Beyond Risk Assessment

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Technology and Instant Access to Information

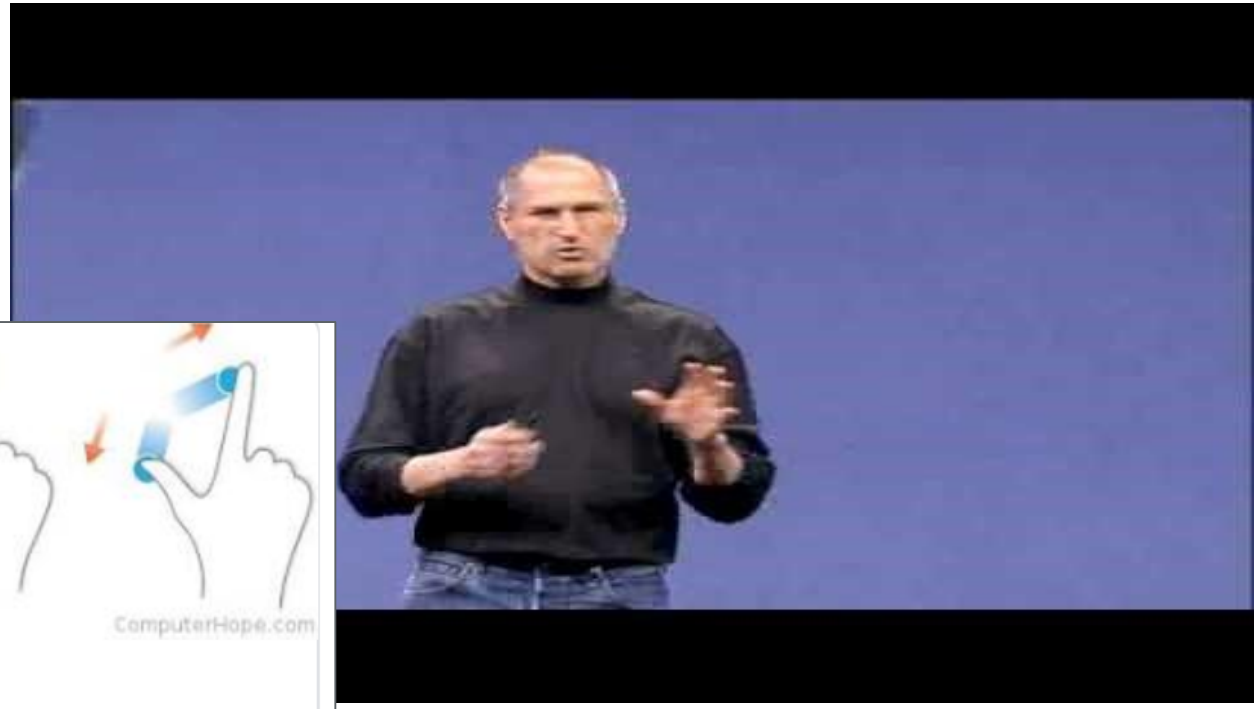
Topics › Cameras ›

DIGITAL PHOTOGRAPHY

Digital Camera Sales Dropped 84% Since 2010

by Felix Richter, May 27, 2019

Pinch-To-Zoom



Pinch-to-zoom refers to the multi-touch gesture that zooms in or out of the displayed content on a device with a touch screen. These devices include a smartphones and tablets. To use **pinch-to-zoom**, touch two fingers on the touch screen, and move them apart to **zoom** out, or together to **zoom** in. Jul 10, 2019

www.computerhope.com › jargon › pinch-to-zoom

What is Pinch-To-Zoom? - Computer Hope

About Featured Snippets Feedback

YPSW 2020

> We have heard about:
  - Robots
  - Talc
  - Psychosocial health factors
  - Linear non-threshold
  - Climate change
  - Cannabinoids
  - Microbiome
  - Health metrics

> Different topics, but one common theme

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HEALTH AND SCIENCE

CDC confirms second US case of coronavirus and is monitoring dozens of other potential cases

PUBLISHED FRI, JAN 24 2020•10:14 AM EST | UPDATED 8 MIN AGO

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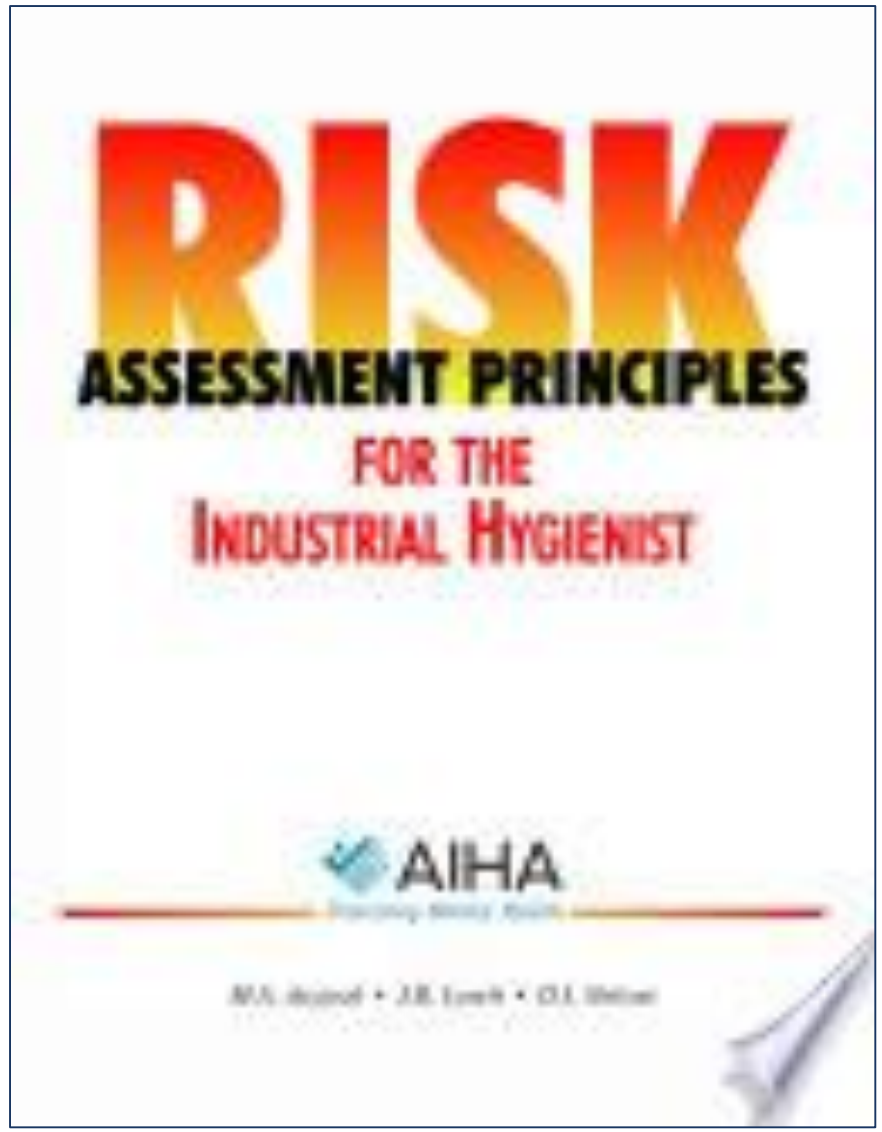
RISK
ASSESSMENT PRINCIPLES
FOR THE
INDUSTRIAL HYGIENIST
AIHA

Key Question

- How do we,
  - Define risk?
  - Assess, measure, or characterize risk?
  - Communicate risk?
  - Manage risk?
  - Address perceptions of risk?
  - Develop risk-based policies?

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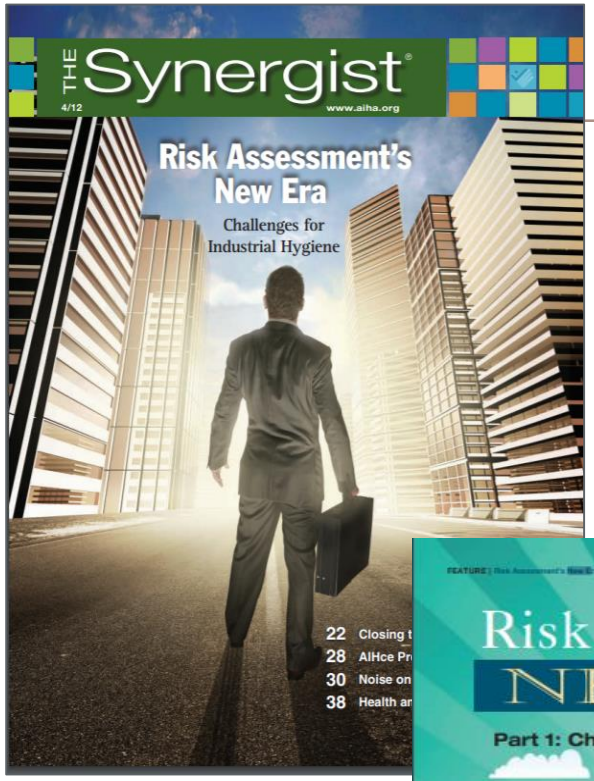

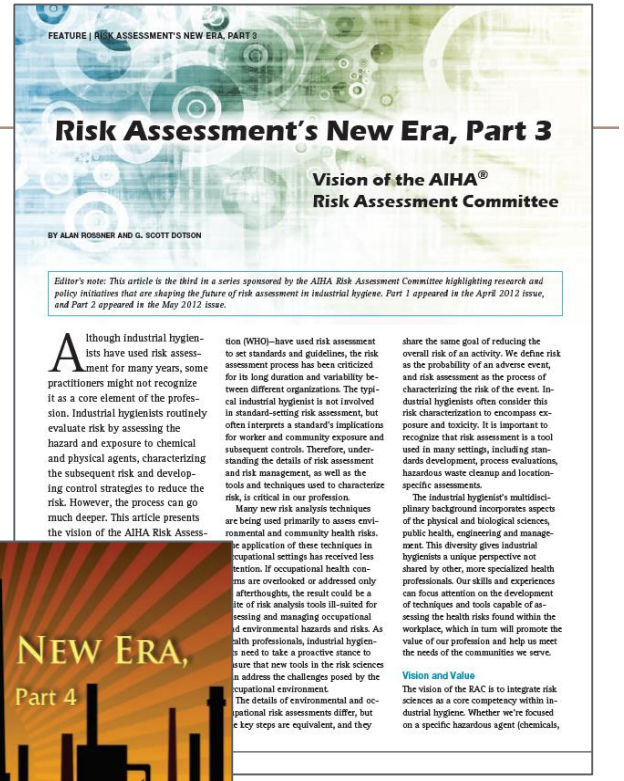

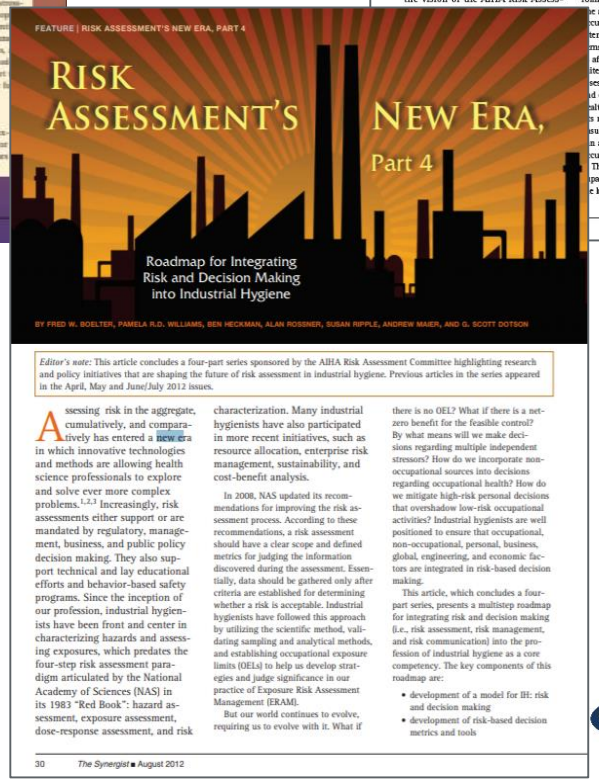

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Our Vision…

1. Occupational risk assessment will not focus on OELs
2. New challenges will require “new” solutions
3. Shift from risk assessment to a broader view of risk and associated disciplines
4. Greater focus on scientific and technical .
5. Integration of risk-based decision making
6. Focus beyond the workplace

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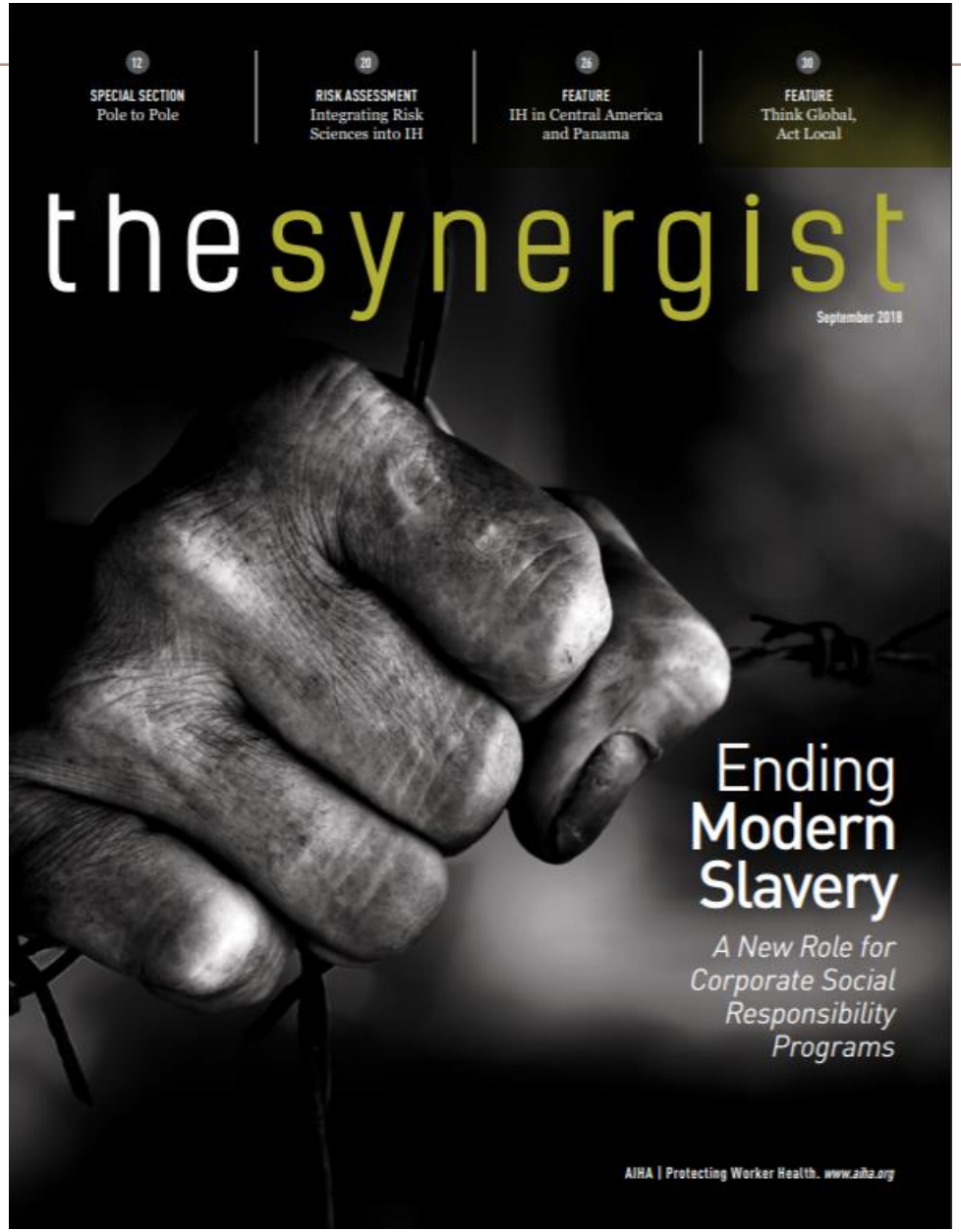

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Beyond Risk Assessment

Integrating the Risk Sciences into the Profession of Industrial Hygiene

BY G. SCOTT DOTSON

Risk: it is that four-letter word used extensively in today's society to discuss everything from the dangers of operating a vehicle to uncertainty in the economy to the perils of certain lifestyle choices. Risk is inherently personal in nature and varies greatly between individuals, organizations, and businesses. For this reason, risk can be a divisive topic. What one person or group deems as an acceptable or "safe" behavior, another will judge as "dangerous" or too risky. The one thing that most of us can agree on is that risks are all around us, regardless of the setting.

Risk in the workplace is no longer being defined by occupational exposure limits or the application of the hierarchy of controls as the standard for risk management.

The modern work environment is no different. The American economy has shifted since the mid-20th century from a focus on manufacturing to one based on the service industry. In response, a substantially greater number of workers can be found in office buildings compared to factories. New technologies, such as nanomaterial-enabled products and processes, are found in every industrial sector alongside traditional hazards, such as noise and lead. As the work environment continues to change, are we prepared to address the challenges that these potential risk factors represent for bothworkers and their employers?

RISK AND INDUSTRIAL HYGIENE

Analyzing and controlling risk in the work environment have long been recognized as core competencies for industrial hygienists. Whether we are discussing a specific hazard (chemical, noise, radiation) or topic (product stewardship, cumulative risk assessment, hazard banding), risk is at the center of the conversation. During these discussions, we often ask:

- Is there a universal definition of risk that we should be applying? If so, what is it?
- Should occupational risk assessments focus on characterizing exposures or managing hazards?
- How do we communicate risks to our intended stakeholders?
- As industrial hygienists, are we exposure assessors or risk assessors?

The responses to these questions are often diverse, separating us into different camps based on our experiences, areas of focus, and opinions. Regardless of how you personally answer these questions, the importance of risk to the profession of industrial hygiene cannot be denied.

AIHA is actively engaged in integrating the topic of risk into our profession. Several risk-based initiatives are currently underway, such as the Risk Body of Knowledge and efforts to demonstrate the value of industrial hygiene as a component of enterprise risk management. These initiatives demonstrate not only that our understanding of risk is expanding beyond traditional risk assessment approaches but that the roles of industrial hygiene professionals are changing. Risk in the workplace is no longer being defined by occupational exposure limits or the application of the hierarchy of controls as the standard for risk management. Instead, our profession is expanding into new areas of expertise, and we are becoming more reliant on increasing our understanding of risk to meet these new challenges.

RISK BEYOND THE WORK ENVIRONMENT

Health professionals in allied fields, such as environmental health and public health, are expanding the knowledge and application of the risk sciences. Through their efforts, we are gaining an increased awareness of the scientific basis of, and novel approaches to, risk assessment. Over the last forty years, the field of risk science, which includes risk analysis, assessment, and management, has grown dramatically and is recognized as a critical tool for addressing complex public and environmental health issues. Numerous organizations, such as the National Academy of Sciences, EPA, and the World Health Organization, have developed different components of the risk sciences. Some of the publications that have shaped our understanding of the risk sciences are listed on page 21.

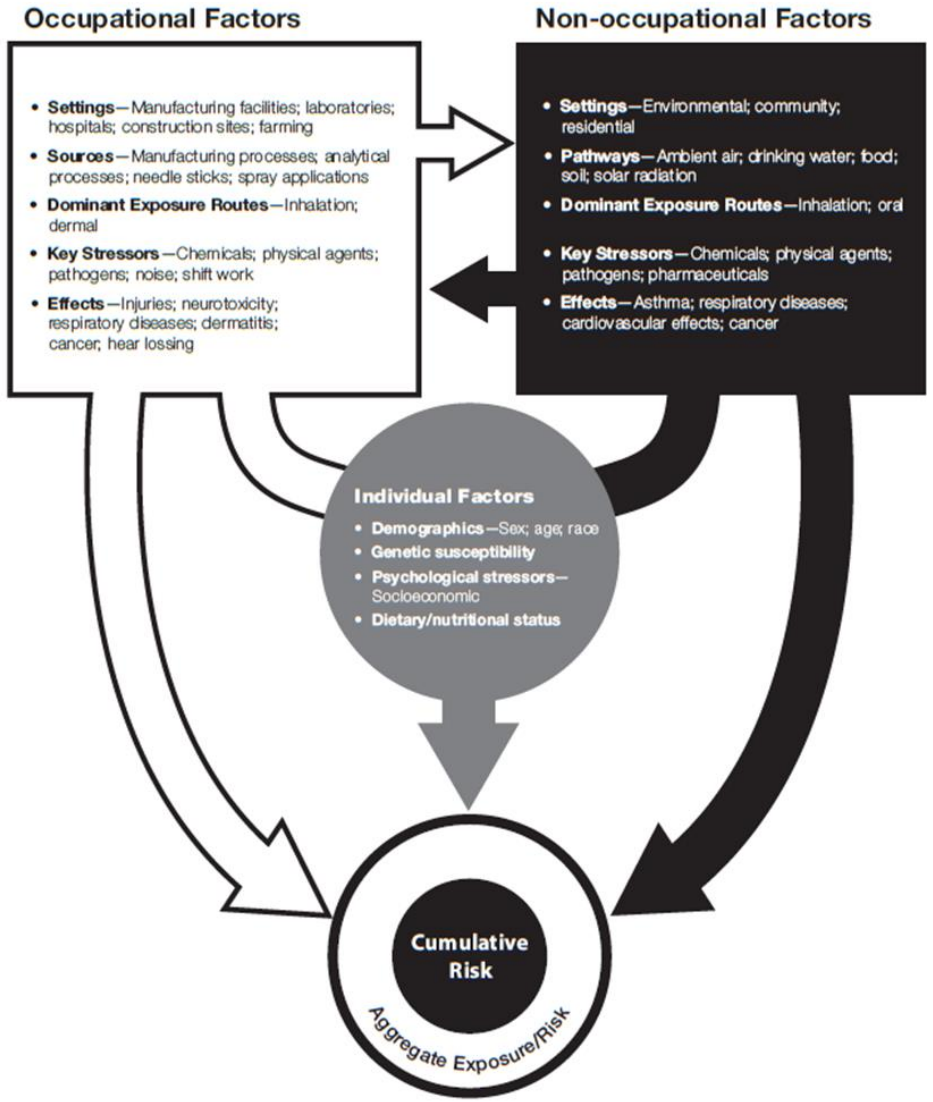
For example, the NAS "Red Book" published in 1984 first outlined the risk assessment and management paradigm that serves as the basis for other approaches, such as those from EPA and WHO. The NAS "Silver Book" expands on the original paradigm and incorporates new elements intended to improve the risk analysis process such as problem formulation and scoping, risk-based decision making, and cumulative risk assessment. Although these efforts may have been created for public and environmental

The Five “Buckets”

Table 1. Methods and Tools for Risk-Based Decision Making

Method/Tool	Description
Decision analysis	Systematic approach for making decisions under uncertainty, which accounts for underlying beliefs and preferences. Steps involve identifying a problem and viable actions, establishing a decision tree that provides for choices and accounts for chance events, and assigning probabilities to each chance event and utility values to the consequences associated with each choice.
Cost-benefit analysis (or benefit-cost analysis)	Systematic process of enumerating all tangible and intangible societal costs and benefits associated with an option or alternative options. Costs and benefits are valued in a common unit (typically monetary) and net benefits are calculated as the difference between total benefits and costs.
Cost-effectiveness analysis	Systematic approach for finding the lowest-cost means of achieving an objective or comparing the relative costs and effects of multiple options. Costs are measured in monetary terms, while effectiveness is expressed as some unit of output or outcome (e.g., number of lives saved).
Comparative risk analysis	Method of comparing multiple risks using a common metric. This procedure is often used to rank environmental hazards by their relative risk for purposes of setting priorities.
Value-of-information analysis	Method of evaluating the benefit of collecting additional information to reduce or eliminate uncertainty in a specific decision-making context. The newly acquired information should affect a behavior, decision, or outcome (or it is not worth obtaining).

Boundaries Are Being Crossed: Cumulative Risk



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Complex Public/Occupational Health Issue?

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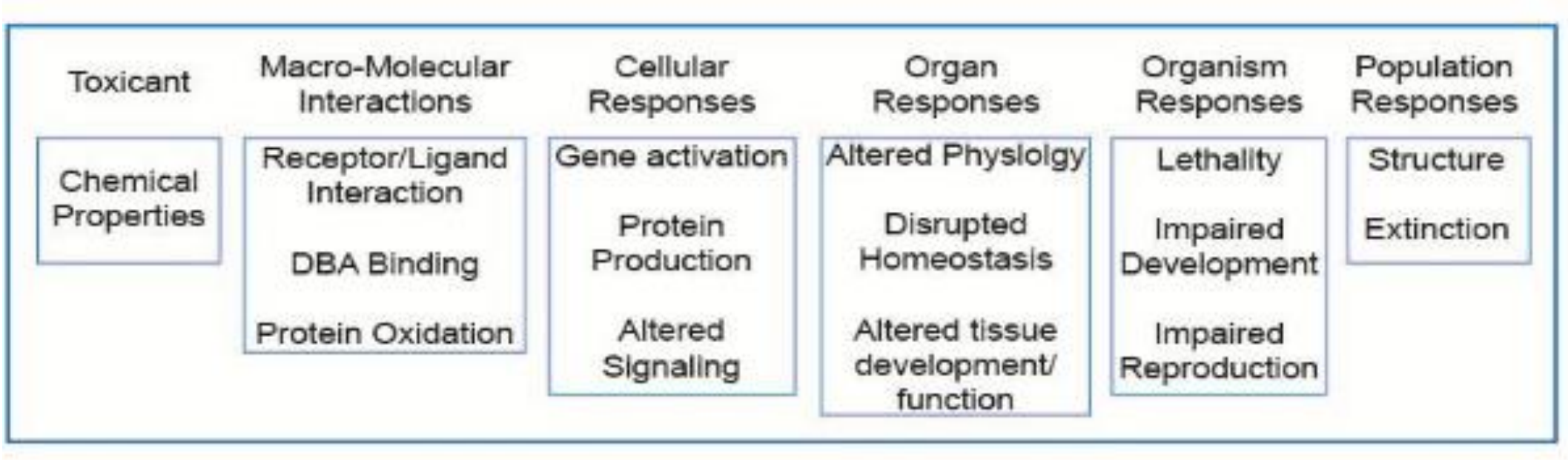
Advancements and Challenges

- Complex Suite of Real Time Monitoring (aka IH in a Box)
  - 1 second above an IDLH?

- Big Data
  - How do we analysis?

More Advancements and Challenges

- High-throughput toxicological studies
  - What do the results mean?
  - Is a subclinical change sufficient to be the basis of a risk assessment?



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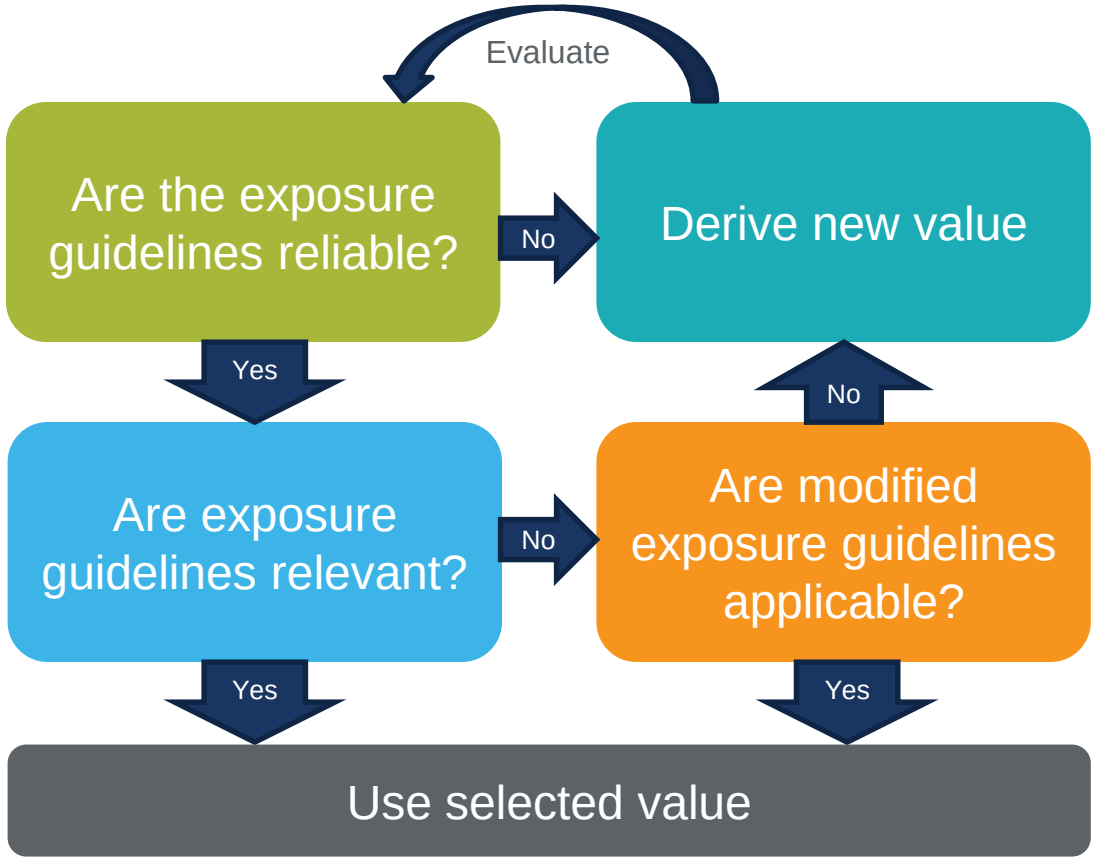
OEL Selection

> Systematic approach needed.

> Two key aspects include:

- Reliability
  - Uses latest health effects data
  - Consistent with current methods
- Relevance
  - The basis matches scenario of interest in terms of population, temporal pattern, route of exposure, chemical form, etc.



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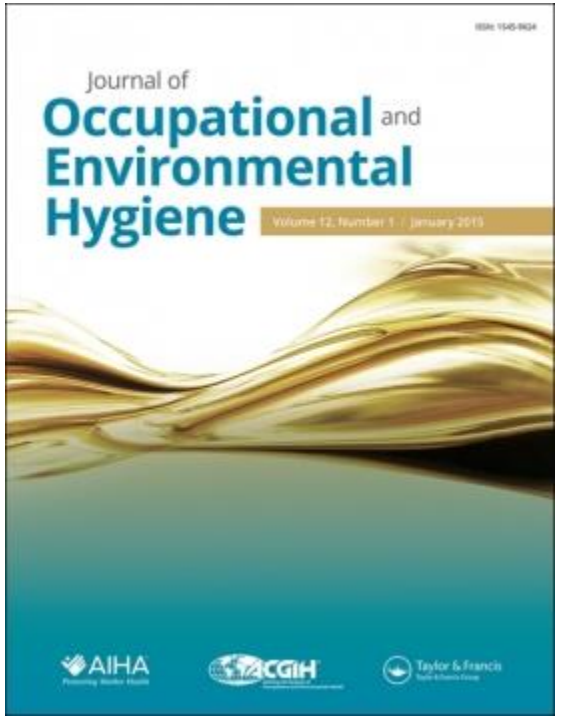
NIOSH OEL Development

Journal of Occupational and Environmental Hygiene Volume 12, 2015 – Issue Supplement 1: State of the Science of Occupational Exposure Limit Methods and Guidance.

- Review of current methods and resources
- Point of departure estimation
- Uncertainty factor application
- Dosimetry adjustments
- Use of new high throughput data and biomarkers
- Implementation in exposure and risk management context
- Aggregate and cumulative risks
- Setting OELs for allergens
- OEL selection



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Revealing Hidden Risks

BY JEANNE FALLON-CARINE AND GRETCHEN N. HANCOCK

Over the past ten years the public has become all too familiar with events where companies either failed to anticipate, or didn't properly manage, enterprise risk. Companies in industries as diverse as oil and gas (Macondo), banking (Wells Fargo), automotive (Volkswagen), technology (Facebook), and tourism (Duck Boats) have experienced very public failures to identify and manage risk. The reputational ramifications that result from these failures have included, in some cases, investor pressure or stock price constriction. In the case of Macondo, an investigation revealed the highly embarrassing fact that BP leaders were present on the Deepwater Horizon rig on the day of the oil spill as part of a safety celebration related to conventional injury and accident metrics. As health and safety practitioners, it is critical for our profession to understand these failures of enterprise risk management as well as traditional accident metrics. This knowledge allows us to implement tools and processes to identify and manage risk with the goal of mitigating adverse outcomes for our employees, companies, and investors.

RISK

A Holistic Approach to Risk

BY JULIE ROTH

JULIE ROTH, CIH, is a health, safety, and environmental manager with Baker Hughes, a GE Company based in Minden, Nev. She is currently the secretary of the AIHA Risk Committee.

Send feedback to synergist@aiha.org

This article is the first in of risk throughout vario series is to understand risk through their overa will group similar indus themes.

The first installment contains comme from three separate interviews with risk leaders from three industrial manufacturing companies. Because they wish to remain anonymous, the article refers to them by initials only. J.J. works in the food and beverage industry, G.H. in industrial tooling and household hardware, and L.B. in the appliance industry. Their responses have been edited.

"We are looking at employees as industrial athletes, where we focus on the overall health of the individual."

QUESTIONS AND ANSWERS

What is your company's overall approach to risk management?

J.J.: Our company's strategy is to increase environmental health and safety performance across every operation and facility. Our strategy is based on an ISO 45001/14001-compliant EHS management system, a digital system, cultural elements that increase leadership involvement and employee engagement, and a Toll gate process to split the strategy in manageable pieces over the next three to five years. [Editor's note: "Toll gate" is a term from the Six Sigma management technique. The intent of Toll gates is to keep managers from moving to a new phase of Six Sigma until the proj-

RISK

A Holistic Approach to Risk, Part 2

Interviews with Leaders in the Pharmaceutical Industry

BY JULIE ROTH

JULIE ROTH, CIH, is a health, safety, and environmental manager with Baker Hughes, a GE Company based in Minden, Nev. She is currently the secretary of the AIHA Risk Committee.

Send feedback to synergist@aiha.org.

Editor's note: In read part 1 of this series in the May Synergist, visit https://bit.ly/synholistrisk1.

This article is the second in a series that focuses on the concept of risk throughout various industries. The purpose of this series is to understand how different industries are addressing risk through their overall business strategies. Each installment will group similar industries together and highlight a few key themes.

Risk communication in the pharmaceutical industry can be challenging. Drugs that can have an adverse effect on workers are often therapeutic to the consumer.

The content in this article stems from separate interviews with risk leaders from the pharmaceutical industry. To preserve their anonymity, the article refers to these leaders by initials only. Their responses have been edited.

QUESTIONS AND ANSWERS

What is your company's overall approach to risk management?

J.D.: Our company can be broken into two parts, with significant differences in risk. The first business unit is our finished dose sites, which essentially bring all the components together. The components are mixed together to form granules and then the finished form (for example, tablets, capsules, or powders in a bottle). The second business unit comprises the chemical plants. The plants create an active pharmaceutical ingredient, or API, which provides the therapeutic effect. This API is what goes into the finished dose to form the finished product, which the patient receives.

For finished dose sites, our risk management across the organization is a bit siloed. The EHS department manages our overall risks. Our Quality department manages risks related to patients, and our Engineering department looks at fire and environmental risks associated with geographic regions or major disasters. In some cases, our departments will interact with each other when we assess risk; however, risk assessment is largely done independently.

Within the EHS department we utilize a risk matrix to prioritize the greatest risks and find ways to reduce these risks. The use of the risk matrix was largely driven by our European sites, which have regulatory requirements for implementing risk assessments.

Risk assessments are conducted for each new project that we work on. Assessments address ingredients that are going into the process; the categorization of the API using a banding system; any flammable liquids being used; combustible dust properties; changes or modifications needed to existing equipment; containment at source of pharmaceutical powders to meet any containment requirements; personal protective equipment; air emissions; wastewater discharge; waste disposal requirements; and any changes that might be needed to existing training requirements.

For our chemical plants, the API group utilizes a similar risk matrix approach. The assessment is much more detailed for new projects at the chemical plants than for the finished dose sites. Examples include:

- Testing conducted on thermal properties of various chemical reactions
- The calculation for pressure relief valves is evaluated for new and existing equipment
- Evaluations of the potential for runaway reactions and systems to stop those reactions

Hazard and operability studies or similar techniques are used to identify hazards. Risk assessments address air discharge, waste generation, wastewater discharges, handling of the contents of residual tanks or reactors, and cleaning of equipment.

B.N.: Pharma companies take a holistic approach to risk. Occupational toxicologists focus on understanding the dataset for the API and impurities. Industrial hygienists and engineers determine how best to effectively implement the results of the hazard characterization and risk assessment. We have the benefit of human data, which allow us to develop assessments tailored toward the end user. Occupational exposure bands are developed first and are followed by numerical occupational exposure limits. Controls are implemented using parameters that are developed for design of new facilities or processes. Exposure monitoring is conducted to verify that controls are working as designed. Risk communication is critical. Occupational health risk assessments are completed by toxicologists and occupational physicians to put potential exposures into perspective.

In Closing…

> Risk is an inherent part of industrial hygiene

> Shift from traditional risk assessment approach to more holistic approaches

> New stressor, populations, scenarios, and analytics

> Need for new skills (pinch-to-zoom for IHs)

> Evolving technology

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Thank you

For more information

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