10 years of medical support in French SOF airborne operations

[redacted]

Static Line (SL) jump

≤ 300m *(1000ft),* day and night, with drop bag and weapons

High Altitude (HA) jump

Military free fall : day and night, alone and team, HALO and HAHO, tactical infiltration, with drop bag and weapons,

FL120 maximum *(3600m)*

Heavy load drop bag

Jump with 130kg *(290 lbs)* load, day and night, HALO, HAHO, tactical infiltration

Tandem pilot

To carry a passenger by day and night, HALO, HAHO, tactical infiltration, drop bag ad weapons

Very High altitude (VHA) jump :

To use all previous qualification ≥ FL 120 (oxygen supply)

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MEDICAL CONSIDERATION

[redacted] **injuried** = **2,7%**

35,5% jumps with injuried

= 1,24 (0-3) injuried by jump

11,8% jumps with major injuries

23,6% jumps with only minors injuries

12 on 41 injuried (**29%**) were **tandem passengers**

97,5% injuries on **landing**

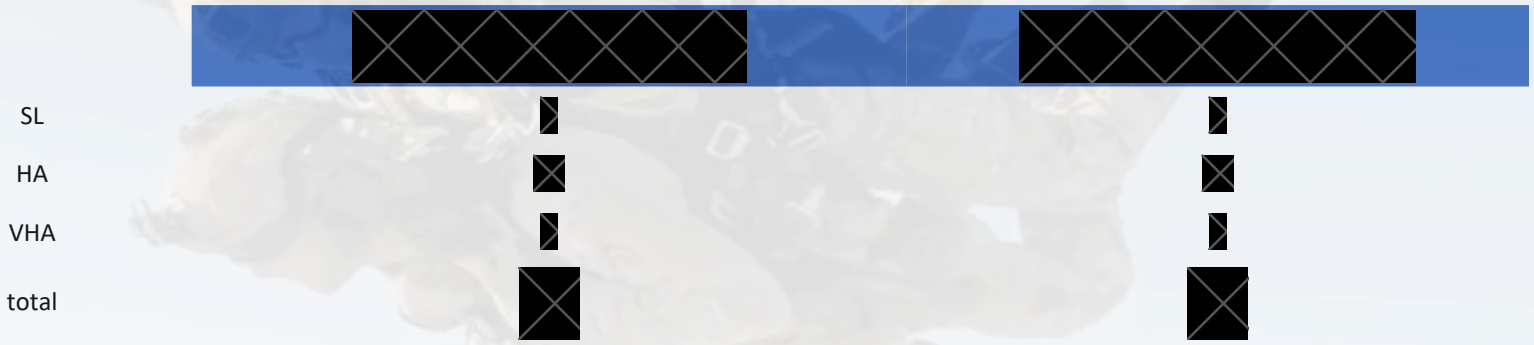
Injury rate → only major injuries = **0,8%**

Injuries

Type of injury	Number
Ankle / knee sprain	[redacted]
Contusions/abrasions	[redacted]
Lower limbs trauma	[redacted]
Lower limbs fractures	[redacted]
Shoulder dislocation	[redacted]
Cervical sprain	[redacted]
Traumatic brain injury	[redacted]
Vertebra fracture	[redacted]
Other	[redacted]

classicaly found in literature

Injuries severity



Minor
(71%)
sprain, contusion/abrasion, mild trauma

Major
(29%)
fracture, dislocation, TBI, severe sprain

No studies → military free fall airborne operations injuries

1 study → MFF training injuries

Some studies → civilian skydiving injuries

Military free fall training injuries.
Glorioso JE Jr, Batts KB, Ward WS.
Mil Med. 1999 Jul;164(7):526-30.

- Most common injuries :
lower axtremities fractures , sprains, dislocations, contusion, abrasions, spine/head trauma

- Landing = most frequent injury mechanism

- Night and combat equipment = risk factor for injury → airborne operation

Epidemiology of **skydiving**-related deaths and **injuries**: A 10-years prospective study of 6.2 million jumps between 2010 and 2019 in France.
Fer C, Guiavarch M, Edouard P.
J Sci Med Sport. 2021 May;24(5):448-453. doi: 10.1016/j.jsams.2020.11.002. Epub 2020 Nov 13.
PMID: 33257175

The epidemiology of **injury** in bungee jumping, BASE jumping, and **skydiving**.
Søreide K.
Med Sport Sci. 2012;58:112-29. doi: 10.1159/000338720. Epub 2012 Jul 18.

The epidemiology of **skydiving injuries**: World freefall convention, 2000-2001.
Barrows TH, Mills TJ, Kassing SD.
J Emerg Med. 2005 Jan;28(1):63-8. doi: 10.1016/j.jemermed.2004.07.008.

- comparable injuries

- significantly lower injury rates

Interesting : low experience associated with higher risk of injury

Compared to static line

Airborne operations	Training
Injuries rate = 8,6% to 12% Same type of injuries	Injuries rates = 0,3 to 13,5% increase significantly : night, combat equipement, load

MFF seams to be safer for airborne operation

→ but not without risk !

- Kotwal et al. Army ranger casualty, attrition, and surgery rates for airborne operations in Afghanistan and Iraq. Aviation space and environmental medicine 2004;75(10):833-40.
- Hallel et al. Parachuting Injuries : A retrospective study of 83818 jumps. J Trauma 1975; 15:14-9
- Craig et al. Parachuting injuries during Operation Royal Dragon, Big Drop III, Ft Bragg, North Carolina, May 15/16 1996. Military Medicine. 1999; 164:41-3.
- Kragh et al. Parachuting injuries: A medical analysis of an airborne operation. Military medicine.1996;161(2):67-9.
- Bricknell et al. Military parachuting injuries: a literature review Occup. 199;49(1):17-26
- Borba Neves et al. Military parachuting injuries in Brazil. Injury. 009 Aug;40(8):897-900, AUG
- Craig et al. Military static line parachute injuries in an Australian commando battalion ANZ J Surg. 2008 Oct;78(10):848-52 UST 01, 2009
- Hay et al. Parachute injuries in the Australian Airborne Battle Group in 2004. ADF Health.2006 Oct;7:73-7
- Dhar et al. Retrospective Study of Injuries in Military Parachuting. Medical journal armed forces india. 2007;63(4):353-55

Landing = critical time

- Especially by night
- Sometimes unprecise landing zone weather conditions :

QFE = altitude

Wind direction and speed

- Rate of descent increase with load

Innovative project

to secure landing

→ radar altimeter

Focus on tandem passengers

29% of injuried

High rate in accordance with littérature*

Tandem passenger
=
often specialist
not MFF qualified
added value to the team

We have to secure them = airbag
(depend on weather condition, tandem pilot experience)

* Chianea et Al. Accidentologie en tandem dans l'armée française. Etude descriptive rétrospective de 2012 à 2017.Med Arm 2019;47(2):107-111.

Tandem landing position

lower limb exposed to injury

Full inflated

Evacuation

9 injuried evacuated

Only major injuries

Evacuation time	< 4h	<12h	12h < MEDEVAC < 24h	missing
MEDEVAC	1	4	2	2

2 severe injuries non evacuated : shoulder dislocation
posterior cruciate ligament rupture

1 TBI with initial LOC : lost for 2 hours → recovered by RESCO mission > 12 hours later

75% severe injuries evacuated **0% minor injuries evacuated**

Long evacuation time

THE decision

↓

discretion Vs evacuation

continue mission Vs best medical care

→ What is the most important ?

Medical advise for Commander decision

Best option : planed

In action decision = communication MC / JMED / PECC / TU Doc

robust medical support = decision making +/- PFC

HAHO - tactical infiltration :

Several km betwen drop point and landing zone

Risk = team splitting → isolate(s) or distant(s) operators

<u>Worst situation : unconscious isolated patient</u>

Radio contact ?

GPS marker ?

Drone research ?

going to his position Vs direct MEDEVAC

to be discussed during mission planing

MEDEVAC → reduced NTM

Drop zone drone view
Parachute dispersion

Delayed MEDEVAC is an option

when ?

- team on target : discretion no more needed

  → MEDEVAC not available for a WIA

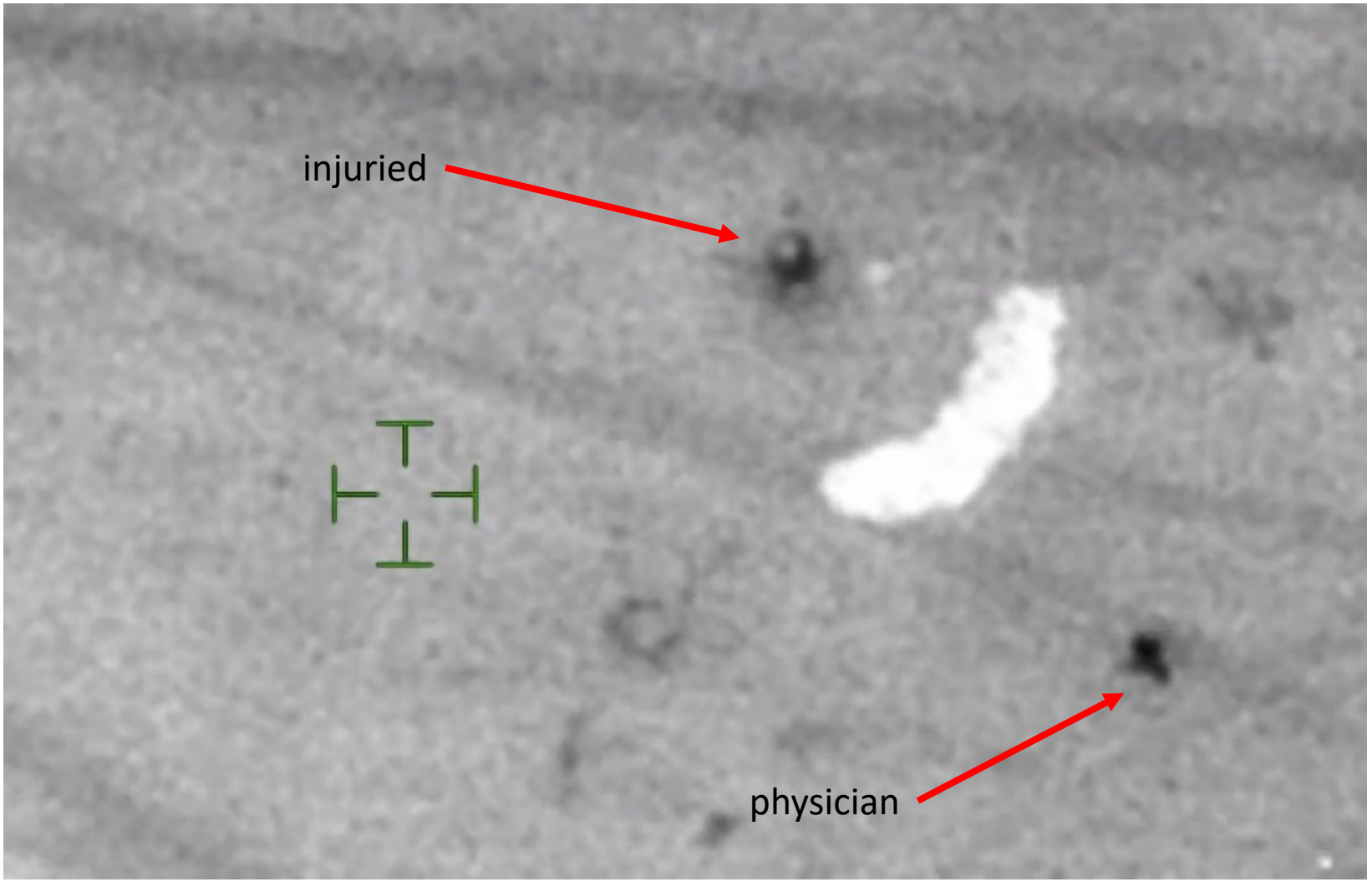
- End of action : if WIA wich is the first to be evacauated ?
- PECC organizes a second MEDEVAC ?

Injuried left alone ? with safety ? with a care giver ?

Best = planed procedure

In action decision making = communication

Catched by drone



Impact on the mission

only **1** mission **canceled**

(physician severely injuried)

no major delay on TOT

Airborne operation = high risk of injury → 1/3 jumps

Have to consider one or several injuried

→ anticipate the medical managment on drop zone

Allow enough time between landing and starting ground insertion

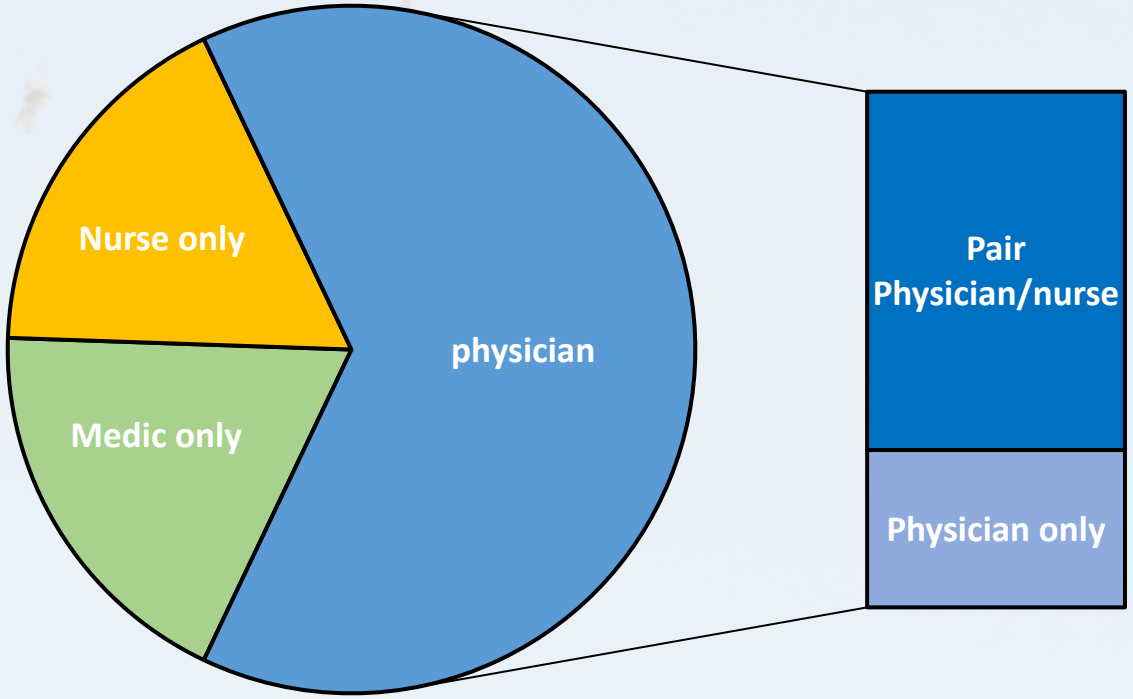
Medical support

63% jumps with a **physician** (alone or with a nurse)

→ **44%** with a **pair physician/nurse**

18% jumps with only a nurse

17% jumps with only medics



Direct action missions = **high risk of injury** (34% french SOF wounded)*
Intelligence/special recon = 10% french SOF wounded*

French SOF medical support = **pair physician/nurse**
→ providing DCR on POI
Medical support have to be **present on mission start**

Physician alone :
no nurse qualified / nurse with an other team / nurse in MEDEVAC

Physician on intel/special recon :
extreme isolation / long mission / no nurse qualified

Medical team : jumps with the firsts

* Prof, Col TRAVERS S. non published datas. French special operation WOI management : 2016-2020.

multiple drop zones

It can be tactically interesting

Spliting medical team decrease the level of care

medical advice → commander decision

SOF medical team

=

able to work in demanding conditions

efficient in uncomfortables conditions

Injuried management on drop zone

by night / discretion = not to compromise drop zone

Anticipating rapid analgesia (IN, inhaled methoxyflurane …)

Dispersion of injuried …. Isolated caregiver

Specific additional equipment for jump support :

in drop bag abandoned with canopy if not used (KED, elastic tape, splint)

Heavy load drop bag ? Time to recover ? → resupply

Future = autonomous delivery systems ?

CONCLUSION

Supporting the jump … **and especially the following mission**

Airborne operation = high risk injury

Injuried on combat jump is NOT an unexpected situation

evacuate Vs continue the mission

decision making = commanding officer with medical advice

delayed evacuation = prolonged field care

Anticipate : medical management time on DZ

abort conditions (number of injuried, speciality)

isolated injuried recovery

QUESTIONS ?

THANK YOU