



Medical management of mass casualty during a CBRNE event

Dr Moni CHAI

Emergency physician

Paris Fire Brigade

THE FRENCH PARTICULARITY

- Emergency medical teams
- First aid
- No paramedics
- Mixture of scoop and run and stay and play
- Yellow plan / red plan / white plan

TWO TYPES OF VICTIMS

- Victims called VALIDS
- Victims called INVALIDS

Victims called VALIDS

- Able to move alone
 - May have been contaminated

- Able to do certain things only :
 - undressing
 - dry decontamination
 - Shower (wash and rinse)
 - drying
 - dressing

- Possible chain flow:
 - 20 victims per hour per line
 - According contaminant

Victims called INVALIDS

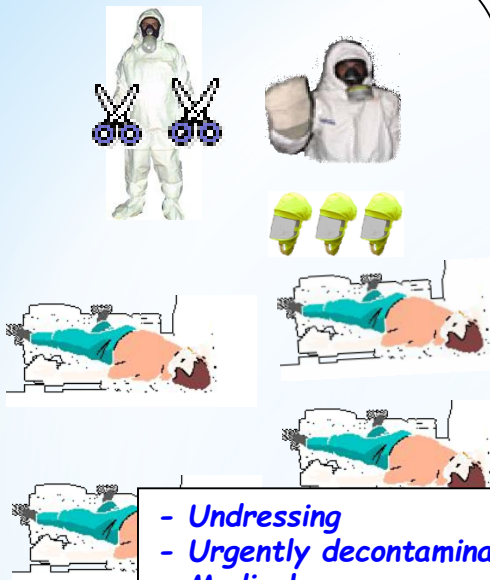
- Unable to move alone
 - Helpless or unconscious
 - Requires travel on a stretcher carried by four rescuers

- Unable to make the gestures :
 - Must be stripped
 - Must be decontaminated urgently
 - Must be medicalized urgently
 - Must be showered
 - Must be dried
 - Should be given to the Advanced Medical Station (PMA)

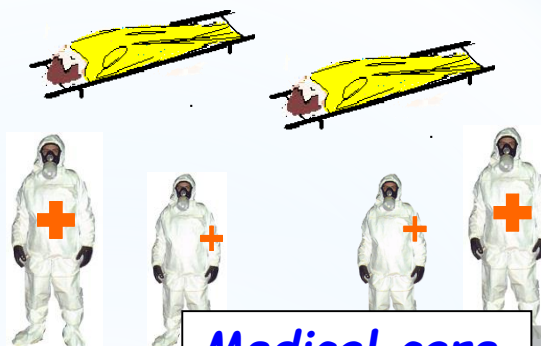
- Possible chain flow :
 - 5-6 victims per hour per line
 - According contaminant
 - According to the victim's medical condition

QUICK REMINDER ON THE DECONTAMINATION

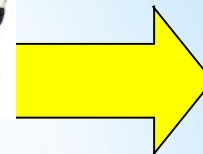
INVALIDS



- Undressing
- Urgently decontamination
- Medical care



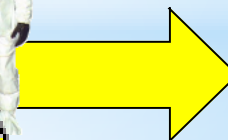
Medical care



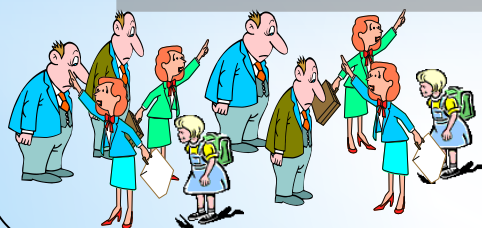
CHDE + PRA



- Emergency undressing
- Urgently decontamination
- to dress again with white clothes



VALIDS



Successful decontamination = Sum of complementary actions

1. Undressing prior (PRV)



2. Dry decontamination (with the glove powder-PRV)



3. Double shower (washing + rinsing)



4. Drying + dressing



5. Contamination control



THE CATEGORIZATION

The old categorization of the french military health service

| Categorization | | Type of injury | |
|----------------|----|-----------------|--|
| UA | EU | Immediate | Thoracic or facial trauma with asphyxiation Bleeding with state of shock |
| | U1 | Before 6 hours | Polytrauma, bleedings, severely burns, crushings of members Comatose cranial trauma |
| UR | U2 | Before 18 hours | Joint fractures, Joint wounds Injuries ENT, oph, stomato Not comatose cranial trauma |
| | U3 | Before 36 hours | Treatment can be deferred |

Categorization of the Disaster Medicine French Society

| Categorization | Type of injury | |
|----------------|----------------------------|---|
| UA | Extreme Emergency (EU) | In a context of contamination, an extreme emergency is an absolute emergency requiring surgical rescue. |
| | First Emergency (U1) | Victims threatened by decompensation of vital function. |
| | Functional Emergency (UF) | Lesions characterized by their topography (eye, face, hand), the lack of development life-threatening, the possibility of a functional or aesthetic impact. |
| UP | Potential Emergencies (UP) | Lesions characterized by their topography (eye, face, hand), the lack of development life-threatening, the possibility of a functional or aesthetic impact. |
| UR | Second Emergency (U2) | Victims with injuries or symptoms not involving the short-term prognosis. |
| | Third Emergency (U3) | Minor injuries characterized by the lack of scalability, the possibility of an evacuation within more than 18 hours without medicalization transport |
| UD | Emergency Exceeded (UD) | delayed surgical treatment; very serious injuries that can not be dealt with immediately and leaving little chance of survival. |

Medical and surgical categorization

« Mass Casualty »

NATO AJP-4.10(A)

Allied Joint Medical Support Doctrine, March 2006

| Categorization | Orientation |
|----------------|--|
| T1 (UA) | Immediate treatment (antidote, decontamination) surgical priority |
| T2 (UR) | Surgery delayed Delayed treatment |
| T3 | Mineure (éclopés, indemnes) surveillance et réévaluation Minimal treatment |
| T4 | Accompanying measures Expectant treatment |

UR U2
U3

FICHE MÉDICALE DE L'AVANT

EU UA
UI

ÉTAT-CIVIL

NOM : _____ PRÉNOM : _____

SEXE : FEMININ ☐  MASCULIN ☐ ÂGE ou DATE DE NAISSANCE : _____ 0-24 MOIS ☐ 2-14 ANS ☐ ADULTE ☐

NATIONALITÉ : _____ PROFESSION : _____

ADRESSE : _____

N° patient PMA

N° SINUS
(autocollant)

Victime(s) proche(s) : numéro(s) SINUS (à coller au verso de la FMA)

PATHOLOGIE/TRAITEMENT

GCS: ____ PA: ____ / ____ FC: ____ FR: ____ SpO2: ____ T °C: ____ CO: ____

PATHOLOGIES DOMINANTES :

UR ☐ UA ☐ CRÂNE ☐ THORAX ☐ABDOMEN ☐ORTHOPÉDIE ☐BRÛLÉ ☐ INTOXIQUÉ ☐BLASTÉ ☐AUTRE ☐ préciser : _____

DIAGNOSTIC et TRAITEMENT :

VVP ☐INTUBÉ ☐IMMOBILISATION ☐

ÉVOLUTION :


AMÉLIORATION ☐STABILISATION ☐AGGRAVATION ☐UR ☐ UA ☐ DCD ☐ 

TRANSPORT/DESTINATION

TRANSPORT : NON MÉDICALISÉ ☐ MÉDICALISÉ ☐ COLLECTIF ☐ VICTIME COUCHÉE ☐

DESTINATION : _____ SERVICE : _____ VECTEUR : _____

FICHE NAVETTE PRV / PMA / TRIAGE -> REGULATION SAMU -> ÉVACUATION

UR ☐ UA ☐ SEXE : FEMININ ☐  MASCULIN ☐ 

ÂGE ou DATE DE NAISSANCE : _____

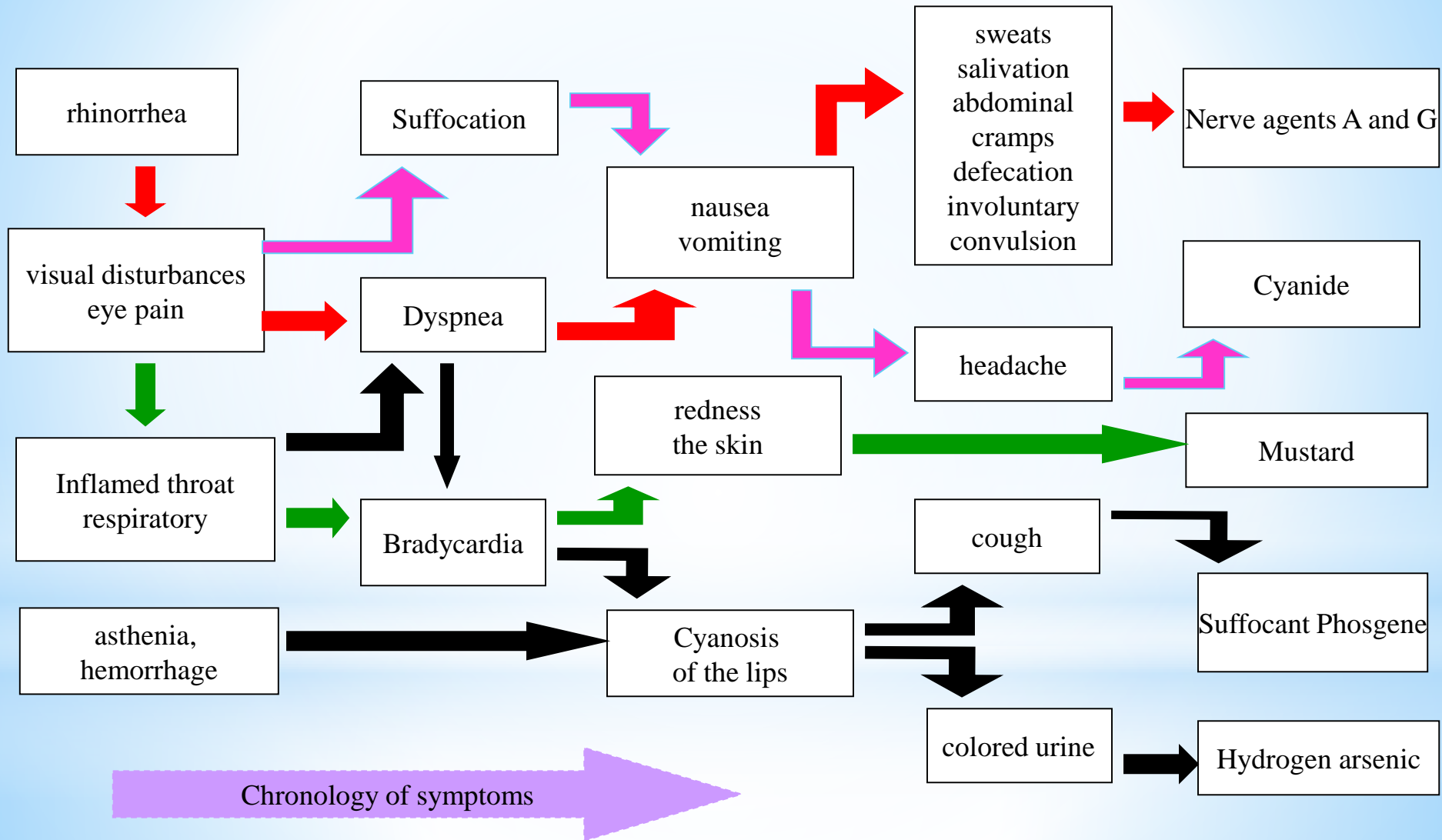
CRÂNE ☐ THORAX ☐ABDOMEN ☐ORTHOPÉDIE ☐BRÛLÉ ☐ INTOXIQUÉ ☐BLASTÉ ☐AUTRE ☐ préciser : _____

DESTINATION : _____ SERVICE : _____ VECTEUR : _____

HORAIRE de DÉPART : _____

PATHOLOGIES AND THEIR TREATMENT

First symptoms suggestive of toxic



SPECIFICS TREATMENTS

| NATURE OF TOXIC | CONTAMINATION | DECONTAMINATION | TREATMENT |
|--|----------------------------------|--|--|
| CYANIDE | Respiratory | | Oxygene, CPR + hydroxocobalamin |
| SUFFOCANTS (<i>Phosgene, ammonia and chlorine</i>) | Respiratory | Glove Shower + soap | Oxygen Respiratory assistance (non invasive ventilation. If orotracheal intubation think PEEP) Aerosol $\beta 2$ agonist (Albuterol, Epinephrine) Δ no corticoids |
| VESICANTS (<i>Yperite, Lewisite, Oxime halogéné(CX)</i>) | Cutaneous and respiratory | Glove Saline eyewash Shower + Potassium permanganate (2 g/l) | Cutaneous lesions = id Burned Lewisite => British Anti Lewisite (BAL) : 2-3 mg/kg in IM, idem D+1, then 3 IM à D+2, then 2 IM/j during 7 to 10 days Aerosol $\beta 2$ agonist (Albuterol, Epinephrine) |
| NERVE AGENTS <i>Agent G (Soman, Sarin, Tabun)</i> <i>Agent V (VX ou A4)</i> | Cutaneous and respiratory | Glove Shower + soap | Respiratory assistance + + + Diazepam and/or Clonazepam for convulsions Atropine for the other clinical Washing with sodium hypochlorite (Na 8g/L) Pralidoxime = antidote |

EARLY TREATMENT OF INTERNAL CONTAMINATION IN THE FIELD

- Medical and surgical emergency prevail over radiological emergency
- If possible within 2 hours
- At the PMA, in hospital or care facilities
- Systematics for anyone suspicious because
 - Good tolerance
 - Easy administration
- Selection of products specified by experts according to the nature of the contaminant

IODINE



Lugol iodine solution
(preventive treatment)

CESIUM



Prussian blue

TRANSURANIC



DTPA aerosol
Injection, washing wounds in health care

TRITIUM



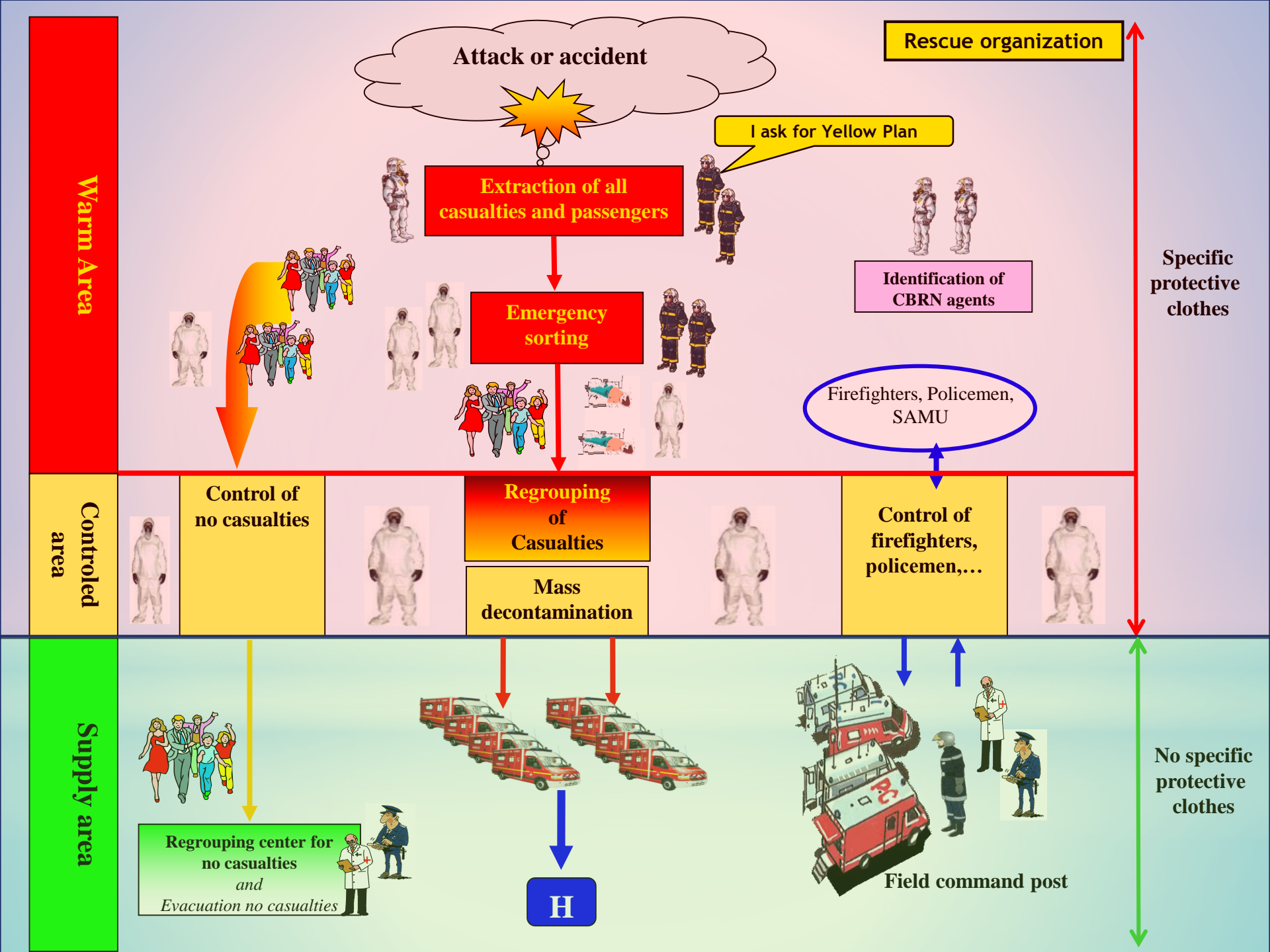
Drinking water (**3l/d**)

URANIUM

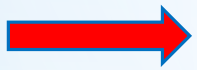


Bicarbonates (perfusion)
Acetazolamide (under medical supervision)

IN PRACTICE...



HOSPITAL CARE



The Example of PERCY hospital

Installations for medical management of radiocontaminated wounded in France

H Civilian Referral Hospitals

★ CTBRC

🚢 PABRC (Navy)

✈️ PABRC (AF)



Actors of case management

HIA

Plastic surgery
Trauma center
Hematology
Reeducation

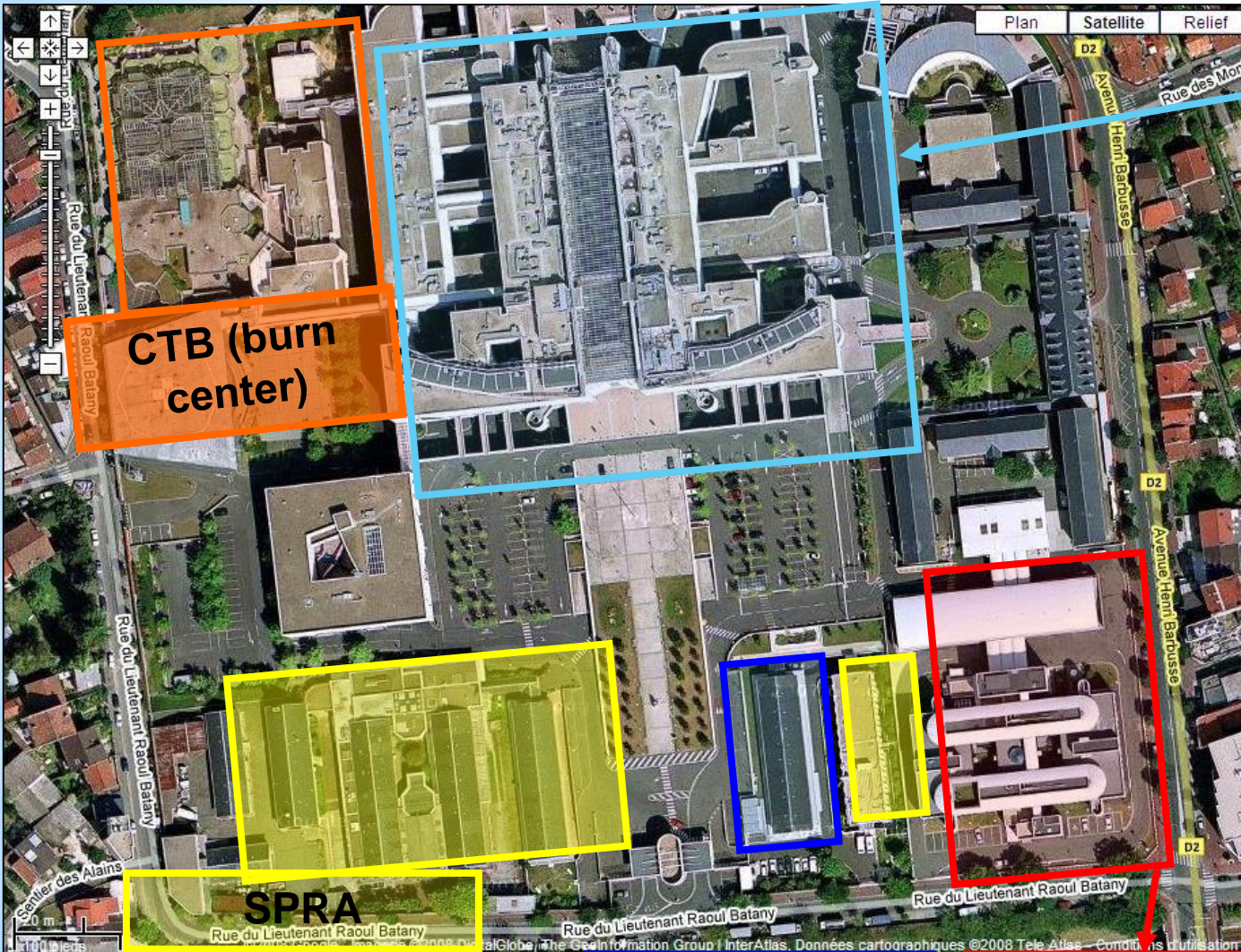
CTB (burn center)

SPRA

CTBRC

Center for treatment of radiocontaminated wounded patients

CTSA (blood transfusion center)



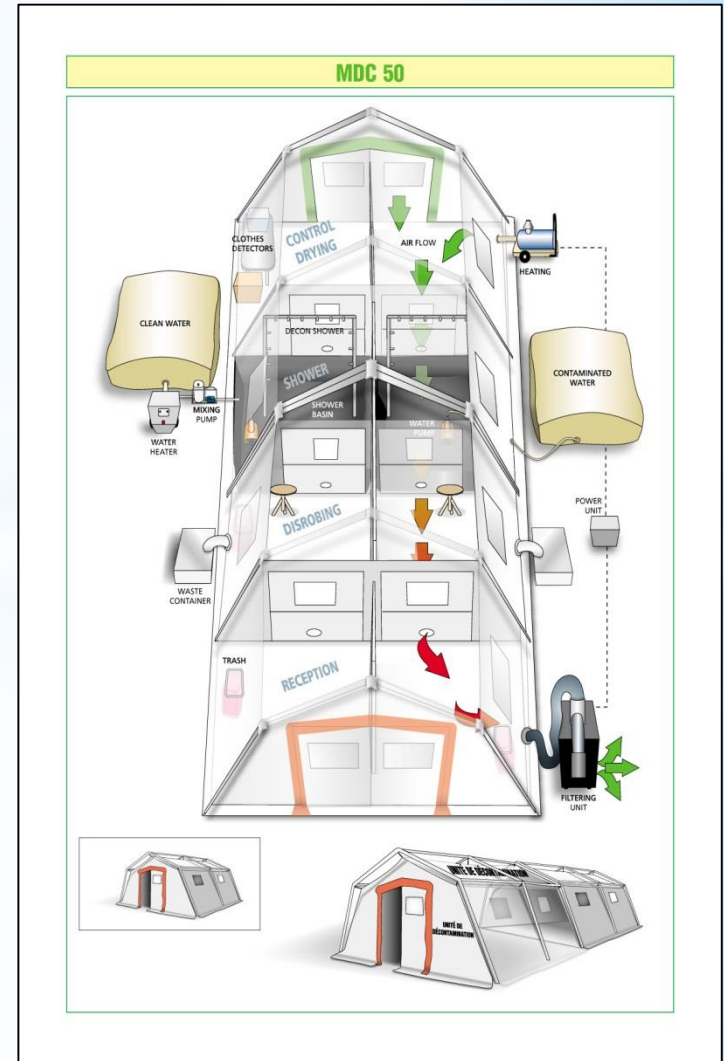
CTBRC of Percy Hospital



Possible extension of the CTBRC



Pre Hospital
Decontamination
Module (M.D.P.H)



**Thank you for your
attention**