

## Summary Table of CBW agents of concern

<b>Anthrax</b>			
<ul style="list-style-type: none"> <li>• Bacteria with negligible man to man transmission (only skin form).</li> <li>• Three clinical forms of disease: cutaneous, gastrointestinal and inhalation (generally associated with deliberate release). Incubation period 1-7 days.</li> <li>• Lethality high without treatment</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
<ul style="list-style-type: none"> <li>• Human vaccine exists, but not readily available.</li> <li>• Antibiotic therapy can also be used for prevention of asymptomatic persons.</li> </ul>	<ul style="list-style-type: none"> <li>• Human vaccine used on high risk groups/occupationally exposed only.</li> <li>• Prolonged antibiotic prophylaxis (up to 60 days) is needed for exposed. Patients may not complete a course of treatment due to length of therapy and perceived risk from side-effects.</li> <li>• Stockpiling and efficient emergency distribution mechanism are needed to ensure rapid start of prophylaxis.</li> </ul>	<ul style="list-style-type: none"> <li>• Numerous antibiotics available for the treatment e.g. penicillin, doxycycline, ciprofloxacin.</li> </ul>	<ul style="list-style-type: none"> <li>• Prolonged antibiotic treatment (up to 60 days) is needed. Patients may not complete a course of treatment due to length of therapy and perceived risk from side-effects.</li> <li>• Stockpiling and efficient emergency distribution mechanisms are needed to ensure rapid start of treatment.</li> </ul>
<b>Smallpox</b>			
<ul style="list-style-type: none"> <li>• Virus, communicable person-to-person.</li> <li>• Average 12-14 day incubation period.</li> <li>• Acute-onset fever of 38°C (101°F) or more followed by a rash characterized by vesicles or firm pustules all in the same stage of development</li> <li>• Case fatality rate averaged 30%</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
<ul style="list-style-type: none"> <li>• Vaccine (live virus) available and licensed, though limited supply</li> <li>• Single dose provides immunity for an estimated 10 years</li> <li>• Vaccine has high incidence of serious and fatal side effects</li> </ul>	<ul style="list-style-type: none"> <li>• Smallpox was declared eradicated in 1980</li> <li>• In absence of confirmed case, mass vaccination is not recommended</li> <li>• Vaccine given up to 4 days after exposure prevents mortality</li> </ul>	<ul style="list-style-type: none"> <li>• No effective treatment other than the management of symptoms</li> <li>• Patients should be isolated</li> <li>• Contact tracing and targeted ("ring") vaccination was key to eradication</li> </ul>	<ul style="list-style-type: none"> <li>• Number of compounds under investigation as chemotherapeutic agents, e.g. cidofovir has produced promising results in laboratory studies</li> <li>• No experience treating smallpox cases with recent advances in medicine</li> </ul>

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<b>Botulinum</b>			
<ul style="list-style-type: none"> <li>• Neurotoxin produced by <i>Clostridium botulinum</i>.</li> <li>• Extremely toxic.</li> <li>• Route of absorption usually by ingestion of contaminated food or drink, but may be aerosolised form.</li> <li>• Time to onset of toxic effects may be 2 hours to 8 days.</li> <li>• Causes descending paralysis, starting with cranial nerves: dry mouth, blurred and double vision, slurred speech, difficulty swallowing, weakness of neck and arms, respiratory failure, death.</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
<ul style="list-style-type: none"> <li>• Vaccine exists, but not readily available.</li> <li>• In an area where toxin has been aerosolised full personal protective equipment should be worn.</li> <li>• Following exposure to aerosol, contaminated clothing and shoes and personal effects must be removed and victims washed with soap and water.</li> <li>• Chemically contaminated casualties should be decontaminated before entering a medical facility to protect staff and other patients. Separate 'dirty' and 'clean' zones should be maintained to prevent cross-contamination.</li> <li>• Care should be taken when handling body fluids of victims because of potency of botulinum toxin.</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccine available to specialised and military personnel,</li> <li>• Decontamination needs to be undertaken quickly to be effective.</li> <li>• Minimum decontamination facilities: plentiful supply of water, buckets, sponges and soap. Purpose-made decontamination tents very expensive and in limited supply.</li> <li>• If possible contaminated wash-off water should be prevented from entering water courses or sewage systems</li> <li>• Secure storage e.g. bins or strong see-through bags required for contaminated clothes, shoes and personal effects prior to their cleansing or disposal, to prevent secondary contamination.</li> </ul>	<ul style="list-style-type: none"> <li>• Trivalent equine antitoxin available (risk of anaphylaxis)</li> <li>• Victims may require intensive supportive care, including prolonged ventilatory support.</li> </ul>	<ul style="list-style-type: none"> <li>• Usefulness of antitoxin is time-limited.</li> <li>• Supplies of antitoxin are limited.</li> <li>• Focus should be on providing ventilatory support and intensive care.</li> </ul>

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<b>Mustard gas</b>			
<ul style="list-style-type: none"> <li>• Vesicant and alkylating agent.</li> <li>• Absorbed by inhalation and through skin.</li> <li>• Time to onset of toxic effects may be hours to days.</li> <li>• Severe injury to eyes and skin, often after asymptomatic latent period.</li> <li>• Injury to respiratory tract: coughing, tight chest, chemical pneumonitis, bronchopneumonia.</li> <li>• Systemic effects: nausea, vomiting, convulsions, bone-marrow depression.</li> <li>• Long term sequelae possible: late-onset blindness, chronic bronchitis, pulmonary fibrosis and carcinoma of the lung.</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
<ul style="list-style-type: none"> <li>• Early decontamination of eyes and skin is critical, even if no symptoms.</li> <li>• Contaminated clothing, shoes and personal effects must be removed and securely stored.</li> <li>• Chemically contaminated casualties should be decontaminated before entering a medical facility to protect staff and other patients. Separate 'dirty' and 'clean' zones should be maintained to prevent cross-contamination.</li> <li>• If entering a contaminated area full personal protection equipment required, including active carbon containing protective clothing and full-face-piece respirator.</li> </ul>	<ul style="list-style-type: none"> <li>• Penetrates ordinary clothing.</li> <li>• Decontamination needs to be undertaken quickly to be effective.</li> <li>• Minimum decontamination facilities: plentiful supply of water, buckets, sponges and soap. Purpose-made decontamination tents very expensive and in limited supply.</li> <li>• If possible contaminated wash-off water should be prevented from entering water courses or sewage systems</li> <li>• Secure storage e.g. bins or strong see-through bags required for contaminated clothes, shoes and personal effects prior to their cleansing or disposal, to prevent secondary contamination.</li> <li>• Vapour carried long distance by wind, therefore casualties may be found over wide geographic area.</li> <li>• Exposed water may be contaminated: may be dangerous oily film on surface.</li> </ul>	<ul style="list-style-type: none"> <li>• No antidote</li> <li>• Irrigate eyes copiously with water or saline</li> <li>• Wash skin with copious amounts of soap and water.</li> <li>• Use mydriatics, topical and systemic antibiotics, analgesics, including parenteral opioids, and topical anaesthetics as required (care should be taken not to use excessive doses of topical anaesthetics)</li> </ul>	<ul style="list-style-type: none"> <li>• Expert medical attention required.</li> <li>• Most therapeutic agents are in routine use in hospitals, but increased stocks may be needed.</li> <li>• Some victims may require prolonged hospital treatment.</li> </ul>

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<b>Sarin / VX / Tabun</b>			
<ul style="list-style-type: none"> <li>• Nerve agents: inhibit acetylcholinesterase</li> <li>• Absorbed by inhalation and through skin.</li> <li>• Symptoms may develop within minutes.</li> <li>• Causes: constricted pupils, runny nose, increased salivation, sweating, diarrhoea, incontinence, muscle twitching, tight chest, convulsions, respiratory failure, death.</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
<ul style="list-style-type: none"> <li>• If entering a contaminated area full personal protection equipment required: pressure-demand, self-contained respiratory mask, NBC protective gloves, suit and boots.</li> <li>• Pre-treatment with pyridostigmine will provide some protection: available to military personnel</li> <li>• Removal of contaminated clothing, shoes and personal effects and thorough decontamination of skin and eyes is extremely important</li> <li>• Chemically contaminated casualties should be decontaminated before entering a medical facility to protect staff and other patients. Separate 'dirty' and 'clean' zones should be maintained to prevent cross-contamination.</li> </ul>	<ul style="list-style-type: none"> <li>• Decontamination needs to be undertaken quickly to be effective.</li> <li>• Minimum decontamination facilities: plentiful supply of water, buckets, sponges and soap. Purpose-made decontamination tents very expensive and in limited supply.</li> <li>• If possible contaminated wash-off water should be prevented from entering water courses or sewage systems</li> <li>• Secure storage e.g. bins or strong see-through bags required for contaminated clothes, shoes and personal effects prior to their cleansing or disposal, to prevent secondary contamination.</li> <li>• Hand-held detection equipment is available for specialised field use.</li> </ul>	<ul style="list-style-type: none"> <li>• Wash skin with soap and water.</li> <li>• Irrigate eyes copiously with water or saline.</li> <li>• Resuscitate and ventilate, as required.</li> <li>• Antidotes: atropine, pralidoxime/obidoxime (latter may be more effective for Tabun), diazepam.</li> <li>• Pralidoxime/obidoxime must be given early, i.e. within 24 hours at latest.</li> <li>• Auto-injector devices containing antidotes available to military personnel.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Expert medical attention required.</li> <li>• Atropine in routine use in hospitals, but larger than usual doses are required (e.g. 1-3 g total doses).</li> <li>• Pralidoxime and obidoxime not widely available and in limited supply.</li> <li>• National stockpiles of antidotes may exist in some countries.</li> <li>• NB if using obidoxime liver function must be monitored.</li> <li>• Diazepam in routine medical use and readily available.</li> <li>• Resuscitation equipment: bag (e.g. Ambu bag) must be equipped with filter; exhaust from ventilatory equipment must vent outdoors rather than into wards.</li> </ul>

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<b>Ricin</b>			
<ul style="list-style-type: none"> <li>Cellular toxin extracted from castor oil beans (<i>Ricinus communis</i>).</li> <li>May be latent period of hours or days before symptoms appear.</li> <li>Main route of exposure is ingestion of contaminated food and drink, but aerosol or dust may be inhaled.</li> <li>Symptoms include: bloody diarrhoea, vomiting and abdominal pain, shock, fever, pulmonary oedema, pneumonia, seizures, depression of the central nervous system, liver and kidney damage, death.</li> <li>Dust causes irritation to eyes, nose and throat, optic nerve damage may occur.</li> <li>May provoke allergic response.</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
<ul style="list-style-type: none"> <li>No vaccine.</li> <li>If entering a contaminated area full personal protection equipment required.</li> <li>Following exposure to dust or aerosol removal of contaminated clothing, shoes and personal effects and thorough decontamination of skin and eyes is important.</li> <li>Chemically contaminated casualties should be decontaminated before entering a medical facility to protect staff and other patients. Separate 'dirty' and 'clean' zones should be maintained to prevent cross-contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Decontamination needs to be undertaken quickly to be effective.</li> <li>Minimum decontamination facilities: plentiful supply of water, buckets, sponges and soap. Purpose-made decontamination tents very expensive and in limited supply.</li> <li>If possible contaminated wash-off water should be prevented from entering water courses or sewage systems</li> <li>Secure storage e.g. bins or strong see-through bags required for contaminated clothes, shoes and personal effects prior to their cleansing or disposal, to prevent secondary contamination.</li> </ul>	<ul style="list-style-type: none"> <li>No antitoxin.</li> <li>Treatment is supportive with maintenance of intravascular volume and respiratory function.</li> </ul>	<ul style="list-style-type: none"> <li>Facilities for intensive supportive care required.</li> <li>Large quantities of intravenous fluids may be needed.</li> </ul>

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<b>Aflatoxin</b>			
<ul style="list-style-type: none"> <li>• Fungal toxin produced by <i>Aspergillus flavus</i> and <i>A parasiticus</i>.</li> <li>• Main route of exposure is ingestion of contaminated food, inhalation of fungal spores also possible.</li> <li>• Ingestion, usually over a number of days, causes liver damage with jaundice, fever, ascites and vomiting.</li> <li>• May be fatal.</li> <li>• May cause liver cancer.</li> </ul>			
<b>Prevention</b>		<b>Treatment</b>	
<b>Available Methods</b>	<b>Practical considerations</b>	<b>Available Methods</b>	<b>Practical considerations</b>
Avoid eating mouldy food.	Aflatoxin contamination of food may not be evident.	Monitor liver function and treat supportively.	