INTRODUCTION TO LEVELS OF EVIDENCE IN RESEARCH

BY: THE RESEARCH COMMITTEE

SOCIETY FOR ARTS IN HEALTHCARE

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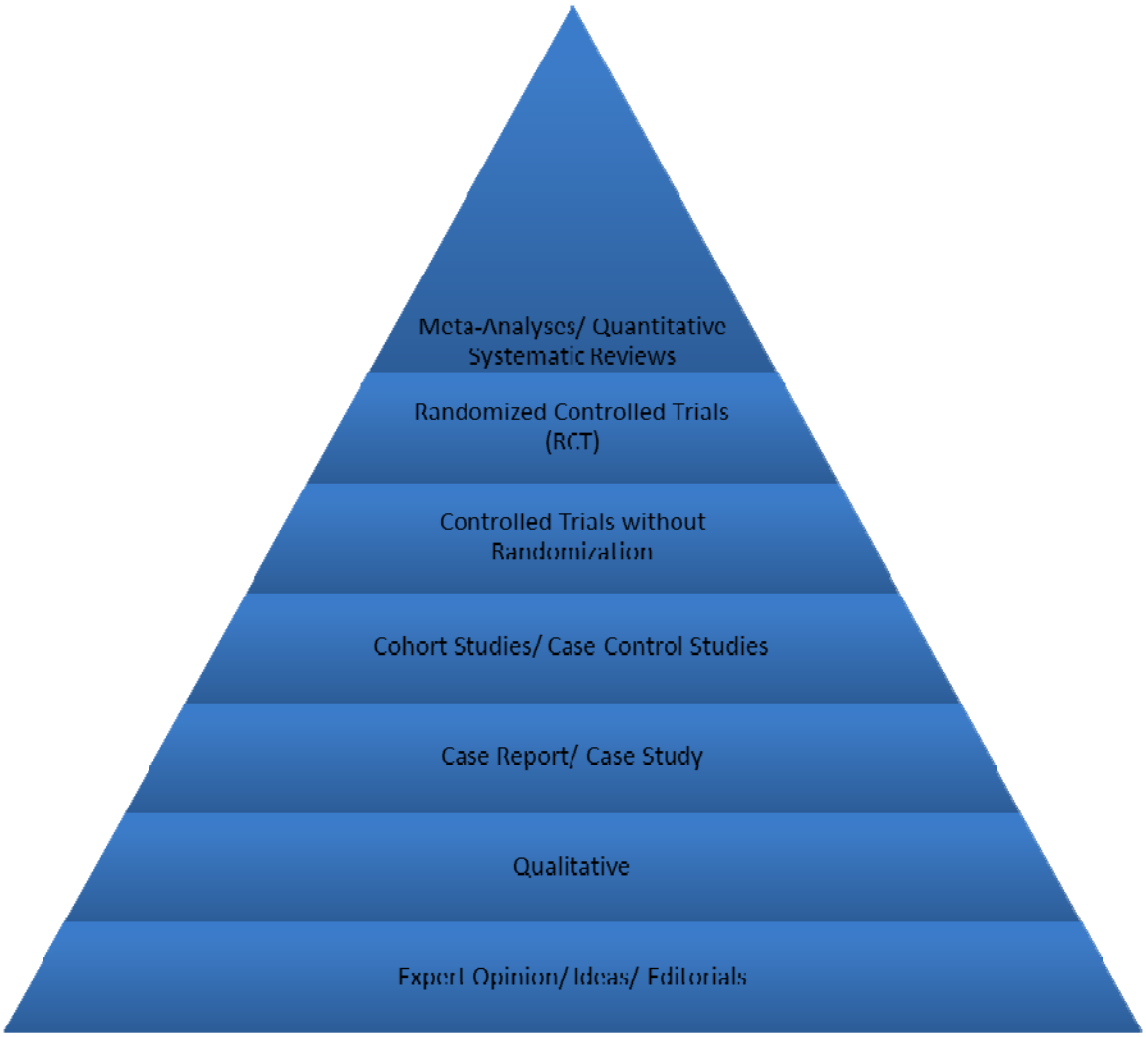
Evidence-Based Practice

Evidence-based practice (EBP) is the existing standard protocol for practice among healthcare professionals. Evidence-based practice is the assimilation of 1) scientific research evidence with pathophysiologic reasoning, 2) health provider experience and skills, and 3) patient preference and input in the specification of the best course of treatment and care (Cook & Levy, 1998; Dileo & Bradt, 2009).

Hierarchical Levels of Evidence in Evidence-based Practice



Source: Dileo, C. & Bradt, J. (2009). On creating the discipline, profession, and evidence in the field of arts and healthcare. *Arts & Health, 1*(2), 168-182. (Reprinted by permission of the publisher: Taylor & Francis Ltd, http://www.informaworld.com.)

GLOSSARY

META-ANALYSES / QUANTITATIVE SYSTEMATIC REVIEWS

DEFINITION:

A comprehensive survey and analysis of multiple clinical trials.

EXAMPLES OF SYSTEMATIC REVIEW JOURNAL ABSTRACT:

1. Daykin, N., Orme, J., Evans, D., Salmon, D., McEachran, M., & Brain, S. (2008). The impact of participation in performing arts on adolescent health and behavior: A systematic review of the literature. *Journal of Health Psychology, 13*(2), 251-264.

   This article reports a systematic review of literature published between 1994 and 2004 on the effects of performing arts for health in young people aged 11—18. The review includes research on music, performance, drama, and dance in community settings and non-curricular mainstream education. A total of 17 electronic databases were searched and 3,670 papers identified, 104 of which met relevance criteria. Full text scrutiny of 85 papers was undertaken and 14 of these were identified for review. The research was heterogeneous, making overall synthesis of results inappropriate. The review demonstrates that research on the impact of the performing arts on young people is at a relatively early stage.

   Link: http://hpq.sagepub.com/cgi/content/abstract/13/2/251

2. Nairn, S., Whotton, E., Marshal, C., Roberts, M., & Swann, G. (2004). The patient experience in emergency department: A review of the literature. *Accident and Emergency Nursing, 12*(3), 159-165.

   This paper analysis the literature on the patient experience within emergency departments. We identify six themes within the literature: waiting times, communication, cultural aspects of care, pain, the environment, and dilemmas in accessing the patient experience. Overall, the literature has a North American bias and is largely quantitative in approach. Although levels of patient satisfaction are high, a number of issues arise within the review, which suggest areas where quality of care could improve. We also identify the problematic nature of accessing the patient experience and suggest future areas for researchers to explore.

   Link: http://www.ncbi.nlm.nih.gov/pubmed/15234713

RANDOMIZED CONTROLLED TRIALS (RCT)

DEFINITION:

An experimental study typically conducted by comparing a treatment group with a control group. The treatment group receives the treatment/intervention under investigation; and the control group receives either no treatment/intervention or some standard default treatment. Participants in the

study are randomly assigned to either the treatment or control groups in order to reduce the risks of bias and differences between groups.

EXAMPLES OF RANDOMIZED CONTROLLED TRIAL JOURNAL ABSTRACT:

1. Chafin, S., Roy, M., Gerin, W., & Christenfeld, N. (2004). Music can facilitate blood pressure recovery from stress. *British Journal of Health Psychology, 9*(3), 393-403.

   OBJECTIVES: Interventions that reduce the magnitude of cardiovascular responses to stress are justified, at least in part, by the notion that exaggerated responses to stress can damage the cardiovascular system. Recent data suggest that it is worthwhile to explore, in addition to the magnitude of the cardiovascular responses during stress (reactivity), the factors that affect the return to baseline levels after the stressor has ended (recovery). This experiment examined the effect of listening to music on cardiovascular recovery.
   DESIGN AND METHOD: Participants (N = 75) performed a challenging three-minute mental arithmetic task and then were assigned randomly to sit in silence or to listen to one of several styles of music: classical, jazz, or pop.
   RESULTS: Participants who listened to classical music had significantly lower post-task systolic blood pressure levels (M = 2.1 mmHg above pre-stress baseline) than did participants who heard no music (M = 10.8 mmHg). Other musical styles did not produce significantly better recovery than silence.
   CONCLUSIONS: The data suggest that listening to music may serve to improve cardiovascular recovery from stress, although not all music selections are effective.

   Link: http://www.ncbi.nlm.nih.gov/pubmed/15296685?dopt=Citation

2. Tse, M. M., Ng, J. K., Chung, J. W., & Wong, T. K. (2002). The effect of visual stimuli on pain threshold and tolerance. *Journal of Clinical Nursing, 11*(4), 462-469.

   BACKGROUND: For many hospital patients, the experience brings pain and anxiety. Unfamiliar surroundings, various diagnostic and therapeutic procedures, and the sight and sounds of medical procedures exacerbate pain and anxiety. OBJECTIVE: To block off the anxiety-inducing sights and sounds of hospital surroundings and create a pleasing environment, the therapeutic potential of visual stimulation as a nursing intervention was investigated.
   DESIGN AND METHODS: In a randomized, controlled, crossover study, pain was produced by a modified tourniquet technique in 46 healthy volunteers. Subjects were randomly allocated to two groups (Group V and Group B) with subsequent cross-over. Those in Group V watches a soundless video display of natural scenery during tourniquet inflation, whereas in Group B subjects watched a static blank screen. Pain threshold was defined as the time when subjects reported the first detectable pain, whereas pain tolerance was the time the pain was reported to be intolerable and deflation of the tourniquet was requested.
   RESULTS: With the use of visual stimuli, there was a significant increase in pain threshold (*P* 0.05) and pain tolerance (*P* 0.01). Gender and the sequence of visual stimuli did not have any significant effect on pain threshold and physiological data correlated with pain scores and visual stimuli are needed.

CONCLUSIONS: The findings have implications for nurses and other healthcare professionals to use various visual stimuli as positive adjuncts to other methods of pain relief and for different pain conditions in clinical areas.

Link: http://www.ncbi.nlm.nih.gov/pubmed/12100642

CONTROLLED TRIALS WITHOUT RANDOMIZATION

DEFINITION:

A study conducted according to the rigors of RCT except that the participants are not randomly assigned to the different groups.

EXAMPLES OF CONTROLLED TRIALS WITHOUT RANDOMIZATION JOURNAL ABSTRACT:

1. Hessig, R. E., Arcand, L. L., & Frost, M. H. (2004). The effects of an educational intervention on oncology nurses' attitude, perceived knowledge, and self-reported application of complementary therapies. *Oncology Nursing Forum, 31*(1), 71-78.

PURPOSE/OBJECTIVES: To evaluate the effects of an educational program on oncology nurses' attitude, perceived knowledge, and self-reported application of 10 complementary therapies (art, exercise, humor, imagery, journaling, massage, music, relaxation, spirituality, and touch).
DESIGN: Quasi-experimental with a pre- and post-test design.
SETTING: A large tertiary care medical center in the midwestern United States.
SAMPLE: A convenience sample consisting of 44 RNs working on two ematology and oncology patient care units. Eleven nurses comprised the educational intervention group, and 14 nurses on the same unit served as one control group. A second control group was comprised of 19 nurses from a different unit.
METHODS: The study approach consisted of the assessment of all participants' initial attitude toward, knowledge of, and application of complementary therapies. A researcher-developed questionnaire was completed before and at three and six months after the educational intervention.
MAIN RESEARCH VARIABLES: Nurses' attitudes toward, knowledge of, and use of complementary therapies.
FINDINGS: Nurses value complementary therapies but lack the knowledge regarding their application. In addition, a gap exists between self-reported knowledge and the actual application of therapies. An eight-hour educational intervention was useful in enhancing knowledge and, to some degree, increasing application of some of the therapies. According to participants, lack of time was the main deterrent impeding use of complementary therapies in their nursing practice.
CONCLUSIONS: Education can affect the knowledge and integration of complementary therapies in nursing practice.
IMPLICATIONS FOR NURSING: Further research is needed to evaluate outcomes and determine educational approaches that will produce positive changes in nurses' attitudes toward, knowledge of, and application of complementary therapies.

Link: http://www.ncbi.nlm.nih.gov/pubmed/14722590

2. Diette, G. B., Lechtzin, N., Haponik, E., Devrotes, A., & Rubin, H. R. (2003). Distraction therapy with nature sights and sounds reduces pain during flexible bronchoscopy: A complementary approach to routine analgesia. *Chest, 123*(3), 941-948.

OBJECTIVE: To determine whether distractions therapy with nature sights and sounds during flexible bronchoscopy (FB) reduces pain and anxiety. DESIGN: Randomized controlled trial. PATIENTS: Consecutive adult patients (n = 80) undergoing FB with conscious sedation. INTERVENTION: Nature scene murals were places at the bedside, and patients were provided a tape of nature sounds to listen to before, during, and after the procedure. Patients assigned to the control group were not offered either the nature scene or the sounds. MEASUREMENTS AND RESULTS: The primary outcomes were patient ratings of pain control (a 5-point scale ranging from poor to excellent) and anxiety. In a multivariate ordinal logistic regression model, the odds of better pain control were greater in the intervention patients than in the control patients (odds ratio [OR], 4.76; 95% confidence interval [CI], 1.35 to 16.7), after adjustment for age, gender, race, education, health status, and dose of narcotic medication. Older patients and patients with better health status reported significantly less pain. There was no difference in patient-reported anxiety between the two groups (OR, 0.87; 95% CI, 0.39 to 1.96). CONCLUSIONS: Distraction therapy with nature sights and sounds significantly reduces pain in patients undergoing FB. Although the précis mechanism of this beneficial effect requires further investigation, clinicians should consider this nonintrusive strategy in addition to standard analgesic medications in patients undergoing painful, invasive procedures.

Link: http://www.ncbi.nlm.nih.gov/pubmed/12628899

Cohort / Case Control Studies

Definition:

A study in which patients who presently have a certain condition and/or receive a particular treatment are followed over time and compared with another group who are not affected by the condition under investigation.

Examples of cohort study journal abstracts:

1. Hamre, H. J., Witt, C. M., Glockmann, A., Ziegler, R., Willick, S. N., & Kiene, H. (2007). Anthroposophic art therapy in chronic disease: A four-year prospective cohort study. *Explore (NY), 3*(4), 365-371.

BACKGROUND: Anthroposophic art therapy (painting, clay modeling, music, and speech exercises) is used in 28 countries but has not yet been studied in primary care. OBJECTIVE: To study clinical outcomes in patients treated with anthroposophic art therapy for chronic diseases. DESIGN: Prospective cohort study. SETTING: Fifty-four medical practices in Germany. PARTICIPANTS AND INTERVENTIONS: One hundred sixty-one consecutive outpatients (primary

care: n = 150), aged 5-71 years, were treated by 52 different art therapists.
MAIN OUTCOME MEASURES: Disease and symptom scores (physician and patient assessment, respectively, 0-10) and quality of life (adults: SF-36 Health Survey, children: KINDL Questionnaire for Measuring Health-Related Quality of Life in Children and Adolescents). Outcomes were measured after 3, 6, 12, 18, and 24 months; SF-36 and symptom scores were also measured after 48 months.
RESULTS: Most common indications were mental disorders (60.9% of patients, primarily depression, fatigue, and anxiety) and neurological diseases (6.8%). The median number of therapy sessions was 15; median therapy duration was 161 days. All outcomes except KINDL improved significantly between baseline and all subsequent follow-ups. Improvements from baseline to 12 months were: disease score from (mean +/- standard deviation) 6.69 +/- 1.72 to 2.46 +/- 1.90 (P < .001), symptom score from 5.99 +/- 1.69 to 3.40 +/- 2.08 (P < .001), SF-36 physical component summary measure from 44.12 +/- 10.03 to 48.68 +/- 9.47 (P < .001), and SF-36 mental component summary measure from 35.07 +/- 12.23 to 42.13 +/- 11.51 (P < .001). All these improvements were maintained until last follow-up.
CONCLUSION: Patients receiving anthroposophic art therapy had long-term reduction of chronic disease symptoms and improvement of quality of life.

Link: http://www.ncbi.nlm.nih.gov/pubmed/17681256

2. Bygren, L. O., Benson, B., & Johansson, S. E. (1996). Attendance at cultural events, reading books or periodicals, and making music or singing in a choir as determinants for survival: Swedish interview survey of living conditions. *British Medical Journal, 313* 1577-1580.

OBJECTIVES: To investigate the possible influence of attendance at cultural events, readings books or periodicals, making music, or singing in a choir as determinants for survival.
DESIGN: A simple random sample was drawn of 15,198 individuals ages 16–74 years. Of these, 85% (12,982) were interviewed by trained non-medical interviewers between 1982 and 1983 about cultural activities. They were followed up with respect to survival until 31 December 1991.
SETTING: Swedish interview survey of living conditions comprising a random sample of the adult Swedish population. SUBJECTS: 12,675 people interviewed between 1982 and 1983.
OUTCOME MEASURES: Survival of subjects after controlling for eight confounding variables: age, sex, education level, income, long term disease, social network, smoking, and physical exercise.
RESULTS: 6,301 men and 6,374 women were followed up, 533 men and 314 women died during this period. The control variables influenced survival in the expected directions except for social network for men, a significant negative effective was found when the analysis was made separately for men and women. We found an influence on mortality when the eight control variables were controlled for in people who rarely attended events compared with those attending most often, the relative risk being 1.57 (95% confidence interval 1.1.8 to 2.09).
CONCLUSION: Attendance at cultural events may have a positive influence on survival. Long term follow up of large samples with confounders that are well controlled for and with the cultural stimulation more highly specified should be used to try to falsify the hypothesis before experiments start.

Link: http://www.ncbi.nlm.nih.gov/pubmed/8990990

Case Report / Case Study

Definition:

A collection of reports on the treatment of individual patients or of reports on a single patient.

Examples of case study journal abstracts:

1. Mell, J. C., Howard, S. M., & Miller, L. (2003). Art and the brain: The influence of frontotemporal dementia on an accomplished artist. *Neurology, 60*(10), 1707-1710.

   A talented artist developed a progressive aphasia syndrome associated with frontotemporal dementia (FTD). As her disease progressed, language and executive skills declined, but her paintings became freer and more original. She demonstrates that artistic development can occur in the setting of language-dominant types of FTD. The study of artistic development in the setting of FTD suggests that language is not required for, and may even inhibit, certain types of visual creativity.

   Link: http://www.ncbi.nlm.nih.gov/pubmed/12771276?dopt=Abstract

2. Stewart, N. J., McMullen, L. M., & Rubin, L. D. (1994). Movement therapy with depressed inpatients: A randomized multiple single case design. *Archives of Psychiatric Nursing, 8*(1), 22-29.

   The relative lack of research on movement therapy in inpatient versus outpatient settings stems from the difficulty of conducting an interpretable study in clinical situations where multiple treatments exist. To control for the multiple treatment confound, this study used a randomized single-case experimental design with 12 replications. Results indicated that the movement therapy, which was designed to target the syndrome of a major depressive episode had a positive effect on mood across experiments ($p < .001$). From a clinical perspective, these results support the use of a movement program as adjunctive treatment, and challenge the view that movement is recreation but not therapy.

   Link: http://www.ncbi.nlm.nih.gov/pubmed/8203940

Qualitative

Definition:

Research that uses a naturalistic/observational approach to understand phenomena in context-specific settings where the researcher does not attempt to manipulate the phenomenon under investigation.

EXAMPLES OF QUALITATIVE STUDY JOURNAL ABSTRACTS:

1. Reynolds, F. & Prior, S. (2003). A lifestyle coat-hanger: A phenomenological study of the meanings of artwork for women coping with chronic illness and disability. *Disability and Rehabilitation, 25*(14), 785-794.

   PURPOSE: The purpose of this phenomenological enquiry was to explore the meanings and functions of art for a group of women living with disabling chronic illness. Participants were recruited on the basis that they considered artwork as central to their current well-being.
   METHOD: Thirty women were interviewed and five submitted written narratives. Interpretative phenomenological analysis was carried out.
   RESULTS: About half of the participants had taken up their preferred artistic occupation since the onset of illness. Participants described their artwork as contributing to their health and well-being in many diverse ways. Art filled occupational voids, distracted thoughts away from illness, promoted the experience of flow and spontaneity, enabled the expression of grief, maintained a positive identity, and extended social networks. Its value was conceptualized by one participant as a 'lifestyle coat-hanger' organizing numerous further roles and activities that gave purpose to life. Art was more than cathartic. It offered a versatile means of overcoming the restrictions imposed by illness on self and lifestyle, in many cases creating a more enriched lifestyle than before.
   CONCLUSIONS: The findings may encourage professionals working in health and rehabilitation settings to assist clients in identifying meaningful, creative occupations that are feasible within the limits imposed by illness or injury.

   Link: http://www.informaworld.com/smpp/content~content=a713823378~db=all

2. Mills, L. J. & Daniluk, J. C. (2002). Her body speaks: The experience of dance therapy for women survivors of child sexual abuse. *Journal of Counseling & Development, 80*(1), 77-85.

   This qualitative, phenomenological study explores the experiences of dance therapy for five women who had been sexually abused as children. Using in-depth, largely unstructured interviews, the women reflect on their dance therapy experiences and on their perceptions of the role of these experiences in their psychological healing. Analysis of these data revealed six common themes related to the women's sense of spontaneity, permission to play, struggle, freedom, intimate connection, and bodily reconnection. The implications of the findings are discussed in terms of the therapeutic nature of dance therapy and how this therapeutic modality facilitates change and healing in clients' lives.

   Link:http://aca.metapress.com/app/home/content.asp?referrer=contribution&format=3&page=1&pagecount=9

EXPERT OPINION & IDEAS & EDITORIALS

DEFINITION:

The perceptions and knowledge of experts in their specialized areas.

EXAMPLES OF EXPERT OPINION/IDEAS JOURNAL ABSTRACTS (FIRST 2 PARAGRAPHS OF ARTICLE):

1. Begley, S. (2000). Music on the mind. Scientists are finding that the human brain is prewired for music. Could this sublime expression of culture be as much about biology as art? *Newsweek, 136*(4), 50-52.

If you were to peek inside Sandra Trehub's lab, you might easily mistake it for one of those obnoxious superbaby classes. Beaming 6- to 9-month-olds sit transfixed in a parent's lap as a few seconds of melody pours from the speakers, and become more alert when the tempo or pitch changes. But the University of Toronto psychologist isn't trying to teach infants the finer points of Vivaldi. She is, instead, trying to shed light on whether the human brain comes preloaded with music software the way a laptop comes preloaded with Windows. In one test, Trehub varies the pitch, tempo, and melodic contour of music, and finds that babies can detect changes in all three. The infants recognize that a melody whose pitch or tempo has changed is the same melody, for instance, suggesting that they have a rudimentary knowledge of music's components. The real surprise, though, comes when Trehub plays consonant (pleasant) and dissonant passages in an attempt to tease out whether our musical preferences are shaped by culture alone or wired into our brain from birth. Infants, she finds, smile when the air is filled with perfect fourths and perfect fifths--chords or sequences separated by five half steps, like C and F, or seven half steps, like C and G, respectively. But babies hate the ugly tritone, in which two notes are separated by six half steps, like C and F sharp, and sound so unresolved and unstable that in medieval times it was known as "the devil." What seems to be a biologically based preference "may explain the inclusion of perfect fifths and fourths in music across cultures and across centuries," says Trehub.

Music has charms to soothe a savage breast, but scientists are finding that it works those charms through the brain. At a recent conference of the New York Academy of Sciences, Trehub and dozens of other scientists interspersed their PET scans and MRIs with snatches of Celine Dion and Stravinsky as they reported on the biological foundations of music. Besides the musical babies, several other lines of evidence suggest that the human brain is wired for music, and that some forms of intelligence are enhanced by music. Perhaps the most striking hint that the brain holds a special place in its gray matter for music is that people can typically remember scores of tunes, and recognize hundreds more. But we can recall only snatches of a few prose passages ("Four score and seven years ago..."). Also, music affects the mind in powerful ways: it not only incites passion, belligerence, serenity, or fear, but does so even in people who do not know from experience, for instance, that a particular crescendo means the killer is about to pop out on the movie screen. All in all, says psychologist Isabelle Peretz of the University of Montreal, "the brain seems to be specialized for music."

Link:http://www.brams.umontreal.ca/plab/research/dossiers_vulgarisation/newsweek_musicmin

d/newsweek_musicmind.html?Story_ID=329414

2. Ulrich, R. S. (1991). Effects of interior design on wellness: Theory and recent scientific research. *Journal of Healthcare Interior Design, 3,* 97-109.

To summarize briefly, key general points in this presentation include the following: To promote wellness, healthcare facilities should be designed to support patients in coping with stress. As general compass points for designers, scientific research suggests that healthcare environments will support coping with stress and promote wellness if they are designed to foster: 1. Sense of control; 2. Access to social support; 3. Access to positive distractions, and lack of exposure to negative distractions. A growing amount of scientific evidence suggests that nature elements or views can be effective as stress-reducing, positive distractions that promote wellness in healthcare environments. In considering the needs of different types of users of healthcare facilities--patients, visitors, staff—it should be kept in mind that these groups sometimes have conflicting needs or orientations with respect to control, social support, and positive distractions. It is important for designers to recognize such differing orientations as potential sources of conflict and stress in health facilities (Schumaker and Pequegnat, 1989). For instance, a receptionist in a waiting area may understandably wish to control the programs on a television that he or she is continuously exposed to; however, patients in the waiting area may experience some stress if they cannot select the programs or elect to turn off the television. Some staff may prefer bright, arousing art for corridors and patient rooms where they spend much of their time; however, for many patients, such art may increase rather than reduce stress. A difficult but important challenge for designers is to be sensitive to such group differences in orientations, and try to assess the gains or losses for one group vis-a-vis the other in attempting to achieve the goal of psychologically supportive design. Designers should also consider programs or strategies that combine or mesh different stress-reducing components. For example, it seems possible that a program enabling patients to select at least some of their wall art or pictures would foster both control and access to positive distraction. As another example, the theory outlined in this paper suggests that an "artist-in-residence" program, wherein an artist with a caring, supportive disposition would work with patients, might foster social support in addition to control and access to positive distraction. Running through this presentation is the conviction that scientific research can be useful in informing the intuition, sensitivity, and creativity of designers, and thereby can help to create psychologically supportive healthcare environments.

Link: http://www.ncbi.nlm.nih.gov/pubmed/10123973

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All information illustrated in this document are basic categories of research and evidence-based studies. This document serves to educate the reader in recognizing the different levels of evidence when perusing the Bibliography/Research sections of the Society for the Arts in Healthcare website. All abstracts mentioned are available to the public through http://www.pubmed.gov .

