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# Research letter

## Identifying priority areas for research into the diagnosis, treatment and prevention of cellulitis (erysipelas): results of a James Lind Alliance Priority Setting Partnership

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DEAR EDITOR, Priority setting partnerships give patients and healthcare professionals an equal voice in driving priorities for future research. This ensures that research answers the most important questions needed to inform clinical practice.<sup>1</sup>

Cellulitis (also known as erysipelas) is an acute, often recurrent, infection of the skin and underlying tissue. It is painful, and repeated episodes lead to progressive damage to the lymph system and skin integrity, leading to lymphoedema and ulceration.<sup>2</sup> The condition has received relatively little research attention to date, and systematic reviews have identified important evidence gaps.<sup>3,4</sup>

This letter describes the results of a recent Cellulitis Priority Setting Partnership, which has identified the top 10 most important questions for future research. Three of the prioritized questions address issues around diagnosis of cellulitis, four about treatment and three about prevention of repeat episodes.

The Cellulitis Priority Setting Partnership took place from January 2016 to April 2017 following a standard methodology

as outlined in the James Lind Alliance guidebook ([www.jla.nih.ac.uk/jla-guidebook](http://www.jla.nih.ac.uk/jla-guidebook)). Full details of the protocol are available ([www.nottingham.ac.uk/dermatology](http://www.nottingham.ac.uk/dermatology)). In brief, we conducted an online survey using SurveyMonkey® software, from April to June 2016, to gather the views of patients and healthcare professionals (Table 1). This survey was supplemented by evidence gaps identified from systematic reviews and guidelines published in the last 3 years ([www.nottingham.ac.uk/research/groups/cebd/resources/maps-of-systematic-reviews.aspx](http://www.nottingham.ac.uk/research/groups/cebd/resources/maps-of-systematic-reviews.aspx)).

Overall, 846 uncertainties were submitted, of which 639 contained a specific question about the diagnosis or management of cellulitis. Submitted uncertainties were combined and refined, to produce a list of 40 'unique uncertainties' that reflected the broad themes of the individual submissions. During this collation and rewording stage, input from the lay members of the steering group ensured that all questions were worded clearly in language understood by the general public. We avoided value-laden statements such as 'What is the role of ...?', which could imply that the treatment is beneficial. Instead a more neutral form of wording was used, such as 'Is there a role for ...?' or 'Could xxxx help to ...?'.

A second online survey took place between December 2016 and February 2017. This interim prioritization survey was completed by 352 participants (Table 1), who were asked to vote for their top 10 priority questions from the 40

Table 1 Characteristics of participants

	First survey	Second survey	Final workshop
Patient with single episode of cellulitis	33 (8.23) <sup>a</sup>	38 (10.76) <sup>b</sup>	1 <sup>c</sup>
Patient with multiple episodes of cellulitis	111 (27.68) <sup>a</sup>	125 (35.41) <sup>b</sup>	10 <sup>c</sup>
Both patient and healthcare professional	1 (0.25) <sup>a</sup>	8 (2.27) <sup>b</sup>	Information not collected
Carer of patient with cellulitis	7 (1.75)	16 (4.53)	–
Patient (other)	19 (4.74)	3 (0.85)	1 <sup>c</sup>
Dermatology doctor	66 (16.46)	38 (10.76)	3
General practitioner/family doctor	87 (21.70)	54 (15.30)	5
Emergency doctor	3 (0.75)	8 (2.27)	–
Nurse	19 (4.74)	20 (5.67)	6
Lymphoedema or infection doctor	30 (7.48)	28 (7.93)	2
Healthcare professional (other)	12 (2.99)	7 (1.98)	–
Other	13 (3.24)	8 (2.27)	–
Total	401	353	28

All data are presented as n (%) unless otherwise stated. <sup>a</sup>Of the 152 patient respondents, 92 (60.5%) had lymphoedema, five (3.3%) had diabetes, six (3.9%) had both conditions and 49 (32.2%) participants did not provide this information. <sup>b</sup>Of the 187 patient respondents, 107 (57.2%) had lymphoedema, six (3.2%) had diabetes, 15 (8.0%) had both, 57 (30.5%) had neither condition, and two participants (1.07%) did not provide this information. <sup>c</sup>Of the 12 patient participants, eight (67%) had lymphoedema and one (8%) had diabetes.

Table 2 Results of Cellulitis Priority Setting Partnership: top 20 uncertainties

Final rank order following workshop	Questions discussed at workshop	Rank order from survey (prior to workshop)
1	<sup>a</sup> How can healthcare professionals be best supported to accurately diagnose and manage cellulitis and to advise their patients in how to prevent relapses?	6
2	What are the best diagnostic criteria for cellulitis, and are they different for different patient groups (e.g. people with lymphoedema)?	3
3	When treating cellulitis, could a higher initial dose and/or longer course of antibiotics result in a faster recovery and/or fewer relapses?	2
4	<sup>b</sup> What is the best nonantibiotic intervention for the prevention of cellulitis (e.g. skin care; foot care; moisturisers; antiseptics; lifestyle changes such as weight loss and exercise; compression garments/bandages; treating athlete's foot; complementary and alternative therapy)?	1
5	Does rest/elevation during an episode of cellulitis help to speed up recovery and improve symptoms, compared with exercise/movement of the affected limb?	8
6	Is the duration, dose and method of administration of antibiotics needed to treat cellulitis related to patient characteristics (e.g. patients with diabetes who are overweight or have swelling of the limb may require a higher dose/duration)?	19
7	What are the early signs and symptoms of cellulitis that can help to ensure speedy treatment?	7
8	What type of patients are most likely to benefit from low-dose antibiotics to prevent repeated episodes of cellulitis?	15
9	<sup>c</sup> Is there a role for the use of compression garments/bandages on the affected limb during an episode ( <i>when tolerable</i> ), or <i>immediately following an episode of cellulitis, to speed recovery and reduce complications and recurrence</i> ?	20
10	How safe are long-term antibiotics for the prevention of recurrent cellulitis?	10
11	What is the best and safest antibiotic, or combination of antibiotics, to treat cellulitis?	4
12	When treating an episode of cellulitis, what features should prompt a change in antibiotic treatment and after what duration?	13
13	Which patients are most likely to benefit from intravenous antibiotics (as inpatient or outpatient) for the treatment of cellulitis?	17
14	Can testing (e.g. blood tests or scans) help to give a faster or more accurate diagnosis of cellulitis?	5
15	What is the best way to ensure speedy treatment of recurrent cellulitis (e.g. keeping antibiotics at home)?	16
16	What are the most appropriate antibiotics for the prevention of cellulitis (including those for patients allergic to penicillin)?	18
17	What is the best treatment to use first when treating cellulitis?	11
18	For how long should low-dose antibiotics be taken to prevent repeat episodes of cellulitis?	14
19	<sup>d</sup> Is there a role for testing to check that the infection has completely cleared before stopping treatment for cellulitis?	12
20	<sup>d</sup> Is there a role for tests to identify the type of bacteria causing the cellulitis in deciding the best treatment option?	9

<sup>a</sup>This uncertainty includes the development of tests or tools to assist with the diagnosis and management of cellulitis. <sup>b</sup>Uncertainty combined and reworded by the steering group following the interim priority setting survey. Number of votes for each in the interim survey: moisturisers (58 votes); compression garments/bandages (50 votes); lifestyle changes, e.g. diet, weight loss, exercise (52 votes); complementary and alternative therapy (46 votes); treatment of fungal foot disease (44 votes); antiseptics following injury (36 votes); improved foot care (30 votes); and regular washing (19 votes). <sup>c</sup>Compression considered to be too painful during the initial acute episode. As a result, minor modification of the wording was agreed by the steering group after the workshop (*italicized words added*). <sup>d</sup>Considered important areas to watch for future developments.

uncertainties identified during the previous stage. Uncertainties were presented to individuals in a random order to minimize selection bias. Participants were first asked to select all uncertainties they felt were important. These selections were then re-presented to the participants and they were asked to choose their top 10 questions from the resulting list. Participants were then asked to choose just three of their 10 that they felt were 'most important' to them.

Once all responses had been submitted, the steering group agreed on additional merging/rewording of 11 uncertainties to ensure that all topics in the priority list were broadly comparable in terms of breadth (e.g. specific questions about how best to prevent cellulitis were combined into a single uncertainty on the best way to prevent cellulitis that did not involve use of antibiotics). This resulted in a revised list of 29 uncertainties from the interim prioritization stage.

In order to select a shortlist of approximately 20 uncertainties for discussion at the final prioritization workshop, the steering group reviewed the results of the interim prioritization survey (based on individuals' top 10 selections), presented in rank order for all responders combined, and then separately for patients and healthcare professionals. Uncertainties were selected for consideration at the final workshop if they were ranked in the top 20 for patients or healthcare professionals and were in the top 20 for all responders on the basis of rank order of choices when selecting their top three uncertainties.

Twenty uncertainties were agreed for discussion at the final workshop, which took place in London on 21 April 2017. This whole-day, face-to-face consensus meeting involved 12 patients, 16 healthcare professionals and two observers (Table 1). Nominal group techniques were employed to achieve consensus on the top 10 research priorities, using a combination of whole-group and small-group discussions. Details of the 20 uncertainties that were discussed at the face-to-face meeting, along with their finalized ranking, are summarized in Table 2.

Results of this priority setting partnership will now be publicized through academic journals, professional networks and social media channels. Uncertainties will be worked up into detailed research questions and submitted to relevant funding bodies. This work has identified a community of patients and healthcare professionals who are interested in conducting and contributing to cellulitis research. We hope that this priority setting partnership will encourage this community to work together to address these important research gaps.

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