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## General practitioners' views and experiences in caring for patients after sepsis - a qualitative interview study

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Complete List of Authors:	Gehrke-Beck, Sabine; Charite Universitätsmedizin Berlin, Institute of General Practice and Family Medicine Gensichen, Jochen; University Hospital Munich, Institute of General Practice and Family Medicine; Jena University Hospital, Institute of General Practice and Family Medicine Turner, Katrina; University of Bristol, School of Social and Community Medicine Heintze, Christoph; Charite Universitätsmedizin Berlin, Institute of General Practice and Family Medicine Schmidt, Konrad; Charite Universitätsmedizin Berlin, Institute of General Practice and Family Medicine; Jena University Hospital, Institute of General Practice and Family Medicine
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3 **Title: General practitioners' views and experiences in caring for patients after sepsis - a qualitative**  
4 **interview study**  
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8  
9 **Authors:**

10 Dr. Sabine Gehrke-Beck <sup>a</sup>, Prof. Dr. Dipl.-Päd., MPH Jochen Gensichen <sup>c, d, e</sup>, Dr. Katrina Turner <sup>b</sup>, Prof. Dr.  
11 MPH Christoph Heintze <sup>a, 1</sup>, Dr. Konrad Schmidt <sup>a, d, e, 1</sup>  
12  
13  
14

15  
16 <sup>a</sup>Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu  
17 Berlin, and Berlin Institute of Health, Institute of General Practice, Charité Campus Mitte, Charitéplatz 1, 10117  
18 Berlin, Germany  
19

20  
21 <sup>b</sup>Population Health Sciences, Bristol Medical School, University of Bristol, Canynge Hall, 39 Whatley Road,  
22 Bristol, BS8 2PS, UK  
23

24  
25 <sup>c</sup>Institute of General Practice and Family Medicine, Munich University Hospital, LMU Munich, Pettenkofenstr.  
26 10, 80336 Munich, Germany  
27

28  
29 <sup>d</sup>Institute of General Practice and Family Medicine, Jena University Hospital, Bachstrasse 18, 07743 Jena,  
30 Germany  
31

32  
33 <sup>e</sup>Center of Clinical Studies, Jena University Hospital, Salvador-Allende-Platz 27, 07747 Jena, Germany  
34  
35  
36  
37  
38

39 <sup>1</sup> shared last authorship  
40  
41  
42

43 **Corresponding author:**

44  
45 Konrad FR Schmidt

46  
47 [Konrad.Schmidt@charite.de](mailto:Konrad.Schmidt@charite.de)

48  
49 Institut für Allgemeinmedizin

50  
51 Charité Universitätsmedizin Berlin

52  
53 Charitéplatz 1

54  
55 10117 Berlin

56  
57 Telephone: ++49-30-450514133

58  
59 Fax: ++49-30-450514092  
60

## **Abstract**

### **Rationale**

Patients surviving critical illnesses, such as sepsis, often suffer from long-term complications. After discharge from hospital, most patients are treated in primary care. Little is known how general practitioners (GPs) perform critical illness aftercare and how it can be improved. Within a randomized controlled trial, an outreach training programme has been developed and applied.

### **Objectives**

The aim of this study is to describe GPs' views and experiences of caring for post-sepsis patients and of participating a specific outreach training.

### **Design**

Semi-structured qualitative interviews

### **Setting**

14 Family practices in the metropolitan area of Berlin, Germany

14 GPs, who had participated in a structured sepsis aftercare program in primary care

### **Results**

Themes identified were: Continuity of care and good relationship with patients, concentration on everyday functioning and lack of information about the intensive care unit (ICU) stay. An outreach education as part of the intervention was considered helpful to improve GPs' knowledge of the management of post-intensive care complications.

### **Conclusions**

GPs approach to patients surviving sepsis supports providing individual and continuing aftercare. Better communication at the ICU-GP interface and training in management of long-term complications of sepsis may be helpful to improve aftercare.

**Keywords:** post intensive care syndrome, sepsis, primary care, General Practitioner, after-care, outreach-education, qualitative research

1  
2  
3 **Abbreviations**  
4

5 GP: general practitioner  
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7 ICU: intensive care unit  
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9 PICS: Post-intensive care syndrome  
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11 SMOOTH: Sepsis survivors monitoring and coordination in outpatient health care  
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3 **Article Summary**  
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- 5
- 6 • Most sepsis survivors are treated by their GPs in the long term
  - 7
  - 8 • There is a lack of specific knowledge about sepsis complications in primary care
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  - 11 • Information flow from intensive to primary care should be improved
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  - 14 • Outreach education on post-sepsis complications may support GPs providing aftercare
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## **Introduction**

An increasing number of patients are treated in intensive care units (ICUs) and survive a critical illness such as sepsis<sup>1</sup>. After discharge, patients may suffer from long-term consequences<sup>2</sup>, such as critical-illness-polyneuropathy, critical-illness-myopathy, cognitive decline, chronic pain<sup>3-6</sup>, depression or post-traumatic stress disorder<sup>3, 7, 8</sup>. These sequelae are referred to as the “Post-intensive care syndrome” (PICS)<sup>1</sup>. They result in lower health-related quality of life and elevated mortality rates, as well as increased health care use<sup>9-11</sup>.

International guidelines state that patients with post-intensive care syndrome should have ongoing, long-term monitoring and therapy<sup>12, 13</sup>. Some patients discharged from ICUs are referred to ICU follow-up clinics. The purpose and structure of these clinics vary between countries, but change of clinical outcomes are rarely shown<sup>14-16,20</sup>. In addition, continuity of care at an ICU-follow up clinic may be difficult, when the patient lives far from the ICU and needs frequent follow-up<sup>17-19</sup>. Even if intensive care doctors and nurses are familiar with complications after critical illness, their role in coordinating ICU follow-up is discussed controversially<sup>20,21</sup>: They seem not to be trained in outpatient care coordination and the clinical variety of possible post-ICU complications<sup>20</sup>. Additionally, they do not know their patients for long and therefore may lack insight into the patient’s psychosocial background<sup>22</sup>. On the contrary, GPs have a long-lasting relationship with their patients and provide care coordination as a core task<sup>23</sup>, which is highly appreciated by the patients<sup>24</sup>. This makes GPs ideal advocates of patients in their rehabilitation pathways. Thus, a Dutch retrospective cohort study found an increased consultation rate in primary care following ICU discharge<sup>25</sup>. Considering, that there were more than two million intensive care treatment cases just in Germany in 2017<sup>26</sup> and an assumed increase driven by the Covid-19 pandemic, GPs need to know how to provide best post-intensive care to these patients, as it has been already called for by others<sup>27</sup>. The concept of the PICS is quite recent, but GPs intensive care experiences may date back to medical studies or early hospital rotations. In a qualitative study, GPs reported lack of background knowledge and confidence in diagnosing and treating post sepsis complications<sup>28</sup>. Kahn (2007) states that GPs need to be educated in how to care for patients after critical illness but do not provide suggestions about how this should be done<sup>22</sup>.

Outreach education and academic detailing appear to change physician behavior and improve care<sup>29</sup>, but current evidence mainly focuses on changing prescribing patterns rather than on complex treatment strategies. Educational outreach visits providing knowledge to primary care for relatively rare medical problems are shown to enhance confidence<sup>30</sup> and are acceptable to GPs<sup>31</sup>. Such an intervention may be effective in educating GPs in



1  
2  
3 how to effectively care for patients with post-intensive care syndrome. However, whether it is needs to be  
4  
5 assessed.

6  
7 The SMOOTH trial evaluated a structured after-care program in general practice for sepsis survivors  
8 including an outreach education for GPs<sup>32, 33</sup>. Sepsis is one of the leading causes of long-term-ICU stays and can  
9 be viewed as a model illness for critical disease<sup>34</sup>. As part of this trial, in-depth interviews were held with GPs to  
10 explore their experiences with patients discharged from ICU and the intervention. Qualitative research has been  
11 conducted with post-ICU patients in detail<sup>35-37, 38, 39, 47</sup>, but, to date, no one had explored in depth the views and  
12 experiences of GPs caring for these patients. The aim of this study is to describe GPs' views and experiences of  
13 caring for post-sepsis patients and of participating a specific outreach training, in order to inform and contribute  
14 to applicable future aftercare structures in primary care.

## 23 **Methods**

### 24 **The SMOOTH-trial**

25  
26 The SMOOTH trial is a multi-center RCT evaluating a primary-care based aftercare-intervention for sepsis  
27 survivors. The intervention included monitoring of the patient by a case manager (a specialized nurse), a patient  
28 education session delivered by the case manager and an educational outreach-visit by a liaison physician to the  
29 GP, details are reported elsewhere<sup>32</sup>. Patients were recruited in the ICU and when they agreed to participate, their  
30 GPs were contacted and asked to join also the trial. 291 patients agreed to participate, with 148 patients were  
31 randomized to the intervention and 143 patients to the control group receiving usual care. As some patients  
32 changed their GPs during the trial, the number of GPs was slightly larger than the number of patients. 307 GPs  
33 were approached to participate. 294 (95.8%) agreed and were included in the trial. Of total 159 GPs in the  
34 intervention group, 55 were recruited at the Berlin trial site.

35  
36 The intervention directed at the GP consisted of one outreach educational visit by a liaison physician - a GP  
37 trained in sepsis aftercare. The visit was scheduled after the patient's discharge and according to time  
38 preferences of the GPs. It took place in the GP practice and lasted about one hour. The education session  
39 included a brief overview of sepsis epidemiology and diagnosis, including red flags in primary care, but focused  
40 specifically on the six most common sequelae of sepsis ("Sepsis Six"). The epidemiology of long-term sequelae,  
41 practical tools for diagnoses and monitoring, as well as evidence-based therapeutic options in routine outpatient  
42 care were presented. A detailed manual covering all the information given and a brief sepsis pocket-card  
43 summarizing main points for everyday practice were handed over to the GP, published elsewhere<sup>33</sup>. The GP was  
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3 asked to contact the liaison physician later at any moment in the study if questions arose during follow-up of the  
4 patient.  
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### 6 7 **Study design and data collection**

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10 As part of implementation evaluation, semi-structured interviews were held with the GPs in the intervention  
11 group of the RCTs to gain insight into their experiences caring for patients surviving sepsis and the GP education  
12 that had been delivered as part of the intervention.  
13  
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15  
16 Qualitative methods are applied within the paradigm of critical rationalism. The aim was to understand the  
17 GPs view of the patient's situation as a starting point of aftercare and the functioning of the intervention from the  
18 GP perspective. We purposefully sampled GPs for interview to ensure interviews were held with GPs of varying  
19 gender and duration of work experience. All those approached for interview had worked at the Berlin trial site.  
20 If GPs were willing to be interviewed, they were posted information about the interviews and a consent form.  
21  
22

23  
24 A 4th year medical student (NS) who had received training in how to conduct qualitative interviews  
25 conducted the interviews as a research project within the regular medical curriculum. She was part of a  
26 qualitative research group and received regular supervision from two of the other authors (SGB, CH) who are  
27 experienced in qualitative research.  
28  
29

30  
31 GPs willing to be interviewed could stipulate the time and location of their interview. A topic guide was  
32 used to ensure consistency across the interviews, see Table 1A/B. It covered the GPs' perception of post-sepsis  
33 patients and their symptoms as well as their experience of caring for these patients and of the educational  
34 session. The first interview was used as a pilot but as no changes were made to the topic guide, the interview was  
35 included in the analysis. With participant consent, the interviews were audiotaped and transcribed verbatim by  
36 NS. GPs were interviewed until data saturation was reached, i.e. when no new themes were identified in the later  
37 interviews.  
38  
39

### 40 41 42 **Patient and Public Involvement**

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44 Patient's perspectives and needs were included into topic guide development by the study team. Beside  
45 literature research, it was based on the results of qualitative interviews with sepsis survivors, using the same  
46 methodical approach and being published elsewhere<sup>47</sup>.  
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## **Data analysis**

The interviews were analyzed thematically<sup>40</sup>. Inductive thematic coding was used to gain an overall insight into the perspectives of the GPs. Transcripts of four interviews were read and re-read by different members of the research team (SGB, CH, KS, JG) who identified themes and developed initial coding frames. These researchers repeatedly discussed their codes and interpretation of the data. Once the coding frame had been agreed, it was applied to all interviews. Coding was done manually by SGB. Results were presented to the research team and discussed until consensus was reached (SGB, CH, JG, KS).

## **Results**

### **Participants**

We contacted 18 GPs for interview. Four GPs declined to participate due to lack of time. The 14 GPs who agreed to be interviewed (tables 2 A/B and 3) choose to be interviewed at work, on practice premises, in a private room. After 14 interviews, theoretical saturation was reached with no new aspects emerging in the last two interviews. The interviews lasted 12–28 minutes (mean 20 minutes). Themes considered relevant to this paper with corresponding quotes are shown in tables 4 and 5.

### **Caring for patients after critical illness**

When analyzing the GPs' accounts, three main themes related to their experience of caring for patients after intensive care were identified as continuity of care and good relationship with patients, lack of information during the acute illness and individual impact of persisting symptoms after discharge.

#### ***Continuity of care and good relationship with patients***

At the start of the interview, the GPs were asked to talk freely about their patient. The accounts given suggested that specific medical diagnoses and the acute sepsis diagnosis played a limited role in the GPs' narration. GPs often commented on the patient's condition before they were diagnosed with sepsis, discussing their pre-existing disease and previous general health status. It was evident that many of them were familiar with the patients' medical history.

Many GPs also talked about the patient's personality. They often focused on the patient's coping and illness behavior as one GP explained:

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3       *"... she is actually a very modest... and shy person and for her medical problems she only claimed what she*  
4  
5 *really needed urgently at that moment. A very kind and pleasant patient."* GP 12

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7       Some GPs also reported on the personal and employment situation of their patients, especially if they felt  
8  
9 that this had been important to the recovery of the patient:

10  
11  
12       *"Despite being my age, she had a young daughter and I think that's why she needed to be functioning and*  
13 *go back to work and she needed the money, yes."* GP 6

14  
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16       Even if most GPs seemed to know their patients very well, two GPs stated that they started caring for their  
17  
18 patients only after the sepsis hospital stay. These two GPs gave little information about their patients.

### 21       ***Lack of information during acute illness***

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23       Most GPs commented that they lacked information about the acute sepsis event. They had not been  
24  
25 informed about their patient's condition or involved in any of the treatment decisions made whilst their patient  
26  
27 was in hospital. Several GPs could not specify the exact diagnosis and focus of the sepsis.

28  
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30       *"The event of sepsis itself, as I said, wasn't diagnosed by me, in the practice, but happened in hospital after*  
31 *the operation and that's why I sort of got him back here as everything was finished. I just had to sort of accept*  
32 *that (...) in the end, I didn't have much to do with it and that's why I don't know much about it."* GP 8

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35       Some GPs perceived the acute sepsis event as a tragic lifetime event for their patients and discussed the  
36  
37 emotional impact of the serious impact on the patient and his/her family.

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40       *"This was a very unlucky course of events (...) surely, everybody asks, why is it just me?"* GP 3

### 43       ***Individual impact of persisting symptoms***

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45       GPs mentioned a number of different aspects when they described the condition of their patients after  
46  
47 discharge and the impact of sepsis sequelae in their quality of life: general weakness and low functioning, the  
48  
49 impact of preexisting diseases, individual specific health impairments and – less frequently- specific diagnosis of  
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51 long-term-complications contributing to the post-intensive care syndrome.

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54       Many interviewees described a general weakness and low functioning of their patients. They attributed this  
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56 to the severe illness and the long hospital stay, without specifying the factors and causes contributing to the  
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58 weakness like underlying illnesses, specific complications or treatment side effects. The focus of their reports  
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3 was on the consequences for independence and autonomy of their patients rather than underlying  
4 pathomechanisms.  
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7 *“Well, she was a shadow of her former self” GP 6*  
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10 Many GPs compared their patients’ health status to their condition before critical illness. In some cases,  
11 they saw their patients’ impairment after discharge as, at least in part, attributable to pre-existing and chronic  
12 illness. In their perception, the acute sepsis event did not alter status of these patients much.  
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15  
16 *“Essentially, he kept the diseases he had before and everything got gradually a bit worse. He tended to be*  
17 *depressive before and now it isn’t much worse.” GP 11*  
18  
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20  
21 The report about their patient condition and complications after sepsis was in many cases given in common,  
22 everyday language without listing specific medical diagnoses or specific sepsis complication. They rather  
23 concentrated on reporting on everyday functioning and overall well-being. Only some GPs classified specific  
24 sepsis sequelae and precisely stated these diagnoses. Some added being only aware of the diagnosis after the  
25 education session, they received as part of the study intervention.  
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31 *“And mainly... he was quite distressed by the gait disturbance; by the painful paresthesia he had (...) the*  
32 *polyneuropathy was what was left from the sepsis syndrome.” GP 8*  
33  
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36 Some GPs reported individual complications of sepsis or sepsis therapy had the main impact on the  
37 patient’s quality of life afterwards, e.g. the loss of a limb or a persisting colostomy.  
38  
39

40 *“As she had, because of this sepsis, she basically lost the leg, well, she had an amputation and ...hmm...she*  
41 *was still quite mobile before and could leave the flat. Hmm, afterwards no longer, because with one leg she*  
42 *couldn’t manage the stairs.” GP 5*  
43  
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46 One GP could not contribute to that aspect, as his patient died shortly after discharge.  
47  
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### 49 **Impact of the outreach education**

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51 Three main themes that described the impact of the education session were identified: acceptability,  
52 increase in knowledge, and the transfer to professional practice.  
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#### 55 *Acceptability*

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3 Most participants stated that they appreciated the time and the effort on the side of the liaison physician to  
4 come to their premises and adapt to their schedule. They commented that this was an advantage for their own  
5 time schedule and comfort.  
6  
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8  
9 *“I was approached at a time that was convenient for me (...), I didn’t need to move anywhere, that could  
10 happen here, well, the colleague bothered to come (...) and as I said that was ideal, I would say.” GP 2*  
11  
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13  
14 However, some GPs said they had many patients to care for and tasks to cope with and could not spare any  
15 time for the training. A few also mentioned that post sepsis patients are rare in a GP practice and that they would  
16 rather invest save time in continuing education for more common diseases.  
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19  
20 *“Well, it was very interesting, the education, but this is just another additional point, that takes time and I  
21 would prefer e.g. to have lunch or something similar.” GP 11*  
22  
23

### 24 **Improvement of knowledge**

25  
26 The majority of practitioners stated that they had gained new knowledge from the education. Many  
27 interviewees reported it was new to them that sepsis can cause specific disease sequelae persisting after hospital  
28 discharge.  
29  
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31  
32 *“Yes, that was largely new to me, that sepsis is seen as a complex illness with long lasting complications.  
33 Till now, I saw it more as a complication, that, when cured, is resolved.” GP 11*  
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36  
37 GPs often also stated, that they weren’t aware that mortality is still elevated long-term after discharge until  
38 they heard about that in the education session.  
39  
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41  
42 *“Most helpful was (...) that sepsis e.g. has a high mortality, the numbers were alarming! I mean, the  
43 mortality after discharge, (...) basically, I thought: Sepsis survived, ok, the bird flies on.” GP 2*  
44  
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46  
47 Some of the GPs reported that they did not know before that polyneuropathy and psychological problems  
48 were common consequences after sepsis and intensive care.  
49  
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51  
52 *“I think, I would not have seen the connection before. Because she had so many other reasons for a  
53 polyneuropathy, I would have probably linked it to the diabetes.” GP 5*  
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57 One GP acquired more information about diagnosis of a sepsis in a patient, even though that was not in the  
58 focus of the education session.  
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3 Some GPs stated that they already knew the information given to them, but even when this was the case,  
4 they still appreciated the repetition and summary preparing them for the care of the patient.  
5

6  
7 *“Well, I didn’t find anything really new to me. But it was brought back and I did concentrate on it and*  
8 *looked closer to it. That was new to me and helps me for, well, aftercare.” GP 9*  
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12 One doctor saw no benefit from the education; he had done research in this field before his GP work and  
13 had the relevant knowledge before.  
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### ***Transfer to practice***

Most of the GPs interviewed said that the new information helped them care for the patient included in the trial, and that it would help them in their future work with similar patients. Most of them saw a benefit in identifying sepsis sequelae.

*“...mainly the polyneuropathy and so on, I look out for it more closely. I say to myself: Look out! You must keep that in mind and ask for it, when they don't tell on their own, if they have problems.” GP 5*

Some reported consequences for the therapy of the patient they cared for within the study and some stated that they would probably change their therapeutic approach to similar patients in the future.

*“I believe I changed some things afterwards. I mentioned the psychotherapist afterwards, that became quite clear, and (patient's name) did agree to that.” GP 4*

One GP had quickly diagnosed a patient with acute sepsis since the training, even though diagnosis of sepsis was not its main focus.

Some GPs doubted the relevance of the information for their work. They stated that caring for similar patients was a very rare event in their practice, and therefore they did not think they would apply the knowledge they had learnt.

*“I don't have any sepsis patients - that's why I can't change anything about what I do.” GP 3*

### **Discussion**

Findings from this study suggest that GPs provide continuity of care and a good relationship with patients and consider pre-existing and chronic disease, personality and coping patterns, as well as social background, when providing post-ICU-care to patients. Many interviewees described the long-term impact of sepsis on their patients as a general weakness and malfunctioning and considered it in relation to the patient's pre-sepsis constitution. Some GPs expressed empathy with the serious life event their patient experienced. GPs reported a lack of information about the course of the disease and their patient's condition while they were in the hospital. Diagnosing and listing specific sepsis sequelae played a minor role.

The outreach education session was acceptable to most GPs. Most GPs acquired new information about long-term-complications of sepsis. They considered this information as helpful to identify and start treatment for



1  
2  
3 specific post-sepsis symptoms. However, some GPs did not value it and pointed to the small numbers of post-  
4 sepsis-patients being in competition with other patients and tasks.  
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7 While most of the GPs' accounts suggested a long-standing knowledge of the patient and an individual  
8 appraisal of their health impairments after discharge, they lacked detailed medical knowledge about sepsis  
9 complications. The outreach education was mainly well accepted and seemed to provide a valid setting to  
10 improve knowledge about specific diagnostic and therapeutic concepts GPs can apply in their professional  
11 practice.  
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### 17 **Comparison with existing literature**

18 Patients' perceptions of their quality of life after an ICU-stay have been examined in several qualitative  
19 studies. A wide range of ongoing health impairments was identified and loss of autonomy was a main aspect<sup>35, 37</sup>.  
20 The views of the GPs identified here is very close to patients' perspectives. The GPs also reported general  
21 weakness and low functioning as a main aspect and that a very individual apprehension of complaints and  
22 impairment. This congruence may facilitate a patient-centered after-care especially in a primary care setting.  
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30 Difficulties in information flow between intensive care units and GPs had been identified before: lack of  
31 information about admission or discharge and ongoing needs of patients after an ICU stay and no involvement in  
32 treatment decisions were reported by GPs in other studies<sup>41-43</sup>. As valid data on the course of disease and current  
33 diagnoses and treatment is essential for follow-up, information during hospital stay and more detailed discharge  
34 information for GPs may be essential to enhance quality in after-care.  
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40 It has been shown that GPs lack information on sepsis and identification of post-ICU-complications<sup>28, 43</sup>.  
41 The acquisition of clinical knowledge has been described and explained by forming of "scripts" with repeated  
42 exposure to clinical patterns<sup>44</sup>. With no ongoing experience in handling ICU-patients and limited encounters of  
43 post-ICU patients, scripts related to the PICS cannot be expected to evolve in GPs in everyday practice. In our  
44 study, the educational intervention led to additional knowledge about specific long-term-post-ICU  
45 complications.  
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55 GPs appreciate personal discussion with experts as a valuable method of continuing education<sup>45</sup>, and  
56 outreach visits as a method to reach GPs have been used before and shown to be accepted well<sup>6</sup>. Knowledge  
57 gain has been demonstrated, but transfer to practice seemed to be difficult<sup>29, 46</sup>. Patient-related intervention may  
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3 be especially helpful<sup>29</sup> to facilitate knowledge transfer. In our study, GPs reported transfer to practice of the  
4 knowledge they acquired, which may be achieved by the patient-related education and the individual discussion  
5 of diagnosis and treatment in the practice.  
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9 Lack of continuum of care is a major patient concern after ICU discharge<sup>35,36</sup>. This study demonstrates that  
10 GPs are familiar with their patients, know about their medical and psychosocial background and consider these  
11 aspects when caring for their patients. Therefore, GPs seem to be an appropriate ICU aftercare provider.  
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### 15 16 **Limitations**

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18 Since 307 GPs were asked to take part in the trial, and 294 agreed, it is likely those who took part in the trial  
19 are representative of other GPs in Germany<sup>33</sup>. Being involved into a sepsis aftercare trial makes GPs informants of  
20 the functioning of the RCTs intervention, but may have changes their perception of the post-sepsis patients they  
21 care for. They may have been more preoccupied with and focused on that patient than otherwise. It might be  
22 those who agreed to be interviewed were more interested than their peers in sepsis as 4 of the 18 GPs approached  
23 for interview declined. As only GPs in the urban area of Berlin were interviewed, specific aspects of GPs in rural  
24 settings may have been missed.  
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32 The interviews were fairly short, which may limit depth of insights. Time constraints are typical of GPs  
33 work and were mentioned repeatedly throughout the interview. As GPs are used to work when time is limited  
34 they managed to answer questions quickly and summon up their experiences.  
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### 39 **Conclusion**

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41 GPs are capable in provision and coordination of ICU follow-up: They have a profound and holistic  
42 knowledge of these complex patients and can appreciate individual their impairments and residing symptoms.  
43 However, lack of specific knowledge about critical illness complications, and lack of information and  
44 communication with ICU care providers are barriers to optimal follow-up in primary care settings.  
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50 GPs should get the necessary background knowledge and individual background information of their  
51 patients to be able to provide high-quality care. Taking into account time constraints and preferred education  
52 formats, outreach visits in the context of the discharge of a post-ICU patient may be a valuable source of  
53 information and support in caring for patients for the GPs interviewed.  
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## Declarations

Declarations of interest: none declared

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Author Statement: SGB, KS and CH had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: SGB, CH, JG, KS. Outreach training conduction: KS. Aquisition, analysis of data: SGB. Interpretation of data: SGB, CH, KS, JG, KT. Drafting of the manuscript: SGB, KS, KT. Critical revision of the manuscript for important intellectual content: SGB, CH, KS, JG, KT.

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3 **Tables**  
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5 **Table 1: Coding framework**  
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8 **A: Caring for post-sepsis patients**  
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Themes	subthemes
Profound knowledge of patients	Pre-existing disease Personality Illness behaviour Social background Continuity of care
Lack of information	
Emotional involvement	
Individual appraisal of persisting symptoms	General weakness and limited functioning Alteration to pre-sepsis condition Specific diagnosis of common complications after intensive care Individual complication

33 **B: Experience and acceptance of the outreach education**  
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Themes	subthemes
Time and effort	Convenience by outreach visit Time strains, competing tasks
Knowledge	Persisting elevated mortality after discharge Specific long-term complications (Polyneuropathy, post-traumatic distress) Relevant summary for practice
Implementation in practice	Identifying complications Initiation of specific therapy Low relevance as small patient numbers in practice

**Table 2: Characteristics of participating GPs and patients****A: Characteristics of the interviewed GPs (n)**

Total	14
Male	8
Female	6
Age [years]	41-64 (mean: 54)
Working in Practice [years]	9-33 (mean: 19)

**B: Characteristics of post sepsis patients cared for by the GPs (n)**

(patients included in the RCT)

Total	14
Male	11
Female	3
Age [years]	45-82 (mean: 66)
Sepsis focus	3 pulmonary
	2 gastrointestinal
	3 renal
	3 tissue infection
	3 unknown

**Table 4: Quotations: Caring for patients after critical illness.**

<i>Themes and subthemes</i>	<i>Quotation</i>
<i>Patients</i>	
Previous health status	<p>„Well, he was a spry patient, he bore his age well and he had no relevant preexisting disease (..) and he came mainly for check-ups.” GP 9</p> <p>„Yes, she needed home visits before. She had an insulin-dependent diabetes , COPD, an heavy nicotine abuse she gave up after a hospital admission, we had home oxygen therapy before , there was a problem with alcohol meanwhile, she had skin problems, heart failure, high blood pressure, all that existed before.” GP 5</p> <p>„A young man, I know him since his school times, over time he developed arterial hypertension. It is obviously in the family, as both his parents suffered from it and a chronic gastritis, apart from this no abnormalities.” GP 3</p> <p>„I didn’t have much contact to (him) before, because he was comparatively fit for his age. He predominantly had orthopedic problems. He is still active, playing golf and so on and (..) but internal diseases, that were serious, he didn’t have that” GP 8</p>
Personality and illness behaviour	<p>„She was actually- or she is actually a very modest... and shy person and for her medical problems she only claimed what she really needed urgently at that moment. A very kind and pleasant patient.“ GP 12</p> <p>“(she is a) tall and robust woman, with a croaky voice... a heavy smoker, always unhappy. Niggling, unsatisfied and complaining, but also a fighter.” GP 6</p> <p>„but she always was...she was a though woman and she never liked taking pills and she eventually said, it is too much, she can’t take it and she got used to the symptoms and she would like to take smaller doses (..), she preferred to be without pills.” GP 5</p> <p>„...well, a rather moaning patient, that came with all kinds of ailments and I considered him generally to be healthier than he himself did. “ GP7</p>
Social background	<p>„She had a quite young daughter. Despite being my age, she had a young daughter and I think that’s why she needed to be functioning and go back to work and she needed the money, yes.” GP 6</p> <p>„...he himself less, but his wife is quite depressive and that means eventually one has problems in everyday life.” GP 8</p> <p>„I know the whole family (...) I know him only since about ten years but the rest of the family more than 30 years (...). They are all very scientific, that’s what I would say. His wife is in a high position in the administration of veterinary surgeons (...), the son is biologist and works in science and the other daughter is a psychologist.” GP 10</p> <p>„...she had a comparatively young daughter, despite being my age, she has a young daughter and I think that’s why she was in need to come</p>

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3 back to normal and go working and she needed the money.” GP 6  
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6 New patient „Well, I basically got to know Mr. (...) only as an acute patient after the hospital admission. He looked for a new GP after this adverse fate  
7 happened to him.” GP 2  
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10 **Critical illness**  
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12 Lack of information „The event of sepsis itself, as I said, wasn’t diagnosed by me, in the practice, but happened in hospital after the operation and that’s why I sort of  
13 got him back here as everything was finished. I just had to sort of accept that (...) in the end, I didn’t have much to do with it and that’s why I  
14 don’t know much about it.“ GP8  
15  
16 „I only saw him again after rehabilitation, I didn’t get a discharge letter either. I only got notice of these things as he stood here in front of me.”  
17 GP 4  
18 Emotional impact „This was a very unlucky course of events (...) surely, everybody asks, ‘why is it just me?’” GP 3  
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20 „I once visited him in hospital and was shocked (...) well, this was a dramatic story.” GP 10  
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22 **Health status**  
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24 General weakness and ow „Well, she was a shadow of her former self.” GP 6  
25 functioning  
26 „...he is not up and about again. Well, he can’t leave the flat, he walks short distances like to the toilet, from bed to toilet, from bed to living  
27 room” GP 11  
28 „I have visited him once in the hospital and was shocked. He could only talk slowly, maybe in an orderly way, but he was heavily impaired after  
29 this intensive care therapy. And afterwards, it got better, he became clearer from the cerebral point of view and the slowing, that was extreme,  
30 went away.“ GP 10  
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32 „...in the beginning, she needed house visits, well, I can only see that her health condition only improved very slowly over a long period of time.  
33 That’s all I can say about it.” GP 12  
34 Alteration to pre-sepsis „...but, I must say, (he) had some problems with his peripheral nerves before due to his lifestyle, (due to) alcohol (...). There was some damage  
35 condition before and then, with the sepsis, that only came to the point it became clinically apparent and now that is the situation.“ GP 2  
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37 „...just like before, she has from time to time exacerbations of her COPD.” GP 12  
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3 „...he had depression before and had depression afterwards and I believe his depression was even less, (...) He had a longstanding depression so  
4 you can't put these things (sepsis) forward.” GP 10  
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6 „...basically, he kept all the diseases he had before and everything grew gradually worse.” GP 11  
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8 Specific diagnosis of „...he had this critical illness neuropathy with pains and muscle weakness and at the beginning also psychological problems with insomnia.”  
9 common complications GP 1  
10 after intensive care  
11 „...now (she suffers from) increasing polyneuropathic pain, that needs to be treated with strong pain killers, with opioids.” GP 2  
12  
13 „...well, he still has a post traumatic distress syndrome, he is still looking for a psychologist.” GP 4  
14  
15 „...he is impaired a bit by the polyneuropathy.” GP 9  
16 Individual complication „...because she had, she lost her leg with the sepsis and she, she had an amputation and before she could move about and could leave the  
17 apartment. But, afterwards, not anymore because she couldn't manage the stairs with one leg.” GP5  
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19 „...and then she was depressive because she had the colostomy.” GP 6  
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**Table 5: Themes, subthemes and quotations impact of outreach education.**

<i>Themes and subthemes</i>	<i>Quotation</i>
<i>Acceptability</i>	
Convenience	„I was approached at a time, I had time and as we arranged it, that was ideal (...) it was announced early enough and I got a mail-reminder an I didn't have to move anywhere, that could happen here, well, the colleague was really committed (...) I would say that was ideal.” GP 2
	„...well, that (the outreach education) happened here in the practice ...nice and friendly... adapted to the needs of the doctor... very good, that was comfortable. Didn't burden me much either.” GP 6
Time strains, competing tasks	„...well, it was really very interesting, the training, but this is – like today (the interview) – just one more thing, that delays and I would rather e.g. go for lunch or something else.” GP 11
	“We have two thousand patients, work has grown so intense, that one has to leave out everything that is not absolutely necessary.” GP 12
<i>Impact on knowledge</i>	
Persisting elevated mortality after discharge	„The mortality after discharge, (...) , that was very impressive, well, because I thought: sepsis overcome, well, everything is fine and the bird flies on.“ GP 2
	„...that statistic, that said, ok, patients that survived this have a much higher mortality (...) these numbers were quite alarming.” GP 5
Specific long-term complications	„...well, that was mainly new, that one looks at sepsis as a complex illness with long-term complications. I did look at is more as a complication, that, when cured, is presumably good and done with.” GP 11
	„...the most helpful was, as I said, the connection. Generally with sepsis, that sepsis can cause other diseases (...) it seems, sepsis can cause serious alterations in the peripheral nerves.” GP 2
	„...the fact, that polyneuropathy had a connection to sepsis was not known to me at all.” GP 12
Relevant summary for practice	„...we all have learnt that during medical studies, but it is not...one doesn't meet a sepsis survivor every day. It is not everyday business. And that's why I found it interesting, that you had it explained again.“ GP 5
	„...in continuing education, we don't get the things that are relevant for practice enough, in that way, it was a nice, short update and training, but nothing really new.“ GP 8
Diagnosis of sepsis	„...what kind of symptoms, how sepsis manifests itself, because, one doesn't consider it so much, isn't it?” GP 6

**Transfer to practice**

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5 Identifying complications „...and since then, I turn my attention more to those symptoms, (...) I really pay attention to things now, that I didn't consider before. It really  
6 helped me.“ GP 6  
7  
8 „One is sensitized for it. Yes, I now pay more attention, especially regarding polyneuropathy and so on, I watch more closely, I say, ok, be  
9 careful, here you must consider that, that is a case you must watch out and ask , if she doesn't tell herself, whether she has symptoms.” GP 5
- 10 Initiation of specific „...now, I would always look first, that I talk with him about what he went through and how it felt in the hospital, what impressions, what  
11 therapy experiences, what feelings and that one really goes on to arrange for psychological care more quickly.” GP 4  
12  
13 “...and I also did some of that in practice, I mentioned the referral to a psychologist and that became very clear.” GP 4  
14  
15 „...from that training I learnt, that it makes sense, to send the patient to physiotherapy. That it is not only about medication, his usual medication  
16 and putting it - may be a bit trivial- I would prescribe antidepressants as well.” GP 7
- 17 Diagnosis of sepsis „... (reporting a case of postoperative sepsis) and I really was more careful and said, this lady has a sepsis. (...) I now have an eye on these  
18 symptoms and I refer more quickly.” GP 6  
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- 20 Low relevance „I don't have any patients after sepsis, that's why I can't change what I am doing.” GP 3  
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# Reporting checklist for qualitative study.

Based on the SRQR guidelines.

## Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

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In your methods section, say that you used the SRQR reporting guidelines, and cite them as:

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	Reporting Item	Page Number
<b>Title</b>		
	<a href="#">#1</a> Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	7
<b>Abstract</b>		
	<a href="#">#2</a> Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2
<b>Introduction</b>		
Problem formulation	<a href="#">#3</a> Description and significance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	5

1	Purpose or research	<a href="#">#4</a>	Purpose of the study and specific objectives or	6
2	question		questions	
3				
4	<b>Methods</b>			
5				
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7	Qualitative approach and	<a href="#">#5</a>	Qualitative approach (e.g. ethnography, grounded	7
8	research paradigm		theory, case study, phenomenology, narrative research)	
9			and guiding theory if appropriate; identifying the	
10			research paradigm (e.g. postpositivist, constructivist /	
11			interpretivist) is also recommended; rationale. The	
12			rationale should briefly discuss the justification for	
13			choosing that theory, approach, method or technique	
14			rather than other options available; the assumptions	
15			and limitations implicit in those choices and how those	
16			choices influence study conclusions and transferability.	
17			As appropriate the rationale for several items might be	
18			discussed together.	
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26	Researcher characteristics	<a href="#">#6</a>	Researchers' characteristics that may influence the	7
27	and reflexivity		research, including personal attributes, qualifications /	
28			experience, relationship with participants, assumptions	
29			and / or presuppositions; potential or actual interaction	
30			between researchers' characteristics and the research	
31			questions, approach, methods, results and / or	
32			transferability	
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37	Context	<a href="#">#7</a>	Setting / site and salient contextual factors; rationale	7
38				
39				
40	Sampling strategy	<a href="#">#8</a>	How and why research participants, documents, or	7
41			events were selected; criteria for deciding when no	
42			further sampling was necessary (e.g. sampling	
43			saturation); rationale	
44				
45				
46	Ethical issues pertaining to	<a href="#">#9</a>	Documentation of approval by an appropriate ethics	7
47	human subjects		review board and participant consent, or explanation for	
48			lack thereof; other confidentiality and data security	
49			issues	
50				
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53	Data collection methods	<a href="#">#10</a>	Types of data collected; details of data collection	7
54			procedures including (as appropriate) start and stop	
55			dates of data collection and analysis, iterative process,	
56			triangulation of sources / methods, and modification of	
57				
58				
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1		procedures in response to evolving study findings;	
2		rationale	
3			
4	Data collection	<a href="#">#11</a> Description of instruments (e.g. interview guides,	7
5	instruments and	questionnaires) and devices (e.g. audio recorders)	
6	technologies	used for data collection; if / how the instruments(s)	
7		changed over the course of the study	
8			
9			
10	Units of study	<a href="#">#12</a> Number and relevant characteristics of participants,	8
11		documents, or events included in the study; level of	
12		participation (could be reported in results)	
13			
14			
15			
16	Data processing	<a href="#">#13</a> Methods for processing data prior to and during	7
17		analysis, including transcription, data entry, data	
18		management and security, verification of data integrity,	
19		data coding, and anonymisation / deidentification of	
20		excerpts	
21			
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23			
24	Data analysis	<a href="#">#14</a> Process by which inferences, themes, etc. were	7,8
25		identified and developed, including the researchers	
26		involved in data analysis; usually references a specific	
27		paradigm or approach; rationale	
28			
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31	Techniques to enhance	<a href="#">#15</a> Techniques to enhance trustworthiness and credibility	7,8
32	trustworthiness	of data analysis (e.g. member checking, audit trail,	
33		triangulation); rationale	
34			
35			
36	<b>Results/findings</b>		
37			
38			
39	Syntheses and	<a href="#">#16</a> Main findings (e.g. interpretations, inferences, and	8
40	interpretation	themes); might include development of a theory or	
41		model, or integration with prior research or theory	
42			
43			
44	Links to empirical data	<a href="#">#17</a> Evidence (e.g. quotes, field notes, text excerpts,	24-28
45		photographs) to substantiate analytic findings	
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47			
48	<b>Discussion</b>		
49			
50	Intergration with prior	<a href="#">#18</a> Short summary of main findings; explanation of how	13,14
51	work, implications,	findings and conclusions connect to, support, elaborate	
52	transferability and	on, or challenge conclusions of earlier scholarship;	
53	contribution(s) to the field	discussion of scope of application / generalizability;	
54		identification of unique contributions(s) to scholarship in	
55		a discipline or field	
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1	Limitations	<a href="#">#19</a>	Trustworthiness and limitations of findings	14
2				
3	<b>Other</b>			
4				
5				
6	Conflicts of interest	<a href="#">#20</a>	Potential sources of influence of perceived influence on	15
7			study conduct and conclusions; how these were	
8			managed	
9				
10				
11	Funding	<a href="#">#21</a>	Sources of funding and other support; role of funders in	15
12			data collection, interpretation and reporting	
13				

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16 American Medical Colleges. This checklist was completed on 07. May 2020 using  
17 <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with  
18 [Penelope.ai](#)  
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# BMJ Open

## General practitioners' views and experiences in caring for patients after sepsis - a qualitative interview study

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Keywords:	PRIMARY CARE, REHABILITATION MEDICINE, Adult intensive & critical care < INTENSIVE & CRITICAL CARE

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3 **General practitioners' views and experiences in caring for patients after sepsis**  
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5 **- a qualitative interview study**  
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8  
9 **Authors:**

10 Dr. Sabine Gehrke-Beck<sup>a</sup>, Prof. Dr. Dipl.-Päd., MPH Jochen Gensichen<sup>c, d, e</sup>, Dr. Katrina Turner<sup>b</sup>, Prof. Dr. MPH  
11 Christoph Heintze<sup>a #</sup>, Dr. Konrad Schmidt<sup>a, d, e #</sup>  
12  
13

14  
15  
16  
17 <sup>a</sup>Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu  
18 Berlin, and Berlin Institute of Health, Institute of General Practice, Charité Campus Mitte, Charitéplatz 1, 10117  
19 Berlin, Germany  
20  
21

22  
23 <sup>b</sup>Population Health Sciences, Bristol Medical School, University of Bristol, Canynge Hall, 39 Whatley Road,  
24 Bristol, BS8 2PS, UK  
25

26  
27 <sup>c</sup>Institute of General Practice and Family Medicine, Munich University Hospital, LMU Munich, Pettenkoferstr.  
28 10, 80336 Munich, Germany  
29

30  
31 <sup>d</sup>Institute of General Practice and Family Medicine, Jena University Hospital, Bachstrasse 18, 07743 Jena,  
32 Germany  
33

34  
35 <sup>e</sup>Center of Sepsis Care and Control, Jena University Hospital, Am Klinikum 1, 07747 Jena, 07747 Jena,  
36 Germany  
37

38  
39  
40 #shared last authorship  
41

42  
43  
44 **Corresponding author:**

45 Konrad Schmidt, MD

46 [Konrad.Schmidt@charite.de](mailto:Konrad.Schmidt@charite.de)

47 Institut für Allgemeinmedizin

48 Charité Universitätsmedizin Berlin

49 Charitéplatz 1

50 10117 Berlin

51 Telephone: ++49-30-450514133

52 Fax: ++49-30-450514092  
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**Abstract****Rationale**

Patients surviving critical illnesses, such as sepsis, often suffer from long-term complications. After discharge from hospital, most patients are treated in primary care. Little is known how general practitioners (GPs) perform critical illness aftercare and how it can be improved. Within a randomized controlled trial, an outreach training programme has been developed and applied.

**Objectives**

The aim of this study is to describe GPs' views and experiences of caring for post-sepsis patients and of participating a specific outreach training.

**Design**

Semi-structured qualitative interviews

**Setting**

14 Family practices in the metropolitan area of Berlin, Germany

14 GPs, who had participated in a structured sepsis aftercare program in primary care

**Results**

Themes identified in sepsis aftercare were: Continuity of care and good relationship with patients, GP's experiences during critical illness and impact of persisting symptoms. An outreach education as part of the intervention was considered by the GPs to be acceptable, helpful to improve knowledge of the management of post-intensive care complications and useful for sepsis aftercare in daily practice.

**Conclusions**

GPs provide continuity of care to patients surviving sepsis. Better communication at the ICU-GP interface and training in management of long-term complications of sepsis may be helpful to improve sepsis aftercare.

**Keywords:** post intensive care syndrome, sepsis, primary care, General Practitioner, aftercare, outreach-education, qualitative research

1  
2  
3 **Abbreviations**  
4

5 GP: general practitioner  
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7 ICU: intensive care unit  
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9 PICS: Post-intensive care syndrome  
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11 SMOOTH: Sepsis survivors monitoring and coordination in outpatient health care  
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14 **Word count abstract: 201**  
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16 **Word count manuscript: 4271**  
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For peer review only

**Strengths and limitations of this study**

- This is the first study to explore in detail GPs' views of managing sepsis survivors.
- Using qualitative interviews meant GPs could raise issues that were salient to them.
- Some of the interviews were short due to GPs having limited time to take part.
- Only GPs in one metropolitan area were interviewed.

For peer review only

## **Introduction**

An increasing number of patients are treated in intensive care units (ICUs) and survive a critical illness such as sepsis<sup>1</sup>. After discharge, patients may suffer from long-term consequences<sup>2</sup>, such as critical-illness-polyneuropathy, critical-illness-myopathy, cognitive decline, chronic pain<sup>3-6</sup>, depression or post-traumatic stress disorder<sup>3 7 8</sup>. These sequelae are referred to as the “Post-intensive care syndrome” (PICS)<sup>1</sup>. They result in lower health-related quality of life and elevated mortality rates, as well as increased health care use<sup>9-11</sup>.

International guidelines state that patients with PICS should have ongoing, long-term monitoring and therapy<sup>12 13</sup>. Some patients discharged from ICUs are referred to ICU follow-up clinics. The purpose and structure of these clinics vary between countries, but change of clinical outcomes are rarely shown<sup>14-17</sup>. In addition, continuity of care at an ICU-follow up clinic may be difficult, when the patient lives far from the ICU and needs frequent follow-up<sup>18-20</sup>. Even if intensive care doctors and nurses are familiar with complications after critical illness, their role in coordinating ICU follow-up is discussed controversially<sup>17 21</sup>: They seem not to be trained in outpatient care coordination and the clinical variety of possible post-ICU complications<sup>17</sup>. Additionally, they do not know their patients for long and therefore may lack insight into the patient’s psychosocial background<sup>22</sup>. On the contrary, GPs have a long-lasting relationship with their patients and provide care coordination as a core task<sup>23</sup>, which is highly appreciated by the patients<sup>24</sup>. This makes GPs ideal advocates of patients in their rehabilitation pathways. Thus, a Dutch retrospective cohort study found an increased consultation rate in primary care following ICU discharge<sup>25</sup>. Considering that there were more than two million intensive care treatment cases just in Germany in 2017<sup>26</sup> and an assumed increase driven by the Covid-19 pandemic<sup>27</sup>, GPs need to know how to provide best post-intensive care to these patients, as it has been already called for by others<sup>28</sup>. The concept of the PICS is quite recent, but GPs intensive care experiences may date back to medical studies or early hospital rotations. In a qualitative study, GPs reported lack of background knowledge and confidence in diagnosing and treating post sepsis complications<sup>29</sup>. Kahn (2007) states that GPs need to be educated in how to care for patients after critical illness but do not provide suggestions about how this should be done<sup>22</sup>.

Outreach education delivered by academics to the GPs appeared to change their clinical behavior and improve patient care.<sup>30</sup> However, current evidence mainly focuses on changing prescribing patterns rather than on complex treatment strategies. Educational outreach visits providing knowledge to primary care for relatively



1  
2  
3 30 rare medical problems are shown to enhance confidence<sup>31</sup> and are acceptable to GPs<sup>32</sup>. Such an intervention may  
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5 31 be effective in educating GPs in how to effectively care for patients with PICS. However, whether it is needs to  
6  
7 32 be assessed.

8  
9 33 The SMOOTH trial evaluated a structured after-care program in general practice for sepsis survivors  
10  
11 34 including an outreach education for GPs<sup>33 34</sup>. Sepsis is one of the leading causes of long-term-ICU stays and can  
12  
13 35 be viewed as a model illness for critical disease<sup>35</sup>. The intervention evaluated in the trial was designed with  
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15 36 reference to the Chronic Care Model<sup>36</sup> at the level of a GP practice. It is focused on patient empowerment, a  
16  
17 37 proactive care team and case management to ensure continuity of care. The trial did not find an improvement in  
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19 38 mental health-related quality of life at 6 months after ICU discharge compared to usual care<sup>33 34</sup>. As part of this  
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21 39 trial, in-depth interviews were held with GPs to explore their experiences with patients discharged from ICU and  
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23 40 the intervention. Qualitative research has been conducted with post-ICU patients in detail<sup>37-43</sup>, but, to date, no  
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25 41 one had explored in depth the views and experiences of GPs caring for these patients. The aim of this study is to  
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27 42 describe GPs' views and experiences of caring for post-sepsis patients and of participating a specific outreach  
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29 43 training, in order to inform and contribute to applicable future aftercare structures in primary care.

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## 32 33 34 45 **Methods**

### 35 36 46 **The SMOOTH-trial**

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38  
39 47 The SMOOTH trial is a multi-center RCT evaluating a primary-care based aftercare-intervention for sepsis  
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41 48 survivors. The intervention included monitoring of the patient by a case manager (a specialized nurse), a patient  
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43 49 education session delivered by the case manager and an educational outreach-visit by a liaison physician to the  
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45 50 GP, details are reported elsewhere<sup>33</sup>. Patients were recruited in the ICU and when they agreed to participate, their  
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47 51 GPs were contacted and asked to join also the trial. Two hundred and nineteen patients agreed to participate,  
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49 52 with 148 patients were randomized to the intervention and 143 patients to the control group receiving usual care.  
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51 53 As some patients changed their GPs during the trial, the number of GPs was slightly larger than the number of  
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53 54 patients. Three hundred seven GPs were approached to participate. Two hundred and ninety-four (95.8%) agreed  
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55 55 and were included in the trial. Of total 159 GPs in the intervention group, 55 were recruited at the Berlin trial  
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57 56 site.

58  
59 57 The intervention directed at the GP consisted of one outreach educational visit by a liaison physician - a GP  
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58 trained in sepsis aftercare. The visit was scheduled after the patient's discharge and according to time

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3 59 preferences of the GPs. It took place in the GP practice and lasted about one hour. The education session  
4  
5 60 included a brief overview of sepsis epidemiology and diagnosis, including red flags in primary care, but focused  
6  
7 61 specifically on the six most common sequelae of sepsis (“Sepsis Six”). The epidemiology of long-term sequelae,  
8  
9 62 practical tools for diagnoses and monitoring, as well as evidence-based therapeutic options in routine outpatient  
10  
11 63 care were presented. A detailed manual covering all the information given and a brief sepsis pocket-card  
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13 64 summarizing main points for everyday practice were handed over to the GP, published elsewhere<sup>34</sup>. The GP was  
14  
15 65 asked to contact the liaison physician later at any moment in the study if questions arose during follow-up of the  
16  
17 66 patient.

### 67 **Study design and data collection**

68 As part of implementation evaluation, semi-structured interviews were held with the GPs in the intervention  
69 group of the RCTs to gain insight into their experiences caring for patients surviving sepsis and the GP education  
70 that had been delivered as part of the intervention.

71 Qualitative methods are applied within the research paradigm of critical realism to complete the results of  
72 the quantitative evaluation using a qualitative exploration<sup>44</sup>. Critical realism can be used to understand the  
73 complexities in primary care and events and phenomena in this setting<sup>45</sup>. The aim was to illuminate and  
74 understand the functioning of the intervention in the social background of a GP practice and to extract  
75 suggestions for future and optimized aftercare in General Practice.

76 The research team consisted of a 4th year medical student (NS), who conducted the interviews as part of a  
77 research project, and four academic GPs (SGB, CH, KS, JG) who were involved in analyses of the data. NS had  
78 received training in qualitative research interviews and was regularly supervised throughout the study by SGB  
79 and CH, who are experienced qualitative researchers. NS had not been involved in the SMOOTH trial, and  
80 interviewees were informed of this, to ensure they felt comfortable making any negative comments about the  
81 trial. SGB, CH, KS and JG were involved in the trial. At the time of the interviews they were not aware, that the  
82 outreach education did not change patient’s mental health related quality of life (primary outcome).

83  
84 A topic guide was developed and based on the aims of the study and an understanding of relevant literature.  
85 The questions included focused on the GPs’ experiences of caring for patients who had survived sepsis, and their  
86 experiences of the trial intervention.

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2  
3 87 We purposefully sampled GPs for interview to ensure interviews were held with GPs of varying gender and  
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5 88 duration of work experience. All those approached for interview had worked at the Berlin trial site. If GPs were  
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7 89 willing to be interviewed, they were mailed information about the interviews and a consent form. GPs willing to  
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9 90 be interviewed could stipulate the time and location of their interview. The first interview was used as a pilot but  
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11 91 as no changes were made to the topic guide, this interview was included in the analysis. With participant  
12  
13 92 consent, the interviews were audiotaped and transcribed verbatim by NS. GPs were interviewed until data  
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15 93 saturation was reached, i.e. when no new themes were identified in the later interviews.

### 16 17 94 **Patient and Public Involvement**

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20 95 Patient's perspectives and needs were included into topic guide development by the study team. Beside  
21  
22 96 literature research, it was based on the results of qualitative interviews with sepsis survivors, using the same  
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24 97 methodical approach and being published elsewhere<sup>42</sup>.

### 25 26 98 **Data analysis**

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29 99 The interviews were analyzed thematically<sup>46</sup>. Inductive thematic coding was used to gain an overall insight  
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31 100 into the perspectives of the GPs. Transcripts of four interviews were read and re-read by different members of  
32  
33 101 the research team (SGB, CH, KS, JG) who identified themes and developed initial coding frames. These  
34  
35 102 researchers repeatedly discussed their codes and interpretation of the data. Once the coding frames had been  
36  
37 103 agreed, they were applied to all interviews, see Tables 1 A and B. Coding was done manually by SGB. Results  
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39 104 were presented to the research team and discussed until consensus was reached (SGB, CH, JG, KS).

40  
41 105  
42  
43 106 This study refers to the standards for reporting qualitative research (SRQR).<sup>47</sup>

1  
2  
3 107 **Results**

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6 108 **Participants**

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8 109 We contacted 18 GPs for interview. Four GPs declined to participate due to lack of time. The 14 GPs who  
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10 110 agreed to be interviewed (Table 2) choose to be interviewed at work, on practice premises, in a private room.  
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12 111 Details of the patients the GPs cared for are shown in Table 3. After 14 interviews, theoretical saturation was  
13  
14 112 reached with no new aspects emerging in the last two interviews. The interviews were conducted from January  
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16 113 to August 2013 and lasted 12–28 minutes (mean 20 minutes). Themes considered relevant to this paper with  
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18 114 corresponding quotes are shown in Tables 4 and 5.

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20 115 **Caring for patients after critical illness**

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23 116 When analyzing the GPs' accounts, three main themes related to their experience of caring for patients after  
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25 117 intensive care were identified as continuity of care and good relationship with patients, GP's experiences during  
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27 118 critical illness and impact of persisting symptoms after discharge.

28  
29 119 ***Continuity of care and good relationship with patients***

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31  
32 120 At the start of the interview, the GPs were asked to talk freely about their patient. The accounts given  
33  
34 121 suggested that specific medical diagnoses and the acute sepsis diagnosis played a limited role in the GPs'  
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36 122 narration. GPs often commented on the patient's condition before they were diagnosed with sepsis, discussing  
37  
38 123 their pre-existing disease and previous general health status. It was evident that many of them were familiar with  
39  
40 124 the patients' medical history.

41  
42 125 Many GPs also talked about the patient's personality. They often focused on the patient's coping and illness  
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44 126 behavior as one GP explained:

45  
46 127 *"... she is actually a very modest... and shy person and for her medical problems she only claimed what she*  
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49 128 *really needed urgently at that moment. A very kind and pleasant patient."* GP 12

50  
51 129 Some GPs also reported on the personal and employment situation of their patients, especially if they felt  
52  
53 130 that this had been important to the recovery of the patient:

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55 131 *"Despite being my age, she had a young daughter and I think that's why she needed to be functioning and*  
57  
58 132 *go back to work and she needed the money, yes."* GP 6

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3 133 Even if most GPs seemed to know their patients very well, two GPs stated that they started caring for their  
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5 134 patients only after the sepsis hospital stay. These two GPs gave little information about their patients.  
6

7 135 ***GP's experiences during critical illness***  
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10 136 Most GPs commented that they lacked information about the acute sepsis event. They had not been  
11  
12 137 informed about their patient's condition or involved in any of the treatment decisions made whilst their patient  
13  
14 138 was in hospital. Several GPs could not specify the exact diagnosis and focus of the sepsis.  
15

16 139 *"The event of sepsis itself, as I said, wasn't diagnosed by me, in the practice, but happened in hospital after*  
17  
18 140 *the operation and that's why I sort of got him back here as everything was finished. I just had to sort of accept*  
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20 141 *that (...) in the end, I didn't have much to do with it and that's why I don't know much about it."* GP 8  
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22

23 142 Some GPs perceived the acute sepsis event as a tragic lifetime event for their patients and discussed the  
24  
25 143 emotional impact of the serious impact on the patient and his/her family.  
26

27 144 *"This was a very unlucky course of events (...) surely, everybody asks, why is it just me?"* GP 3  
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29

30 145 ***Impact of persisting symptoms***  
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33 146 GPs mentioned a number of different aspects when they described the condition of their patients after  
34  
35 147 discharge and the impact of sepsis sequelae in their quality of life: general weakness and low functioning, the  
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37 148 impact of preexisting diseases, individual specific health impairments and – less frequently- specific diagnosis of  
38  
39 149 long-term-complications contributing to PICS.  
40

41 150 Many interviewees described a general weakness and low functioning of their patients. They attributed this  
42  
43 151 to the severe illness and the long hospital stay, without specifying the factors and causes contributing to the  
44  
45 152 weakness like underlying illnesses, specific complications or treatment side effects. The focus of their reports  
46  
47 153 was on the consequences for independence and autonomy of their patients rather than underlying  
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49 154 pathomechanisms.  
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51 155 *"Well, she was a shadow of her former self"* GP 6  
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54 156 Many GPs compared their patients' health status to their condition before critical illness. In some cases,  
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56 157 they saw their patients' impairment after discharge as, at least in part, attributable to pre-existing and chronic  
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58 158 illness. In their perception, the acute sepsis event did not alter status of these patients much.  
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3 159 *“Essentially, he kept the diseases he had before and everything got gradually a bit worse. He tended to be*  
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5 160 *depressive before and now it isn't much worse.” GP 11*  
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7 161 The report about their patient condition and complications after sepsis was in many cases given in common,  
8  
9 162 everyday language without listing specific medical diagnoses or specific sepsis complication. They rather  
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11 163 concentrated on reporting on everyday functioning and overall well-being. Only some GPs classified specific  
12  
13 164 sepsis sequelae and precisely stated these diagnoses. Some added being only aware of the diagnosis after the  
14  
15 165 education session, they received as part of the study intervention.  
16

17  
18 166 *“And mainly... he was quite distressed by the gait disturbance; by the painful paresthesia he had (...) the*  
19  
20 167 *polyneuropathy was what was left from the sepsis syndrome.” GP 8*  
21

22 168 Some GPs reported individual complications of sepsis or sepsis therapy had the main impact on the  
23  
24 169 patient's quality of life afterwards, e.g. the loss of a limb or a persisting colostomy.  
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26  
27 170 *“As she had, because of this sepsis, she basically lost the leg, well, she had an amputation and ...hmm...she*  
28  
29 171 *was still quite mobile before and could leave the flat. Hmm, afterwards no longer, because with one leg she*  
30  
31 172 *couldn't manage the stairs.” GP 5*  
32

33 173 One GP could not contribute to that aspect, as his patient died shortly after discharge.  
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### 35 174 **Impact of the outreach education**

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38 175 Three main themes that described the impact of the education session were identified: acceptability,  
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40 176 improvement of knowledge, and the transfer to professional practice.  
41

#### 42 177 ***Acceptability***

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45 178 Most participants stated that they appreciated the time and the effort on the side of the liaison physician to  
46  
47 179 come to their premises and adapt to their schedule. They commented that this was an advantage for their own  
48  
49 180 time schedule and comfort.  
50

51  
52 181 *“I was approached at a time that was convenient for me (...), I didn't need to move anywhere, that could*  
53  
54 182 *happen here, well, the colleague bothered to come (...) and as I said that was ideal, I would say.” GP 2*  
55

56 183 However, some GPs said they had many patients to care for and tasks to cope with and could not spare any  
57  
58 184 time for the training. A few also mentioned that post sepsis patients are rare in a GP practice and that they would  
59  
60 185 rather save time in continuing education for more common diseases.

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3 186 *“Well, it was very interesting, the education, but this is just another additional point, that takes time and I*  
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5 187 *would prefer e.g. to have lunch or something similar.” GP 11*

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7 188 ***Improvement of knowledge***

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10 189 The majority of practitioners stated that they had gained new knowledge from the education. Many  
11  
12 190 interviewees reported it was new to them that sepsis can cause specific disease sequelae into after hospital  
13  
14 191 discharge.

15  
16 192 *“Yes, that was largely new to me, that sepsis is seen as a complex illness with long lasting complications.*  
17  
18 193 *Till now, I saw it more as a complication, that, when cured, is resolved.” GP 11*

19  
20  
21 194 GPs often also stated, that they weren't aware that mortality is still elevated long-term after discharge until  
22  
23 195 they heard about that in the education session.

24  
25 196 *“Most helpful was (...) that sepsis e.g. has a high mortality, the numbers were alarming! I mean, the*  
26  
27 197 *mortality after discharge, (...) basically, I thought: Sepsis survived, ok, the bird flies on.” GP 2*

28  
29  
30 198 Some of the GPs reported that they did not know before that polyneuropathy and psychological problems  
31  
32 199 were common consequences after sepsis and intensive care.

33  
34 200 *“I think, I would not have seen the connection before. Because she had so many other reasons for a*  
35  
36 201 *polyneuropathy, I would have probably linked it to the diabetes.” GP 5*

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38  
39 202 One GP acquired more information about diagnosis of a sepsis in a patient, even though that was not in the  
40  
41 203 focus of the education session.

42  
43 204 Some GPs stated that they already knew the information given to them, but even when this was the case,  
44  
45 205 they still appreciated the repetition and summary preparing them for the care of the patient.

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47  
48 206 *“Well, I didn't find anything really new to me. But it was brought back and I did concentrate on it and*  
49  
50 207 *looked closer to it. That was new to me and helps me for, well, aftercare.” GP 9*

51  
52 208 One doctor saw no benefit from the education; he had done research in this field before his GP work and  
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54 209 had the relevant knowledge before.

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3 210 ***Transfer to practice***  
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5 211 Most of the GPs interviewed said that the new information helped them care for the patient included in the  
6  
7 212 trial, and that it would help them in their future work with similar patients. Most of them saw a benefit in  
8  
9 213 identifying sepsis sequelae.  
10

11  
12 214 *“...mainly the polyneuropathy and so on, I look out for it more closely. I say to myself: Look out! You must*  
13  
14 215 *keep that in mind and ask for it, when they don't tell on their own, if they have problems.” GP 5*  
15

16 216 Some reported consequences for the therapy of the patient they cared for within the study and some stated  
17  
18 217 that they would probably change their therapeutic approach to similar patients in the future.  
19

20  
21 218 *“I believe I changed some things afterwards. I mentioned the psychotherapist afterwards, that became quite*  
22  
23 219 *clear, and (patient's name) did agree to that.” GP 4*  
24

25 220 One GP had quickly diagnosed a patient with acute sepsis since the training, even though diagnosis of  
26  
27 221 sepsis was not its main focus.  
28

29  
30 222 Some GPs doubted the relevance of the information for their work. They stated that caring for similar  
31  
32 223 patients was a very rare event in their practice, and therefore they did not think they would apply the knowledge  
33  
34 224 they had learnt.  
35

36 225 *“I don't have any sepsis patients - that's why I can't change anything about what I do.” GP 3*  
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41 227 **Discussion**  
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44 228 Findings from this study suggest that GPs provide continuity of care and a good relationship with patients  
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46 229 and consider pre-existing and chronic disease, personality and coping patterns, as well as social background,  
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48 230 when providing post-ICU-care to patients. Many interviewees described the long-term impact of sepsis on their  
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50 231 patients as a general weakness and malfunctioning and considered it in relation to the patient's pre-sepsis  
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52 232 constitution. Some GPs expressed empathy with the serious life event their patient experienced. GPs reported a  
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54 233 lack of information about the course of the disease and their patient's condition while they were in the hospital.  
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56 234 Diagnosing and listing specific sepsis sequelae played a minor role.  
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3 236 The outreach education session was acceptable to most GPs. Most GPs acquired new information about  
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5 237 long-term-complications of sepsis. They considered this information as helpful to identify and start treatment for  
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7 238 specific post-sepsis symptoms. This finding is consistent with findings from a recent qualitative study critical  
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9 239 care nurses delivering a recovery programme to ICU survivors<sup>48</sup>. However, some GPs did not value it and  
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11 240 pointed to the small numbers of post-sepsis-patients being in competition with other patients and tasks.

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16 242 While most of the GPs' accounts suggested a long-standing knowledge of the patient and an individual  
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18 243 appraisal of their health impairments after discharge, they lacked detailed medical knowledge about sepsis  
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20 244 complications. The outreach education was mainly well accepted and seemed to provide a valid setting to  
21  
22 245 improve knowledge about specific diagnostic and therapeutic concepts GPs can apply in their professional  
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24 246 practice.

#### 25 26 247 **Comparison with existing literature**

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29 248 Patients' perceptions of their quality of life after an ICU-stay have been examined in several qualitative  
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31 249 studies<sup>43</sup>. A wide range of ongoing health impairments was identified and loss of autonomy was a main aspect<sup>37-</sup>  
32  
33 250 <sup>39</sup>. The views of the GPs identified here is very close to patients' perspectives. The GPs also reported general  
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35 251 weakness and low functioning as a main aspect and a very individual apprehension of complaints and  
36  
37 252 impairment. This congruence may facilitate a patient-centered after-care especially in a primary care setting.

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41 254 Difficulties in information flow between intensive care units and GPs had been identified before: lack of  
42  
43 255 information about admission or discharge and ongoing needs of patients after an ICU stay and no involvement in  
44  
45 256 treatment decisions were reported by GPs in other studies<sup>49-51</sup>. As valid data on the course of disease and current  
46  
47 257 diagnoses and treatment is essential for follow-up, information during hospital stay and more detailed discharge  
48  
49 258 information for GPs may be essential to enhance quality in after-care.

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53  
54 260 It has been shown that GPs lack information on sepsis and identification of post-ICU-complications<sup>29 51</sup>.  
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56 261 The acquisition of clinical knowledge has been described and explained by forming of "scripts" with repeated  
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58 262 exposure to clinical patterns<sup>52</sup>. With no ongoing experience in handling ICU-patients and limited encounters of  
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60 263 post-ICU patients, scripts related to the PICS cannot be expected to evolve in GPs in everyday practice. In our

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3 264 study, the educational intervention led to additional knowledge about specific post-ICU complications. This may  
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5 265 meet patient's ongoing need for feedback of their ICU history, as well as the resulting impairments<sup>43</sup>.

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10 267 GPs appreciate personal discussion with experts as a valuable method of continuing education<sup>53</sup>, and  
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12 268 outreach visits as a method to reach GPs have been used before and shown to be accepted well<sup>30</sup>. Knowledge  
13  
14 269 gain has been demonstrated, but transfer to practice seemed to be difficult<sup>30,54</sup>. Patient-related intervention may  
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16 270 be especially helpful<sup>30</sup> to facilitate knowledge transfer. In our study, GPs reported transfer to practice of the  
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18 271 knowledge they acquired, which may be achieved by the patient-related education and the individual discussion  
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20 272 of diagnosis and treatment in the practice.

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22 273 Lack of continuum of care is a major patient concern after ICU discharge<sup>37,38</sup>. The Chronic Care Model can  
23  
24 274 be used to inform the ongoing care at the level of an individual practice, but also to organize patient-centered  
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26 275 transsectoral and interdisciplinary care<sup>36</sup>. Local organization of a follow-up multiprofessional network and a  
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28 276 stepped-care approach could help to ensure continuity of care. This study demonstrates that GPs are familiar  
29  
30 277 with their patients, know about their medical and psychosocial background and consider these aspects when  
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32 278 caring for their patients. Therefore, GPs seem to be appropriate ICU aftercare providers. In addition, increased  
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34 279 intersectoral information flow could contribute to ensure continuity of care, e.g. quality of discharge letters may  
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36 280 be improved by training, checklists, software solutions or positive peer pressure<sup>55,56</sup>.

### 37 38 281 **Limitations**

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41 282 Since 307 GPs were asked to take part in the trial, and 294 agreed, it is likely those who took part in the trial  
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43 283 are representative of other GPs in Germany<sup>34</sup>. Being involved in a sepsis aftercare trial informed GPs about the  
44  
45 284 functioning of the RCTs intervention, but may have changed their perception of the post-sepsis patients they care  
46  
47 285 for. They may have been more preoccupied with and focused on that patient than otherwise. It might be those  
48  
49 286 who agreed to be interviewed were more interested than their peers in sepsis as 4 of the 18 GPs approached for  
50  
51 287 interview declined. As only GPs in the urban area of Berlin were interviewed, specific aspects of GPs in rural  
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53 288 settings may have been missed.

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55 289 The interviews were fairly short, which may limit depth of insights. Time constraints are typical of GPs  
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57 290 work and were mentioned repeatedly throughout the interview. As GPs are used to work under pressure, they  
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59 291 were able to answer questions quickly and to summarise their experiences. Due to the time pressures they were  
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3 292 under, those interviewed were not contacted again to explore whether they agreed with the researchers' analysis  
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5 293 of the data. However, themes and subthemes were discussed repeatedly in the research group.  
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10 295 **Conclusion**  
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12 296 GPs are in a good position to offer continuity of care to sepsis survivors. However, they need training and  
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14 297 information flow from secondary care for optimal aftercare provision.  
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20 299 GPs have a profound and holistic knowledge of these complex patients and can appreciate individual their  
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22 300 impairments and residual symptoms. However, lack of specific knowledge about critical illness complications  
23  
24 301 and lack of information and communication with ICU care providers are barriers to optimal follow-up in primary  
25  
26 302 care settings.  
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28 303 GPs should get the necessary background knowledge and individual information of their patients to provide  
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30 304 high-quality aftercare. Taking into account time constraints and preferred education formats, outreach visits in  
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32 305 the context of discharge of a post-ICU patient may be a valuable source of information and support.  
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## Declarations

Declarations of interest: none declared

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Ethics approval: The protocol of the SMOOTH-trial was approved by the institutional review board of the University of Jena, 26 January 2011 (No.3001/111). The protocol of this interview study was approved by the Ethics Committee of the Charité Universitätsmedizin April 2013 (No.EA4/023/13).

Author Statement: SGB, KS and CH had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: SGB, CH, JG, KS. Outreach training conduction: KS. Acquisition, analysis of data: SGB. Interpretation of data: SGB, CH, KS, JG, KT. Drafting of the manuscript: SGB, KS, KT. Critical revision of the manuscript for important intellectual content: SGB, CH, KS, JG, KT.

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Data sharing statement: Audio recordings and transcriptions of the analysed interviews are stored at a secure server of Charité University Medicine and can be shared upon reasonable request.

The BMJ's qualitative reporting checklist has been created based on the reporting guidelines of standards for reporting qualitative research (SRQR).

**Table 1A****Coding framework: Caring for patients after critical illness**

Themes	Subthemes
<i>Continuity of care and good relationship with patients</i>	Previous health status Personality and illness behavior Social background Continuity of care
<i>GP's experiences during critical illness</i>	Lack of information Emotional impact
<i>Impact of persisting symptoms</i>	General weakness and limited functioning Alteration to pre-sepsis condition Specific diagnosis of common complications after intensive care Individual complication

**Table 1B****Coding framework: Impact of the outreach education**

Themes	Subthemes
<i>Acceptability</i>	Convenience by outreach visit Time strains, competing tasks
<i>Improvement of knowledge</i>	Persisting elevated mortality after discharge Specific long-term complications (Polyneuropathy, post-traumatic distress) Diagnosis of sepsis Relevant summary for practice
<i>Transfer into practice</i>	Identifying complications Initiation of specific therapy Diagnosis of sepsis Low relevance as small patient numbers in practice

**Table 2: Self-declared details of interviewed GPs**

No. of GPs	Age*	Sex	practice organisation (no. of GPs)	license to practice since*	practice opening *	specialisation	practice characteristics, subspecialisations (multiple mention possible)	home visits (no/week)	patients > 60 years (estimate)	academic teaching practice
14	41-68 yrs (mean: 55 yrs)	8 male 6 female	6 joint practices (2-6 GPs)  8 single practices	< 10 yrs: 0 10-20 yrs: 1 20-30 yrs: 3 30-40 yrs: 6 >40 yrs: 2 no data: 2	< 10 yrs: 1 10-20 yrs: 5 20-30 yrs: 4 30-40 yrs: 4 >40 yrs: 0 no data: 0	7 GPs 6 general internists# 1 practitioner without specialisation	2 none 7 complementary medicine 3 psychosomatics 2 pain management 1 gastroenterology 1 infectiology 1 oncology 1 diabetology	<5/wk: 3 5-10/wk: 4 >10wk: 2 none: 2 no data: 3	<30%: 5 30-50%: 6 >50%: 2	7 no 7 yes

\*at the time of the interview

#a considerable proportion of primary care in Germany is provided by general internists.

**Table 3: Characteristics of post-sepsis patients cared for by the GPs (n)**

Total	14
Male	11
Female	3
Age [years]	45-82 (mean 66)
Sepsis focus	3 pulmonary
	2 gastrointestinal
	3 renal
	3 tissue infection
	3 unknown

For peer review only

**Table 4: Quotations - Caring for patients after critical illness**

Themes and subthemes	Quotation
<i>Continuity of care and good relationship with patients</i>	
Previous health status	„Well, he was a spry patient, he bore his age well and he had no relevant preexisting disease (...) and he came mainly for check-ups.” GP 9
	„Yes, she needed home visits before. She had an insulin-dependent diabetes, COPD, an heavy nicotine abuse she gave up after a hospital admission, we had home oxygen therapy before, there was a problem with alcohol meanwhile, she had skin problems, heart failure, high blood pressure, all that existed before.” GP 5
	„A young man, I know him since his school times, over time he developed arterial hypertension. It is obviously in the family, as both his parents suffered from it and a chronic gastritis, apart from this no abnormalities.” GP 3
	„I didn't have much contact to (him) before, because he was comparatively fit for his age. He predominantly had orthopedic problems. He is still active, playing golf and so on and (...) but internal diseases, that were serious, he didn't have that.” GP 8
Personality and illness behavior	„She was actually- or she is actually a very modest... and shy person and for her medical problems she only claimed what she really needed urgently at that moment. A very kind and pleasant patient.“ GP 12
	“... (she is a) tall and robust woman, with a croaky voice... a heavy smoker, always unhappy. Niggling, unsatisfied and complaining, but also a fighter.” GP 6
	„but she always was... she was a tough woman and she never liked taking pills and she eventually said, it is too much, she can't take it and she got used to the symptoms and she would like to take smaller doses (...), she preferred to be without pills.” GP 5
	„...well, a rather moaning patient, that came with all kinds of ailments and I considered him generally to be healthier than he himself did.“ GP7
Social background	„She had a quite young daughter. Despite being my age, she had a young daughter and I think that's why she needed to be functioning and go back to work and she needed the money, yes.” GP 6
	„...he himself less, but his wife is quite depressive and that means eventually one has problems in everyday life.” GP 8
	„I know the whole family (...) I know him only since about ten years but the rest of the family more than 30 years (...). They are all very scientific, that's what I would say. His wife is in a high position in the administration of veterinary surgeons (...), the son is biologist and works in science and the other daughter is a psychologist.” GP 10
	„...she had a comparatively young daughter, despite being my age, she has a young daughter and I think that's why she was in need to come back to normal and go working and she needed the money.” GP 6
Continuity of care	„Well, I basically got to know Mr. (...) only as an acute patient after the hospital admission. He looked for a new GP after this adverse fate happened to him.” GP 2



**GP's experiences during critical illness**

Lack of information „The event of sepsis itself, as I said, wasn't diagnosed by me, in the practice, but happened in hospital after the operation and that's why I sort of got him back here as everything was finished. I just had to sort of accept that (...) in the end, I didn't have much to do with it and that's why I don't know much about it.“ GP8

„I only saw him again after rehabilitation, I didn't get a discharge letter either. I only got notice of these things as he stood here in front of me.“ GP 4

Emotional impact „This was a very unlucky course of events (...) surely, everybody asks, 'why is it just me?'" GP 3

„I once visited him in hospital and was shocked (...) well, this was a dramatic story.“ GP 10

**Impact of persisting symptoms**

General weakness and low functioning „Well, she was a shadow of her former self.“ GP 6

„...he is not up and about again. Well, he can't leave the flat, he walks short distances like to the toilet, from bed to toilet, from bed to living room.“ GP 11

„I have visited him once in the hospital and was shocked. He could only talk slowly, maybe in an orderly way, but he was heavily impaired after this intensive care therapy. And afterwards, it got better, he became clearer from the cerebral point of view and the slowing, that was extreme, went away.“ GP 10

„...in the beginning, she needed house visits, well, I can only see that her health condition only improved very slowly over a long period of time. That's all I can say about it.“ GP 12

Alteration to pre-sepsis condition „...but, I must say, (he) had some problems with his peripheral nerves before due to his lifestyle, (due to) alcohol (...) There was some damage before and then, with the sepsis, that only came to the point it became clinically apparent and now that is the situation.“ GP 2

„...just like before, she has from time to time exacerbations of her COPD.“ GP 12

„...he had depression before and had depression afterwards and I believe his depression was even less, (...) He had a longstanding depression so you can't put these things (sepsis) forward.“ GP 10

„...basically, he kept all the diseases he had before and everything grew gradually worse.“ GP 11

Specific diagnosis of common complications after intensive care „...he had this critical illness neuropathy with pains and muscle weakness and at the beginning also psychological problems with insomnia.“ GP 1

„...now (she suffers from) increasing polyneuropathic pain, that needs to be treated with strong pain killers, with opioids.“ GP 2

„...well, he still has a post traumatic distress syndrome, he is still looking for a psychologist.“ GP 4

„...he is impaired a bit by the polyneuropathy.“ GP 9

Individual complication „...because she had, she lost her leg with the sepsis and she, she had an amputation and before she could move about and could leave the apartment. But, afterwards, not anymore because she couldn't manage the stairs with one leg.“ GP5

„...and then she was depressive because she had the colostomy.“ GP 6

**Table 5: Themes, subthemes and quotations: Impact of outreach education.**

Themes and subthemes	Quotation
<i>Acceptability</i>	
Convenience by outreach visit	„I was approached at a time, I had time and as we arranged it, that was ideal (...) it was announced early enough and I got a mail-reminder and I didn't have to move anywhere, that could happen here, well, the colleague was really committed (...) I would say that was ideal.” GP 2
	„...well, that (the outreach education) happened here in the practice ...nice and friendly... adapted to the needs of the doctor... very good, that was comfortable. Didn't burden me much either.” GP 6
Time strains, competing tasks	„...well, it was really very interesting, the training, but this is – like today (the interview) – just one more thing, that delays and I would rather e.g. go for lunch or something else.” GP 11  “We have two thousand patients, work has grown so intense, that one has to leave out everything that is not absolutely necessary.” GP 12
<i>Impact on knowledge</i>	
Persisting elevated mortality after discharge	„The mortality after discharge, (...) that was very impressive, well, because I thought: sepsis overcome, well, everything is fine and the bird flies on.“ GP 2  „...that statistic, that said, ok, patients that survived this have a much higher mortality (...) these numbers were quite alarming.” GP 5
Specific long-term complications (Polyneuropathy, post-traumatic distress)	„...well, that was mainly new, that one looks at sepsis as a complex illness with long-term complications. I did look at it more as a complication, that, when cured, is presumably good and done with.” GP 11  „...the most helpful was, as I said, the connection. Generally with sepsis, that sepsis can cause other diseases (...) it seems, sepsis can cause serious alterations in the peripheral nerves.” GP 2  „...the fact, that polyneuropathy had a connection to sepsis was not known to me at all.” GP 12
Diagnosis of sepsis	„...what kind of symptoms, how sepsis manifests itself, because, one doesn't consider it so much, isn't it?” GP 6
Relevant summary for practice	„...we all have learnt that during medical studies, but it is not...one doesn't meet a sepsis survivor every day. It is not everyday business. And that's why I found it interesting, that you had it explained again.“ GP 5  „...in continuing education, we don't get the things that are relevant for practice enough, in that way, it was a nice, short update and training, but nothing really new.“ GP 8
<i>Transfer to practice</i>	
Identifying complications	„...and since then, I turn my attention more to those symptoms, (...) I really pay attention to things now, that I didn't consider before. It really helped me.“ GP 6  „One is sensitized for it. Yes, I now pay more attention, especially regarding polyneuropathy and so on, I watch more closely, I say, ok, be careful, here you must

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consider that, that is a case you must watch out and ask , if she doesn't tell herself, whether she has symptoms." GP 5

Initiation of specific therapy

„...now, I would always look first, that I talk with him about what he went through and how it felt in the hospital, what impressions, what experiences, what feelings and that one really goes on to arrange for psychological care more quickly." GP 4

“...and I also did some of that in practice, I mentioned the referral to a psychologist and that became very clear.” GP 4

„...from that training I learnt, that it makes sense, to send the patient to physiotherapy. That it is not only about medication, his usual medication and putting it - may be a bit trivial- I would prescribe antidepressants as well.” GP 7

Diagnosis of sepsis

„... (reporting a case of postoperative sepsis) and I really was more careful and said, this lady has a sepsis. (...) I now have an eye on these symptoms and I refer more quickly.” GP 6

Low relevance as small patient numbers in practice

„I don't have any patients after sepsis, that's why I can't change what I am doing.” GP 3

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# Reporting checklist for qualitative study.

Based on the SRQR guidelines.

## Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SRQR reporting guidelines, and cite them as:

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	Reporting Item	Page Number
<b>Title</b>		
	<a href="#">#1</a> Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	7



## Abstract

[#2](#) Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions

## Introduction

[#3](#) Description and significance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement

[#4](#) Purpose of the study and specific objectives or question

## Methods

[#5](#) Qualitative approach and research paradigm

Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability.

As appropriate the rationale for several items might be discussed together.

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1	Data collection	<a href="#">#11</a>	Description of instruments (e.g. interview guides,	7
2			questionnaires) and devices (e.g. audio recorders)	
3	instruments and		used for data collection; if / how the instruments(s)	
4			changed over the course of the study	
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11	Units of study	<a href="#">#12</a>	Number and relevant characteristics of participants,	8
12			documents, or events included in the study; level of	
13			participation (could be reported in results)	
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31	Data analysis	<a href="#">#14</a>	Process by which inferences, themes, etc. were	7,8
32			identified and developed, including the researchers	
33			involved in data analysis; usually references a specific	
34			paradigm or approach; rationale	
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41	Techniques to enhance	<a href="#">#15</a>	Techniques to enhance trustworthiness and credibility	7,8
42			of data analysis (e.g. member checking, audit trail,	
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48	<b>Results/findings</b>			
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51	Syntheses and	<a href="#">#16</a>	Main findings (e.g. interpretations, inferences, and	8
52			themes); might include development of a theory or	
53	interpretation		model, or integration with prior research or theory	
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1	Links to empirical data	<a href="#">#17</a>	Evidence (e.g. quotes, field notes, text excerpts,	24-28
2			photographs) to substantiate analytic findings	
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6	<b>Discussion</b>			
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10	Intergration with prior	<a href="#">#18</a>	Short summary of main findings; explanation of how	13,14
11	work, implications,		findings and conclusions connect to, support, elaborate	
12			on, or challenge conclusions of earlier scholarship;	
13	transferability and		discussion of scope of application / generalizability;	
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24	Limitations	<a href="#">#19</a>	Trustworthiness and limitations of findings	14
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30	Conflicts of interest	<a href="#">#20</a>	Potential sources of influence of perceived influence on	15
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38	Funding	<a href="#">#21</a>	Sources of funding and other support; role of funders in	15
39			data collection, interpretation and reporting	
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 44 American Medical Colleges. This checklist was completed on 07. May 2020 using  
 45 <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with  
 46 [Penelope.ai](#)

# BMJ Open

## General practitioners' views and experiences in caring for patients after sepsis - a qualitative interview study

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2020-040533.R2
Article Type:	Original research
Date Submitted by the Author:	23-Dec-2020
Complete List of Authors:	Gehrke-Beck, Sabine; Charite Universitätsmedizin Berlin, Institute of General Practice and Family Medicine Gensichen, Jochen; University Hospital Munich, Institute of General Practice and Family Medicine; Jena University Hospital, Institute of General Practice and Family Medicine Turner, Katrina; University of Bristol, School of Social and Community Medicine Heintze, Christoph; Charite Universitätsmedizin Berlin, Institute of General Practice and Family Medicine Schmidt, Konrad; Charite Universitätsmedizin Berlin, Institute of General Practice and Family Medicine; Jena University Hospital, Institute of General Practice and Family Medicine
<b>Primary Subject Heading</b>:	General practice / Family practice
Secondary Subject Heading:	Rehabilitation medicine, Infectious diseases, Intensive care
Keywords:	PRIMARY CARE, REHABILITATION MEDICINE, Adult intensive & critical care < INTENSIVE & CRITICAL CARE

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3 **General practitioners' views and experiences in caring for patients after sepsis**  
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5 **- a qualitative interview study**  
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9 **Authors:**

10 Dr. Sabine Gehrke-Beck<sup>a</sup>, Prof. Dr. Dipl.-Päd., MPH Jochen Gensichen<sup>c, d, e</sup>, Dr. Katrina Turner<sup>b</sup>, Prof. Dr. MPH  
11 Christoph Heintze<sup>a #</sup>, Dr. Konrad Schmidt<sup>a, d, e #</sup>  
12  
13

14  
15  
16  
17 <sup>a</sup>Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu  
18 Berlin, and Berlin Institute of Health, Institute of General Practice, Charité Campus Mitte, Charitéplatz 1, 10117  
19 Berlin, Germany  
20  
21

22  
23 <sup>b</sup>Population Health Sciences, Bristol Medical School, University of Bristol, Canynge Hall, 39 Whatley Road,  
24 Bristol, BS8 2PS, UK  
25

26  
27 <sup>c</sup>Institute of General Practice and Family Medicine, Munich University Hospital, LMU Munich, Pettenkoferstr.  
28 10, 80336 Munich, Germany  
29

30  
31 <sup>d</sup>Institute of General Practice and Family Medicine, Jena University Hospital, Bachstrasse 18, 07743 Jena,  
32 Germany  
33

34  
35 <sup>e</sup>Center of Sepsis Care and Control, Jena University Hospital, Am Klinikum 1, 07747 Jena, 07747 Jena,  
36 Germany  
37

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40 #shared last authorship  
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42  
43  
44 **Corresponding author:**

45 Konrad Schmidt, MD

46 [Konrad.Schmidt@charite.de](mailto:Konrad.Schmidt@charite.de)

47 Institut für Allgemeinmedizin

48 Charité Universitätsmedizin Berlin

49 Charitéplatz 1

50 10117 Berlin

51 Telephone: ++49-30-450514133

52 Fax: ++49-30-450514092  
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## Abstract

### Background

Patients surviving critical illnesses, such as sepsis, often suffer from long-term complications. After discharge from hospital, most patients are treated in primary care. Little is known how general practitioners (GPs) perform critical illness aftercare and how it can be improved. Within a randomized controlled trial, an outreach training programme has been developed and applied.

### Objectives

The aim of this study is to describe GPs' views and experiences of caring for post-sepsis patients and of participating a specific outreach training.

### Design

Semi-structured qualitative interviews .

### Setting

14 primary care practices in the metropolitan area of Berlin, Germany.

### Participants

14 GPs, who had participated in a structured sepsis aftercare program in primary care.

### Results

Themes identified in sepsis aftercare were: Continuity of care and good relationship with patients, GP's experiences during their patient's critical illness and impact of persisting symptoms. An outreach education as part of the intervention was considered by the GPs to be acceptable, helpful to improve knowledge of the management of post-intensive care complications and useful for sepsis aftercare in daily practice.

### Conclusions

GPs provide continuity of care to patients surviving sepsis. Better communication at the ICU-GP interface and training in management of long-term complications of sepsis may be helpful to improve sepsis aftercare.

**Trial registration number** (of the RCT): ISRCTN61744782



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3 **Keywords:** post intensive care syndrome, sepsis, primary care, General Practitioner, aftercare, outreach-  
4 education, qualitative research  
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7 **Abbreviations**  
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10 GP: general practitioner  
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12 ICU: intensive care unit  
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14 PICS: Post-intensive care syndrome  
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16 SMOOTH: Sepsis survivors monitoring and coordination in outpatient health care  
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3 **Strengths and limitations of this study**  
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- 5
- 6 • This is the first study to explore in detail GPs' views of managing sepsis survivors.
  - 7
  - 8 • Using qualitative interviews meant GPs could raise issues that were salient to them.
  - 9
  - 10
  - 11 • Some of the interviews were short due to GPs having limited time to take part.
  - 12
  - 13
  - 14 • Only GPs in one metropolitan area were interviewed.
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For peer review only

## **Introduction**

An increasing number of patients are treated in intensive care units (ICUs) and survive a critical illness such as sepsis<sup>1</sup>. After discharge, patients may suffer from long-term consequences<sup>2</sup>, such as critical-illness-polyneuropathy, critical-illness-myopathy, cognitive decline, chronic pain<sup>3-6</sup>, depression or post-traumatic stress disorder<sup>3 7 8</sup>. These sequelae are referred to as the “Post-intensive care syndrome” (PICS)<sup>1</sup>. They result in lower health-related quality of life and elevated mortality rates, as well as increased health care use<sup>9-11</sup>.

International guidelines state that patients with PICS should have ongoing, long-term monitoring and therapy<sup>12 13</sup>. Some patients discharged from ICUs are referred to ICU follow-up clinics. The purpose and structure of these clinics vary between countries, but change of clinical outcomes are rarely shown<sup>14-17</sup>. In addition, continuity of care at an ICU-follow up clinic may be difficult, when the patient lives far from the ICU and needs frequent follow-up<sup>18-20</sup>. Even if intensive care doctors and nurses are familiar with complications after critical illness, their role in coordinating ICU follow-up is discussed controversially<sup>17 21</sup>: They seem not to be trained in outpatient care coordination and the clinical variety of possible post-ICU complications<sup>17</sup>. Additionally, they do not know their patients for long and therefore may lack insight into the patient’s psychosocial background<sup>22</sup>. On the contrary, GPs have a long-lasting relationship with their patients and provide care coordination as a core task<sup>23</sup>, which is highly appreciated by the patients<sup>24</sup>. This makes GPs ideal advocates of patients in their rehabilitation pathways. Thus, a Dutch retrospective cohort study found an increased consultation rate in primary care following ICU discharge<sup>25</sup>. Considering that there were more than two million intensive care treatment cases just in Germany in 2017<sup>26</sup> and an assumed increase driven by the Covid-19 pandemic<sup>27</sup>, GPs need to know how to provide best post-intensive care to these patients, as it has been already called for by others<sup>28</sup>. The concept of the PICS is quite recent, but GPs intensive care experiences may date back to medical studies or early hospital rotations. In a qualitative study, GPs reported lack of background knowledge and confidence in diagnosing and treating post sepsis complications<sup>29</sup>. Kahn (2007) states that GPs need to be educated in how to care for patients after critical illness but do not provide suggestions about how this should be done<sup>22</sup>.

Outreach education delivered by academics to the GPs appeared to change their clinical behavior and improve patient care.<sup>30</sup> However, current evidence mainly focuses on changing prescribing patterns rather than on complex treatment strategies. Educational outreach visits providing knowledge to primary care for relatively

1  
2  
3 30 rare medical problems are shown to enhance confidence<sup>31</sup> and are acceptable to GPs<sup>32</sup>. Such an intervention may  
4  
5 31 be effective in educating GPs in how to effectively care for patients with PICS. However, whether it is needs to  
6  
7 32 be assessed.

8  
9 33 The SMOOTH trial evaluated a structured after-care program in general practice for sepsis survivors  
10  
11 34 including an outreach education for GPs<sup>33 34</sup>. Sepsis is one of the leading causes of long-term-ICU stays and can  
12  
13 35 be viewed as a model illness for critical disease<sup>35</sup>. The intervention evaluated in the trial was designed with  
14  
15 36 reference to the Chronic Care Model<sup>36</sup> at the level of a GP practice. It is focused on patient empowerment, a  
16  
17 37 proactive care team and case management to ensure continuity of care. The trial did not find an improvement in  
18  
19 38 mental health-related quality of life at 6 months after ICU discharge compared to usual care<sup>33 34</sup>. As part of this  
20  
21 39 trial, in-depth interviews were held with GPs to explore their experiences with patients discharged from ICU and  
22  
23 40 the intervention. Qualitative research has been conducted with post-ICU patients in detail<sup>37-43</sup>, but, to date, no  
24  
25 41 one had explored in depth the views and experiences of GPs caring for these patients. The aim of this study is to  
26  
27 42 describe GPs' views and experiences of caring for post-sepsis patients and of participating a specific outreach  
28  
29 43 training, in order to inform and contribute to applicable future aftercare structures in primary care.

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## 32 33 34 45 **Methods**

### 35 36 46 **The SMOOTH-trial**

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38  
39 47 The SMOOTH trial is a multi-center RCT evaluating a primary-care based aftercare-intervention for sepsis  
40  
41 48 survivors. The intervention included monitoring of the patient by a case manager (a specialized nurse), a patient  
42  
43 49 education session delivered by the case manager and an educational outreach-visit by a liaison physician to the  
44  
45 50 GP, details are reported elsewhere<sup>33</sup>. Patients were recruited in the ICU and when they agreed to participate, their  
46  
47 51 GPs were contacted and asked to join also the trial. Two hundred and ninety-one patients agreed to participate,  
48  
49 52 with 148 patients were randomized to the intervention and 143 patients to the control group receiving usual care.  
50  
51 53 As some patients changed their GPs during the trial, the number of GPs was slightly larger than the number of  
52  
53 54 patients. Three hundred seven GPs were approached to participate. Two hundred and ninety-four (95.8%) agreed  
54  
55 55 and were included in the trial. Of total 159 GPs in the intervention group, 55 were recruited at the Berlin trial  
56  
57 56 site.

58  
59 57 The intervention directed at the GP consisted of one outreach educational visit by a liaison physician - a GP  
60  
58 trained in sepsis aftercare. The visit was scheduled after the patient's discharge and according to time

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3 59 preferences of the GPs. It took place in the GP practice and lasted about one hour. The education session  
4  
5 60 included a brief overview of sepsis epidemiology and diagnosis, including red flags in primary care, but focused  
6  
7 61 specifically on the six most common sequelae of sepsis (“Sepsis Six”). The epidemiology of long-term sequelae,  
8  
9 62 practical tools for diagnoses and monitoring, as well as evidence-based therapeutic options in routine outpatient  
10  
11 63 care were presented. A detailed manual covering all the information given and a brief sepsis pocket-card  
12  
13 64 summarizing main points for everyday practice were handed over to the GP, published elsewhere<sup>34</sup>. The GP was  
14  
15 65 asked to contact the liaison physician later at any moment in the study if questions arose during follow-up of the  
16  
17 66 patient.

### 67 **Study design and data collection**

68 As part of implementation evaluation, semi-structured interviews were held with the GPs in the intervention  
69 group of the RCTs to gain insight into their experiences caring for patients surviving sepsis and the GP education  
70 that had been delivered as part of the intervention.

71 Qualitative methods are applied within the research paradigm of critical realism to complete the results of  
72 the quantitative evaluation using a qualitative exploration<sup>44</sup>. Critical realism can be used to understand the  
73 complexities in primary care and events and phenomena in this setting<sup>45</sup>. The aim was to illuminate and  
74 understand the functioning of the intervention in the social background of a GP practice and to extract  
75 suggestions for future and optimized aftercare in General Practice.

76 The research team consisted of a 4th year medical student (NS), who conducted the interviews as part of a  
77 research project, and four academic GPs (SGB, CH, KS, JG) who were involved in analyses of the data. NS had  
78 received training in qualitative research interviews and was regularly supervised throughout the study by SGB  
79 and CH, who are experienced qualitative researchers. NS had not been involved in the SMOOTH trial, and  
80 interviewees were informed of this, to ensure they felt comfortable making any negative comments about the  
81 trial. SGB, CH, KS and JG were involved in the trial. At the time of the interviews they were not aware, that the  
82 outreach education did not change patient’s mental health related quality of life (primary outcome).

83  
84 A topic guide was developed and based on the aims of the study and an understanding of relevant literature.  
85 The questions included focused on the GPs’ experiences of caring for patients who had survived sepsis, and their  
86 experiences of the trial intervention.

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3 87 We purposefully sampled GPs for interview to ensure interviews were held with GPs of varying gender and  
4  
5 88 duration of work experience. All those approached for interview had worked at the Berlin trial site. If GPs were  
6  
7 89 willing to be interviewed, they were mailed information about the interviews and a consent form. GPs willing to  
8  
9 90 be interviewed could stipulate the time and location of their interview. The first interview was used as a pilot but  
10  
11 91 as no changes were made to the topic guide, this interview was included in the analysis. With participant  
12  
13 92 consent, the interviews were audiotaped and transcribed verbatim by NS. GPs were interviewed until data  
14  
15 93 saturation was reached, i.e. when no new themes were identified in the later interviews.

### 16 17 94 **Patient and Public Involvement**

18  
19  
20 95 Patient's perspectives and needs were included into topic guide development by the study team. Beside  
21  
22 96 literature research, it was based on the results of qualitative interviews with sepsis survivors, using the same  
23  
24 97 methodical approach and being published elsewhere<sup>42</sup>.

### 25 26 98 **Data analysis**

27  
28  
29 99 The interviews were analyzed thematically<sup>46</sup>. Inductive thematic coding was used to gain an overall insight  
30  
31 100 into the perspectives of the GPs. Transcripts of four interviews were read and re-read by different members of  
32  
33 101 the research team (SGB, CH, KS, JG) who identified themes and developed initial coding frames. These  
34  
35 102 researchers repeatedly discussed their codes and interpretation of the data. Once the coding frames had been  
36  
37 103 agreed, they were applied to all interviews, see Tables 1 A and B. Coding was done manually by SGB. Results  
38  
39 104 were presented to the research team and discussed until consensus was reached (SGB, CH, JG, KS).

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41 105  
42  
43 106 This study refers to the standards for reporting qualitative research (SRQR).<sup>47</sup>

1  
2  
3 107 **Results**

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6 108 **Participants**

7  
8 109 We contacted 18 GPs for interview. Four GPs declined to participate due to lack of time. The 14 GPs who  
9  
10 110 agreed to be interviewed (Table 2) choose to be interviewed at work, on practice premises, in a private room.  
11  
12 111 Details of the patients the GPs cared for are shown in Table 3. After 14 interviews, theoretical saturation was  
13  
14 112 reached with no new aspects emerging in the last two interviews. The interviews were conducted from January  
15  
16 113 to August 2013 and lasted 12–28 minutes (mean 20 minutes). Themes considered relevant to this paper with  
17  
18 114 corresponding quotes are shown in Tables 4 and 5.

19  
20 115 **Caring for patients after critical illness**

21  
22  
23 116 When analyzing the GPs' accounts, three main themes related to their experience of caring for patients after  
24  
25 117 intensive care were identified as continuity of care and good relationship with patients, GP's experiences during  
26  
27 118 their patient's critical illness and impact of persisting symptoms after discharge.

28  
29 119 ***Continuity of care and good relationship with patients***

30  
31  
32 120 At the start of the interview, the GPs were asked to talk freely about their patient. The accounts given  
33  
34 121 suggested that specific medical diagnoses and the acute sepsis diagnosis played a limited role in the GPs'  
35  
36 122 narration. GPs often commented on the patient's condition before they were diagnosed with sepsis, discussing  
37  
38 123 their pre-existing disease and previous general health status. It was evident that many of them were familiar with  
39  
40 124 the patients' medical history.

41  
42 125 Many GPs also talked about the patient's personality. They often focused on the patient's coping and illness  
43  
44 126 behavior as one GP explained:

45  
46 127 *"... she is actually a very modest... and shy person and for her medical problems she only claimed what she*  
48  
49 128 *really needed urgently at that moment. A very kind and pleasant patient."* GP 12

50  
51 129 Some GPs also reported on the personal and employment situation of their patients, especially if they felt  
52  
53 130 that this had been important to the recovery of the patient:

54  
55 131 *"Despite being my age, she had a young daughter and I think that's why she needed to be functioning and*  
57  
58 132 *go back to work and she needed the money, yes."* GP 6

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3 133 Even if most GPs seemed to know their patients very well, two GPs stated that they started caring for their  
4  
5 134 patients only after the sepsis hospital stay:

6  
7 135 „Well, I basically got to know Mr. (...) only as an acute patient after the hospital admission. He looked for  
8  
9 136 a new GP after this adverse fate happened to him.”

10  
11  
12 137 These two GPs gave little information about their patients.

### 13 138 ***GP's experiences during their patient's critical illness***

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16  
17 139 Most GPs commented that they lacked information about the acute sepsis event. They had not been  
18  
19 140 informed about their patient's condition or involved in any of the treatment decisions made whilst their patient  
20  
21 141 was in hospital. Several GPs could not specify the exact diagnosis and focus of the sepsis.

22  
23 142 “The event of sepsis itself, as I said, wasn't diagnosed by me, in the practice, but happened in hospital after  
24  
25 143 the operation and that's why I sort of got him back here as everything was finished. I just had to sort of accept  
26  
27 144 that (...) in the end, I didn't have much to do with it and that's why I don't know much about it.” GP 8

28  
29  
30 145 Some GPs perceived the acute sepsis event as a tragic lifetime event for their patients and discussed the  
31  
32 146 emotional impact of the serious impact on the patient and his/her family.

33  
34 147 “This was a very unlucky course of events (...) surely, everybody asks, why is it just me?” GP 3

### 35 36 37 148 ***Impact of persisting symptoms***

38  
39  
40 149 GPs mentioned a number of different aspects when they described the condition of their patients after  
41  
42 150 discharge and the impact of sepsis sequelae in their quality of life: general weakness and low functioning, the  
43  
44 151 impact of preexisting diseases, individual specific health impairments and – less frequently- specific diagnosis of  
45  
46 152 long-term-complications contributing to PICS.

47  
48 153 Many interviewees described a general weakness and low functioning of their patients. They attributed this  
49  
50 154 to the severe illness and the long hospital stay, without specifying the factors and causes contributing to the  
51  
52 155 weakness like underlying illnesses, specific complications or treatment side effects. The focus of their reports  
53  
54 156 was on the consequences for independence and autonomy of their patients rather than underlying  
55  
56 157 pathomechanisms.

57  
58 158 “Well, she was a shadow of her former self” GP 6  
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3 159 Many GPs compared their patients' health status to their condition before critical illness. In some cases,  
4  
5 160 they saw their patients' impairment after discharge as, at least in part, attributable to pre-existing and chronic  
6  
7 161 illness. In their perception, the acute sepsis event did not alter status of these patients much.

8  
9 162 *"Essentially, he kept the diseases he had before and everything got gradually a bit worse. He tended to be*  
10  
11 163 *depressive before and now it isn't much worse."* GP 11

12  
13  
14 164 The report about their patient condition and complications after sepsis was in many cases given in common,  
15  
16 165 everyday language without listing specific medical diagnoses or specific sepsis complication. They rather  
17  
18 166 concentrated on reporting on everyday functioning and overall well-being. Only some GPs classified specific  
19  
20 167 sepsis sequelae and precisely stated these diagnoses. Some added being only aware of the diagnosis after the  
21  
22 168 education session, they received as part of the study intervention.

23  
24 169 *"And mainly... he was quite distressed by the gait disturbance; by the painful paresthesia he had (...) the*  
25  
26 170 *polyneuropathy was what was left from the sepsis syndrome."* GP 8

27  
28  
29 171 Some GPs reported individual complications of sepsis or sepsis therapy had the main impact on the  
30  
31 172 patient's quality of life afterwards, e.g. the loss of a limb or a persisting colostomy.

32  
33 173 *"As she had, because of this sepsis, she basically lost the leg, well, she had an amputation and ...hmm...she*  
34  
35 174 *was still quite mobile before and could leave the flat. Hmm, afterwards no longer, because with one leg she*  
36  
37 175 *couldn't manage the stairs."* GP 5

38  
39  
40 176 One GP could not contribute to that aspect, as his patient died shortly after discharge.

#### 41 42 177 **Impact of the outreach education**

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44  
45 178 Three main themes that described the impact of the education session were identified: acceptability,  
46  
47 179 improvement of knowledge, and the transfer to professional practice.

#### 48 49 180 ***Acceptability***

50  
51  
52 181 Most participants stated that they appreciated the time and the effort on the side of the liaison physician to  
53  
54 182 come to their premises and adapt to their schedule. They commented that this was an advantage for their own  
55  
56 183 time schedule and comfort.

57  
58 184 *"I was approached at a time that was convenient for me (...), I didn't need to move anywhere, that could*  
59  
60 185 *happen here, well, the colleague bothered to come (...) and as I said that was ideal, I would say."* GP 2

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3 186 However, some GPs said they had many patients to care for and tasks to cope with and could not spare any  
4  
5 187 time for the training. A few also mentioned that post sepsis patients are rare in a GP practice and that they would  
6  
7 188 rather save time in continuing education for more common diseases.

8  
9 189 *“Well, it was very interesting, the education, but this is just another additional point, that takes time and I*  
10  
11 190 *would prefer e.g. to have lunch or something similar.” GP 11*

### 14 191 ***Improvement of knowledge***

15  
16 192 The majority of practitioners stated that they had gained new knowledge from the education. Many  
17  
18 193 interviewees reported it was new to them that sepsis can cause specific disease sequelae into after hospital  
19  
20 194 discharge.

21  
22  
23 195 *“Yes, that was largely new to me, that sepsis is seen as a complex illness with long lasting complications.*  
24  
25 196 *Till now, I saw it more as a complication, that, when cured, is resolved.” GP 11*

26  
27 197 GPs often also stated, that they weren't aware that mortality is still elevated long-term after discharge until  
28  
29 198 they heard about that in the education session.

30  
31  
32 199 *“Most helpful was (...) that sepsis e.g. has a high mortality, the numbers were alarming! I mean, the*  
33  
34 200 *mortality after discharge, (...) basically, I thought: Sepsis survived, ok, the bird flies on.” GP 2*

35  
36 201 Some of the GPs reported that they did not know before that polyneuropathy and psychological problems  
37  
38 202 were common consequences after sepsis and intensive care.

39  
40  
41 203 *“I think, I would not have seen the connection before. Because she had so many other reasons for a*  
42  
43 204 *polyneuropathy, I would have probably linked it to the diabetes.” GP 5*

44  
45 205 One GP acquired more information about diagnosis of a sepsis in a patient, even though that was not in the  
46  
47 206 focus of the education session.

48  
49  
50 207 Some GPs stated that they already knew the information given to them, but even when this was the case,  
51  
52 208 they still appreciated the repetition and summary preparing them for the care of the patient.

53  
54 209 *“Well, I didn't find anything really new to me. But it was brought back and I did concentrate on it and*  
55  
56 210 *looked closer to it. That was new to me and helps me for, well, aftercare.” GP 9*

57  
58  
59 211 One doctor saw no benefit from the education; he had done research in this field before his GP work and  
60  
212 had the relevant knowledge before.

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3 213 ***Transfer to practice***  
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5 214 Most of the GPs interviewed said that the new information helped them care for the patient included in the  
6  
7 215 trial, and that it would help them in their future work with similar patients. Most of them saw a benefit in  
8  
9 216 identifying sepsis sequelae.  
10

11  
12 217 *"...mainly the polyneuropathy and so on, I look out for it more closely. I say to myself: Look out! You must*  
13  
14 218 *keep that in mind and ask for it, when they don't tell on their own, if they have problems."* GP 5  
15

16 219 Some reported consequences for the therapy of the patient they cared for within the study and some stated  
17  
18 220 that they would probably change their therapeutic approach to similar patients in the future.  
19

20  
21 221 *"I believe I changed some things afterwards. I mentioned the psychotherapist afterwards, that became quite*  
22  
23 222 *clear, and (patient's name) did agree to that."* GP 4  
24

25 223 One GP had quickly diagnosed a patient with acute sepsis since the training, even though diagnosis of  
26  
27 224 sepsis was not its main focus.  
28

29  
30 225 Some GPs doubted the relevance of the information for their work. They stated that caring for similar  
31  
32 226 patients was a very rare event in their practice, and therefore they did not think they would apply the knowledge  
33  
34 227 they had learnt.  
35

36 228 *"I don't have any sepsis patients - that's why I can't change anything about what I do."* GP 3  
37  
38

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40  
41 230 **Discussion**  
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43  
44 231 Findings from this study suggest that GPs provide continuity of care and a good relationship with patients  
45  
46 232 and consider pre-existing and chronic disease, personality and coping patterns, as well as social background,  
47  
48 233 when providing post-ICU-care to patients. Many interviewees described the long-term impact of sepsis on their  
49  
50 234 patients as a general weakness and malfunctioning and considered it in relation to the patient's pre-sepsis  
51  
52 235 constitution. Some GPs expressed empathy with the serious life event their patient experienced. GPs reported a  
53  
54 236 lack of information about the course of the disease and their patient's condition while they were in the hospital.  
55  
56 237 Diagnosing and listing specific sepsis sequelae played a minor role.  
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3 239 The outreach education session was acceptable to most GPs. Most GPs acquired new information about  
4  
5 240 long-term-complications of sepsis. They considered this information as helpful to identify and start treatment for  
6  
7 241 specific post-sepsis symptoms. This finding is consistent with findings from a recent qualitative study critical  
8  
9 242 care nurses delivering a recovery programme to ICU survivors<sup>48</sup>. However, some GPs did not value it and  
10  
11 243 pointed to the small numbers of post-sepsis-patients being in competition with other patients and tasks.

12  
13 244

14  
15  
16 245 While most of the GPs' accounts suggested a long-standing knowledge of the patient and an individual  
17  
18 246 appraisal of their health impairments after discharge, they lacked detailed medical knowledge about sepsis  
19  
20 247 complications. The outreach education was mainly well accepted and seemed to provide a valid setting to  
21  
22 248 improve knowledge about specific diagnostic and therapeutic concepts GPs can apply in their professional  
23  
24 249 practice.

#### 25 26 250 **Comparison with existing literature**

27  
28  
29 251 Patients' perceptions of their quality of life after an ICU-stay have been examined in several qualitative  
30  
31 252 studies<sup>43</sup>. A wide range of ongoing health impairments was identified and loss of autonomy was a main aspect<sup>37-</sup>  
32  
33 253 <sup>39</sup>. The views of the GPs identified here is very close to patients' perspectives. The GPs also reported general  
34  
35 254 weakness and low functioning as a main aspect and a very individual apprehension of complaints and  
36  
37 255 impairment. This congruence may facilitate a patient-centered after-care especially in a primary care setting.

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39 256

40  
41 257 Difficulties in information flow between intensive care units and GPs had been identified before: lack of  
42  
43 258 information about admission or discharge and ongoing needs of patients after an ICU stay and no involvement in  
44  
45 259 treatment decisions were reported by GPs in other studies<sup>49-51</sup>. As valid data on the course of disease and current  
46  
47 260 diagnoses and treatment is essential for follow-up, information during hospital stay and more detailed discharge  
48  
49 261 information for GPs may be essential to enhance quality in after-care.

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51 262

52  
53  
54 263 It has been shown that GPs lack information on sepsis and identification of post-ICU-complications<sup>29 51</sup>.  
55  
56 264 The acquisition of clinical knowledge has been described and explained by forming of "scripts" with repeated  
57  
58 265 exposure to clinical patterns<sup>52</sup>. With no ongoing experience in handling ICU-patients and limited encounters of  
59  
60 266 post-ICU patients, scripts related to the PICS cannot be expected to evolve in GPs in everyday practice. In our

1  
2  
3 267 study, the educational intervention led to additional knowledge about specific post-ICU complications. This may  
4  
5 268 meet patient's ongoing need for feedback of their ICU history, as well as the resulting impairments<sup>43</sup>.

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9  
10 270 GPs appreciate personal discussion with experts as a valuable method of continuing education<sup>53</sup>, and  
11  
12 271 outreach visits as a method to reach GPs have been used before and shown to be accepted well<sup>30</sup>. Knowledge  
13  
14 272 gain has been demonstrated, but transfer to practice seemed to be difficult<sup>30 54</sup>. Patient-related intervention may  
15  
16 273 be especially helpful<sup>30</sup> to facilitate knowledge transfer. In our study, GPs reported transfer to practice of the  
17  
18 274 knowledge they acquired, which may be achieved by the patient-related education and the individual discussion  
19  
20 275 of diagnosis and treatment in the practice.

21  
22 276 Lack of continuum of care is a major patient concern after ICU discharge<sup>37, 38</sup>. The Chronic Care Model can  
23  
24 277 be used to inform the ongoing care at the level of an individual practice, but also to organize patient-centered  
25  
26 278 transsectoral and interdisciplinary care<sup>36</sup>. Local organization of a follow-up multiprofessional network and a  
27  
28 279 stepped-care approach could help to ensure continuity of care. This study demonstrates that GPs are familiar  
29  
30 280 with their patients, know about their medical and psychosocial background and consider these aspects when  
31  
32 281 caring for their patients. Therefore, GPs seem to be appropriate ICU aftercare providers. In addition, increased  
33  
34 282 intersectoral information flow could contribute to ensure continuity of care, e.g. quality of discharge letters may  
35  
36 283 be improved by training, checklists, software solutions or positive peer pressure<sup>55, 56</sup>.

### 37 38 284 **Limitations**

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40  
41 285 Since 307 GPs were asked to take part in the trial, and 294 agreed, it is likely those who took part in the trial  
42  
43 286 are representative of other GPs in Germany<sup>34</sup>. Being involved in a sepsis aftercare trial informed GPs about the  
44  
45 287 functioning of the RCTs intervention, but may have changed their perception of the post-sepsis patients they care  
46  
47 288 for. They may have been more preoccupied with and focused on that patient than otherwise. It might be those  
48  
49 289 who agreed to be interviewed were more interested than their peers in sepsis as 4 of the 18 GPs approached for  
50  
51 290 interview declined. As only GPs in the urban area of Berlin were interviewed, specific aspects of GPs in rural  
52  
53 291 settings may have been missed.

54  
55 292 The interviews were fairly short, which may limit depth of insights. Time constraints are typical of GPs  
56  
57 293 work and were mentioned repeatedly throughout the interview. As GPs are used to work under pressure, they  
58  
59 294 were able to answer questions quickly and to summarise their experiences. Due to the time pressures they were  
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2  
3 295 under, those interviewed were not contacted again to explore whether they agreed with the researchers' analysis  
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5 296 of the data. However, themes and subthemes were discussed repeatedly in the research group.  
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10 298 **Conclusion**  
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12 299 GPs are in a good position to offer continuity of care to sepsis survivors. However, they need training and  
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14 300 information flow from secondary care for optimal aftercare provision.  
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19 302 GPs have a profound and holistic knowledge of these complex patients and can appreciate individual their  
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21 303 impairments and residual symptoms. However, lack of specific knowledge about critical illness complications  
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23 304 and lack of information and communication with ICU care providers are barriers to optimal follow-up in primary  
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25 305 care settings.  
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28 306 GPs should get the necessary background knowledge and individual information of their patients to provide  
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30 307 high-quality aftercare. Taking into account time constraints and preferred education formats, outreach visits in  
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32 308 the context of discharge of a post-ICU patient may be a valuable source of information and support.  
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## **Declarations**

Declarations of interest: none declared

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Author Statement: SGB, KS and CH had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: SGB, CH, JG, KS. Outreach training conduction: KS. Acquisition, analysis of data: SGB. Interpretation of data: SGB, CH, KS, JG, KT. Drafting of the manuscript: SGB, KS, KT. Critical revision of the manuscript for important intellectual content: SGB, CH, KS, JG, KT.

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Data sharing statement: Audio recordings and transcriptions of the analysed interviews are stored at a secure server of Charité University Medicine and can be shared upon reasonable request.

The BMJ's qualitative reporting checklist has been created based on the reporting guidelines of standards for reporting qualitative research (SRQR).

**Table 1A****Coding framework: Caring for patients after critical illness**

Themes	Subthemes
<i>Continuity of care and good relationship with patients</i>	Previous health status Personality and illness behavior Social background Continuity of care
<i>GP's experiences during their patient's critical illness</i>	Lack of information Emotional impact
<i>Impact of persisting symptoms</i>	General weakness and limited functioning Alteration to pre-sepsis condition Specific diagnosis of common complications after intensive care Individual complication

**Table 1B****Coding framework: Impact of the outreach education**

Themes	Subthemes
<i>Acceptability</i>	Convenience by outreach visit Time strains, competing tasks
<i>Improvement of knowledge</i>	Persisting elevated mortality after discharge Specific long-term complications (Polyneuropathy, post-traumatic distress) Diagnosis of sepsis Relevant summary for practice
<i>Transfer into practice</i>	Identifying complications Initiation of specific therapy Diagnosis of sepsis Low relevance as small patient numbers in practice



**Table 2: Self-declared details of interviewed General Practitioners (GPs)**

<b>No. of GPs</b>	<b>14</b>
<b>Age*</b> (yrs)	41-68 (mean: 55)
<b>Sex</b>	
male	8 (42.9%)
female	6 (57.2%)
<b>Practice organization</b> (no. of GPs)	
joint practices (2-6 GPs)	6 (57.2%)
single practices	8 (42.9%)
<b>license to practice since*</b>	
10-20 yrs	1 (7.1%)
20-30 yrs	3 (21.4%)
30-40 yrs	6 (57.2%)
>40 yrs	2 (14.3%)
no data	2 (14.3%)
<b>practice opening</b> (no.)*	
< 10 yrs	1 (7.1%)
10-20 yrs	5 (35.7%)
20-30 yrs	4 (28.6%)
30-40 yrs	4 (28.6%)
<b>Specialization</b> (no.)	
GPs	7 (50%)
General internists <sup>#</sup>	6 (57.2%)
Practitioner without specialisation	1 (7.1%)
<b>Practice characteristics, subspecialisations<sup>§</sup></b> (no.)	
Complementary medicine	7 (50%)
Psychosomatics	3 (21.4%)
Pain management	2 (14.3%)
Gastroenterology	1 (7.1%)
Infectiology	1 (7.1%)
Oncology	1 (7.1%)
Diabetology	1 (7.1%)
<b>Home visits</b> (no/week)	
<5/wk	3 (21.4%)
5-10/wk	4 (28.6%)
>10 wk	2 (14.3%)
none	2 (14.3%)
no data	3 (21.4%)
<b>Patients &gt; 60 years</b> (estimate no.)	
<30%	5 (35.7%)
30-50%	6 (57.2%)
>50%	2 (14.3%)
<b>Academic teaching practice</b>	
yes	7 (50%)
no	7 (50%)

\*at the time of the interview § multiple mention possible

<sup>#</sup>A considerable proportion of primary care in Germany is provided by general internists.

**Table 3: Characteristics of post-sepsis patients cared for by the General Practitioners (n)**

Total	14
Male	11
Female	3
Age [years]	45-82 (mean 66)
Sepsis focus	3 pulmonary
	2 gastrointestinal
	3 renal
	3 tissue infection
	3 unknown

For peer review only

**Table 4: Quotations - Caring for patients after critical illness**

Themes and subthemes	Quotation
<i>Continuity of care and good relationship with patients</i>	
Previous health status	„Well, he was a spry patient, he bore his age well and he had no relevant preexisting disease (...) and he came mainly for check-ups.” GP 9
	„Yes, she needed home visits before. She had an insulin-dependent diabetes, COPD, an heavy nicotine abuse she gave up after a hospital admission, we had home oxygen therapy before, there was a problem with alcohol meanwhile, she had skin problems, heart failure, high blood pressure, all that existed before.” GP 5
	„A young man, I know him since his school times, over time he developed arterial hypertension. It is obviously in the family, as both his parents suffered from it and a chronic gastritis, apart from this no abnormalities.” GP 3
	„I didn't have much contact to (him) before, because he was comparatively fit for his age. He predominantly had orthopedic problems. He is still active, playing golf and so on and (...) but internal diseases, that were serious, he didn't have that.” GP 8
Personality and illness behavior	„She was actually- or she is actually a very modest... and shy person and for her medical problems she only claimed what she really needed urgently at that moment. A very kind and pleasant patient.“ GP 12
	“...(she is a) tall and robust woman, with a croaky voice...a heavy smoker, always unhappy. Niggling, unsatisfied and complaining, but also a fighter.” GP 6
	„but she always was...she was a tough woman and she never liked taking pills and she eventually said, it is too much, she can't take it and she got used to the symptoms and she would like to take smaller doses (...), she preferred to be without pills.” GP 5
	„...well, a rather moaning patient, that came with all kinds of ailments and I considered him generally to be healthier than he himself did.“ GP7
Social background	„She had a quite young daughter. Despite being my age, she had a young daughter and I think that's why she needed to be functioning and go back to work and she needed the money, yes.” GP 6
	„...he himself less, but his wife is quite depressive and that means eventually one has problems in everyday life.” GP 8
	„I know the whole family (...) I know him only since about ten years but the rest of the family more than 30 years (...). They are all very scientific, that's what I would say. His wife is in a high position in the administration of veterinary surgeons (...), the son is biologist and works in science and the other daughter is a psychologist.” GP 10
	„...she had a comparatively young daughter, despite being my age, she has a young daughter and I think that's why she was in need to come back to normal and go working and she needed the money.” GP 6
Continuity of care	„Well, I basically got to know Mr. (...) only as an acute patient after the hospital admission. He looked for a new GP after this adverse fate happened to him.” GP 2

**GP's experiences during their patient's critical illness**

- Lack of information „The event of sepsis itself, as I said, wasn't diagnosed by me, in the practice, but happened in hospital after the operation and that's why I sort of got him back here as everything was finished. I just had to sort of accept that (...) in the end, I didn't have much to do with it and that's why I don't know much about it.“ GP8
- „I only saw him again after rehabilitation, I didn't get a discharge letter either. I only got notice of these things as he stood here in front of me.“ GP 4
- Emotional impact „This was a very unlucky course of events (...) surely, everybody asks, 'why is it just me?'" GP 3
- „I once visited him in hospital and was shocked (...) well, this was a dramatic story.“ GP 10

**Impact of persisting symptoms**

- General weakness and low functioning „Well, she was a shadow of her former self.“ GP 6
- „...he is not up and about again. Well, he can't leave the flat, he walks short distances like to the toilet, from bed to toilet, from bed to living room.“ GP 11
- „I have visited him once in the hospital and was shocked. He could only talk slowly, maybe in an orderly way, but he was heavily impaired after this intensive care therapy. And afterwards, it got better, he became clearer from the cerebral point of view and the slowing, that was extreme, went away.“ GP 10
- „...in the beginning, she needed house visits, well, I can only see that her health condition only improved very slowly over a long period of time. That's all I can say about it.“ GP 12
- Alteration to pre-sepsis condition „...but, I must say, (he) had some problems with his peripheral nerves before due to his lifestyle, (due to) alcohol (...) There was some damage before and then, with the sepsis, that only came to the point it became clinically apparent and now that is the situation.“ GP 2
- „...just like before, she has from time to time exacerbations of her COPD.“ GP 12
- „...he had depression before and had depression afterwards and I believe his depression was even less, (...) He had a longstanding depression so you can't put these things (sepsis) forward.“ GP 10
- „...basically, he kept all the diseases he had before and everything grew gradually worse.“ GP 11
- Specific diagnosis of common complications after intensive care „...he had this critical illness neuropathy with pains and muscle weakness and at the beginning also psychological problems with insomnia.“ GP 1
- „...now (she suffers from) increasing polyneuropathic pain, that needs to be treated with strong pain killers, with opioids.“ GP 2
- „...well, he still has a post traumatic distress syndrome, he is still looking for a psychologist.“ GP 4
- „...he is impaired a bit by the polyneuropathy.“ GP 9
- Individual complication „...because she had, she lost her leg with the sepsis and she, she had an amputation and before she could move about and could leave the apartment. But, afterwards, not anymore because she couldn't manage the stairs with one leg.“ GP5
- „...and then she was depressive because she had the colostomy.“ GP 6

**Table 5: Themes, subthemes and quotations: Impact of outreach education.**

Themes and subthemes	Quotation
<i>Acceptability</i>	
Convenience by outreach visit	„I was approached at a time, I had time and as we arranged it, that was ideal (...) it was announced early enough and I got a mail-reminder and I didn't have to move anywhere, that could happen here, well, the colleague was really committed (...) I would say that was ideal.” GP 2
	„...well, that (the outreach education) happened here in the practice ...nice and friendly... adapted to the needs of the doctor... very good, that was comfortable. Didn't burden me much either.” GP 6
Time strains, competing tasks	„...well, it was really very interesting, the training, but this is – like today (the interview) – just one more thing, that delays and I would rather e.g. go for lunch or something else.” GP 11  “We have two thousand patients, work has grown so intense, that one has to leave out everything that is not absolutely necessary.” GP 12
<i>Impact on knowledge</i>	
Persisting elevated mortality after discharge	„The mortality after discharge, (...) that was very impressive, well, because I thought: sepsis overcome, well, everything is fine and the bird flies on.“ GP 2  „...that statistic, that said, ok, patients that survived this have a much higher mortality (...) these numbers were quite alarming.” GP 5
Specific long-term complications (Polyneuropathy, post-traumatic distress)	„...well, that was mainly new, that one looks at sepsis as a complex illness with long-term complications. I did look at it more as a complication, that, when cured, is presumably good and done with.” GP 11  „...the most helpful was, as I said, the connection. Generally with sepsis, that sepsis can cause other diseases (...) it seems, sepsis can cause serious alterations in the peripheral nerves.” GP 2  „...the fact, that polyneuropathy had a connection to sepsis was not known to me at all.” GP 12
Diagnosis of sepsis	„...what kind of symptoms, how sepsis manifests itself, because, one doesn't consider it so much, isn't it?” GP 6
Relevant summary for practice	„...we all have learnt that during medical studies, but it is not...one doesn't meet a sepsis survivor every day. It is not everyday business. And that's why I found it interesting, that you had it explained again.“ GP 5  „...in continuing education, we don't get the things that are relevant for practice enough, in that way, it was a nice, short update and training, but nothing really new.“ GP 8
<i>Transfer to practice</i>	
Identifying complications	„...and since then, I turn my attention more to those symptoms, (...) I really pay attention to things now, that I didn't consider before. It really helped me.“ GP 6  „One is sensitized for it. Yes, I now pay more attention, especially regarding polyneuropathy and so on, I watch more closely, I say, ok, be careful, here you must

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consider that, that is a case you must watch out and ask , if she doesn't tell herself, whether she has symptoms." GP 5

Initiation of specific therapy

„...now, I would always look first, that I talk with him about what he went through and how it felt in the hospital, what impressions, what experiences, what feelings and that one really goes on to arrange for psychological care more quickly." GP 4

“...and I also did some of that in practice, I mentioned the referral to a psychologist and that became very clear.” GP 4

„...from that training I learnt, that it makes sense, to send the patient to physiotherapy. That it is not only about medication, his usual medication and putting it - may be a bit trivial- I would prescribe antidepressants as well.” GP 7

Diagnosis of sepsis

„... (reporting a case of postoperative sepsis) and I really was more careful and said, this lady has a sepsis. (...) I now have an eye on these symptoms and I refer more quickly.” GP 6

Low relevance as small patient numbers in practice

„I don't have any patients after sepsis, that's why I can't change what I am doing.” GP 3

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# Reporting checklist for qualitative study.

Based on the SRQR guidelines.

## Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SRQR reporting guidelines, and cite them as:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014;89(9):1245-1251.

		Page
	Reporting Item	Number
<b>Title</b>	<p><a href="#">#1</a> Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended</p>	7

## Abstract

[#2](#) Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions

## Introduction

[#3](#) Description and significance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement

[#4](#) Purpose of the study and specific objectives or question

## Methods

[#5](#) Qualitative approach and research paradigm

Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability.

As appropriate the rationale for several items might be discussed together.

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6	Researcher	<a href="#">#6</a>	7
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8	characteristics and		
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22	Context	<a href="#">#7</a>	7
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25	Sampling strategy	<a href="#">#8</a>	7
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35	Ethical issues pertaining	<a href="#">#9</a>	7
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45	Data collection methods	<a href="#">#10</a>	7
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1	Data collection	<a href="#">#11</a>	Description of instruments (e.g. interview guides,	7
2			questionnaires) and devices (e.g. audio recorders)	
3	instruments and		used for data collection; if / how the instruments(s)	
4			changed over the course of the study	
5	technologies			
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11	Units of study	<a href="#">#12</a>	Number and relevant characteristics of participants,	8
12			documents, or events included in the study; level of	
13			participation (could be reported in results)	
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19	Data processing	<a href="#">#13</a>	Methods for processing data prior to and during	7
20			analysis, including transcription, data entry, data	
21			management and security, verification of data integrity,	
22			data coding, and anonymisation / deidentification of	
23			excerpts	
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31	Data analysis	<a href="#">#14</a>	Process by which inferences, themes, etc. were	7,8
32			identified and developed, including the researchers	
33			involved in data analysis; usually references a specific	
34			paradigm or approach; rationale	
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41	Techniques to enhance	<a href="#">#15</a>	Techniques to enhance trustworthiness and credibility	7,8
42	trustworthiness		of data analysis (e.g. member checking, audit trail,	
43			triangulation); rationale	
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48	<b>Results/findings</b>			
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51	Syntheses and	<a href="#">#16</a>	Main findings (e.g. interpretations, inferences, and	8
52			themes); might include development of a theory or	
53	interpretation		model, or integration with prior research or theory	
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1	Links to empirical data	<a href="#">#17</a>	Evidence (e.g. quotes, field notes, text excerpts,	24-28
2			photographs) to substantiate analytic findings	
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6	<b>Discussion</b>			
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10	Intergration with prior	<a href="#">#18</a>	Short summary of main findings; explanation of how	13,14
11	work, implications,		findings and conclusions connect to, support, elaborate	
12			on, or challenge conclusions of earlier scholarship;	
13	transferability and		discussion of scope of application / generalizability;	
14			identification of unique contributions(s) to scholarship	
15	contribution(s) to the field		in a discipline or field	
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24	Limitations	<a href="#">#19</a>	Trustworthiness and limitations of findings	14
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27	<b>Other</b>			
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30	Conflicts of interest	<a href="#">#20</a>	Potential sources of influence of perceived influence on	15
31			study conduct and conclusions; how these were	
32			managed	
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38	Funding	<a href="#">#21</a>	Sources of funding and other support; role of funders in	15
39			data collection, interpretation and reporting	
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 44 American Medical Colleges. This checklist was completed on 07. May 2020 using  
 45 <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with  
 46 [Penelope.ai](#)