

# FIA Institute Doha Summit December 2014 - Day I

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## **Formula E - Phil Rayner**

Electric & hybrid cars

Current = Voltage / Resistance

V = 400 - 800V (Formula E)

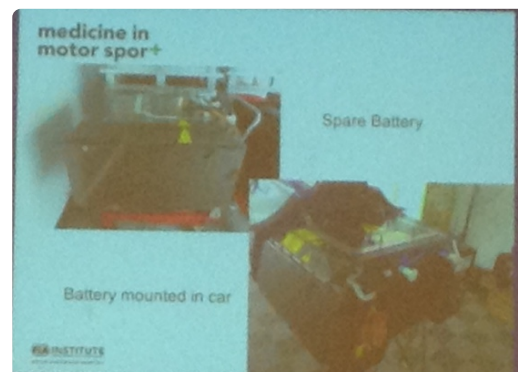
R = 1500ohm when dry

C = 260 - 500mA - Potential for VF, resp arrest, death.  
Risk of arcing.

Standard treatment approach



Dr Phil Rayner



Formula E Li-ion batteries

Lithium ion batteries

- once burning very difficult to extinguish.
- 50L water tanks can be discharged to flood & cool. Pressure plate in floor blows out to allow water to drain (risk?)
- 250L water tanks in pit garage can be connected via valve to battery tank to flood tank
- can also use dry ice
- risk of fume in enclosed space, so pushed out of pit garage if fire

All Formula E mechanics and garage personnel have received 1.5 days of BLS training

All pit garages set up in standardised way - rescue equipment all same in same location

Drivers being trained to climb out on to the car body and then jump down on to the ground landing on both feet so as to avoid completing a circuit.

Linesman gloves with leather over gloves

Rubber soled boots

Rescue pole

Insulated mat

Voltage detector device to check if car bodywork is live

Williams engineer in the delegate's medical car taken to incident if no green light to disconnect fuses, which requires a specific tool. Don't touch the three red cable which are high tension voltage cables!!

Risk in rain?



A Formula E training exercise.  
Note the insulation mats.

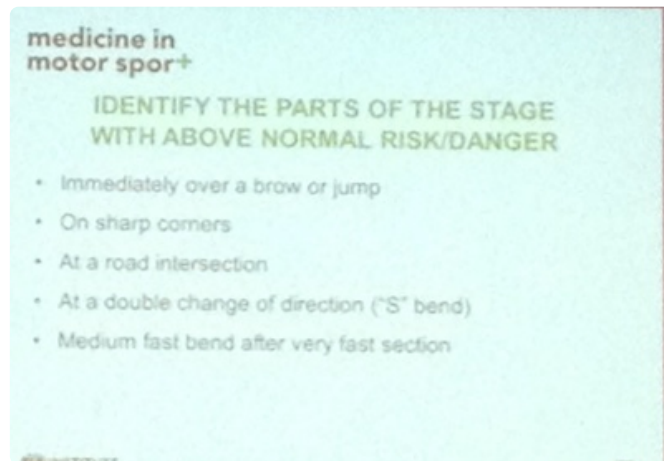
Green light - Safe

Red light / No light - potential danger

Appendix H

## **Rally safety - Jean Duby**

Key danger points to include in the road book and to place safety measures against



Input from local competitor with race experience is invaluable in identifying danger spots.

Spectator risk - usually don't understand risk when trying to get good view

Photographer risk - often underestimate risk when trying to get best shot

Rally marshal risk - the tabard is not a safety shield

All of this needs careful planning when setting up event and drawing up safety plan

First on scene first aid training for competitors "should be mandatory" (Duby)

Useful to discuss the role of the medical response with competitors at the start of an event / season (Scholtz)

Role for embedding micro GPS tech into spectator tickets and official & photographer ID cards to monitor movement, especially around danger spots and incidents.

Role for camera drones?

- Range is an issue

- Flight time (battery life) might be an issue.

- Air traffic is a potential safety issue (Already a problem with spectators using drones)

Role for camera in zero car transmitting live images to rally base who can then activate spectator marshals or security for crowd control.

## **Concussion - P Hutchinson**

Nothing new in terms of diagnosis or management

Role of persistence of symptoms emphasised but relationship to patient outcome remains fuzzy

MRI recommended for prolonged symptoms or neuropsych deficit but again impact of findings on patient outcome unclear as no resulting treatments proposed.

Little if any motorsport specific evidence (Data may exist within certain groups but not published or publicly available)

BESS test a sensitive indicator of ongoing injury - <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3445164/>

Role of brain biomarkers played down (dismissed) due to paucity of evidence

Role of brain imaging played up if persistent symptoms (*despite lack of evidence lacking intervention to outcomes*)

AWPTAS not discussed.

## **WRC Review**

Keep evac routes clear - spectator parking, camping

Service park med centre - balance between insufficient and excess

Mixed function MIV versus Medical MIV + Rescue vehicle

Marshals - at risk if standing in poor position (Spain)

Return to competition after injury - poor standardisation and objectivity.

## **Formula 1 review**

Bianchi crash

92G over 20mS!!!

Concussion

2013 none

2014 3 One major, two minor (GP 2 & 3)

Vertbral injury

2013 one. 2014 one.

Marshal deaths

2013 one (Canada - run over by recovery vehicle during track recovery, bent down to pick up dropped radio)

Extrication: poor results when

- high team turnover
- insufficient training

Emerging competitor challenges

- Younger drivers competing - 17yo in GP2
- First professional female driver for a long time (GP2) (*Note, this does not take in to account all motorsports, eg Danica Patrick in NASCAR, Molly Taylor in ERC*)
- Some teams rotating multiple drivers (6-8) through their cars, including reserve drivers, over the competition weekend, usually in free practice session.

## **Formula E review**

Medical car is also electric. Sits on recharging mat in pit lane.

Review of Beijing event, including Heidfeld/Prost crash

Review of Malaysia event - no issues

## **Regulation amendments**

Main items

- world rallycross regulations
- hybrid electric car regs
- extricable seat and extrication procedures
- medical centre clarifications

## **Real time stress monitoring**

Made increasingly possible with the evolution of wearable tech

Measuring variables at in the context of interest

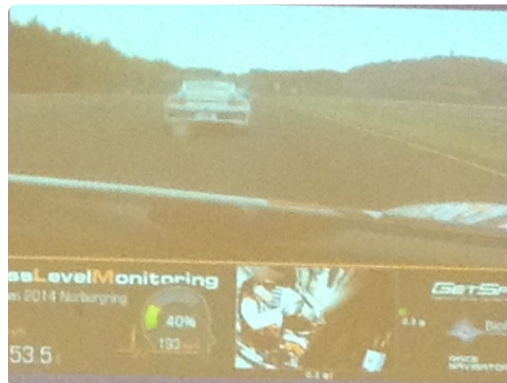
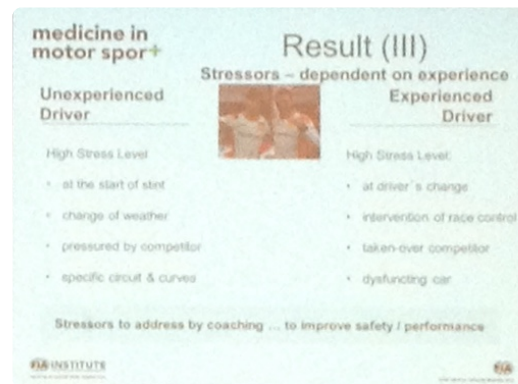
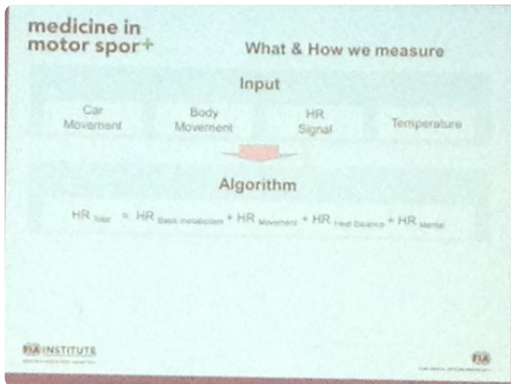
What is measured?

- Car movement
- Body movement

- HR
- Temp

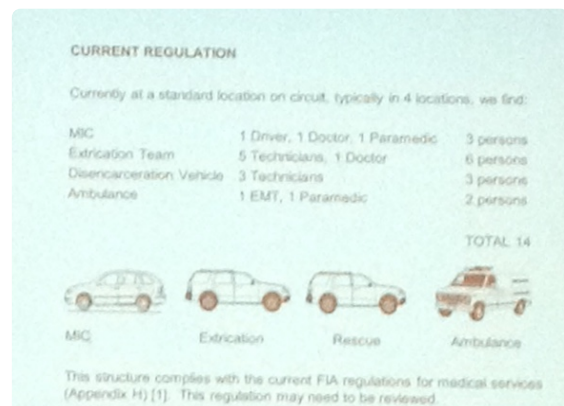
Values plugged in to algorithm to derive assessment of "stress" (????)

Live stream camera from driver's eye view also recorded. Linked to circuit position map.

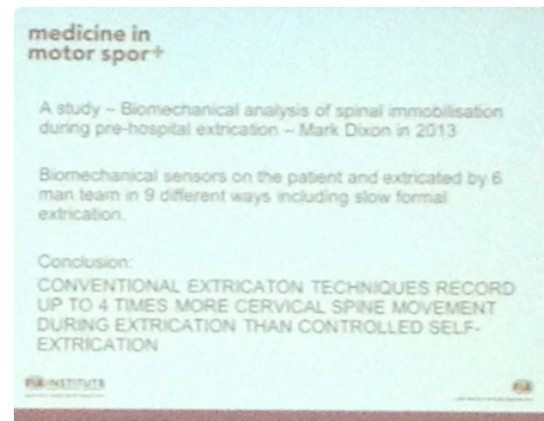
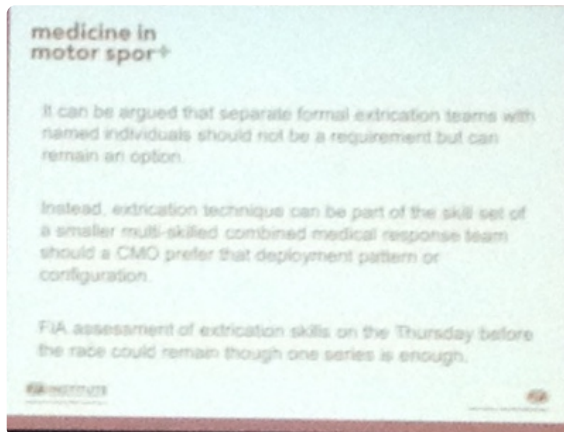


## The case against extrication teams

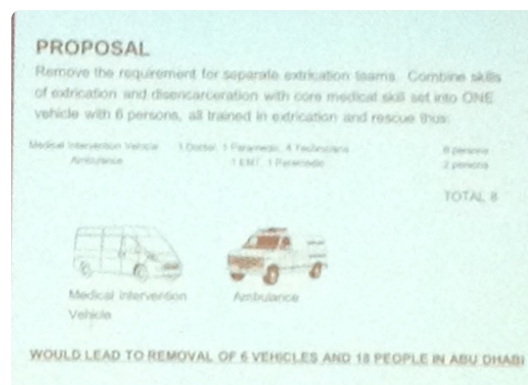
The current model:



Evidence base for outcome benefit of current model is very limited



Military model = small, specific team who know each other and can do each other's roles if needed.



Extrication in its current form is really only optimal for upright car, free of obstacles with no immediate hazards.

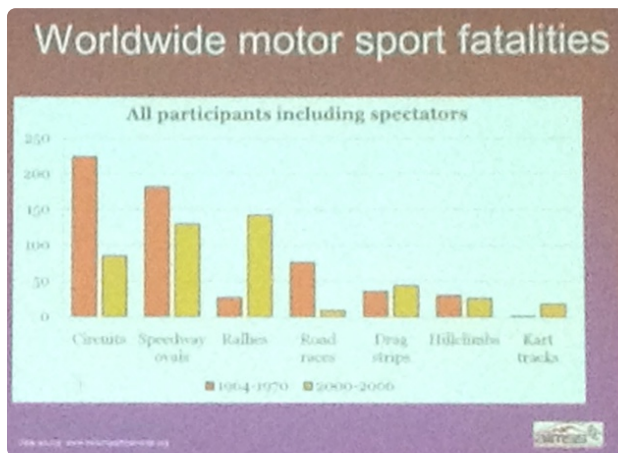
Lots of post session conversation over the following two days with majority support for proposal to combine medical and rescue into one vehicle and cross training of that vehicle's occupants. Everyone has their role but can do each other's if needed. Clear team leader duty. Similar to rally.

## Silverstone Circuit medical management 4 year observation study - P Hutchinson

*The fact it was even done is to be applauded. Why haven't we done this in Australia yet? Such valuable information.*

Demographics

Injuries



Note opposite trends in rally & karting

Incident versus Circuit location - Genius! Identification of consistent hazard black spots

Work load plotted against time of year and staffing availability  
Car versus bike outcomes

## Hugh Scully - Physicians in motorsport

- 1960-70s: "1 in 7 drivers died while racing"
- Development of motorsport medicine starting in mid 70s (USA 1975 Bock, Olvey & Trammell, FI 1978 Watkins)
- Integration of injury monitoring and engineering developments - car structures, safety equipment, track features
- Integrated, cross-trained medical rescue response team  
(Listen to podcast for more on these)



## **FIA Accident Database - J-J Isserman**

Triggers

- Fatal
- Serious: >8 weeks off (*too insensitive!*)
- Significant (*ill-defined*)

Online

Dropdown menus

Section D a little difficult to complete as often won't know exact times of interventions

Freetext box at end to write additional notes if needed

Print out to keep for ASN's own records as cannot save to own computer.

Submitted to FIA once completed

Lots of controversy when Jean Jaques Isserman stated that ASNs will submit data but not be provided access to their own and others' data. Paul Trafford attempted to clarify by saying that ASNs could apply for access to specific anonymised data for a particular project, eg head injury patterns in closed cockpit circuit racing.

## **Anti-doping - S Camargo**

WADA Code updated every 5 years. Next update 2015.

Greater range of offences

Greater range and Harsher penalties

FIA a signatory since Dec 2011

Therapeutic Use Exemptions

- WADA: Mutual recognition of national TUEs rather than imposing international TUEs.
- FIA has not chosen this option yet but moving in that direction.

Registered Testing Pool

- Registry of location of each athlete to facilitate testing

- Athletes given 60 minute window to present for testing. No show = failed test. 3 fails = Penalty +/- hearing.

#### FIA Appendix A

- alcohol testing now included
- improved testing confidentiality: no one informed of doping control requests until 1 hour before. More to ensure athletes can't cheat the system than confidentiality of athlete.

### **FIA Institute BMC and new edition of Medicine Motorsport Book**

Online platforms

Mobile device compatible

Still in development. Three chapters completed to date.

Aim is to integrate book with BMC and regional and network events (eg RTTLS course, serious accident study group seminar) to create a holistic education and training package.

Focus on:

- Motorsport environment awareness (Circuit craft)
- Context specific theory and skills, clinical and extrication as well as race administration