



THE FUTURE IN MONITORING AND MANAGEMENT OF CARCINOGENS

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TNO innovation
for life



INTRODUCTION

- › Not new: one of the first official cases identified in the eighteenth century
- › Cancer is the first cause of work-related deaths in the EU: 53%
- › The number of deaths in the EU around 102,000 per year
- › Estimate of at least 666,000 people worldwide per year*
- › Across the EU, 1 in 5 workers faces an occupational cancer risk
- › Asbestos is the biggest killer: over 100,000 lives a year worldwide.
- › Estimate: 10 million death worldwide due to asbestos before it is controlled
- › Worldwide more death from work-caused cancer than from work accidents.
- › > 50 substances are listed as known or probable causes of workplace cancer
- › Well known examples: asbestos, diesel exhaust, welding fumes, silica



THE TECHNOLOGICAL DRIVERS



Smart information
collection



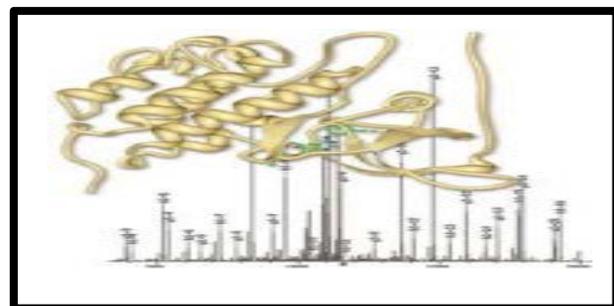
Sensor technology



Big data



Satellite data



Systems Biology
Transcriptomics, proteomics, and
metabonomics

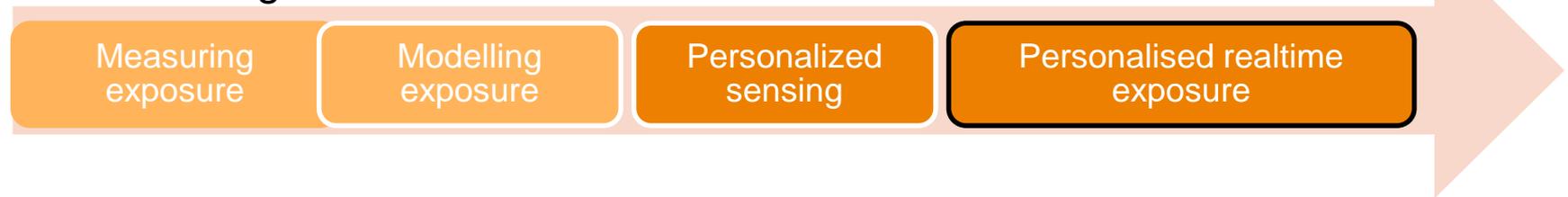


Non invasive high throughput
biomarkers

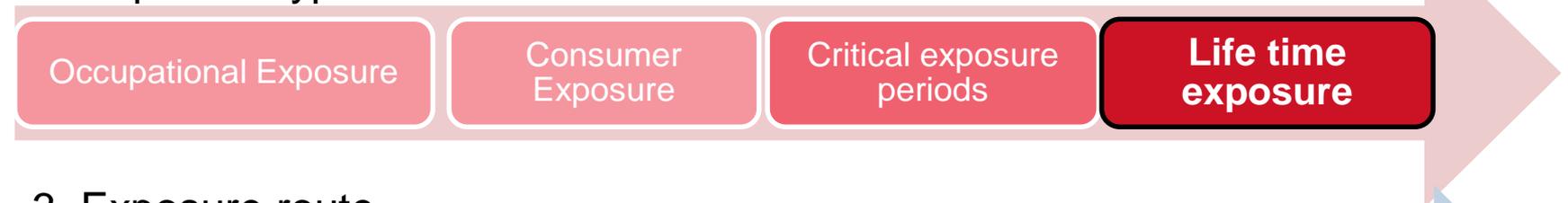


TRENDS

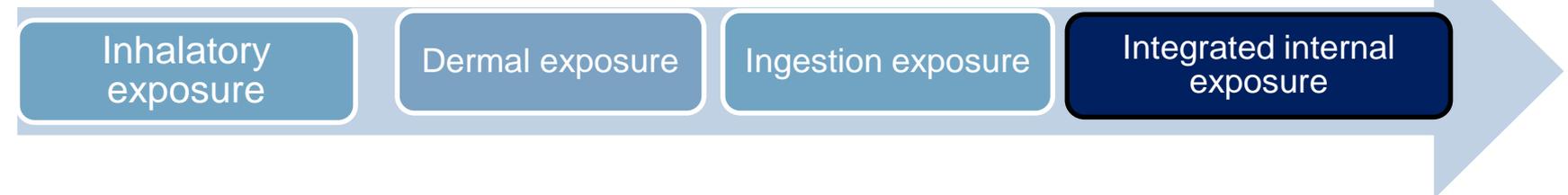
1. Monitoring



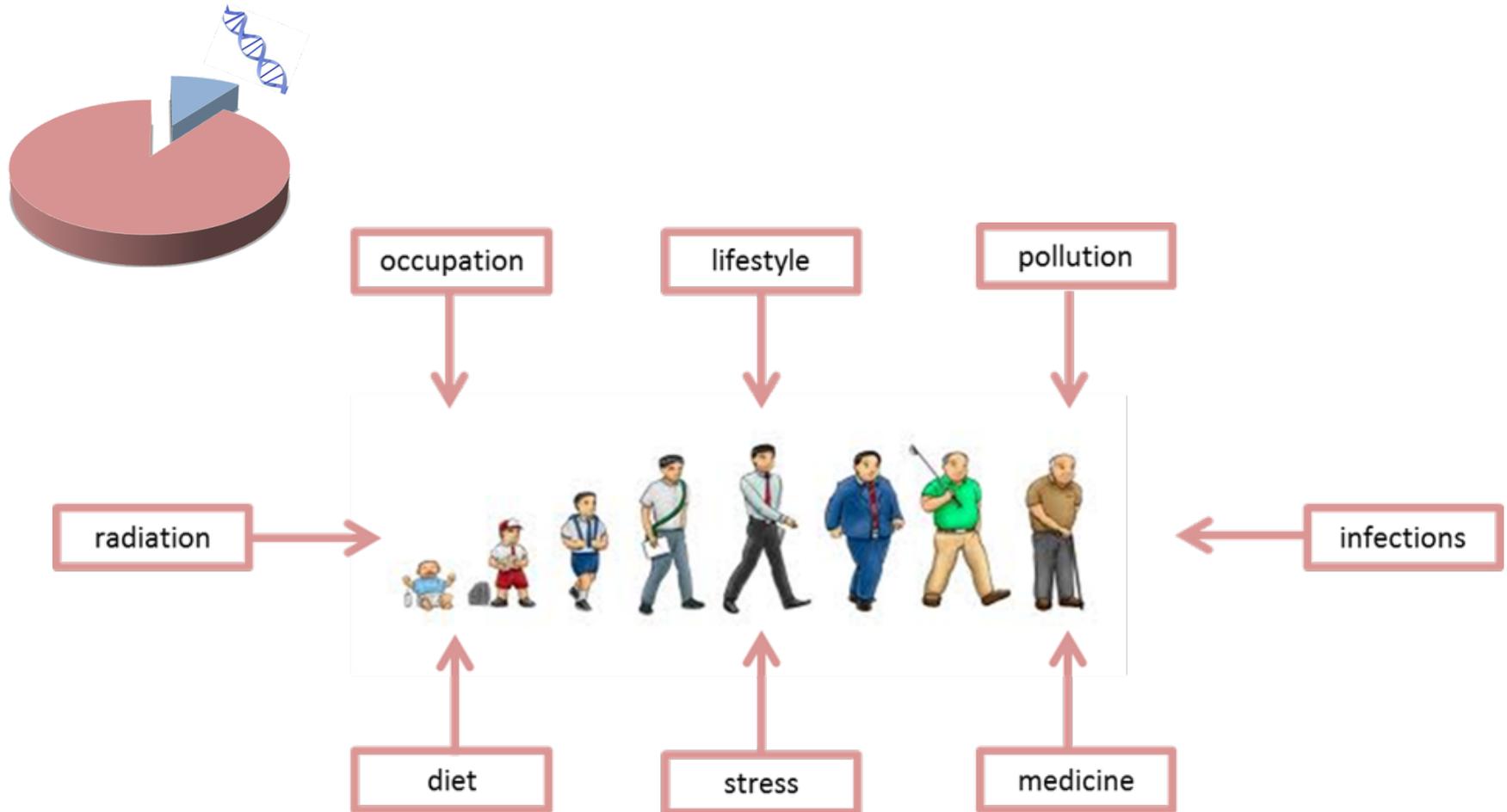
2. Exposure type



3. Exposure route



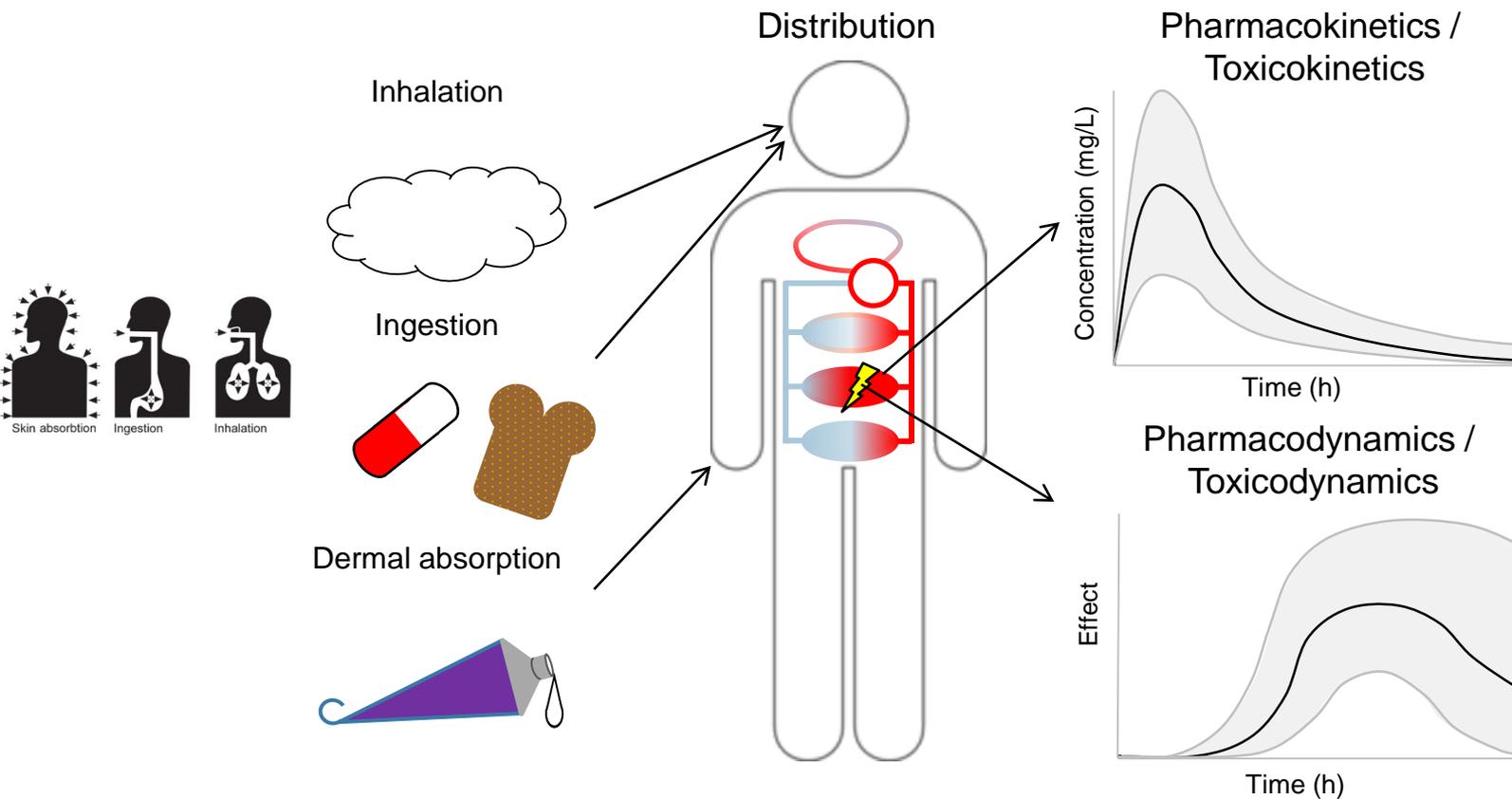
LIFE TIME EXPOSURE: THE EXPOSOME



INTEGRATED EXPOSURE: EXTERNAL - INTERNAL EXPOSURE MODELLING

External exposure

Internal exposure



PERSONALISED SENSING



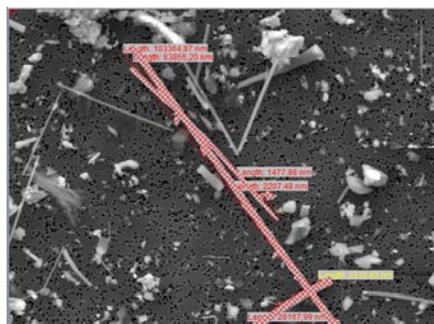
Chemicals



Particles



Point of care biosensors

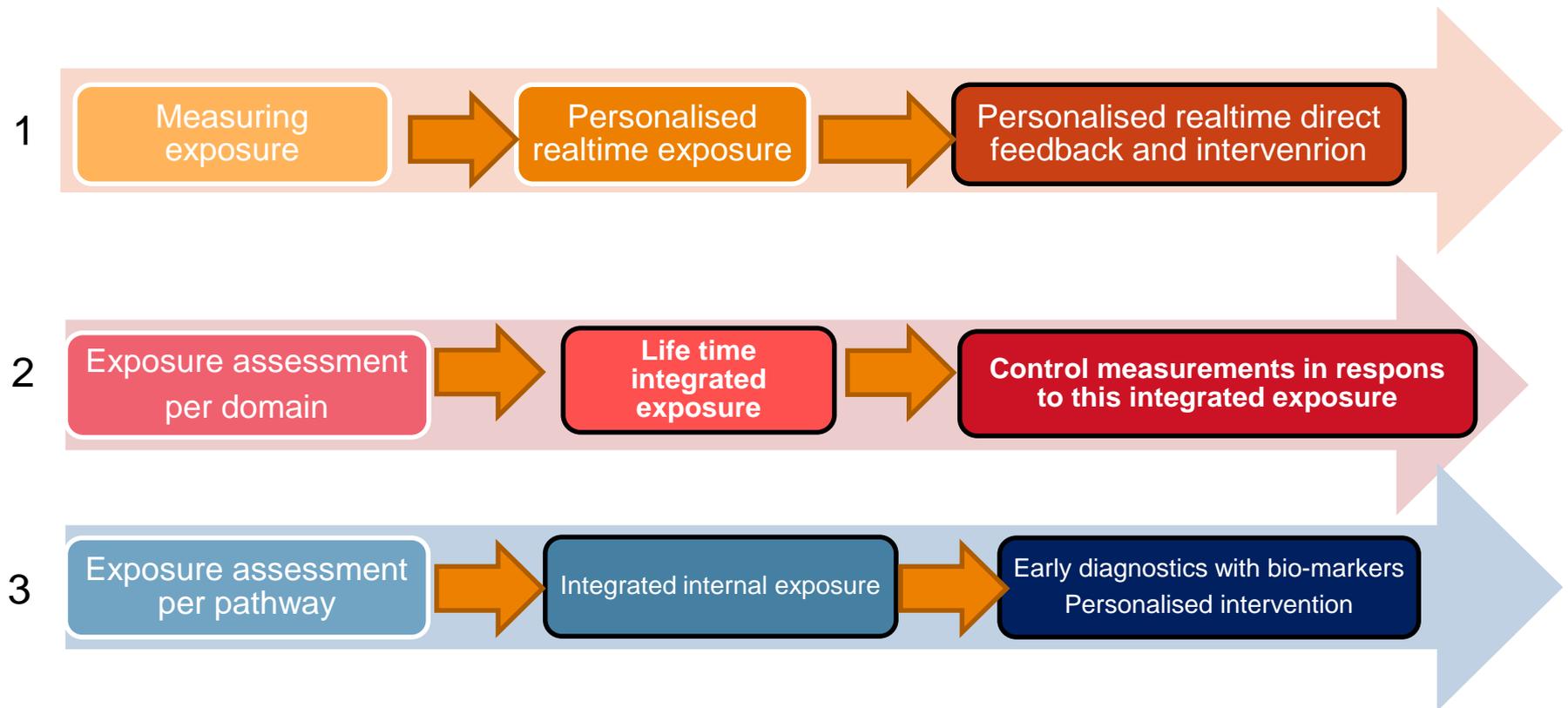


Asbestos

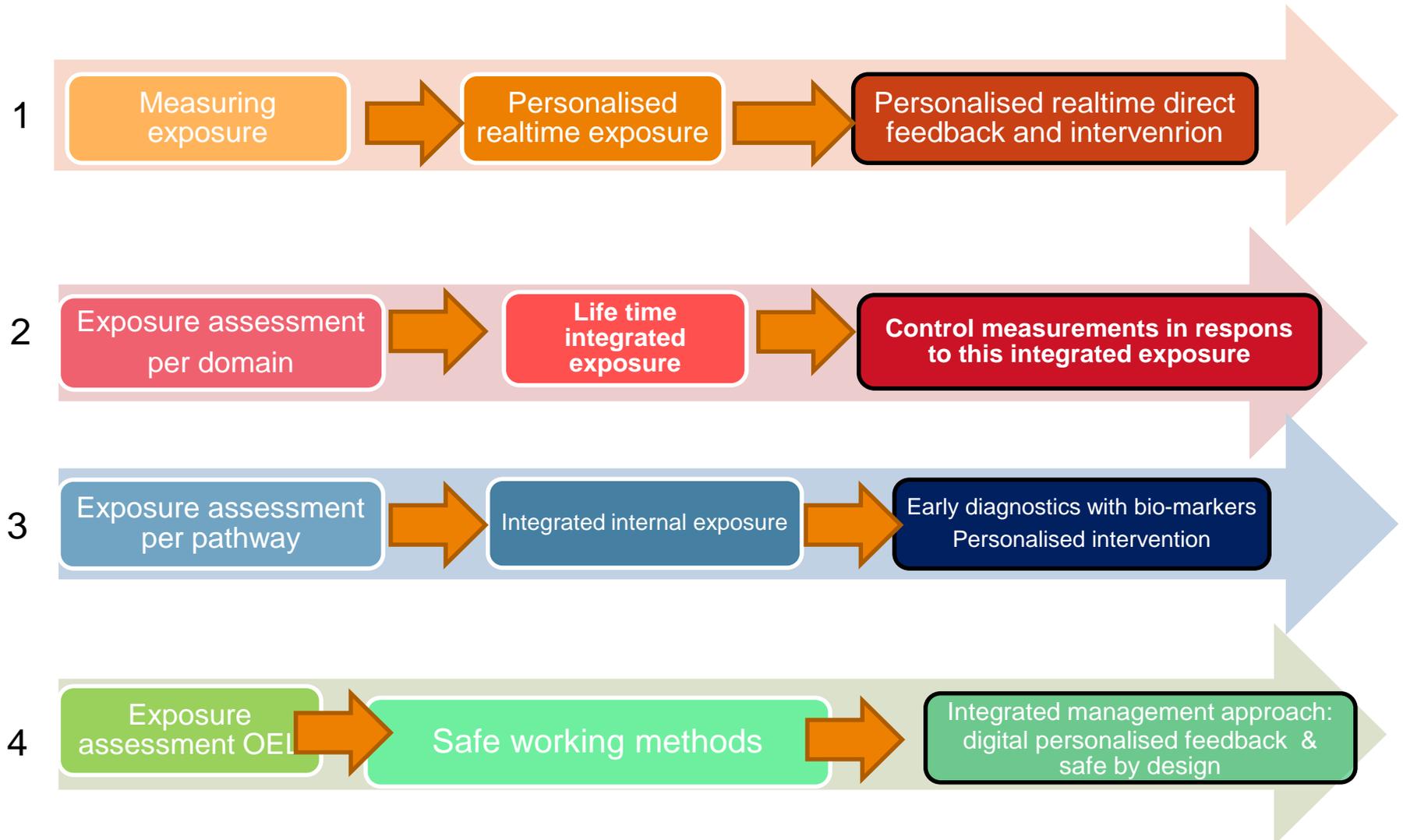




IMPLICATIONS FOR MANAGEMENT



IMPLICATIONS FOR MANAGEMENT



PERSONALISED MANAGEMENT TOOLS



- Vermoeidheid ↓
- Slaapkwaliteit ↑
- Gezond gedrag ↑



MANAGEMENT: INTEGRATED APPROACH

Stoffenmanager®

Welcome!

What is Stoffenmanager?

Health and safety working with dangerous substances is complex. Regulations, standards and products are continuously changing, making advice and complete practical management a real challenge. Stoffenmanager will close the gap between national legislation and practice. Stoffenmanager brings order and clarity through its structured knowledge and information.

The quantitative exposure model of Stoffenmanager is accepted by the Dutch Labour Inspectorate as method to evaluate exposure to chemical substances at the workplace. This part of the tool is also mentioned in the European REACH & CLP Guidance.

Questions? Contact us at info@stoffer.nl

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ART ADVANCED REACH TOOL

Welcome to the Advanced Reach Tool 1.5

Chemical Safety Assessments can be complex and time consuming. While Tier 1 models estimating exposure are available, should they be unable to show safe use, then refinement with more data or better assumptions is the only way forward. The Advanced Reach Tool (ART) version 1.5 incorporates a mechanistic model of inhalation exposure and a statistical facility to update the estimates with measurements selected from an in-built exposure database or the user's own data. This combination of model estimates and data produces more refined estimates of exposure and reduced uncertainty.

The ART project has been conducted in close collaboration with a range of stakeholders from industry and member states. The use of ART for workers exposure assessment under REACH is described in ECHA's updated Guidance on [Information Requirements and Chemical safety assessment](#).

ART is currently only calibrated to assess exposure to inhalable dust, vapours, and mists. However, for lack of suitable calibration data, ART can not (for the time being) be used for the assessment of fumes, fibres, gases, and dust resulting from emissions during hot metallurgical processes.

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News

E-Team - A new project to evaluate REACH Tier 1 exposure assessment models downloaded 12 april 2012

The Institute of Occupational Medicine is evaluating the different Tier 1 exposure assessment models under REACH: the ECETOX, TRA, NIOSH, EMKC-Expo...

More...

Contributors to ART



EMKC - Easy-to-use workplace control scheme for hazardous substances

The Easy-to-use workplace control scheme for hazardous substances (EMKC) by the German Federal Institute for Occupational Safety and Health (Baua) exists since 2005. It is a practical guideline for risk management preventing activities with hazardous substances. The EMKC is intended to help especially small and medium-sized enterprises (SMEs) to transfer information from safety data sheets and workplaces into practical risk reducing measures leading to safer working conditions.

Step 1: Hazard Group (HG) Evaluation

Step 2: Hazard Group (HG) Control

Step 3: Control Strategy (CS) Control

Step 4: Effectiveness Check (Efficacy)

Step 5: Control Strategy (CS) Control

Step 6: Effectiveness Check (Efficacy)

Step 7: Control Strategy (CS) Control

Step 8: Effectiveness Check (Efficacy)

Research on health and safety at work www.baua.de



Safe & healthy working methods

www.dustfreeworking.tno.nl

TNO

English

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DUSTFREE WORKING

Dust-free working means dust-free tools. Sign the petition.

[READ MORE >](#)

DUST-FREE WORKING

Fine particulate matter is harmful to health, particularly when it contains carcinogens like respirable crystalline silica (RCS), hardwood, chromium and nickel. Workers coming into contact with this dust must be very careful and work in a responsible, safe and – above all – healthy way.

For TNO, it is essential to reduce workplace exposure to fine particulate matter (PM) – and to develop more systems to achieve that. Our goal is “dust-free working”.

Together with Bosch, DeWalt, Dustoo, Festool, Hilti, Makita, Metabo, Numatic, Starmix and other equipment manufacturers, we are therefore actively developing effective management systems for fine particulates. These include vacuum extractors, which can reduce exposure to particulate matter by as much as 100 times. The resulting “dust-free” tools and systems are assessed (validated) using a TNO Performance Test.

Every tool or system has its own test. Amongst other things, this measures actual user exposure to harmful substances. Workers correctly using a device which has passed its test do not exceed the current Dutch statutory long-term occupational exposure limits for PM (GSW TGG-8u: Workplace Exposure Limit, eight-hour time-weighted average). Moreover, such use is accepted by the Inspectorate SZW, the Dutch labour inspectorate, as constituting adequate exposure management.

NEWS

- 10 December 2015
More than 3000 deceased annually by occupational diseases in The Netherlands
- 5 November 2015
European Innovation Award for Extractor Welding Torch
- 14 October 2015
- 1 October 2015
- 27 August 2015

[All News Items >](#)

DIRECTLY TO

- > Dust Extractor Classification
- > Calculation model source concentration



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MAKITA VACUUM CLEANER VC2512L AND DRILLS

DUST-FREE WORKING

MAKITA VACUUM CLEANER VC2512L

IN COMBINATION WITH SEVERAL DRILLS



Makita vacuum cleaner VC2512L with 3.5 meter Ø 32 mm nose (or equivalent)



Bosch dustfree system GDE 16

Several drills



More information is available on www.makita.nl

Responsible use: 2000 boreholes per 8-hour working day in sand-time blocks



sand-time block

Responsible use: 2000 boreholes per 8-hour working day in concrete / brick



concrete / brick

CONTACT

For details on the use of this label and its interpretation refer to the TNO website below:

DUSTFREEWORKING.TNO.NL

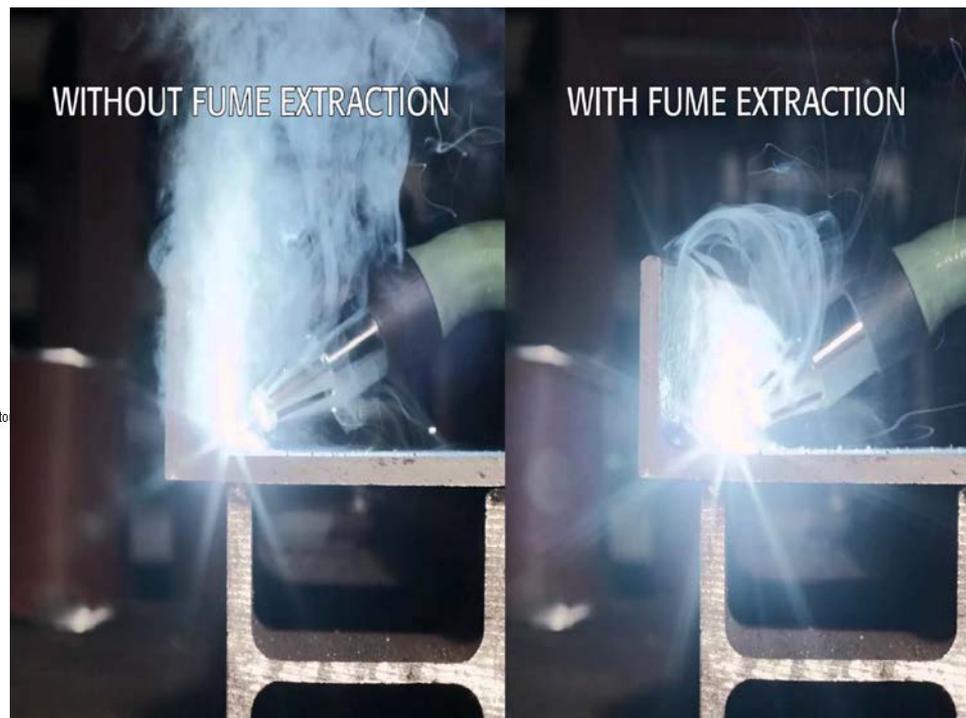
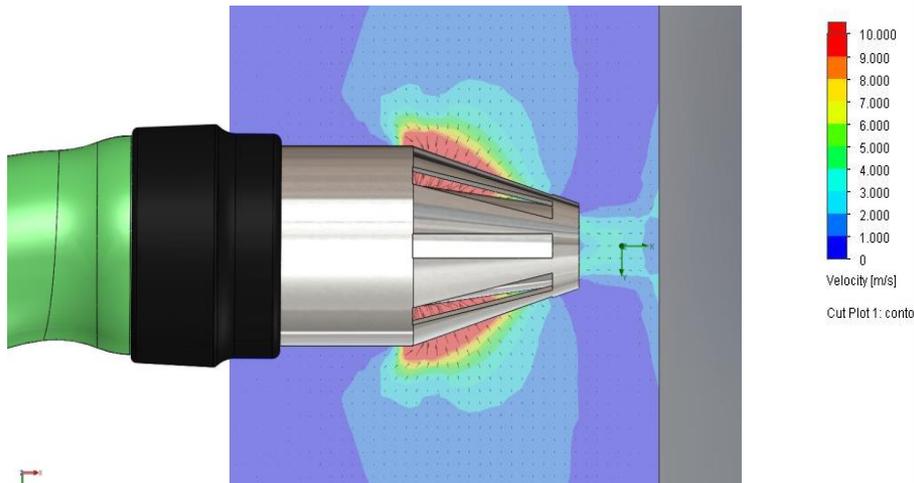
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Safe & healthy working methods

WWW.TRANSLAS.COM
TRANSLAS 7XM EXTRACTOR®



Safe working methods relating to dangerous substances



IN CONCLUSION

- › New emerging technologies allow better understanding of risk and effect
- › Open the gate to a real time personalized assessment and more direct and targeted management
- › Make early warning systems more widely available which allow for better protection and pro active management
- › Digitalization should lead to the necessary integrated information on what to do for all stakeholders (onsite information, on site learning, feedback etc)
- › Effective management is an integrated effort (personalized and context) which is embedded in the culture and core business of companies
- › Regulators can actively incorporate validated good practices in their policies to make the best practice the easy practice



THANK YOU FOR YOUR ATTENTION

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