The non-conventional warfare scenario: when chemicals are used

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Disclosure

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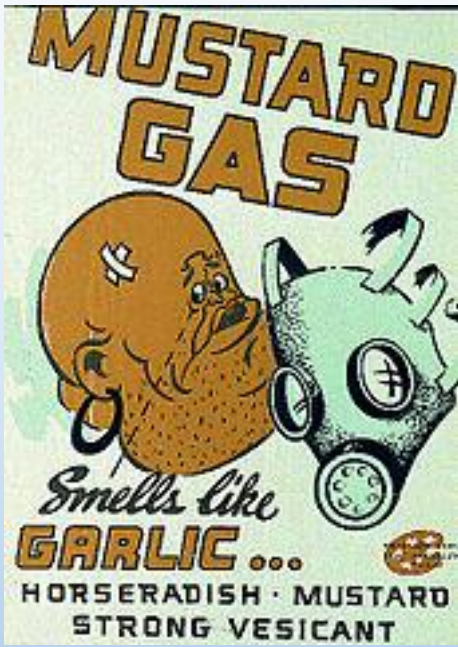
Chem-agents are commonly classified by the type of harm they cause.

1. **Nerve Agents** – disrupt nervous system, causes paralysis, fatal quickly
2. **Blister Agents** – destroy skin and tissues, cause blindness, may be fatal
3. **Choking Agents** – lung fills with fluid, cause choking, quick or delayed fatality
4. **Blood Agents** – interferes with oxygen at the cellular level, fatal quickly
5. **Riot-Control Agents** – skin and breathing irritations, rarely fatal



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Some chem-agents are persistent, many are not persistent

Persistent chemicals

- remain on surfaces without evaporating or breaking down for more than 24 hours
- can remain for days to weeks

Non-persistent chemicals

- quickly evaporate and break down
- carried in bulk on commercial carriers

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Lethal doses vary among different chem-agents

Chemical Agent	100% Lethal Air Dose Quantity		
	Domed Stadium	Movie Theater	Boeing 747-400
Nerve	49lt	2 ½ Cups	38ml
Blister	1297lt	15lt	0.9lt
Chocking	2953lt	34lt	2.1lt
Blood	1968lt	22lt	1.42lt
Riot-Control	6888lt	80lt	5lt

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Chem-Agent Detection

- Some can be seen
- Some can be smelled
- Some can be tasted
- Most can be felt (e.g. burning sensation, choking)
- *All can be detected by appropriate instruments*

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Construct a system

- How clean is clean?
- Designed for community hospital, reliable, replicable
- Follow ...guidelines

- Training and education
- Implementation of local resources
- Development of SOPs

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How do we implement these concepts

- Tier-based approach to patient decontamination

- Self care (and bystander care)
- Gross decontamination
- Technical decontamination procedure

- Immediate is best
  - Environmental and safety consideration
  - Short period of wet decon is adeguate (60-90 sec)
  - Add soap if immediately available

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Bottom Line

Do the best for the most with what is available

- **Goal** – Minimize effect of contamination to protect healthcare workers and improve patient outcome

- Objective

Remove contamination from the skin , eyes , wounds as early as possible.

Stop additional and ongoing exposure as early as possible

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Decontamination issues

- Safety
  - Establishing security, zones
- Environment
  - Waste water, temperature, ground cover
- Property
  - Valuables, tracking
- Modesty
  - Cultural, religious and personal values
- Special
  - Language, adults & kids, special needs

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Decontamination triage

- Contaminated, sick
  - Assisted decontamination and therapy
- Contaminated, not sick
  - Self-directed decontamination
- Decontaminated (at scene)
  - Medical evaluation and treatment

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If you remember one thing. . .

- Decontamination

- Decontamination

- Decontamination

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Remember

Warm is where decontamination occurs

Cold is where treatment

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Chemical attack summary

- Decontamination

- Protect yourself
- Identify the toxidrome
- Many agents have specific therapies
- Aggressive supportive care
- Monitor for delayed toxicity

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Many thanks

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Management of patients with entrapped UXO

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U.S. Army policy states that Moss should not be operated on because of the risk to medics and other patients

“Brown explained the possible scenarios to the medical team, including the possibility that they could all become 'pink mist' if the grenade exploded, and they agreed to treat him…”

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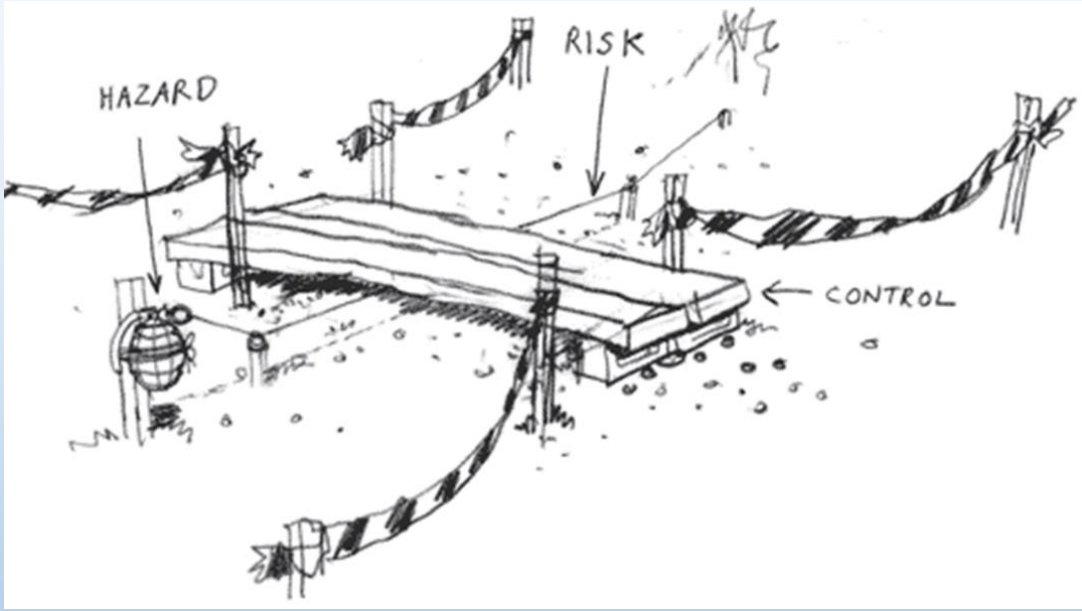
Limitations

Medevac Golden hour
Risk for patient
Risk for personnel
Risk for infrastructure



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Rules of rescue and risk

- Type of ordnance.
- Identification of medical equipment
- Location of the injury.
- Condition of the patient.
- Anaesthesia-Surgical procedure
- Facilities and resources available.

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Risk Awareness

All explosives are sensitive to:

- Shock
- Heat
- Friction

Some explosive weapons have complex electronic fuzing and in addition to the above may be sensitive to electricity and electromagnetic fields (e.g. those induced by phones, radios, MRI scanners, pacing, defibrillating and other medical equipment, etc)

ERW suitably exposed to the above stimuli will explode!

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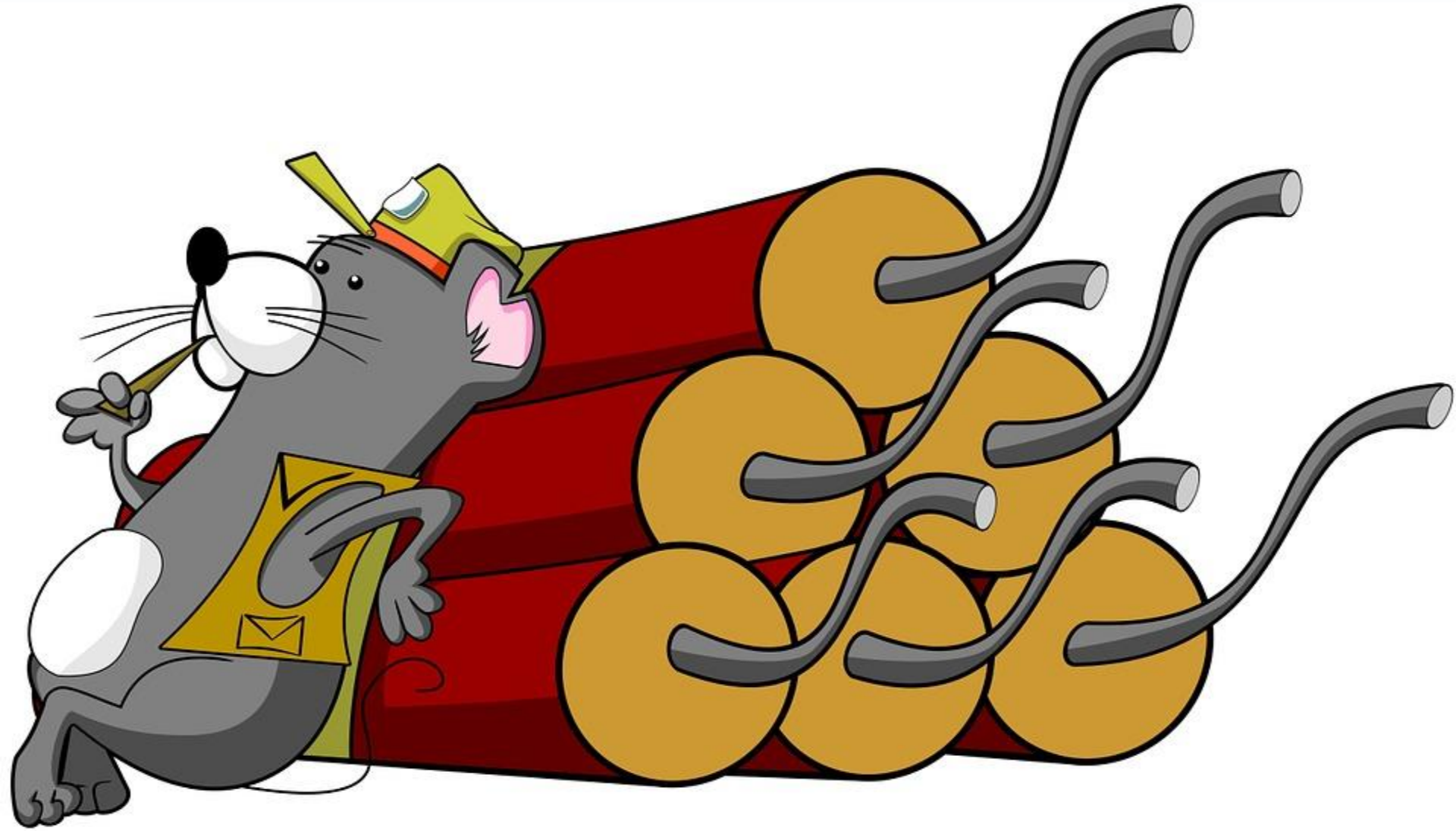
How to be prepared…



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Generic Advice

- Attempt to identify UXO cases as soon as possible during triage/admittance
- Reduce the staff level in the vicinity of a patient with UXO to a minimum
- Isolate the patient from the rest of the patient body where feasible
- Treat the patient as a medical case first with an UXO component rather than vice versa
- Take antistatic precautions when interacting with the patient
- Seek technical assistance from WeC department ASAP

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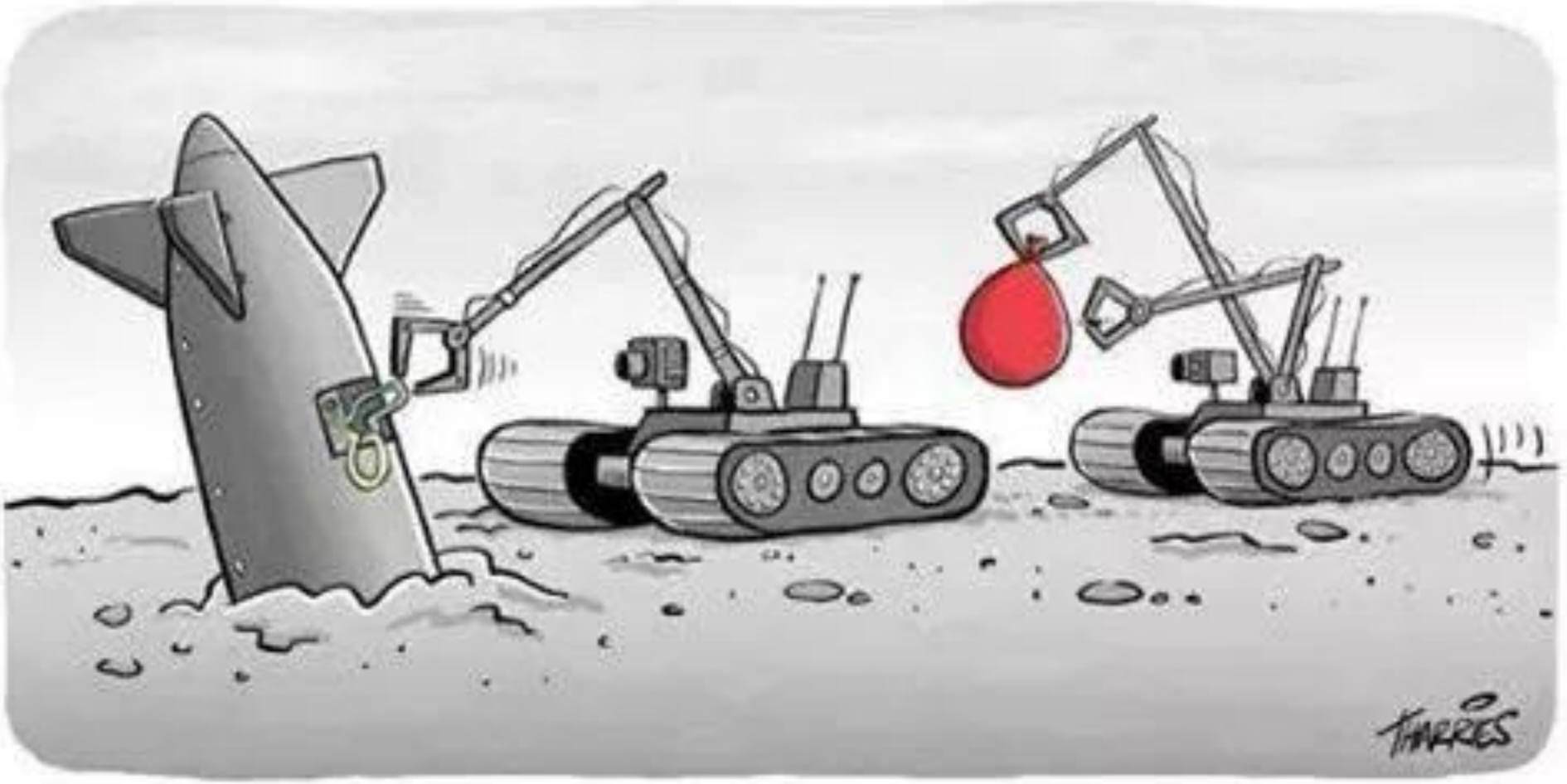
Many thanks…



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