

# NIOSH's Approach to Training and Training Effectiveness Research

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The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

National Institute for Occupational Safety and Health  
Education and Information Division



# NIOSH's Efforts in Worker Training and Training Effectiveness Research

**1974-2012** Training Research

**1985** Established Worker Notification program

**1989-2010** Hazardous Substance Training

**1993** Developed 3 + 3 Donning Method for self-contained Self Rescuers (now legally mandated procedure for training)

**1994** M. Colligan (ed) Occupational Medicine: State of the Art Review on Training

**1998** Cohen et al. Assessing Occupational Safety and Health Training-literature review

# Assessing Occupational Safety and Health Training

*A Literature Review*

Prepared by:

Alexander Cohen, PhD  
Michael J. Colligan, PhD

With Technical Assistance from:

Raymond Sinclair  
Jerry Newman  
Ronald Schuler

June 1998

# Conclusion

Training is effective in reducing injuries and illnesses (NIOSH, 1998)

# NIOSH's Efforts in Worker Training and Training Effectiveness Research (cont'd)

**1999** Training Intervention Effectiveness Research document



# A Model for Research on Training Effectiveness



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health

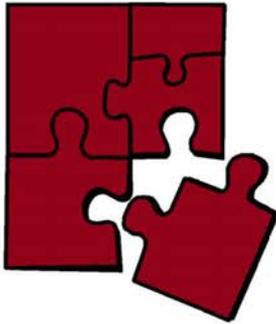


# NIOSH's Efforts in Worker Training and Training Effectiveness Research (cont'd)

- 1999** Training Intervention Effectiveness Research document
- 1999** National Conference on Workplace Training
- 2002** NIOSH Safety Checklist Program for Schools
- 2002** Worker Training in a New Era: Responding to New Threats
- 2003** Emergency Responders Training Grant Program
- 2004** Report on National Conference on Workplace Training



*Report from the  
National Conference on*



# **Workplace Safety & Health Training**

**Putting The Pieces Together & Planning For The Challenges Ahead**

## ***Co-Sponsoring Agencies***



**National Institute for  
Environmental Health Sciences**



**Occupational Safety &  
Health Administration**

**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health



# NIOSH's Efforts in Worker Training and Training Effectiveness Research (cont'd)

- 2005** Working Together for Safety – Training Vocational Students
- 2010** NIOSH/IWH Systemic Review of the Effectiveness of Training

January 2010

## A systematic review of the effectiveness of training & education for the protection of workers



Ins

sharing best evidence

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- 2005** Working Together for Safety – Training Vocational Students
- 2010** NIOSH/IWH Systemic Review of the Effectiveness of Training
- 2011** Talking Safety – High School Curriculum
- 2011** Startup of the Mine Rescue and Escape Training Laboratory
- 2012** Systematic review of training effectiveness(Scand J Work Environ Health)

# Review

*Scand J Work Environ Health*. 2012;38(3):193–208. doi:10.5271/sjweh.3259

## A systematic review of the effectiveness of occupational health and safety training

by Lynda S Robson, PhD,<sup>1</sup> Carol M Stephenson, PhD,<sup>2</sup> Paul A Schulte, PhD,<sup>2</sup> Benjamin C Amick III, PhD,<sup>1,3</sup> Emma L Irvin, BA,<sup>1</sup> Donald E Eggerth, PhD,<sup>2</sup> Stella Chan, MSc,<sup>4</sup> Amber R Bielecky, MSc,<sup>1</sup> Anna M Wang, BScN,<sup>1</sup> Terri L Heidotting, EdD,<sup>5</sup> Robert H Peters, MSc,<sup>6</sup> Judith A Clarke, MA,<sup>1</sup> Kimberley Cullen, MSc,<sup>1</sup> Cathy J Rotunda, EdD,<sup>7</sup> Paula L Grubb, PhD<sup>8</sup>

Robson LS, Stephenson CM, Schulte PA, Amick BC III, Irvin EL, Eggerth DE, Chan S, Bielecky AR, Wang AM, Heidotting TL, Peters RH, Clarke JA, Cullen K, Rotunda CJ, Grubb PL. A systematic review of the effectiveness of occupational health and safety training. *Scand J Work Environ Health*. 2012;38(3):193–208. doi:10.5271/sjweh.3259

**Objectives** Training is regarded as an important component of occupational health and safety (OHS) programs. This paper primarily addresses whether OHS training has a beneficial effect on workers. The paper also examines whether higher engagement OHS training has a greater effect than lower engagement training.

**Methods** Ten bibliographic databases were searched for pre-post randomized trial studies published in journals between 1996 and November 2007. Training interventions were included if they were delivered to workers and were concerned with primary prevention of occupational illness or injury. The methodological quality of each relevant study was assessed and data was extracted. The impacts of OHS training in each study were summarized by calculating the standardized mean differences. The strength of the evidence on training's effectiveness was assessed for (i) knowledge, (ii) attitudes and beliefs, (iii) behaviors, and (iv) health using the US Centers for Disease Control and Prevention's *Guide to Community Preventive Services*, a qualitative evidence synthesis method.

**Results** Twenty-two studies met the relevance criteria of the review. They involved a variety of study populations, occupational hazards, and types of training. Strong evidence was found for the effectiveness of training on worker OHS behaviors, but insufficient evidence was found of its effectiveness on health (ie, symptoms, injuries, illnesses).

**Conclusions** The review team recommends that workplaces continue to deliver OHS training to employees because training positively affects worker practices. However, large impacts of training on health cannot be expected based on research evidence.

**Key terms** education; evaluation; intervention; OHS; OHS training; prevention; primary prevention.

# NIOSH Approach to Training and Training Effectiveness Research

- ❑ Removing hazards is the primary means of protecting workers. The hierarchy of controls is paramount in this regard
- ❑ Management has the responsibility for a safe and healthy workplace; training is a component of that effort.
- ❑ The purpose of training is to increase knowledge and awareness, empower workers, augment skills, and equip workers so they can engage in safe work practices.
- ❑ The fact that training addresses behavior among other outcomes should not be construed as a preference for behavior-based safety. Management commitment and responsibility are the primary features of a health and safety program.

# Title

- ❑ An effective training program requires consideration of training as a systematic process that requires the attention to issues before, during, and after training.
- ❑ Critical in conducting training is to assess its effectiveness
- ❑ Research on the effectiveness of training should include a full range of outcomes: knowledge, attitudes, empowerment, skills, and behaviors.
- ❑ Training and training effectiveness research merit continued attention by the occupational safety and health community.

January 2010

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sharing best evidence

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# Systematic Reviews

- ❑ Evidence-based conclusion
- ❑ Transparent and scientific
- ❑ Systematically attempts to find appropriate evidence
- ❑ Appraises its strengths and limitations
- ❑ Draws together evidence such that the more robust studies are given greater weight

# Systematic Review of the Effectiveness of Training [2010] & Robson et al. [2012]

- ❑ Reviewed 22 randomized control trials
- ❑ Found strong evidence of the effectiveness of training on specifically trained behaviors
- ❑ Findings on knowledge, attitudes, and beliefs consistent with the evidence on behavior
- ❑ In addition to workers, foreman, employers, contractors, and owners should have OSH training.
- ❑ Found a lack of high quality randomized trials
- ❑ Need more rigorous studies of training effectiveness

# Summary in Review of the Effectiveness of Training (IWH 2010)

In short, for training to be effective, it is likely that a worker must be empowered and enabled to perform according to the training content.