

**Findings** Two main themes were determined: health promotion as part of the role of emergency care staff; barriers to health promotion in the emergency care setting.

The study findings indicate that staff working in emergency care have the time to engage with health promotion activities and see it as part of their job. They reported understaffing and lack of knowledge in the breadth of topics they may have to engage with as barriers.

**Conclusions** A system-wide approach to health promotion in these clinical settings could provide staff with the training and framework (educational support, support from clinical managers, resources for in-house education and dissemination of information e.g., leaflets/apps) that they need to support their patients by incorporating health promotion activities into the routine processes of care.

The findings of this qualitative scoping study underpin the promotED study (funded by the NIHR) to explore barriers to health promotion advice delivered by staff working in urgent care and emergency departments.

#### PP28 AN ANALYSIS OF NHS 111 DEMAND FOR PRIMARY CARE SERVICES: A RETROSPECTIVE COHORT STUDY

<sup>1</sup>Richard Pilbery, <sup>2</sup>Madeleine Smith, <sup>3</sup>Jonathan Green, <sup>4</sup>Dan Chalk, <sup>5</sup>Colin O'Keeffe. <sup>1</sup>Yorkshire Ambulance Service NHS Trust, UK; <sup>2</sup>NHS Devon, UK; <sup>3</sup>University of Plymouth, UK; <sup>4</sup>University of Exeter, UK; <sup>5</sup>University of Sheffield, UK

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**Background** The NHS 111 service triages over 16,650,745 calls per year and approximately 48% of callers are triaged to a primary care disposition, such as a telephone appointment with a general practitioner (GP). However, there has been little assessment of the ability of primary care services to meet this demand. If a timely service cannot be provided to patients, it could result in patients calling 999 or attending emergency departments (ED) instead.

This study aimed to explore the patient journey for callers who were triaged to a primary care disposition, and the ability of primary care services to meet this demand.

**Methods** We obtained routine, retrospective data from the Connected Yorkshire research database, and identified all 111 calls between the 1st January 2021 and 31st December 2021 for callers registered with Bradford or Airedale GP, who were triaged to a primary care disposition. Subsequent healthcare system access (111, 999, primary and secondary care) in the 72 hours following the index 111 call was identified, and a descriptive analysis of the healthcare trajectory of patients was undertaken.

**Results** There were 56,102 index 111 calls, and a primary care service was the first interaction in 26,690/56,102 (47.6%) of cases, with 15,470/26,690 (58%) commenced within the specified triage time frame. Calls to 999 were higher in the cohort who had no prior contact with primary care (58% vs 42%) as were ED attendances (58.2% vs 41.8), although the proportion of avoidable ED attendances was similar (10.5% vs 11.8%).

**Conclusion** Less than half of 111 callers triaged to a primary care disposition contact a primary care service, and even when they do, call triage time frames are frequently not met, suggesting that current primary care provision cannot meet the demand from 111.

#### PP29 MODELLING 111 DEMAND FOR PRIMARY CARE SERVICES USING DISCRETE EVENT SIMULATION

<sup>1</sup>Richard Pilbery, <sup>2</sup>Madeleine Smith, <sup>3</sup>Jonathan Green, <sup>4</sup>Dan Chalk, <sup>5</sup>Colin O'Keeffe. <sup>1</sup>Yorkshire Ambulance Service NHS Trust, UK; <sup>2</sup>NHS Devon, UK; <sup>3</sup>University of Plymouth, UK; <sup>4</sup>University of Exeter, UK; <sup>5</sup>University of Sheffield, UK

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**Background** Almost half of the 16,650,745 calls to NHS 111 each year are triaged to a primary care disposition. However, there is evidence that contact with a primary care service occurs in less than 50% of cases and triage time frames are frequently not met. This can result in increased utilisation of other healthcare services.

This study aimed to model *in-silico* the current healthcare system for patients triaged to a primary care disposition and determine the effect of reconfiguring the system to ensure a timely primary care service contact.

**Methods** Data from the Connected Yorkshire research database, consisting of all 111 calls made in 2021 by callers registered with Bradford or Airedale GP who were triaged to a primary care disposition, and subsequent healthcare system access in the 72 hours after the index 111 call, were used to develop a model and Discrete Event Simulation in Python, using the SimPy package.

We simulated 100 runs of one year of 111 calls and calculated the mean difference and 95% confidence intervals in primary care contacts, 999 calls and avoidable ED attendances.

**Results** The simulation of the current system estimated that there would be 39,283 (95%CI 39,237–39,328) primary care contacts, 2,042 (95%CI 2,032–2,051) 999 calls and 1,120 (95%CI 1,114–1,127) avoidable ED attendances. Modifying the model to ensure a timely primary care response resulted in a mean increase in primary care contacts of 37,748 (95%CI 37,667–37,829), a mean reduction in 999 calls of -449 (95%CI -461– -436) and a mean reduction in avoidable ED attendance of -26 (95%CI -35– -17).

**Conclusion** The model suggests that timely contact with a primary care service reduces 999 calls, but has minimal impact on avoidable ED attendance, and is likely impractical given that primary care service capacity would need to double.

#### PP30 EXPLORING AMBULANCE AND EMERGENCY DEPARTMENT CLINICIAN EXPERIENCES OF CAPILLARY BLOOD KETONE METER USE IN THE AMBULANCE SETTING: SEMI-STRUCTURED INTERVIEWS

<sup>1</sup>Larissa Prothero, <sup>1</sup>Thomas Strudwick, <sup>1</sup>Theresa Foster, <sup>2,6</sup>Ketan Dhatariya, <sup>3</sup>Adrian Boyle, <sup>3</sup>Andrea Lake, <sup>4</sup>Julia Williams, <sup>5,6</sup>Gerry Rayman. <sup>1</sup>East of England Ambulance Service NHS Trust, Barton Mills, UK; <sup>2</sup>Norfolk and Norwich University Hospitals NHS Foundation Trust, Norwich, UK; <sup>3</sup>Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK; <sup>4</sup>University of Hertfordshire, Hatfield, UK; <sup>5</sup>East Suffolk and North Essex NHS Foundation Trust, Ipswich, UK; <sup>6</sup>University of East Anglia, Norwich, UK

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**Background** KARMA2 was a feasibility study which explored whether ambulance clinicians could reliably and safely identify diabetic ketoacidosis (DKA) using capillary blood ketone meters and commence fluid therapy (0.9% saline) in accordance with the study protocol, to determine if a large-scale clinical trial was warranted. One aim of this study was to understand the experiences of ambulance and hospital

clinicians regarding ambulance hyperglycaemia care and impacts of blood ketone meter use.

**Methods** During May to September 2022, twenty online, semi-structured qualitative interviews were carried out with emergency care staff involved with the KARMA2 study: a convenience sample was obtained comprising 10 ambulance paramedic and non-paramedic participants and 10 Emergency Department (ED) doctors and nursing staff employed at study partner hospitals. Following transcription, interviews were analysed using an inductive thematic approach.

**Results** Ambulance staff reported positive experiences using capillary blood ketone meters and considered them a beneficial diagnostic tool for DKA recognition, commencement of fluid therapy for 'high-risk DKA', improved clinical handovers and safety-netting. There appears to be scope for improved ambulance hyperglycaemia education - 'sick day rules' and euglycaemic DKA were unfamiliar for most. ED staff were supportive of ambulance blood ketone assessments and 'high-risk DKA' pre-alerts. They considered them to expedite hospital DKA diagnosis and prioritise resuscitation bed allocation and care. Additionally, pre-hospital cannulation and fluid therapy would facilitate prompt initiation of hospital DKA management protocols. Meter use would also support differentiation of DKA from other hyperglycaemic emergencies, i.e., hyperosmolar hyperglycaemic state.

**Conclusion** Ambulance capillary blood ketone meter use offers earlier recognition of patients at high risk of DKA, the opportunity to commence fluid therapy prior to hospital arrival, and prioritise ongoing care. Full KARMA2 data analysis is ongoing; however, study findings are informing a content update to the current Joint Royal Colleges Ambulance Liaison Committee Glycaemic Emergencies clinical guidelines.

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#### HOW DO PRE-ALERTS INFLUENCE PATIENT CARE IN THE EMERGENCY DEPARTMENT? FINDINGS FROM QUALITATIVE RESEARCH WITHIN THREE UK AMBULANCE SERVICES

<sup>1</sup>Jaqui Long, <sup>1</sup>Rachel O'Hara, <sup>1</sup>Fiona Sampson, <sup>1</sup>Joanne Coster, <sup>2</sup>Fiona Bell, <sup>2</sup>Peter Webster. <sup>1</sup>The University of Sheffield, UK; <sup>2</sup>Yorkshire Ambulance Service NHS Trust, UK

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**Background** Ambulance clinicians may call ahead to the ED to inform them that a critically ill or deteriorating patient is on their way (pre-alert). Pre-alerting is an important part of the care pathway for certain conditions (e.g. stroke, STEMI). However, the value of pre-alerting for other conditions is less well understood.

**Methods** We undertook semi-structured interviews with ambulance clinicians (n=35) from three ambulance services and ED clinicians (n=32) from 6 EDs and non-participant observation in 6 EDs (86 hours, 109 pre-alerts). Detailed observation notes and verbatim interview transcripts were imported into NVivo and analysed thematically.

**Results** Pre-alert calls were key to enabling staff to appropriately prioritise patient care, with responses ranging from large multidisciplinary teams awaiting the patient's arrival to psychological preparedness. ED staff valued this advance notice, even when they were unable to make practical changes due to lack of space in the department. ED response to pre-alert calls was related to their capacity at the time of call.

Although ED staff expressed frustration at perceived over- or inappropriate use of the pre-alert phone, there was widespread acknowledgement that under-alerting was potentially more harmful, particularly in the context of increased risk to patients due to longer wait times.

There were differences in how EDs recorded and responded to pre-alerts. A lack of training in receiving and managing pre-alert calls led to inconsistencies in how calls were taken and increased the risk of inappropriate action. ED staff valued clarity, conciseness of information and an accurate arrival time from pre-alert calls, as this enabled most effective use of limited resources.

**Conclusion** Pre-alerts were generally welcomed and enabled preparation and appropriate care for the most unwell patients, despite the challenges they posed to already stretched departments. They could be improved by consistency of delivery and receiving of pre-alert calls.

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#### WHAT FACTORS AFFECT PRE-HOSPITAL PRE-ALERTS? ANALYSIS OF ROUTINE AMBULANCE DATA

<sup>1</sup>Richard Pilbery, <sup>2</sup>Fiona Sampson, <sup>2</sup>Esther Herbert, <sup>1</sup>Fiona Bell, <sup>3</sup>Andy Rosser, <sup>4</sup>Rob Spaight, <sup>1</sup>Andy Pountney, <sup>1</sup>Mark Millins, <sup>2</sup>Steve Goodacre. <sup>1</sup>Yorkshire Ambulance Service NHS Trust, UK; <sup>2</sup>The University of Sheffield, UK; <sup>3</sup>West Midlands Ambulance Service NHS Foundation Trust, UK; <sup>4</sup>East Midlands Ambulance Service NHS Trust, UK

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**Background** Ambulance clinicians can use pre-alerts calls to advise emergency departments (EDs) of the imminent arrival of a patient who may require immediate senior clinical review or intervention. Consistency of pre-alert practice is important in ensuring that EDs can respond to pre-alerts appropriately. We sought to understand what factors might affect variation in pre-alerting practice.

**Methods** We explored variation in pre-alert use by analysing clinician factors (role, experience, qualification, time of pre-alert during shift), patient factors (NEWS2 score, clinical working impression, age, sex) and hospital factors (receiving ED, ED handover delay status). We created a linked data set containing patient, 999 call and human resource records for all ambulance conveyances from three UK Ambulance Services for one year (July 2020 to June 2021). We used lasso regression to identify candidate variables for three (one per service) multivariate logistic regression models to explain variation in pre-alert rates in terms of clinician, patient and hospital factors.

**Results** Patient factors (NEWS score and specific clinical conditions) were the most significant variables associated with pre-alert use. In addition, male patients were more likely to be pre-alerted than females.

Pre-alert rates were also affected by clinician role, receiving hospital (including several hospitals that were not tertiary centres for major trauma, stroke or myocardial infarction) and anticipated handover delay at receiving hospitals. There was no evidence of higher pre-alert rates in the final hour of shift.

**Conclusion** We identified variation in pre-alert practice that was not explained by the patient's clinician presentation. Further qualitative work with ED and ambulance staff is required to explore other factors that influence decisions to pre-alert.