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Introduction Pleural infection remains common with an increasing incidence. It is associated with a high morbidity and mortality. The development of a validated clinical risk score at presentation to identify those at high risk may help formulate early management strategies.

Methods The RAPID score was constructed based on a large cohort of patients entering a multicentre UK pleural infection trial—MIST1 (n=411). Out of 32 baseline clinical characteristics recorded at trial entry, model selection was undertaken to find variables predictive of poor clinical outcome. Results were obtained by using backwards selection with a p value of 0.05. Multiple imputation was used to account for patients with missing baseline variables. The primary outcome assessed was mortality at 3 months. Total time in hospital was also assessed.

Results Age, urea, albumin, hospital acquired infection, and non-purulence were all found to be clinical predictors or poor outcome. A score was developed using these variables.

R - urea <5=0, 5–8=1, >8=2
A - age <50=0, 50–70=1, >70=2
P - purulence=0, non purulence=1
I - iatrogenic/hospital acquired infection =1 community acquired =0
D - dietary factors. Albumin >27=0 <27=1
Total RAPID score range 0–7

In order to help interpret the RAPID score, we stratified patients into low-risk, medium-risk, and high-risk groups. Patients with a RAPID score of 0–2 are considered low risk, a score of 3–4 indicates a medium risk, and a score of 5–7 indicates high risk. This scoring system was then validated using another large cohort of patients with pleural infection who had been enrolled in a UK multicentre trial –MIST2 (n=210). Abstract S61 table 1 shows the main results. Time in hospital increased with increasing RAPID score. In MIST1 patients with RAPID 0–2 had median stay 10 (7–16) days, compared to RAPID >5 who had a median stay of 18 (9–26) days. This trend was also seen in MIST2.

Abstract S61 Table 1 Parameter estimates (mortality at 3 months)—RAPID score

	% died 3 months*	OR (95% CI)	p Value
MIST1			
0–2 (reference group)	1/186 (1)	–	–
3-4	14/121 (12)	24.41 (3.14 to 186.65)	0.002
≥5	26/51 (51)	192.40 (25.01 to 1480.41)	<0.001
MIST2			
0–2 (reference group)	3/97 (3)	–	–
3–4	6/65 (9)	3.19 (0.77 to 13.23)	0.11
≥5	9/29 (31)	14.1 (3.50 to 56.78)	<0.001

*Patients who were missing the necessary data to calculate the RAPID score were not included in mortality summaries, however these patients were used to calculate ORs for mortality.

Conclusion The RAPID score appears to allow for risk-stratification of patients with pleural infection at presentation and could prove useful in clinical practice in guiding initial management.

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S62 APPEARANCES OF EMPYEMA ON CT: ANALYSIS OF THE MIST 2 COHORT

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Introduction and Objectives Several studies have described the typical imaging features of empyema on CT, including pleural thickening, pleural enhancement, septation and loculation. However, there are

Abstract S62 Table 1 Prevalence of CT features associated with empyema in patients in the MIST 2 Cohort

Feature	% with feature
Empyema	
Empyema size	
Small	46
Moderate	40
Large	14
Volume change in hemithorax	
Decreased	25
Normal	69
Increased	6
Visible septa	24
Loculation	17
Air-fluid levels	54
Microbubbles	58
Extrapleural (EP) changes	
Increased EP Fat thickness	57
Increased EP Fat attenuation	50
Chest wall oedema	12
Parietal pleura (PP) changes	
Abnormal PP enhancement	99
PP Thickness	
<2 mm	14
2–5 mm	80
>5 mm	6
Visceral pleura (VP) changes	
Subvisceral oedema	34
Visible VP enhancement	66
Enhancement visible due:	
Adjacent subvisceral oedema	48
Adjacent pleural air	11
Neither	42
VP Thickening	
<2 mm	53
2–5 mm	25
>5 mm	1
Indrawing/Tenting of VP	30
Parenchymal Changes	
Volume change in hemithorax	
Decreased	25
Normal	69
Increased	6
Passive atelectasis	95
Parenchymal bands	63
Pneumonia/consolidation	63
Position relative to empyema:	
Adjacent	87
Remote	13
Associated cavitation	29
Small airway nodularity	17
Tree-in-bud changes	12
Bronchial wall thickening	33

further CT features of empyema which are less well described, or have only been reported in small groups of patients. The aim of this study was to establish the prevalence of the different CT imaging features of empyema in a large, well-characterised cohort of empyema patients.

Methods This was a retrospective cohort study comprising a subgroup of patients from the MIST 2 trial, who underwent a pre-treatment thoracic CT at a single institution. Patients in this trial had confirmed empyema using consistent diagnostic criteria. To ensure consistent and reliable image interpretation, each CT examination was assessed for predefined imaging features by three independent Thoracic Radiologists using a proforma. These features are listed in Abstract S62 table 1. We explored the sensitivity of the presence of five "classic" features of empyema described by Kearney *et al* (2000): loculation, parietal pleural thickening and enhancement and increased extrapleural fat thickness and attenuation.

Results 97 patients were included in the study. Imaging features are summarised in Abstract S62 table 1. 98.5% (95% CI 90.9% to 99.9%) of patients had at least two of five classic CT features of empyema. Additionally, we noted a significant number of patients with visceral pleural enhancement (66%), with indrawing/tenting of the visceral pleural (30%) and with subvisceral oedema (34%). Parenchymal changes were seen in the majority of patients. Associated consolidation was seen in the ipsilateral lung in 63% of patients; which was adjacent to the empyema in 87% of cases.

Conclusion This study describes the prevalence of multiple CT features of empyema and highlights the frequency of associated visceral changes. Many of the typical features of empyema were highly prevalent in this population but we also noted a high frequency of several other, less well-reported features. Subvisceral oedema is a previously unreported feature of empyema. These features may have implications for both diagnosis and prognosis.

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S63 TELEHEALTH IN ACUTE COMMUNITY ACQUIRED PNEUMONIA: PROOF OF CONCEPT AND PROVISIONAL EVALUATION OF IMPACT ON HOSPITAL LENGTH OF STAY

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Background/Aims Although remote patient monitoring systems are rapidly emerging, much has concentrated on managing chronic rather than acute conditions. British Thoracic Society (BTS) guidelines on acute community acquired pneumonia (CAP) suggest not all patients with CURB65 scores 0 to 2 need hospital inpatient treatment and, with the alternative of a supervised environment, we report post hoc analysis of what was initially a proof of concept model adopting a Telehealth enabled system as a potentially effective option designed to reduce hospital length of stay (LOS).

Methods Over 1 year to May 2011, 138 patients (60 male, 78 female) with mean (SD, range) age 65.5 (18.7, 19–95) years were admitted with CAP were identified. Selection for Telehealth was guided by initial CURB65 scores, patient competence/compliance with technology, social considerations and geographical factors as the provision was only within the area supported by Telford & Wrekin (T&W) PCT; patients were declined while on intravenous antibiotics. Remote monitoring (blood pressure, heart rate, respiratory rate, oxygen saturation, temperature) was via a Broomwell Health system (wrist watch concept) with twice daily planned data downloads managed and triaged through a HUB system filtering recordings to community based nurses. Data on LOS were skewed and non-parametric analysis of median (IQ) values undertaken to compare outcomes by area.

Results Abstract S63 table 1 shows raw data by age, sex, and LOS (days). 85% had CURB65 scores 0 to 2 and 17 (12.3%) died (8 had higher CURB65 scores). 33/138 (24%) were managed using Telehealth (majority CURB65 0–1) representing 35.5% from the T&W area. Comparing groups as a whole showed significantly ($p<0.05$) lower (median, IQ) LOS (days) for T&W (4, 2–8) vs the rest (6, 4–9). Differences in initial CURB65 scores, age and sex distribution between groups were not statistically significant when considering those patients with CURB65 0–2 where again LOS was reduced for T&W (n=75) at 4 (2–7) vs the rest (n=42) at 6 (3.8–9.3). None on Telehealth died but one had an unrelated admission.

Abstract S63 Table 1

	All cases	Within T&W area	Not within T&W
Number (Male/Female)	138 (60/78)	93 (36/57)	45 (24/21)
Mean age (SD, range)	65.5 (18.7, 19–95)	66.4 (18.8, 19–95)	63.5 (18.4, 19–88)
Median age (IQR)	68 (53.8–81)	70 (53.5–82)	65 (50–81)
Mean (SD, range) length of stay	9.1 (12.5, 0–71)	8.0 (10.7, 0–56)	11.4 (15.4, 1–71)
Median (IQR) length of stay	5.5 (3–8.25)	4.0 (2.0–8.0)	6 (4.0–9.0)
CURB65 0–2 (%)	84.8	80.6	93.3
Deceased	17/138 (12.3%)	12/93 (12.9%)	5/45 (11.1%)

Conclusion We have shown the proof of concept in adopting this technology in managing acute CAP and although we provide additional evidence to demonstrate reduction in length of stay, more controlled studies with economic models and an assessment of the return on investment are required. Most of the observed benefit seems to stem from more actively managing and discharging patients with lower CURB65 scores but who nevertheless presented as acute hospital admissions and subsequently benefited from the same provisions offered by Telehealth.

S64 UNDERSTANDING BETTER THE PATHOPHYSIOLOGY OF ASPIRATION PNEUMONIA

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Background Aspiration of oropharyngeal or gastric contents into the lower airways can cause a number of syndromes including chemical

Abstract S64 Table 1 Clinical presentation and pre-disposing risk factors

Clinical presentation	N (out of 51)
Fever	20 (39%)
Tachypnoea	37 (73%)
Tachycardia	39 (76%)
Hypoxic	45 (88%)
Hypotension	8 (16%)
Altered mental state	28 (55%)
Crackles on auscultation	44 (86%)
Pre-disposing risk	22 (43%)
Nursing/residential home	35 (67%)
History of aspiration	20 (39%)
Dementia	24 (47%)
Oesophageal dysphagia	18 (35%)
PEG/NG fed stroke	4 (8%)