



SMR

SYMPOSIUM MEDISCH
RAMPENMANAGEMENT

26 oktober 2024



Disaster Management

Medical aspects of CBRN

Congres Rode Kruis 26 Okt 24

Blankenberge



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AGENDA

1. Introduction – VUCA
2. Medical Disaster Management
3. CBRN
4. Awareness First Responders
5. Take Home Messages




1. VUCA




PEOPLE BEHIND THE STUDY OF NINETY PROMINENT LEADERS

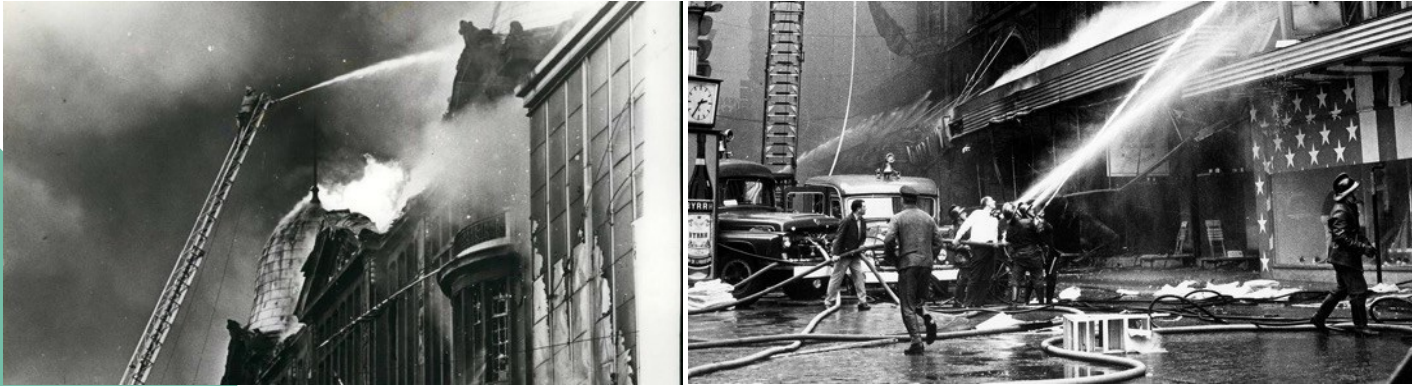
Warren Bennis



Burt Nanus



22 May 1967 – INNO – 359 dead



**8 Aug 1956
Marcinelle - 262 dead**



**23 Dec 1958 – Zichen-Zussen-Bolder
18 dead - Roosburgramp**



**25 Apr 1966 – Walfergem Asse
10 dead children**



**15 Feb 1961 – Plane crash Berg
73 dead**





**Heizeldrama 1985
39 dead**



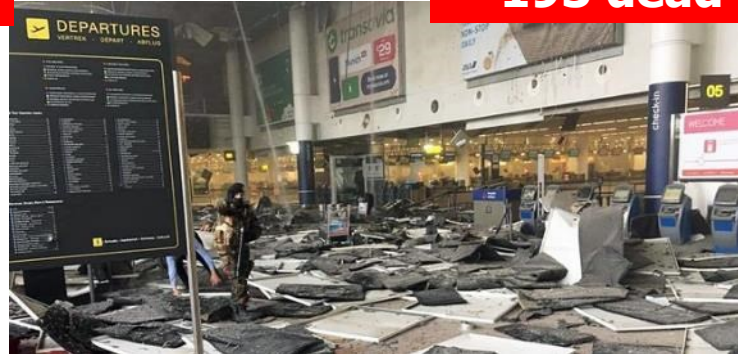
**Herald 1987
193 dead**



**Gellingen 2004
24 dead**



**Switel 1994
15 dead 164 burn injuries**



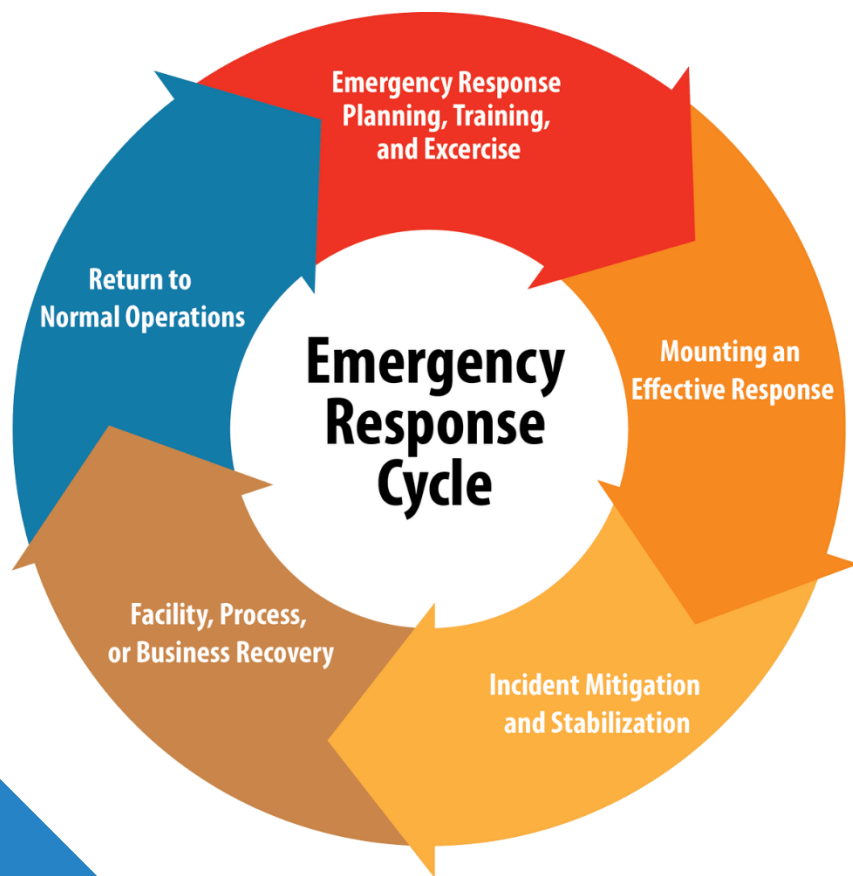
**Brussel 22 Mar 2016
32 dead >340 blast injuries**



**Floodings Belgium Jul 2021
31 dead**



2. Disaster Management



First Line

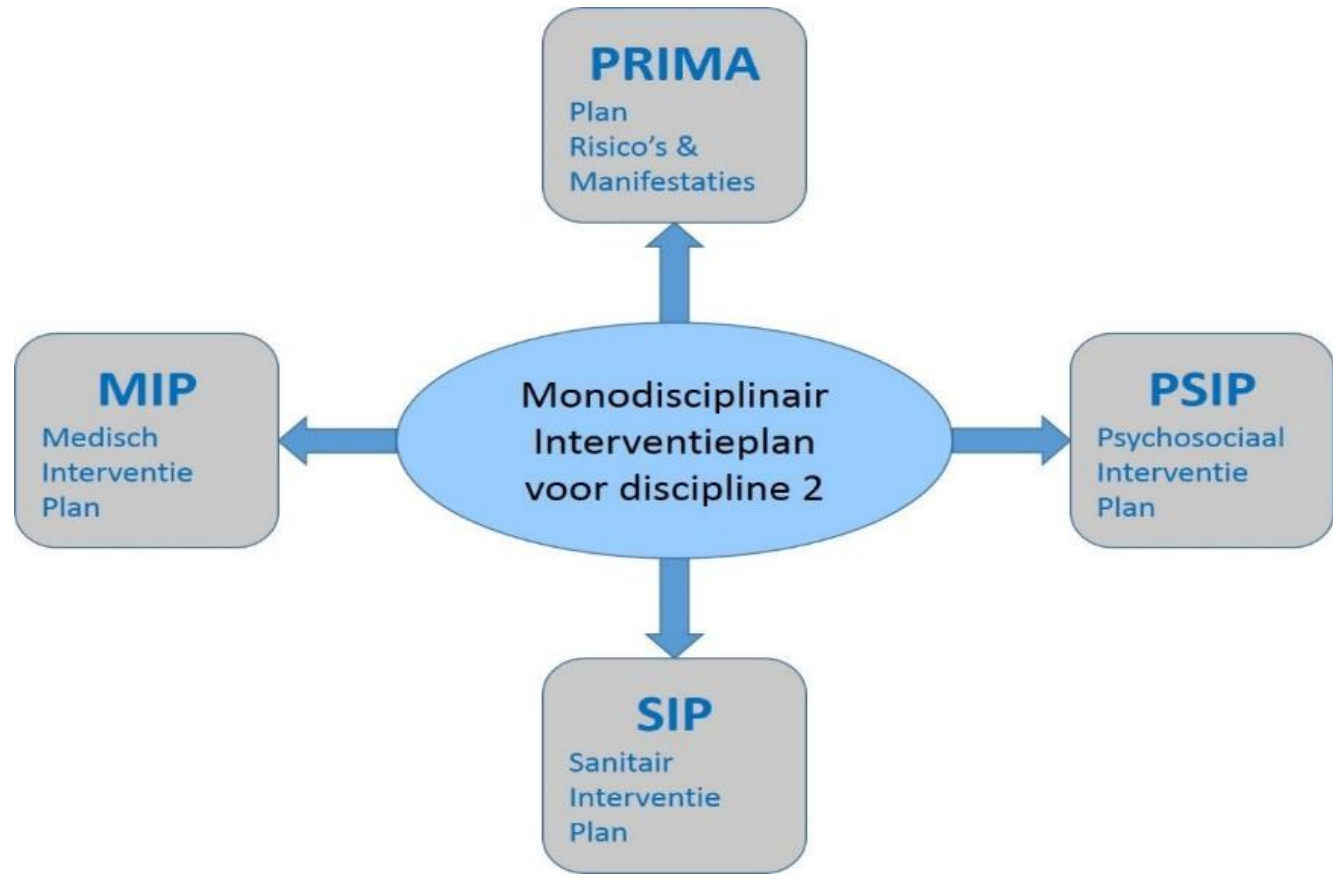
- ❑ **D1** – Fire Department
 - ❖ Fire Dpt zones (35 since 2015)
- ❑ **D2** – Medical Services
 - ❖ MMT – PIT – Ambulances – Red Cross
- ❑ **D3** – Police
- ❑ **CP-Ops** : Led by **DIR-CP-Ops**



Police



Monodisciplinary plan D2





SKRIPALS' JOURNEY

09.20: The Skripals are believed to have laid plastic flowers on the grave with Russian sales tags on them. It is believed Yulia brought the fake flowers to the UK from Russia.



2 Later on Sunday morning: Sergei and Yulia return to their home in Christie Miller Road, Salisbury, for a few hours.

3 13.30: Sergei's car is seen being driven down Devizes Road, towards the town centre.

4 13.40: Sergei and Yulia arrive in Sainsbury's upper level car park at the Mallings.

5 Some time after this: They go to the Bishops Mill Pub in the town centre.

6 14.20: They dine at Zizzi restaurant.

7 15.35: They leave Zizzi restaurant.

7 16.15: Emergency services receive a report from a member of the public and police arrive at the scene within minutes, where they find Sergei and Yulia extremely ill on a park bench near the restaurant.



3. CBRN

☐ Chemical substances

❖ Toxic Industrial Chemicals (**TIC**)

❖ Chemical Warfare Agents (**CWA**)

☐ Biological agents

☐ Radiological and Nuclear materials



e/E - BLAST

CBRN? CBRNe? CBRNE? NRBC?

- CBRNe: explosives as a mean of dispersal to CBRN substances
- CBRNE: explosives are used as the primary weapon itself



DIM – what's happening...







Tokyo 20 March 1995 - GB

- ❑ 13 killed by CWA Sarin (GB)
- ❑ Aum Shinrikyo
- ❑ 50 heavily injured
- ❑ >5000 people with temporary visual problems
- ❑ Secondary contaminations



MASSACRE BY POISON GAS



Many die, 1,200 collapse in Tokyo Tube attack





SARIN attack - Subway Tokyo

20th March 1995



Japanese study published by Tokuda in Resuscitation in 2006, 10 years after the sarin gas attacks advocates early management in three parts:

- **Emergency decontamination**
 - **Respiratory resuscitation**
 - **Antidotes**
- lead to increase the victims' chances of survival

Prehospital management of sarin nerve gas terrorism in urban settings: 10 years of progress after Tokyo subway attack.

Y. Tokuda and al. Resuscitation (2006) 68, 193-202



Sarin attack - Khan Cheikhoun (Syria) 87 peoples were killed



TIC & CWA

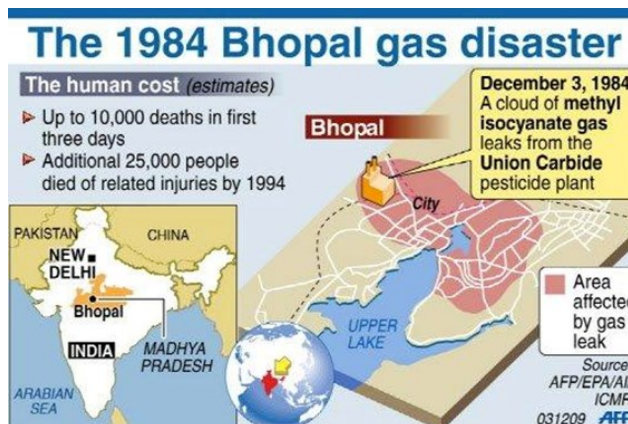




Toxic Industrial Chemicals (TIC)

□ Industrial use + transport of...

- ❖ Chlorine (Cl)
- ❖ Phosgene – (COCl₂)
- ❖ Methyl isocyanate (C₂H₃NO)
- ❖ Ammonia – (NH₃)
- ❖ Fluor – (F)
- ❖ ...





Industrial accidents

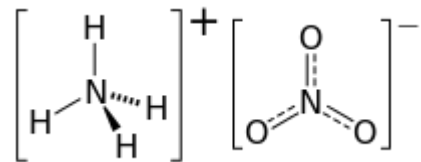




Port of Beirut – 04 Aug 2020



- NH_4NO_3
- 218 deaths
- > 7000 injured



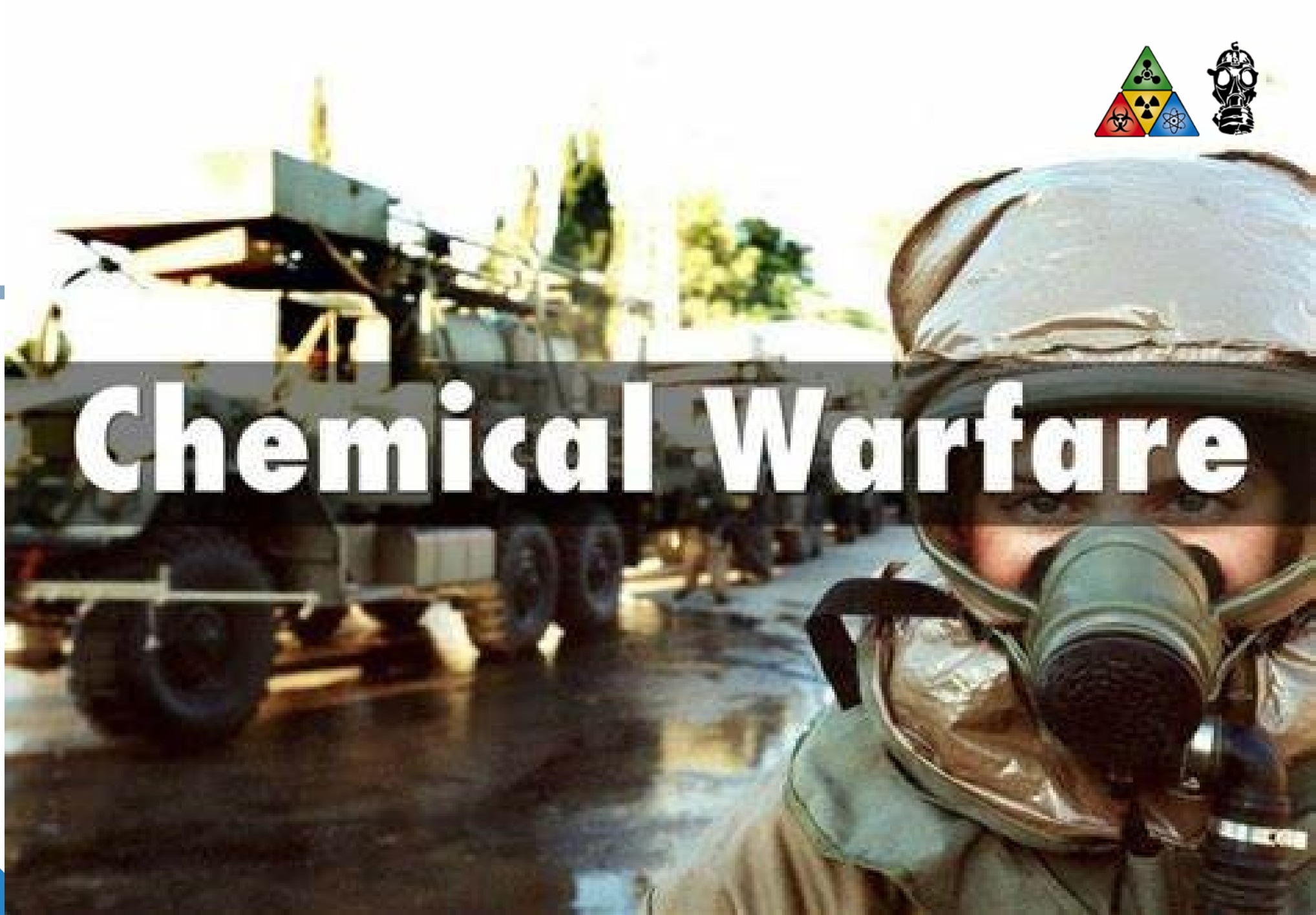


NIGHTLY
NEWS

CWA

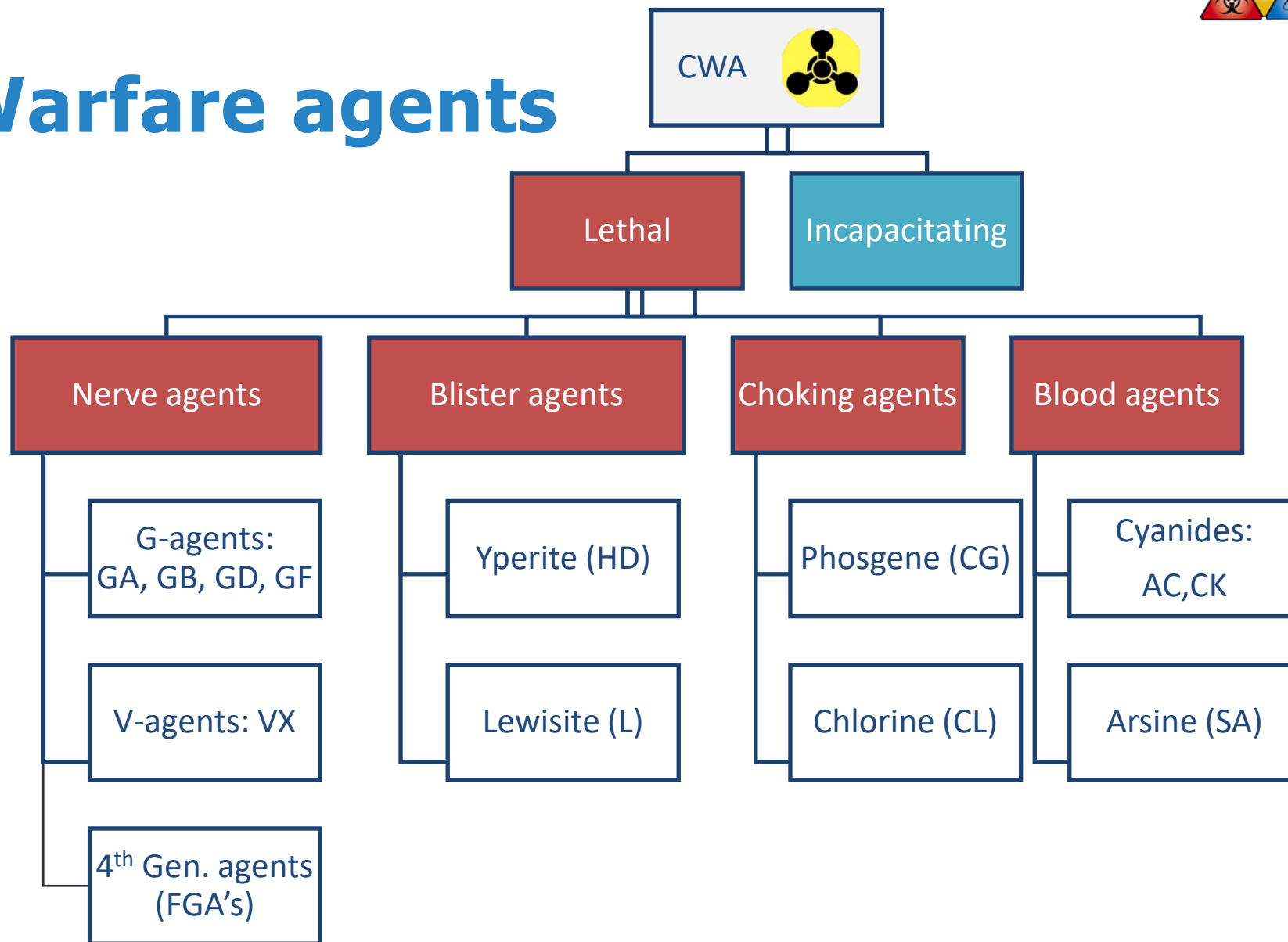


Chemical Warfare

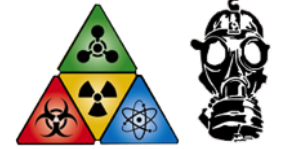




Chemical Warfare agents



Relevance of CWA



- Military use – Syria.
- Terrorist use – Tokyo, ISIS.
- Homeland security – Salisbury incident.
- Counter terrorist use – Moscow theatre incident.

Toxicity levels – LD50

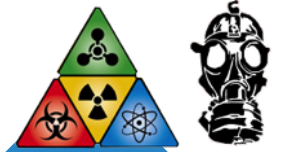
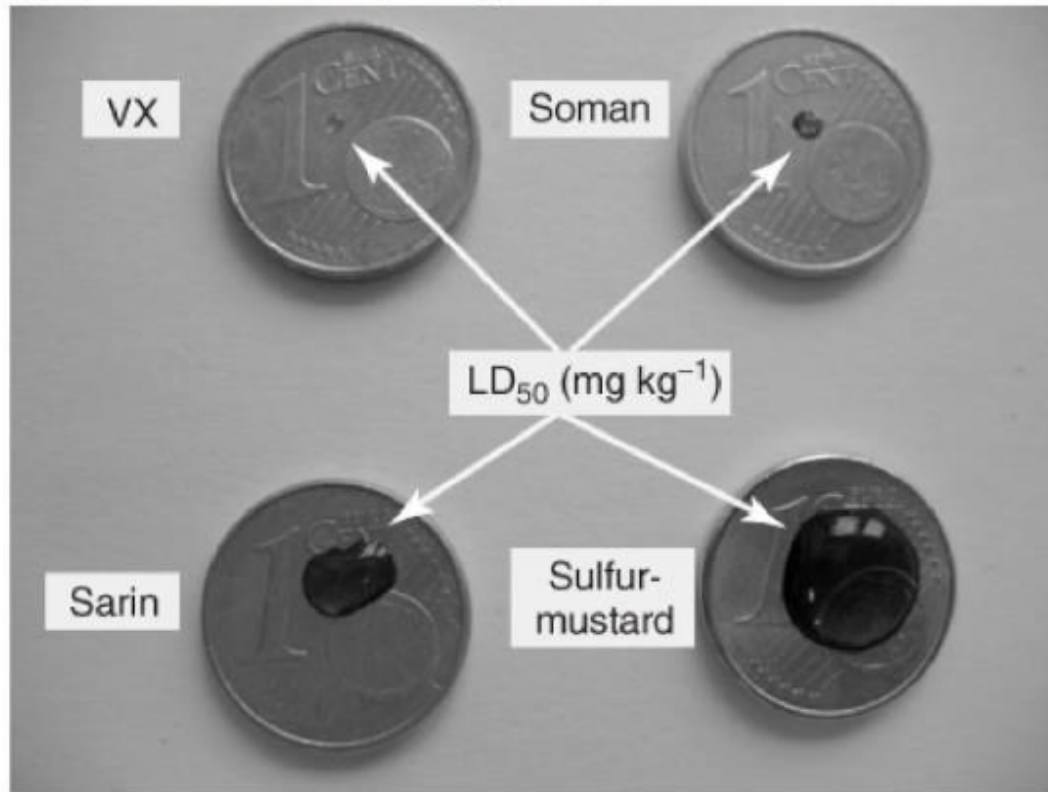


Figure 3.2 Comparison of the amount of indicated chemical warfare agent, applying skin contact effecting an LD₅₀-toxicity.





Blister Agents





Major toxidromes



Organophosphates



Opioids



Cyanides

4. Situational awareness

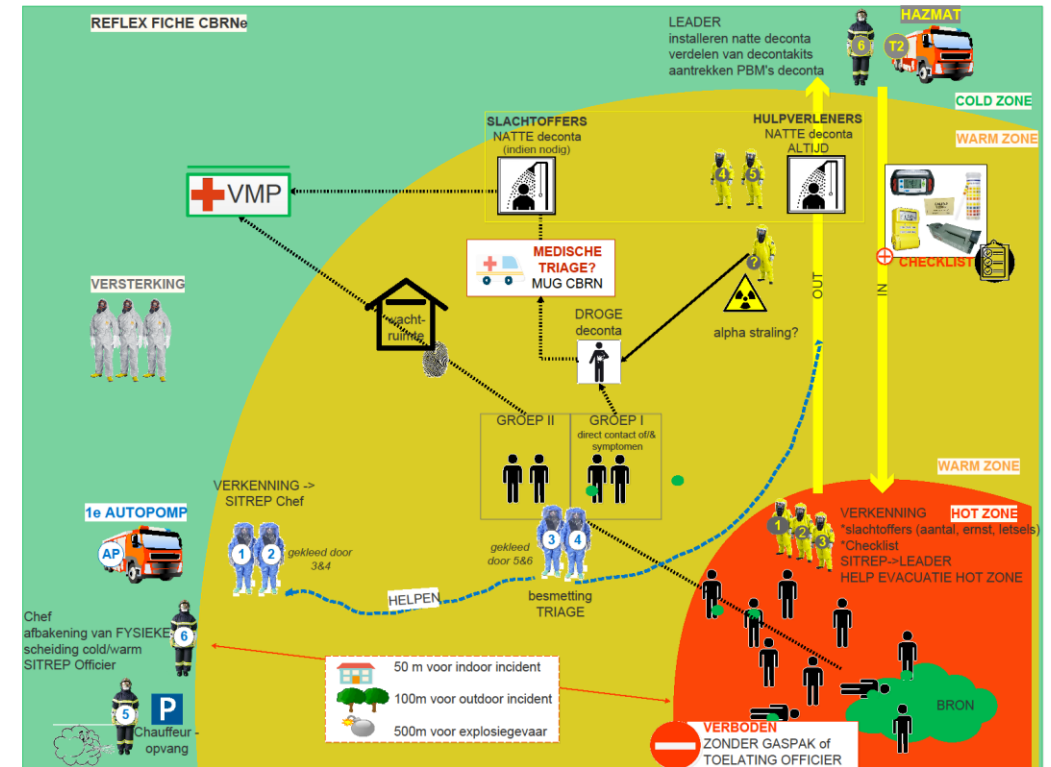
- ❑ “rupture of normality”
 - Death birds, animals, unconscious,...
- ❑ **1-2-3 rule**
 - 1 unconscious → possible
 - 2 unconscious → ??
 - 3 unconscious → **CBRN**
- ❑ **Toxidromes** (same symptoms)
 - unconscious, respiratory distress, sweating, blurred vision, convulsions, pinpoint, hypersalivation, tearing eyes,...
- ❑ ***Sensitive*** locations
 - Schools, stations, airports, closed spaces, cinema, NATO/EU buildings, ...
(crowded places)





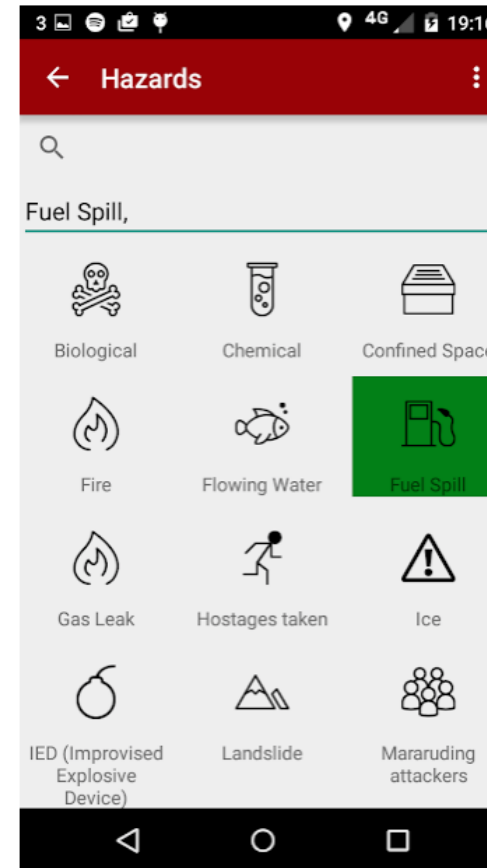
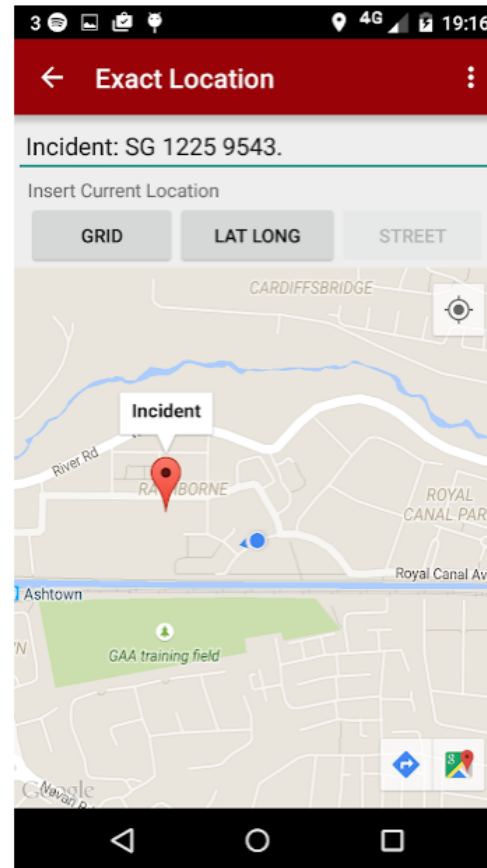
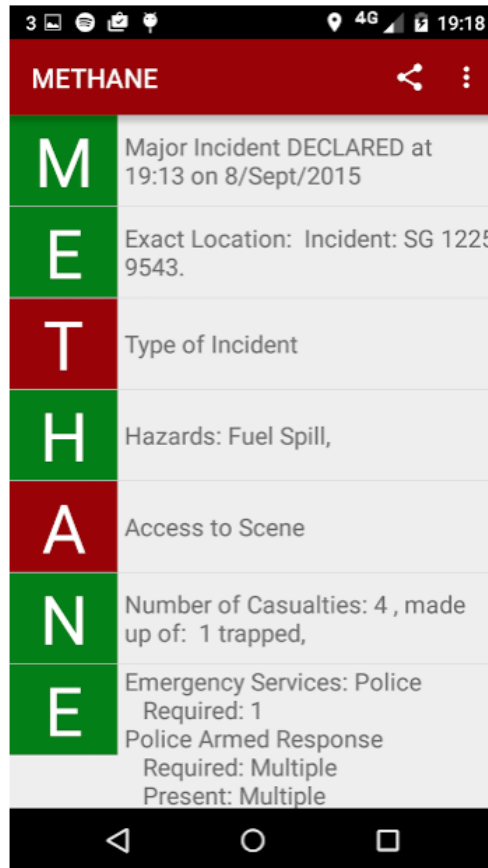
On site management – C4

- ❑ Command – Control – Coordination – Communication
- ❑ **RV punt** → upwind (PEB !)
- ❑ **SitRep** & scaling up (NC 112) → **METHANE**
- ❑ **CP-Ops** – assessment (MKO)
 - ❖ specific plan of action
 - ❖ **D1** (AGS) - D2 - D3 – D4 – D5
 - ❖ AGS
 - ❖ Decontamination? (Civil Protection)
- ❑ PPE : **If No PPE → STAY OUT**





METHANE reporting



Treatment Protocol - HASTY



REMOVE³-protocol



Med TP - Deliberate (MARCHE)²



TCCC/TECC		CBRN	
Massive Bleeding	M	Mask casualty	
Airway	A	Antidotes	
Respiration	R	Rapid Spot Decontamination	
Circulation	C	Countermeasures	
Hypothermia/ Head Injury	H	Hypothermia from decon/ AMS – head injury or agent?	
Everything else	E	Extraction	

C R E S S		Nerve agent	Cyanide	Opiate (Morphine)	Atropine	Sepsis	Heat stroke
C	Consciousness	Convulsions	Unconscious / Convulsions	Reduced → unconscious	Agitated / Confused	Normal, reduced or altered	Altered
R	Respiration	Increased or reduced → stopped	Increased or stopped	Reduced → stopped	Increased	Increased	Increased
E	Eyes	Pinpoint pupils*	Normal / Large pupils	Pinpoint pupils	Large pupils / Blurred vision	Normal	Normal / Large pupils
S	Secretions	Increased*	Normal	Normal	Dry mouth / Thirsty	Normal / Sputum	Normal
S	Skin	Sweaty	Pink → blue	Normal / Blue	Flushed / Dry	Warm → pale Non-blanching rash	Varied
Other features		Vomiting Incontinence Slow pulse	Sudden onset		Fast pulse	Fast pulse Fever (>38.3°C) Bio-syndrome* No radial pulse	High temperature (>38°C)

* Pinpoint pupils (and/or increased secretions) may be delayed if skin absorption or eye protection worn.

† 'Bio-syndromes' include: respiratory, cutaneous (skin), lymphadenopathy, haemorrhagic, gastrointestinal, and neurological (central & peripheral).



5. Take Home Messages

1. Situational CBRNe Awareness
2. MDM (MIP/PIP/BIP)
3. CBRN not standalone!
4. DIM - Toxidromes
5. Buy some time
6. **MCM** - R³ & (MARCHE)²
7. **STAY SAFE**





Questions?
