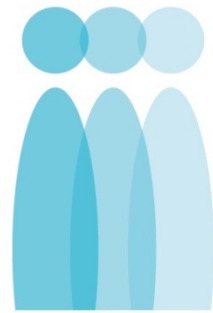




# **Can Advanced Paramedics Diagnose Patients in the Field and Accurately Predict Admission into Hospital?**

**An Observational Study of Advanced Life  
Support Interventions by Advanced Paramedics  
in the HSE Mid Western Area**

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## **Advanced Paramedic Clinical Activity Study (APCAS)**



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# Background

- Until recently, provision of emergency prehospital medicine in Ireland provided only by Emergency Medical Technicians (EMTs) and more recently, Paramedics
- In last five years Advanced Life Support Paramedics (AP's) have been introduced
- Intention of increasing the level of care brought to the public in the out of hospital setting
- In other nations, APs have been in operation for many years

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- Numerous studies conducted to attest to effectiveness and necessity of AP's
  - 2008 UK study found admission prediction – sensitivity 71% (65-78%), specificity 77% (71-81%) – ‘reasonable accuracy’<sup>1</sup>
  - Higher qualification, training, and experience of ALS personnel increased survival after OHCA and improve status with cardiac chest pain and respiratory failure.<sup>2</sup>
  - 2006 American study found paramedic prediction rates of the following<sup>3</sup>:
    - Cardiac cases with a sensitivity of 86% and specificity 86%
    - Respiratory cases with a sensitivity of 71% and specificity 93%
    - All other cases with a sensitivity of 82% and specificity 91%

1. Clesham et al 2008
2. Fischer et al 2010
3. Ackerman 2006



# Introduction

- No similar studies in Ireland
- €100,000 per ALS trainee & costs of operating an ALS ambulance
- Could potentially provide significant feedback to both ALS paramedics and their instructors
- Identify areas of weaknesses and strengths in current ALS training and point to future program development in this region.




# Objectives

- To compare the initial diagnosis reached by the ALS practitioner with the diagnosis of the hospital physician
- Determine if APs can predict whether or not patient will be admitted to hospital



# Methods


- A data collection log was issued to participating AP's to prospectively collect certain specifics of each call.
- This form provides documentation of:
  1. Call times
  2. Advanced interventions used
  3. The initial clinical diagnosis
  4. Admission required (yes/no)
- Data collection time: December 1<sup>st</sup>, 2008 to May 1<sup>st</sup> 2009


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- The hospital diagnosis within 24 hours of admission was obtained
  - Patients still received standard care according to Pre-Hospital Emergency Care Council issued Clinical Practice Guidelines
  - Ethical Approval sought and received from MWRH Complex Scientific Research Ethics Committee Protocol



## Results

- 17 Advanced Paramedics in the Mid-West Region were invited to participate.
- The total number who participated is unknown as data sheets were not coded for each AP
- The Control Room reported 2145 ASI calls were responded to by APs in the Mid West during the six months
- 1369 ASI calls were recorded by AP's
- Form completion rate for all ASI calls of 64%

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- The total number of patients who were seen or attended to by a GP prior to the arrival of the Ambulance was 451 (197 or 14% of ASI calls)
  - The number of ASI call patients available for analysis who had **not** been seen by a GP prior or during the attendance of the ambulance crew was 1,165.
  - Clinical impression recorded on 1249 forms

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- The number of patients **not** seen by a GP who had both a clinical impression recorded by the AP **and** a hospital diagnosis available was 792



## Concordance between Advance Paramedic's Clinical Impression and that recorded in Emergency Department Diagnosis

	Result	Frequency
Concordance between AP clinical impression and hospital clinical impression	YES	562 (71.0%)
	NO	230 (29.0%)
	Total	792 (100%)

# Concordance Rate between Advanced Paramedic Opinion on admission and Final Outcome

		Admitted to Hospital		Total
		Yes	No	
AP stated that patient would require admission to Hospital	Yes	279	163	422
	No	86	313	399
	Total	365	476	841

Sensitivity	76%
Specificity	66%



# Discussion

- Still early days of study analysis
- Results similar to that of other international studies classified as reasonable accuracy
- AP training off to seemingly good start
- Need to further analyze diagnosis prediction data to determine strengths and shortfalls
- Limitations – includes only a small pool of AP's, may have had only a small group out of pool participate
- Future directions - Could potentially develop protocols for hospital by-pass protocols that would be reliant upon AP's clinical assessment



# Conclusion

- Reasonable accuracy of prediction of admission and diagnosis
- In future could take the findings and identify weaknesses in training and clinical assessment
- Potentially modify AP protocols to allow greater freedom in decision making for treatment options



# References

1. Clesham K et al. Can emergency medical service staff predict the disposition of patients they are transporting? (2008), *Emerg Med J* 25:691-694
2. Fischer M et al. Comparing emergency medical service systems – A project of the European Emergency Data Project. (2010), doi:10.1016/j.resuscitation.2010.11.001
3. Ackerman R and Waldron R. Difficulty Breathing: Agreement of Paramedic and Emergency Physician Diagnosis (2006), *Prehospital Emerg Care* 10(1): 77-80.