



## Evidence-Based Series 20-2 IN REVIEW

A Quality Initiative of the  
Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO)

### Effective Teaching Strategies and Methods of Delivery for Patient Education

*A. Jusko Friedman, R. Cosby, S. Boyko, J. Hatton-Bauer, G. Turnbull,  
and the Patient Education Panel*

Report Date: December 10, 2009

An assessment conducted in January 2017 placed Evidence-based Series (EBS) 20-2 IN REVIEW. This means that it is undergoing a review for currency and relevance. The Patient Education Panel has determined that it is still appropriate for this document to continue to be available while this updating process unfolds. The PEBC has a formal and standardized process to ensure the currency of each document ([PEBC Assessment & Review Protocol](#))

EBS 20-2 consists of three sections and is available on the [CCO Website](#) on the PEBC [Patient Education](#) page.

- Section 1: Guideline Recommendations
- Section 2: Evidentiary Base
- Section 3: EBS Development Methods and External Review Process

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**Evidence-Based Series 20-2: Section 1 - IN REVIEW**

**Effective Teaching Strategies and Methods of Delivery  
for Patient Education:  
Guideline Recommendations**

*A. Jusko Friedman, R. Cosby, S. Boyko, J. Hatton-Bauer, G. Turnbull,  
and the Patient Education Panel*

A Quality Initiative of the  
Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO) and  
the Patient Education Panel, Cancer Care Ontario

**Report Date: December 10, 2009**

**QUESTION**

What are the most effective teaching strategies and methods of delivery for patient education?

**TARGET POPULATION**

The target population for this intervention is any individual who seeks services from the cancer system covering the entire continuum of care (prevention, screening, diagnosis, treatment, survivorship, and palliative care).

**INTENDED USERS**

The intended users of this guidance document are healthcare professionals involved in patient education. This may include patient education specialists and healthcare administrators and managers. Physicians, nurses and allied healthcare professionals with an interest in patient education may also be interested in this document.

**RECOMMENDATIONS**

The following recommendations are informed by the currently available evidence (see Section 2). The recommendations are not meant to provide specific details with respect to the content provided through patient education. These recommendations are meant to provide an overview concerning the efficaciousness of the teaching strategies and methods of delivery that have been evaluated in the literature.

### Teaching Strategies

- Computers can be an effective patient education teaching strategy, especially when patients are given information specific to their own situation rather than general information.
- Audiotapes of patient consultations can be effective for patient recall of verbal education.
- Videotapes (or more modern formats such as CDs and DVDs) can be an effective teaching strategy in delivering patient education.
- The provision of written materials, and, especially, tailored print materials, can also be an effective patient education teaching strategy. All written information should be prepared at a reading level appropriate for the general population. New patient information packages provided to patients prior to their first clinic visit are very useful to them.
- Verbal instruction should only be used in conjunction with another teaching method.
- Demonstrations, if appropriate for the situation, can be a very effective teaching strategy.
- The use of multiple teaching strategies is a good option for patient education.
- Use visual aids appropriately. Pictures and illustrations are useful for enhancing printed materials especially in those with low literacy skills. The illustrations should be non-ambiguous and should be accompanied by text written in simple language.

### Methods of Delivery

- Patient-specific information (i.e., information specific to the individual's actual clinical situation) should be provided to patients, rather than general information about their cancer.
- Patient education should be structured. An ad hoc random question and answer format session is not sufficient.
- Patient education should involve multiple teaching strategies.
- Patient education for minority groups should be culturally sensitive.

### KEY EVIDENCE

- The evidentiary base is composed of 19 systematic reviews (1-19) and four meta-analyses (20-23).
- In the summaries of the evidence that follows, the range of the standardized effect sizes reported in the primary literature is presented, as is the range of p-values. When p-value or effect size has not been reported, this is also indicated. Standardized effect sizes greater than zero reflect an improvement.
- Computer interventions increase patient knowledge (Effect Size [ES], 0.12-1.03; p, Not Reported [NR]), reduce anxiety and increase satisfaction (ES, -0.05-0.40; p, NR) (1,6,7,11,12,15,18-20,23). ES is explained in the Methods section in Section 2 of this evidence-based series.
- Audiotapes of consultations increase patient knowledge. (ES, NR; p-values from individual studies, <0.001-0.05) (17).
- Videotape interventions increase patient knowledge (ES, 0.12-1.03; p=NR) (7,15,19,20) and satisfaction (ES, 0.05-0.40; p, NR) (7,20).
- New patient information packages improve patient knowledge, especially if provided prior to the first clinic appointment (ES, NR; p, NR) (4).
- Verbal instruction is the least effective teaching strategy and should not be used alone (ES, 0.28; p, NR) (23).

- Demonstrations are a good teaching strategy with a large effect size (ES, 0.79; p, NR) (23).
- The use of multiple methods is a good teaching strategy with a moderate effect size (ES= 0.44; 67% of patient receiving patient education by multiple methods had better outcomes than did patients receiving standard care; p=NR) (23).
  - Illustrations to complement text result in greater patient comprehension than text alone especially in those with low literacy skills (ES, NR; p-values from individual studies, 0.033-0.05) (14).
  - Patient-specific information is better than general information with respect to patient knowledge, anxiety and satisfaction (ES, NR; p, NR) (4).
  - Culturally sensitive patient education for minorities improves patient knowledge (ES, NR; p, NR) (8,13,21).

### QUALIFYING STATEMENTS

- The clinic should make any necessary equipment (e.g., computer, audiotape player, videotape player, DVD player) available, in the clinic or patient care areas, for patients who do not have that equipment at home.
- Much of the evidence available is based on effect size meta-analysis. Therefore it is difficult to estimate magnitude of effect.
- The evidence underpinning these recommendations is complex and not easily summarized; please refer to Section 2 of this report for more details.
- This guideline articulates the best evidence on effective teaching strategies in providing a structured patient education program. The learning relationship between patients, families, and healthcare providers; tailoring teaching interventions; readiness to learn; individual's learning style; and information seeking behaviours, i.e., the influence of monitoring versus blunting behaviours are critical in patient teaching. While beyond the scope of this guideline, these are important considerations in a patient-centered approach to patient education. Further, as the prevalence of cancer increases and as cancer is seen as a chronic disease, guidance for self-management/self-care and therapeutic patient education interventions are recommended.

### FUTURE RESEARCH

More research is needed on methods of delivery for patient education. In addition, there is a growing patient education literature on health outcomes and changes of behaviour that should be evaluated systematically.

### RELATED GUIDELINES

PEBC Evidence-Based Series Reports (EBS):

- EBS Special Report: *Establishing Comprehensive Cancer Patient Education Services: A Framework to Guide Ontario Cancer Education Services* (<http://www.cancercare.on.ca/pdf/pebcperf.pdf>).
- EBS 19-2 *Provider-Patient Communication: A Report of Evidence-Based Recommendations to Guide Practice in Cancer* (<http://www.cancercare.on.ca/pdf/pebc19-2s.pdf>).

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IN REVIEW



## Evidence-Based Series 20-2: Section 2

# Effective Teaching Strategies and Methods of Delivery for Patient Education: Evidentiary Base

*A. Jusko Friedman, R. Cosby, S. Boyko, J. Hatton-Bauer, G. Turnbull, and the Patient Education Panel*

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**Report Date: December 10, 2009**

### QUESTION

What are the most effective teaching strategies and methods of delivery for patient education?

### INTRODUCTION

Patient education is any set of planned educational activities, using a combination of methods including teaching, counselling and behaviour modification that is designed to improve patients' knowledge and health behaviours (1). Patient education practices within cancer programs and centres in Ontario vary according to institution. Currently, there is no provincial standard for how patient education is delivered in Ontario. However, as our healthcare system becomes more cost-conscious, health professionals will need to become more aware of their need to demonstrate that they are effectively meeting patient educational needs with respect to patient outcomes and cost (2).

Studies have established the informational needs of cancer patients (3-5). Psycho-educational interventions, which include education, exercise and psychosocial support, have been demonstrated to improve clinical outcomes in adult patients with a variety of diseases (6,7). This guidance document evaluates the effect of various teaching strategies and methods of delivery for patient education on patient outcomes. The teaching strategies of patient education that were targeted were taken from a framework outlined by the University Health Network (UHN) Patient Education Task Forum<sup>1</sup> (8). That resource includes traditional lectures, discussions, simulated games, computer technology, written material, audiovisual

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<sup>1</sup> Permission to cite this reference was received from Audrey Friedman on March 11, 2009. For more information regarding this reference, please contact Audrey Friedman.



sources, verbal recall, demonstration and role playing. The targeted methods of delivery, which were taken from this same resource (8), involve how the teaching strategy is delivered and include instructor-centred, interactive, individualized learning and experiential learning. By using this guidance document, cancer programs will be better able to use limited resources when designing patient education programs and delivering patient information.

## **METHODS**

The evidence-based series (EBS) guidelines developed by Cancer Care Ontario's Program in Evidence-Based Care (PEBC) use the methods of the Practice Guidelines Development Cycle (9). For this project, the core methodology used to develop the evidentiary base was the systematic review. Evidence was selected and reviewed by one PEBC methodologist. The reference lists from those sources were also searched for additional publications.

This systematic review is a convenient and up-to-date source of the best available evidence on effective teaching strategies and methods of delivery for patient education. The body of evidence in this review is primarily comprised of systematic review data with and without meta-analysis. That evidence forms the basis of the recommendations developed by the Patient Education Working Group of the Patient Education Panel (Appendix 1). The systematic review and companion recommendations are intended to promote evidence-based practice in Ontario, Canada. The PEBC is supported by the Ontario Ministry of Health and Long-Term Care through Cancer Care Ontario. All work produced by the PEBC is editorially independent from its funding source.

### **Literature Search Strategy**

The scientific and clinical literature was systematically searched for publications pertaining to patient education teaching strategies and methods of delivery. The MEDLINE (1995 through November 2006), EMBASE (1995 through November 2006), CINAHL (1995 through November 2006), and HealthSTAR (1995 through November 2006) databases were searched for relevant publications using search terms pertaining to patient education, teaching strategies and methods of delivery. The full search strategy can be found in Appendix 2. The original search targeted several publication types including guidelines, systematic reviews, meta-analyses and randomized controlled trials. When the search was completed it was apparent that there were enough of the highest levels of evidence (i.e., systematic reviews and meta-analyses) that it was unnecessary to include the individual trials.

The literature searches were updated in May 2009 for MEDLINE to May (week two) 2009, for EMBASE to week 19 2009, for HealthSTAR to April 2009 and for CINAHL to May 2009.

### **Study Selection Criteria**

#### ***Inclusion Criteria***

Articles were selected for inclusion in this systematic review if they were published English-language reports involving human participants that were practice guidelines, systematic reviews or meta-analyses that examined teaching strategies and methods of delivery for patient education. The search was not limited to publications of patient education in oncology since patient education teaching strategies and methods in all health disciplines may be similar. Specific reported outcome measures were not used as part of the selection criteria. It was not expected a priori that any cancer clinical outcome data would be located. However, any such sources of evidence were explicitly included. The comparisons considered were teaching intervention versus standard care (control) and teaching intervention versus another teaching intervention.

**Exclusion Criteria**

Letters, editorials, notes, case-reports, commentaries, comparative trials, non-randomized trials, randomized controlled trials and non-systematic reviews were not included in this systematic review.

**Synthesizing the Evidence**

The evidence used in this guidance document was drawn from systematic reviews, with or without meta-analysis, and did not support data pooling using meta-analytic techniques.

**Effect Sizes in Meta-Analysis**

In meta-analysis, effect sizes (ES) are calculated for each study such that the mean of the control group is subtracted from the mean of the experimental group and then divided by the within-group standard deviation, as follows:

$$\text{Effect Size} = \frac{\text{Mean (treatment group)} - \text{Mean (control group)}}{\text{Standard Deviation (within group)}}$$

In this way, the results of each study are converted to a standard ES score, which allows comparison of the results of several studies on a common scale. ESs are interpreted as small (ES=0.20), moderate (ES=0.50) or large (ES=0.80) (10). It is important to remember, however, that these descriptors of small, moderate and large effect sizes are arbitrary conventions and should be considered as such. At the same time, these proposed conventions are considered reasonable (10).

**RESULTS****Literature Search Results**

The database searches yielded 23 systematic reviews and meta-analyses (11-33) that met the selection criteria. Of these 23 papers, five [one meta-analysis (13) and four systematic reviews (11,12,14,15)] pertained to patient education and methods of delivery in oncology exclusively and 18 [15 systematic reviews (17,18,20-32) and three meta-analysis (16,19,33)] pertained to patient education and methods of delivery in a variety of health settings. Because the identified literature was poor with respect to outcomes other than patient knowledge, anxiety and satisfaction, data for these three outcomes was targeted. Table 1 shows the topic areas covered by each of the included papers. The teaching strategies evaluated are not necessarily mutually exclusive. Therefore studies were categorized into the teaching strategy that was most applicable.

Table 1: Evidence included in this report by topic area covered.

GROUPING	STUDY, Year (Ref)	TEACHING STRATEGIES										METHODS OF DELIVERY				
		Traditional Lectures	Discussions	Simulated Games	Computer Technology	Written Materials	Audiotapes	Videotapes	Verbal	Demonstration	Role Playing	Other	Patient-specific vs. General Information	Structured vs. Unstructured Teaching	Group vs. Individual Teaching	Culturally Specific vs. Not Culturally Specific Information
PATIENT EDUCATION IN ONCOLOGY	Ranmal et al., 2008 (11)				•											
	van der Meulen et al., 2008 (12)					•	•									
	Gysels & Higginson, 2007 (13)				•			•								
	Gaston & Mitchell, 2005 (14)					•	•									
	McPherson et al. 2001 (15)				•	•	•					•				
PATIENT EDUCATION IN VARIOUS HEALTH SETTINGS	Bailey et al., 2009 (16)															•
	Duke et al., 2009 (17)														•	
	Meilleur & Littleton-Kearney, 2009 (18)				•			•								
	Hawthorne et al., 2008 (19)															•
	Jeste et al., 2008 (20)				•				•							
	Khunti et al., 2008 (21)															•
	Ryan et al., 2008 (22)								•							
	Yankova, 2008 (23)												•			
	Beranova & Sykes, 2007 (24)				•											
	Bussey-Smith & Rossen, 2007 (25)				•											
	Whittemore, 2007 (26)															•
	Houts et al. 2006 (27)												•			
	Trevena et al. 2006 (28)				•	•	•	•	•				•			
	Johnson & Sandford, 2005 (29)					•				•						
	Santo et al. 2005 (30)						•									
	Wofford et al. 2004 (31)				•											
Chelf et al. 2001 (32)				•		•	•					•				
Theis & Johnson, 1995 (33)	•	•		•	•	•	•	•	•				•	•		

Abbreviations: vs.= versus.

### *Study Design and Quality*

The quality of each systematic review was assessed using the ‘assessment of multiple systematic reviews’ or ‘AMSTAR’ tool. The tool began with 37-items that combined the 10 items of the Overview Quality Assessment Questionnaire (OQAQ) (34), the 24 items of the Sacks et al. (35) checklist and three items judged to be methodologically important. Factor analysis identified 11 components from these 37 items, and one item from each component was chosen for the final 11-item AMSTAR instrument. The resulting instrument was deemed to have good face and content validity (36). AMSTAR was recently validated externally (37,38). Table 2 shows how each of the included systematic reviews and meta-analyses scored on each of the 11 AMSTAR items.

Although there are no rules about what constitutes a ‘good’ or ‘acceptable’ AMSTAR score, some general observations can be made about the systematic reviews and meta-analyses that comprise this document. All included papers had an a priori design, all conducted comprehensive literature searches, and all either appropriately pooled or did not pool the individual study findings. All studies provided a list of included studies, but very few provided lists of excluded studies. Almost all studies provided the characteristics of the included studies, assessed and documented the quality of the included studies and used the study quality in formulating conclusions. None of the studies assessed the likelihood of publication bias, and only a few studies made any statements regarding conflict of interest.

The systematic reviews and meta-analyses retrieved for this document included studies that reported on a wide array of measures of patient outcomes. Examples include the Spielberger State-Trait Anxiety Inventory, the Patient Satisfaction with Consultation Scale and investigator-designed knowledge questionnaires. However, the systematic reviews and meta-analyses did not provide details on the actual measures of patient outcomes used in each study and generally only provided information on the standardized ES.

Table 2: Evaluation of included publications using AMSTAR.

ITEM	STUDIES OF PATIENT EDUCATION IN ONCOLOGY					STUDIES OF PATIENT EDUCATION IN VARIOUS HEALTH DISCIPLINES																		
	Ranmal et al., 2008 (11)	van der Meulen et al., 2008 (12)	Gysels & Higginson, 2007 (13)	Gaston & Mitchell, 2005 (14)	McPherson et al. 2001 (15)	Bailey et al., 2009 (16)	Duke et al., 2009 (17)	Meilleur & Littelton-Kearney, 2009 (18)	Hawthorne et al., 2008 (19)	Jeste et al., 2008 (20)	Khunti et al., 2008 (21)	Ryan et al., 2008 (22)	Yanknova, 2008 (23)	Beranova & Sykes, 2007 (24)	Bussey-Smith & Rossen, 2007 (25)	Whittemore, 2007 (26)	Houts et al. 2006 (27)	Trevena et al. 2006 (28)	Johnson & Sandford, 2005 (29)	Santo et al. 2005 (30)	Wofford et al. 2004 (31)	Chelf et al. 2001 (32)	Theis & Johnson, 1995 (33)	
1. Was an 'a priori' design provided?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Was there duplicate study selection and data extraction?	Y	Y	N	Y	N	Y	Y	N	Y	N	Y	Y	N	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y
3. Was a comprehensive literature search performed?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5. Was a list of studies (included and excluded) provided?	Y	N	N	N	N	Y	Y	N	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N
6. Were the characteristics of the included studies provided?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
7. Was the scientific quality of the included studies assessed and documented?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	Y
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	Y
9. Were the methods used to combine the findings of the studies appropriate?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10. Was the likelihood of publication bias assessed?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
11. Was the conflict of interest stated?	Y	N	N	N	N	Y	Y	N	Y	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	N
TOTAL AMSTAR POINTS	10	8	7	8	7	10	10	7	10	7	9	10	7	8	9	7	4	8	9	5	8	6	7	

Abbreviations: N = no; Y = yes

## **Outcomes**

The patient education teaching strategies that were targeted came from the framework developed by the Patient Education Task Force of the UHN (8). The strategies identified in this report are traditional lectures, discussions, simulated games, computer technology, written material, audiovisual sources, verbal recall, demonstration, and role playing. For this review, audiovisual sources were split into audiotapes and videotapes, as it became apparent that these two types of strategies each had their own body of evidence.

The methods of delivery considered were centred on how to deliver the teaching strategies including but not necessarily limited to instructor-centred, interactive, individualized learning and experiential learning. They were taken from the same framework used to inform the teaching strategies that were targeted (8). However, these will be discussed together as there was limited evidence found regarding the various methods of delivering patient education.

## **Teaching Strategies**

### **(a) Traditional Lectures (including personal instruction)**

One meta-analysis (33) evaluated the effect of traditional lectures compared to routine care on outcomes related to patient education. In this meta-analysis, effect sizes and 95% confidence intervals were calculated for 'patient outcomes' in general (i.e., not specifically defined). Based on the pooling of 12 individual studies, the effect size for traditional lectures was 0.48 (95% confidence interval [CI], 0.29-0.67), which is considered to be a moderate effect size as defined by Cohen (10).

### **(b) Discussions**

One meta-analysis (33) evaluated the effect of discussions compared to routine care on outcomes related to patient education. Based on the pooling of 39 individual studies, discussions had a small to moderate effect size of 0.34 (95% CI, 0.25-0.43) for 'patient outcomes' in general (i.e., not specifically defined).

### **(c) Simulated Games**

No systematic reviews or meta-analyses were found that evaluated the effect of simulated games on patient knowledge, anxiety, or satisfaction.

### **(d) Computer Technology**

Eleven systematic reviews or meta-analyses (11,13,15,18,20,24,25,28,31-33) were found that evaluated the effect of computer technology on outcomes related to patient education. These systematic reviews were checked for overlap with respect to the individual studies used within them. One systematic review (15) was excluded because its one computer study was included in a more recent systematic review (13). Because the systematic reviews by Jeste et al. (20), Wofford et al. (31), Chelf et al. (32) and Gysels and Higginson (13) had some of the same studies, only the information from the unique set of studies in each was included in this review. In this way, any individual study that appeared in more than one systematic review was discussed only in the context of the more recent systematic review.

Bussey-Smith and Rosen (25) evaluated the effectiveness of interactive, computerized asthma patient education programs and found that asthma knowledge increased in four of the nine individual studies examined. However, these improvements were limited to older children and did not apply to younger children or adults. Beranova and Sykes (24) reviewed five individual studies of computer-based software programs for educating patients with coronary heart disease. They reported that, in all five studies, both intervention and control

(standard education) groups demonstrated increased knowledge. However, the increase was significantly improved in those receiving computer based education, even six months after the intervention. In addition, patients were more satisfied with computer-based learning than with standard educational methods in three individual studies.

Ranmal et al. (11) looked at various methods of improving communication with children and adolescents about their cancer and evaluated one study of computer-assisted patient education. The knowledge level increased immediately after the intervention but retention over time was not evaluated. In a systematic review of patient education in genetic conditions, Meiller and Littleton-Kearney (18) found that computer interventions resulted in increased knowledge (p values, <0.0001-0.03) and decreased anxiety (p values, <0.005-0.06). In the four individual studies that were unique to Jeste et al. (20), all were positive with respect to knowledge, one was positive with respect to satisfaction and one was negative with respect to satisfaction.

Gysels and Higginson (13) did a meta-analysis of six computer studies and three videotape studies. Overall, they found that patients receiving personalized information (i.e., information based on their own situation) by computer were more satisfied than those receiving general information. They also found that anxiety was not increased by computer interventions and that it was actually decreased in some studies. For the purposes of pooling the data, these authors combined the computer and videotape studies together. The ES for individual studies of computer *and* videotape interventions ranged from 0.12 to 1.03 for knowledge and -0.05 to 0.40 for satisfaction. Theis and Johnson (33) calculated ES for computer interventions compared to routine care for 'patient outcomes' in general (i.e., not specifically defined) to be 0.55 (95% CI, 0.22-0.88), based on three studies.

Trevena et al. (28) evaluated three randomized controlled trials of computer interventions and concluded that knowledge was increased in comparison results with audio-booklet or written material alone. Of the 21 individual studies that were unique to Wofford et al. (31), nine assessed knowledge, and one assessed anxiety. Of the nine studies evaluating knowledge, seven resulted in increased knowledge. In the one study evaluating anxiety, anxiety was increased in the group receiving general information by computer but not in the group receiving personalized information by computer. Chelf et al. (32) evaluated computer assisted learning (CAL) with respect to decision-making programs and found that knowledge increased even in pediatric populations. They also found some evidence that CAL resulted in higher patient satisfaction.

#### ***(e) Written Material***

Six systematic reviews or meta-analyses (12,14,15,28,29,33) were found that evaluated the effect of written material on outcomes related to patient education. These publications were checked for overlap with respect to the individual studies used within them. As a result of this check, one systematic review (12) was excluded from use in this section as it did not contribute any unique studies that were not already covered in the other systematic reviews and meta-analyses used. Gaston and Mitchell (14) reported that written material in the form of summary letters written to the patient by the physician or information booklets were effective patient education strategies with respect to satisfaction and information recall. However they noted that writing individual letters to patients does increase the workload of busy clinicians. They also concluded that written material must be prepared at a reading level that is suitable for the general population.

Written information in the form of new patient information packages or booklets improved patient knowledge and reduced confusion especially if it was provided to the patient prior to the first clinic appointment, rather than at the first appointment (15). The use of tailored print material resulted in better information recall than did general print

materials, and evidence-based leaflets increased knowledge compared to no leaflet (28). Johnson and Sandford (29), in their systematic review of two trials comparing written and verbal information with verbal information only, found that knowledge significantly improved when written materials were combined with verbal health information in comparison to verbal information only. They also found that satisfaction was high overall but not statistically different between intervention and controls in one trial and higher in the intervention group compared to controls in the other trial ( $p < 0.0001$ ).

Theis and Johnson (33) determined that the ES for written material compared to routine care for 'patient outcomes' in general (i.e., not specifically defined), based on 22 studies, was 0.43 (95% CI, 0.33-0.53), which is a small to moderate ES.

#### **(f) Audiotapes**

Seven systematic reviews or meta-analyses (12,14,15,28,30,32,33) were found that evaluated the effect of audiotapes on outcomes related to patient education. These publications were checked for overlap with respect to the individual studies used within them. As a result of this check, five systematic reviews (12,14,15,28,32) were excluded from use in this section as they were either studies already included in a systematic review that focussed on audiotapes exclusively or the audiotape information was grouped with other information and could not be parsed out.

Santo et al. (30) exclusively evaluated the use of audiotapes in patient education. They found that most studies of audiotapes of patient consultations resulted in increased patient knowledge, at least within the short term. The addition of an audiotape recording of a patient consultation to written recommendations also resulted in increased patient knowledge. They reported that audiotapes of general information might result in decreased recall, possibly because these tapes overwhelmed patients with too much information.

Santo et al. (30) found seven audiotape studies that measured anxiety as an outcome. They reported that audiotapes decreased anxiety in three studies, made no difference in anxiety in three studies and increased anxiety in one study. With respect to satisfaction, patients reported appreciation of the audiotapes, especially when the information was tailored to their specific situation (30).

Theis & Johnson (33) determined that the effect size for audiotapes, compared to routine care, was 0.58 (95% CI, 0.31-0.85) for 'patient outcomes' in general (i.e., not specifically defined), based on the pooling of five studies, which was a moderate ES.

#### **(g) Videotapes**

Seven systematic reviews or meta-analyses (13,18,20,22,28,32,33) evaluated the effect of videotapes on outcomes related to patient education. Meilleur and Littleton-Kearnery (18) evaluated two studies of video interventions, of which one measured knowledge and both measured anxiety and satisfaction. In the study that evaluated knowledge, knowledge was increased in the intervention group ( $p = 0.000$ ) compared to controls. In the studies that measured anxiety and satisfaction as outcomes, anxiety was not significantly different between the groups in both of the studies, whereas satisfaction was significantly higher in the video intervention group in both studies ( $p < 0.05$  and  $p = 0.000$ ).

Jeste et al. (20) found 22 studies of video patient education interventions. Of these, 13 reported increased knowledge for the intervention group, and nine reported negative results. Video interventions were also associated with greater satisfaction in general.

Ryan et al. (22) found that audiovisual interventions did not significantly increase knowledge consistently. Of the four studies they evaluated, two found no significant differences in knowledge, one reported increased knowledge but did not test it statistically, and one study reported no significant differences between groups in knowledge immediately



after the intervention but did report significantly better knowledge retention in the intervention group two to four weeks following the intervention.

Gysels and Higginson (13) performed a meta-analysis including six computer and three videotape studies. Overall, they found that, with respect to knowledge, videotape was better than the same information given verbally, but the combination of videotape and verbal discussion was no better than videotape alone. Other systematic reviews also reported that videotapes increased patient knowledge (28,32).

Videotape interventions had no effect on anxiety (13,28). As reported in the section on computer technology above, Gysels & Higginson (13) combined the computer and videotape studies together when they pooled the data. The ES for individual studies of videotape *and* computer interventions ranged from 0.12 to 1.03 for knowledge and -0.05 to 0.40 for satisfaction. Theis and Johnson (33) calculated ES for videotape interventions compared to routine care for 'patient outcomes' in general (i.e., not specifically defined) to be 0.41 (95% CI, 0.29-0.53) based on 23 studies.

#### **(h) Verbal**

Three systematic reviews or meta-analyses (28,29,33) were found that evaluated the effect of verbal information on outcomes related to patient education. These publications were checked for overlap with respect to the individual studies used within them. As a result of this check, one systematic review (28) was excluded from use in this section as it was made up of studies already included in another systematic review or because the verbal information was grouped with other information and could not be parsed out. Johnson and Sandford (29) found that the combination of written and verbal information was significantly better than verbal information alone with respect to knowledge. However, this was based on 2 studies only. Theis and Johnson (33) found verbal teaching to be the least effective strategy among all the strategies they looked at and recommended that it not be used alone. Based on 30 studies, they report a small effect size for 'patient outcomes' in general (i.e. not specifically defined) of 0.28 (95%CI: 0.19-0.37) for verbal teaching compared to routine care.

#### **(i) Demonstration**

One meta-analysis (33) evaluated the effect of demonstrations on outcomes related to patient education. Based on the pooling of nine individual studies, demonstrations had a large ES of 0.79 (95% CI, 0.55-1.03) for 'patient outcomes' in general (i.e., not specifically defined) compared to routine care.

#### **(j) Role Playing**

No systematic reviews or meta-analyses were found that evaluated the effect of role playing on patient knowledge, anxiety, or satisfaction.

#### **(k) Other Types of Teaching Strategies**

Information was found about types of teaching strategies other than those included in the UHN framework. Houts et al. (27) reviewed the role of pictures in improving health communication. They reported that five of six studies found that illustrated materials resulted in greater patient comprehension than did non-illustrated material. This was especially true among those with low literacy skills. The sixth study found no difference between illustrated and non-illustrated materials with respect to comprehension (94% versus 97% accuracy). Because accuracy was so high in both groups in this particular study, the authors felt that there was a ceiling effect at play in this situation. With respect to recall, three of five studies found higher recall with illustrated text compared to text alone in both young and older participants. One study found no effect on recall, and one study reported

that younger participants benefitted from the addition of illustrations, but older participants were hampered by the illustrations. These authors concluded that pictures should be used to illustrate key points, should be accompanied by text using simple language and should not contain distracting details (27).

van der Meulen et al. (12) reported on one randomized controlled trial that evaluated the use of question prompt sheets and found they improved recall but only if the physician was proactive in addressing the questions that the patient asked. Trevena et al. (28) reported on two randomized controlled trials that made use of question prompt sheets and found there was an increase in knowledge if the prompt sheets were used in conjunction with a leaflet.

Another option for patient educators is to make use of multiple teaching strategies. Based on ten studies, Theis and Johnson (33) reported that 67% of patients who received patient education using multiple teaching strategies had better outcomes (not specifically defined) than did patients receiving standard care (ES, 0.440; 95% CI, 0.287-0.593), which is a small to moderate effect.

### ***Methods of Delivery***

There was not as much information available about methods of delivery in patient education as there was regarding teaching strategies. Nine systematic reviews/meta-analyses did have information regarding methods of delivery. McPherson et al. (15) reported that seven of the 10 studies they evaluated provided patient-specific information rather than general information. Overall, such targeted interventions increased knowledge, decreased anxiety and increased satisfaction. Chelf et al. (32) reported that, following an 'instructional session', patients undergoing chemotherapy remembered more information about the drugs they were taking and the potential side effects of those drugs. They also noted that orientation programs in general increased cancer patients' knowledge and decreased anxiety.

Duke et al. (17) reported on three studies that evaluated individual education for patients with type 2 diabetes. In one study, knowledge significantly improved at six months post-intervention for those receiving individual education compared to usual care. The other two studies compared individual to group education. One study demonstrated that both groups had improvements in knowledge compared to baseline, but there was no significant difference between individual and group education groups. In the third study, there was a significant improvement in knowledge in the group education arm over the individual education arm six months post-intervention but the difference disappeared by 12 months post-intervention. Duke et al. (17) also reported on the clinical outcome of glycemic control. They reported short term but not significant improvements, at six to nine months post-intervention, in hemoglobin-A1c (HBA<sub>1c</sub>) in those receiving individual education compared to usual care. Group education resulted in significant (p=0.0007) improvements in HBA<sub>1c</sub> at six to nine months post-intervention compared to individual education but no differences at 12-18 months post-intervention. Theis and Johnson (33) report ES for various methods of delivery. Small ES was reported for group (ES, 0.269; 95% CI, 0.195-0.343; 13 studies) and individualized (ES, 0.240; 95% CI, 0.039-0.441; 5 studies) teaching for 'patient outcomes' in general (i.e., not specifically defined). This means that 60.6% of patients receiving group teaching and 59.5% of patients receiving individualized teaching had better outcomes than did those receiving routine care.

Yankova (23) conducted a systematic review and report on four studies that evaluated whether or not structured teaching increased patient knowledge about patient-controlled analgesia. Structured teaching resulted in significant increases in knowledge in comparison to ad hoc instruction (p<0.05 in all four studies). Theis and Johnson (33) reported moderate ES for structured teaching (ES, 0.539; 95% CI, 0.465-0.613; 37 studies), independent study (ES,

.521; 95% CI, 0.251-0.791; 5 studies) and for multi-methods (ES, 0.440; 95% CI, 0.287-0.593; 10 studies). Again, this was for 'patient outcomes' in general. No specific outcome was articulated. This means that 70.5% of patients receiving structured teaching, 69.8% of patients who did independent study and 66.9% of patients who receiving patient education from a variety of methods had better outcomes than those receiving routine care (33).

Four systematic reviews or meta-analyses (16,19,21,26) were found that evaluated the effect of culturally appropriate patient education for minority groups on outcomes related to patient education. These publications were checked for overlap with respect to the individual studies used within them. As a result of this check, one meta-analysis (19) was excluded from use in this section as it was mostly comprised of studies already included in the other systematic reviews of culturally specific education. Bailey et al. (16) looked at the effect on knowledge of culturally specific patient education for child and adult asthmatics from minority groups. Based on two pediatric studies, they reported that knowledge scores were significantly better in children (mean difference, 3.30; 95% CI, 1.07-5.53) and parents (mean difference, 1.90; 95% CI, -0.04-3.84) receiving culturally specific education. Khunti et al. (21) reported on the effect of culturally appropriate patient education for migrant South Asians with type 2 diabetes. They had found five studies that assessed knowledge. Of these, three studies reported improvements in knowledge in the group receiving culturally specific education, and two reported no difference between intervention and controls. Whittemore (26) evaluated culturally appropriate patient education in Hispanic adults with type 2 diabetes. They found four studies that assessed knowledge. In all cases, diabetes knowledge was significantly increased for those receiving culturally appropriate education compared to those who did not. Khunti et al. (21) and Whittemore (26) also reported on the clinical outcome of glycemic control. Whittemore (26) reported that seven of eight studies that measured HBA<sub>1c</sub> demonstrated improved glycemic control in those receiving culturally appropriate patient education, whereas Khunti et al. (21) reported variable results, with a few studies demonstrating improvements in HBA<sub>1c</sub> but only in the short term (up to three months).

## DISCUSSION

The evidence base for this document consists of systematic reviews and meta-analyses that evaluated teaching strategies and methods of delivery for patient education. There was much more evidence available for teaching strategies than for methods of delivery. Although each teaching strategy for which evidence was available was effective to some degree (i.e., better than controls), clearly some methods were more effective than others.

Most studies of patient education, especially those in cancer, measure behavioural and/or psychosocial outcomes and not clinical outcomes (e.g., survival, response, recurrence). One notable exception is studies of patient education in diabetes where glycemic control and to a lesser extent blood pressure might be evaluated.

Two of the articles in the evidentiary base are meta-analyses that estimated overall ES (13,33). These analyses are only appropriate and meaningful when the studies included in the meta-analysis were homogenous in such areas as the population groups studied or research questions addressed. The studies included in these meta-analyses show no obvious heterogeneity that would call the results into question. Moreover, both analyses reported on and attempted to deal with statistical heterogeneity. In the Theis and Johnson (33) paper, if heterogeneity was detected, outlier studies were removed until heterogeneity was achieved; weighted effect sizes were calculated based on the number of studies remaining after homogeneity was reached. In the Gysels and Higginson (13) paper, a random effects model was used when heterogeneity was encountered.

With respect to specific teaching strategies, verbal teaching (29,33) and discussions (33) were found to be the least effective teaching strategies. In fact, Theis and Johnson (33) recommend that verbal teaching be used in combination with other teaching strategies and not as a stand-alone teaching method.

The use of computer technology was found to be an effective teaching strategy, positively affecting patient knowledge, anxiety and satisfaction (11,13,18,20,24,25,28,31-33). Audiotapes, videotapes, written materials and lectures were all found to be more effective teaching strategies than were verbal teaching and discussions (33). All of these strategies were found to have a positive effect on patient knowledge, anxiety and patient satisfaction (13,14,18,20,28-30,32). Gaston and Mitchell (14) also concluded that written materials must be prepared at a reading level that is suitable for the general population. In Canada, it has been demonstrated that health literacy varies from community to community (39); therefore, written materials might need to be reviewed to ensure they can be understood by the individual community the patient education program serves. Demonstrations had the highest ES of any of the teaching strategies evaluated and should be considered in appropriate situations. Houts et al. (27) demonstrated that the addition of illustrations to written text is an effective teaching strategy when compared with written material lacking illustrations. This was especially true for those with low literacy skills. The use of multiple teaching strategies is also a viable option. Theis & Johnson (33) found that almost 67% of patients who received patient education using several different strategies had better outcomes than those who received routine care.

All the teaching strategies evaluated are used to provide effective patient education. However, their target audience must be taken into account and therefore they cannot be applied in the same way to every patient. These strategies will only be as effective as their audience's access to the necessary tools to use them, whether that tool is an intangible such as literacy or a tangible such as having access to an audiotope player. As a result there is no 'one size fits all' solution for the strategies needed to educate patients.

With respect to methods of delivery, targeted interventions that provide patient-specific information have been found to increase patient knowledge, decrease anxiety and increase satisfaction (15). In addition, structured teaching has been shown to be much more effective than unstructured ad hoc teaching (23,33). Culturally appropriate patient education has also been found to increase patient knowledge (16,21,26).

There are several limitations to this systematic review. The reporting of the systematic reviews and of the individual studies that comprise them is imprecise where the specific outcomes chosen are concerned. This is because the tools to measure a given outcome (e.g., knowledge) vary not only between diseases but also within a given disease. Moreover, these tools are not always validated. Related to this is the fact that 'outcomes' are not always clearly articulated, making it impossible to determine the exact outcome that was measured. A second limitation is that the individual studies that make up any given systematic review or meta-analysis vary considerably. A third limitation is that the teaching strategies evaluated are not necessarily mutually exclusive, and, as a result, studies were categorized into the teaching strategy that was most applicable. A fourth limitation of this systematic review is the fact that the details of the various interventions are unclear. The data does not necessarily provide this information and more importantly, it would not be pragmatic to report all the details in a document of this nature. Finally, while the reporting of ES is acceptable, absolute differences would provide much more compelling data regarding the impact of a given teaching strategy. However, absolute differences were not reported in any meaningful way. Furthermore, there is considerable variation in ES, which makes interpretation tricky. Despite these limitations, there is enough consistency in the findings of

the systematic reviews and meta-analyses used in this guidance document, across different diseases, upon which overall generalizable recommendations can be made.

## CONCLUSIONS

Patient education is a vital component of health care but currently, there is no provincial standard for how patient education is delivered in Ontario. This report discusses several teaching strategies for the delivery of patient education that were effective in increasing knowledge, decreasing anxiety and increasing satisfaction and that included computer technology, audio and videotapes, written materials and demonstrations. Various teaching strategies used in combination were similarly successful; for example, illustrations enhanced patient understanding of written materials. In addition, structured teaching, culturally appropriate teaching and teaching targeted to a patient's individual situation were found to be better than ad hoc teaching or teaching that only provides general information to a patient. These findings provide guidance for future discussions centred on establishing provincial standards for patient education delivery.

## CONFLICT OF INTEREST

All the authors reported no conflicts of interest.

## JOURNAL REFERENCE

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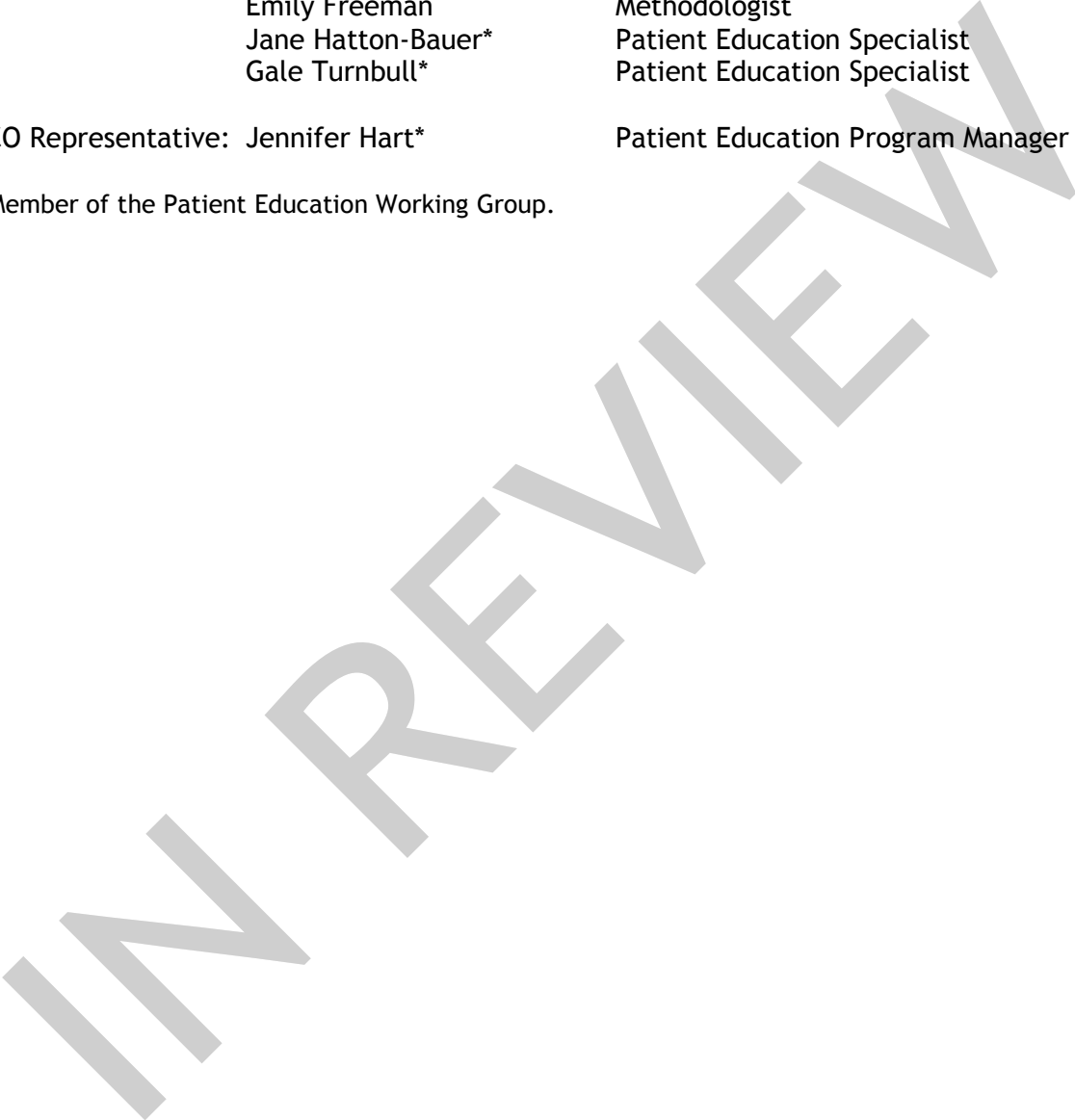
**Appendix 1. Members of the Patient Education Panel and the Patient Education Working Group.**

Panel Chair: Audrey Jusko Friedman\* Provincial Head, Patient Education

Panel Members: Susan Boyko\* Patient Education Specialist  
Nadia Coakley Methodologist  
Roxanne Cosby\* Methodologist  
Emily Freeman Methodologist  
Jane Hatton-Bauer\* Patient Education Specialist  
Gale Turnbull\* Patient Education Specialist

CCO Representative: Jennifer Hart\* Patient Education Program Manager

\* Member of the Patient Education Working Group.



**Appendix 2. MEDLINE, EMBASE, HealthSTAR, and CINAHL search strategy (all databases searched at once).**

1. patient education.mp
2. patient education/mt
3. teaching/mt
4. or/1-3
5. clinical trials/ or clinical trials, phase ii/ or clinical trials, phase iii/ or clinical trials, phase iv/ or controlled clinical trials/ or randomized controlled trials
6. meta-analysis
7. "review literature"
8. clinical trial.pt
9. clinical trial, phase ii.pt
10. clinical trial, phase iii.pt
11. clinical trial, phase iv.pt
12. meta-anaysis.pt
13. randomized controlled trial.pt
14. controlled clinical trial.pt
15. guideline.pt
16. randomized.mp
17. or/ 5-16
18. 4 and 17
19. limit 18 to english
20. limit 19 to human [Limit not valid in: CINAHL; records were retained]
21. remove duplicates from 20



### Evidence-Based Series 20-2: Section 3

## Effective Teaching Strategies and Methods of Delivery for Patient Education: EBS Development Methods and External Review Process

*A. Jusko Friedman, R. Cosby, S. Boyko, J. Hatton-Bauer, G. Turnbull,  
and the Patient Education Panel*

A Quality Initiative of the  
Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO) and  
the Patient Education Panel, Cancer Care Ontario

**Report Date: December 10, 2009**

#### THE PROGRAM IN EVIDENCE-BASED CARE

The Program in Evidence-based Care (PEBC) is an initiative of the Ontario provincial cancer system, Cancer Care Ontario (CCO) (1). The PEBC mandate is to improve the lives of Ontarians affected by cancer, through the development, dissemination, implementation, and evaluation of evidence-based products designed to facilitate clinical, planning, and policy decisions about cancer care.

The PEBC supports a network of disease-specific panels, termed Disease Site Groups (DSGs) and Guideline Development Groups (GDGs), as well as other groups or panels called together for a specific topic, all mandated to develop the PEBC products. These panels are comprised of clinicians, other healthcare providers and decision makers, methodologists, and community representatives from across the province.

The PEBC is well known for producing evidence-based guidelines, known as Evidence-based Series (EBS) reports, using the methods of the Practice Guidelines Development Cycle (1,2). The EBS report consists of an evidentiary base (typically a systematic review), an interpretation of and consensus agreement on that evidence by our Groups or Panels, the resulting recommendations, and an external review by Ontario clinicians and other stakeholders in the province for whom the topic is relevant. The PEBC has a formal standardized process to ensure the currency of each document, through the periodic review and evaluation of the scientific literature and, where appropriate, the integration of that literature with the original guideline information.

## The Evidence-Based Series

Each EBS is comprised of three sections:

- *Section 1: Guideline Recommendations.* Contains the clinical recommendations derived from a systematic review of the clinical and scientific literature and its interpretation by the Group or Panel involved and a formalized external review in Ontario by review participants.
- *Section 2: Evidentiary Base.* Presents the comprehensive evidentiary/systematic review of the clinical and scientific research on the topic and the conclusions reached by the Group or Panel.
- *Section 3: EBS Development Methods and External Review Process.* Summarizes the evidence-based series development process and the results of the formal external review of the draft version of Section 1: Guideline Recommendations and Section 2: Evidentiary Base.

## DEVELOPMENT OF THIS EVIDENCE-BASED SERIES

### Development and Internal Review

This EBS was developed by the Patient Education Panel, CCO, and the PEBC. The series is a convenient and up-to-date source of the best available evidence on effective teaching strategies and methods of delivery for patient education developed through review of the evidentiary base, evidence synthesis, and input from external review participants by the Panel. The Panel consisted of several patient education specialists and several methodologists.

### Report Approval Panel

Prior to the submission of this EBS draft report for external review, the report was reviewed and approved by the PEBC Report Approval Panel, which consists of two members, including an oncologist, with expertise in clinical and methodology issues. Key issues raised by the Report Approval Panel and their resolution by the Patient Education Panel (*italicized*) included suggestions that:

- An explanation be provided regarding the lack of clinical outcomes. *An explanation was added to the Methods in Section 2 and in the Discussion.*
- A qualifying statement regarding the difficulty of establishing magnitude of effect based on effect size meta-analysis be added. *A qualifying statement was added to Section 1.*
- The magnitude of effect be added to the Key Evidence in Section 1. *This data was not available, but effect sizes and p-values were added to the Key Evidence where available.*
- The interventions evaluated in the document are likely not mutually exclusive and may overlap. *This was clarified in the Results in Section 2.*
- The primer on effect sizes in meta-analysis be moved from the Results to the Methods section. *This change was made.*
- Some explanation regarding the AMSTAR results be provided. *This was added in Section 2.*
- The reporting of some studies was imprecise as it related to the articulation of the specific outcomes evaluated. *This data was not provided in some studies, a fact that was clarified throughout the Results section where appropriate.*
- The reporting of the comparison group be consistent throughout the Results section. *The reported was altered where necessary.*

- The limitations of the data be better articulated. *The study limitations were clarified and outlined in the Discussion.*
- The intended users of this guidance document should be redefined. *The Intended Users section was clarified.*
- Given the limitations of the data, the conclusions may not be generalizable. *It was clarified in the Discussion that, despite the data limitations, the consistency of all the available evidence across diseases makes it possible to provide generalizable recommendations.*

### Expert Panel

Prior to the submission of this EBS draft report for external review, the report was reviewed by an Expert Panel, which consisted of a group of patient education specialists from the CCO Patient Education Program. Key issues raised by the Expert Panel and not already covered in the Report Approval Panel comments above, and their resolution by the Patient Education Panel (*italicized*), included suggestions that:

- ‘Diagnosis’ should be added to the continuum of care. *This change was made.*
- The recommendations regarding computers, audiotapes, videotapes and demonstrations be worded in a more consistent fashion. *This change was made.*
- A recommendation should be added that visual aids should be age and gender sensitive. *Whereas this point may be self-evident, it could not be added without sufficient supporting evidence.*
- The evidence used should be limited to oncology. *The explanation as to why evidence from all healthcare settings was included was clarified.*
- There should be some mention regarding illiterate or functionally illiterate patients as they make up a large proportion of the oncologic patient population. *While this may be true, it could not be added in the absence of documented supporting evidence. There is mention of the issue of health literacy in the Discussion.*

### External Review by Ontario Clinicians and Other Experts

The PEBC external review process is two-pronged and includes a targeted peer review that is intended to obtain direct feedback on the draft report from a small number of specified content experts and a professional consultation that is intended to facilitate dissemination of the final guidance report to Ontario practitioners.

Following the review and discussion of Section 1: Recommendations and Section 2: Evidentiary Base of this EBS and review and approval of the report by the PEBC Report Approval Panel, the Patient Education Working Group circulated Sections 1 and 2 to external review participants for review and feedback. Box 1 summarizes the draft recommendations and supporting evidence developed by the Patient Education Working Group.

#### **BOX 1:**

DRAFT RECOMMENDATIONS (approved for external review September 9, 2009)

#### **QUESTION**

What are the most effective teaching strategies and methods of delivery for patient education?

#### **TARGET POPULATION**

The target population for this intervention is any individual who seeks services from the cancer system covering the entire continuum of care (prevention, screening, diagnosis, treatment, survivorship and palliative care).

**INTENDED USERS**

The intended users of this guidance document are healthcare professionals involved in patient education. This may include patient education specialists and healthcare administrators and managers. Physicians, nurses and allied healthcare professionals with an interest in patient education may also be interested in this document.

**RECOMMENDATIONS**

The following recommendations are informed by the currently available evidence (see Section 2). The recommendations are not meant to provide specific details with respect to the content provided through patient education. These recommendations are meant to provide an overview concerning the efficaciousness of the teaching strategies and methods of delivery that have been evaluated in the literature.

**Teaching Strategies**

- Computers can be an effective patient education teaching strategy, especially when patients are given information specific to their own situation rather than general information.
- Audiotapes of patient consultations can be effective for patient recall of verbal education.
- Videotapes (or more modern formats such as CDs and DVDs) can be an effective teaching strategy in delivering patient education.
- The provision of written materials, and, especially, tailored print materials, can also be an effective patient education teaching strategy. All written information should be prepared at a reading level appropriate for the general population. New patient information packages provided to patients prior to their first clinic visit are very useful to them.
- Verbal instruction should only be used in conjunction with another teaching method.
- Demonstrations, if appropriate for the situation, can be a very effective teaching strategy.
- The use of multiple teaching strategies is a good option for patient education.
- Use visual aids appropriately. Pictures and illustrations are useful for enhancing printed materials especially in those with low literacy skills. The illustrations should be non-ambiguous and should be accompanied by text written in simple language.

**Methods of Delivery**

- Patient-specific information (i.e., information specific to the individual's actual clinical situation) should be provided to patients, rather than general information about their cancer.
- Patient education should be structured. An ad hoc random question and answer format session is not sufficient.
- Patient education should involve multiple teaching strategies.
- Patient education for minority groups should be culturally sensitive.

**KEY EVIDENCE**

- The evidentiary base is composed of 19 systematic reviews (1-19) and four meta-analyses (20-23).
- In the summaries of the evidence that follows, the range of the standardized effect

sizes reported in the primary literature is presented, as is the range of p-values. When p-value or effect size has not been reported, this is also indicated. Standardized effect sizes greater than zero reflect an improvement.

- Computer interventions increase patient knowledge (Effect Size [ES], 0.12-1.03; p, Not Reported [NR]), reduce anxiety and increase satisfaction (ES, -0.05-0.40; p, NR) (1,6,7,11,12,15,18-20,23). ES is explained in the Methods section in Section 2 of this evidence-based series.
- Audiotapes of consultations increase patient knowledge. (ES, NR; p-values from individual studies, <0.001-0.05) (17).
- Videotape interventions increase patient knowledge (ES, 0.12-1.03; p=NR) (7,15,19,20) and satisfaction (ES, 0.05-0.40; p, NR) (7,20).
- New patient information packages improve patient knowledge, especially if provided prior to the first clinic appointment (ES, NR; p, NR) (4).
- Verbal instruction is the least effective teaching strategy and should not be used alone (ES, 0.28; p, NR) (23).
- Demonstrations are a good teaching strategy with a large effect size (ES, 0.79; p, NR) (23).
- The use of multiple methods is a good teaching strategy with a moderate effect size (ES= 0.44; 67% of patient receiving patient education by multiple methods had better outcomes than did patients receiving standard care; p=NR) (23).
  - Illustrations to complement text result in greater patient comprehension than text alone especially in those with low literacy skills (ES, NR; p-values from individual studies, 0.033-0.05) (14).
  - Patient-specific information is better than general information with respect to patient knowledge, anxiety and satisfaction (ES, NR; p, NR) (4).
  - Culturally sensitive patient education for minorities improves patient knowledge (ES, NR; p, NR) (8,13,21).

#### QUALIFYING STATEMENTS

- The clinic should make any necessary equipment (e.g., computer, audiotape player, videotape player, DVD player) available in the clinic for patients who do not have that equipment at home.
- Much of the evidence available is based on effect size meta-analysis. Therefore it is difficult to estimate magnitude of effect.
- The evidence underpinning these recommendations is complex and not easily summarized; please refer to Section 2 of this report for more details.

#### **Methods**

*Targeted Peer Review:* During the guideline development process, four targeted peer reviewers from Ontario, Alberta, Nova Scotia and the USA considered to be clinical and/or methodological experts on the topic were identified by the Patient Education Working Group. Several weeks prior to completion of the draft report, the nominees were contacted by email and asked to serve as reviewers. Four reviewers agreed, and the draft report and a questionnaire were sent via email for their review. The questionnaire consisted of items evaluating the methods, results, and interpretive summary used to inform the draft recommendations and whether the draft recommendations should be approved as a guideline.



Written comments were invited. The questionnaire and draft document were sent out on September 9, 2009. Follow-up reminders were sent at two weeks (email) and at four weeks (telephone call). The Patient Education Working Group reviewed the results of the survey.

**Professional Consultation:** Feedback was obtained through a brief online survey of health care professionals who are the intended users of the guideline. All patient educators, physicians, nurses, supportive care staff, allied health professionals, and hospital and health care administrators involved in patient education in the PEBC database were contacted by email to inform them of the survey. Participants were asked to rate the overall quality of the guideline (Section 1) and whether they would use and/or recommend it. Written comments were invited. Participants were contacted by email and directed to the survey website where they were provided with access to the survey, the guideline recommendations (Section 1), and the evidentiary base (Section 2). The notification email was sent on September 18, 2009. The consultation period ended on October 30, 2009. The Patient Education Working Group reviewed the results of the survey.

### Results

**Targeted Peer Review:** Three responses were received from the four reviewers who initially agreed to review the guideline. The key results of the feedback survey are summarized in Table 1.

**Table 1. Responses to nine items on the targeted peer reviewer questionnaire.**

Question	Reviewer Ratings (N=3)				
	Lowest Quality (1)	(2)	(3)	(4)	Highest Quality (5)
1. Rate the guideline development methods.					3
2. Rate the guideline presentation.					3
3. Rate the guideline recommendations.				2	1
4. Rate the completeness of reporting.				1	2
5. Does this document provide sufficient information to inform your decisions? If not, what areas are missing?			1	2	
6. Rate the overall quality of the guideline report.				1	2
	Strongly Disagree (1)	(2)	Neutral (3)	(4)	Strongly Agree (5)
7. I would make use of this guideline in my professional decisions.			1		2
8. I would recommend this guideline for use in practice.				1	2

**9. What are the barriers or enablers to the implementation of this guideline report?**

Two reviewers felt that a barrier to the implementation of this guideline report would be the dissemination plan itself. It was felt that every patient educator should see the document and that there should be accompanying slides and training program. Enablers that were identified were that it was thorough, well written, and easy to navigate, as well as the reputation of CCO and the authors of the document.

**Summary of Written Comments**

The main points contained in the written comments were:

- Recommendations could be evaluated using the GRADE scale.
- Recommendations are not very specific.
- It might be helpful to include discussions about learner preferences versus teacher preferences.
- An implementation plan should be included.

*Professional Consultation:* Nineteen responses were received. Key results of the feedback survey are summarized in Table 2.

**Table 2. Responses to four items on the professional consultation survey.**

General Questions: Overall Guideline Assessment	Number (%)				
	Lowest Quality (1)	(2)	(3)	(4)	Highest Quality (5)
a. Rate the overall quality of the guideline report.			4(22)	8(44)	6(33)
	Strongly Disagree (1)	(2)	(3)	(4)	Strongly Agree (5)
b. I would make use of this guideline in my professional decisions.		3(16)	3(16)	6(32)	7(37)
c. I would recommend this guideline for use in practice.		2(11)	4(21)	6(32)	7(37)

- d. What are the barriers or enablers to the implementation of this guideline report?

The main barrier identified by several respondents relates to resources, both in terms of human resources and equipment and technological resources. For example, even though the use of technology appears effective in patient education, it is very costly to develop the appropriate programs. One respondent cited the difficulty in providing appropriate education to patients and families as well as a lack of 'buy-in' by multidisciplinary team members. Enablers that were identified included comprehensiveness, strength of the evidence which was presented in an easy-to-follow format and readability of the document.

**Summary of Written Comments**

The main points contained in the written comments were:

- Nurse educators and innovators in patient education should have access to this document.
- The qualifying statement in Section 1 should include clinic and patient care areas.
- Having patient consultation audiotapes would/might change how practitioners interact with patients.
- Individual learning styles (ex., blunders and monitors) for patients would be relevant information to accompany this guideline.
- The guideline is weakened by its reliance on systematic reviews.
- The body of evidence is not keeping up with the pace of technological development. Patients now have tools at their disposal that have not been assessed extensively yet.
- There are online resources for self-education or for peer-to-peer support.
- We deal with culturally diverse populations and am uncertain whether these evidence-based approaches are best for all cultural backgrounds.

### ***Modifications/Actions***

- a. The PEBC historically does not grade recommendations. The rationale has been that it is not advantageous to create hierarchies of recommendations that imply that some are better than others. The recommendations are to be considered in their totality, and the reader can then decide on their 'importance' based on the readers own needs/priorities and the qualifying statements (if included) and the key evidence sections.
- b. A statement regarding the specificity of the recommendations was added to the list of Qualifying Statements in Section 1.
- c. The working group recognizes that the topic of learner preferences versus teacher preferences is an important one but beyond the scope of the current guideline.
- d. CCO carries out dissemination and implementation of guidelines.
- e. Guideline dissemination is done by CCO.
- f. The qualifying statement was so changed.
- g. The working group recognizes the importance of this statement. However, the recommendation regarding the use of audiotaped consultations is evidence-based.
- h. The working group recognizes the importance of individual learning styles such as blunter and monitors. However, it is beyond the scope of this guideline.
- i. Systematic reviews (with or without meta-analyses) are considered to be the highest levels of evidence.
- j. The working group recognizes that technology is advancing at a very rapid pace. Unfortunately, it is not possible to systematically study technologies that have not yet been assessed.
- k. Online self help and peer support is available but is beyond the scope of this document.
- l. Evidence is presented in Section 2 and a recommendation is provided in Section 1 regarding the delivery of culturally sensitive patient education programs.

### **Conclusion**

This EBS report reflects the integration of feedback obtained through the external review process with final approval given by the Patient Education Working Group and the Report Approval Panel of the PEBC. Updates of the report will be conducted as new evidence informing the question of interest emerges.

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The PEBC is a provincial initiative of Cancer Care Ontario supported by the Ontario Ministry of Health and Long-Term Care through Cancer Care Ontario. All work produced by the PEBC is editorially independent from its funding source.

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