



UK Health  
Security  
Agency

# Key concepts of chemical and environmental public health hazards in the home

# Chemical And Environmental Hazards

- You've covered Indoor air quality
- This talk will look at Chemical and Environmental Hazards associated with:
  - Building fabric
  - Gardens
  - External influences

# What is a Hazard?

- **Harm:** a **measurable adverse effect** on a receptor (people/environment)
- **Hazard:** a property/source or situation that in a particular circumstance **could lead to harm or pollution**
- **Risk:** **the likelihood or probability of an occurrence**, of a defined hazard and the magnitude (or seriousness) of the **consequences** of that occurrence.
- So if have a hazard (source) need a likelihood (pathway)



# Building Fabric

## Hazards in the home

- Lead paint, pipework
- Asbestos lagging, plaster, floor tiles
- Dust tracked back in, if the garden is contaminated
- Cladding
- Radon (houses built with local stone)

But, none pose a risk unless there is access to them.

# Building Fabric - Lead

White gloss – window sills, door frames, doors, bannisters

Badly ventilated or insulated property

- Damp can cause paint to flake to uncover lead paint
- Child with pica
  
- Well insulated property
- DIY
- Child with pica

# Building Fabric - Lead

## Regulations & Guidelines:

***The Environmental Protection (Controls on Injurious Substances) Regulations 1992*** - paint for domestic use less than 0.01% lead

*BSI Specification for permissible limits of lead in low-lead paints and similar materials. BS4310 1974 withdrawn 1997, recommended that <10000ppm lead or 1% (10 g/kg) of lead in the dry film was permissible, although higher lead concentration paint could be sold*

*BSI. Specification for permissible limit of lead in low-lead paints and similar materials BS 4310:1968 1.5% is “low-lead paint” labelled as “**do not apply to surfaces that may be chewed by children**”*

Lead paint highest levels 1930's to 50's, (20-50%)- but certainly in Victorian properties

Regularly see paint tested in houses over 1000mg/kg

Lead gives paint a sweet taste.

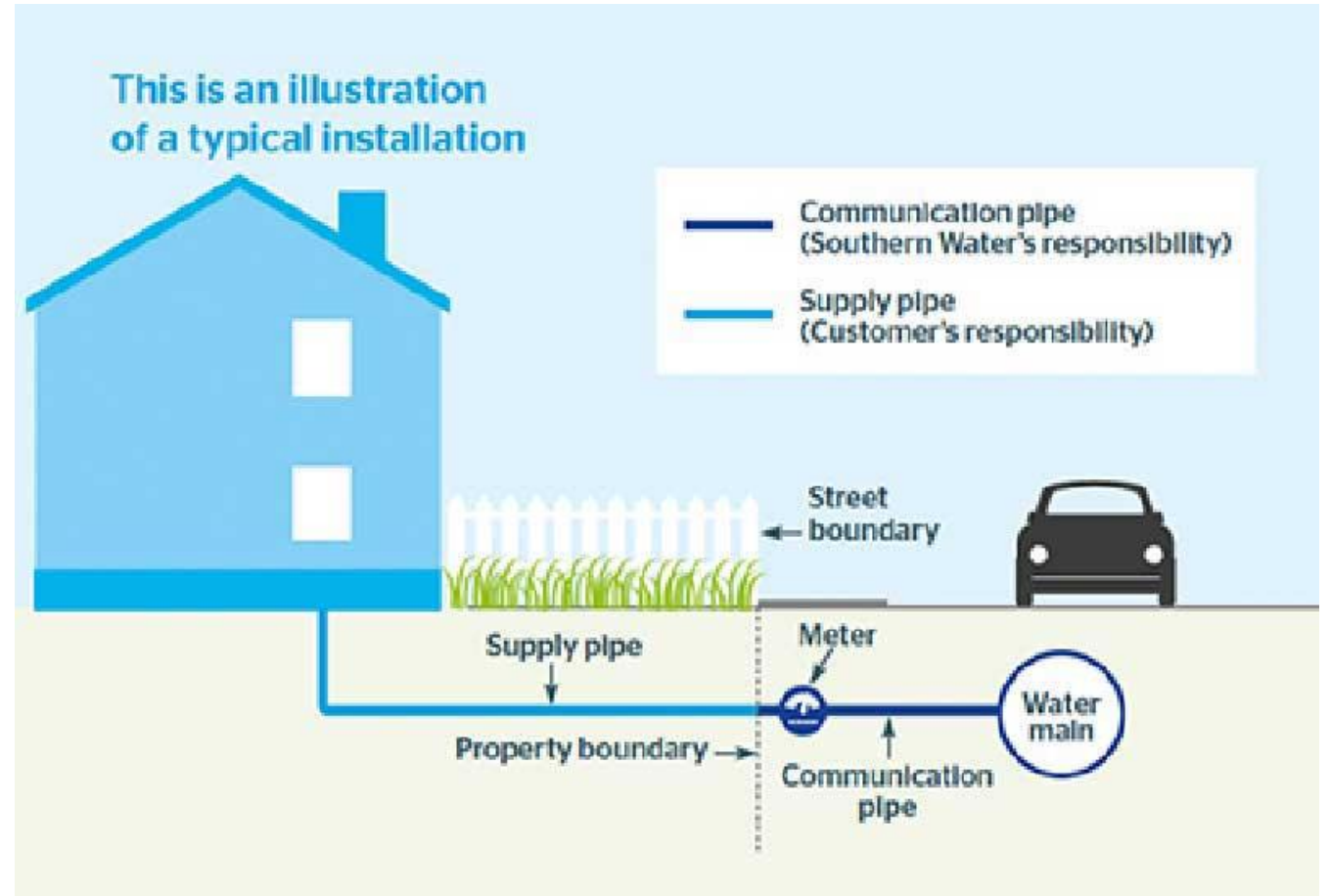
# Building Fabric – Lead

Lead water pipework

Pre 1970's property

Post 1970's non-compliance to  
'The Water Supply (Water Fittings)  
Regulations 1999' (lead solder or  
brass fittings)

Still have lead communication pipes  
in roads belonging to water co.



# Building Fabric – Lead

Lead water pipework – Lead water standard 10µg/l.

If you need to use lead pipes, don't drink the water that has been standing in the pipes overnight or all day whilst at work, especially if soft water

run the **kitchen** tap for about one minute

(longer if your cold kitchen tap is more than 50 metres from the water mains - run your tap an extra 15 seconds for every extra 10 metres to the water main.)

Running the tap can include flushing toilet, taking a shower

Kitchen tap as closest tap to mains water

Climate change issues with pipes warming



# Building Fabric - Asbestos

- White/Chrysotile banned in the UK since 1999
- Blue/brown (the amphibole type – crocidolite/amosite) banned since 1985
- Asbestos may be present in any house or building built before the year 2000
- HSE does not recommend the DIY removal of asbestos without advice.
- Slightly damaged asbestos-containing materials (ACMs) can sometimes be repaired by sealing or enclosing them.
- Generally safe if not degraded, best to leave it alone/cover it
- Household with building in poor repair most at risk
- Keen DIY enthusiast
- Airborne fibres the risk

# Building Fabric – Asbestos (from HSE)

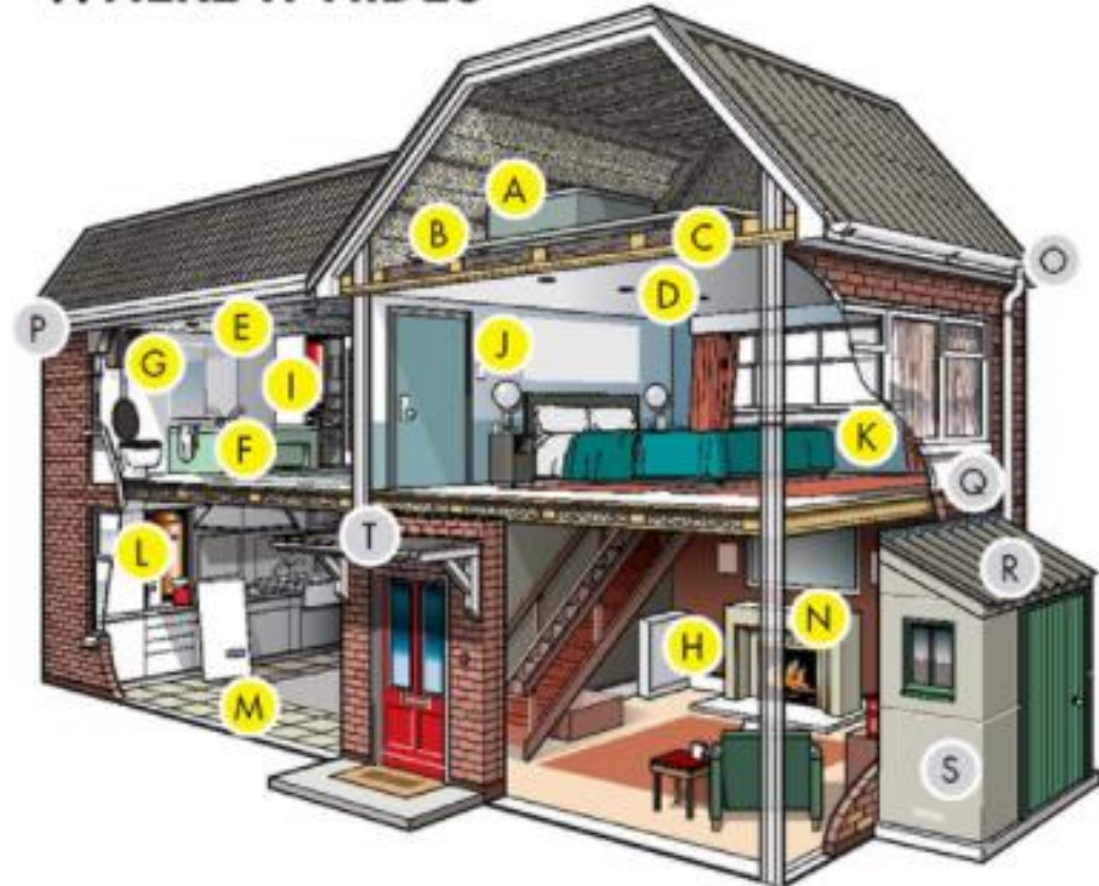
## Inside

- A. [Asbestos cement](#) Water tank
- B. Pipe [lagging](#)
- C. [Loose fill](#) insulation
- D. [Textured decorative coating](#) eg artex
- E. [AIB](#) ceiling tiles
- F. [AIB](#) bath panel
- G. [Toilet seat and cistern](#)
- H. [AIB](#) behind fuse box
- I. [AIB](#) airing cupboard and/or [sprayed insulation](#) coating boiler
- J. [AIB](#) partition wall
- K. [AIB](#) interior window panel
- L. [AIB](#) around boiler
- M. [Vinyl floor tiles](#)
- N. [AIB](#) behind fire

## Outside

- O. Gutters and [Asbestos cement](#) downpipes
- P. Soffits – [AIB](#) or [asbestos cement](#)
- Q. [AIB](#) exterior window panel
- R. [Asbestos cement](#) roof
- S. [Asbestos cement](#) panels
- T. [Roofing felt](#)

## ASBESTOS WHERE IT HIDES



# Accidents in the Home

Accidental ingestion –

- **cleaning products**,
- **Plants** such as yew, aconitum, foxglove, daffodil bulbs, etc

Accidental ingestion or inhalation -

- **spillage or mixing of cleaning products** (producing gas –  $H_2S$ ,  $Cl$ )
- Children at risk from accidental ingestion – bright cleaning products low down
- Migrants from ingestion of misidentified plants
- Adults cleaning toilets, floors – more is not better!

# Accidents in the Home – specific chemicals

## **Mercury:**

- Inhalation risk mainly
- Broken thermometers, barometers, etc
- Volatilises in warmth – ventilate room, turn off heating, shut door to rest of house. Ventilate if possible for 24hrs after removing source
- Pick up droplets using sticky tape/card, then double bag. Dispose of soft furnishings unless can “cut out” affected area.

## **Radium:**

- Luminescent dials, watches - found in sheds, garages, below beds
- Modern equipment (post 1970s) uses tritium (H-3) as the radioactive material. Previously, promethium-147 (Pm-147) in the 1950s and 1960s (half life 2.6 years)
- radium-226 (Ra-226) pre-war to the 1950s. Half life 1600 years, primarily emits alpha particles
- Needs disposal – talk to Radiation Protection Advisor

# Accidents in the Home – specific chemicals

## Carbon monoxide

- Cant see it, smell it or taste it
- Inhalation - headache, dizziness, confusion, disorientation, memory loss, fainting, coma and death
- Incomplete burning of carbon-based fuels (gas, oil, wood, coal and petrol).
  
- Poorly insulated, cold and damp homes that need extra heating
- Badly ventilated properties with open fires
- Faulty heating appliances (boilers, gas fires, etc)
- Portable generators used indoors after floods
- BBQs and camp stoves used inside homes or in tents, caravans or boats
- No Carbon monoxide detector
  
- The Smoke and Carbon Monoxide Alarm (England) Regulations 2015
  
- Private sector landlords are required to have at least one smoke alarm installed on every storey of their properties and a CO alarm in rooms containing a solid fuel burning appliance (eg a coal fire, wood burning stove). The landlord must make sure the alarms are in working order at the start of each new tenancy.

# Water Supplies

- **Private supplies** – talk in their own right!
- Badly protected sources (coliforms), insufficient treatment, mineralised bedrock (e.g. lead, arsenic, etc)
- **Public Water Supplies**
- Lead pipework
- Fluoridation - 12% of 3 yr olds have caries in their primary teeth and 25% of 5 yr olds, increasing to 50% in the worst affected LA areas – strongly linked to deprivation. Approx 5.8 million people in England, (27 councils), receive fluoridated water (1mg/l)
- **Distribution problems in large building** – block of flats, hospitals
- Large tanks, stagnant pipes (rare use taps)
- Legionella, lead.

# Outside - yard or garden

- **Soil contamination** – past land use, by busy road.
- Keep soil covered – decking/grass/concrete, prevent tracked back, prevent ingestion/inhal
- **External property coverings** - Red lead paint still used on metal pipe, old paint on wood
- Can be fenced off, replaced – ingestion risk for children/pica children
- **Nearby busy road** – AQ inhalation risk, noise (stressor), yellow paint (lead) if pica child, brake and tyre wear dust inhalation.
- **Ground gas** via permeable ground, service runs - from landfills, coal mines or bedrock (radon)
- **Nearby industrial/landfill land uses** – visible dust, odour, noise, vermin, gasses (H<sub>2</sub>S)
- **Extreme Events** - heat/cold/radiation/flooding/high winds – more a problem for poorly maintained, poorly built, poorly insulated and poorly ventilated properties.
- **Lack of Greenspace**/derelict land/poorly maintained properties – mental health issues

# Vulnerable Groups

**Many hazards from environmental and chemical hazards are not a risk.**

Knowledge, clear instructions, ability to access funds, all prevent risk.

- Children/adults with learning disabilities, pica, not easy to supervise 24/7
- Children and adults who cannot read/understand warnings
- Adults without the capability or means to manage the hazard - unhealthy and unsuitable homes.



# In Conclusion

The presence of 'a chemical' in the environment does not always lead to exposure.

In order for it to cause any adverse health effects, you must come into contact with it. You may be exposed by breathing or ingesting it, or by skin contact with it.

Following exposure to any chemical, the adverse health effects by which you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

[Chemical hazards compendium - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/362822/Chemical_hazards_compendium_-_GOV.UK_(www.gov.uk).pdf)  
<https://www.toxbase.org/upload/Public%20Content/NPIS%20Low%20Toxicity%20Substances.pdf>

## If ingested:

These substances are considered to be of low toxicity when ingested acutely. They may cause oral irritation and mild gastrointestinal upset but other features are unlikely to present

## What to do:

A small glass of water (or milk or juice) may be given if there is mild gastrointestinal upset

*If considerable quantities are ingested or persisting or worrying symptoms are present medical professionals should consult TOXBASE® ([www.toxbase.org](http://www.toxbase.org)) or contact the NPIS*

### In the Garden

Animal urine/faeces  
Bird faeces  
Compost  
Dog and cat faeces (less than 10 days old)  
Earth/Soil  
Grass  
Peat  
Slugs, snails and worms  
Small dead insects or spiders

### Craft Items

Ball point pen ink  
Blu Tack® and similar preparations\*\*  
Chalk  
Children's paints  
(including face, finger, powder and poster)  
Crayons (wax)  
Crepe paper  
Felt tip pen ink  
Gel pen ink  
Glue (water based or PVA and stick such as Prit stick®)  
Glitter  
Pencil lead (graphite)  
Plasticine® (not Play Doh®) \*\*  
Putty\*\*

-Substances marked \*\* could pose an obstruction risk.

### Pharmaceuticals

Antacids (e.g. Rennie®)  
Aqueous cream  
Calamine lotion  
Cough sweets/lozenges  
Evening primrose oil  
Folic acid  
Guaifenesin-only cough preparations  
Hormone replacement therapy (HRT)  
Homeopathic preparations (*not* herbal remedies)  
Hydrocortisone cream  
K-Y Jelly®  
Nappy rash cream (e.g. Bepanthen®) #  
Oral contraceptive pill  
Omega 3 fish oils  
Prednisolone  
Pyridoxine  
Sudocrem®#  
Thiamine  
Vitamins B, C and E  
Witch hazel  
Zinc oxide cream

-Substances with # may post a small aspiration risk.

### Cleaning Products

Air freshener, non-aerosol  
(*not* reed diffusers and electrical plug-ins)  
Cleaning wipes (such as floor or surface wipes)\*\*  
Household liquid carpet cleaner\*  
Washing up liquid\*  
(*not* dishwasher products)

-Substances marked \* may produce foam if ingested in large amounts. There is a small risk of aspiration into the lungs if vomiting occurs.  
-Substances marked \*\* could pose an obstruction risk.

### Miscellaneous

Artificial sweeteners  
Bubble liquid\*  
Candles  
Cat litter\*\*  
Chewing gum (nicotine-free)  
Coal and artificial coal\*\*  
Foil  
Food packaging/sweet wrappers  
Human urine/faeces  
Ice packs for cooling food or drink (*not* sports injuries)  
Indoor emulsion paint  
Luminous glowsticks/necklaces  
Matches  
Mouldy, out-of-date or raw food  
Nappies or incontinence pads\*\*  
Newspaper  
Polystyrene\*\*  
Sand incl Kinetic or Magic sand\*\*  
Silver paper/foil  
Silica gel (desiccant sachet)  
Teething rings  
Tinsel  
Wallpaper paste

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### Animal or Plant food

Bird seed  
Cat and dog food  
Cut flower food  
Fish food  
Animal/Dog chocolate drops

### Plants

African violet (*Saintpaulia ionantha*)  
Cacti  
Carnation (*Dianthus*)  
Christmas cactus (*Schlumbergera bridgesii*)  
Cyclamen  
Dandelion (*Taraxacum officinale*)  
Daisy (*Bellis perennis*)  
Fuchsia  
Geranium (*Pelargonium species*)  
Hawthorn (*Crataegus monogyna*)  
Honeysuckle (*Lonicera species*)  
Jasmine  
Marigold (*Calendula officinalis*)  
Nasturtium (*Tropaeolum majus*)  
Pansy (*Viola tricolor*)  
Petunia  
Primrose (*Primula vulgaris*)  
Rose (*Rosa species*)  
Rowan (*Sorbus aucuparia*)  
Snapdragon (*Antirrhinum majus*)  
Spider plant (*Chlorophytum comosum*)  
Star Gazer Lily (*Lilium speciosum*)  
Yucca  
Violet (*Viola tricolor*)

### Cosmetics and Toiletries

Aftersun lotions and creams  
Aloe Vera  
Baby wipes \*\*  
Bubble bath\*  
Deodorant, non-aerosol  
Face masks  
Hair conditioner/shampoo\* (*not* insecticidal or medicated)  
Liquid soap\*  
Moisturiser/hand cream/body lotion  
Shaving foam  
Shower gel\*  
Solid cosmetics  
(e.g. lipstick, ChapStick®, eye shadow, foundation)  
Solid (Toilet) soap\*  
-Substances marked \* may produce foam if ingested in large amounts. There is a small risk of aspiration into the lungs if vomiting occurs.  
-Substances marked \*\* could pose an obstruction risk.

The information provided is designed solely for use by healthcare professionals and limited to being an additional support for medical decisions. Reliance upon any information is entirely at the persons own risk.

For medical advice members of the public should contact: NHS 111 in England & NHS 24 in Scotland (Tel 111); NHS Direct in Wales: (Tel 0845 4647). ROI; for advice on accidental poisoning (01) 809 2166

In an emergency, if the patient has collapsed or is not breathing properly call 999 immediately.

# Any Questions?

- Thank you for listening