



Wokingham GP Alliance



Royal Berkshire  
NHS Foundation Trust

# Sepsis6 At First Contact Evaluation

A Network Approach to delivering the SEPSIS6 Care Package

4th Regional Emergency Department Collaborative



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# SAFE

## SEPSIS6 At First Contact Evaluation

### Introduction and Background

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## SAFE – SEPSIS6 At First-Contact Evaluation




**Abstract:** Whilst in a Semi – Urban Location Delivery of SEPSIS6 within one hour of diagnosis would seem probable. In reality our Paramedic Practitioners were often unable to help (except of Oxygen & IV Fluids) care for seriously ill sepsis patients, whilst waiting for an Emergency Ambulance [Target mean 18 Minutes, 90<sup>th</sup> Percentile 40 Minutes (Diag. 3.3)]. Handover, Reassessment & Documentation by the Ambulance Crew, traffic in to RBH can be awful even with blue lights. On busy winter pressures days, there can be a delay in the crew handing over to the hospital team, who only then can start the key elements of SEPSIS6, i.e. IV Antibiotics.

SEPSIS6 At First-contact Evaluation, a Sepsis Care Quality Improvement Pilot Proposal between Wokingham GP Alliance Paramedic Practitioner - Home Visit Project & Royal Berkshire Hospital NHS Foundation Trust – Emergency Department, will deliver Emergency Department lead SEPSIS6 care at the bedside in the patient’s own home immediately on diagnosis.









## Problem Description





- In the UK, sepsis admission mortality is 35% which equates to 44,000 deaths and 150,000 hospital admissions.
- Five fold higher mortality than MI and Stroke
- Sepsis is time-critical, and in cases of septic shock every hour that appropriate antibiotic administration is delayed, there is an 8% increase in mortality.
- Even if all target timings hit their NHS system wide targets time to delivery of SEPSIS6 treatment would be 108 minutes
- During winter pressures this can rise to 230 minutes (Diag. 3.2). This suggests mortality could be increased by as much as 14% with optimal timings and 30% during winter pressures in septic shock or red flag sepsis.
- During the time the Practitioner is waiting for the ambulance and during transfer to hospital only two elements of SEPSIS6 are delivered, notably excluding the key IV Antibiotic Elements.



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**Changing standards & demands**

EXISTING RESPONSE STANDARDS		NEW RESPONSE STANDARDS			
TYPE	% Calls / Demand	TYPE	% Calls / Demand		
Red 1	3%	75% within 8 mins 95% within 19 mins	Call 1	8%	Standard mean <27 mins <15 mins 90 <sup>th</sup> centile response time
Red 2	47%	75% within 8 mins 95% within 19 mins	Call 2	48%	Standard mean <18 mins <8 mins 90 <sup>th</sup> centile response time
Green	50%	No National Standard – Locally agreed Green 30 mins or Green 60 mins	Call 3	34%	<14.5 mins 90 <sup>th</sup> centile response time
			Call 4	10%	<180 mins 90 <sup>th</sup> centile response time

**SEPSIS**

### Time To Sepsis6 Delivery

Minutes	Best Case / Target <sup>9,10</sup>	Nominal	Winter Pressures <sup>9,10</sup>
Ambulance C2 Response	18	30	40
Ambulance Handover / Re Evaluation	10	20	20
Time from Scene to ED Handover (15 minute travel time)	20	40	50
Time from Handover to Sepsis 6 Complete	60	90	120
<b>Total</b>	<b>108</b>	<b>180</b>	<b>230</b>
Project On Scene to Sepsis 6 complete Time *	20	20	20
Improvement Sepsis 6 Delivery Forecast	88	160	210

**SEPSIS PERFORMANCE**

Red 1 Performance: **73.9%** (Target: 75%)

Red 2 Performance: **70.6%** (Target: 75%)

Red 3 Performance: **94.2%** (Target: 95%)


Green 1: **07:19** (Target: 08:00)

Green 2: **13:21** (Target: 14:00)



Green 3: **17:24** (Target: 18:00)

Green 4: **35:05** (Target: 36:00)

**SEPSIS**



**SAFE – SEPSIS6 At First-Contact Evaluation**





**SEPSIS6 At First-contact Evaluation, a Sepsis Care Quality Improvement Pilot Proposal between Wokingham GP Alliance Paramedic Practitioner - Home Visit Project & Royal Berkshire Hospital NHS Foundation Trust Emergency Department.**


**Will deliver Emergency Department lead SEPSIS6 care at the bedside in the patient's own home immediately on diagnosis.**


**SEPSIS RED FLAGS**

- Responds only to voice or pain / unresponsive
- Acute confusional state
- Systolic B.P ≤ 90 mmHg (or drop > 40 from normal)
- Heart rate > 130 per minute
- Respiratory rate ≥ 25 per minute
- Needs oxygen to keep SpO2 ≥ 92%
- Non-blanching rash, mottled / ashen / cyanotic
- Not passed urine in last 18 h / UO <0.5 ml / kg / hr
- Lactate ≥ 2 mmol / l
- Recent chemotherapy



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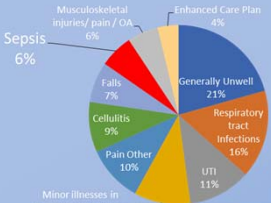



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**Rationale:**

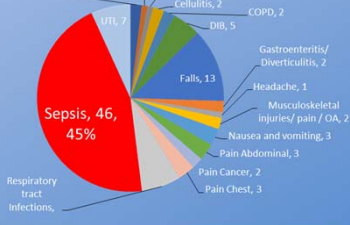
- In the first 12 months the scheme has seen 1138 patients to date, 68 (6%) were Septic.
- In total 102 (9%) required urgent hospital admission .
- Of these, 48 (37%) were suffering from sepsis.

**Diag 5.1 – Paramedic Practitioner Home Visit Project  
Top 10 Conditions**





Condition	Percentage
Generally Unwell	21%
Respiratory tract infections	16%
UTI	11%
Minor illnesses in household patients	10%
Pain Other	10%
Cellulitis	9%
Falls	7%
Musculoskeletal injuries/pain/OA	6%
Sepsis	6%
Enhanced Care Plan	4%

**Diag 5.2 - Paramedic Practitioner Home Visit Project -  
Conditions Requiring Emergency Admission**





Condition	Count	Percentage
Sepsis	46	45%
Falls	13	
UTI	7	
Pain Chest	3	
Pain Abdominal	3	
Nausea and vomiting	3	
Pain Cancer	2	
Gastroenteritis/Diverticulitis	2	
COPD	2	
DIB	5	
Cellulitis	2	
Cancer - Other	1	
Back pain/Sciatica	1	
Asthma	2	
Headache	1	
Musculoskeletal injuries/pain/OA	2	





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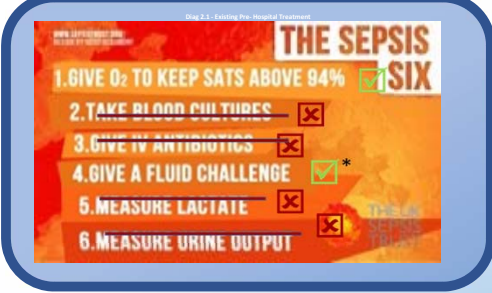



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**Specific Aims:**


- Formal identification of Amber & Red Flag Sepsis using the screening tool by Paramedic Practitioners
- Immediate concurrent call for emergency ambulance transport and commencement of treatment including:
- Delivery the RBHNFT SEPSIS6 Protocol immediately.


**Existing Pre-Hospital Treatment**

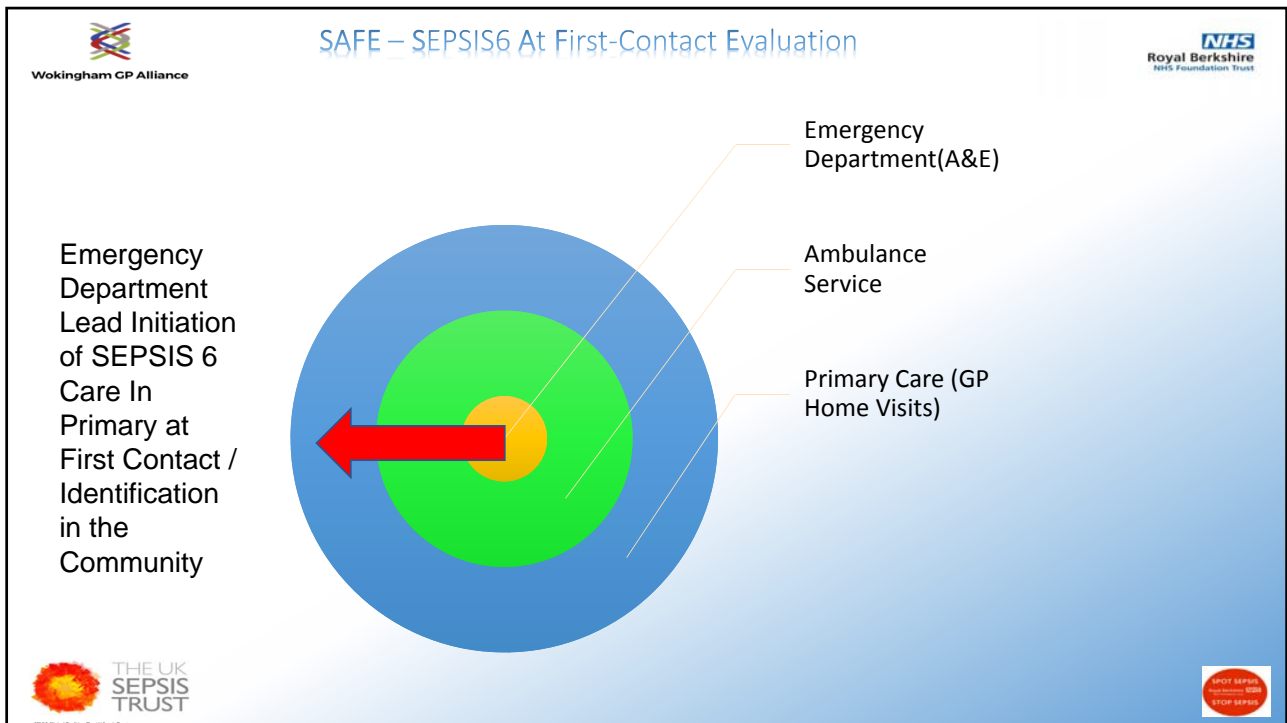


**Proposed Pre-Hospital treatment**









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**Study Intervention(s):**

**Intervention(s):** Immediate concurrent call for emergency ambulance transport and commencement of treatment including. Delivery the RBFT SEPSIS6 Protocol, with targeted rationalised antimicrobials.

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**Generally Unwell GP Home Visits  
Existing Models of Care  
Timeline Illustration**

0800: Request Home Visit  
1300: GP Visits  
1315: Red Flag SEPSIS Ambulance call  
1345: Ambulance Arrives at Pt home  
1350: Oxygen and IV Fluids started by crew  
1400: Depart for Hospital  
1430: Ambulance Arrive at ED  
1445: Blood Cultures Taken  
1500: IV Antibiotics given  
1515: SEPSIS 6 Initial Treatment Complete  
**Total from Call to Abx 7 Hours**

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**Paramedic Practitioner Service  
+  
SAFE Study  
Timeline Illustration**

0800: Request Home Visit  
0900: Paramedic Practitioner Visits  
0915: Starts SEPSIS 6 Lactate, Oxygen, Blood Cultures, IV Antibiotics & IV Fluids  
Red Flag SEPSIS Ambulance call  
0945: IV Antibiotics Completed  
0945: Ambulance Arrives at Pt home and receives proforma handover  
1000: Depart for Hospital  
1030: Ambulance Arrive at ED with SEPSIS 6 Initial Treatment Complete  
**Total from Call to Abx 1Hour 15 Minutes**

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### RBHNFT IV Antibiotics Sepsis


Clinical Indication	First line	Alternative in penicillin allergy
Severe community-acquired pneumonia (Chest Sepsis)	Benzylopenicillin 1.2g 4 hourly IV + Clindamycin 1.2g 6 hourly IV	<b>Penicillin allergy</b> Teicoplanin 10mg/kg 12 hourly IV for 3 doses, then 10mg/kg 24 hourly IV + Clindamycin 1.2g 6 hourly IV
Urosepsis	Gentamicin 7mg/kg 24 hourly* IV with therapeutic drug monitoring (refer to IV gentamicin guideline) until culture results are available. Followed by treatment based on urine and/or blood culture results. <b>Review the clinical indication for urinary catheter, if present and remove/replace as appropriate</b>	
Intra-abdominal sepsis	Co-amoxiclav 1.2g 8 hourly IV	<b>Penicillin-allergy or high risk for MDR infection**</b> Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline) + Metronidazole 500mg 8 hourly IV
Unilateral lower limb cellulitis with evidence of sepsis	Benzylopenicillin 1.2g 4 hourly IV + Clindamycin 1.2g 6 hourly IV	<b>Penicillin allergy or high risk for MRSA</b> Teicoplanin 10mg/kg 12 hourly IV for 3 doses, then 10mg/kg 24 hourly IV + Clindamycin 1.2g 6 hourly IV
Meningitis	Ceftriaxone 2g 12 hourly IV (if immunocompromised, pregnant or elderly (> 60 years) ADD Amoxicillin 2g 6 hourly IV) <b>Nosocomial bacterial meningitis e.g. following neurosurgery: Meropenem 2g 8 hourly IV</b>	
CRBSI	Teicoplanin 10mg/kg 12 hourly IV for 3 doses, then 10mg/kg 24 hourly IV + Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline) Followed by treatment based on BC results	
Neutropenic sepsis: Please refer to neutropenic sepsis management protocol	Piperacillin/tazobactam 4.5g 6 hourly IV ± Gentamicin 7mg/kg STAT IV	<b>History of Penicillin allergy:</b> Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline) ± Teicoplanin 10mg/kg 12 hourly IV for 3 doses, then 10mg/kg 24 hourly IV
Sepsis of unknown origin	Teicoplanin 10mg/kg 12 hourly IV for 3 doses, then 10mg/kg 24 hourly IV + Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline)	



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### SAFE IV Antibiotics


Clinical Indication	First line	Alternative in anaphylactic-type ('true') penicillin allergy
Severe community-acquired pneumonia (Chest Sepsis)	Ceftriaxone 1g 12 hourly IV + Clindamycin 1.2g 6 hourly IV	Clindamycin 1.2g 6 hourly IV
Urosepsis	Gentamicin 7mg/kg 24 hourly* IV with therapeutic drug monitoring (refer to IV gentamicin guideline) until culture results are available. Followed by treatment based on urine and/or blood culture results. <b>Review the clinical indication for urinary catheter, if present and remove/replace as appropriate</b>	
Intra-abdominal sepsis	Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline) + Metronidazole 500mg 8 hourly IV	
Unilateral lower limb cellulitis with evidence of sepsis	Ceftriaxone 1g 12 hourly IV + Clindamycin 1.2g 6 hourly IV	Clindamycin 1.2g 6 hourly IV
Meningitis	Ceftriaxone 2g 12 hourly IV	
Neutropenic sepsis	Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline) ± Clindamycin 1.2g 6 hourly IV	
Sepsis of unknown origin	Gentamicin 7mg/kg 24 hourly IV with therapeutic drug monitoring (refer to IV gentamicin guideline) + Clindamycin 1.2g 6 hourly IV	



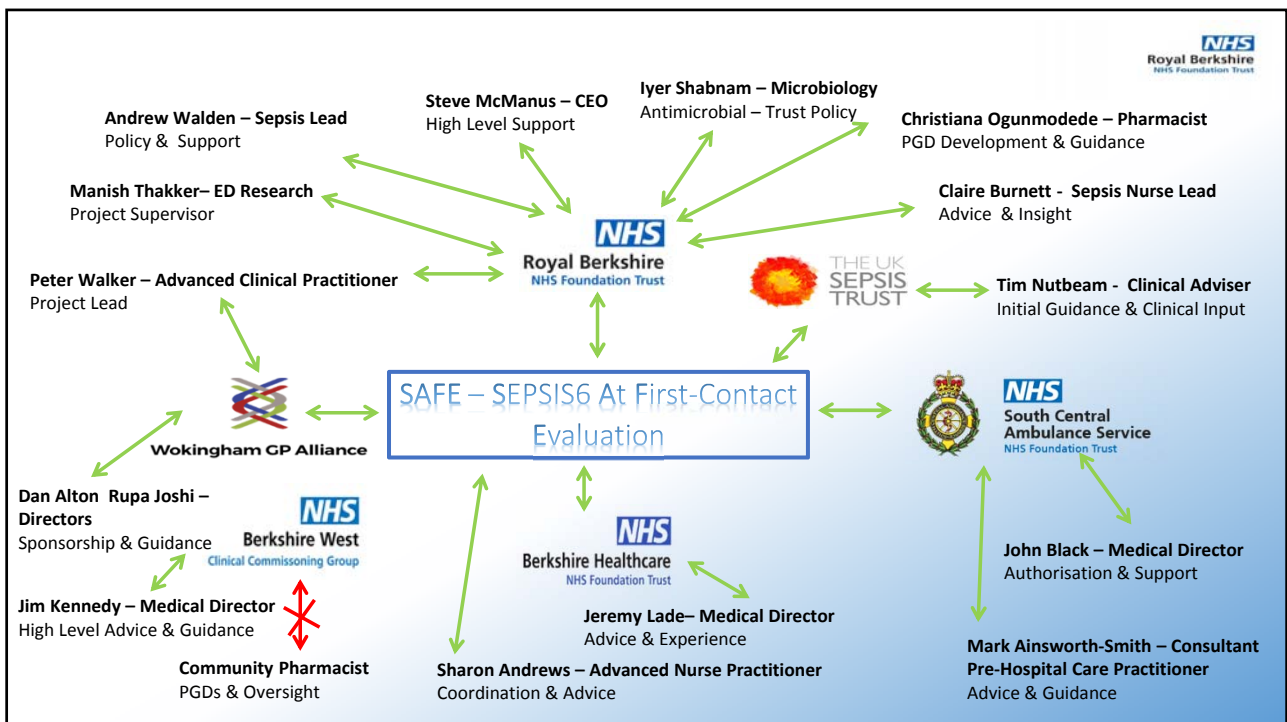
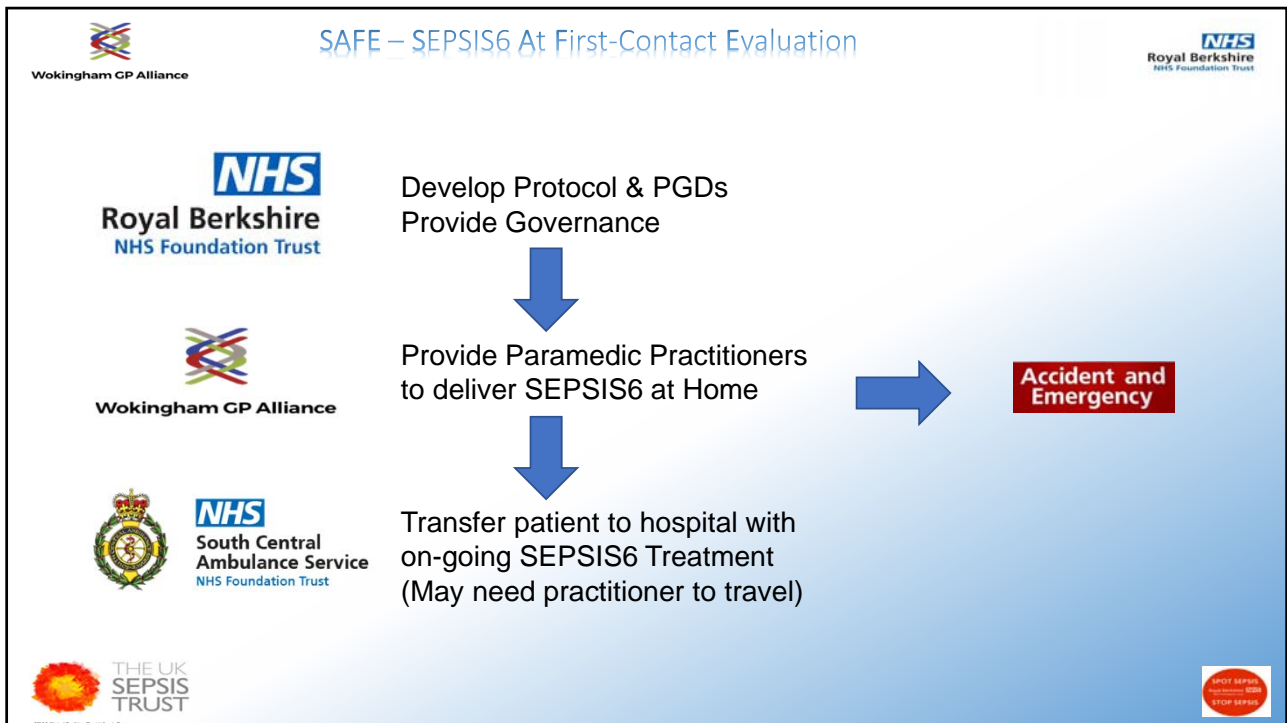
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First Dose IV Abx given as per this 'modified' yet targeted formulary.

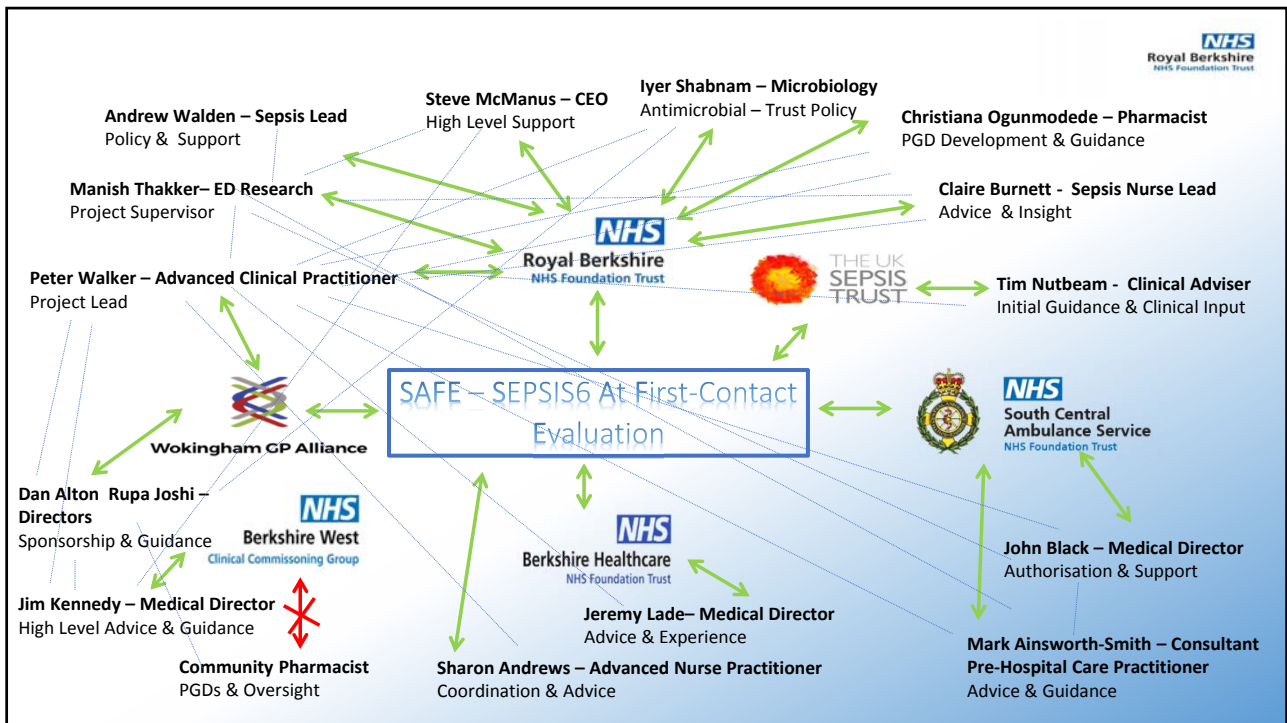
Second dose given in AMU / ITU when due as per main RBFT Protocol (previous slide).




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**Study of the Interventions & Measures :**



**Study of the Interventions:**  
Prospective Cohort Study of GP referred SEPSIS patients vs SAFE Project referred SEPSIS patients.

**Primary Measures:**

- Time from presentation to health service (ie call to GP surgery) to initiation of antibiotics
- Time saved for A&E
- Illness Severity as measured in number of bed days

**Secondary Measures:**

- Accuracy of SEPSIS Diagnosis
- Accuracy of SEPSIS Origin
- Effect of Project Modified Antibiotic Regimen vs Standard RBHNT Protocol
- Conformance to PGD

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### Previous Studies of Antimicrobial Therapy for SEPSIS Pre-Hospital :

- Showed that Level 7 Training in Examination & Diagnosis was beneficial
- Have Shown Paramedic Practitioners can Safely Deliver IV Antibiotics
- Have shown that Practitioners can take effectively take Blood Cultures
- Failed to show a clear benefit as used a single antibiotic. This failing has been addressed by the use of Gram +ve & Gram -ve targeted antimicrobial therapy by infection source as per guidance by the Sepsis Trust.

Alam, N., Oskam, E., Stassen, P.M., van Exter, P., van de Ven, P.M., Haak, H.R., Holleman, F., van Zanten, A., van Leeuwen-Nguyen, H., Bon, V. and Duineveld, B.A., 2018. Prehospital antibiotics in the ambulance for sepsis: a multicentre, open label, randomised trial. *The Lancet Respiratory Medicine*, 6(1), pp.40-50.

Seymour, C.W., Kahn, J.M., Martin-Gill, C., Callaway, C.W., Yealy, D.M., Scales, D. and Angus, D.C., 2017. Delays from first medical contact to antibiotic administration for sepsis. *Critical care medicine*, 45(5), p.759.

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### Further Development post Proof of Concept :

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**Berkshire Healthcare**  
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- Join the Evaluation enabling the 'Rapid' Advanced Nurse Practitioners to deliver SAFE
- Berkshire East & Reading South Primary Care Alliances to join the Evaluation
- Additional Sites (Emergency Departments) join the Evaluation allowing SAFE to be delivered in to other EDs in the region
- South Central Ambulance Service allow their 'Practitioner' grade staff to deliver SAFE
- Further study to leave patients in their care/nursing home without transport to ED who respond well to treatment and or for whom ED / Acute Admission is not appropriate

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## SAFE – SEPSIS6 At First-Contact Evaluation

# Questions...

