

Abstracts

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01 IS THE PATIENT ALERT?

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Introduction: The Advanced Medical Priority Dispatch System (AMPDS) is currently used by over 90% of the statutory ambulance services in the United Kingdom. This system uses a systematic method of questioning the caller to triage emergency calls made to the control rooms. In 19 out of the 32 protocols used, the question 'Is the patient alert (able to talk)?' is asked. If the response is 'no' then most ambulance services allocate their highest response to the call. Feedback from operational and control room staff suggest that in the majority of cases, where the call is not trauma related, this information is inaccurate and that the call is heavily over-prioritised, stretching resources and adversely affecting performance.

Objectives: To determine whether the information obtained by the AMPDS question 'Is the patient alert?' confirms the ambulance crews findings (recorded on the patient report form using the AVPU scale) upon their arrival at scene.

Methods: Based on feedback from staff, four 'not alert' determinants that did not relate to trauma calls were selected. A consecutive sample of 325 call records that had been allocated these determinants from the first week of December 2000 was identified. The control room (AMPDS) documentation and the patient report form were compared to determine whether the AMPDS information matched the findings of the ambulance crew. The results were documented on a Microsoft® Excel® spreadsheet.

Findings: From the 325 calls collated, 65 were inappropriate for analysis. Of the 260 cases analysed, the patient was fully alert in 86% (SD±7.6) of cases, verbally responsive in 9% (SD±4.3) of cases, 4.5% (SD±3.4) of the time the patient was responsive to pain only and in 0.5% (SD±0.5) of cases the patient was unresponsive. There was no evidence documented by any ambulance crew to indicate that the patients condition had improved prior to their arrival, as has been evident in other internal audits.

Conclusions: This was a small audit undertaken during a single time period, with the aim of identifying a trend. It was evident that the four determinants analysed were over-prioritised. The question, in its present format, generates misleading answers from the caller and results in inaccurate information being passed to the ambulance crew responding. With these four determinants producing 3% of the total workload and constituting over 9% of those calls allocated the highest response (LAS internal data) there is the potential for an inappropriately high level of resources to be targeted to these calls with the associated cost and planning implications, to the detriment of true life-threatening injuries and illnesses.

02 ACCURACY OF INFORMATION PROVIDED TO AMBULANCE CREWS

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Background: The London Ambulance Service uses the Advanced Medical Priority Dispatch System to provide protocol questioning of callers and identify the urgency of patient's needs. Feedback from ambulance crew staff suggests that the information provided to the crew by Central Ambulance Control (CAC) does not accurately describe the condition of the patient as found on scene.

Objective: To determine how often the description provided to the ambulance crew matches the condition of the patient as found on scene.

Methods: The Patient Report Forms (PRFs) for all emergency calls for one ambulance station for one week were assessed independently by four members of LAS staff (Paramedic, Medical Director, CAC Manager and Researcher) to judge whether the description recorded for "Call Given As" matched the patient information entered by the crew at scene. Incidents were excluded from the study if; the ambulance was cancelled, the PRFs had insufficient information for a judgement to be made or the call was a hoax.

Results: Of the 103 PRFs assessed the results were:

- 85 accurate (unanimous)
- 5 accurate (majority)
- 7 inaccurate (unanimous)
- 4 inaccurate (majority)
- 2 with panel equally divided (2 accurate and 2 inaccurate)

Limitations: There may have been information passed to the crew that was not recorded on the PRF. In some cases the condition of the patient may have changed.

Conclusion: Given the limitations of obtaining patient information from 999 callers, the resulting information received by vehicle crew staff is frequently accurate (87%). The reasons for the inaccuracies will be explored.

03 ACCEPTABILITY OF EMERGENCY MEDICAL DISPATCH (EMD) TO PEOPLE WHO CALL 999 TO REQUEST AN AMBULANCE

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Introduction: One of the potential benefits of Emergency Medical Dispatch (EMD) systems is the facility to give advice to 999 callers before an ambulance arrives. We conducted a before and after study to determine the acceptability of EMD to people who call the 999 service to request an ambulance.

Methods: Postal questionnaire to two systematic samples of approximately 500 named callers to one ambulance service before and one year after the implementation of EMD.

Results: Response rates to the surveys were 72% before and 63% after implementation of EMD. The proportion of respondents very satisfied with the service in general increased from 71% (238/336) to 79% (220/277). The proportion of callers who were very satisfied with the call increased from 78% (268/345) to 86% (247/287). The proportion of callers who reported receiving first aid advice increased from 7% (23/323) to 43% (117/272) and general information from 13% (41/315) to 58% (157/269). Satisfaction with the amount of advice given increased while satisfaction with the response times remained stable at 6% (254/320) before and 78% (217/279) after EMD. Written comments by some callers did criticise some of the advice given as unnecessary, while in a few cases there was discordance between the ambulance crew and caller regarding the importance of the problem.

Conclusion: Introducing EMD increases the amount of first aid advice and general advice given to callers, and satisfaction with these aspects of the service, while maintaining satisfaction with response times. Overall satisfaction with the service increased, although some changes may be necessary to prevent a small amount of dissatisfaction associated with EMD.

04 A RETROSPECTIVE ANALYSIS OF ROAD TRAFFIC RELATED DEATHS IN CAMBRIDGESHIRE, 1997-2000

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Background: Official statistics relating to road accident fatalities describe only the total number killed and the accident type. No information is currently collected regarding the time, place and cause of death.

Objectives and Methods: This study aimed to further describe the epidemiology of road accident fatalities in Cambridgeshire within the four-year period. A single database was created which included ambulance times and records, immediate care records, police accident data, and clinical notes for casualties who survived to hospital. Post mortem records were analysed to generate an injury severity score (ISS) and record the time and place of death. The predicted probability of survival (Ps) was calculated using TRISS methodology.

Results: There were 260 fatalities from 235 separate accidents. 163 (63%) casualties were confirmed dead at the accident scene, 31 were confirmed dead in the A&E department (mean 1½ hours) and a further 29 deaths occurred later in intensive care (mean 5 days). The overall mean time from the accident to the arrival at hospital was 60 minutes (n=76, SD=23min), with 29 casualties reported as trapped at scene. Over a quarter of road accident fatalities had sustained injuries that were incompatible with life (ISS=75). Potentially preventable deaths are discussed including eight people with a predicted probability of survival greater than 90%. The accident types and patient demographics are presented together with injury type and severity.

Conclusions: Most road accident fatalities occur within the first hour following an accident and out of hospital. There was no classical tri-modal distribution of time of death seen in this study. There were only a few cases of preventable deaths at scene or at hospital. The greatest scope for reducing road accident deaths may lie in primary prevention strategies that stop the accident occurring in the first place

05 IMPLEMENTATION OF TREAT AND REFER PROTOCOLS FOR AMBULANCE CREWS: OPERATIONAL IMPACT

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Introduction: In order to address evidence that many patients attended by emergency ambulance crews do not need to travel to an A&E, this ambulance service carried out a trial of protocols which allowed crews to leave appropriate patients at home with a referral or self-care advice. The aim of the protocols was to leave more patients at home, and to do so consistently and safely. Operationally, it was expected that without the need to convey, jobs would be shorter, and ambulance availability would improve.

Methods: Treat and Refer protocols were trialled between May and August, 2000. Patients coded with designated study illness codes (selected as likely to be appropriate for the new protocols) attended by crews from the intervention station and a neighbouring 'control' station were included. Operational impact was assessed by comparing conveyance rates and job cycle times for patients in the intervention and control groups.

Results: 797 patients were included (260 intervention, 537 controls). Protocols were reported as used for 110 patients. There were no age/sex differences between groups, but intervention patients were more likely to have been attended during the week ($\chi^2 = 4.28, p = .05$) and daytime ($\chi^2 = 6.75, p = .01$), and for a fall ($\chi^2 = 20.14, p = .01$). There was no difference in non-conveyance rate between patients in the intervention and control groups (95/260, 36.5% vs 195/537, 36.3%). The mean job-cycle time was 5.9 minutes longer for intervention than control group patients (53.3 minutes : 47.4 minutes; $t = 3.7, p < .001$). Within the intervention group, for non-conveyed patients, crews spent 16.3 minutes longer when a protocol was used ($p < .001$; 95% CI 7.8, 24.8).

Limitations: Patients were not randomised to treatment, and there were some differences between groups.

Conclusions: Contrary to expectation, with no impact on conveyance rates and longer job cycle times, ambulance availability may not improve following introduction of this initiative.

06 USE OF TREAT AND REFER PROTOCOLS BY AMBULANCE CREWS DURING A CONTROLLED TRIAL

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Introduction: With clear evidence that much of the workload of the emergency ambulance service is non-urgent in nature, this ambulance service introduced Treat and Refer (T&R) protocols for crews to use to leave patients at scene with an onward referral or self-care advice. With crews already leaving a significant proportion of 999 patients at scene, it was not known how crews would use these protocols which required using a systematic approach to assessment and triage.

Methods: Treat and Refer protocols were trialled between May and August, 2000. Patients attended by crews trained in their use and coded with designated study illness codes were included. Prehospital documentation was assessed retrospectively by the study A&E SpR to determine protocol applicability for each patient.

Results: Seventeen of the 23 protocols were reported as used 119 times, for 110 of the 260 patients included in the study. The SpR

judged a further 74 cases to have been appropriate for protocol usage, and judged 3 cases for which a protocol had been used to have been inappropriate for protocol usage. All 8 crew members who were trained and attended patients during the study period used the new protocols although the proportion of patients for whom the protocols were used varied widely between individuals (mean 42%, range 11–100%). The falls protocol was used 57 times, far more than any other protocol (the next most frequently used: 'soft tissue injury', 9 times). Protocol usage resulted in non-conveyance 49.5% of the time, compared to 27.2% of the time when protocols were not used ($\chi^2 = 13.69, p < .001$).

Conclusions: Treat and Refer protocols were used at least sometimes by all crews during the study period. Retrospective assessment by a clinician indicated that they could have been used for many more patients. It cannot be assumed that protocol usage necessarily raises the non-conveyance rate, nevertheless this suggests that further potential for impact remains.

07 A COMPARISON OF OXYGEN DELIVERY VIA DIFFERENT OXYGEN MASK SYSTEMS

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Introduction: The effects of oxygen supply rates, tidal volume, inspiratory flow rate and respiratory rate upon maximum, and mean oxygen concentrations delivered to the patient were studied in three types of oxygen mask. The performance of a simple Hudson mask was compared with the performance of a rebreathing mask and a second simple mask with no reservoir bag.

Method: A model respiratory system, which allowed variation in respiratory characteristics using a Michigan m11 test lung, driven by a Puritan Bennett pb7200 series ventilator and resusc Annie face, was used. Gas flow was measured using a pneumotach. Oxygen concentrations were measured using an oxygen analyser (datex multi-cap oximeter) placed between the face and model lungs equating to a tracheal oxygen sample assessment. The dead space was purged between breaths removing error attributable to oxygen remaining within the system. Oxygen delivery flow rates of 6, 10 and 14 l were studied in the three test masks over a range of physiological variables. Tidal volumes of 300, 500 and 800 ml. Inspiratory flow rates of 20, 40, 60 and 80 litres per minute. Respiratory rates of 10, 15, 20 and 25 breaths per minute.

Results: Maximum, mean and base oxygen concentrations were recorded from the tracheal sampler for the different test scenarios. Both maximum and mean oxygen concentrations remained relatively constant across the test parameters for the simple masks without reservoir bags mean oxygen percentages varied from 24 to 36.5%. The performance of these two masks was similar. The performance of the mask with a reservoir bag was dramatically affected by changes in inspiratory flow rate and tidal volume. The mean airway oxygen percentages of the non-rebreather mask varied from 32 to 75%.

Conclusions: The results illustrate a marked impact upon efficacy of oxygen delivery associated with changes in respiratory patterns. The clinical implications when using this oxygen delivery system in a variety of patients are potentially important. This study illustrates the extent to which changes in respiratory patterns may effect oxygen delivery and provides evidence to support a review of the choice of oxygen system used in different clinical scenarios.

08 COMMUNICATION DIFFICULTIES DURING 999 AMBULANCE CALLS

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Introduction and Aims: This study was conducted in order to determine the extent of communication difficulties occurring during calls for an emergency ambulance.

Method: Retrospective review of a sample of 999 calls to two ambulance control rooms.

Results: 1,830 calls were in the study. Communication problems were encountered in 482 calls (26%), of which 33% were due to the emotional state of the caller and 10% were attributable to the

call-receiver. Communication problems were more likely to be observed if calls were made from payphones or mobile phones (49.8%) as opposed to other phones (23.1%) ($\chi^2[1df]=71.2$, $p<0.001$) and less likely if the call was made by a health professional (9.5% vs. 28.6%, $\chi^2[1df]=26.4$, $p<0.001$). Only 2% of communication problems were attributable to callers not having English as a first language whereas 10% were attributable to strong regional accents, unclear or slurred speech. The extent of communication problems were associated with the caller being closely related as well as in close proximity to the patient.

Limitations: The two ambulance services chosen may not be representative of the whole country. It is possible that the case-mix generated during the winter differs from that during the rest of the year and that the extent of communication problems may vary by season.

Conclusions: Language difficulties are not a major source of communication difficulty. Mobile phones and payphones appear to be related to an increased level of communication problems. If available, terrestrial phones should be used for 999 calls. The distance from patient to caller may make receipt of information and ability to give first aid advice difficult in two-thirds of 999 calls. There is a need for more staff training to reduce communication difficulties related to the call-receiver.

09 THE PRE-HOSPITAL RECOGNITION BY PARAMEDICS OF INDICATIONS FOR THROMBOLYSIS FOR PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Objective: Heart disease is the major cause of death in Wales. Myocardial infarction accounts for most fatalities either acutely or as a result of late heart failure and unheralded sudden cardiac death. Prompt relief of new coronary occlusions by thrombolytic agents has been shown to reduce significantly both early mortality and morbidity from Acute myocardial infarction (AMI) and the pre-hospital delivery of these drugs is feasible; moreover does not carry any increased risks over delivery of the drug in the hospital. This study tests the hypothesis that paramedics can accurately and independently identify patients with acute myocardial infarction who are suitable for pre-hospital thrombolysis, and thus reduce the "call to needle" time.

Method: Paramedics from rural Wales were trained in the acquisition and recognition of 12-lead ECGs, and in the identification of the indications for thrombolytic therapy. Ninety-six consecutive patients, who were considered to be suffering from a cardiac related condition, were included in the study. The paramedics acquired a 12-lead ECG for all patients and using a list of inclusion criteria, decided if the patients were suitable for pre-hospital thrombolysis, noting the time the thrombolytic would have been administered. The sensitivity and specificity were calculated for the "notional" paramedic decision to administer a thrombolytic, compared with the actual treatment received by the patient in hospital.

Results: A specificity of 100% (95% CI 95.9% to 100%) was obtained, demonstrating that paramedics were unlikely to inappropriately select patients for pre-hospital thrombolysis. A sensitivity of 100% (95% CI 64.6% to 100%) was also obtained with a potential reduction in call to needle time of 41.2 minutes (95% CI 25.7mins to 56.9mins, $P=0.001$).

Conclusions: It was concluded that the paramedic selection of patients for the pre-hospital administration of a thrombolytic is both feasible and safe.

10 CLINICAL AUDIT: A COLLABORATIVE METHODOLOGY FOR THE SOUTH EAST AMBULANCE CLINICAL AUDIT GROUP (SEACAG) THAT WORKED!

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Introduction: Cardiac arrest survival figures published & unpublished to date have been from individual UK Ambulance Trusts and have reported large variations in survival. No UK Ambulance Trusts have collaboratively published out of hospital cardiac arrest survival data. SEACAG have overcome the complexities and challenges of different operating models to achieve a collaborative audit. Achieving pre-hospital collaboration is essential to ensure the NSF – CHD targets can be measured and reported by trusts in a clinically meaningful way.

Methods: Consensus meetings & group emails were used to agree audit objectives, Utstein definitions and the data collection tool. To encourage maximum participation, the audit was designed at two levels: Level One equalled twelve months' data collection (5 trusts) and Level Two one month's data collection (5 trusts). The audit covered the period 01 April 1999 – 31st March 2000. Analysis was undertaken in 2 stages to reflect the levels of participation.

Results: In total ten Trusts participated in the audit – 5 at level one and 5 at level 2. SEACAG are now able to collaboratively report cardiac arrest survival for 10 ambulance trusts for March 2000 and one year cardiac arrest survival for 5 trusts from April 99 – March 2000 with confidence that each service is using the same definitions and measures of survival.

Discussion: Many hurdles have been overcome to achieve this audit. Not least agreement on Utsteins definitions to achieve the required level of detail. Some services had to modify their patient report forms or data collection processes; others had to initiate all processes from scratch. The outcomes of the audit mark a major achievement in pre-hospital benchmarking in the UK. The lessons learnt should be reflected upon, widely disseminated, and used as a basis for national clinical improvement and benchmarking in the ambulance service.

11 DEVELOPING AN EXPERT CONSENSUS TO IDENTIFY 999 CALLS NOT REQUIRING AN EMERGENCY AMBULANCE RESPONSE

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Objective: Currently, an ambulance must be dispatched to every 999 call, regardless of its nature. Emergency calls are currently sorted into two categories of clinical urgency, using a decision support protocol (the Medical Priority Dispatch System). This research addresses the identification of patients suitable for a third, non-urgent, group (Category C) which would not require an emergency ambulance but could instead receive referral to more appropriate care.

Methods: A panel of ten physicians was recruited, with a background of Accident and Emergency Medicine, General Practice, or Pre-hospital Emergency Care. A Delphi technique was used to obtain member's views. A list of the 248 dispatch codes that represent the clinical findings identified during 999 calls was provided. Following a first round, anonymised results were sent to each expert with a request to increase consensus.

Results: Ultimately, 13 codes (5%) received a unanimous Category C recommendation, and 150 codes (60%) received a unanimous rejection. If majority voting (60% or greater agreement) was used to identify Category C codes, 54 (22%) were selected as such. This represents 12.44% of emergency calls per annum (95% CI 12.21 to 12.69%). The kappa statistic for the chance corrected proportional agreement of the expert panel members was 0.35 (fair) after the first round and 0.62 (substantial) after the second.

Conclusion: The dispatch codes recommended for inclusion in Category C represent an important proportion of 999 calls that could be referred to a more appropriate NHS provider. This could reduce inappropriate utilisation of emergency ambulances and Accident and Emergency Departments and the number of accidents involving emergency ambulances, and help to offset a consistently rising 999 call volume. Consequently, response times for patients with time-critical conditions may improve. However, given the low accuracy of expert opinion, further research is required to validate these recommendations before changing existing ambulance systems.

12 AN ALTERNATIVE RESPONSE VEHICLE (ARV): EVALUATION OF A PILOT SCHEME AT LONDON AMBULANCE SERVICE NHS TRUST (LAS)

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Introduction: Recent policy changes have allowed the pilot of alternative services to a full 999/A&E ambulance response. Analysis of regular 999 callers at LAS showed that routine maternity cases are common, and Alarm Line services regularly use 999 to gain 'assistance only' for clients who have fallen. Three areas of high demand, with supportive Alarm Line and maternity services,

were selected for a 1 year pilot, using two 'ARVs'. Protocols for Alarm Line, midwifery, and ambulance staff were developed, and calls received a 30 minute response. Calls classified as non-serious and non-urgent ('green') were also included in the pilot with a 19 minute response.

Method of evaluation: Quantitative data was collected on number of calls received and attended, potential workload from retrospective analysis of phone line and routine patient record information, and cost. Qualitative data was collected via a questionnaire on stakeholder views.

Results: Utilisation was low throughout the trial (mean 17%, peak 26%) with some early access and tasking difficulties. Cost was high by unit hour utilisation. No adverse clinical events occurred. Midwife feedback included some concern about women calling 999 directly, and the length of the protocols. Alarm Line client feedback was very positive. Frontline ambulance staff involvement and satisfaction was high.

Abstract 12 Number and type of calls attended

	Total Mar 00 to Feb 01			
	Assist	Maternity	Green	Total
Station 1	1516	11	724	2251
Station 2	1164	40	642	1846
Other	7	0	3	10
Total	2687	51	1369	4107

Limitations: No control group.

Conclusions: The introduction of this new service has proved very popular with clients and staff. An 'alternative response' model is recommended, improving cost-effectiveness by use of different vehicles, and increasing utilisation rate, whilst continuing to monitor clinical safety, effectiveness and acceptability of any widened protocols.

13 BLUE LIGHT BICYCLES: EVALUATION OF A CYCLE RESPONSE UNIT (CRU) PILOT SCHEME

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Introduction: The concentration of emergency calls and high non-conveyance rates in some heavily congested and pedestrianised areas of central London, lead a Qualified Ambulance Technician to propose a CRU. A working group addressed optimum geographical area, legal issues, police collaboration, operating and tasking procedures, health and safety, vehicle and equipment, and publicity. One CRU was piloted for 10 weeks in a 1km area of central London.

Methods: The evaluation consisted of: (1) Retrospective analysis from ambulance records of response and job cycle times, AMPDS categories, CRU and local area Category A performance. (2) Ongoing feedback from stakeholders on equipment, risk, clinical care and perceptions.

Results: The CRU responded to 142 calls, approximately 1 call every 2 hours. Under utilisation occurred, with a mean potential activation of 11 calls per shift. Mean response time was 6.8 minutes, with 86% of Category A calls responded to within 8 minutes. Category A performance in the area improved from 53.6 to 56.5%. The CRU was on scene first in 88%, cancelled the ambulance in 16%, and the patient was not conveyed in a further 18% of cases. Level of risk was deemed to be acceptable with changes to clothing and slower speeds in hours of darkness. Feedback from patients, public, staff and press was very positive. Cost comparisons with a fast response car are favourable to the CRU.

Limitations: This was implemented as a service development with no control. Patient satisfaction was not sought in a structured manner.

Conclusions and recommendations: The LAS should carry out a full cost effectiveness analysis and if favourable implement a team, with the possibility of further teams, in order to maximise the positive clinical (patient) and operational benefits. Tasking of the CRU must be consistent. The importance of carrying out fully evaluated pilot schemes must be promoted.

14 PREHOSPITAL EMERGENCY CARE OF ASTHMA PATIENTS: CONTINUING THE AUDIT SPIRAL

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Introduction: A 1995 audit of emergency prehospital asthma care indicated undertreatment of asthma associated with:

- under-recognition
- lack of observations
- narrow treatment protocols.

Protocols and training were revised in line with British Thoracic Society guidelines for management of acute asthma. A re-audit was carried out to assess the impact of the changes.

Methods: Prehospital and A&E documentation were collected for patients administered nebulised prehospitally in the catchment area of three hospitals or diagnosed with asthma at the A&E department of those hospitals January to March 1999. Data were compared with findings from the first audit.

Results: The number of patients included more than doubled (1999: n = 537, 1995: n = 252), mainly due to a large increase in patients administered salbutamol and diagnosed with COPD in A&E (1999: 163/339; 1995: 15/204). The proportion of patients diagnosed with asthma at A&E who received nebulised salbutamol prehospitally increased from the first audit from 58% (110/189) to 75% (131/177) ($\chi^2 = 11.9$, $p = .001$), although this leaves a number not treated (1999: 24%; 1995 42%). In 1999 in many of these cases, key observations were missing (peak flow 84%; respiratory rate, 65%; pulse rate 21%). Overall, prehospital documentation of observations did not improve (1999: peak flow 145/537, 27%; respiratory rate 288/537, 54%; pulse rate 502/537, 93%. 1995: 115/252, 46%; 131/252, 52%; 181/252, 72%).

Limitations: In both audits the proportion of patients for whom an A&E diagnosis could not be found was high.

Conclusions: Changes in protocols and training appear to have resulted in more appropriate treatment of patients with asthma although many other patients also now receive nebulised salbutamol. The need for clear documentation should be re-emphasised and monitored through continuous clinical supervision and documentation review as some patients who should be treated for asthma are still missed.

15 EMERGENCY (999) CALLS TO THE AMBULANCE SERVICE THAT DO NOT RESULT IN THE PATIENT BEING TRANSPORTED TO HOSPITAL: AN EPIDEMIOLOGICAL STUDY

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Background: In the UK, approximately 20% of emergency (999) calls are not transported to hospital after an emergency ambulance has attended the scene of the incident. While it has been suggested that some of these calls could be more appropriately managed by an alternative response, little is known about this group of patients or the priority assigned to the initial 999 call.

Objective: To describe the demographic and clinical characteristics of patients who are not transported to hospital following an emergency (999) call to the East Midlands Ambulance Service, and the priority assigned when the ambulance is dispatched.

Methods: The first 500 non-transported patients from 1st March 2000 were identified from the ambulance service command and control data. Epidemiological and clinical data were then obtained from the patient report form completed by the attending ambulance crew and compared with the initial priority dispatch (AMPDS) code that determined the urgency of the ambulance response.

Results: Data were obtained for 497 patients over a six week period. The age distribution showed a bimodal distribution with peaks in early adulthood and in those over 65 years. Females accounted for 54% of cases and 17% lived alone. Of the 418 cases where AMPDS codes were available, 26% were assigned an AMPDS delta code (the most urgent category) at the time the call was received. Falls

accounted for 34% of all non-transported calls. This group of patients were predominantly elderly (over 70 years old), 59% were female and 33% lived alone. The majority (89%) were identified as less urgent (coded AMPDS alpha or bravo) at telephone triage. Non-specific illnesses accounted for 10% of calls and alcohol intoxication was the primary diagnosis in 6% and a further 4% were linked to alcohol. The mean time that an ambulance was committed to each non-transported call was 34 minutes.

Conclusions: This study shows that falls in the elderly account for a significant proportion of non-transported 999 calls and are often assigned a low priority when the call is first received. There could be major gains if these patients could be triaged to an alternative response, both in terms of increasing the ability of the ambulance service to respond faster to clinically more urgent calls and improving the cost-effectiveness of the health service. The AMPDS priority dispatch system has been shown to be sensitive but this study suggests that its specificity may be poor, resulting in rapid responses to relatively minor problems. More research is required to determine which AMPDS codes reliably and safely identify 999 calls where an alternative to an emergency ambulance would be a more appropriate response.

16 SURVIVAL FROM OUT-OF-HOSPITAL CARDIAC ARREST IN GREATER LONDON

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Introduction: The London Ambulance Service NHS Trust (LAS), as part of its commitment to improving patient care and promoting evidence-based practice, conducts a continuous audit of attended out-of-hospital cardiac arrests.

Methods: Clinical, operational and outcome measures were collected for every patient who had suffered an out of hospital cardiac arrest in Greater London between January 1998 – December 1999. During this period, the LAS attempted to resuscitate 7955 patients whose cardiac arrest was of presumed cardiac etiology. Data were collected and are reported in accordance with the Utstein recommendations.

Results: The typical cardiac arrest patient was male (65%) with an average age of 67 years. The majority of cardiac arrests (68%) occurred in the home. However, an arrest was more likely to be witnessed when it occurred in public. Despite the high number of arrests in public that were bystander witnessed (63%), only 33% of these patients received bystander CPR. When bystander CPR was initiated, patients were over 1½ times more likely to survive than those whose CPR was delayed until the arrival of the ambulance crew (3.4% v. 2.1%). Analysis of ambulance response times revealed that 37% of cardiac arrests were attended within 8 minutes of the call for emergency help; and 13% of those who presented with a shockable cardiac rhythm received the first LAS defibrillatory shock within 8 minutes of the call for help. In total, 119 patients survived to be discharged from hospital. Using the Utstein recommended calculation of survival, the survival rate from out-of-hospital cardiac arrest was 2.5%.

Conclusions: The findings support the chain of survival concept and highlight the importance of bystander CPR and the need for a public education programme that both informs and encourages the use of basic life support techniques. The findings also emphasise the need for faster response intervals.

17 A STUDY TO EVALUATE THE EDUCATION AND TRAINING OF PARAMEDICS IN AN INNER-CITY AMBULANCE SERVICE

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Introduction: Anecdotal reports suggest that paramedics are dissatisfied with their education and training. For example: trainees were made to feel 'not up to the task', experiencing feelings of ridicule, embarrassment and humiliation. Furthermore, paramedics stated that certain instructors were intimidating, overly didactical and, that they were treated like children attending compulsory education.

Aims: (1) To assess and evaluate andragogy as an alternative to pedagogy. (2) To confirm the premise that paramedics are dissatisfied with the delivery of their education and training. (3) To investigate the relationship between theory and practice and the adaptation of skills to pre-hospital emergency care (assessment or diagnosis).

Literature review: The literature review has identified the necessary teaching strategies required for a transition from one of pedagogy to andragogy. And, moreover, how a suitable andragogical model can successfully be applied to the education and training of future paramedics.

Methods: Qualitative. N=9 interviews were conducted, followed by a focus group discussion (n=7). Qualitative techniques were deemed best suited for eliciting the paramedics' perceptions on how trainees, attending an adult course, should be educated. Quantitative. A questionnaire was designed as a means for data collection which asked for age, sex, experiences and expectations. The questionnaire was self-administered to ensure a high rate of return and the data was entered into SPSS for analysis.

Results: N=9 paramedics (mean age 37.5) met the participation criterion (place of training) and n=55 (93.2%) returned questionnaires. 31 (56.4%) stated that they were shouted at abusively during training and 13 (23.6%) believed that they were 'definitely' treated like children. Moreover, 42 (76.4%) were made to feel that they were 'not up to the task'. However, 6 (10.9%) paramedics felt that the curriculum met their needs and expectations, unfortunately, 14 (25.5%) 'definitely' did not.

Conclusions and Recommendations: It is believed that the services teaching strategies are inappropriate for today's paramedics, and that a modern alternative approach to an authoritarian pedagogical style of education and training should be considered: Andragogy.

18 MINOR PSYCHIATRIC DISORDER AMONGST EMERGENCY AMBULANCE PERSONNEL: RESULTS OF A 'VIOLENCE AT WORK STUDY': ONE YEAR ON (AMBEX 2000 TO 2001)

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Introduction: Results from a 'violence at work' study (poster presentation, Ambex 2000) has demonstrated an association between abuse and the 'general health' of paramedics and EMTs. However, further analysis of the General Health Questionnaire (GHQ 12) has revealed that more than half of the respondents are suffering from, 'Minor Psychiatric Disorder' (MPD).

Aim: To examine and assess psychological morbidity amongst emergency ambulance personnel.

Methods: Quantitative health data was obtained by administering a questionnaire (GHQ 12) to all paramedics and EMTs throughout Cardiff and the Vale. The GHQ 12 asked questions on their well being, which was assessed for significant correlation between health variables. Finally, the GHQ 12 was scored for evidence of staff suffering from MPD.

Results: From n=98 eligible staff, n=94 (96%) returned questionnaires. Descriptive analysis showed that 53.2% of staff were feeling unhappy and depressed, and 56.3% felt constantly under strain. The Pearson correlation coefficient revealed that depression was strongly related to feelings of worthlessness ($r=0.566$) [$P<0.05$], and a loss of confidence ($r=0.629$), [$P<0.01$]. Psychological morbidity was scored significant at levels above 3 (>3). Data analysis has revealed that nH (51.1%) of emergency personnel had scored >3. Moreover, this compares to previous studies, within the NHS, where doctors (27.8%) were classed as 'cases', alongside other paramedical disciplines such as, radiologists (27%).

Conclusion: Clearly, this investigation has shown that ambulance paramedics and EMTs score significantly higher than other NHS staff. Therefore, questions need to be asked why these results appear so high. Those 'trying to prove a point', may have introduced bias; however, the results may also be genuine and therefore, reflecting real psychological morbidity amongst emergency ambulance personnel. It is recommended that further investigations be conducted to assess and measure the extent of psychiatric disorder within ambulance services, so that the appropriate interventions to address psychological morbidity can be implemented.