

HOW YOU WORK IS HOW YOU LIVE



Guide to Total Workplace Safety and Health

Holistic Safety, Health and Wellbeing in Your Company



TOTAL WORKPLACE SAFETY & HEALTH (TWSH)

DRIVERS, CHALLENGES AND REWARDS

SINGAPORE HEALTHCARE ENTERPRISE RISK MANAGEMENT CONGRESS,
21ST AUGUST 2014

INTERVIEW

What is Workplace Safety & Health?

Why do we need Total Workplace Safety & Health?

What does it mean to you?

WORKPLACE SAFETY & HEALTH



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- [Observatory for WSH Landscape](#)
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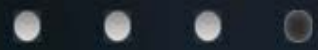


Hawazi Daipi
Senior Parliamentary Secretary for Education and Manpower,
Republic of Singapore

SPS Hawazi Daipi: "We want everyone to arrive back home safe and healthy"

For the recently released DGUV Prevention Yearbook 2012/2013 (pages 26-27), SPS Hawazi Daipi was interviewed with regards to his thoughts on Singapore's WSH prevention strategies.

[READ MORE](#)



WHAT IS WORKPLACE SAFETY & HEALTH

- Management of workplace hazards and risks with the aim of prevention of injury or ill-health.
- **Risk** - *combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury or ill health that can be caused by the event or exposure(s)*
- Risk = Hazard X Outrage

RISK AREAS IN NUS



Laboratories



Workshops



Animal facilities



Construction Sites



Offices



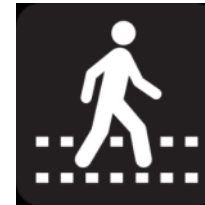
Food & Beverage



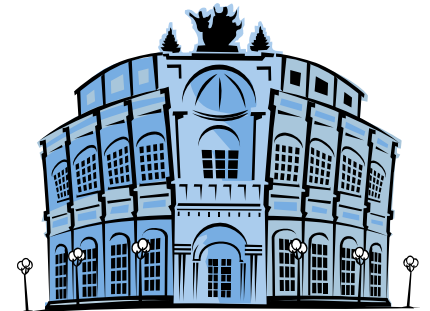
Sports facilities



Housing



Traffic & pedestrian



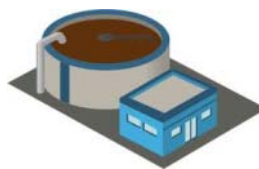
Performance Halls



Research Diving



Field Trips

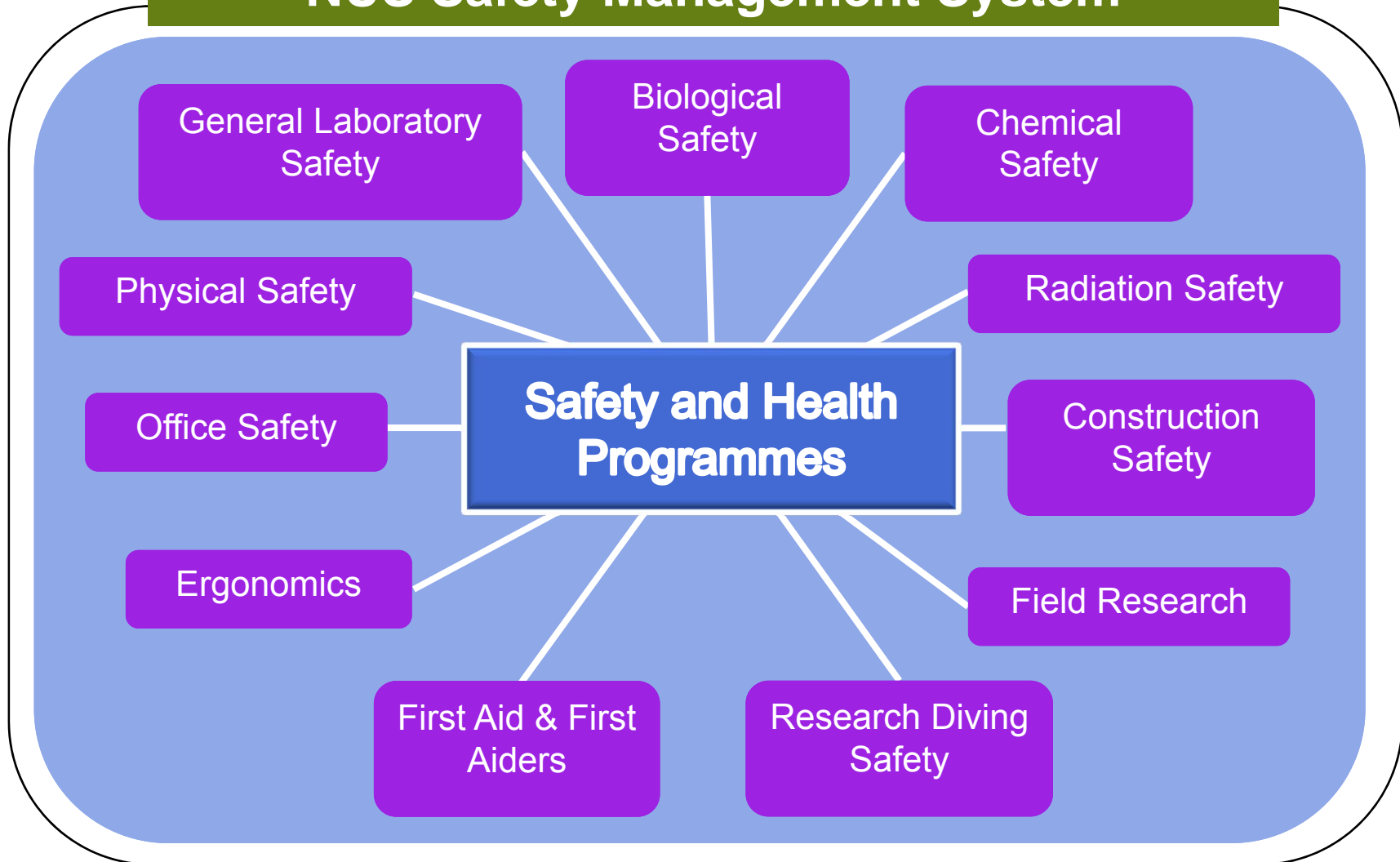


Building Facilities



Collaborations

NUS Safety Management System



ACCIDENTS IN OTHER UNIVERSITIES

Home ▶ Media Room ▶ News Releases ▶ News - Details PRINT PAGE

Oct 19, 2011

CSB Releases Investigation into 2010 Texas Tech Laboratory Accident; Case Study Identifies Systemic Deficiencies in University Safety Management Practices

Denver, CO, October 19, 2011 – The U.S. Chemical Safety Board (CSB) today released its final report into a January 7, 2010, chemistry laboratory explosion at Texas Tech University in Lubbock, Texas, recommending that the American Chemical Society develop new hazard evaluation guidelines for laboratories and calling on the Occupational Safety and Health Administration to issue a Safety Bulletin on the importance of controlling the physical hazards of chemicals in academic laboratories.



The accident occurred during the handling of

2010 – Chemical explosion

Yale student dies after her hair 'is caught in a machine' at chemistry laboratory

By DAILY MAIL REPORTER
UPDATED: 11:52 GMT, 14 April 2011

[Share](#) [Tweet](#) [+1](#) [Share](#) 26 View comments

- Victim died from accidental asphyxia
- A memorial will be held before the end of term
- 'She was a brilliant student and extraordinary woman'

A senior Yale University science student has been killed after her hair got caught in a machine in a freak accident at a campus laboratory.

Michele Dufault, 22, died while using a fast-spinning lathe in the student machine shop at Sterling Chemistry Laboratory in New Haven, Connecticut.

Dufault, described as a 'brilliant student,' was an astronomy and physics major from Massachusetts and a member of the Yale Precision Marching Band.

She was working on a project in the basement of the laboratory where students and staff build or modify research instruments when the tragedy happened.

Her hair is thought to have been caught in



2011 – Hair caught by lathe machine

EDUCATION

UCLA researcher's death draws scrutiny to lab safety

Professor is first in U.S. to be charged with felony in worker's death; UC regents reach settlement in criminal case

by Jim Morris, Center for Public Integrity — July 27, 2012, 2:08 p.m. [0](#)

The People v. Professor Harran

Source: CIRWides

Four days after Christmas 2008, a 23-year-old research associate working in a UCLA laboratory accidentally pulled the plunger out of a syringe while conducting an experiment.

The syringe contained a solution that combusts upon contact with air. The solution spilled onto Sheharbano "Sheri" Sangji's hands and torso. Her polyester sweater burst into flames. She wasn't wearing a lab coat, no one had told her she had to.



2008 – Chemical Fire

Princeton University laboratory accident sends three people to the hospital



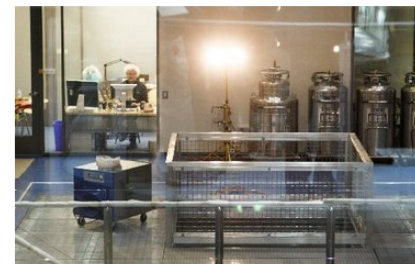
By Bridget Clerkin/The Times of Trenton
on May 23, 2012 at 5:14 PM, updated May 23, 2012 at 8:24 PM

[Print](#)

PRINCETON BROUGH—

Three people were sent to the hospital this afternoon following an accident at Princeton University's Frick Laboratory that sparked a flash fire and sent chemicals into the air.

A female post-doctoral student, another Princeton student and a security guard were treated for minor chemical irritations



Cie Stroud/For The Times

Part of the nuclear magnetic resonance lab in the B level of the Frick Chemistry Laboratory at Princeton University in Princeton, N.J.

2012 – Incompatible Chemicals



Can we prevent accidents in NUS?



PREDICTION BY.....



Happened on a Friday !



Feb
Lab Fire



Aug
Cleanroom Fire



Oct
Fire in Lecture Theatre

2012



In last 20 years, two Asiana crashes resulted in deaths

By Joe Sterling, CNN

July 8, 2013 — Updated 0019 GMT (0819 HKT)



Asiana Airlines Flight 214 sits just off the runway at San Francisco International Airport on Sunday, July 7, in a handout photo from the National Transportation Safety Board. The Boeing 777 coming from Seoul, South Korea, crashed on landing on Saturday, July 6.

Plane crash-lands in San Francisco

HIDE CAPTION

**COULD THIS
HAVE BEEN
PREVENTED?**

JULY 8, 2013

WERE THERE SIGNS?

Five airline 'near misses' prompt call for changes in safety rules

By Aaron Cooper, CNN

July 2, 2013 -- Updated 1548 GMT (2348 HKT)



July 2, 2013

- Report on “near misses”

WERE THERE SIGNS?

After MH17 And Two Other Plane Crashes, Is It Still Safe To Fly?

By *Ismat Sarah Mangla*  @ismat  i.mangla@ibtimes.com
on July 24 2014 9:15 PM

Nervous flyers have powerful reasons to be fearful right now. Over the last eight days alone, 462 people have been killed in three different air crashes on three different continents. That grim toll -- from [Malaysia Airlines](#), [TransAsia](#) and [Air Algérie](#) -- came just four months after the unsettling disappearance of MH370, a Malaysia Airlines jet carrying 239 human beings. Major swaths of airspace now seem vulnerable to missiles unleashed as part of one violent conflict or another -- a fact underscored by the downing of MH17 and the decision by major carriers to scrap flights into Israel.

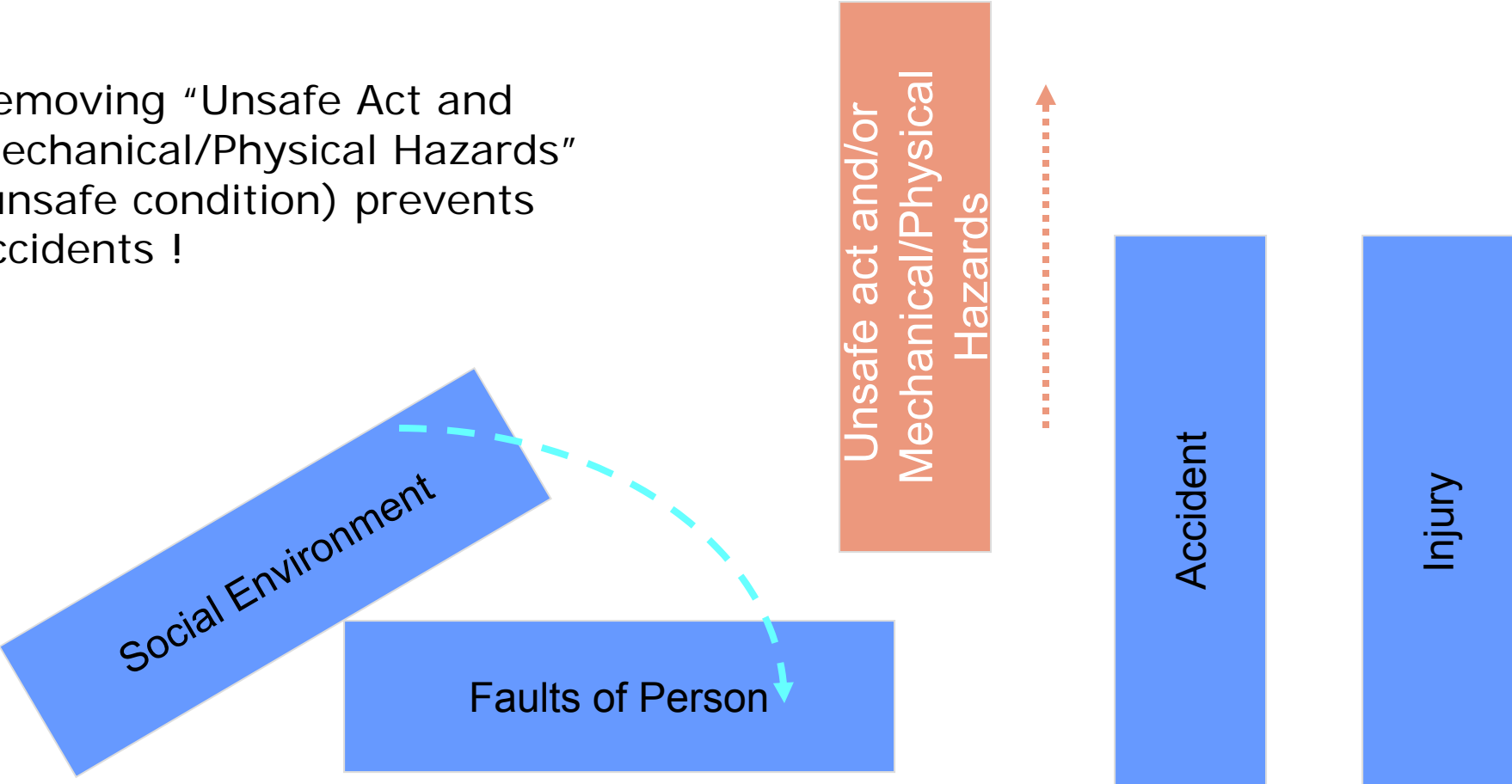
<http://www.ibtimes.com/after-mh17-two-other-plane-crashes-is-it-still-safe-fly-163>

THE DOMINO THEORY (H.W. HEINRICH)

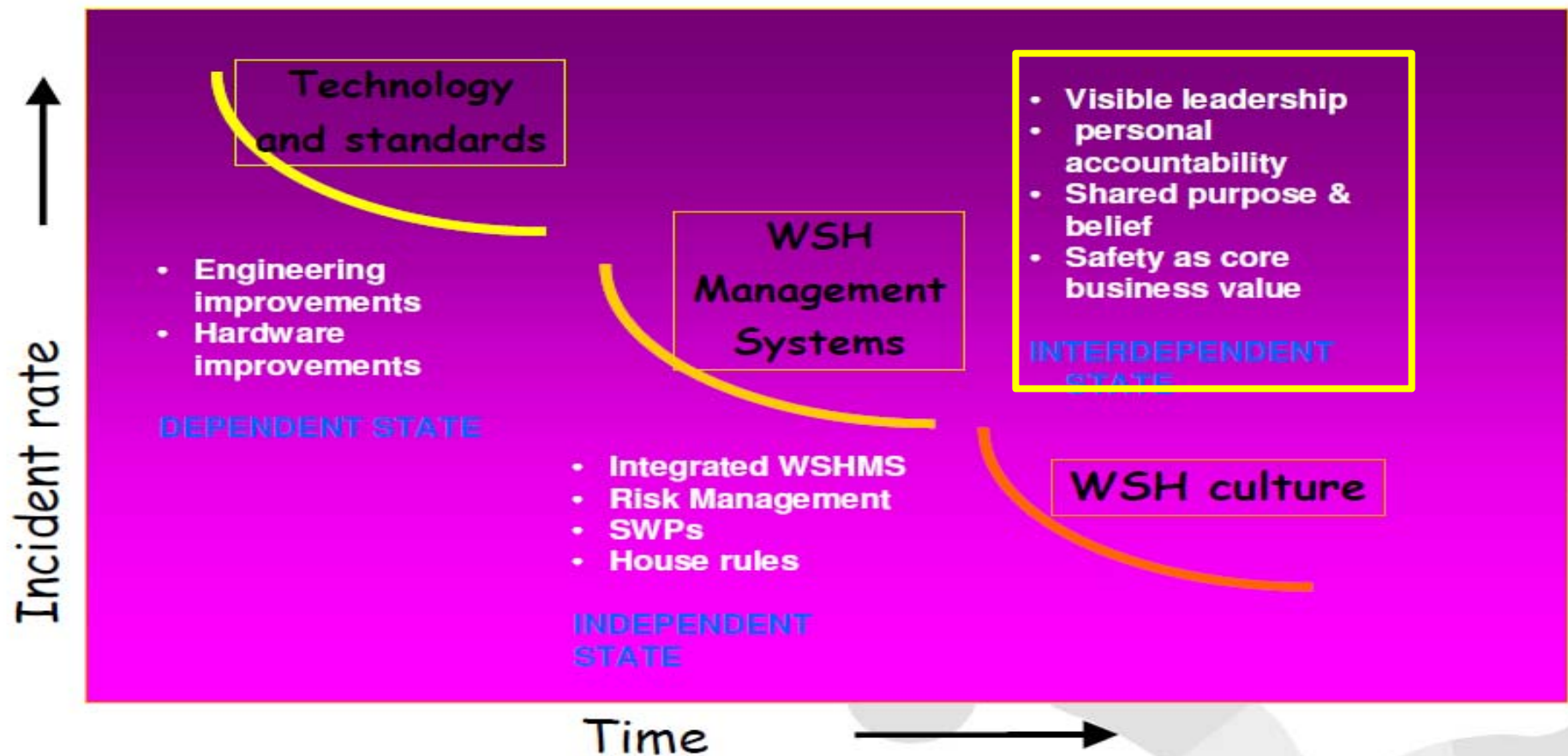


DOMINO THEORY OF ACCIDENT PREVENTION

Removing "Unsafe Act and mechanical/Physical Hazards" (unsafe condition) prevents accidents !



Development of safety culture



TECHNOLOGY & STANDARDS



<http://www.cybervally.com/2011/03/5-important-safety-innovations-cars>

TECHNOLOGY & STANDARDS

Implementing Recommendations from the Front Line



With input from front-line caregivers, Lancaster General Hospital has remodeled some patient rooms with special equipment to safely care for bariatric patients. Above: lift equipment into a bariatric bathroom.

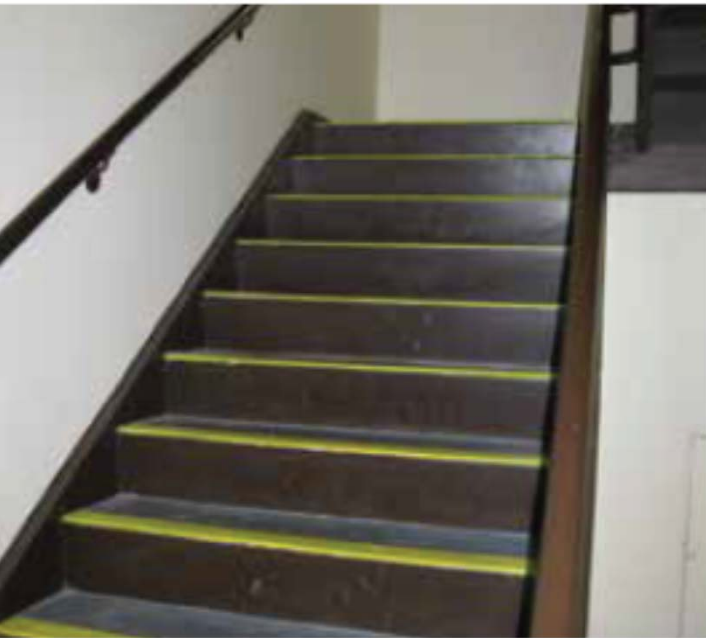
Slip-Resistant Shoes to Prevent Falls



After assessing the data on slips, trips, and falls, AnMe Medical Center saw the need to focus on wet floors in environmental services and the nutrition department. Slip-resistant shoes are part of the solution.

TECHNOLOGY & STANDARDS

A Targeted Investment in Safety



Adding stair treads yellow was one of the simple but effective safety solutions that Blake Medical Center discovered by analyzing exactly where patients, visitors, and staff were tripping and falling.

Everyone Pitches in for Safety



Lancaster General is part of the growing number of hospitals that have implemented "no passing zones" where all employees are obligated to respond to patient fall alarms. The result: quicker response times, fewer patient falls, more satisfied patients, and a "flatter hierarchy" where physicians and other staff look out for each other's safety.

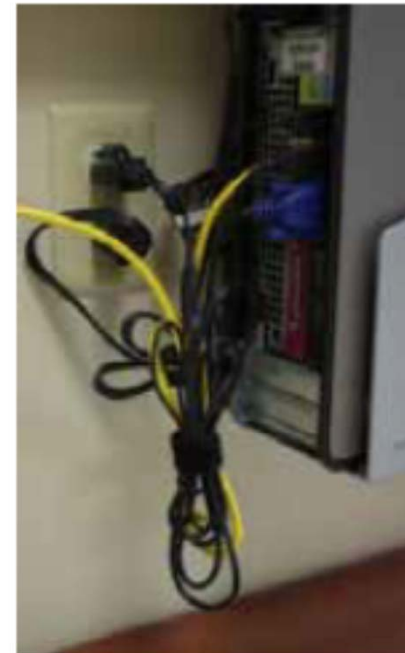
TECHNOLOGY & STANDARDS

Reducing Injuries From Patient Aggression



giver wears Kevlar sleeves to reduce the risk of

Tying Up Loose Ends



Associates at St. Vincent's Medical Center have suggested practical safety solutions, such as tying loose cords and positioning a recharging station to minimize lifting of heavy batteries.

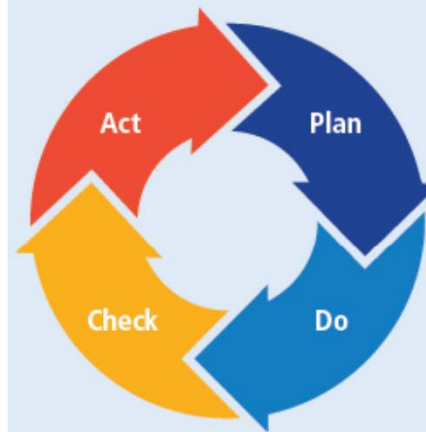
SAFETY MANAGEMENT SYSTEMS

Caring for Our Caregivers



Safety and Health Management Systems: A Road Map for Hospitals

The Plan-Do-Check-Act Cycle



Plan: Establish the organization's commitments, goals, and ex safety and health performance; develop an organizational stru ccesses to manage and achieve performance objectives; identif workplace hazards and risks; evaluate and select control mea and reduce identified risks; and determine activities, processes programs, and resources needed to achieve objectives.

Do: Implement plans, programs, and procedures throughout th a systematic and controlled manner.

Check: Monitor and measure whether plans are carried out a ate whether plans are effective and safety and health objective achieved; and conduct periodic reviews of the suitability and e safety and health management system.

Act: Take needed corrective actions; modify and update the safety and health management system and tion's goals and objectives as needed; and implement the entire PDCA cycle on a regular and periodic b

Adapted from Deming, W.E. 1986. Out of the Crisis. MIT Center for Advanced Engineering Study.

SAFETY MANAGEMENT SYSTEMS

The hazard prevention and control hierarchy



NUS SAFETY POLICIES & DIRECTIVES

Policies

- **University Safety & Health Policy**
- **Biological Safety Policy**
- **Chemical Safety Policy**
- **Radiation Safety Policy**
- **Fire Safety Policy**
- **Safety Policy for Tenants**
- **NUS Crisis Policy**

Safety Directives

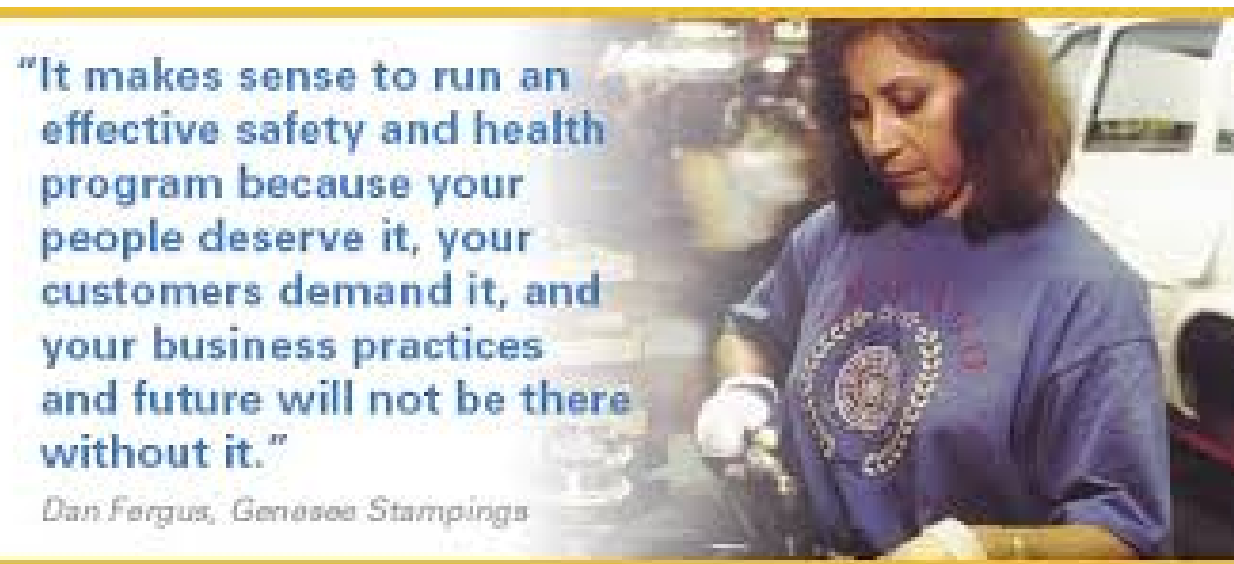
- **Access to and Supervision of Undergraduates in Laboratories for Project or Research Work**
- **Authorized Access to Laboratories**
- **NUS Students Working In Non NUS Organizations**

NUS Safety Policies & Safety Directives:
<http://www.nus.edu.sg/osh/policies.htm>

SAFETY CULTURE

Safety Culture is the way **safety** is perceived, valued and prioritised in an organisation. It reflects the real commitment to **safety** at all levels in the organisation. It has also been described as "how an **organisation behaves when no one is watching**"

http://www.skybrary.aero/index.php/Safety_Culture

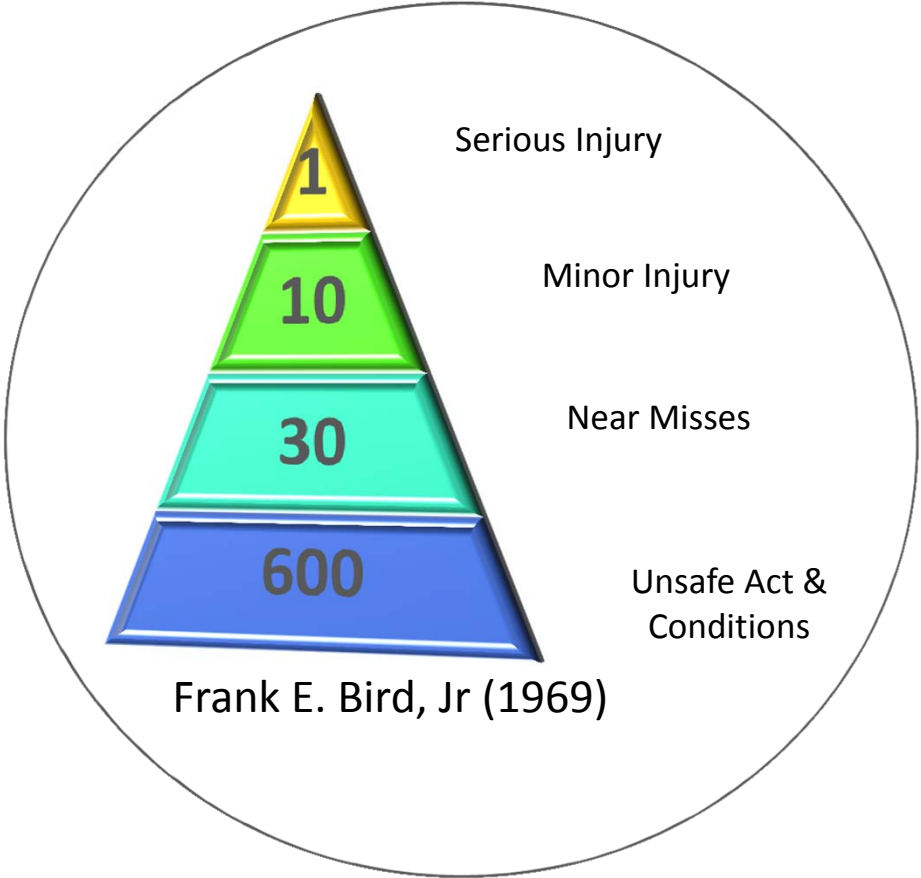
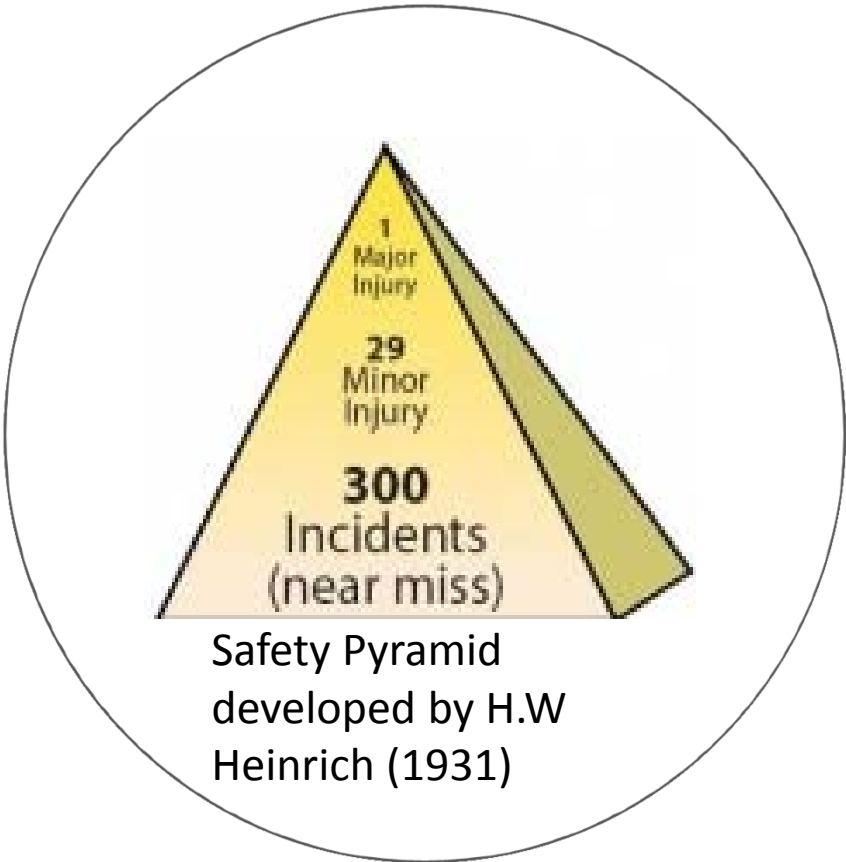


"It makes sense to run an effective safety and health program because your people deserve it, your customers demand it, and your business practices and future will not be there without it."

Dan Fergus, Genesee Stampings

Safety Customer Services
Resourcefulness
Positive Attitude
Integrity
Teamwork Loyalty
Respect Accountability
Dedication

IMPORTANCE OF ARRESTING UNSAFE ACTS



SAFETY CULTURE

Felt Leadership in Action



as Midtown Hospital's COO leads a daily
lle.

Recognizing a "Good Catch"



At UMC Brackenridge, the Chief Operating Officer
a note and a small gift to thank an associate
a "good catch" by reporting a safety concern
miss event.

Open Lines of Communication



Blake Medical Center's "Ask Dan" campaign encourages
all employees to share their questions and thoughts with
the CEO.

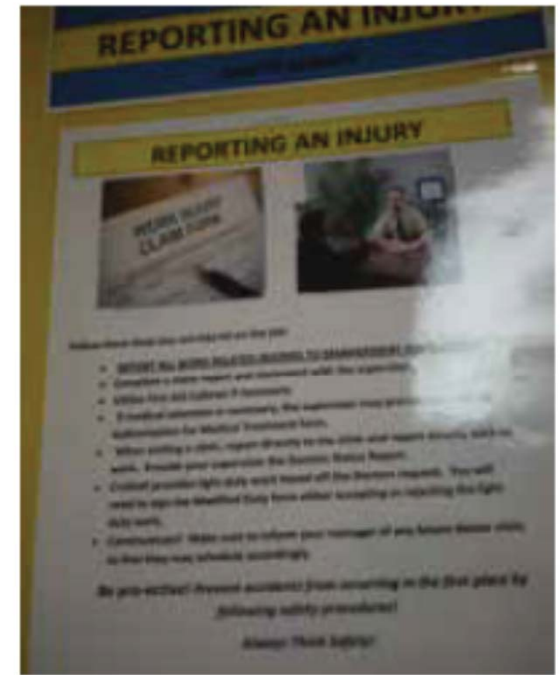
SAFETY CULTURE

Safety Every Day



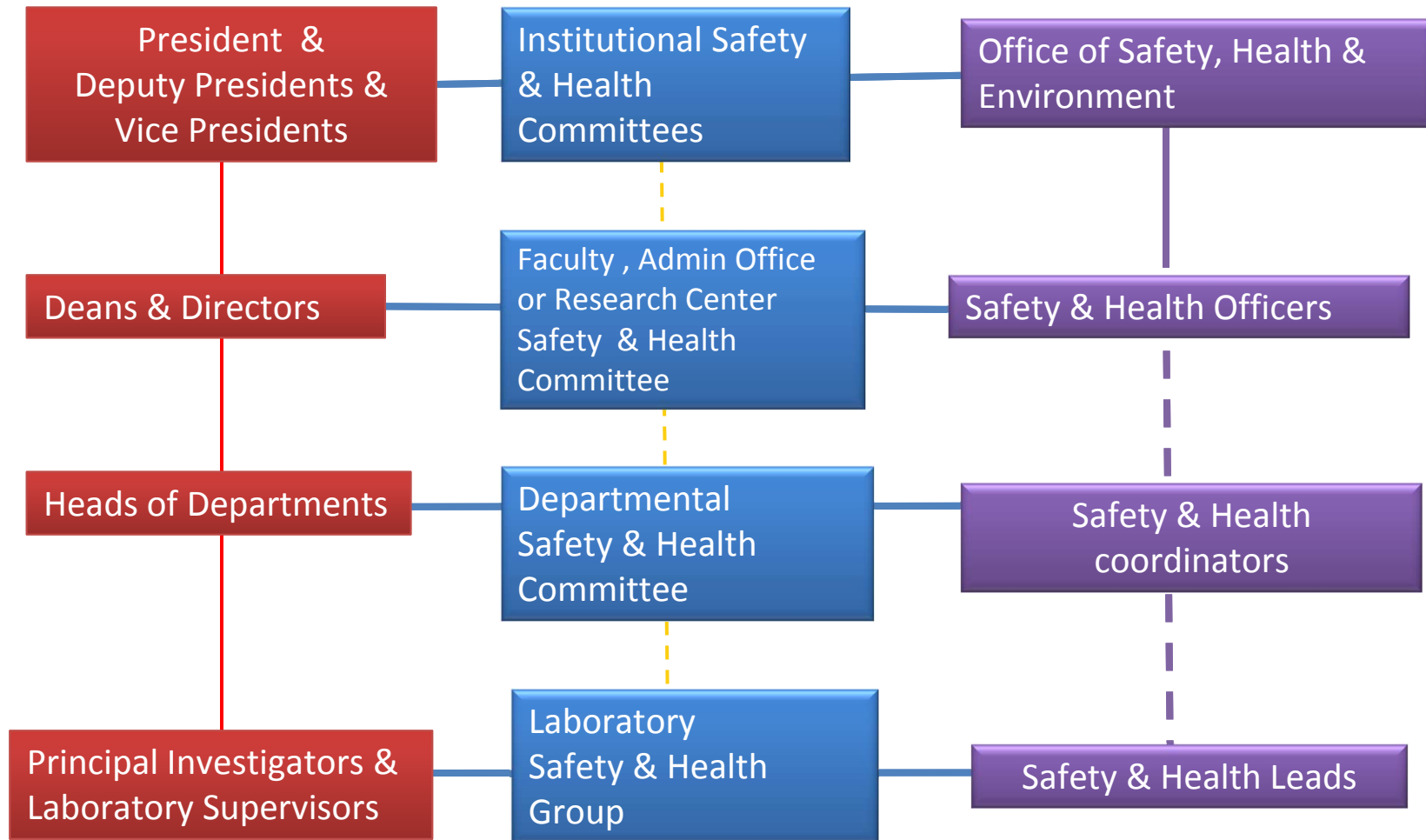
Cincinnati Children's Hospital, safety incidents and concerns are reviewed at daily check-in meetings.

Making Reporting Routine



Saint Thomas Midtown Hospital encourages associates report every injury and "good catch."

NUS Safety & Health Organization Chart



EARNING ORGANIZATION: CRYOTUBE EXPLOSION

A researcher at a university reported that a vial of potentially infectious material “exploded” when she removed it from liquid nitrogen



Another researcher was blinded in one eye when a cryotube exploded while being thawed



LEARNING ORGANIZATION: CRYOTUBE EXPLOSION

- Ensure cryogenic storage vials are designed for VAPOUR PHASE STORAGE in liquid nitrogen freezers
- Perform visual check on cryovial to ensure there are no defects around the rim
- Do not re-use cryovials
- When removing samples, pause for a moment in the neck of the Dewar before bringing them into the room atmosphere (if the cryovial was to pop open, it would usually happen early in the warming up phase)
- Don face shield together with cryogloves

HOW ARE OUR INCIDENT RATES?

Worker Safety in Hospitals

Caring for our Caregivers



Worker Safety in Hospitals Home

Understanding the Problem

Safety & Health Management Systems

Safe Patient Handling

MSD Assessment

Management Support

Policy / Program Development

Facility & Patient Needs Assessment

Facilitating Change

Safe Patient Handling Equipment

Education & Training

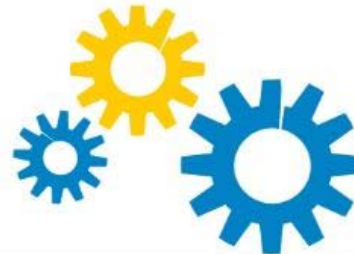
Did you know that a hospital is one of the most hazardous places to work? In 2011, U.S. hospitals recorded 253,700 work-related injuries and illnesses, a rate of 6.8 work-related injuries and illnesses for every 100 full-time employees. This is almost twice the rate for private industry as a whole.

OSHA created a suite of resources to help hospitals assess workplace safety needs, implement safety and health management systems, and enhance their safe patient handling programs. Preventing worker injuries not only helps workers—it also helps patients and will save resources for hospitals. [Download the overview*](#) and explore the links below to learn more about the resources available.



Understanding the Problem

Hospitals are hazardous workplaces and face unique challenges that contribute to the risk of injury and illness.



Safety & Health Management Systems

A safety and health management system can help build a culture of safety, reduce injuries, and save money.



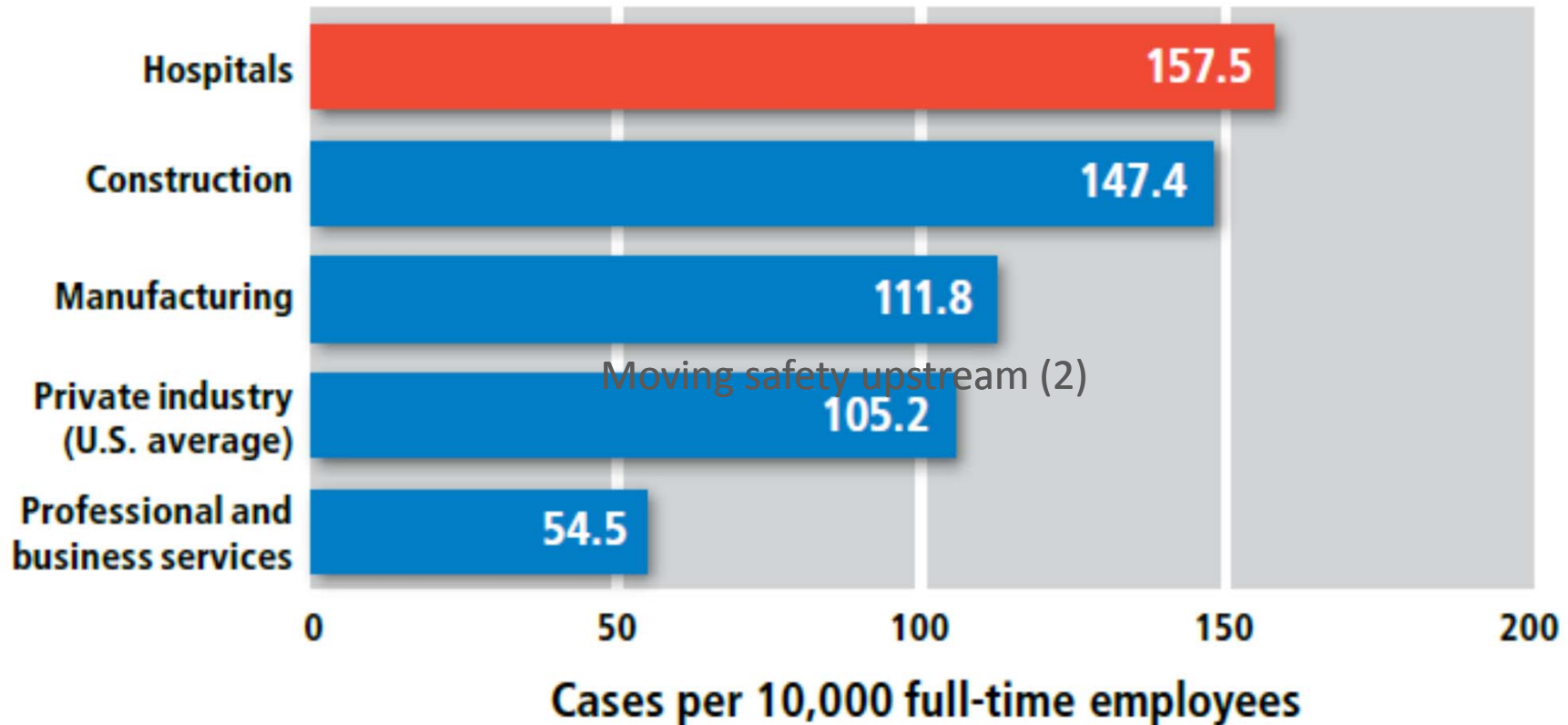
Safe Patient Handling

Safe patient handling programs, policies, and equipment can help cost-effectively reduce the biggest cause of workplace injuries.

https://www.osha.gov/dsg/hospitals/mgmt_tools_resources

HOW ARE OUR INCIDENT RATES?

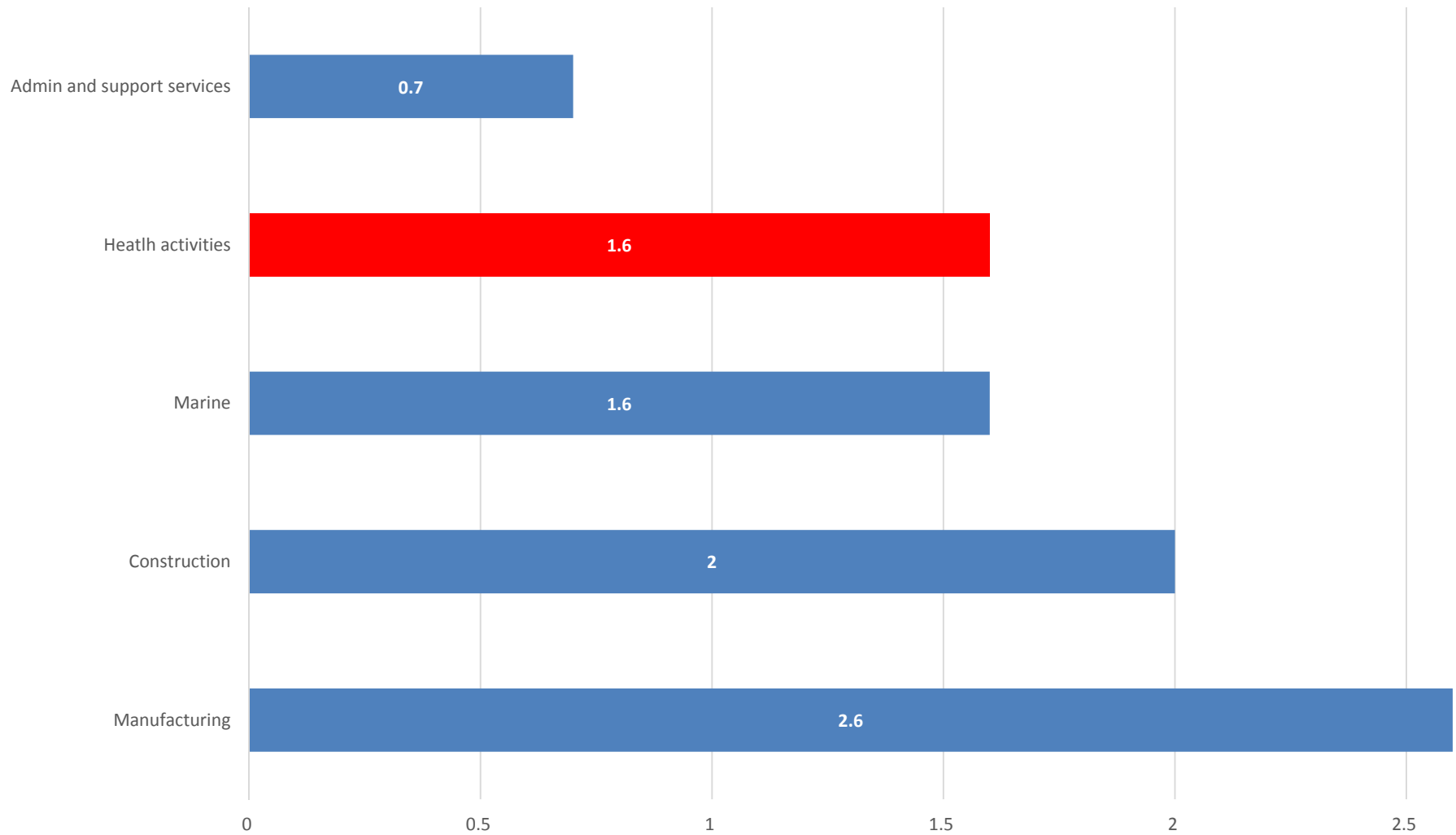
Injuries and Illnesses Resulting in Days Away from Work, 2011



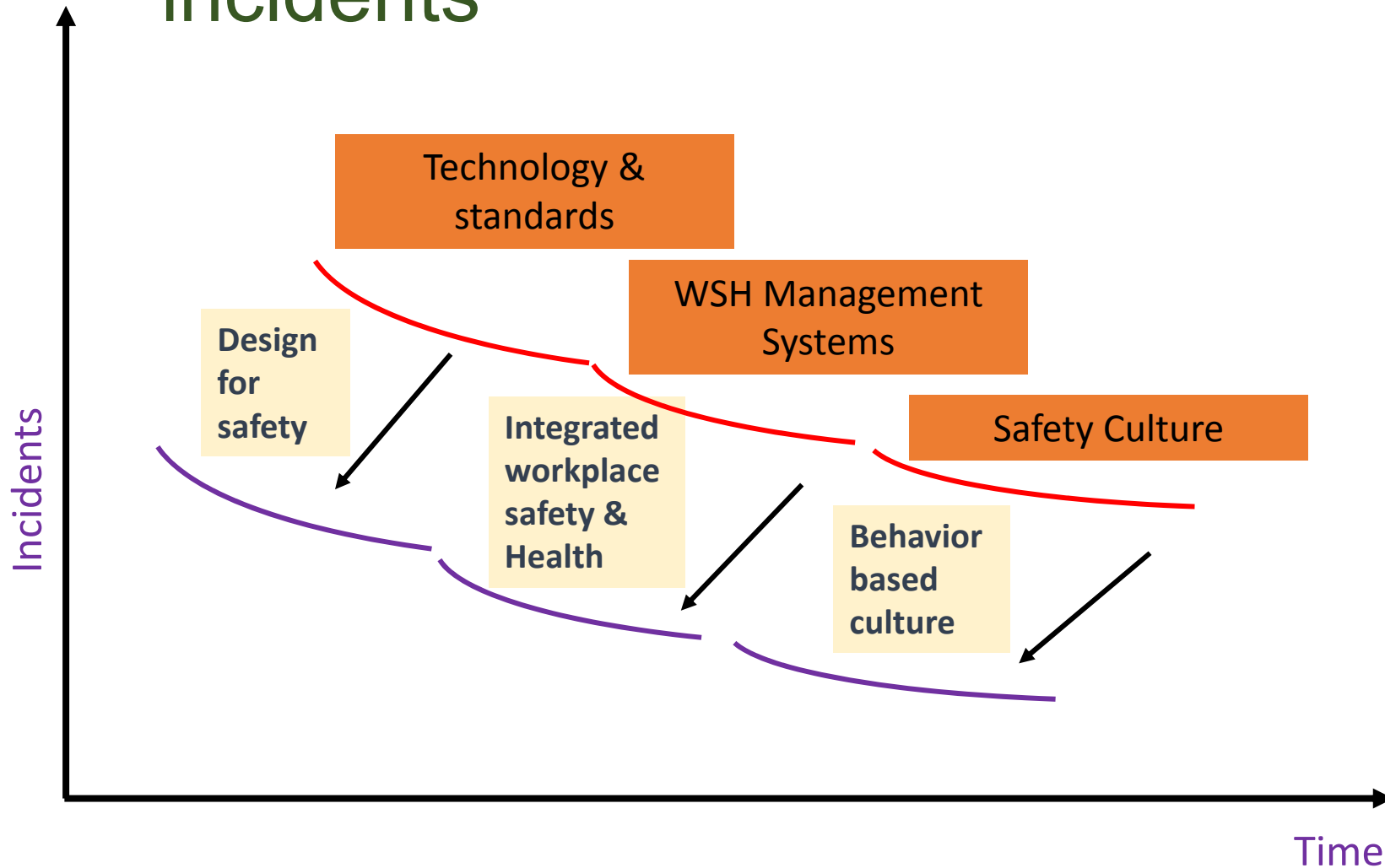
Data source: Bureau of Labor Statistics

2013 Healthcare Industry Statistics (Singapore)

Accident Frequency rate per million man-hours



Accelerating the reduction of incidents



DESIGN FOR SAFETY



Safety features incorporated into the product

DESIGN FOR SAFETY

Dual Snap-Cap Tubes (dual-position snap-cap tubes)

Patented dual snap-cap enables both culturing and storage in the same tube. Leave it loose to allow for aerobic culturing while keeping your sample clean and sterile. When a tight closure is required, simply push down on the cap to obtain a leak-proof seal. This prevents leakage of your sample during handling and storage. It also prevents your sample from evaporating.

g. from BD Falcon

<http://www.gonagenmedikal.com/eng/IVF-Petri-Dishes-Pipets-Tubes/352003-polystyrene-round-bottom-test-tube.asp>. It comes in either polypropylene or polystyrene

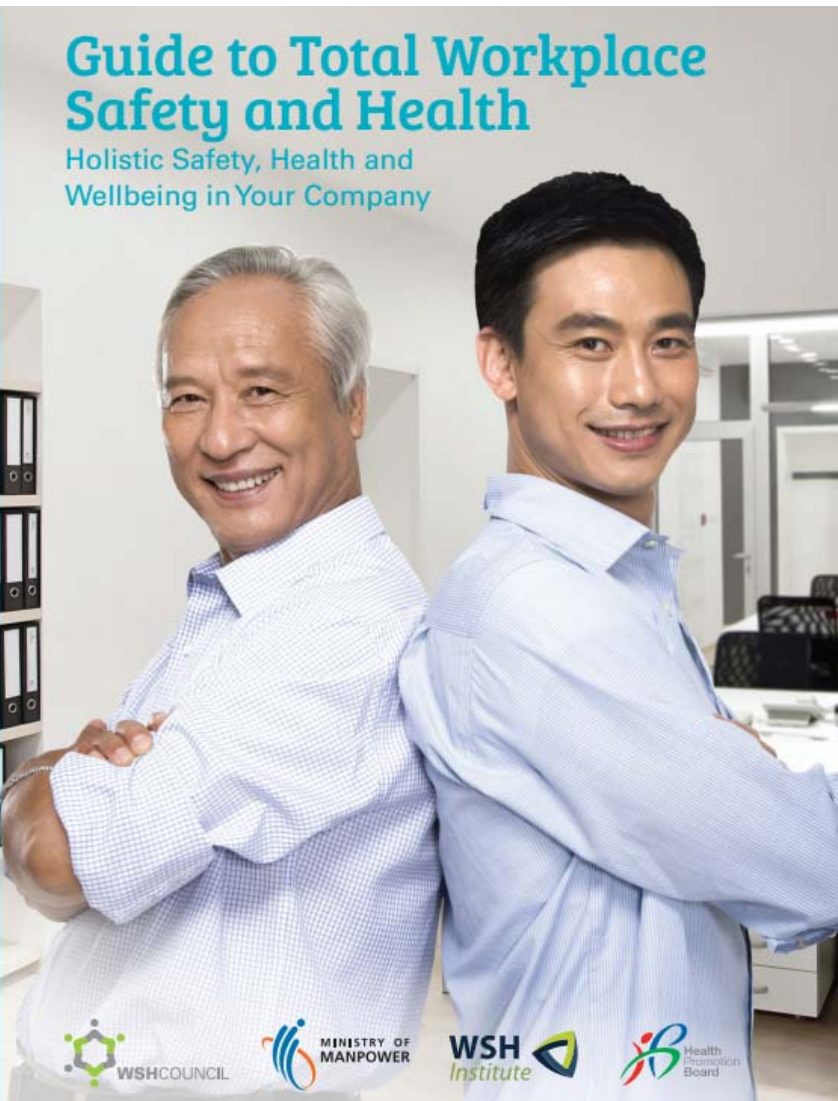


DESIGN FOR SAFETY



Trolley for Chemical waste transportation

TOTAL WORKPLACE SAFETY & HEALTH?



- Holistic and integrated system to manage workplace safety and health risks.
- Encompass BOTH safety and health risks.
- Promotion of health and well-being of workers.

DRIVERS

WHY THE NEED FOR TWSH?

Changing Demographics of workplace:



Email interview with insight, dated 04-Sep-2010

By Channel NewsAsia, Updated: 28/07/2010



There should be no retirement age:
MM Lee

ASSESSING THE “FITNESS TO WORK”



1. Pre-work
2. Pre-employment
3. “Periodic Assessment”
4. Return to work
5. Exit

WHY THE NEED FOR TWSH?

2. Unhealthy workforce:

- May lead to safety lapses at work, increase in sickness absenteeism, increased likelihood of musculoskeletal and other stress related problems.



BETTER WORK PERFORMANCES

Work, Well-being and Wealth: Active Ageing at Work

Scand J Work Environ Health: conference abstracts

Working with a chronic disease

by Brouwer S, PhD, Koolhaas W, MSc, van Rijn RM, PhD, de Vries HJ, PhD

Objective As the workforce ages, the prevalence of workers with chronic diseases increases. The aim of this study is to provide insight into the characteristics of those workers and present the consequences of chronic diseases on work participation. Potential personal and societal implications will be discussed.

Method Data gathered in several studies will be used: a systematic literature review about the influence of poor health on exit from paid employment and data from two cross-sectional studies about working with chronic diseases.

Results Self-perceived health status is a risk factor for leaving the labor force and is strongly associated with work ability. Psychosocial factors based on individual resources (such as coping behavior, self-efficacy, work attitude, and perceived support) influence the level of work ability among workers with chronic diseases. Poor-to-moderate work ability levels were found among workers with chronic diseases, which indicate a higher risk of long-term sickness absence and work disability.

Conclusion To increase sustainable employability of workers with chronic diseases, good health should be promoted and psychosocial factors should be addressed in strategies and interventions at the workplace.

Key terms perceived health; psychosocial.

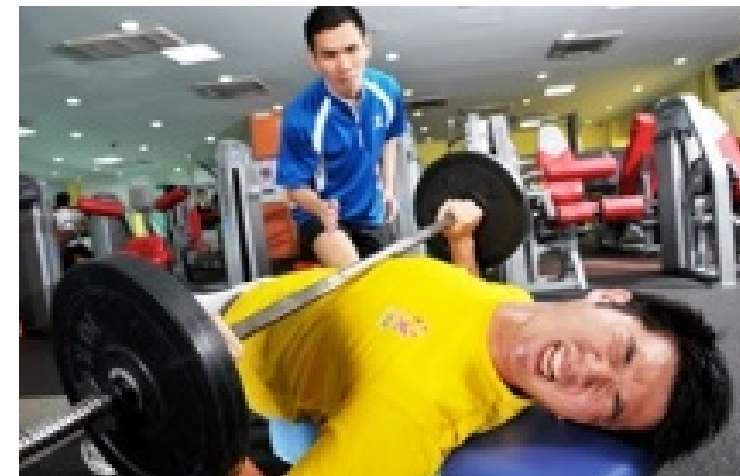
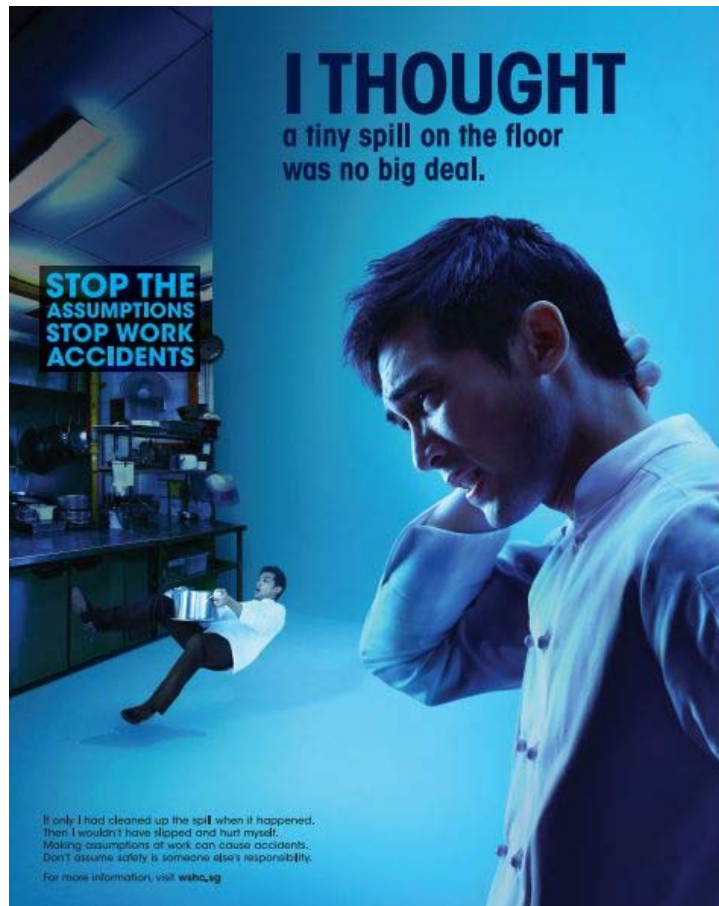
Correspondence to: S Brouwer, University Medical Center Groningen, Department of Health Sciences, Groningen,

<http://www.sjweh.fi/www2013-abs>

“Poor-to-moderate work ability levels were found among workers with chronic diseases, which indicate a higher risk of long-term sickness absence and work disability”

WHY THE NEED FOR TWSH?

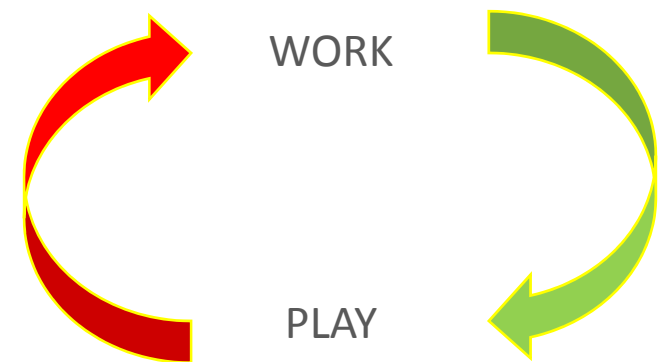
“Holistic Approach to Safety” – Safety Mindset



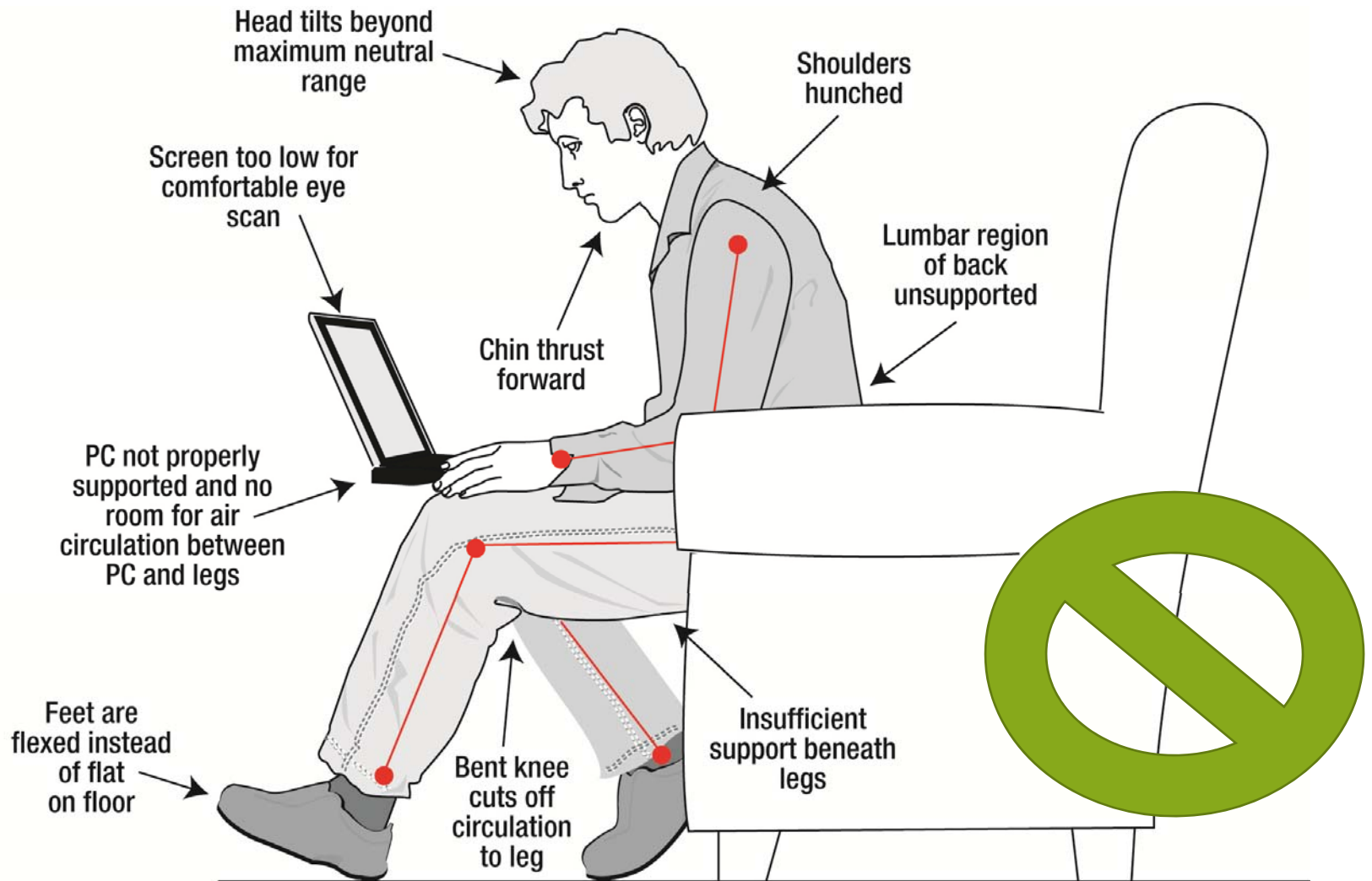
HOW YOU WORK IS HOW YOU LIVE



- National Workplace Safety and Health (WSH) campaign 2014
- Highlights how the bad habits formed at work and the risks we take at our workplace will not only affect us at work but also **has a negative impact on the quality of our lives outside work.**



WORKING WORK HOME: LAPTOP COMPUTERS



Courtesy of Occupational Health Clinic for Ontario Workers Inc.

HOW YOU WORK IS HOW YOU LIVE



- **Two sides of the same coin**
 - Can the way we lead our lives outside work affect workplace performance?
 - Can workplace programmes exert positive influence on our quality of life outside work?
 - **Can we shift an individual's own beliefs and values so that they believe and act in a safer, healthier manner beyond the workplace?**
 - Will an improved quality of life as a result of workplace programmes translate into higher work productivity?

NO-WIN SITUATION

Aging workforce,
unhealthy
lifestyle & lack of
safety mindset

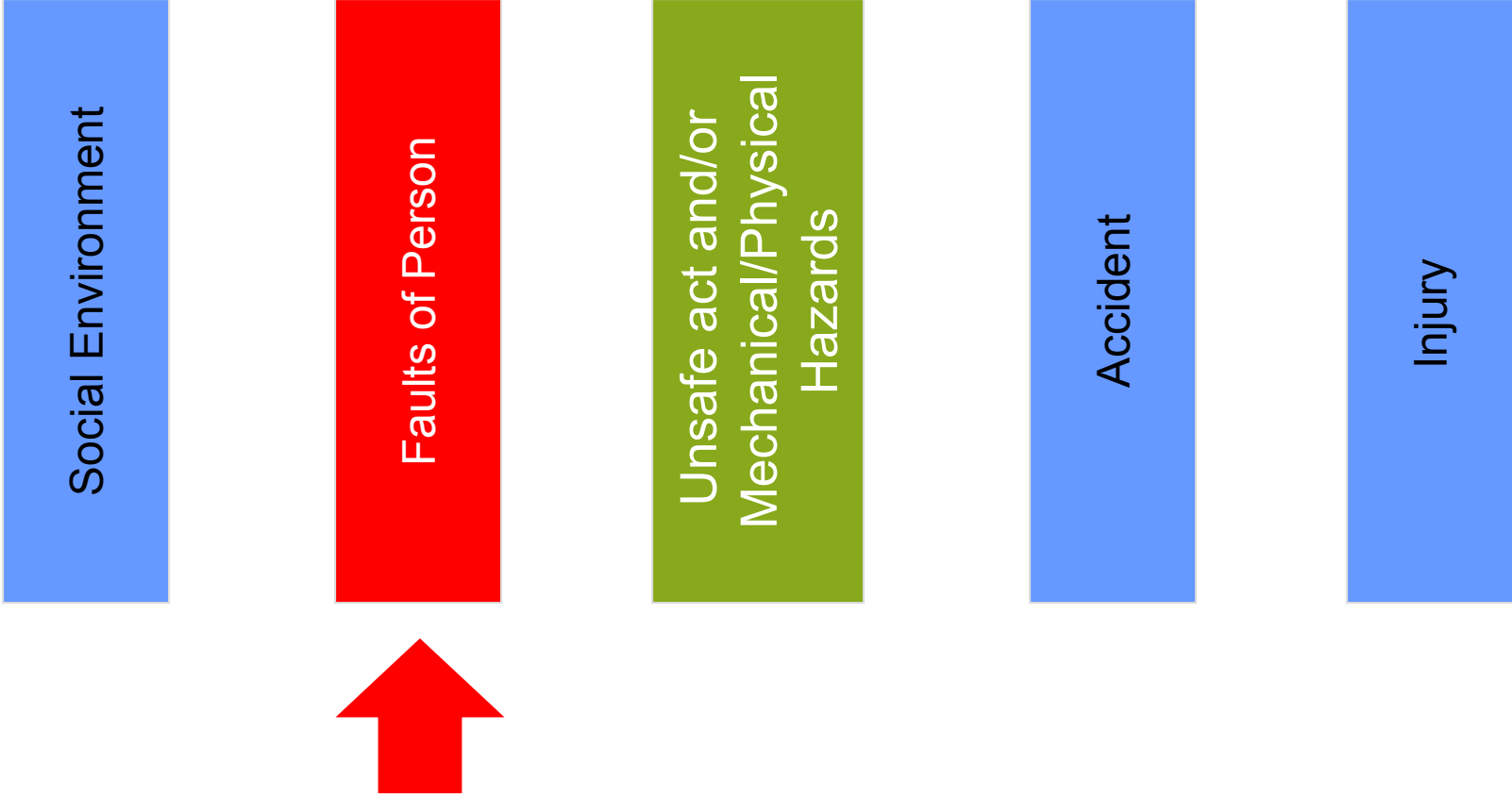
Higher risk of ill
health and injury

Reduced quality
of life,
productivity &
shortened
career

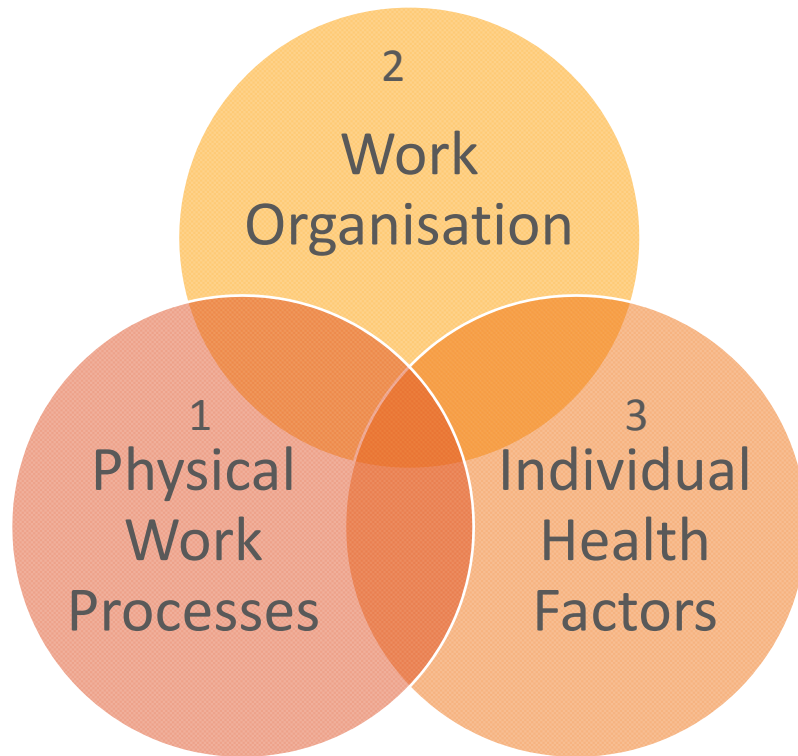


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THE DOMINO THEORY (H.W. HEINRICH)

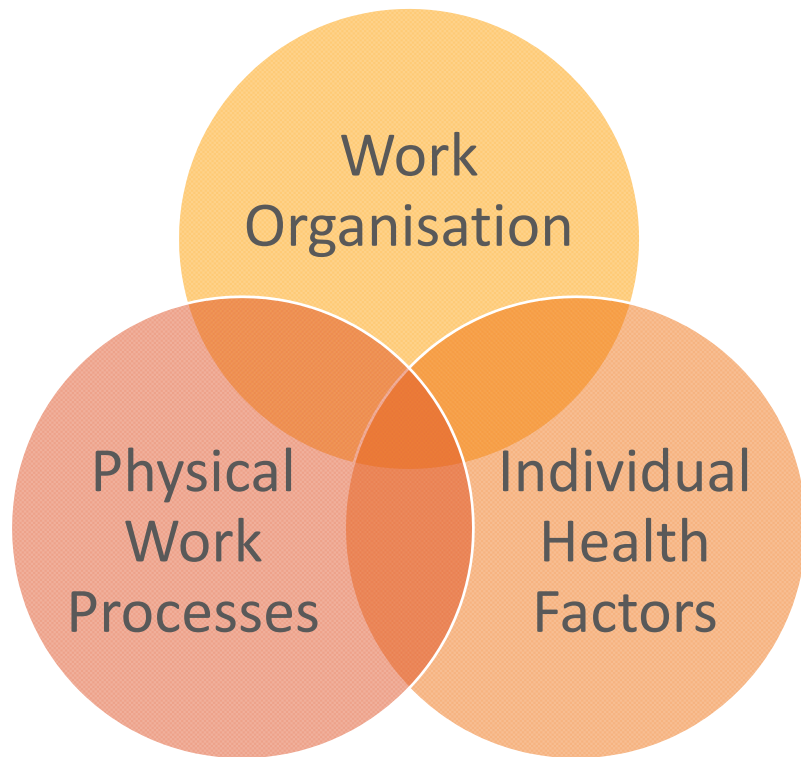


RECOGNIZE INTERSECTIONS IN THE WORKPLACE



1. Physical work environment & processes
 - Physical, chemical, electrical, biological, ergonomics hazards etc.
2. Work organisation
 - Work schedules
 - Work expectations
 - Work based relationships
3. Individual health factors
 - Age
 - Pre-existing health conditions or risk factors
 - Lifestyle (drinking, smoking etc)
 - BMI
 - Pregnancy

RECOGNIZE INTERSECTIONS IN THE WORKPLACE



Well – Being → Happy at work →

Occupational → Safe at work →

**Product
at work**

CREATE A WIN-WIN SITUATION



**Win-Win
situation for
both employee
& employer**



EXAMPLE OF TWSH IN ACTION

Work Process	Major Work Activities	Hazards	Accidents or Ill health arising from hazards
<p>Assisting elderly / disabled patient to other washroom (bathing, dressing, using the toilet)</p> <p><u>Work organization factors</u></p> <ul style="list-style-type: none"> - Staffing issues? - Peak period? 	<p>Transferring patient from the bed to wheelchair</p>	<p>Manual lifting of patient</p> <p>Long work shift / fatigue</p>	<p>Musculoskeletal disorder (MSD)</p> <ul style="list-style-type: none"> - Neck & upper limb disorders - Lower limb disorders - Back pain & injuries <p>Older workers may have increased incidence of MSD</p>



Individual Factors

- Muscle weakness
- Bone loss
- Poor life

HOW CAN TWOSH HELP?

PIPETTING ERGONOMICS



Courtesy of University of Guelph

HOW CAN TWOSH HELP?

PIPETTING ERGONOMICS



Courtesy of University of British Columbia

HOW CAN TWSH SUPPORT SHARPS HANDLING?

Guidelines for safe handling of sharps.

Keep hands away from needles

Use mechanical methods for needle removal

Never bend, recap or manipulate sharps by hand.

Dispose of entire unit into sharps container

Collect reusable sharps in labeled, leak-proof container



BETTER WORK PERFORMANCES



- Since 2008-2013, 44,500 employees have participated in the Energy and Resilience programme and **80%** said their performance at work had improved and **90%** reported increases in energy.

Health, safety, and well-being

Reduced injury and illness rates by 12% from 2012.

➔ See page 57

↓ 12%

Health, safety, and well-being

Equipped 48,300 employees with the tools to cope with workload stress through energy and resilience training since 2008.

➔ See page 58

48,300

- There were **significant reduction** in perceived workplace pressures and better able to cope.
- Employees were more likely to make **improvements in their lifestyle**, especially diet, and report they are in excellent health



“IF OUR STUDENTS DO NOT SEE AND EXPERIENCE SAFETY & HEALTH BEST PRACTICES BEING IMPLEMENTED IN THE UNIVERSITY, THEY WILL ALSO MOST LIKELY ENTER THE WORKFORCE IGNORANT OF SAFETY & HEALTH ISSUES. SO, IN NUS, OUR RESPONSIBILITY TO MAINTAIN HIGH SAFETY STANDARDS IS EVEN GREATER.”

Prof Tan Chorh Chuan
President
National University of Singapore

THANK YOU

Saravanan Gunaratnam

Deputy Director

Office of Safety, Health & Environment

National University of Singapore

oshsg@nus.edu.sg

<http://www.nus.edu.sg/osh/>