

SENSITISING SUBSTANCES IN SMALL ENTERPRISES



Risks and preventive measures

FÜR EIN GESUNDES BERUFSLEBEN

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 **BGW**
Berufsgenossenschaft
für Gesundheitsdienst
und Wohlfahrtspflege

Berufsgenossenschaft für Gesundheitsdienst und Wohlfahrtspflege (BGW)



BGW Headquarter, Hamburg

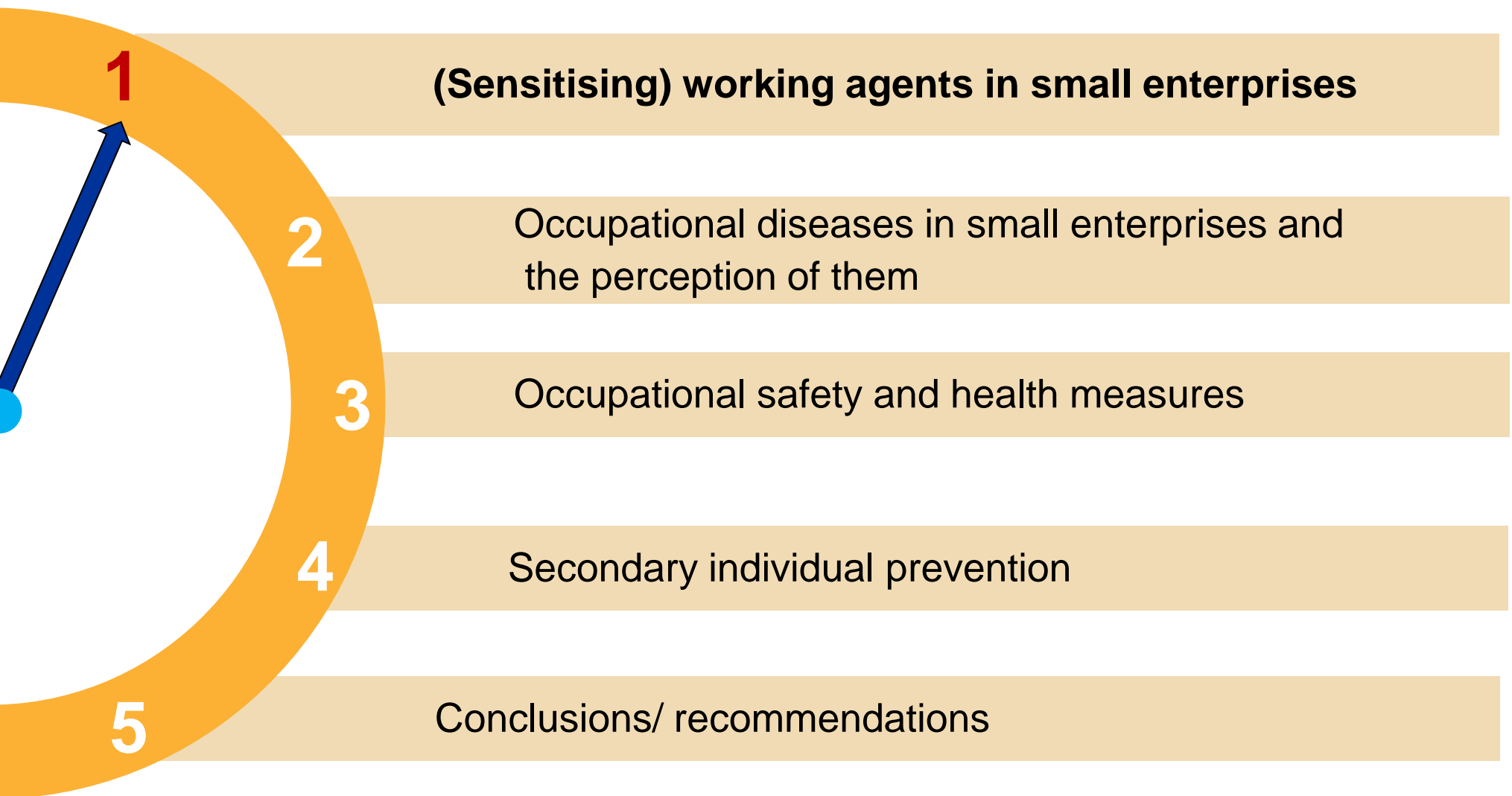
- German Social Accident Insurance Institution for the Health and Welfare Services
- approx. 650.000 member companies
- > 7 million insured employees
- insured sectors (examples):
 - ➔ Hospitals
 - ➔ Doctors' practices
 - ➔ Inpatient care/ home care
 - ➔ Pharmacies
 - ➔ Hairdressers
 - ➔ Pest control

BGW / Hazardous substances & toxicology section



- ➔ Part of the Health Science and Occupational Medicine Departement
- ➔ Located in Cologne
- ➔ Chemists, engineers, technicians, administrative assistants
- ➔ **Main focus:** chemical hazards in the health services
(disinfectants, pharmaceuticals, anesthetic gases, cytotoxic substances, sterilising agents etc.)

Topics



Selected small enterprises in the BGW

Sector	Number (2014)		
	Enterprises	Company sites	Insured individuals
Pharmacies	16.813	21.009	263.514
Doctors' practices / laboratories	116.508	118.846	822.193
Dentists' practices	43.874	44.554	392.452
Veterinary practices / pest control companies	14.029	14.323	52.508
Hairdressers	72.670	83.278	328.130
Total	263.894	282.010	1.858.797
% BGW	42,39	39,62	24,05

Working agents in selected BGW sectors

Working agents	Pharmacies	Doctors' practices	Dentists' practices	Veterinary practices	Hair-dressers
Office materials (paper, photocopying materials)	x	x	x	x	(x)
Cleaning agents	x	x	x	x	x
Disinfectants	x	x	x	x	(x)
Medicinal substances	x			(x)	
Pharmaceuticals	x	x	x	x	
Diagnostic agents		x		x	
Laboratory chemicals	x	(x)			
Preservatives		(x)		x	
Gloves	x	x	x	x	x
Disposable materials		x	(x)	x	
Cosmetics (general)					(x)
Hair (animal, human)				x	x
Hair-treatment agents					x
Technical products (paints, oil, grease, petrol)	(x)	(x)	(x)	x	(x)

Disinfectants: typical ingredients

- Approx. 1000 different products analysed
- Active substances (aldehydes, alcohols, quaternary ammonium compounds, biguanides, alkylamines, etc.), solvents, surfactants, perfumes

Over 200 different ingredients in total were identified.


Ingredient	CAS No	Number of indications				
		Total	Surface	Skin-/hands	Instruments	Linen
2-Propanol	67-63-0	331	181	102	47	1
Ethanol	64-17-5	187	135	35	14	3
Didecyl dimethyl ammonium chloride	7173-51-5	182	166		16	
1-Propanol	71-23-8	128	87	31	10	
Quaternary ammonium compounds	68391-01-5	108	95		13	
N-(3-Aminopropyl)-N-dodecylpropane-1,3-diamine	2372-82-9	90	39		51	
Glutaraldehyde	111-30-8	68	40		28	
Isotridecanol, ethoxylated	69011-36-5	62	42		16	4

Disinfectants: Ingredients and their synonyms

Designation of product ingredients by manufacturer:

■ Use of synonyms (up to 15 different)

Examples

- 
- | | |
|------------------------|--------------------|
| ▶ Piperazine | ▶ Glyoxal |
| ▶ Piperazinhexahydrid | ▶ Diformyl |
| ▶ Diethylenediamine | ▶ 1,2-Ethanedial |
| ▶ Lumbricol | ▶ 1,2-Ethanedione |
| ▶ 1,4-Diazacyclohexane | ▶ Oxal aldehyde |
| | ▶ Glyoxal aldehyde |

■ Use of vague terms

- | | |
|-----------------------|----------------------------|
| ▶ Alkansulfonat | ▶ Amine derivates |
| ▶ Biguanid-Derivat | ▶ Organic acids |
| ▶ Colours/ Perfume | ▶ Quat. ammonium compounds |
| ▶ Guanidine compounds | |

DESINFO evaluation: sensitising ingredients

CAS No	Name (other synonyms are possible)	Test series	Classification
107-22-2	Glyoxal	DKG DES	H317 / R43
111-30-8	Glutaraldehyde	DKG DES	H314 + H334 / R42/43
25655-41-8	Povidone iodine	DKG DES	
50-00-0	Formaldehyde	DKG S	H317 / R43
61789-40-0	Cocamidoproyl betaine	DKG F, KH	
68391-01-5	Benzalkonium chloride	DKG DES	
127-65-1	Sodium-p-toluolenesulfon-chloramide		H334 / R42
3586-55-8	1,6-Dihydroxy-2,5-dioxahexane		H317 / R43
59-50-7	4-Chloro-3-methylphenol		H317 / R43
110-85-0	Piperazine		H314 + H334 / R42/43

DESINFO: formaldehyde releaser

Non declared formaldehyde in disinfectants

Example: **Kxxxxxx extra**

	Active Substances	concentration [g/100 g]
Declaration manufacturer	(Ethylenedioxy)dimethanol	14,1
	Glutaraldehyde	5,0
	Didecyl dimethyl ammonium chloride	8,0
Analysis by DGUV/IFA	Formaldehyde	4,6
	Glutaraldehyde	3,1

(Ethylenedioxy)dimethanol [CAS-No. 3586-55-8]

Synonyms: 1,6-Dihydroxy-2,5-dioxahexane

1,2-Ethanediybis (oxy)-bis-methanol

Topics



Accidents and occupational diseases at the BGW

Sector	Number (2014)		
	Occupational accidents	Commuting accidents	Diseases
Pharmacies	872	689	63
Doctors' practices / laboratories	1,890	2,319	733
Dentists' practices	1,028	1,124	613
Veterinary practices / pest control companies	1,554	140	101
Hairdressers	1,699	963	1432
Total	7,043	5,235	2,942
% BGW	9.78	17.92	23.37

Items triggering disease (occupational disease (BK) codes 5101, 4301, 4302) in the BGW's statistics (2006-2014)

	Pharmacies [%]	Doctors' practices [%]	Dentists' practices [%]	Veterinary practices [%]	Hair- dressers [%]
Rubber, rubber ingredients, latex	2.26	2.77	2.84	2.14	0.4
Resin / oil / natural substances	2.63	0.07	0.33	0.8	0.29
Disinfectants / preservatives	34.96	44.64	38.82	31.28	2.32
Medicinal substances /pharmaceuticals	4.9	1.14	0.43	1.1	-
Hair-treatment agents	-	-	-	-	36.60
Cleaning agents	6.39	2.96	2.61	1.07	1.14
Water	27	23.2	22.7	18.2	24
Specific chemical compounds	7.9	7.98	13.44	6.95	7.61
Hair, bristles, feathers etc. (animal /human)	-	0.1	-	23.3	0.6
Total	86.04	82.86	81.17	84.84	72.96
Not stated	8.6	10.2	10.5	13.6	20.2

Diseases of the skin and respiratory tract (BGW, 2014)

BGW (mandatory reporting)	Occupational disease (BK) code	Figures (2014)
Skin diseases	5101	7229
Diseases of the respiratory tract	4301/4302	437

- Insured individuals (2014) = 7.729 million
- **Reporting proportion, skin** = 0.094% p.a.
 - = **3.76 % per working life (40 yrs)**
 - = **18.8 % per 5 employees**
- **Reporting proportion, respiratory tract** = 0.0057% p.a.
 - = **0.23 % per working life (40 yrs)**
 - = **1.15 % per 5 employees**

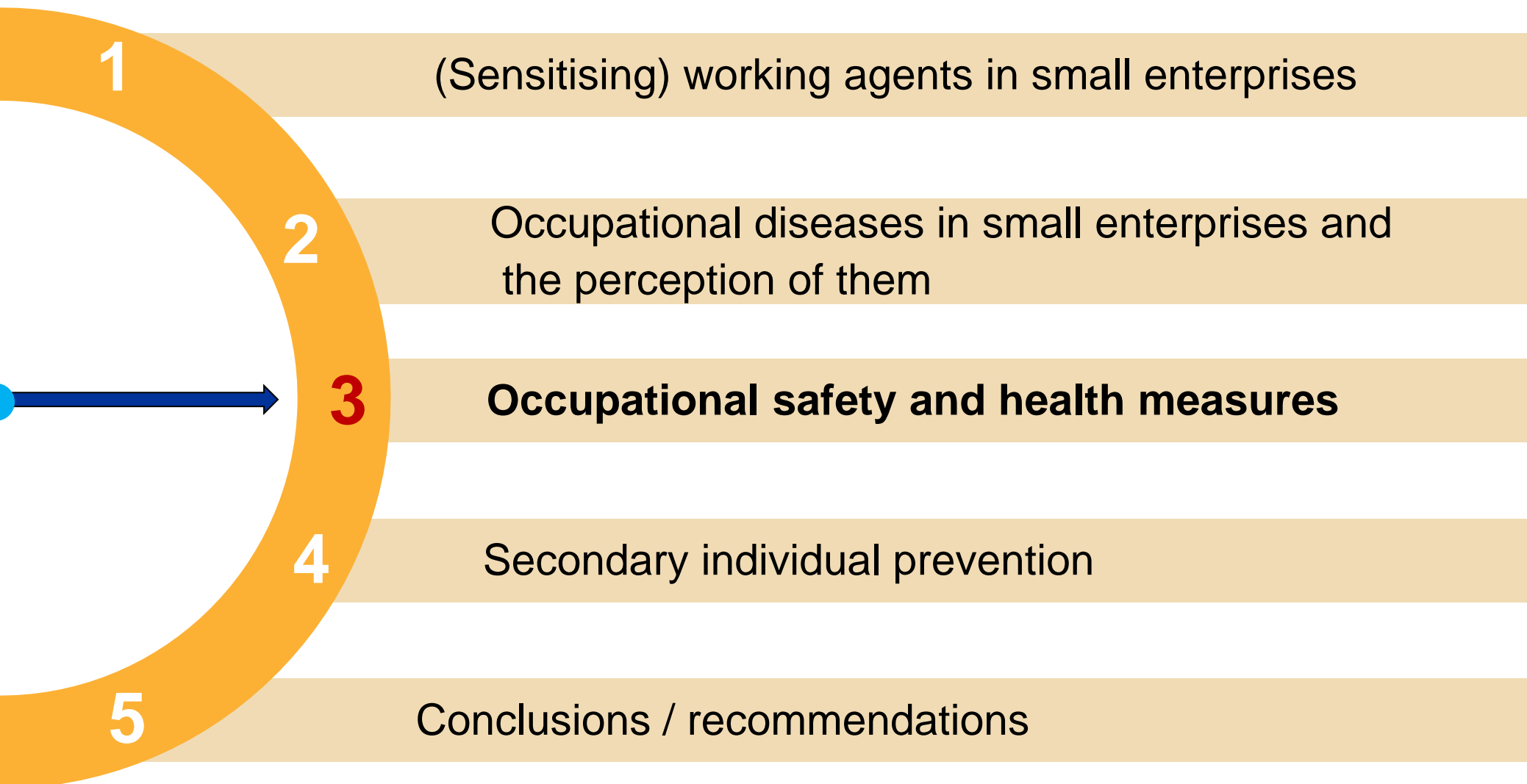
Conclusion: sensitising substances in small enterprises

- Lay persons are often unable to identify potentially sensitising working agents as such.
- Classification and labelling of products is only a partial solution (problem: pharmaceuticals, cosmetics, commodities, etc.).
- Diseases of the skin and respiratory tract are not sufficiently frequent to lead to greater attention being paid to protective measures in small enterprises.

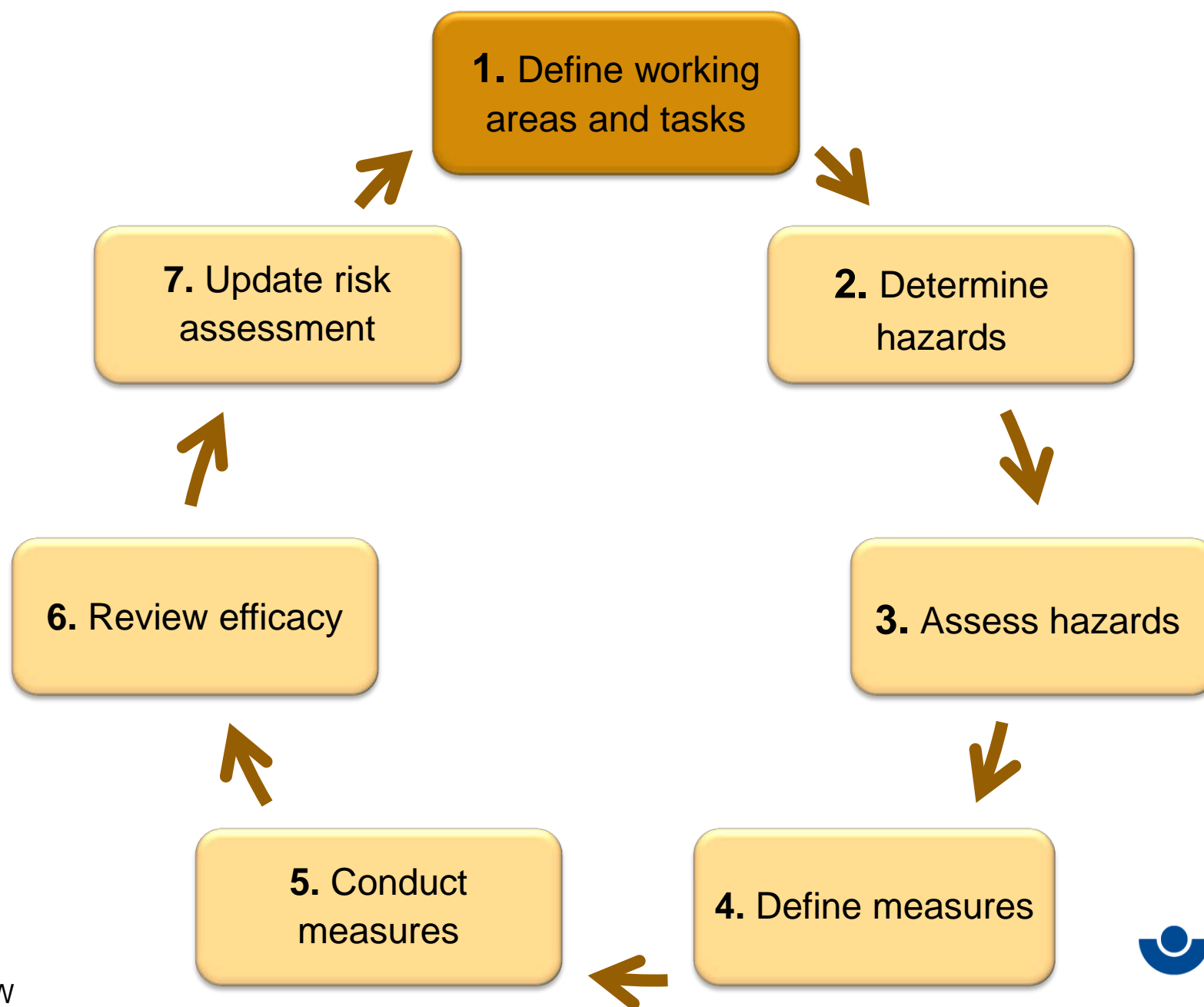
Example:
Hairdressers in Germany
Measures for protection against
sensitisation are rarely applied



Topics



Risk assessment: action cycle



Risk assessment: preparation

- Involvement of experts (OSH professionals, occupational physicians, occupational hygienists)
- *Incidence and severity of accidents and disease in small enterprises*
- Compilation of materials:
 - ➔ Descriptions of substances, e.g. material safety data sheets
 - ➔ Task descriptions, e.g. from quality management
- *In-house exposure data (e.g. from measurements)*
- *Conclusions from preventive occupational medical care*

Risk assessment: exposure assessment

Dermal exposure:

- No limit values for dermal exposure
- Dermal exposure can generally be described only in qualitative terms (data scatter (RISKOFDERM), comparability of measurement methods)
- In Germany: system of classification according to a small number of parameters: substance, quantity, duration

Inhalative exposure:

- Occupational exposure limits for atmospheric exposure are not generally geared to the potential for sensitisation
- Quantification by atmospheric measurements is not usually helpful

Risk assessment: protective measures

- **S**ubstitution
- **T**echnical measures
- **O**rganizational measures
- **P**ersonal measures

- Expertise
- State of the art
- Dependent upon the sector
- Based upon:
 - *Measurements*
 - *Experience in the sector*

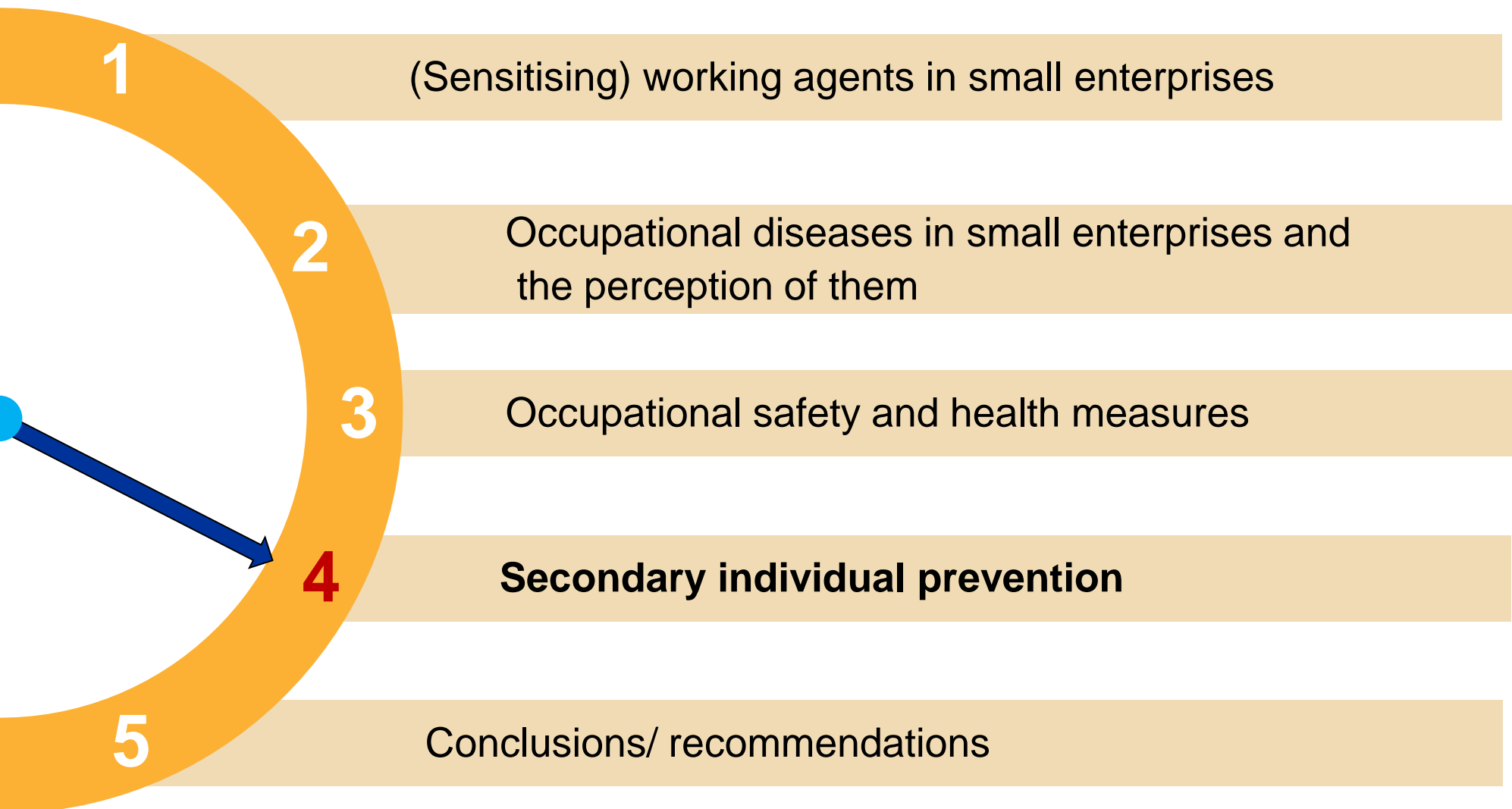
Sector-specific guides
(sector-specific solutions)



Sector-specific guides for small enterprises (examples, Germany)

Sector	TRGS technical rules for hazardous substances	Sector-specific guides / information (examples)
Doctors' practices Pharmacies etc.	TRGS 525 „Hazardous Substances in medical facilities“	DGUV-I 107-002 „Disinfection task in the health sector“ DGUV-I 207-007 „Working safely with cytotoxic drugs“
Hairdressers	TRGS 530 „Hairdressing sector“	BGW TP-9GB „Risk assessment for hairdressers“ BGW TP-HSP-9 „Skin-protection plan“

Topics



Primary and secondary prevention

PRIMARY PREVENTION

Is intended to prevent the incidence of diseases by eliminating the causes

EXAMPLE

Reduction of chromate in cement-based working agents in order to prevent chromate eczema

SECONDARY PREVENTION

Is intended to prevent progression from early stages of the disease

EXAMPLE

Measures triggered by the dermatologist for personal protection of the skin (individual secondary prevention)

Secondary personal prevention (BGW)

- Availability of **medical consultations on skin and the respiratory tract** for clarification of uncertain individual diagnoses concerning the skin and respiratory tract

BGW figures: >1,700 consultations per year

- Availability of seminars on **behavioural prevention**, e.g. among hairdressers

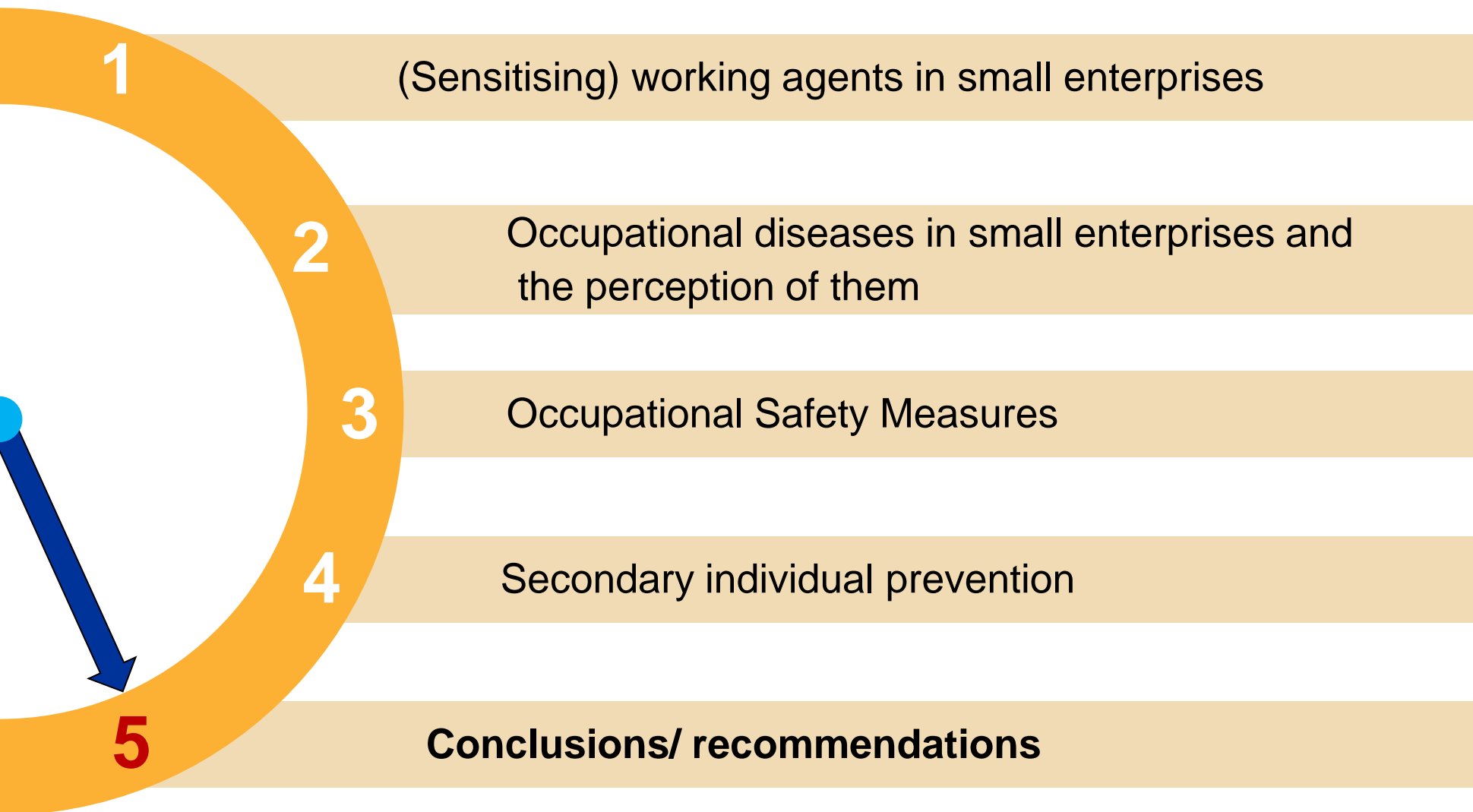
Topics: e.g. wearing of PPE, correct working practices

- Consultations in the company in which the individual suffering the disease works, for the purpose of **circumstantial prevention**

Example topic:

- substitution of products
- technical optimization
- personalized workplace design

Topics



Conclusions / recommendations

- Sensitisation is difficult to prevent in small enterprises.
- First priority: the **substitution** of hazardous substances with sensitizing properties
- Employers require **sound information**
(on chemical substances, appropriate preventive measures)
- **Sectoral information** from the national OSH institutions and professional associations (e.g. on the state of the art) is recommended
- **Monitoring** of OSH standards by official bodies can motivate enterprises to conduct high-quality risk assessment.

Merci beaucoup pour votre attention!

Thank you for your attention!

Vielen Dank für Ihre Aufmerksamkeit!



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