**Additional File 1. The mapping of: Behaviour Change Wheel [1], EPOC categories [2], Leeman taxonomy [3] and behaviour change techniques [4].**

|  | **Behaviour Change Wheel [1]** *Intervention function 1-9/ Policy category 10-16* | **EPOC category [2]** | **Leeman taxonomy [3]** | **Behaviour change techniques [4]** |
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| 1 | Education:*Increasing knowledge or understanding* | 2.1.1 *Professional interventions*a) Distribution of educational materials (Distribution of published or printed recommendations for clinical care, including clinical practice guidelines, audio-visual materials and electronic publications. The materials may have been delivered personally or through mass mailings.)b) Educational meetings (Health care providers who have participated in conferences, lectures, workshops or traineeships.)d) Educational outreach visits (Use of a trained person who met with providers in their practice settings to give information with the intent of changing the provider’s practice. The information given may have included feedback on the performance of the provider(s). | EducationRaising awareness | Feedback on the behaviourFeedback on the outcome(s) of the behaviourBiofeedbackSelf-monitoring of behaviourSelf-monitoring of outcome of behaviourCue signaling rewardSatiationPrompts/cueInformation about antecedentsRe-attributionBehavioural experimentsInformation about social and environmental consequencesInformation about health consequencesInformation about emotional consequencesInformation about others’ approval |
| 2 | Persuasion: *Using communication to induce positive or negative feelings or stimulate action* | 2.1.1 *Professional interventions*c) Local consensus processes (Inclusion of participating providers in discussion to ensure that they agreed that the chosen clinical problem was important and the approach to managing the problem was appropriate.)e) Local opinion leaders (Use of providers nominated by their colleagues as ‘educationally influential’. The investigators must have explicitly stated that their colleagues identified the opinion leaders.) | Persuasion via interpersonal channels & via reinforcing beliefsOpinion leader | Feedback on the behaviourFeedback on the outcome(s) of the behaviourBiofeedbackRe-attributionFocus on past successVerbal persuasion about capabilityPersuasive sourceFraming/reframingIdentity associated with changed behaviourIdentification of self as role modelInformation about social and environmental consequencesInformation about health consequencesInformation about emotional consequencesSalience of consequencesInformation about others’ approvalSocial comparison |
| 3 | Incentivisation: *Creating expectation of reward* | 2.1.2 *Financial interventions*2.1.2.1 *Provider interventions*a) Fee-for-service (provider has been paid for number and type of service delivered)b) Prepaid (no other description)c) Capitation (provider was paid a set amount per patient for providingspecific care)d) Provider salaried service (provider received basic salary for providingspecific care)e) Prospective payment (provider was paid a fixed amount for health care inadvance)f) Provider incentives (provider received direct or indirect financial reward or benefit for doing specific action)g) Institution incentives (institution or group of providers received direct or indirect financial rewards or benefits for doing specific action)h) Provider grant/allowance (provider received direct or indirect financial reward or benefit not tied to specific action)i) Institution grant/allowance (institution or group of providers receiveddirect or indirect financial reward or benefit not tied to specific action)l) Formulary (added to reimbursable available products) | Financial incentivesReinforcing expectations of positive outcomes | Paradoxical instructionsFeedback on the behaviourFeedback on the outcome(s) of the behaviourBiofeedbackSelf-monitoring of behaviourSelf-monitoring of outcome of behaviourMonitoring of behaviour by others without evidence of feedbackMonitoring outcome of behaviour by others without evidence of feedbackCue signalling rewardRemove aversive stimulusReward approximationRewarding completionSituation-specify rewardReward incompatible behaviourReduce reward frequencyReward alternate behaviourRemove punishmentSocial rewardMaterial rewardMaterial reward (outcome)Self-rewardNon-specific rewardIncentiveBehavioural contractCommitmentDiscrepancy between current behaviour and goalImaginary reward |
| 4 | Coercion: *Creating expectation of punishment or cost* | 2.1.2 *Financial interventions*2.1.2.1 *Provider interventions*j) Provider penalty (provider received direct or indirect financial penalty forinappropriate behaviour)k) Institution penalty (institution or group of providers received direct or indirect financial penalty for inappropriate behaviour)l) Formulary (removed from reimbursable available products) |  | Feedback on the behaviourFeedback on the outcome(s) of the behaviourBiofeedbackSelf-monitoring of behaviourSelf-monitoring of outcome of behaviourMonitoring of behaviour by others without evidence of feedbackMonitoring outcome of behaviour by others without evidence of feedbackRemove access to the rewardPunishmentBehaviour costRemove rewardFuture punishmentBehavioural contractCommitmentDiscrepancy between current behaviour and goalIncompatible beliefsAnticipated regretImaginary punishment |
| 5 | Training: *Imparting skills* |  |  |  |
| 6 | Restriction: *Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)* |  |  |  |
| 7 | Environmental restructuring: *Changing the physical or social context* | 2.1.3.3 *Structural interventions*a) Changes to the setting/site of service delivery (e.g. moving a family planning service from a hospital to a school)b) Changes in physical structure, facilities and equipment (e.g change of location of nursing stations, inclusion of equipment where technology in question is used in a wide range of problems and is not disease specific, for example an MRI scanner.)c) Changes in medical records systems (e.g. changing from paper to computerised records, patient tracking systems)2.1.1 *Professional interventions*h) Reminders (Patient or encounter specific information, provided verbally, on paper or on a computer screen, which is designed or intended to prompt a health professional to recall information. This would usually be encountered through their general education; in the medical records or through interactions with peers, and so remind them to perform or avoidsome action to aid individual patient care. Computer aided decisionsupport and drugs dosage are included.) | Modified medical record systemEnvironment-al changeChanges to the work environmentReminder systemsInterpersonal networks and communica-tion | Cue signalling rewardRemove access to the rewardRemove aversive stimulusSatiationExposureAssociative learningReduce prompt/cuePrompts/cueAdding objects to the environmentRestructuring the physical environmentRestructuring the social environment |
| 8 | Modelling: *Providing an example for people to aspire to or imitate* |  | Opinion leader |  |
| 9 | Enablement: *Increasing means/reducing barriers to increase capability or opportunity (beyond education, training and environmental restructuring)* | 2.1.1 *Professional interventions*f) Patient mediated interventions (New clinical information (not previously available) collected directly from patients and given to the provider e.g. depression scores from an instrument.)g) Audit and feedback (Any summary of clinical performance of health care over a specified period of time. The summary may also have included recommendations for clinical action. The information may have been obtained from medical records, computerised databases, or observations from patients.)h) Reminders (Patient or encounter specific information, provided verbally, on paper or on a computer screen, which is designed or intended to prompt a health professional to recall information. This would usually be encountered through their general education; in the medical records or through interactions with peers, and so remind them to perform or avoidsome action to aid individual patient care. Computer aided decisionsupport and drugs dosage are included.)2.1.2 *Financial interventions*2.1.2.2 *Patient interventions*a) Premium (Patient payment for health insurance. It is important to determine if the patient paid the entire premium, or if the patient’semployer paid some of it. This includes different types of insurance plans.)b) Co-payment (Patient payment at the time of health care delivery in addition to health insurance e.g. in many insurance plans that cover prescription medications the patient may pay 5 dollars per prescription, with the rest covered by insurance.)c) User-fee (Patient payment at the time of health care delivery.)d) Patient incentives (Patient received direct or indirect financial reward or benefit for doing or encouraging them to do specific action.)e) Patient grant/allowance (Patient received direct or indirect financial reward or benefit not tied to specific action.)f) Patient penalty (Patient received direct or indirect financial penalty for specified behaviour e.g. reimbursement limits on prescriptions.)2.1.3 *Organisational interventions*2.1.3.2 *Patient orientated interventions*a) Mail order pharmacies (e.g. compared to traditional pharmacies)b) Presence and functioning of adequate mechanisms for dealing with patients’ suggestions and complaintsc) Consumer participation in governance of health care organisation | External change agentGuidance from managerAudit and feedbackPerformance evaluationsWorkgroup develops changeReminder systemsWorkgroup oversightPilot testingDesignation of a change leader | Social support (unspecified)Social support (practical)Social support (emotional)Reduce negative emotionsConserve mental resourcesPharmacological supportSelf-monitoring of behaviourSelf-monitoring of outcome of behaviourBehaviour substitutionOvercorrectionGeneralisation of a target behaviourGraded tasksAvoidance/reducing exposure to cues for the behaviourAdding objects to the environmentRestructuring the physical environmentRestructuring the social environmentDistractionBody changesBehavioural experimentsMental rehearsal of successful performanceFocus on past successSelf-talkVerbal persuasion about capabilitySelf-rewardGoal setting (behaviour)Goal setting (outcome)Behavioural contractCommitmentAction planningReview behaviour goal(s)Review outcome goal(s)Discrepancy between current behaviour and goalProblem solvingPros and consComparative imagining of future outcomesValued self-identityFraming/reframingIncompatible beliefsIdentity associated with changed behaviourIdentification of self as role modelSalience of consequencesMonitoring of emotional consequencesAnticipated regretImaginary punishmentImaginary rewardVicarious consequences |
| 10 | Communication/marketing: *Using print, electronic, telephonic or broadcast media* | i) Marketing (Use of personal interviewing, group discussion (‘focus groups’), or a survey of targeted providers to identify barriers to change and subsequent design of an intervention that addresses identified barriers.)j) Mass media ((i) varied use of communication that reached great numbers of people including television, radio, newspapers, posters, leaflets, and booklets, alone or in conjunction with other interventions; (ii) targeted at the population level.) |  | See map of policy category to intervention functions  |
| 11 | Guidelines: *Creating documents that recommend or mandate practice. This includes all changes to service provision* |  |  |  |
| 12 | Fiscal: *Using the tax system to reduce or increase the financial cost* |  |  |  |
| 13 | Regulation: *Establishing rules or principles of behaviour or practice* | 2.1.4 *Regulatory interventions*Any intervention that aims to change health services delivery or costs by regulation or law. (These interventions may overlap with organisational and financial interventions.)a) Changes in medical liabilityb) Management of patient complaintsc) Peer reviewd) Licensure |  | See map of policy category to intervention functions |
| 14 | Legislation: *Making or changing laws* |  |  |  |
| 15 | Environmental/ social planning: *Designing and/or controlling the physical or social environment* |  |  |  |
| 16 | Service provision: *Delivering a service* | 2.1.3.3 *Structural interventions*d) Changes in scope and nature of benefits and servicese) Presence and organisation of quality monitoring mechanismsf) Ownership, accreditation, and affiliation status of hospitals and other facilitiesg) Staff organisation2.1.3.1 *Provider orientated interventions*a) Revision of professional roles (Also known as ‘professional substitution’, ‘boundary encroachment’ and includes the shifting of roles among health professionals. For example, nurse midwives providing obstetrical care; pharmacists providing drug counselling that was formerly provided by nurses and physicians; nutritionists providing nursing care; physical therapists providing nursing care. Also includes expansion of role to include new tasks.)b) Clinical multidisciplinary teams (creation of a new team of healthprofessionals of different disciplines or additions of new members to the team who work together to care for patients)c) Formal integration of services (bringing together of services across sectors or teams or the organisation of services to bring all services together at one time also sometimes called ‘seamless care’)d) Skill mix changes (changes in numbers, types or qualifications of staff)e) Continuity of care (including one or many episodes of care for inpatients or outpatients)• Arrangements for follow-up.• Case management (including co-ordination of assessment, treatment and arrangement for referrals)g) Communication and case discussion between distant health professionals (e.g. telephone links; telemedicine; there is a television/video link between specialist and remote nurse practitioners) | Centralised care management | See map of policy category to intervention functions |

\*The following were excluded because an outcome rather than an intervention: EPOC category: f) Satisfaction of providers with the conditions of work and the material and psychic rewards (e.g. interventions to ‘boost morale’)

Reference List

 1. Michie S, van Stralen MM, West R: **The behaviour change wheel: A new method for characterising and designing behaviour change interventions.** *Implement Sci* 2011, **6:** 42.

 2. Cochrane Effective Practice and Organisation of Care Group. **EPOC resources for review authors.** http://epoc.cochrane.org/ . 2010.

 3. Leeman J, Baernholdt M, Sandelowski M: **Developing a theory-based taxonomy of methods for implementing change in practice.** *J Adv Nurs* 2007, **58:** 191-200.

 4. Michie S, Richardson M, Johnston M, Abraham C, Francis JJ, Hardeman W *et al*.: **The Behavior Change Technique Taxonomy (v1) of 93 hierarchically-clustered techniques: building an international consensus for the reporting of behavior change interventions.**  *Ann Behav Med*  2013, **46:** 81-95.