach – but only a small first step
  – prompts consideration of the full range of options
  – provides a basis for analysing behaviour in context to select an appropriate mix of options
  – takes account of environmental/external as well as individual/internal changes that may be needed

• Specific evidence of the behaviour in question is then needed to examine priorities and details of the intervention based on BCTs
Progress, but ... 

- Construction of further BCTs is still required as list remains incomplete
- Different taxonomies developing  
  - Adding confusion  
  - Need for consensus
- Need for structure to make lists easier to use
- More data required to verify utility of approach
• BCW Guide to intervention design (Spring 2014)

• UCL Centre for Behaviour Change
  
  @UCLbehavechange or email behaviourchange@ucl.ac.uk

• BCT Taxonomy (v1) online training (May 2014)