Physician Response Unit: 
taking the Emergency Department to the patient

Pop-Up University Workshop 
NHS EXPO
Introduction & history
@tonyjoy81

Operational overview
@asalexiou

Activity and impact
@smitchinson1

Bill’s soapbox

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The Physician Response Unit

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2001

Department of Health

‘Reforming Emergency Care’
999 call

Call taker

Emergency Operation Centre dispatcher / allocator

LAS ambulance crew: ambulance / FRU / MRU / CRU

ED reception

ED triage

ED clerking (FY2)

ED senior review (registrar / consultant)

Physician Response Unit

DECISION MAKER

NHS 111

Physician Response Unit

DECISION MAKER

Call taker

Emergency medical dispatcher

Ambulance crew

Physician Response Unit

DECISION MAKER

ED reception

ED triage

ED clerking (FY2)

ED senior review (registrar / consultant)

DECISION MAKER


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'Coolest car in London' saves lives

By Dr Michael Eyre
BBC Health Check

3 November 2014

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The Case for Change

- Clinical workforce
- Impact potential
- Caseload
- System:
  - Recruitment & Retention
  - Innovation needed to support system
  - 5YFV
Development

• Operational hours 0800-2000, 365d/yr
• PRU Fellows
• Emergency Ambulance Crew (EACs)
PRU Fellowships

- All higher EM trainees
- Split job plan: PRU:ED:SPA
- Champions of ‘Community Emergency Medicine’
- Prehospital Care
- Whole system perspective
Emergency Ambulance Crew

• Development opportunity
• Clinical experience working alongside doctor
• Scene management, extrication etc...
The Consultation

• Patient at the centre
• Not time-bound; undistracted
• ‘Pre-medicalization’
• Clinicians can see patients in their own habitat:
  • Network
  • Function
  • Safety
A day in the life…

90 year old lady, ‘funny-turn’ in nursing home, fallen and hit head sustaining laceration to scalp.

999 call

Physician Response Unit

Clinical assessment & examination from senior clinical decision-maker.
- Observations
- ECG
- iStat bloods (if indicated)
- Urinalysis (if indicated)
- Wound glue applied

< 1 hr

Emergency Department

Assessment / triage
- Investigations (bloods / ECG / urinalysis / imaging?)
- Junior doctor clerking* (Senior review)
- Wound care

Several hours

Patient transport to nursing home
Discharge letter to GP

Las ambulance (+/- FRU)

Clinical assessment
- Observations
- ECG
- Assessment mandates conveyance to ED for:
  - Medical review
  - Wound closure

Patient left at nursing home
Discharge letter to GP

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*risk of over-investigation and/or unnecessary hospital admission (and associated risks)
45 year old female
Bariatric >150kg
Multiple sclerosis
Bed-bound and care-dependent
CPAP at home
Acute behavioural change – ‘usual presentation of UTI for patient’

75 year male
Advanced gastric cancer, poor feeding
Unconscious at home
Multiple recent admissions with same problem
Family not coping

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65 year old male
Urinary retention

999 call

**Physician Response Unit**
- Clinical assessment & examination from senior clinical decision-maker.
- Observations
- Catheterisation (full asepsis)
- IStat bloods (check creatinine)
- Urinalysis (& for MC&S)
- Nurse-led catheterisation education
- Patient left at home Catheter-in-situ
- Referral to TWOC clinic
- Discharge letter to GP

**LAS Ambulance (+/- FRU)**
- Clinical assessment
- Observations
- ECG
- Assessment mandates conveyance to ED for:
  - medical review
  - catheterisation

**Emergency Department**
- Assessment / triage
- Investigations (bloods / ECG / urinalysis)
- Catheterisation
- Junior doctor clerking (Senior review)
- Patient transport home
- Referral to TWOC clinic
- Discharge letter to GP

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Remote access to patient records in a pre-hospital setting
Why we wanted access to patient records?

• We aim to take the Emergency Department to the patient
• One key aspect of most patient encounters/consultations is access to their medical records to view blood results/clinic letters and view recent imaging.
• Missing piece to our armory
• Historically very complex to access patient records in the pre-hospital setting, hence restricting the decision making capabilities of the emergency response team
Getting connected?

• Dell Laptop was formatted for secure Virtual Desktop Infrastructure to the Barts Health network

• Secure-IT 2-factor Authentication (TFA) is used alongside NHS-Smartcard access to Cerner Millennium

• Each clinical team member given a login

• Community view portal to both EMIS and PACS
Case 1 – Mrs. B

• 76 year old Mrs. B
  • Severe COPD
  • 7th floor flat in Mile End tower block – non functioning lift
  • Care package in place but possibly not meeting requirements
  • Very breathless, Oxygen levels 84% room air, minimal improvement of supplementary oxygen
  • Awoke feeling severely breathless, mucky thick green phlegm
  • Denies recent hospital admission/GP review or imaging
Case 1 – Mrs. B

- Conveyance to hospital
- Early commencement of therapy
  - Nebulisers
  - IV/PO antibiotics
  - Steroids
  - Oxygen therapy
- Lengthy Challenging extrication
- Temporary pause to package of care
- Likely long inpatient stay with increased nosocomial complication risk
- Re-enactment of care package

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Case 1 – Mrs. B

• EHR accessed remotely – Clinical notes, EMIS and PACS reviewed
• Respiratory clinic notes and community respiratory team documentation reviewed
• Recent chest X-ray 4 days prior call with report available
• Clearly no change from baseline function
• No benefit from hospital attendance

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Case 2 - Mr T

• 86yo male
• Police called by carer as patient not answering door
• Background – Progressive Amyloid Cerebral Angiopathy (Dementia) & recurrent falls
• PRU tasked to patient as primary response
Case 2 – Mr T

- Pt not speaking
- Reduced mobility
- Apparently confused
- Sitting in bed in a squalid flat

- Physical examination and observations normal
- Impression – Progressive clinical decline
Case 2 – Mr T

• Cerner accessed
• Review of bloods, imaging and Emergency Department attendances
• No clinical records/letters/discharge summaries at home
• On Cerner evident that had multiple identical presentations with protracted inpatient stays
• Daughter (community nurse) had appt the same day to visit a care home to assess suitability
• Cerner enabled fully informed decision to leave at home
• Family happy

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"The 250"

- Identified using data analysis as the highest impact users of LAS resources, ED attendances and inpatient bed days
- Carefully filtered patient group
- Targeted dispatch could have more profound impact on local resources and the wider NHS
- Dynamic rather than static patient group
"The 250"

**Selection Criteria:**

The query looks at the 12 months preceding the end of the latest quarter, and then applies the following criteria:

1. Patients who have had 7 or more admissions. Defined as frequent users.
2. Patients who have had at least one admission per each of the 4 quarters. Defined as quarterly users.
3. Patients who have had at least one admission in 3 of the 4 quarters, and are now aged 80 plus. Defined as infrequent but 80 plus.
4. Patients who have had 4 or more admissions in the latest quarter. Defined as rising users.

**Exclusion Criteria:**

1. Patients aged 3 or below
2. Patients who have been marked as deceased before last update, if admitted before end of last quarter
3. Patients with a sickle cell diagnosis
4. Patients with no fixed abode registered
"The 250"

Number of patients by category:

- Frequent User: 90
- Infrequent but 80 plus: 90
- Quarterly User/other: 44
- Rising User: 34

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Physician Response Unit

Service Activity and Impact

9 month review
(11th September 2017 to 11th June 2018)
1500 patients
Average 5.5 patients / day
PRU activity by borough

- Tower Hamlets: 40%
- City of London: 9%
- Hackney: 27%
- Islington: 12%
- Newham: 11%
- Waltham Forest: 1%

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Patient ages
Dispatch / tasking

In October, LAS introduced a new dispatch process (Ambulance Response Programme [ARP]) with a new set of triage categories and response time KPIs.
Dispatch / tasking (2)

Additional LAS resources involved
- Yes: 650 (43%)
- No: 850 (57%)

Dispatch method
- Crew Request: 27%
- Primary dispatch: 73%
Outcomes – Patient disposition

- Death in community: 2%
- Managed in community: 68%
- Referred to hospital: 30%
Outcomes – Disposition by triage category

<table>
<thead>
<tr>
<th>Triage Category</th>
<th>Death in Community</th>
<th>Referred to Hospital</th>
<th>Manage in Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4</td>
<td>33%</td>
<td>16%</td>
<td>67%</td>
</tr>
<tr>
<td>C3</td>
<td>4%</td>
<td>26%</td>
<td>96%</td>
</tr>
<tr>
<td>C2</td>
<td>26%</td>
<td>38%</td>
<td>74%</td>
</tr>
<tr>
<td>C1</td>
<td>38%</td>
<td>36%</td>
<td>62%</td>
</tr>
<tr>
<td>R2</td>
<td>36%</td>
<td>2%</td>
<td>64%</td>
</tr>
<tr>
<td>R1</td>
<td>21%</td>
<td>16%</td>
<td>37%</td>
</tr>
</tbody>
</table>

- Death in community
- Referred to hospital
- Manage in community
Service evaluation: methods

• The PRU interacts with various organisations: LAS, Acute hospitals, community health services and primary care providers

• Some measures of impact can be readily estimated:
  • Number of ambulance resources saved
  • Number of ED attendances saved
  • Hospital admissions and bed-days saved

• Other soft outcomes have not been measured, but may have a significant impact on the quality and productivity of the wider system:
  • Integration of services within and across boroughs
  • Recruitment and retention (innovative and attractive working opportunities)
Service evaluation: methods

- Patient level data was reviewed between 11th September 2017 and 11th June 2018 (273 days)

- In order to measure potential cost savings, average costs were sourced from NHS Reference Costs, 2015-16 (Department of Health):
  - Average cost of an ambulance ‘see and treat and refer’: £181
  - Average cost of an ambulance ‘see and treat and convey’: £236
  - Average cost of an Emergency Department attendance: £138
  - Average cost of an non-elective admitted inpatient bed occupancy per night (at Barts Health): £550

- Mean length of stay data has been sourced by matching diagnoses from PRU discharges with data from NHS Digital, Hospital Episode Statistics for England. Admitted Patient Care statistics, 2016-17.

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Impact: London Ambulance Service

- In 273 days, the team saved alternative LAS resources from being dispatched to 850 patients.
- The team estimated that out of 1012 patients that were managed in the community, 801 patients would have likely been conveyed to the Emergency Department.
- Therefore:
  1. **3.1 LAS resources** (FRU/CRU/MRU/ambulance) per day were saved for other emergency callers.
  2. There was an estimated reduction in **801 LAS ambulance conveyances** (2.9 per day). At a unit cost of £236 this equates to an estimated cost saving of: **£189,036**

N.B. The cost saving calculated does not include the reduction in primary response vehicles as the type of resource cannot be known – but therefore the total expected cost-saving would be higher than the quoted figure.

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Impact: Emergency Department Attendances

- In 273 days, the team saved an estimated **801 ED attendances**

- At an average tariff cost of £138 per episode, this equates to an estimated cost saving of: **£110,538**

- This activity helps to:
  - **reduce over-crowding** and high demand in the Emergency Department
  - demonstrate to ambulance and ED staff that **alternative care pathways** can successfully be accessed to enhance patient care
  - reduce the risk of **over-investigation** and unnecessary **prolonged encounters** for patients attending the ED
Impact: Hospital admissions

- In 273 days, the team estimated that 167 patients that were managed in the community would otherwise have been admitted to inpatient wards in hospital.

- Based on matched condition mean length-of-stay data from HES, this equates to an inpatient bed occupancy reduction of 1002 bed days.

- The cost of a non-elective inpatient bed per night at Barts Health is £550. Therefore this activity gives an estimated cost saving of £551,100.

- This activity helps to:
  - Reduce overcrowding and exit-block in the Emergency Department
  - Reduce pressure on acute inpatient wards
  - Demonstrate to staff that alternative pathways are available that can treat patients successfully in the community setting (with excellent patient feedback).

- This is a necessary paradigm shift given the system challenges across the acute / emergency sector.

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Total approximate cost-saving

• In 273 days, the PRU model was able to deliver a range of potential cost savings as described

• The total cost saved is estimated at £850,674

• The operational cost of the PRU in the same time-frame is approximately £224,250 (including medical and LAS staffing, vehicle costs and expendibles).

**NET savings: £626,424**
Patient feedback

• “I Want Great Care”: In September 2017, the PRU ranked 10th out of 219 services. It was 24th in October.

• 97.35% of participants were likely to recommend the service; 0% were unlikely to recommend.

• Average 5 star score: 4.88
**Autumn 2017**

The response unit guys were really friendly and professional. They gave me clear instructions on what they were doing and why. In such a short space of time they had me feeling better and put my mind at ease with their diagnosis. And, just in case I didn't say it at the time (as I was feeling pretty rough) .... Thanks! :)

My daughter received exemplary care from the team. They arrived promptly, worked efficiently and were lovely with her. I was very pleased with the care she received.

Excellent service, support and care. They looked at health background and carried test in order to provide the best advice. Nothing to improve. Overall a great service.

My daughter is 3 years old. She has global developmental delay, sight impairment and few other neurological issues. On 27/09/17 she suffered from her 1st epileptic seizures. We were at the Stratford station waiting to board the Jubilee line. When our daughter had the 1st seizure, we called TFL staff and they then called for medical help. The help came quick and I would like to mention the name of Dr. Sophie & Dean (ambulance). I had asked for their names. Both of the medical staff were excellent in every way from coming quick to taking care of our daughter as we (me and wife) were in shock to see our daughter having the seizures.

Both Dr. Sophie & Dean made us understand what was going on with our daughter. Did assessment and got a registrar involved from Newham General also. As our daughter had 3 episodes in 1 hour while being treated she was then taken to Newham General Hospital and admitted. I cannot thank Dr. Sophie & Dean enough for the way they were caring and kept us informed and involved in the process.

I wish this Physicist Response Unit should be grown on the whole country scale. Excellent job they do. Excellent service & could have been worse if not for these 2 guys rushing to our help.

Thanks to RLH & very special thank you to Dr. Sophie & Dean (Ambulance). God Bless You all.

**PATIENT FEEDBACK (1)**

Fast and caring.

My daughter received exemplary care from the team. They arrived promptly, worked efficiently and were lovely with her. I was very pleased with the care she received.

The service was done very quickly and much quicker than when at A and E.

Asked a lot of questions - I feel they understood me well.

The patient was my 3-year-old girl who had fallen and injured the back of her head. The paramedics were brilliant with her they were kind and caring and as she was in shock and I was worried for her welfare it was great not to have to go and wait to be seen at A&E. Thank you.

I could not have ask for a better doctors they treated me with kindness and compassion

It was first class, little room for improvement.

Very caring and understanding. Thank you.

They came fully equipped and had all the right information and provided the help straightaway.

Dr Rob and his team were great. I had been hit by a passing cyclist (no fault on either of our parts) who stopped and immediately called for an ambulance though I didn’t feel one was necessary - I felt that I could walk to St Bartholomew’s. The cyclist insisted that I stay. Shortly thereafter an emergency worker arrived and offered me the option of a roving Dr who would probably be able to take care of my minor stitches to my hand on site and save me the trouble of going to the A & E and waiting for 3 hours or so.

Dr Rob & two others arrived shortly thereafter. We went over my medical history and needs and then commandeered a consultation room at a nearby pharmacy. Within about 30 minutes or so, everything was taken care of, and we were all on our way. I know from experience with friends that had I gone to the A & E I might still be there. This is a great service and I couldn’t be happier with the way I was treated with compassion, professionalism and even wit. Bravo.
Autumn 2017

The Response Unit arrived very soon after I made the call, and treated my 4-year-old son with respect, kindness and kept him amused to keep his mind off the accident. Very much appreciated.

The services was fantastic, also the medics that came they were very friendly and helpful. The only downside is that the call took too many questions.

I felt totally cared for and looked after. The doctor and paramedics were 2nd to none and I can’t say enough nice things about them.

The team we’re absolutely amazing, so kind, caring and efficient. You couldn’t ask for better care or nicer people, they really did do an excellent job.

The services was very quick, the staff were professional but at the same time reassuring. They did a very good series of investigations and were able to come to a decision very quickly.

The whole experience apart from the fall :p was great they done a check on my back, neck, legs etc was kept in the loop between the doctors team Rob, Tony and Olly and the ambulance team was told about how I would feel later and what to do if I felt uncomfortable later, I was given copy’s of the sheets detailing the incident, they also made me call my gf to talk to her about what happened and all the procedures. The team was great would like to ask you to say thanks to them from me and I hope them all the best in the future.

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Questions