

# Mapping Safety Interventions in Small Metal Fabrication Businesses

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# Intervention Mapping

- Study planning model proposed by Dr. Kay Bartholomew (University of Texas-Houston)
- Step-by-step process for intervention design
- Integrates behavioral theories, epidemiologic evidence and target population information

# Data Collection

- Advisory board
  - Representatives from metal fabrication businesses, government agencies, business associations, technical schools and unions
- Machine safety documents
  - Regulations, consensus standards
- Health and safety professionals
  - Machine guarding expertise
- Employee focus groups
- Pilot tests at representative businesses

# Needs Assessment

## Intervention Map

Step 1 – Define Program Objectives

Step 2 – Select Methods & Strategies

Step 3 – Design a Program Plan

Step 4 – Adoption & Implementation Plan

Step 5 – Monitoring & Evaluation Plan

# Step 1A – Define Program Objectives

- Identify overall program goals and performance objectives
  - What changes do you expect in behaviors or environmental conditions as a result of the intervention?
- Evaluate each performance objective for its underlying determinants
  - Why does this behavior or situation occur?
  - Draw on relevant health behavior theories
- Identify learning or change objectives

# Step 1A – Machine Safety

- Overall goal
  - Bring about improvements in machine and workplace safety
- Compare effectiveness of interventions aimed at one or two target populations
  - Business owners
  - Business owners & employees

# Business Owners

- Failure to provide safe machinery and a safe environment
- Lack of knowledge, resources and time
- Old equipment that is difficult to retrofit
- No contact with OSHA, except after a serious injury
- Complex machine safety regulations
- No on-site staff with H&S expertise
- Limited access to external assistance
- No readily-available or easy-to-use machine safety evaluations

# Program Goals - Owners

- Be able to assess safety in their business
- Be familiar with methods for improving workplace and machine safety
- Include employees in decision-making and problem solving
- Support skill-based training of employees
- Support employee suggestions for improvements
- Make improvements in machine guarding and employee training
- Make improvements in policies and programs



# Employees

- Employees will use machine guards and follow safe procedures...
  - If available
  - If adequately trained
  - If not “short-circuited” by other policies
  - If supervisors and peers expect and support their use

# Program Goals - Employees

- View machine safety more positively
- Use guards and other safety devices
- Follow policies and procedures
- Be able to assess machine safety
- Become familiar with safety improvement processes
- Participate in health and safety decision-making

# Step 1B – Personal and Environmental Determinants

## ■ Social Cognitive Theory

- Self-efficacy – confidence in improving machine safety or using machines safely
- Reinforcements – perceptions of policies or procedures that encourage or discourage machine safety
- Environment – perceptions of the influence of equipment, training and management support on machine safety
- Situation – perceptions of the impact of guards, policies or procedures on ability to improve safety or work safely

# Step 1B – Machine Safety

- Identify an objective for each performance objective and determinant
- Example: Business Owners Able to Assess Shop Safety
  - Environment: Have accessible and useful info
  - Self-efficacy: Use info more confidently
  - Reinforcement: See improvements in shop safety scores and employee satisfaction
  - Situation: View shop safety as important to the business

# Step 2 – Select Methods & Strategies

- Information transfer
  - Skill building
  - Problem solving
  - Goal setting
  - Active learning
    - Incentives
    - Social support
  - Guided practice
  - Reinforcements

# Step 2 – Machine Safety

## ■ Business Owners

- Increase knowledge, motivate improvements

## ■ Interventions

- Written report with audit and survey results
  - Highlight high priority items and compare results with other businesses
- CD
  - Machine safety checklists connected to ANSI and OSHA standards
  - Tailored safety programs
  - Safety committee guidelines
  - Training materials

- Owner & Employee Intervention
  - Health and safety committees
  - Peer trainer (3-4 sessions)
  - Knowledge about machine guarding
  - Use machine safety checklists
  - Safety committee process and function

# Intervention Mapping

- Brings clarity to each of the steps required for designing and implementing an intervention study
- Ensures a systematic and thorough review of each target population
- Leads to measurable objectives