

**TRB EMS Subcommittee ANB10(5)**

# **EMS Safety Summit 2012**

## **Safety Systems, Strategies and Solutions**

### **Alternative Vehicles: Motorcycles in EMS**

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# Motorcycles in EMS

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# Motorcycles in EMS





# The Motorcycle Medic



**TRB**



# Paramedic Motorcycle



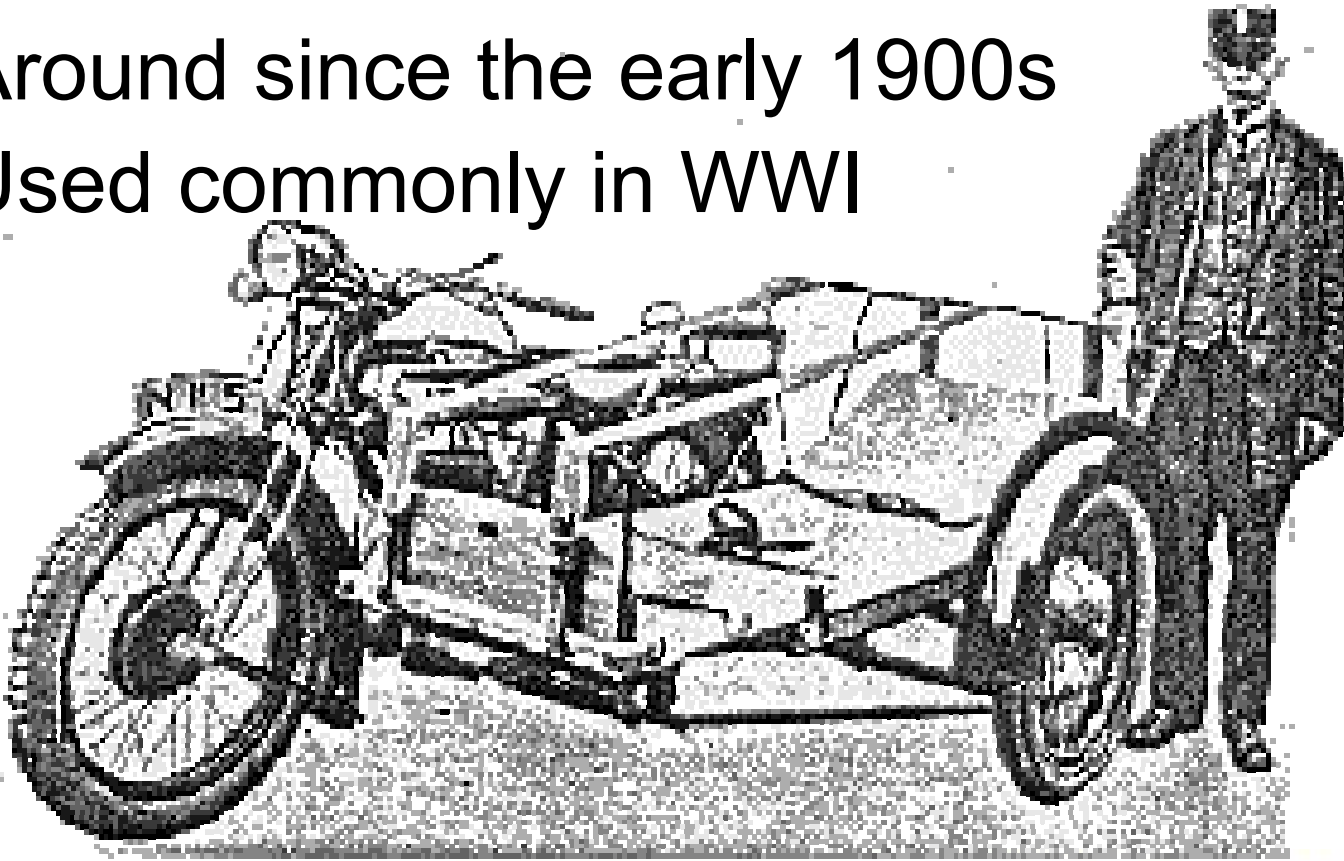
**Offered on e-bay  
(free shipping in UK!)**



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# Motorcycle EMS (not new!)

- Around since the early 1900s
- Used commonly in WWI



# Motorcycle EMS (not new!)

- Resurgence in interest isn't new
  - Hong Kong (since at least **1990**)
  - United Kingdom (since **1990**)
  - Singapore (since **1992**)

And its use is widespread.....



**Mar 23, 2009**

# London EMS

**The London Ambulance Service's has expanded  
it's motorcycle paramedic fleet  
with 12 Honda Pan European motorcycles**

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# Utrecht Netherlands



# Japan

- Japanese fire depts use off-road motorcycles as emergency vehicles



# Sao Paulo Brazil

- Deployed in two-man teams
  - the lead vehicle carrying a first aid kit & IV fluids
  - the rear vehicle carries more advanced equipment
- Hundreds more bikes ordered recently



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# Hong Kong Paramedic Motorcycle



**From 15 (in 2000) to 35 paramedic motorcycles (2008)**

# Australia

- “Response times as little as 3.5 mins vs **8 mins** for ambulances”
- “The ave response time for a motorcycle crew was 3 minutes, well below standard crew average of **10 mins**”



# Miami



- Results
  - 1,300 dispatched calls
  - for immediate life threatening calls  
**< 3 min response time (vs 6 - 8 mins with ambulance)**

# Nantucket's Special Ops Motor Medics



Motor Medic



Motor Medic

**The Motor Medics are located at key downtown districts  
Population goes from 6,000 to >60,000 in the summer**



<http://www.massfiretrucks.com/MASS%20N.htm>

# Motorcycle Special Events Team

- Volunteers supporting community events, providing on route emergency care & communications.





# Motorcycle Special Events Team

- A registered First Responder Org
- State certified & credentialed providers
- Medical Direction under the Austin/Travis County EMS System



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# Motorcycle Special Events Team



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# Faster Response Times?

- What is the published evidence?



# Singapore Study

- Simultaneous dispatch - Ambulances average **4.96 mins** longer than motorcycles ( $p < 0.001$ , 95% CI 2.61-7.31)

**Marcus Ong, Yiong Huak Chan, Venkataraman Anantharaman. Improved Response Times with Motorcycle Based Fast Response Paramedics in an Urban Setting. SGH PROCEEDINGS. 2003;2(3): 214-219.**

# Response Times

- In a congested urban setting (Taiwan)
  - Motorcycles simultaneously dispatched with an ambulance arrived on scene **1.4 minutes** sooner during rush hour and **0.9 minutes** faster in non-rush hour traffic

Lin CS, Chang H, Shyu KG, Liu CY, Lin CC, Hung CR, Chen PH. A method to reduce response times in prehospital care: the motorcycle experience. Am J Emerg Med 1998;16:711-713

# Response Times

- In Portugal
  - **63%** of cases of simultaneous dispatch resulted in the motorcycle arriving **before** the ambulance

**Soares-Oliveira M, Egipto P, Costa I, Cunha-Ribiero LM.  
Emergency motorcycle: has it a place in a medical emergency system?  
Am J Emerg Med 2007;6:620-622.**

# Response Times

- A Dutch study
  - found a **2 minutes faster** response time for motorcycles distances up to 7 kilometers

**Veen AA van der, Zwakhals SLN, Hazelzet-Krans B, Manen JW van. Niet zonder zorg, een onderzoek naar de doelmatigheid en kwaliteit van de ambulancezorg. RIVM rapport (Not without care, a study of efficiency and quality ambulance care. RIVM Report) 270556002 2001.**

# Response Times

Does it matter?



# Norwegian Study

- In Oslo 3 patients were resuscitated by the motorcycle responders prior to the arrival of the ambulance and 2 achieved ROSC

**Nakstad AR, Bjelland B, Sandberg M. Medical emergency motorcycle – is it useful in a Scandinavian Emergency Medical Service? Scand J Trauma Resusc Emerg Med. 2009 17(1):9 <http://www.sjtrem.com/content/17/1/9>**

# Outcomes

- To date few studies have addressed and most are seriously underpowered
- Most focus on response times

But wait there is more....

# You Call – We Haul



**This needs to stop**

# Non Transports

- City of Akron in 2011 had a 30% (8783/28,853) non-transport rate (refusals, medics initiated non-transport, DOA etc)

# Assessment

- In unclear calls/invalid assists or those felt unlikely to need an ambulance the Motorcycle Medic can assess **without tying up an ambulance**

# Ambulance Sparing

- In Oslo
  - 1/3 of all motorcycle dispatches were specifically dispatched to clarify the need for transport
  - another 1/3 was dispatched as the closest available unit.

**Nakstad AR, Bjelland B, Sandberg M. Medical emergency motorcycle – is it useful in a Scandinavian Emergency Medical Service? Scand J Trauma Resusc Emerg Med. 2009 17(1):9**



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# Ambulance Sparing

- **In almost 1/4 (23.5%) of all motorcycle missions ambulance use was avoided!**

**Nakstad AR, Bjelland B, Sandberg M. Medical emergency motorcycle – is it useful in a Scandinavian Emergency Medical Service? Scand J Trauma Resusc Emerg Med. 2009 17(1):9**

# Treat and Release

- Lin (Taiwan) had a **32% non-transport rate**
  - but the ambulance was dispatched along with the motorcycle and was therefore always readily available for transport

Lin CS, Chang H, Shyu KG, Liu CY, Lin CC, Hung CR, Chen PH. A method to reduce response times in prehospital care: the motorcycle experience. *Am J Emerg Med* 1998;16:711-713



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# Treat and Release

- In Portugal 18% of motorcycle medic cases the patient were not transported

**Soares-Oliveira M, Egipto P, Costa I, Cunha Ribiero LM. Emergency motorcycle: has it a place in a medical emergency system? Am J Emerg Med 2007;6:620-622.**

# Dutch Study

- 1842 total emergency dispatches:
  - 1664 were primary dispatches
    - **468** by the motorcycle (often roaming)
    - **1196** by ambulance (in station mostly)
  - 178 in response to requests for assistance by the originally dispatched unit

Van der Pol H, Mencl F, de Vos R. The Impact of an Emergency Motorcycle Response Vehicle on Prehospital Care in an Urban Area. *Eur J Emerg Med* 2011 18(6)328-333.

# Transport & Treat and Release

	TRANSPORTED	REFERRED TO HOSPITAL BY OWN MEANS
MOTORCYCLE	<b>40%</b>	<b>9%</b>
AMBULANCE	<b>72%</b>	<b>1%</b>

**Remainder were released**



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# Treat and Release

- More likely to occur when the motorcycle medic responded irrespective of complaint!
- Except the elderly – they were more likely to be transported irrespective of response mode



# Emergency Call

- In the first few minutes you don't usually need ....



# Emergency Call

- The maximum response option is usually unnecessary, frequently dangerous and always costly





# Emergency Call



- But you do need .....



- Can be delivered by a motorcycle medic



# What About?

- Additional uses:
  - Locked in/lonely (freq callers)
  - Invalid assists
  - Nontransports and refusals
- Excellent PR and good QA



# Take Home Points

- They are fast, highly mobile and may make a difference when response times matter

# Take Home Points

- Provide a highly mobile and rapid extra set of hands for back up to ambulance crews

# Take Home Points

- Motorcycles provide more response options for less than adding another ambulance!
- And provide follow-up options as well



**And If  
Motorcycles  
Make  
you  
Nervous**

# The future?

Rural Patient Transport Device - AmbiCycle™



US Patent Pending Jan 09  
Dr. Mark E. Benden CPE  
Dr. Eric Wilke