

National Institute for Occupational Safety and Health



Nuts and Bolts of *Total Worker Health*[®] Approaches

Chia-Chia Chang, MPH, MBA

Office for *Total Worker Health*[®]

National Institute for Occupational Safety and Health (NIOSH)

ASSP Northern Virginia chapter and AHMP Cyber chapter

Apr 20, 2023

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention.

Total Worker Health[®] is a registered trademark of the U.S. Department of Health and Human Services (HHS).

Work as we *knew* it



21st Century Work



Volatile
 Uncertain
 Complex
 Ambiguous

Evolution of Work

- Agriculture
- Water and steam power -> Machines
- Electric power and mass production
- Electronics and information technology



Breaker boys, Woodward Coal Mines

Breaker boys, Woodward Coal Mines
Library of Congress Prints and
Photographs Division Washington,
D.C. 20540 USA
<http://hdl.loc.gov/loc.pnp/pp.print>



Library of Congress Prints and
Photographs Division Washington,
D.C. 20540 USA
<http://hdl.loc.gov/loc.pnp/pp.print>



<https://circulatingnow.nlm.nih.gov/2017/07/31/new-history-of-the-nlm-information-age/#jp-carousel-12107>

Robotics and Artificial Intelligence



- Sensing
 - Internet of Things (IoT)
- Thinking
 - Artificial Intelligence (AI)
- Acting
 - Physical
 - Digital

Technology: Challenges

- Job displacement
- Need for upskilling and retraining
- Super-worker
- Algorithm black box
- New types of injuries
- Need to update safety standards
- Complexity of human-system interaction
- Surveillance

Habitat for Humanity builds its first 3D printed house



...to provide housing for low-income households.

Photo by Habitat for Humanity.

<https://www.woodworkingnetwork.com/video/habit-at-humanity-builds-its-first-3d-printed-house>

Chang CC, Tamers SL, Swanson N. The Role of Technological Job Displacement in the Future of Work. NIOSH Science Blog, Feb 15, 2022

Harvard
Business
Review

Diversity Latest Magazine Ascend Topics Podcasts Video Store

How the Metaverse Could Change Work

by Mark Purdy

April 06, 2022

Like Add to cart?

Metaverse vs employment law: the reality of the virtual workplace

It is unclear how employment protections apply in the universal digital realm. What counts as harassment? And can an avatar be discriminated against?

Kate Swamy FEBRUARY 22 2022

FAST COMPANY

TECH · WORK LIFE · NEWS · IMPACT · PODCASTS · VIDEO · RECOMMENDER · INNOVATION

07-01-19

Walmart is using VR to help decide who should get promotions

Walmart has used VR to test how well 10,000 workers perform in challenging situations—data that informs whether those employees will be promoted to management positions.

Nasdaq MARKET ACTIVITY NEWS - INSIGHTS SOLUTIONS

Labrad News

100% More Super Stocks to Invest Now - Small portfolio idea

2022 Market News

Close to Work

Is the Metaverse the Answer for Displaced Workers in the Future?

WORKING

PHOTOGRAPHY
APR 22, 2022 12:00PM EDT

Organizational Structures

Centralized

1. Chain of command
Examples: Military, police
2. Bureaucracy
Example: Government
3. 20th century hierarchy
Examples: Most companies



Alternate Organizational Structures

4. Projects: Creative, defined start/end
Example: Movies, sports, freelance
5. Entrepreneurial: Combines 20th century with projects. Focus on innovation
Examples: Google, Apple, Tesla
6. Pathfinders: Piloting new 21st century ways to organize people/work
Examples: Zappos, Menlo, Valve
7. Wirearchy: Leveraging the power of community
Examples: Wikipedia, Linux, AirBnB

<https://osha.europa.eu/en/publications/fourth-industrial-revolution-and-social-innovation-workplace/view>

Economic Security



Unemployment

- Health, stress, suicide

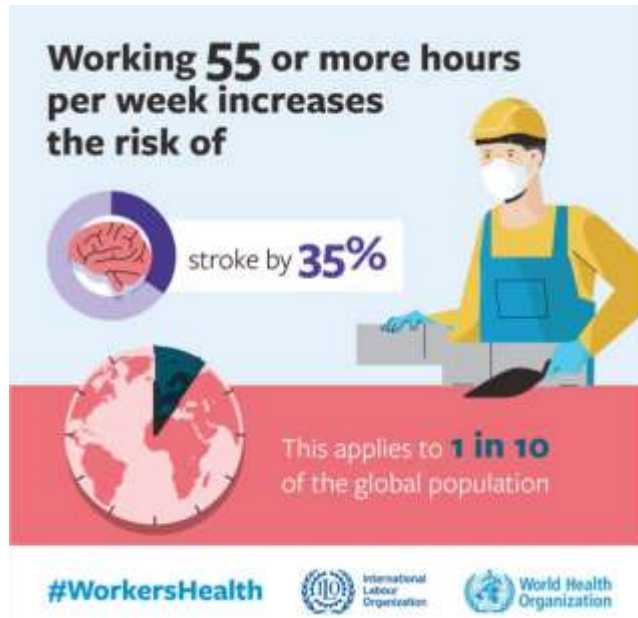
Job security

- Engagement, productivity

Low wages

- Food, shelter, healthcare
- Self-esteem
- Job satisfaction

<https://blogs.cdc.gov/niosh-science-blog/2020/06/22/economic-security-covid-19/>



<https://www.who.int/news/item/16-09-2021-who-ilo-almost-2-million-people-die-from-work-related-causes-each-year>
<https://www.who.int/multi-media/details/working-55-or-more-hours-per-week-increases-the-risk-of-heart-disease>

9



Mental Health, Opioids Use Disorder, and Work

Suicide risk:

- Low-skilled work,
- Lower education,
- Lower absolute and relative socioeconomic status,
- Work-related access to lethal means,
- Job stress
 - Poor supervisory and colleague support, low job control, and job insecurity.

<https://www.cdc.gov/mmwr/volumes/69/wr/mm6903a1.htm>
<https://link.springer.com/article/10.1007/s00420-019-01514-4>

Opioid use or misuse influenced by:

- Work-related injuries and illnesses,
- Psychosocial work-related stress (e.g., job insecurity or high demand/low control jobs),
- Socioeconomic standing,
- Education level



Work and worker health in the post-pandemic world: a public health perspective

- Social-political-economic environment
- Employment and labor patterns
- Enterprise
- Worker



Peters SE, Dennerlein JT, Wagner GR, Sorensen G. Work and worker health in the post-pandemic world: a public health perspective. *The Lancet Public Health*. 2022;7(2):e188-e194.

Substance Use Disorders in Workers



- **1 in 12** workers has an untreated substance use disorder (SUD).
- Construction, mining, and service occupations have the highest rates of alcohol and other drug use disorders – and jobs in these industries are often safety-sensitive positions.
 - Education, healthcare, and professional and protective services jobs have the lowest.
- Industries with higher numbers of workers with alcohol use disorders also have more workers with illicit drug, pain medication, and marijuana use disorders.

<https://www.prnewswire.com/news-releases/new-analysis-employers-stand-to-save-an-average-of-8-500-for-supporting-each-employee-in-recovery-from-a-substance-use-disorder-301183912.html>

Table 6. Strategic focus areas for the future of OSH.

Strategic Focus Area	Underlying Strategic Issues
Data Security	The OSH workforce no longer meets worker needs due to worker fear of being monitored and data privacy issues (H2) Increased data security demands pose greater challenges to OSH research and surveillance activities (H2) Data security and privacy are an essential and unaddressed element of worker protection policies (H3)
Mental health	Significant increase in resources devoted towards the development of guidance for workplace psychosocial health and well-being policies (H1) New OSH competencies and a related discipline are needed to address significant worker mental health burden (H3)
Partnerships	OSH researchers lose the ability to access surveillance data and work sites due to changes in OSH policies and regulations (H2) Partner and key interest group connections must be built and maintained as virtual staff become more geographically dispersed (H2)
Research	Research into exposures to novel hazards and mental health requires reorganization and reeducation to incorporate expertise in new technologies (H1) Declining public and Congressional support limits mandated scope (H2) OSH community must continue to address traditional hazards as new OSH issues emerge at a rapid pace and require attention (H2) OSH research is driven by new OSHQ metrics and the needs of priority populations and key interest groups, requiring a new approach to the OSH research portfolio (H3)
Virtual Work	Federal human resources policies for remote work are not in line with private industry (H1)

Felkner SA, Streit JMK, Edwards NT, Howard J. Four Futures for Occupational Safety and Health. *IJERPH* 2023; 20(5):4333. <https://doi.org/10.3390/ijerph20054333>

The Value of Worker Well-Being

Public Health Reports
2018, Vol. 124(6) 582-586
© 2019, Association of Schools and
Programs of Public Health
All rights reserved.
Article reuse guidelines:
sagepub.com/journalsPermissions
DOI: 10.1177/0033354919878434
journals.sagepub.com/home/phr



On average, employed US adults spend more than half of their waking lives working or engaging in work-related activities.¹ The time spent at the workplace, the tasks performed there, and the work environment all affect overall health.^{2,3} We know many colleagues for whom their job is a great source of joy and fulfillment. They are passionate about their work and derive from it a strong sense of purpose and connection to others. However, we have also seen people working long hours under stressful conditions, which makes it difficult for them to spend time with their families and friends, balance work and non-work commitments, and pursue hobbies and other interests. Many are fatigued and some are burned out, which, in the



Jerome M. Adams, MD, MPH
Vice Admiral, US Public Health Service
US Surgeon General

other health indicators, including physical activity and diet quality.^{3,4} Work environment can also influence employees' mental health and stress levels.^{5,15} Work-related factors that affect worker well-being include job demands and pressures, degree of autonomy and flexibility, quality of interactions with supervisors and coworkers, frequency of shift work, and length of the workday.¹⁶⁻²⁰

The nature of work is changing, and some changes may have a considerable effect on worker well-being. On the one hand, new practices that are being adopted to promote employee well-being (eg, non-standard employment arrangements) can also foster team member engagement and improved perfor-

<https://journals.sagepub.com/doi/pdf/10.1177/0033354919878434>

Workplace Mental Health & Well-Being is a Priority

84% of respondents said their workplace conditions had contributed to at least one mental health challenge.

81% of workers reported that they will be looking for workplaces that support mental health in the future.

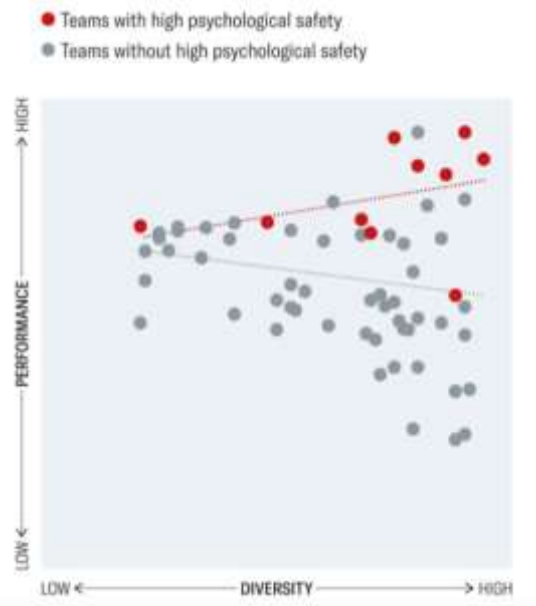


<https://www.hhs.gov/surgeongeneral/priorities/workplace-well-being/index.html>

Mind Share Partners' 2021 Mental Health at Work Report <https://www.mindsharepartners.org/mentalhealthatworkreport-2021>

APA's 2022 Work and Well-being Survey results. [https://www.apa.org/pubs/reports/work-well-being/2022-mental-health-support#:~:text=A%20majority%20\(81%25\)%20of,into%20their%20future%20job%20decisions](https://www.apa.org/pubs/reports/work-well-being/2022-mental-health-support#:~:text=A%20majority%20(81%25)%20of,into%20their%20future%20job%20decisions)

Psychological Safety and Team Performance

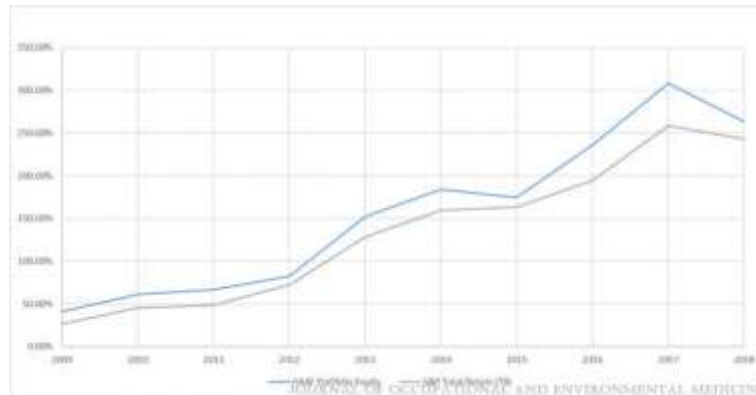


<https://hbr.org/data-visuals/2022/03/psychological-safety-diversity-and-team-performance>

Henrik Bresman and Amy C. Edmondson. Research: To Excel, Diverse Teams Need Psychological Safety. HBR Mar 17, 2022

Organizational Performance

Relative performance—Health Advantage Appreciation Fund (HAAF) compared with S&P 500



Fabius, Raymond; Phares, Sharon. Companies That Promote a Culture of Health, Safety, and Wellbeing Outperform in the Marketplace. *Journal of Occupational and Environmental Medicine*63(6):456-461, June 2021. doi: 10.1097/JOM.0000000000002153.

https://journals.lww.com/joem/Fulltext/2021/06000/Companies_That_Promote_a_Culture_of_Health,.2.aspx

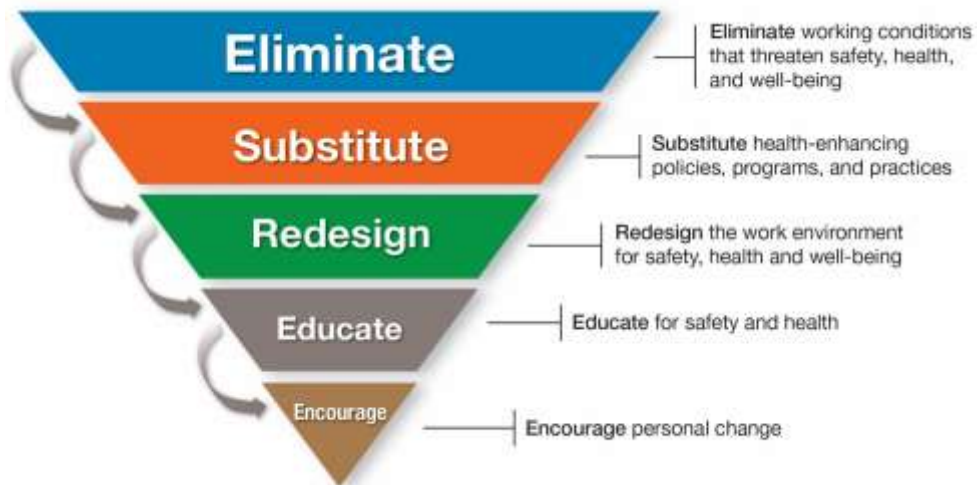
Total Worker Health[®] Approach



Policies, programs, and practices that integrate **Protection** from work-related safety and health hazards with promotion of injury and illness **prevention** efforts to advance **worker well-being**

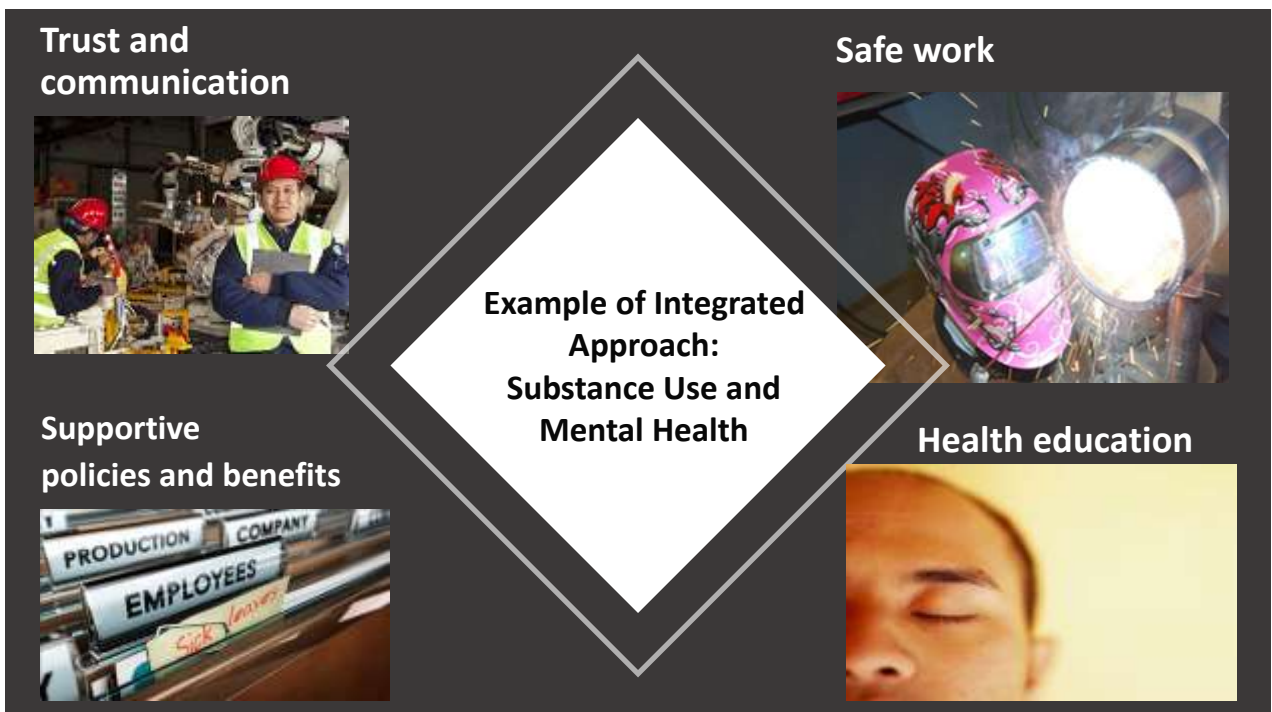
Create Worker Well-Being

Hierarchy of Controls Applied to TWH



Total Worker Health[®] Approach to Well-Being

- Health in all policies
- Socio-ecologic model
- Social determinants of health
- Root cause analysis
- Macro- and cognitive ergonomics
- Systems engineering





Issues Relevant to Advancing Worker Well-being Using *Total Worker Health*® Approaches

Prevention and Control of Hazards and Exposures

- Biological Agents
- Chemicals
- Ergonomic Factors
- Physical Agents
- Psychosocial Factors
- Risk Assessment and Management

Built Environment Supports

- Accessible and Affordable Health Enhancing Options
- Clean and Equipped Breakrooms, Restrooms, and Lactation Facilities
- Healthy Workspace Design and Environment
- Inclusive and Universal Design
- Safe and Secure Facilities

Community Supports

- Access to Safe Green Spaces and Pathways
- Healthy Community Design
- Safe and Clean Environment (Air and Water Quality, Noise Levels, Tobacco-Free)
- Safe, Healthy, and Affordable Housing Options
- Transportation and Commuting Assistance

Compensation and Benefits

- Adequate Wages and Prevention of Wage Theft
- Affordable, Comprehensive, and Confidential Healthcare Services
- Chronic Disease Prevention and Management Programs
- Continual Learning, Training, and (Re-)Skilling Opportunities
- Disability Insurance (Short- and Long-Term)
- Employee Assistance and Substance Use Disorder Programs
- Equitable Pay, Performance Appraisals, and Promotions
- Minimum Guaranteed Hours
- Paid Time Off (Sick, Vacation, Caregiving, Parental)
- Prevention of Healthcare Cost Shifting to Workers
- Retirement Planning and Benefits
- Work-Life Programs
- Workers' Compensation Benefits

Healthy Leadership

- Collaborative and Participatory Environment
- Corporate Social Responsibility
- Responsible Business Decision-Making
- Supportive Managers, Supervisors, and Executives
- Training
- Worker Recognition, Appreciation, and Respect

Organization of Work

- Adequate Breaks
- Comprehensive Resources
- Fatigue, Burnout, Loneliness, and Stress Prevention
- Job Quality and Quantity
- Meaningful and Engaging Work
- Safe Staffing
- Work Intensification Prevention
- Work-Life Fit

Policies

- Elimination of Bullying, Violence, Harassment, and Discrimination
- Equal Employment Opportunity
- Family and Medical Leave
- Human and Natural Resource Sustainability
- Information Privacy
- Judicious Monitoring of Workers and Biomonitoring Practices
- Optimizing Function and Return-to-Work
- Prevention of Stressful Job Monitoring Practices
- Reasonable Accommodations
- Transparent Reporting Practices
- Whistleblower Protection
- Worker Well-Being Centered
- Workplace Supported Recovery Programs

Technology

- Artificial Intelligence
- Robotics
- Sensors

Work Arrangements

- Contracting and Subcontracting
- Free-Lance
- Global and Multinational
- Multi-Employer
- Non-Standard
- Organizational Restructuring, Downsizing, and Mergers
- Precarious and Contingent
- Small- and Medium-Sized Employers
- Temporary
- Unemployment and Underemployment
- Virtual

Workforce Demographics

- Diversity and Inclusivity
- Multigenerational
- Productive Aging across Lifecourse
- Vulnerable Workers
- Workers with Disabilities



Updated January 2020

Total Worker Health[®] Key Tenets

What it is...

- ✓ A *Total Worker Health* (TWH) approach examines how the work organization and work itself can holistically influence worker safety, health, and well-being
- ✓ TWH embraces voluntary, participatory interventions
- ✓ TWH programs protect workers' rights and privacy

What it is NOT...

- ✗ TWH does not “blame the worker”
- ✗ TWH is not consistent with workplace policies that discriminate against or penalize workers for their individual health conditions or create disincentives for improving health
- ✗ TWH is not a wellness/health promotion program that has been implemented without simultaneously providing safe and healthful working conditions

<https://www.cdc.gov/niosh/twh/faq.html>

Worker Well-Being Framework

Worker well-being is an *integrative* concept that characterizes quality of life with respect to an individual's health and *work-related environmental, organizational, and psychosocial* factors.

It is the experience of *positive perceptions* and the presence of *constructive conditions* at *work* and in *other areas of life* that enables workers to thrive and achieve their full potential.



- Chari R, Chang CC, Sauter S, Petrun Sayers EL, Cerully JL, Schulte P, Schill AL, Uscher-Pines LI. Expanding The Paradigm of Occupational Safety And Health: A New Framework For Worker Well-Being. JOEM 2018, 60(7):589-593 10.1097/JOM.0000000000001330
- Chari R, Sauter SL, Petrun Sayers EL, Huang W, Fisher GG, Chang C-C. Development of the National Institute for Occupational Safety and Health Worker Well-Being Questionnaire. J Occup Environ Med. 2022;64(8):707-717. DOI: 10.1097/JOM.0000000000002585

Workplace Physical Environment & Safety Climate



Workplace Policies and Culture

- Paid sick leave
 - Medical care
 - Recuperation
 - Infections



Worker Evaluation & Experience

- Supportive supervision
 - Sleep
 - Job satisfaction
 - Well-being
 - Physical health
- Skill utilization - Employee health
- Job insecurity – Engagement



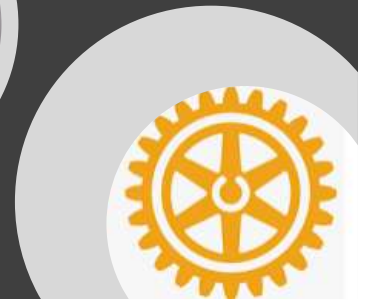
Health Status

- Insomnia
- Sleepy at Work
- Cognitive Functioning & Work Limitations
- Work-related Injury, Injury Consequence



Home, Community, & Society

- Family members impacted by worker injuries
 - More likely for hospitalization, musculoskeletal disease
- Life satisfaction -> occupational injury
- Financial insecurity
- Emotion and social support



NIOSH WellBQ

<https://www.cdc.gov/niosh/twh/wellbq/default.html>

- Free for public use
- Approximately 15 minutes
- 68 items
- Available in Spanish
- HERO Clearinghouse



Putting the NIOSH WellBQ into Practice

- Use in its entirety to capture the multidimensional concept of worker well-being
 - Permissions for using copyrighted items in the instrument are only granted / acceptable when using the entire NIOSH WellBQ
- Examine changes over time or assess the impact of interventions
- Compare results between groups
- Follow-up via tools in Resources for Action:

<https://www.cdc.gov/niosh/twh/resourcesaction.html>



Fundamentals of TWH Approaches



Demonstrate leadership commitment



Eliminate hazards and promote well-being



Engage workers in program design, delivery



Ensure confidentiality and privacy



Integrate systems effectively



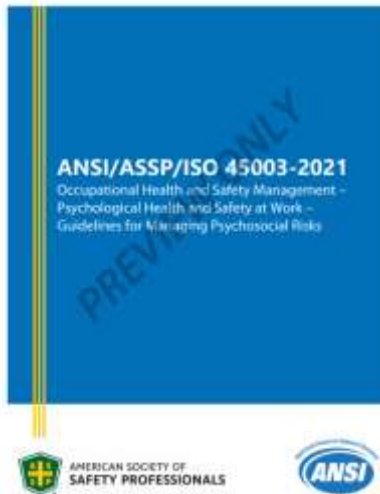
https://www.cdc.gov/niosh/docs/2017-112/pdfs/2017_112.pdf



<https://www.assp.org/resources/total-worker-health>

<https://acoem.org/Publications/Press-Releases/Bigger-Companies-Score-Higher-on-Total-Worker-Health-Implementation>

Management Systems



https://www.assp.org/docs/default-source/default-document-library/iso_45003_tech_report_final_210703.pdf

https://www.assp.org/docs/default-source/standards-documents/preview/45003_2021_wms_preview.pdf

Interventions

Protection from Harm

- Prioritize workplace physical and psychological safety
- Enable adequate rest
- Normalize and support mental health
- Operationalize DEIA* norms, policies, and programs

Connection & Community

- Create cultures of inclusion and belonging
- Cultivate trusted relationships
- Foster collaboration and teamwork

Opportunity for Growth

- Offer quality training, education, and mentoring
- Foster clear, equitable pathways for career advancement
- Ensure relevant, reciprocal feedback

Work-Life Harmony

- Provide more autonomy over how work is done
- Make schedules as flexible and predictable as possible
- Increase access to paid leave
- Respect boundaries between work and non-work time

Mattering at Work

- Provide a living wage
- Engage workers in workplace decisions
- Build a culture of gratitude and recognition
- Connect individual work with organizational mission

<https://www.hhs.gov/surgeongeneral/priorities/workplace-well-being/index.html>

Workplace- Supported Recovery

Evidence-based policies and programs to:

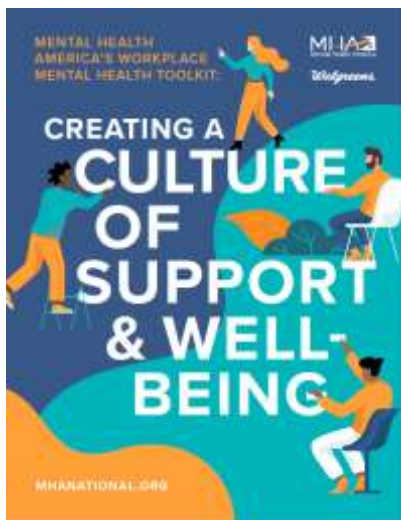
- Reduce risk of initiating substance misuse
- Lower threshold/barriers for seeking care
- Educate, empower management teams
- Lower stigma
- Ensure privacy and confidentiality
- Assist workers in recovery, reintegration, return to work



Healthy Work Design



- Training
- Social interactions
- Job-related decision making
- Recognition of strengths, functions
- Supportive of risk taking
- Appreciation
- Return-to-work
- Trust, transparency, equity



Supportive People Managers

- Encourage fair and effective management practices
- Provide management training
- Include shared decision-making in performance evaluations
- Encourage mentorship

From Mental Health America's Workplace Mental Health Toolkit: Creating a Culture of Support & Well-Being
<https://www.mhanational.org/workplace/toolkit>

Resources



Promising Practice

Planting the Seeds of a New Comprehensive TWH Program

Editor's Note: This article features the work of Dr. Christian B. Rathke, DMSc, PA-C, DFAAPA, Director of Total Worker Health in National Environmental Satellite, Data, and Information Service; Captain, United States Public Health Service.

<https://stlbhc.site-ym.com/page/TWHGuide>
<https://www.yourworkpath.com/totalworkerhealth-casestudies>
<https://www.cdc.gov/niosh/twh/practices.html>



Promising Practices for Total Worker Health

Healthy Parks, Healthy Communities, Healthy Nation: The National Park Service

41



<https://www.societyfortotalworkerhealth.org/>

NIOSH Centers of Excellence for Total Worker Health®



- California Labor Laboratory (CALL Center)
- Johns Hopkins P.O.E. Total Worker Health* Center in Mental Health (POE Center)
- Carolina Center for Total Worker Health* and Well-being
- Oregon Healthy Workforce Center (OHWC)
- Center for Health, Work & Environment
- The Harvard T.H. Chan School of Public Health Center for Work, Health & Well-being
- Center for the Promotion of Health in the New England Workplace (CPH-NEW)
- UIC Center for Healthy Work
- Healthier Workforce Center of the Midwest
- Utah Center for Promotion of Work Equity (U-POWER)

<https://www.cdc.gov/niosh/twh/centers.html>



AgriSafe Network	Mental Health America
American Association of Occupational Health Nurses	Miami Occupational Research Group, U of Miami
American College of Occupational and Environmental Medicine	Mount Sinai Entities
American College of Preventive Medicine	National Aeronautics and Space Administration
American Industrial Hygiene Association	National Association of Community Health Workers (NACHW)
American Physical Therapy Association	National Association of Worksite Health Centers
American Society of Safety Professionals	National Oceanic and Atmospheric Administration (NOAA)
Association of Occupational Health Professionals in Healthcare	National Park Service
Center for Intelligent Environments (CENTIENTS)	National Safety Council
Centers for Disease Control and Prevention	Nebraska Safety Council
Center for Social Epidemiology	Northern Kentucky University
City of Eugene, OR	Ohio Bureau of Workers' Compensation
City of Plano, TX	SAIF Corporation
Dartmouth Hitchcock Medical Center	Society for Occupational Health Psychology
Dr. James F. McNeil Vocational Consulting Services	St. Louis Area Business Health Coalition
Eastern Kentucky University	St. Luke's Health System (Idaho)
Eskenazi Health	University of Alabama
Eugene Water & Electric Board	University of Buffalo
HealthPartners Institute	University of California --Davis
Institute on Disability, U of New Hampshire	University of California --Los Angeles
Interdisciplinary Center for Healthy Workplaces, U of CA -- Berkeley	University of California --Santa Cruz
International Brotherhood of Boilermakers	University of Georgia
ISSA--The Worldwide Cleaning Industry Association	University of Michigan
Kentucky Injury Prevention and Research Center	University of North Carolina --Greensboro
Labor Occupational Health Program, U of CA --Berkeley	University of Rochester
Laborers' Health & Safety Fund of North America	University of Texas Health Science Center at Houston
Madison County, NY	Western Kentucky University
Massachusetts Coalition for Safety and Health (MassCOSH)	Wilkes Recovery Resources, Inc
National Institutes of Health	

<https://www.cdc.gov/niosh/twh/affiliate.html>



After Work



Before Work

Thank You!
cuc8@cdc.gov

Connect with us!



Website: <http://www.cdc.gov/niosh/twh>



Twitter [@NIOSH_TWH](https://twitter.com/NIOSH_TWH)



LinkedIn *NIOSH Total Worker Health Group*:
<https://www.linkedin.com/groups/4473829/>



TWH in Action! eNewsletter
<http://www.cdc.gov/niosh/TWH/newsletter/>

Thank you!
cuc8@cdc.gov