



Inorganic Mercury/Elemental Mercury

Incident Management

Key Points

Fire

- non-flammable and non-combustible under normal conditions
- reacts with nitric acid and hot concentrated sulphuric acid; reaction with ammonia or halogens generates a fire and explosion hazard
- metallic mercury is a liquid and when heated emits toxic vapours
- in the event of a fire involving mercury, use fine water spray and chemical protective clothing with liquid-tight connections for the whole body and breathing apparatus

Health

- inhalation is the predominant route of exposure to metallic mercury
- inhalation of mercury vapour causes cough, breathlessness, mild hypoxaemia and chest pain; flu-like symptoms with myalgia and fever, nausea and vomiting may also occur
- ingestion of large amounts of metallic mercury may cause nausea, vomiting and abdominal pain
- ingestion is the main route of exposure for inorganic mercury compounds
- features on ingestion depend on the specific salt
- systemic toxicity may include acute tubular necrosis and neurological features


Environment

- hazardous to the environment; inform the Environment Agency where appropriate


Hazard Identification

Standard (UK) dangerous goods emergency action codes


Mercury compound, liquid, N.O.S. packing group I

UN		2024	Mercury compound, liquid, N.O.S. packing group I	
EAC		2X	Use fine water spray. Wear chemical protective clothing with liquid-tight connections for whole body in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses	
APP		B	Gas-tight chemical protective suit in combination with breathing apparatus [†]	
Hazards	Class	6.1	Toxic substance	
	Sub-risks	–	–	
HIN		66	Highly toxic substance	
<p>UN – United Nations number, EAC – emergency action code, APP – additional personal protection, HIN – hazard identification number</p> <p>* Chemical protective clothing with liquid tight connections for whole body (type 3) conforming to relevant standards such as BS 8428 or EN 14605, in combination with breathing apparatus BS EN 137</p> <p>† Chemical protective clothing should be gas-tight conforming to BS EN 943 part 2, in combination with breathing apparatus conforming to BS EN 137</p> <p>Reference</p> <p>Dangerous Goods Emergency Action Code List. National Chemical Emergency Centre (NCEC), Part of Ricardo-AEA. The Stationery Office, 2015.</p>				



Mercury compound, liquid, N.O.S. packing groups II & III

UN		2024	Mercury compound, liquid, n.o.s. packing groups II & III	
EAC		2X	Use fine water spray. Wear chemical protective clothing with liquid-tight connections for whole body in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses	
APP		–	–	
Hazards	Class	6.1	Toxic substance	
	Sub-risks	–	–	
HIN		60	Toxic or slightly toxic substance	
<p>UN – United Nations number, EAC – emergency action code, APP – additional personal protection, HIN – hazard identification number</p> <p>* Chemical protective clothing with liquid tight connections for whole body (type 3) conforming to relevant standards such as BS 8428 or EN 14605, in combination with breathing apparatus BS EN 137</p> <p>Reference Dangerous Goods Emergency Action Code List. National Chemical Emergency Centre (NCEC), Part of Ricardo-AEA. The Stationery Office, 2015.</p>				






Mercury compound, solid, N.O.S.

UN		2025	Mercury compound, solid, N.O.S.	
EAC		2X	Use fine water spray. Wear chemical protective clothing with liquid tight connections for whole body in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses	
APP		–	–	
Hazards	Class	6.1	Toxic substance	
	Sub-risks	–	–	
HIN		66/60	Highly toxic substance/toxic or slightly toxic substance	
<p>UN – United Nations number, EAC – emergency action code, APP – additional personal protection, HIN – hazard identification number</p> <p>* Chemical protective clothing with liquid-tight connections for whole body (type 3) conforming to relevant standards such as BS 8428 or EN 14605, in combination with breathing apparatus BS EN 137</p> <p>Reference Dangerous Goods Emergency Action Code List. National Chemical Emergency Centre (NCEC), Part of Ricardo-AEA. The Stationery Office, 2015.</p>				

Mercury

UN		2809	Mercury	
EAC		2X	Use fine water spray. Wear liquid-tight chemical protective clothing in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses	
APP		–	–	
Hazards	Class	8	Corrosive substances	
	Sub-risks	6.1	Toxic substance	
HIN		86	Corrosive or slightly corrosive substance, toxic	
<p>UN – United Nations number, EAC – emergency action code, APP – additional personal protection, HIN – hazard identification number</p> <p>* Chemical protective clothing with liquid tight connections for whole body (type 3) conforming to relevant standards such as BS 8428 or EN 14605, in combination with breathing apparatus BS EN 137</p> <p>Reference Dangerous Goods Emergency Action Code List. National Chemical Emergency Centre (NCEC), Part of Ricardo-AEA. The Stationery Office, 2015.</p>				

Classification, labelling and packaging (CLP)*

Hazard class and category	Acute Tox. 2	Acute toxicity (inhalation), category 2	
	Repr. 1B	Toxic to reproduction, category 1B	
	STOT RE 1	Specific target organ toxicity following repeated exposure, category 1	
	Aquatic Acute 1	Acute hazard to the aquatic environment, category 1	
	Aquatic Chronic 1	Chronic hazard to the aquatic environment, category 1	
Hazard statement	H330	Fatal if inhaled	
	H360D	May damage the unborn child	
	H372	Causes damage to organs through prolonged or repeated exposure	
	H400	Very toxic to aquatic life	
	H410	Very toxic to aquatic life with long-lasting effects	
Signal words	DANGER		
* Implemented in the EU on 20 January 2009			
Reference			
European Commission. Harmonised classification – Annexe VI to Regulation (EC) No. 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures. http://echa.europa.eu/information-on-chemicals/cl-inventory-database (accessed 11/2015).			

Physicochemical Properties

CAS number	7439-97-6
Molecular weight	200.6
Empirical formula	Hg
Common synonyms	Quicksilver, liquid silver
State at room temperature	Liquid
Volatility	Vapour pressure = 0.002 mm at 25°C
Relative density Relative vapour density	13.5 at 25°C (water = 1) 6.93 (air = 1)
Flammability	Not combustible
Lower explosive limit	Not applicable
Upper explosive limit	Not applicable
Water solubility	Slightly soluble in water
Reactivity	Reacts with nitric acid and hot concentrated sulphuric acid. Reacts violently with ammonia and halogens, generating a fire and explosion hazard. Attacks aluminium and many other metals
Reaction or degradation products	Emits toxic vapours when heated to decomposition
Odour	Odourless
References	
<p>Hazardous Substances Data Bank. Mercury, Elemental. HSDB No. 1208 (last revision date 23/08/2005). US National Library of Medicine: Bethesda MD. http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB (accessed 12/2015).</p> <p>International Programme on Chemical Safety. International chemical safety card entry for mercury. ICSC 0056, 2004. World Health Organization: Geneva.</p> <p>Mercury, Elemental (HAZARTEXT™ Hazard Management). In Klasco RK (Ed): TOMES® System, Truven Healthcare Analytics Inc, Greenwood Village CO, US. RightAnswer.com Inc, Midland MI, US. http://www.rightanswerknowledge.com (accessed 12/2015).</p>	

Reported Effect Levels from Authoritative Sources

Exposure by inhalation

Mercury vapour

mg/m ³	Duration	Signs and symptoms	Reference
<44.3	4–8 hours	Chest pains, haemoptysis, dyspnoea, cough and impairment of lung function	a
<p>These values give an indication of levels of exposure that can cause adverse effects. They are not health protective standards or guideline values</p> <p>Reference</p> <p>a WHO. Elemental mercury and inorganic mercury compounds: human health aspects. Concise International Chemical Assessment Document (CICAD) 50, 2003. World Health Organization: Geneva.</p>			

Exposure by ingestion

Mercuric chloride

mg/kg bw	Signs and symptoms	Reference
20–30 (adults)	Vomiting, diarrhoea, severe abdominal pain, oropharyngeal pain, ulceration and haemorrhages throughout the length of the gastrointestinal tract	a
<p>These values give an indication of levels of exposure that can cause adverse effects. They are not health protective standards or guideline values</p> <p>Reference</p> <p>a WHO. Elemental mercury and inorganic mercury compounds: human health aspects. Concise International Chemical Assessment Document (CICAD) 50, 2003. World Health Organization: Geneva.</p>		

Published Emergency Response Guidelines

Emergency response planning guideline (ERPG) values (see note)

	Listed value (ppm)	Calculated value (mg/m ³)
ERPG-1*	NA	NA
ERPG-2 [†]	0.25	2.0
ERPG-3 [‡]	0.5	4.1

Note Values relate to mercury vapour

* Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odour

[†] Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action

[‡] Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects

NA Not appropriate

Reference
American Industrial Hygiene Association (AIHA). 2015 Emergency Response Planning Guideline Values. <https://www.aiha.org/get-involved/AIHAGuidelineFoundation/EmergencyResponsePlanningGuidelines/Documents/2015%20ERPG%20Levels.pdf> (accessed 10/2015).

Acute exposure guideline levels (AEGs) (see note)

	Concentration (mg/m ³)				
	10 min	30 min	60 min	4 hours	8 hours
AEG-1*	NR	NR	NR	NR	NR
AEG-2 [†]	3.1	2.1	1.7	0.67	0.33
AEG-3 [‡]	16	11	8.9	2.2	2.2

Note Values relate to mercury vapour

* Level of the chemical in air at or above which the general population could experience notable discomfort

[†] Level of the chemical in air at or above which there may be irreversible or other serious long-lasting effects or impaired ability to escape

[‡] Level of the chemical in air at or above which the general population could experience life-threatening health effects or death

NR Not recommended due to insufficient data

Reference
US Environmental Protection Agency. Acute Exposure Guideline Levels. <http://www.epa.gov/oppt/aegl/pubs/chemlist.htm> (accessed 12/2015).

Exposure Standards, Guidelines or Regulations

Occupational standards (see note)

	LTEL (8-hour reference period)		STEL (15-min reference period)	
	ppm	mg/m ³	ppm	mg/m ³
WEL	–	0.2	–	–
<p>Note Values relate to mercury and divalent inorganic compounds including mercuric oxide and mercuric chloride (measured as mercury)</p> <p>WEL – workplace exposure limit, LTEL – long-term exposure limit, STEL – short-term exposure limit</p> <p>Reference Health and Safety Executive (HSE). EH40/2005 Workplace Exposure Limits, 2nd Edition, 2011.</p>				

Public health guidelines

Drinking water standard WHO guideline for drinking-water quality	1 µg/L 6 µg/L (inorganic mercury)
Air quality guideline	1 µg/m ³ annual average
Soil guideline values and health criteria values	Residential Elemental mercury – 1 mg/kg dry weight soil Inorganic mercury – 170 mg/kg dry weight soil
	Allotments Elemental mercury – 26 mg/kg dry weight soil Inorganic mercury – 80 mg/kg dry weight soil
	Commercial Elemental mercury – 26 mg/kg dry weight soil Inorganic mercury – 3,600 mg/kg dry weight soil
	Tolerable daily intake_{oral} Elemental mercury – not derived Inorganic mercury – 2 µg/kg bw/day
	Mean daily intake_{oral} Elemental mercury – negligible Inorganic mercury – 1 µg/day
	Tolerable daily intake_{inhalation} Elemental mercury – 0.06 µg/kg bw/day Inorganic mercury – 0.06 µg/kg bw/day
	Mean daily intake_{inhalation} Elemental mercury – 0.05 µg/day
References EA. Contaminants in soil: updated collation of toxicological data and intake values for humans. Mercury. Science Report SC050021. 2009. Environment Agency: Bristol. EA. Soil Guideline values for mercury in soil. Science Report SC050021/Mercury SGV.2009. Environment Agency: Bristol. The Private Water Supplies Regulations 2009 and the Private Water Supplies Regulations (Wales) 2010. The Water Supply (Water Quality) Regulations 2000 (England) and the Water Supply (Water Quality) Regulations 2001 (Wales). WHO. Guidelines for Drinking-water Quality, 4 th Edition, 2011. World Health Organization: Geneva. WHO Regional Office for Europe. Air Quality Guidelines for Europe, European Series, No. 91, 2 nd Edition, 2000. World Health Organization: Copenhagen).	

Health Effects

Major routes of exposure

- inhalation is the predominant route of exposure to metallic mercury
- ingestion is the main route of exposure for inorganic mercury compounds; divalent mercuric (Hg^{2+}) salts are substantially more corrosive than monovalent mercurous (Hg^+) salts to the gastrointestinal tract

Immediate signs or symptoms of acute exposure

Elemental mercury

Route	Signs and symptoms
Inhalation	<p>Elemental mercury is volatile, particularly when the ambient temperature is high, and is absorbed rapidly. Patients may develop flu-like symptoms with myalgia and fever. Nausea and vomiting may also occur</p> <p>Acute inhalation of mercury vapour causes cough, breathlessness, mild hypoxaemia and non-specific chest pain within a few hours of exposure. Erosive bronchitis and bronchiolitis have been observed. Diffuse infiltrates consistent with pulmonary oedema may be found on chest X-ray. Acute respiratory distress syndrome has been reported</p> <p>Metallic taste, gingival erythema, oropharyngeal pain, hypersalivation, gingivostomatitis and hepatic dysfunction can occur</p> <p>Fatigue, agitation, headaches, tremor, ataxia, paraesthesiae and peripheral neuropathy have also been reported</p> <p>Proteinuria and renal failure secondary to acute tubular necrosis, nephrotic syndrome and hyperchloraemia may occur. Thrombocytopenia, leucocytosis and neutrophilia have been reported</p> <p>Personality changes, memory loss and hallucinations may also occur in acute mercury vapour poisoning</p>
Ingestion	<p>Ingestion of small amounts of elemental mercury is unlikely to cause features. If large amounts of elemental mercury are ingested, patients may develop nausea, vomiting and abdominal pain</p> <p>Aspiration of mercury is likely during substantial ingestion. Features similar to those seen following inhalation of mercury vapour may follow</p> <p>Sequestration of ingested mercury in the appendix has caused appendicitis</p>
Dermal	<p>Discoid eczema, hyperhidrosis, skin erythema and pruritis can develop following dermal exposure to elemental mercury</p>
Ocular	<p>Exposure to mercury vapour may lead to conjunctivitis and ocular irritation. The eyes may develop grey or brown lens discolouration. Blurred vision, photophobia and reduction of the visual field are also possible. Reduction in colour and depth of vision may also occur</p>
<p>References</p> <p>TOXBASE. Mercury (metallic), 06/2014. http://www.toxbase.org (accessed 01/2016).</p> <p>TOXBASE. Mercury metallic – features and management, 06/2014. http://www.toxbase.org (accessed 01/2016).</p>	

Inorganic mercury compounds

Route	Signs and symptoms
Inhalation	Inhalational exposures are unusual. However, occupational dermal and inhalational exposure have led to systemic toxicity, particularly the nephrotic syndrome
Ingestion	<p>Mercuric salts Features following ingestion include burning of the mouth and throat, abdominal pain, nausea, vomiting, haematemesis and (sometimes bloody) diarrhoea. Dehydration, acute colitis, intestinal mucosal necrosis, circulatory collapse, coma and death may ensue</p> <p>Other features described in acute poisoning include ECG changes (atrial fibrillation, broadening of the QRS complex), transient pancytopenia and increased transaminase, amylase and creatine kinase activities, although these are likely, at least in part, to be secondary to the metabolic disturbances present rather than direct inorganic mercury toxicity</p> <p>Patients surviving the acute gastrointestinal/renal phase of mercuric mercury poisoning may go on to develop renal glomerular and neurological damage; see <i>systemic toxicity</i></p> <p>Mercurous salts Mercurous chloride (calomel) causes “pink disease” (acrodynia) which is a hypersensitivity reaction characterised by fever, irritability, photophobia, an erythematous desquamating rash, hyperkeratosis of the palms and soles, and lymphadenopathy</p> <p>Systemic features of mercury poisoning may occur following acute exposure</p>
Dermal	Inorganic mercuric compounds, notably “cinnabar” (mercuric sulphide) used as a red dye in tattoos, have caused contact dermatitis and granulomatous reactions. Skin lightening creams and soaps containing mercurous chloride or mercuric chloride cause systemic mercury toxicity, particularly after repeated exposures
Ocular	May cause pain, blepharospasm, lacrimation, conjunctivitis, palpebral oedema and photophobia
Systemic	<p>Systemically absorbed mercuric ions cause acute tubular necrosis (exacerbated after mercuric salt ingestion by hypovolaemic shock). Substantial or repeated exposure may result in glomerular damage, nephrotic syndrome with proteinuria and oedema, and type IV hypersensitivity granulomatous interstitial nephritis</p> <p>Neurological features including weakness, irritability, weight loss (or failure to thrive in young children), hypersalivation, tremor and paraesthesiae</p>
References	
TOXBASE. Mercury inorganic – features and management, 06/2014. http://www.toxbase.org (accessed 01/2016).	
TOXBASE. Chemicals splashed or sprayed into the eyes, 02/2014. http://www.toxbase.org (accessed 01/2016).	

Decontamination at the Scene

Summary

The approach used for decontamination at the scene will depend upon the incident, location of the casualties and the chemicals involved. Therefore, a risk assessment should be conducted to decide on the most appropriate method of decontamination.

Mercuric chloride is a corrosive substance. Therefore, following disrobe, improvised wet decontamination should be considered. For elemental mercury and other inorganic mercury compounds, following disrobe improvised dry decontamination should be considered, **unless casualties are demonstrating signs or symptoms of exposure to caustic or corrosive substances** (see below for further information).

Emergency services and public health professionals can obtain further advice from Public Health England (Centre for Radiation, Chemical and Environmental Hazards) using the 24-hour chemical hotline number: 0344 892 0555.

Disrobe

The disrobe process is highly effective at reducing exposure to HAZMAT/CBRN material when performed within 15 minutes of exposure.

Therefore, disrobe must be considered the primary action following evacuation from a contaminated area.

Where possible, disrobe at the scene should be conducted by the casualty themselves and should be systematic to avoid transferring any contamination from clothing to the skin. Consideration should be given to ensuring the welfare and dignity of casualties as far as possible.

Improvised decontamination

Improvised decontamination is an immediate method of decontamination prior to the use of specialised resources. This should be performed on all contaminated casualties, unless medical advice is received to the contrary. Improvised dry decontamination should be considered for an incident involving chemicals **unless the agent appears to be corrosive or caustic**.

Improvised dry decontamination

- any available dry absorbent material can be used, such as kitchen towel, paper tissues (eg blue roll) and clean cloth
- exposed skin surfaces should be blotted and rubbed, starting with the face, head and neck and moving down and away from the body
- rubbing and blotting should not be too aggressive, or it could drive contamination further into the skin

- all waste material arising from decontamination should be left in situ, and ideally bagged, for disposal at a later stage

Improvised wet decontamination

- water should only be used for decontamination where casualty signs and symptoms are consistent with exposure to caustic or corrosive substances such as acids or alkalis
- wet decontamination may be performed using any available source of water such as taps, showers, fixed installation hose-reels and sprinklers
- when using water, it is important to try and limit the duration of decontamination to between 45 and 90 seconds and, ideally, to use a washing aid such as cloth or sponge
- improvised decontamination should not involve overly aggressive methods to remove contamination as this could drive the contamination further into the skin
- where appropriate, seek professional advice on how to dispose of contaminated water and prevent run-off going into the water system

Additional notes

- following improvised decontamination, remain cautious and observe for signs and symptoms in the decontaminated person and in unprotected staff
- if water is used to decontaminate casualties this may be contaminated, and therefore hazardous, and a potential source of further contamination spread
- all materials (paper tissues etc) used in this process may also be contaminated and, where possible, should not be used on new casualties
- the risk from hypothermia should be considered when disrobe and any form of wet decontamination is carried out
- people who are contaminated should not eat, drink or smoke before or during the decontamination process and should avoid touching their face
- consideration should be given to ensuring the welfare and dignity of casualties as far as possible. Immediately after decontamination the opportunity should be provided to dry and dress in clean robes/clothes.
- people who are processed through improvised decontamination should subsequently be moved to a safe location, triaged and subject to health and scientific advice. Based on the outcome of the assessment, they may require further decontamination

Interim wet decontamination

Interim decontamination is the use of standard fire and rescue service (FRS) equipment to provide a planned and structured decontamination process prior to the availability of purpose-designed decontamination equipment.

Decontamination at the scene references

National Ambulance Resilience Unit. Joint Emergency Services Interoperability Programme (JESIP). Initial operational response to a CBRN incident. Version 1.0, September 2013.

NHS England. Emergency Preparedness, Resilience and Response (EPRR). Chemical incidents: planning for the management of self-presenting patients in healthcare settings. April 2015.

Clinical Decontamination and First Aid

Clinical decontamination is the process where trained healthcare professionals using purpose-designed decontamination equipment treat contaminated people individually.

Detailed information on clinical management can be found on TOXBASE – www.toxbase.org.

Important note

- if the patient has not been decontaminated following surface contamination, secondary carers must wear appropriate NHS PPE for chemical exposure to avoid contaminating themselves; the area should be well ventilated

Clinical decontamination following surface contamination

- carry out decontamination after resuscitation
- this should be performed in a well-ventilated area, preferably with its own ventilation system
- contaminated clothing should be removed, double-bagged, sealed and stored safely
- decontaminate open wounds first and avoid contamination of unexposed skin
- any particulate matter adherent to skin should be removed and the patient washed with copious amounts of water under low pressure for at least 10–15 minutes. **The earlier irrigation begins, the greater the benefit**
- pay special attention to mucous membranes, moist areas such as skin folds, fingernails and ears

Elemental mercury

Dermal exposure

- decontaminate (as above) the patient following surface contamination
- patients with major skin exposure may have inhaled a significant amount of vapour; in this case manage as for inhalation
- other measures as indicated by the patient's clinical condition

Ocular exposure

- remove contact lenses if present
- anaesthetise the eye with a topical local anaesthetic (eg oxybuprocaine, amethocaine or similar); **however, do not delay irrigation if local anaesthetic is not immediately available**

- immediately irrigate the affected eye thoroughly with 1,000 mL 0.9% saline (eg by an infusion bag with a giving set). A Morgan Lens may be used if anaesthetic has been given. Irrigate for 10–15 minutes irrespective of initial conjunctival pH. Aim for a final conjunctival pH of 7.5–8.0. The conjunctivae may be tested with indicator paper. Retest 20 minutes after irrigation and use further irrigation if necessary
- repeated instillation of local anaesthetics may reduce discomfort and help more thorough decontamination; however, prolonged use of concentrated local anaesthetics is damaging to the cornea
- patients with corneal damage, those who have been exposed to strong acids or alkalis and those whose symptoms do not resolve rapidly should be referred **urgently** to an ophthalmologist
- other supportive measures as indicated by the patient's clinical condition

Inhalation

- maintain a clear airway and ensure adequate ventilation
- give supplemental oxygen
- monitor oxygen saturation, blood pressure, pulse, body temperature, respiratory rate and conscious level
- other supportive measures as indicated by the patient's clinical condition

Ingestion

- clinical management is unlikely to be required
- in cases of aspiration treat aspiration pneumonia conventionally
- other supportive measures as indicated by the patient's clinical condition

Inorganic mercury compounds

Dermal exposure

- decontaminate (as above) the patient following surface contamination
- monitor blood pressure, pulse and oxygen saturation
- assess for systemic toxicity, particularly renal and neurological features
- other measures as indicated by the patient's clinical condition

Ocular exposure

- remove contact lenses if present
- anaesthetise the eye with a topical local anaesthetic (eg oxybuprocaine, amethocaine or similar); **however, do not delay irrigation if local anaesthetic is not immediately available**

- immediately irrigate the affected eye thoroughly with 1,000 mL 0.9% saline (eg by an infusion bag with a giving set). A Morgan Lens may be used if anaesthetic has been given. Irrigate for 10–15 minutes irrespective of initial conjunctival pH. Aim for a final conjunctival pH of 7.5–8.0. The conjunctivae may be tested with indicator paper. Retest 20 minutes after irrigation and use further irrigation if necessary
- repeated instillation of local anaesthetics may reduce discomfort and help more thorough decontamination; however, prolonged use of concentrated local anaesthetics is damaging to the cornea
- patients with corneal damage, those who have been exposed to strong acids or alkalis and those whose symptoms do not resolve rapidly should be referred **urgently** to an ophthalmologist
- other supportive measures as indicated by the patient's clinical condition

Inhalation

- ensure a clear airway and adequate ventilation
- monitor blood pressure, pulse and oxygen saturation
- assess for systemic toxicity, particularly renal and neurological features
- other measures as indicated by the patient's clinical condition

Ingestion

- **maintain airway and establish haemodynamic stability**
- in severely affected patients critical care input is essential. Urgent assessment of the airway is required. A supraglottic-epiglottic burn with erythema and oedema is usually a sign that further oedema will occur that may lead to airway obstruction
- do **not** attempt gastric lavage
- monitor blood pressure, pulse, and oxygen saturation
- other supportive measures as indicated by the patient's clinical condition

Clinical decontamination and first aid references

TOXBASE	http://www.toxbase.org (accessed 01/2016)
TOXBASE	Mercury inorganic – features and management, 06/2014
TOXBASE	Mercury (metallic), 06/2014
TOXBASE	Mercury metallic – features and management, 06/2014
TOXBASE	Chemicals splashed or sprayed into the eyes, 02/2014

This document from the PHE Centre for Radiation, Chemical and Environmental Hazards reflects understanding and evaluation of the current scientific evidence as presented and referenced here.

First published: June 2016

For queries relating to this document, please contact generaltox@phe.gov.uk

© Crown copyright 2016, www.gov.uk/phe

Re-use of Crown copyright material (excluding logos) is allowed under the terms of the Open Government Licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ for terms and conditions.