

Methods of Intervention at Individual and Small Group Levels

Effective Strategies and Delivery Approaches to Changing Diet and Activity for Weight Control

Deborah F. Tate, Ph.D., M.S.
 University of North Carolina at Chapel Hill
 Associate Professor, Departments of Health Behavior and Nutrition
 Director, Communication for Health Applications and Interventions Core
 Lineberger Comprehensive Cancer Center
 Nutrition Obesity Research Center

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Comprehensive lifestyle interventions consisting of diet, physical activity and behavior therapy produce 8 kg weight loss in 6 months with frequent in person treatment

Section 3.4.2. p 37

2013 AHA/ACC/TOS Guidelines for Management of Overweight and Obesity in Adults (Jensen MD et al., Circulation, 2013)

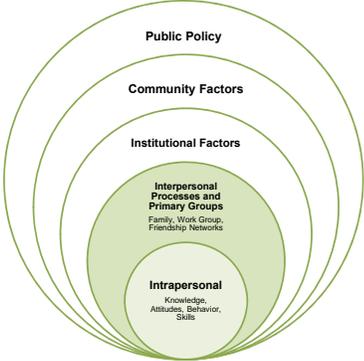
Requests for Presentation

- 1) Theoretical models or behavior change techniques for Weight Control Interventions
- 2) Factors Impacting Efficacy of Face to Face Weight Management Interventions
 - format, where, who delivers
- 3) Evidence for Alternatives to Face to Face Delivery Modes
 - channels and factors impacting efficacy

THEORETICAL MODELS OR TECHNIQUES FOR WEIGHT LOSS INTERVENTIONS

Theories and Models

Social Ecological Model of Health Promotion (McLeroy et al., 1988)



Theories Underlying Interventions Aimed at Changing Individuals

Therapeutic Approaches and Theories
Behavior Modification (Beh) Classical Conditioning Operant Conditioning
Cognitive Behavioral Therapy (CBT) Cognitive Theories Social Cognitive Theory/Social Learning Theory
Trans-Theoretical Model (TTM)
Self-Determination Theory (SDT)/ Motivation/Focused

Evidence for Approaches

Therapeutic Approaches and Theories	Summary
Behavioral & CBT combined with Diet and Exercise Classical Conditioning Operant Conditioning Cognitive Theories Social Cognitive Theory	<ul style="list-style-type: none"> • Most commonly used approach • Foundation of DPP and Look Ahead • Strong evidence <ul style="list-style-type: none"> • Cochrane Review (Shaw et al. 2005), others • Consistent findings in Spahn et al Systematic Review 2010 for nutrition counseling
Trans-Theoretical Model (TTM)	<ul style="list-style-type: none"> • Insufficient evidence for effects on weight loss (Cochrane Review (Mastellos et al. 2014))
Motivation Focused Approaches Self-Determination Theory (SDT)	<ul style="list-style-type: none"> • Often combined with Bmod/CBT approaches • Evidence for combined effects vs. controls <ul style="list-style-type: none"> • Systematic Review (Armstrong et al., 2011) • Few comparisons of additive value (West et al, 2007)

Behavioral/CBT is effective

Components

Uses structured curriculum and variety of behavioral and cognitive behavioral techniques to achieve goals

- Dietary modification for calorie reduction
- Exercise goals for increased expenditure
- Self-monitoring
- Other Techniques:
 - Stimulus Control
 - Goal Setting
 - Problem Solving
 - Relapse prevention
 - Cognitive Restructuring
 - Motivation enhancement
- Weight Management Counseling Support

Newer in Field to Focus on Behavior Change Techniques



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A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy

Susan Michie^{1*}, Stefanie Ashford², Falko F. Sniehotta³, Stephan U. Dombrowski⁴, Alex Bolder⁵ and David P. French⁶

¹Department of Clinical, Educational and Health Psychology, University College London, Gower Street, London WC1E 6BT, UK; ²Applied Research Centre in Health and Lifestyle Interventions, Coventry University, Priory Street, Coventry CV1 1PR, UK; ³Centre for Population Research in Public Health, Institute of Health and Society, Medical Faculty, Newcastle University, Newcastle Road, Newcastle, NE2 4AX, UK; ⁴Health Services Research Unit, University of Aberdeen, Aberdeen, Aberdeen AB27 2ZD, UK

(Received 26 April 2010; final version received 28 September 2010)

Background: Current reporting of intervention content in published research articles and protocols is generally poor, with great diversity of terminology, resulting in low replicability. This study aimed to extend the scope and improve the reliability of a 26-item taxonomy of behaviour change techniques developed by Abraham and Michie (Michie, C. and Michie, S. (2005). A taxonomy of behaviour change techniques used in interventions. *Health Psychology*, 24(3), 279-287) in order to improve the reporting and scientific study of behaviour change interventions. **Methods:** Three UK study centres collaborated to explore the existing taxonomy to two systematic reviews of interventions to increase physical activity and

The Behavior Change Technique Taxonomy (v1) of 43 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions

Susan Michie, PhD, (Psychol); Michie, Richard, PhD; Mark Johnson, PhD, (Psychol); Charles Abraham, PhD, (Psychol); Jill Francis, PhD, (Psychol); Wendy Richardson, PhD; Victoria F. Garcia, PhD; James Cook, PhD; Graham E. Ward, PhD

November 2013, Volume 10(1)

Abstract
Background (CONSORT) guidelines call for precise reporting of behavior change interventions in trial reports. The method of describing active content of interventions will prevent and quantify...
Objectives: The objectives of this study is to develop an...
If the 26 BCCTs requiring a best fit score, 27 had also...

What are behavior change techniques?

- Are operationally defined aspects of the content of the intervention (what is actually “done” in the intervention to change behavior)
- Individual techniques are linked to theory/theories
- Examples:

Provide information on behavior-health link, Provide information on consequences, Provide information about others' approval, Prompt intention formation, Prompt barrier identification, Provide general encouragement, Set graded tasks, Provide instruction, Model/demonstrate the behavior, Prompt specific goal setting, Prompt review of behavioral goals, Prompt self-monitoring of behavior,	Provide feedback on performance, Provide contingent rewards, Teach to use prompts/signals, Agree 2 behavioral contract, Prompt practice, Use of follow up prompts, Provide opportunities for social comparison, Plan social support/social change, Prompt identification as role model/position advocate, Prompt self talk, Relapse prevention, Stress management Motivational interviewing, Time management
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Michie, Abraham, et al., Health Psychology, 2009

Effective Techniques

- Few RCTs isolating specific techniques; more commonly a package of techniques form the intervention that is studied
- Meta-regression across 122 studies (Michie et al. 2009)
 - Average # of techniques in treatment package reported = 6 (sd 3)
 - Interventions focused on self-monitoring more effective
 - “In conclusion, our analyses offer clear support for including self-monitoring of behavior.. as well as...”
 - prompting intention formation,
 - prompting specific goal setting,
 - providing feedback on performance, and
 - prompting review of behavioral goals

FACTORS IMPACTING EFFICACY OF FACE TO FACE WEIGHT MANAGEMENT INTERVENTIONS

Key Components of a Comprehensive Lifestyle Modification Program to Achieve a 7% to 10% Weight Loss

*In addition to Diet and Activity Prescriptions

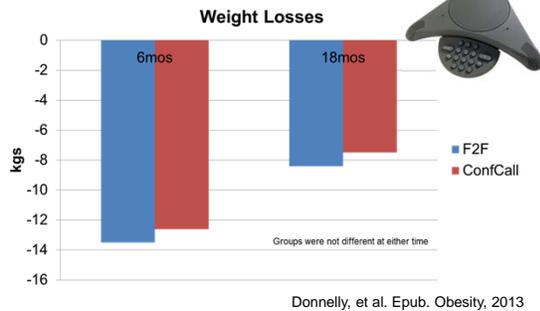
Components in Addition to Diet and Activity Prescription	For Weight Loss
Frequency and duration of treatment contact	Weekly contact, in person or by telephone, for 20-26 wk. (Internet/e-mail contact yields smaller weight loss.) Group or individual contact.
Behavior therapy prescript on	Daily monitoring of food intake and physical activity by use of paper or electronic diaries. Weekly monitoring of weight. Structured curriculum of behavior change (eg, Diabetes Prevention Program). Regular feedback from an interventionist.

Adapted from Table 2: Wadden, et al. Circulation. 2012;125:1157-70.

Format: Individual vs. Group F2F

- Strong evidence for both approaches
 - Diabetes Prevention Program – Individual
 - Look Ahead – Combination (3 group, 1 individual per month)
- RCT comparing individual vs. group –
 - Group greater WL; no effect of matching to participant preference on outcome
 - » Renjilian, Perri et al. 2001

Group F2F v. Group Conference Calls Results



Intensive Contact is More Effective

Obesity Guidelines 2013: Best Results

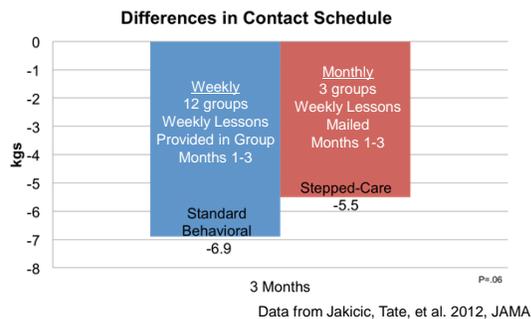
- >14 sessions in 6 months
- Greater WL than moderate-low intensity

- Moderate intensity:
 - 1-2 sessions per month
 - Better than usual care
 - WL of ~ 2-4 kg

- Low Intensity
 - Fewer than monthly
 - Not better than usual care

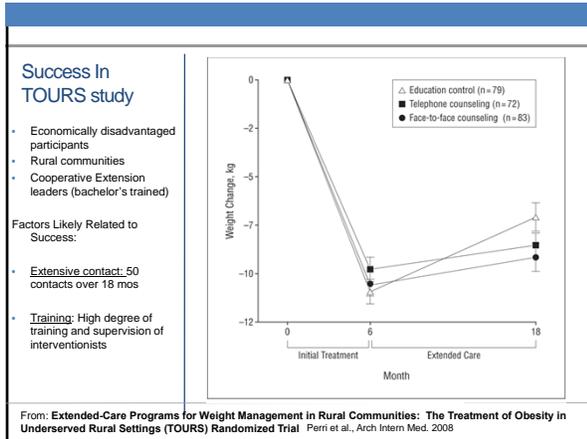
2013 AHA/ACC/TOS Guidelines for Management of Overweight and Obesity in Adults (Jensen MD et al., Circulation, 2013)

3 month weight loss

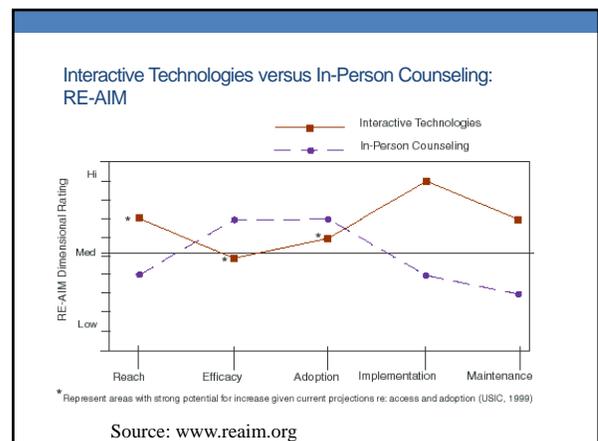
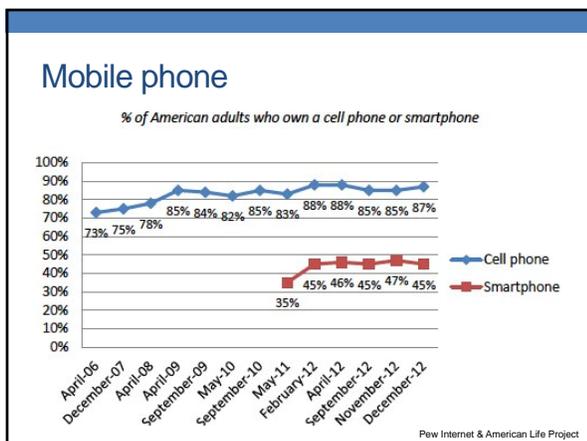
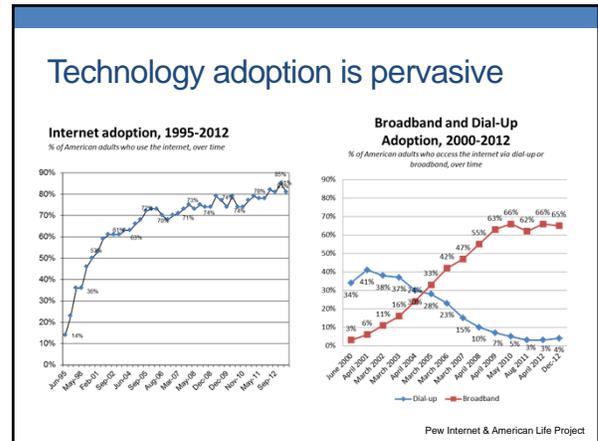


Results in Community Settings: Changes in Setting, Contact or Interventionist?

- Attenuated effects vs. clinical trial results
 - Review of 28 US based studies translating DPP into community or "real world" settings: Average weight loss 4-5%
 - (Mohammed, et al., Health Affairs, 2012)
- May reflect numerous changes:
 - participants recruited (often more diverse),
 - reduced contact to be feasible for setting constraints and to be more cost efficient, or
 - Loss of fidelity? Training or supervision of interventionists?



EVIDENCE FOR ALTERNATIVES TO FACE TO FACE DELIVERY MODES



Internet with Group Chat Treatment vs. In person

RESULTS:
In person weight losses are ~2 kg > than Internet

Table 2

Mean Weight Loss from Baseline to 6 months with Observed Data and Intent-to-Treat

	Observed Data				Baseline Carried Forward			
	Internet (n=190)	In-Person (n=190)	Hybrid (n=152)	p-value	Internet (n=164)	In-Person (n=158)	Hybrid (n=164)	p-value
Weight Loss (kg; mean(SD))	-5.5(5.4)	-8.0(6.4)	-8.0(5.3)	<0.01	-5.5(5.4)	-7.6(6.2)	-5.7(5.4)	<0.01
Percent weight lost (intent-to-treat)	-5.8(5.4)	-8.3(6.1)	-8.4(5.7)	<0.01	-5.7(5.4)	-7.4(6.2)	-6.0(5.8)	<0.01
Percent losing ≥ 5% (N)	54.8	65.3	58.8	0.42	52.2	60.0	55.4	0.23
Percent losing ≥ 7% (N)	37.7	35.0	44.4	0.08	37.3	53.2	42.0	0.03

Harvey-Berino, West et al., Preventive Medicine, 2010

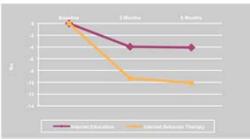
Internet Behavioral Treatment for Obesity Can Be Effective



Tate et al., JAMA, 2001; 285: 1172-1177; Tate, et al., JAMA 2003; 289: 1833-1836; Tate, et al., Archives of Internal Medicine, 2006; Wing, Tate, et al., NEJM, 2006

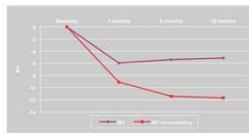
2 RCTs of Internet Behavioral WL

Internet Behavior Therapy Significantly Improves Weight Loss vs. Internet Education



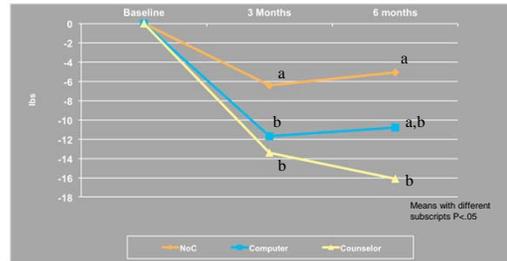
RCT study comparing Internet Education to Internet Behavioral Weight Loss Program (IBT) over 6 mos in Adults Tate, et al., JAMA 2001; 285: 1172-1177.

Weekly e-Counseling Significantly Improves Weight Loss over 1 year



RCT study comparing Internet Behavioral Weight Loss Program (IBT) to IBT plus weekly e-mail counseling. Adults at increased risk for Type 2 Diabetes, to study a translation of the Diabetes Prevention Program to Internet delivery. Tate, et al., JAMA 2003; 289: 1833-1836

Automated Tailored Feedback Improves Weight Loss and Is As Effective as Human e-Counseling at 3 Months



RCT comparing Website with either No Counseling (NoC), Weekly Automated Computer Tailored Feedback (Computer), and Weekly e-mail Counseling (Counselor). The Computer group achieved at 5% Weight Loss at 6 months. Tate, et al., Archives of Internal Medicine, 2006; 166:1620-1625

Improving the Automated Approach

- Expanded and more varied message library
- Greater degree of tailoring might engage users longer
- Tailoring on additional variables may make the experience more like human e-counseling
- Use the automated approach in conjunction with periodic human interactions

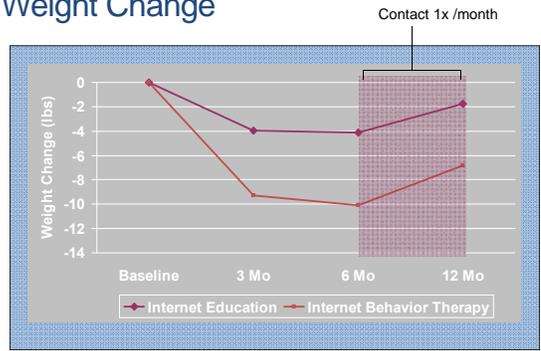
What is an Internet Intervention?

- “Internet interventions are typically behaviorally or cognitive-behaviorally-based treatments that have been operationalized and transformed for delivery via the Internet. Usually, they are highly structured; self or semi-self guided; based on effective face-to-face interventions; personalized to the user; interactive; enhanced by graphics, animations, audio, and possibly video; and tailored to provide follow-up and feedback.”
- Ritterband LM, Gonderfrederick LA, Cox DJ, Clifton AD, West RW, Borowitz SM. Internet interventions: In review, in use, and into the future. Professional Psychology: Research & Practice. 2003 Oct;34(5):527-34.

Frequency of E-mail Contact

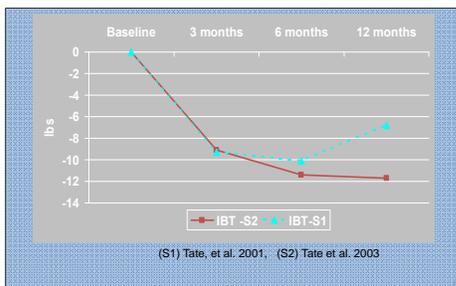
Months	Counselor E-mail
0-6	Weekly
6-9	Monthly
9-12	None

Weight Change



12 month follow-up added – not part of original study ~ data unpublished

Exploratory Analysis – Comparing the Internet Behavior Therapy Arms from 2 Studies with Different Contact Frequency Between 6 and 12 months



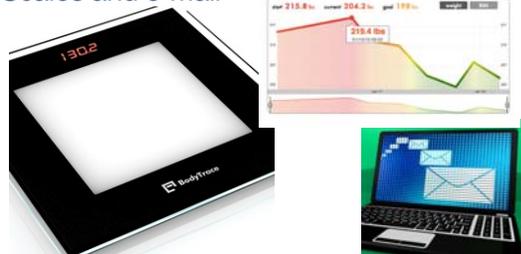
(S1) Tate, et al. 2001, (S2) Tate et al. 2003

What worked ???

Active Ingredients in Internet Behavior Therapy

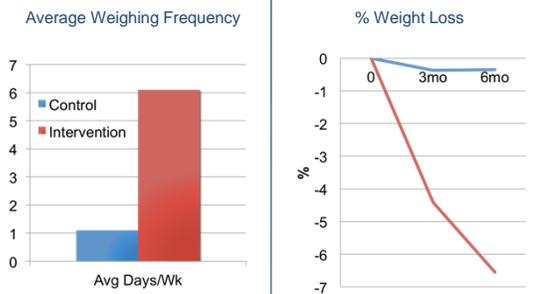
- Structured Lessons?
- Accountability – Reporting weight?
- Generic weekly prompt via e-mail?
- Peer Support via Message Board?
- Reinforcement & Problem Solving with e-counselor?

Daily Weighing Intervention Using Smart Scales and e-Mail



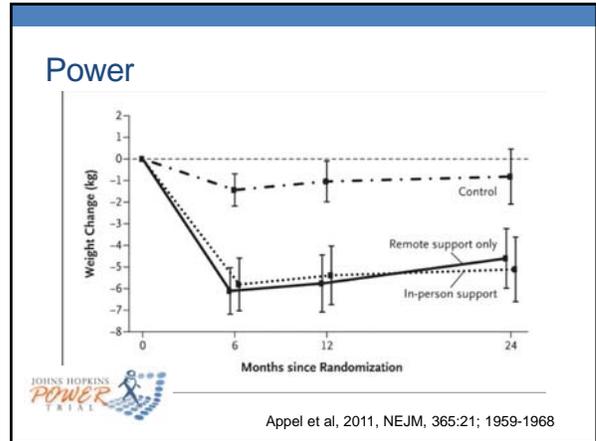
2 Group RCT:
 Daily Weighing Intervention with e-scales and weekly tailored email
 no other self-monitoring prescribed
 Wait-list Control given e-scales
 (Steinberg, Tate et al. in press)

Daily Weighing Intervention Using Smart Scales and e-Mail



(Steinberg, Tate et al. Obesity, 2013)

HYBRID OR COMBINATION APPROACHES



Pilot Hybrid Face to Face and Email Coaching

- RCT 6 month pilot trial examining reduced frequency Face to Face group meetings combined with one of 3 types of health coaching via email
 - Professional coaches
 - Peer to Peer coaches (randomly assigned)
 - Mentor (successful weight loser)
- 12 F2F group meeting over 6 mos
 - 0-6 weeks – weekly (6)
 - 7-12 weeks – biweekly (3)
 - 12-24 – monthly (3)

Leahey, et al., Obesity, 2012

RCT: Internet Group Chat Treatment vs. Hybrid

Adding 1x month in person sessions does not enhance outcomes over internet (Hybrid Internet Only)

Table 2
Mean Weight Loss from Baseline to 6 months with Observed Data and Intent-to-Treat

	Observed Data				Baseline Carried Forward			
	Internet (n=199)	InPerson (n=190)	Hybrid (n=193)	p-value	Internet (n=194)	InPerson (n=188)	Hybrid (n=184)	p-value
Weight Loss (kg; mean(SD))	-5.0(5.6)	-8.0(6.1)	-6.0(5.5)	<0.01	-5.0(5.6)	-7.6(6.2)	-5.7(5.5)	<0.01
Percent weight lost (mean(SD))	-5.8(5.4)	-8.3(5.1)	-6.4(5.7)	<0.01	-5.7(5.4)	-7.9(6.2)	-6.0(5.8)	<0.01
Percent losing ≥ 5% (%)	52.8	65.3	58.8	0.12	52.2	62.0	55.6	0.23
Percent losing ≥ 7% (%)	37.7	58.0	44.4	0.02	37.5	53.2	48.0	0.05

Harvey-Berino, West et al., Preventive Medicine, 2010

Mobile

Emerging evidence: Using mobile technology is promising

- Podcasts
- Mobile Internet
- Apps
- SMS (text messaging)
- Hybrid

Text Messaging



(Examples from Tate et al. Studies)

Mobile based approaches produce better outcomes than control conditions

- Few studies to date
- Review (Siopis, et al. Journal of Human Nutrition and Dietetics, 2014)
 - 14 studies – most smaller and shorter term
 - Better WL than controls
 - Mean WL in mobile 2.56 kgs
- 2 studies with mobile podcasts, twitter support, monitoring or combination
 - Means 2.4 -3 kgs
 - Theory-based components contributed to greater efficacy
 - Turner-McGrievy et al. 2009
 - Turner-McGrievy & Tate, 2011

Summary

- Behavioral and cognitive behavioral approaches have most evidence for efficacy.
 - Package known to be effective
 - Less evidence for individual techniques with exception of SM, FB, counselor support.
- Potential for delivery of face to face treatment to be reduced with intensive calls, email, and potentially mailed structured treatment materials.
- Community and Technology delivered interventions based on the effective model are better than controls, less effective than gold standard face to face
 - Including components known to be effective in F2F improves efficacy.

QUESTIONS
