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## Orthopaedic trauma patients' experiences with emergency department care and follow-up through Virtual Fracture Care review: a qualitative study

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Complete List of Authors:	Wilinge, Gijs; OLVG, Surgery; Spierings, Jelle; St Antonius Ziekenhuis Locatie Utrecht Mathijssen, Elke; UMC Utrecht, The Healthcare Innovation Center (THINC.) Goslings, J. Carel ; OLVG Twigt, Bas; OLVG, Surgery van Veen, Ruben; OLVG Locatie West, Surgery
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3 1 **Orthopaedic trauma patients' experiences with emergency department care and follow-up**  
4 **through Virtual Fracture Care review: a qualitative study**  
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9 4 **Author list and contributions**

10 5 GJA Willinge<sup>1</sup>, MD e-mail: g.j.a.willinge@olvg.nl  
11 6 JF Spierings<sup>2</sup>, MD e-mail: j.spierings@antoniuziekenhuis.nl  
12 7 EGE Mathijssen<sup>3</sup>, M.Sc. e-mail: e.g.e.Mathijssen-2@umcutrecht.nl  
13 8 JC Goslings<sup>1</sup>, MD, Professor e-mail: j.c.goslings@olvg.nl  
14 9 BA Twigt<sup>1</sup>, MD, PhD e-mail: b.twigt@olvg.nl  
15 10 RN van Veen<sup>1</sup>, MD, PhD e-mail: r.n.vanveen@olvg.nl  
16  
17  
18  
19

20 11  
21 12 **Institution:**

22 13 <sup>1</sup> OLVG Hospital, Amsterdam, Department of Trauma surgery,  
23 14 Jan Tooropstraat 164, 1061 AE, Amsterdam, The Netherlands

24 15 <sup>2</sup> St. Antonius Hospital Utrecht, Department of Trauma surgery;  
25 16 Koekoekslaan 1, 3435CM Nieuwegein, The Netherlands.

26 17 <sup>3</sup> The Healthcare Innovation Centre, Julius Centre for Health Sciences and Primary Care, University  
27 18 Medical Centre Utrecht, Heidelberglaan 100, 3584 CX, Utrecht, The Netherlands  
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33 19  
34 20 **Corresponding author:**

35 21 Gijs Willinge, OLVG Hospital, Department of Trauma Surgery  
36 22 Jan Tooropstraat 164  
37 23 1061 AE Amsterdam, The Netherlands  
38 24 Tel: +316 15489516  
39 25 Email: g.j.a.willinge@olvg.nl  
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## 26 **Abstract**

### 27 **Objectives**

28 This study aimed to identify factors influencing orthopedic trauma patients' experiences and  
29 satisfaction with emergency department (ED) care and follow-up through a Virtual Fracture Care  
30 (VFC) review workflow.

### 31 **Design**

32 This study had an explorative, qualitative design using individual, semi-structured interviews.

### 33 **Setting**

34 An urban Level-2 trauma centre and teaching hospital in Amsterdam, the Netherlands.

### 35 **Participants**

36 Patients were eligible for participation if they were Dutch- or English-speaking orthopedic trauma  
37 patients, aged 18 years or above, who visited the hospital's ED between June and September 2022,  
38 and were treated through a VFC review workflow. Exclusion criteria were: reason for follow-up other  
39 than injury, Eye/Motor/Verbal score <15 at ED admission, follow-up treatment in another hospital,  
40 treatment initiated in another hospital, acute hospital admission (<24hrs). Twenty-three patients were  
41 invited for participation, of whom 15 participated and were interviewed.

### 42 **Results**

43 Several influential factors contributed to seven major themes: 1) waiting times; 2) information provision;  
44 3) healthcare professional communication; 4) care expectations; 5) care coordination; 6) care  
45 environment; and 7) patient condition. Overall, participants were satisfied with received care.  
46 Interpersonal skills of healthcare professionals, and timing and content of provided information were  
47 specifically valued. Additionally, patients stated that their needs in the ED differed from those after ED  
48 discharge, and appreciated the way the VFC review workflow addressed this. Points of improvement  
49 included more active involvement of patients in the care process and prevention of inconsistent  
50 instructions by different healthcare professionals.

### 51 **Conclusions**

52 The experiences of patients are influenced by several factors that can be classified into seven interrelated  
53 themes. Our study found that the VFC review workflow effectively addresses the majority of the  
54 identified influential factors, contributing to positive feedback from participants. To enhance patient  
55 experiences, healthcare professionals should consider all of these factors and strive for an optimal  
56 balance between them when reorganizing workflows.

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3 57 **Strengths and limitations of this study**  
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- 5 58 • Heterogeneous sample in terms of gender, age, type of injury and treatment strategy with  
6 59 continuance of data collection until the point of data saturation  
7  
8 60 • Interviews were conducted by two independent researchers, not involved in the  
9 61 development of the VFC review workflow or daily clinical care, which was emphasized to  
10 62 the participants to encourage them to speak frankly, with the semi-structured nature of the  
11 63 interviews enabling uncovering of further potential off-topic information  
12  
13 64 • Involvement of different types of healthcare professionals in the development of the topic  
14 65 list enhanced the variety of addressed perspectives in the interviews  
15  
16 66 • Since this study was conducted among patients who received care according to a specific  
17 67 workflow (i.e. the VFC review workflow), the results may not be transferable to settings  
18 68 with other workflows.  
19  
20 69 • The explorative, qualitative study design did not allow examination of the relative  
21 70 importance of influential factors  
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28 72 **Funding statement:**

29 73 No funding was received for this study  
30  
31 74

32 75 **Competing interest statement:**

33 76 There are no competing interests to declare  
34  
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36  
37 78 **Word count:** 3316  
38  
39 79

40 80 **Keywords:** Orthopaedic Trauma, Patient experience, Emergency department, Virtual Fracture Care,  
41 81 Virtual Fracture Clinic  
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45 83 **Data statement:**

46 84 Study data will be saved on a secure drive of the UMC Utrecht, and will be available upon reasonable  
47 85 request.  
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## 86 Introduction

87 In the Netherlands (NL), orthopedic trauma patients account for one-third of Emergency Department  
88 (ED) visits, and this number is rising. (1) This increase poses significant challenges to the already  
89 strained ED healthcare services in providing timely and high-quality care to patients. (2, 3) Patient  
90 satisfaction and experiences are critical indicators of the quality of care delivered by EDs, emphasizing  
91 the need to evaluate the impact of this increasing burden on these outcomes. (4, 5)

92  
93 To address the challenges posed by the rising burden of orthopedic trauma injuries, innovative  
94 workflows have been introduced in Dutch orthopedic trauma care, including the Virtual Fracture Care  
95 (VFC) review workflow. (6) With VFC review, ED healthcare professionals electronically refer patients  
96 to a multidisciplinary VFC meeting on the next workday for review and treatment planning by the  
97 attending (orthopaedic) trauma surgeon. Immediately following the VFC review meeting, patients are  
98 contacted by phone to inform them of their definitive diagnosis, treatment and complete follow-up plan.  
99 This workflow aims to streamline orthopedic trauma care by transferring part of the diagnostic phase  
100 from the ED visit to an organized, supervised setting on the next workday and by directly scheduling  
101 follow-up appointments with appropriate healthcare professionals. Previous studies have demonstrated  
102 positive results regarding patient satisfaction with ED care and follow-up through similar VFC  
103 workflows, but an in-depth exploration of patients' experiences is lacking. (7, 8)

104  
105 A qualitative analysis of these experiences would complement quantitative studies and inform  
106 interventions to enhance patient experiences and satisfaction by providing a deeper understanding of the  
107 perceived quality of care and patients' needs and expectations. (9) Therefore, the aim of this study was  
108 to identify factors influencing orthopedic trauma patients' experiences and with ED care and follow-up  
109 through the VFC review workflow.

## 110 **Methods**

### 111 **Study design and setting**

112 This was an explorative, qualitative study using individual, semi-structured interviews. This study was  
113 conducted in an urban Level-2 trauma centre and teaching hospital in Amsterdam, NL. Approximately  
114 85.000 patients visit the ED of this hospital annually. Patients were eligible for participation in this study  
115 if they were Dutch- or English-speaking orthopedic trauma patients, aged 18 years or above, who visited  
116 the hospital's ED between June and September 2022, and who were treated through the VFC review  
117 workflow. Exclusion criteria were: reason for follow-up other than the injury (e.g., social care reasons),  
118 Eye/Motor/Verbal score <15 at ED admission, follow-up treatment in another hospital, treatment  
119 initiated at another hospital, direct hospital admission (<24hrs). One of the researchers (GW) contacted  
120 patients on the next workday after their ED visit to inform them about the study and provide them with  
121 an information letter and consent form. Patients were selected using a purposive maximum variation  
122 sampling method to ensure a heterogeneous sample in terms of gender, age, type of injury and treatment  
123 strategy. The sample size was determined by the principle of data saturation. (10) This study was  
124 reported according to the Standards for Reporting Qualitative Research (SRQR) (appendix A). (11)

### 126 **The Virtual Fracture Care workflow**

127 At the study institution, orthopedic trauma patients who require follow-up treatment (non-operative and  
128 scheduled operative treatment) are managed through the VFC review workflow. (6) ED healthcare  
129 professionals provide patients with appropriate immobilization measures and refer them to a VFC  
130 review meeting scheduled for the next workday via the electronic patient record. Upon referral to the  
131 VFC review meeting, patients receive information leaflets regarding the VFC workflow and their injury.  
132 During the VFC review meeting, a multidisciplinary team (consisting of a comprising a casting  
133 technician, surgical resident, orthopedic trauma surgeon and administrative outpatient clinic assistant)  
134 reviews all referrals (approximately 30 patients per meeting) and assigns predefined digital trauma care  
135 protocols to each patient via dropdown menus within the electronic patient records. These protocols  
136 provide an extensive treatment plan for the entire follow-up treatment, including all follow-up  
137 appointments and radiographic imaging. The VFC team can further tailor these protocols to specifically  
138 fit each patients situation if necessary. After VFC review, patients are contacted by phone to provide  
139 information about their injury, treatment plan, and to reach consent on the definitive treatment. Patients  
140 then receive their follow-up treatment plan by mail or via their electronic patient record within one  
141 workday after their ED visit.

### 143 **Data collection**

144 The interviews were conducted using the online video-communication platform Microsoft Teams.  
145 Participants who were not able to use Teams were interviewed by telephone. Two experienced  
146 researchers (EM and IK) who were not part of the medical team conducted the interviews, using a topic



1  
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3 147 list with several open-ended questions (Supplementary file 1). The research team piloted the topic list  
4 148 to ensure its clarity and comprehensiveness, and subsequently modified it as necessary. Field notes were  
5 149 taken to document contextual information after each interview. Verbatim transcriptions of the audio  
6 150 recordings were obtained, using a professional transcription service.  
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### 11 152 **Data analysis**

12  
13 153 The transcripts and fields notes were analysed by the same researchers who conducted the interviews.  
14 154 The six steps of inductive, thematic analysis as described by Braun and Clarke (2006) were followed,  
15 155 namely: 1) becoming familiar with the data; 2) generating initial codes; 3) searching for themes; 4)  
16 156 reviewing themes; 5) defining and naming themes; and 6) writing up the results. (12) Researcher  
17 157 triangulation (between EM and IK) was used to increase the quality and credibility of the data analysis.  
18 158 (13) The researchers independently analysed data, discussed discrepancies and reached consensus about  
19 159 the final themes and interpretations. Memos were written to help the researchers keep track of decisions  
20 160 made during data analysis. The data analysis was facilitated by NVivo version 12 (QSR International  
21 161 Pty Ltd. NVivo. (2020).  
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### 27 163 **Ethical considerations**

28  
29 164 The study was not subject to the Dutch Medical Research involving Human Subjects Act. Therefore, a  
30 165 waiver for ethical approval was provided by the Medical Research Ethics Committee; NedMec in  
31 166 Utrecht, NL (document number 22/034). The participants provided written informed consent prior to  
32 167 the interviews. Data were handled according to the Dutch Implementation Act of the General Data  
33 168 Protection Regulation (GDPR).  
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### 38 170 **Patient and public involvement**

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40 171 Patients were not involved in the design, intervention, research question or outcome measures of the  
41 172 current study. Healthcare professionals were involved in the design of the topic lists for the semi-  
42 173 structured interviews.  
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### 46 175 **Results**

47  
48 176 In total, 23 patients were invited for participation. Fifteen patients chose to participate and eight patients  
49 177 chose to refrain from participation or did not respond to the invitation. Characteristics of the participants  
50 178 ( $n=15$ ) are shown in Table 1. The median length of the interviews was 27 minutes and ranged from 16  
51 179 to 33 minutes. Three interviews were conducted by telephone. Data saturation was achieved after 15  
52 180 interviews.  
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3 182 A variety of factors influencing orthopedic trauma patients' experiences and with ED care and follow-  
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5 183 up through VFC review were identified and subsequently categorized into seven interrelated themes,  
6  
7 184 namely: 1) waiting times; 2) information provision; 3) healthcare professional communication 4) care  
8  
9 185 expectations; 5) patient condition; 6) care coordination and 7) care environment; (Figure 1). Relevant  
10  
11 186 quotes were selected to illustrate the results (Table 2).

## 187 188 **1. Waiting times**

### 189 ED length of stay

190 Most participants indicated that they were positively surprised about the length of stay at the ED. Their  
191 waiting time was shorter than expected and they were able to leave the hospital in a timely manner.  
192 Participants whose waiting time was longer than expected were less satisfied. The participants mainly  
193 attributed waiting times to the volume of activity at the time of their ED visit (i.e., on a weekday or at  
194 the weekend and at day- or night-time) (Q#1). Some participants would have preferred more information  
195 about the underlying reason for waiting and how long they were expected to wait, since being  
196 uninformed makes waiting feel longer. (Q#2) Furthermore, the participants preferred interaction with  
197 healthcare professionals when waiting by themselves. This provided distraction and prevented them  
198 from worrying. Participants who were accompanied by a family member or friend valued their  
199 companionship for this same distraction. The participants' perceived waiting time was also influenced  
200 by their physical comfort. The presence of pain was particularly mentioned as a factor that contributes  
201 to the feeling of time moving slowly. (Q#3)

### 202 203 Follow-up care

204 The participants preferred short time intervals between their ED visit and follow-up care. Clarity about  
205 follow-up care (e.g. operative vs. non-operative treatment, follow-up appointments, immobilization  
206 method) was important to them, since they wanted to know what to expect as soon as possible. All  
207 participants valued the VFC phone call in this regard. Some participants requiring surgery also indicated  
208 that they were glad about not having to wait long for their surgery to take place. (Q#4)

## 209 210 **2. Information provision**

### 211 Type, amount and frequency of information

212 In general, the participants were satisfied with the type and amount of information that was provided to  
213 them both during their ED visit and the next workday during the VFC phone call. They indicated that  
214 the information on various topics was relevant, sufficient and timely. Some participants mentioned that  
215 they missed individually tailored information, particularly regarding their recovery process. (Q#5) The  
216 participants also valued the opportunity to ask questions the next day during the VFC phone call, since  
217 new questions often arose some time after leaving the ED. (Q#6)

218

### 219 Delivery mode

220 The participants valued the provision of information leaflets. This allowed them to go through the  
221 information at their own pace and convenience. Some participants stressed the importance to read back  
222 information that was provided to them during their ED visit, since it is hard to remember everything at  
223 once. (Q#7) In general, the delivery mode (face-to-face or by telephone) made no difference to the  
224 participants. Saving time was mentioned as an advantage of a telephone consultation. Moreover, the  
225 participants' mobility was often limited by their injury making a telephone consultation a much more  
226 practical alternative to a face-to-face consultation.

227

## 228 **3. Healthcare professional communication**

### 229 Interpersonal skills

230 In general, the participants were satisfied with the interpersonal skills of healthcare professionals. They  
231 described them as being very friendly, honest and empathic. Most participants indicated that healthcare  
232 providers took the time to listen to them. They were given plenty of opportunity to ask questions and  
233 their questions were adequately answered. The participants valued the efforts of healthcare professionals  
234 to understand their specific needs. (Q#8) Some participants mentioned that specifically humour used by  
235 healthcare professionals could help to reframe tense situations.

236

### 237 Medical capabilities

238 All participants indicated that they felt like they were in good hands. Healthcare professionals clearly  
239 explained their actions, which strengthened the participants' confidence in their medical capabilities.  
240 (Q#9)

241

### 242 Patient-centeredness

243 Most participants preferred healthcare professionals to involve them in the different stages of the care  
244 process. However, they had different preferences for the exact level of involvement. While some  
245 participants preferred as much involvement as possible, others explicitly stated that they did not want to  
246 know or see everything. Sharing medical images was particularly mentioned as something that facilitates  
247 involvement and could help someone to better understand their injury. (Q#10) Some participants  
248 stressed the importance of the use of plain language (i.e., the avoidance of medical jargon) to increase  
249 their understanding of what exactly was said.

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## 251 **4. Care expectations**

### 252 Personal preference

253 All participants expected to receive the best possible care. However, personal preference determined  
254 what exactly was important to someone. While some participants focused on the treatment of their

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3 255 injury, the focus of others was on other care aspects such as its personal touch. In general, participants'  
4 256 care expectations were met. Unmet care expectations led to dissatisfaction (Q#11).

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### 7 8 258 Relativism

9 259 Care expectations were shaped by relativism. In general, the participants recognized that healthcare  
10 260 professionals were busy and therefore accepted that they did not have much time for them except from  
11 261 carrying out their routines. Some participants were also aware of the ED's triage process, accepting that  
12 262 patients who were worse off than themselves were given priority.

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### 15 16 264 Previous ED experiences

17 265 Some participants had built up care expectations based on previous ED experiences, which determined  
18 266 how they evaluated their present experience. (Q#12) Those with no previous experiences had no material  
19 267 for comparison and indicated that they did not know what to expect.

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## 22 23 269 **5. Patient condition**

### 24 25 270 Physical and emotional impact

26 271 Most participants arrived at the ED in pain. They preferred healthcare professionals to anticipate on their  
27 272 pain by actively offering them analgesics instead of having to ask for it themselves. The emotional  
28 273 impact of their ED visit varied from person to person. In general, the participants felt vulnerable not  
29 274 knowing what they were up to. Some participants mentioned that they were stressed and anxious. They  
30 275 valued the ability of healthcare professionals to acknowledge and address their vulnerabilities. (Q#13)

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## 33 34 277 **6. Care coordination**

### 35 36 278 Healthcare professional teamwork

37 279 In general, the participants experienced effective and efficient teamwork among healthcare  
38 280 professionals. Inconsistencies between the instructions of different healthcare professionals led to  
39 281 dissatisfaction. (Q#14). Some participants indicated that they experienced fragmentation of care during  
40 282 their ED visit, with different healthcare professionals (e.g. ED nurses, radiologists) working in their own  
41 283 silos. They missed someone who was primarily responsible for their case. (Q#15)

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### 44 45 285 Correspondence

46 286 Some participants mentioned that the hospital sent a large volume of appointment notification emails,  
47 287 causing them to lose the overview. Moreover, the purpose of these appointments was not always clear.  
48 288 They would have preferred more information about this before leaving the hospital. One participant  
49 289 recounted receiving an email about an appointment with a surgeon within a few days, lacking any  
50 290 additional context. As a result, the participant assumed that she needed surgery. This caused this  
51 291 participant to worry, only to learn during that phone call that surgery was, in fact, not required.

292

## 7. Care environment

### Hospital ambience

In general, the participants were satisfied with the hospital ambience. Some participants stressed the importance of a patient-friendly care environment with visual and auditory privacy. (Q#16)

297

### Facilities

The participants valued facilities such as the availability of hospital beds and blankets to keep them comfortable. One participant was dissatisfied with the hospital's high parking costs.

301

### **Discussion**

This study identified factors influencing orthopedic trauma patients' experiences and with ED care and follow-up through VFC. A variety of influential factors were identified and categorized into seven themes, namely: 1) waiting time; 2) information provision; 3) healthcare professional communication; 4) care expectations; 5) patient condition; 6) care coordination and 7) care environment. It is important to note that these themes are strongly interrelated and no factor is solely responsible for shaping the patient perspective. Our results show that patients were generally satisfied with the received care. The VFC review workflow addresses the majority of the identified influential factors, contributing to the positive feedback from participants.

311

Waiting time influences patient experiences, with less time spent waiting resulting in more positive perception of care. Additionally, our results indicate the way patients perceive their waiting time is of greater influence on their satisfaction than the absolute amount of time spent waiting. These results are in accordance with current literature. (9, 14-17) Healthcare professionals can potentially reduce perceived waiting time in the ED by actively engaging patients as soon as possible, providing clarity about ED processes and addressing their concerns, and by timely providing analgesics. (5, 17-19) Furthermore, patients preferred clarity about their diagnosis and follow-up treatment plan as soon as possible. The VFC review workflow accommodates this by providing patients with a complete and supervised treatment plan on the first workday after their ED visit. This was perceived as timely and was highly valued by our patients.

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Patient experiences are also influenced by the type of information they receive and how this is communicated by healthcare professionals. (20-22) Patients highly valued healthcare professionals who make an effort to understand and address their personal situation and actively involve them in the decision making process (e.g. showing and explaining medical images). (5, 19, 23, 24) Additionally, it is not the mode of delivery that affected patient satisfaction regarding communication with healthcare

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3 328 professionals, but rather that their questions and needs were addressed sufficiently. (4, 5, 21, 24) These  
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5 329 findings are also supported by several studies stating that remote care is a satisfactory alternative to face-  
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7 330 to-face care. (25-27) Interpersonal interaction, patient involvement in the treatment process, and  
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9 331 communication are therefore key determinants of patient satisfaction both in the ED and with the remote  
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11 332 care through VFC review.

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13 334 It is important to note that information needs in the ED may differ from those at home, after patients  
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15 335 have had time to reflect and become aware of their situation. Furthermore, an ED visit can be stressful  
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17 336 and patients' capacity to process and retain information may be impaired. (28, 29) The VFC workflow  
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19 337 addresses these challenges, as patients receive only the necessary information in the ED and are provided  
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21 338 with (digital) leaflets containing information on the VFC review workflow, immobilization material  
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23 339 (brace or cast) and general information about their injury. After a one-workday interval, they are  
24  
25 340 informed of their definitive diagnosis and further treatment. This process allows patients the opportunity  
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27 341 to review relevant information, address remaining or newly arisen concerns, needs or questions, and  
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29 342 receive further treatment information in a less stressful setting. (30) This was specifically valued by the  
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31 343 study participants. The VFC review workflow also enhances the information provision by enabling  
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33 344 healthcare professionals to timely inform patients of their entire follow-up treatment from start to finish,  
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35 345 rather than just the next step in treatment. This may help patients timely shape realistic expectations for  
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37 346 the complete treatment process, potentially increasing satisfaction and enabling self-care.

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41 348 Although the VFC review workflow responds to several of the identified influential factors, others  
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43 349 remain that are not addressed or altered by its implementation (e.g. interpersonal skills, patient-centred  
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45 350 communication, medical capabilities of healthcare professionals, hospital ambience and facilities,  
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47 351 physical and emotional impact of injuries). The patient's perspective is shaped by the sum of all  
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49 352 influential factors, rather than a selected few, and every patient attributes a different measure of  
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51 353 relevance to each different factor. (9, 14, 17, 19) Therefore, patient experiences can only be optimized  
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53 354 if healthcare professionals keep investing in all identified factors. Based on our results, potential for  
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55 355 further improvement of ED care and the VFC review workflow lies in more individually tailored  
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57 356 communication and information, and adequate coordination between different types of caregivers, such  
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59 357 as the administrative outpatient clinic assistant and the healthcare professional who performs the VFC  
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61 358 phone call. It is important to consider the effects of new workflows on all of these factors and try to find  
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63 359 the optimal balance between them.

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67 361 Several qualitative research techniques were used to assure the rigor of this study. We selected a  
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69 362 heterogeneous sample in terms of gender, age, type of injury and treatment strategy and sampling and  
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71 363 data collection continued until the point of data saturation. The interviews were conducted by two  
72  
73 364 independent researchers, which was emphasized to the participants to encourage them to speak frankly.

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3 365 The semi-structured nature of the interviews enabled uncovering further potential off-topic information.  
4 366 Furthermore, involvement of different types of healthcare professionals in the development of the topic  
5 367 list enhanced the variety of addressed perspectives in the topics. The analysis was independently  
6 368 conducted by two researchers (i.e. researcher triangulation) and relevant quotes were selected to  
7 369 illustrate results, contributing to the analysis' transparency.  
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12 370  
13 371 Since this study was conducted among patients who received care according to a specific workflow (i.e.  
14 372 the VFC review workflow), the results may not be transferable to settings with other workflows.  
15 373 Furthermore, we only addressed the perspective of patients. Addressing the perspective of both patients  
16 374 and healthcare professionals could help substantiate feasible points of improvement and highlight  
17 375 potential discrepancies between these two stakeholder groups. Although this study identified a variety  
18 376 of factors influencing patient experiences, the explorative, qualitative study design did not allow us to  
19 377 examine the relative importance of these factors. Future research may use a quantitative study design  
20 378 for this purpose.  
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## 26 380 **Conclusion**

27 381 The experiences of patients are influenced by several factors that can be classified into seven interrelated  
28 382 themes. The VFC review workflow effectively addresses the majority of the identified influential  
29 383 factors, contributing to the positive feedback from participants. In order to enhance patient experiences,  
30 384 healthcare professionals should consider all of these factors and strive for an optimal balance between  
31 385 them when reorganizing workflows.  
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460 **Tables 1 + 2:****Table 1. Baseline characteristics of study participants (n=15)**

Sex, n (%)	
Male	7 (47)
Female	8 (53)
Age, median (range)	
	42 (23-66)
Type of injury, n (%)	
Acromioclavicular joint dislocation	1 (7)
Mid-shaft clavicle fracture	1 (7)
Glenohumeral joint dislocation + humerus fracture	1 (7)
Humerus fracture	2 (13)
Metatarsal shaft fracture	2 (13)
Distal Phalanx fracture	1 (7)
Distal radius fracture	3 (20)
Radial head fracture	1 (7)
Talus fracture	1 (7)
Triquetrum fracture	2 (13)
Treatment strategy, n (%)	
Non-operative	10 (67)
Operative	5 (33)

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Theme	#	Participant	Quote
<b>Waiting times</b>			
ED length of stay	#1	Participant 5, M, 35 years	"I was positively surprised that everything went as quickly as it did. I imagined this long queue at the emergency department with ambulances rushing in with patients who were worse off than me. However, nothing could be further from the truth. I was in and out of the emergency department within 2 hours."
	#2	Participant 15, F, 26 years	"At one point, my partner asked me: What are we actually waiting for? That might be something that could be improved. Since it was my first time there, I had no idea how long such a visit would take."
	#3	Participant 7, M, 39 years	"Well, the fact that the pain was much less, that certainly made a lot of difference. When you are continuously in pain, it makes something like this feel like a lot longer."
Follow-up care	#4	Participant 14, F, 32 years	"It is very important to have information in a timely manner. For example, if I needed surgery or not. I was glad that I did not have to leave the house for this information. I was not that mobile."
<b>Information provision</b>			
Type, amount and frequency	#5	Participant 14, F, 32 years	"For example, my wrist is still swollen. Is that because of the oedema or is it because of something else? Can I maybe do more than just keeping my wrist elevated? Is it useful to put some ice on it? Maybe some tips for a better recovery would have been nice."
	#6	Participant 1, M, 51 years	"I can imagine that if you are there alone (ED), things will pass you by. Because you have so many other things going through your mind. What about work? And things at home? A thousand and one things are going through your mind. So it was very nice that you also got an information leaflet with you. And yes, the phone call with the doctor the next morning. Of course, afterwards (after the ED visit), I had a little more time to write down one or two other questions that I could ask the doctor during the phone call the next day."
Delivery mode	#7	Participant 10, M, 30 years	"It is always very nice if you can read back some information afterwards"
<b>Healthcare professional communication</b>			
Interpersonal skills	#8	Participant 14, F, 32 years	"You couldn't really tell that they were busy. They were just focused on me and engaged with me at that time. So I thought that was really nice."
Medical capabilities	#9	Participant 2, F, 59 years	"At that time, you are in a lot of pain. If someone then tells you what needs to be done and how, and that it is going to be incredibly painful, but that the pain will be over afterwards... At that point...well...you leave yourself in their hands, because you think: this person knows what she is doing."
Patient-centeredness	#10	Participant 4, F, 58 years	"Also with the second X-ray, they said: oh, the fracture is clearly visible. But unfortunately, I did not see it for myself. That was a shame, I would have liked to see it. That is something that they could pay more attention to."
<b>Care expectations</b>			
Personal preference	#11	Participant 9, F, 56 years	"Just giving you a glass of water after you just threw up. Well, I think you really shouldn't have to ask for that."
Previous care experiences	#12	Participant 6, F, 44 years	"I had something entirely else some time ago, at the start of this year. When I compare that situation to this one, I'm like wow, I got so much attention now! That would have been nice the last time. So I experienced a lot of luxury this time."
<b>Patient condition</b>			
Physical and emotional impact	#13	Participant 9, F, 56 years	"Well, I mean...it's obviously a huge event for me, you know. And for them...well, a broken shoulder is probably not that exciting for them. But to me, it meant a lot."
<b>Care coordination</b>			
Healthcare professional teamwork	#14	Participant 3, M, 26 years	"When I arrived, I was told to walk all the way to the end of the hallway after the first conversation. And it was not until after the radiographs were made, that I heard I shouldn't walk anymore. So, I had to limp all the way back."
	#15	Participant 5, M, 36 years	"What I noticed was that everyone in the hospital has their own specific tasks, which is really great. However, for me, a broader view is required at a certain point, like what is specifically going on and what does this actually mean? So, kind of like...who is in charge?"
<b>Care environment</b>			
Hospital ambience	#16	Participant 6, F, 44 years	"I think that if you are surrounded by screaming people with all sorts of open wounds... that it would be hard to relax. And, that this would also influence the conversations that you have afterwards. So, I think the waiting area should help you feel as comfortable as possible."

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3 **463 Figure legends**  
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5 464 Figure 1. An overview of the identified themes with the relevant influential factors. ED = Emergency  
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7 465 Department, VFC = Virtual Fracture Care  
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11 **467 Author Statement**  
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13 468 1. GJA Willinge: Active involvement in the design, data collection, data analysis, interpretation of data  
14 469 and drafting of the manuscript

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16 470 2. JF Spierings: Active involvement in the design, data analysis, interpretation of data and drafting of  
17 471 the manuscript

18  
19 472 3. EGE Mathijssen: Active involvement in the design, data analysis, interpretation of data and drafting  
20 473 of the manuscript

21  
22 474 4. JC Goslings: Active involvement in the interpretation of data and critical revision of the manuscript.

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24 475 5. BA Twigt: Active involvement in the study design, interpretation of data and critical revision of the  
25 476 manuscript.

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27 477 6. RN van Veen: Active involvement in the study design, interpretation of data and critical revision of  
28 478 the manuscript.

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32 480 All contributing authors have approved this version of the manuscript for publication and agree to be  
33 481 accountable for all aspects of the work

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43  
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46  
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53 490 collecting and analyzing of the qualitative data.  
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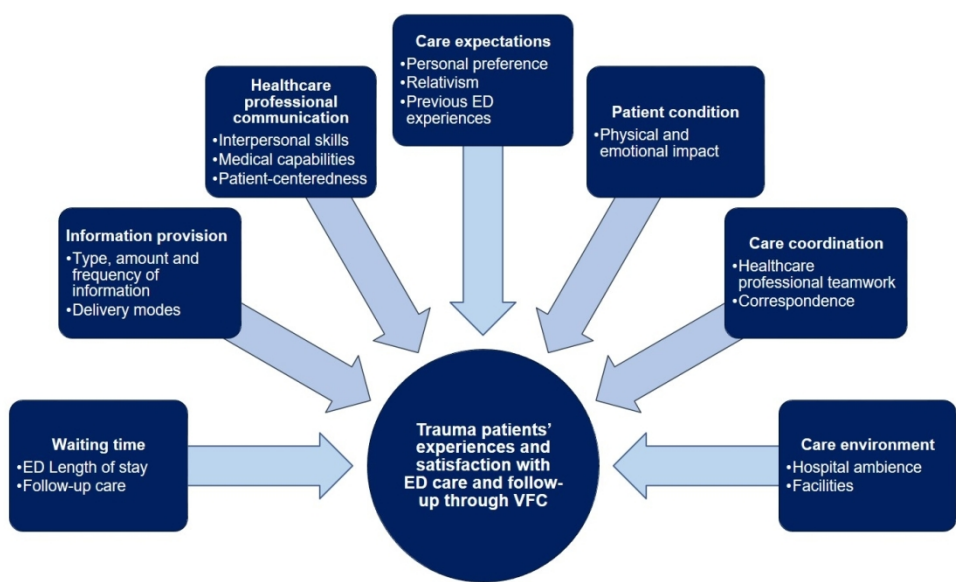


Figure 1. An overview of the identified themes with the relevant influential factors. ED = Emergency Department, VFC = Virtual Fracture Care

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No.	Topic	Item
<b>Title and abstract</b>		
S1	Title	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
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions
<b>Introduction</b>		
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement
S4	Purpose or research question	Purpose of the study and specific objectives or questions
<b>Methods</b>		
S5	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 <sup>a</sup>
S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability
S7	Context	Setting/site and salient contextual factors; rationale <sup>b</sup>
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale <sup>b</sup>
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues
S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale <sup>b</sup>
S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study
S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts
S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale <sup>b</sup>
S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale <sup>b</sup>
<b>Results/findings</b>		
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings
<b>Discussion</b>		
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field
S19	Limitations	Trustworthiness and limitations of findings
<b>Other</b>		
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting
<p><sup>a</sup>The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.</p> <p><sup>b</sup>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.</p>		

ACADEMIC MEDICINE

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# BMJ Open

## Orthopaedic trauma patients' experiences with emergency department care and follow-up through Virtual Fracture Care review: a qualitative study

Journal:	<i>BMJ Open</i>
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<b>Primary Subject Heading</b>:	Surgery
Secondary Subject Heading:	Qualitative research, Patient-centred medicine, Emergency medicine
Keywords:	ACCIDENT & EMERGENCY MEDICINE, Orthopaedic & trauma surgery < SURGERY, Trauma management < ORTHOPAEDIC & TRAUMA SURGERY

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3 1 **Orthopaedic trauma patients' experiences with emergency department care and follow-up**  
4 **through Virtual Fracture Care review: a qualitative study**  
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9 4 **Author list and contributions**

10 5 GJA Willinge<sup>1</sup>, MD e-mail: g.j.a.willinge@olvg.nl  
11 6 JF Spierings<sup>2</sup>, MD e-mail: j.spierings@antoniuziekenhuis.nl  
12 7 EGE Mathijssen<sup>3</sup>, PhD e-mail: e.g.e.Mathijssen-2@umcutrecht.nl  
13 8 JC Goslings<sup>1</sup>, MD, Professor e-mail: j.c.goslings@olvg.nl  
14 9 BA Twigt<sup>1</sup>, MD, PhD e-mail: b.twigt@olvg.nl  
15 10 RN van Veen<sup>1</sup>, MD, PhD e-mail: r.n.vanveen@olvg.nl  
16  
17  
18  
19

20 11  
21 12 **Institution:**

22 13 <sup>1</sup> OLVG Hospital, Amsterdam, Department of Trauma surgery,  
23 14 Jan Tooropstraat 164, 1061 AE, Amsterdam, The Netherlands  
24 15 <sup>2</sup> St. Antonius Hospital Utrecht, Department of Trauma surgery;  
25 16 Koekoekslaan 1, 3435CM Nieuwegein, The Netherlands.  
26 17 <sup>3</sup> The Healthcare Innovation Centre, Julius Centre for Health Sciences and Primary Care, University  
27 18 Medical Centre Utrecht, Heidelberglaan 100, 3584 CX, Utrecht, The Netherlands  
28  
29  
30  
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32

33 19  
34 20 **Corresponding author:**

35 21 Gijs Willinge, OLVG Hospital, Department of Trauma Surgery  
36 22 Jan Tooropstraat 164  
37 23 1061 AE Amsterdam, The Netherlands  
38 24 Tel: +316 15489516  
39 25 Email: g.j.a.willinge@olvg.nl  
40  
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**Abstract****Objectives**

This study aimed to identify factors influencing orthopedic trauma patients' experiences and satisfaction with emergency department (ED) care and follow-up through a Virtual Fracture Care (VFC) review workflow.

**Design**

This study employed an explorative, descriptive, qualitative design using individual, semi-structured interviews.

**Setting**

An urban Level-2 trauma centre and teaching hospital in Amsterdam, the Netherlands.

**Participants**

Eligible patients were Dutch- or English-speaking orthopedic trauma patients, aged 18 years or above, who visited the hospital's ED between June and September 2022, and were treated through a VFC review workflow. Exclusion criteria were: reason for follow-up other than injury, Eye/Motor/Verbal score <15 at ED admission, follow-up treatment in another hospital, treatment initiated in another hospital, acute hospital admission (<24hrs). Twenty-three patients were invited for participation, of whom 15 participated and were interviewed.

**Results**

Several influential factors contributed to seven generic themes: 1) waiting times; 2) information provision; 3) health care professional communication; 4) care expectations; 5) care coordination; 6) care environment; and 7) patient condition. Overall, participants were satisfied with received care. Interpersonal skills of health care professionals, and timing and content of provided information were specifically valued. Additionally, patients stated that their needs in the ED differed from those after ED discharge, and appreciated the way the VFC review workflow addressed this. Points of improvement included more active involvement of patients in the care process and prevention of inconsistent instructions by different health care professionals.

**Conclusions**

Patient experiences with ED care and VFC review follow-up are influenced by factors categorized into seven themes. The VFC review workflow effectively addresses these factors, leading to positive feedback. Recommendations for health care professionals include anticipating evolving post-ED information needs, engaging patients early to provide clarity about the care process, involving them in treatment decisions, and expanding information provision across the entire care pathway.

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3 58 **Strengths and limitations of this study**  
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- 5 59 • Heterogeneous sample in terms of gender, age, type of injury and treatment strategy with  
6 60 continuance of data collection until the point of data saturation  
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8 61 • Interviews were conducted by two independent researchers, not involved in the  
9 62 development of the VFC review workflow or daily clinical care, which was emphasized to  
10 63 the participants to encourage them to speak frankly, with the semi-structured nature of the  
11 64 interviews enabling uncovering of further potential off-topic information  
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13 65 • Involvement of different types of health care professionals in the development of the topic  
14 66 list enhanced the variety of addressed perspectives in the interviews  
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16 67 • Since this study was conducted among patients who received care according to a specific  
17 68 workflow (i.e. the VFC review workflow), the results may not be transferable to settings  
18 69 with other workflows.  
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20 70 • The explorative, descriptive, qualitative study design did not allow examination of the  
21 71 relative importance of influential factors  
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28 73 **Funding statement:**

29 74 No funding was received for this study  
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32 76 **Competing interest statement:**

33 77 There are no competing interests to declare  
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37 79 **Word count:** 3316  
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40 81 **Keywords:** Orthopaedic Trauma, Patient experience, Emergency department, Virtual Fracture Care,  
41 82 Virtual Fracture Clinic  
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45 84 **Data statement:**

46 85 Study data will be saved on a secure drive of the UMC Utrecht, and will be available upon reasonable  
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## 87 **Introduction**

88 In the Netherlands (NL), orthopedic trauma patients accounted for one-third of Emergency Department  
89 (ED) visits in 2022 (661.000/1.800.000), and this number has increased over the years. (1) This increase  
90 poses significant challenges to the already strained ED healthcare services in providing timely and high-  
91 quality care to orthopedic trauma patients. (2, 3) Patient satisfaction and experiences are critical  
92 indicators of the quality of care delivered by EDs, emphasizing the need to evaluate the impact of this  
93 increasing burden on these outcomes for this population. (4, 5)

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95 To maintain high-quality orthopedic trauma care, innovative workflows have been introduced in the  
96 Netherlands, including the Virtual Fracture Care (VFC) review workflow. (6) With VFC review, ED  
97 health care professionals electronically refer patients to a multidisciplinary VFC meeting on the next  
98 workday for review and treatment planning by the attending (orthopaedic) trauma surgeon. Immediately  
99 following the VFC review meeting, patients are contacted by phone to inform them of their definitive  
100 diagnosis, treatment and complete follow-up plan. This workflow aims to streamline orthopedic trauma  
101 care by transferring part of the diagnostic phase from the ED visit to an organized, supervised setting on  
102 the next workday and by directly scheduling follow-up appointments with appropriate health care  
103 professionals. Previous studies have demonstrated positive results regarding patient satisfaction with  
104 ED care and follow-up through similar VFC workflows, but an exploration of patients' experiences is  
105 lacking. (7, 8)

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107 A qualitative analysis of these experiences would complement quantitative studies and inform  
108 interventions to enhance patient experiences and satisfaction by providing a deeper understanding of the  
109 perceived quality of care and patients' needs and expectations. (9) Therefore, the aim of this study was  
110 to identify factors influencing orthopedic trauma patients' experiences and satisfaction with ED care  
111 and follow-up through the VFC review workflow.

## 112 **Methods**

### 113 **Study design and setting**

114 This was an explorative, descriptive study using a generic qualitative design. This study was conducted  
115 in an urban Level-2 trauma centre and teaching hospital in Amsterdam, NL. Approximately 85.000  
116 patients visit the ED of this hospital annually. Patients were eligible for participation in this study if they  
117 were Dutch- or English-speaking orthopedic trauma patients, aged 18 years or above, who visited the  
118 hospital's ED between June and September 2022, and who were treated through the VFC review  
119 workflow. Exclusion criteria were: reason for follow-up other than the injury (e.g., social care reasons),  
120 Eye/Motor/Verbal score <15 at ED admission, follow-up treatment in another hospital, treatment  
121 initiated at another hospital, direct hospital admission (<24hrs). One of the researchers (GW) contacted  
122 patients on the next workday after their ED visit to inform them about the study and provide them with  
123 an information letter and consent form. Patients were selected using a purposive maximum variation  
124 sampling method to ensure a heterogeneous sample in terms of gender, age, type of injury and treatment  
125 strategy. The sample size was determined by the principle of data saturation. (10) This study was  
126 reported according to the Standards for Reporting Qualitative Research (SRQR) (appendix A). (11)

### 128 **The Virtual Fracture Care workflow**

129 At the study institution, orthopedic trauma patients who require follow-up treatment (non-operative and  
130 scheduled operative treatment) are managed through the VFC review workflow. (6) ED health care  
131 professionals provide patients with appropriate immobilization measures and refer them to a VFC  
132 review meeting scheduled for the next workday via the electronic patient record. Upon referral to the  
133 VFC review meeting, patients receive information leaflets regarding the VFC workflow and their injury.  
134 During the VFC review meeting, a multidisciplinary team (consisting of a comprising a casting  
135 technician, surgical resident, orthopedic trauma surgeon and administrative outpatient clinic assistant)  
136 reviews all referrals (approximately 30 patients per meeting) and assigns predefined digital trauma care  
137 protocols to each patient via dropdown menus within the electronic patient records. These protocols  
138 provide an extensive treatment plan for the entire follow-up treatment, including all follow-up  
139 appointments and radiographic imaging. The VFC team can further tailor these protocols to specifically  
140 fit each patients situation if necessary. After VFC review, patients are contacted by phone to provide  
141 information about their injury, treatment plan, and to reach consent on the definitive treatment. Patients  
142 then receive their follow-up treatment plan by mail or via their electronic patient record within one  
143 workday after their ED visit.

### 145 **Data collection**

146 Data were collected using individual, semi-structured interviews. The interviews were conducted using  
147 the online video-communication platform Microsoft Teams. Participants who were not able to use  
148 Teams were interviewed by telephone. Two experienced researchers (EM and IK) who were not part of

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3 149 the medical team conducted the interviews, using a topic list with several open-ended questions  
4 150 (Appendix B). The research team piloted the topic list to ensure its clarity and comprehensiveness, and  
5 151 subsequently modified it as necessary. Field notes were taken to document contextual information after  
6 152 each interview. Verbatim transcriptions of the audio recordings were obtained, using a professional  
7 153 transcription service.  
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### 12 155 **Data analysis**

13 156 The transcripts and fields notes were analysed by the same researchers who conducted the interviews.  
14 157 The six steps of inductive, thematic analysis as described by Braun and Clarke (2006) were followed,  
15 158 namely: 1) becoming familiar with the data; 2) generating initial codes; 3) searching for themes; 4)  
16 159 reviewing themes; 5) defining and naming themes; and 6) writing up the results. (12) Researcher  
17 160 triangulation (between EM and IK) was used to increase the quality and credibility of the data analysis.  
18 161 (13) The researchers independently analysed data, discussed discrepancies and reached consensus about  
19 162 the final themes and interpretations. Memos were written to help the researchers keep track of decisions  
20 163 made during data analysis. The data analysis was facilitated by NVivo version 12 (QSR International  
21 164 Pty Ltd. NVivo. (2020).  
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### 31 166 **Ethical considerations**

32 167 The study was not subject to the Dutch Medical Research involving Human Subjects Act. Therefore, a  
33 168 waiver for ethical approval was provided by the Medical Research Ethics Committee; NedMec in  
34 169 Utrecht, NL (document number 22/034). The participants provided written informed consent prior to  
35 170 the interviews. Data were handled according to the Dutch Implementation Act of the General Data  
36 171 Protection Regulation (GDPR).  
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### 42 173 **Patient and public involvement**

43 174 Patients were not involved in the design, intervention, research question or outcome measures of the  
44 175 current study. Health care professionals were involved in the design of the topic lists for the semi-  
45 176 structured interviews.  
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### 50 178 **Results**

51 179 In total, 23 patients were invited for participation. Fifteen patients chose to participate and eight patients  
52 180 chose to refrain from participation or did not respond to the invitation. Characteristics of the participants  
53 181 ( $n=15$ ) are shown in Table 1. The median length of the interviews was 27 minutes and ranged from 16  
54 182 to 33 minutes. Three interviews were conducted by telephone. Data saturation was achieved after 15  
55 183 interviews.  
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3 185 A variety of factors influencing orthopedic trauma patients' experiences and with ED care and follow-  
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5 186 up through VFC review were identified and subsequently categorized into seven generic themes,  
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7 187 namely: 1) waiting times; 2) information provision; 3) health care professional communication 4) care  
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9 188 expectations; 5) patient condition; 6) care coordination and 7) care environment; (Figure 1). Relevant  
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11 189 quotes were selected to illustrate the results (Table 2).

## 12 13 191 **1. Waiting times**

### 14 192 ED length of stay

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16 193 Most participants indicated that they were positively surprised about the length of stay at the ED. Their  
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18 194 waiting time was shorter than expected and they were able to leave the hospital in a timely manner.  
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20 195 Participants whose waiting time was longer than expected were less satisfied. The participants mainly  
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22 196 attributed waiting times to the volume of activity at the time of their ED visit (i.e., on a weekday or at  
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24 197 the weekend and at day- or night-time) (Q#1). Some participants would have preferred more information  
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26 198 about the underlying reason for waiting and how long they were expected to wait, since being  
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28 199 uninformed makes waiting feel longer. (Q#2) Furthermore, the participants preferred interaction with  
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30 200 health care professionals when waiting by themselves. This provided distraction and prevented them  
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32 201 from worrying. Participants who were accompanied by a family member or friend valued their  
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34 202 companionship for this same distraction. The participants' perceived waiting time was also influenced  
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36 203 by their physical comfort. The presence of pain was particularly mentioned as a factor that contributes  
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38 204 to the feeling of time moving slowly. (Q#3)

### 39 205 40 206 Follow-up care

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42 207 The participants preferred short time intervals between their ED visit and follow-up care. Clarity about  
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44 208 follow-up care (e.g. operative vs. non-operative treatment, follow-up appointments, immobilization  
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46 209 method) was important to them, since they wanted to know what to expect as soon as possible. All  
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48 210 participants valued the VFC phone call in this regard. Some participants requiring surgery also indicated  
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50 211 that they were glad about not having to wait long for their surgery to take place. (Q#4)

## 51 212 52 213 **2. Information provision**

### 53 214 Type, amount and frequency of information

54  
55 215 In general, the participants were satisfied with the type and amount of information that was provided to  
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57 216 them both during their ED visit and the next workday during the VFC phone call. They indicated that  
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59 217 the information on various topics was relevant, sufficient and timely. Some participants mentioned that  
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218 they missed individually tailored information, particularly regarding their recovery process. (Q#5) The  
219 participants also valued the opportunity to ask questions the next day during the VFC phone call, since  
220 new questions often arose some time after leaving the ED. (Q#6)

### 222 Delivery mode

223 The participants valued the provision of information leaflets. This allowed them to go through the  
224 information at their own pace and convenience. Some participants stressed the importance to read back  
225 information that was provided to them during their ED visit, since it is hard to remember everything at  
226 once. (Q#7) In general, the delivery mode (face-to-face or by telephone) made no difference to the  
227 participants. Saving time was mentioned as an advantage of a telephone consultation. Moreover, the  
228 participants' mobility was often limited by their injury making a telephone consultation a much more  
229 practical alternative to a face-to-face consultation.

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## 231 **3. Health care professional communication**

### 232 Interpersonal skills

233 In general, the participants were satisfied with the interpersonal skills of health care professionals. They  
234 described them as being very friendly, honest and empathic. Most participants indicated that health care  
235 providers took the time to listen to them. They were given plenty of opportunity to ask questions and  
236 their questions were adequately answered. The participants valued the efforts of health care  
237 professionals to understand their specific needs. (Q#8) Some participants mentioned that specifically  
238 humour used by health care professionals could help to reframe tense situations.

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### 240 Medical capabilities

241 All participants indicated that they felt like they were in good hands. Health care professionals clearly  
242 explained their actions, which strengthened the participants' confidence in their medical capabilities.  
243 (Q#9)

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### 245 Patient-centeredness

246 Most participants preferred health care professionals to involve them in the different stages of the care  
247 process. However, they had different preferences for the exact level of involvement. While some  
248 participants preferred as much involvement as possible, others explicitly stated that they did not want to  
249 know or see everything. Sharing medical images was particularly mentioned as something that facilitates  
250 involvement and could help someone to better understand their injury. (Q#10) Some participants  
251 stressed the importance of the use of plain language (i.e., the avoidance of medical jargon) to increase  
252 their understanding of what exactly was said.

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## 254 **4. Care expectations**

### 255 Personal preference

256 All participants expected to receive the best possible care. However, personal preference determined  
257 what exactly was important to someone. While some participants focused on the treatment of their

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3 258 injury, the focus of others was on other care aspects such as its personal touch. In general, participants'  
4 259 care expectations were met. Unmet care expectations led to dissatisfaction (Q#11).

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### 7 8 261 Relativism

9 262 Care expectations were also shaped by relativism. (Q#12) In general, the participants recognized that  
10 263 health care professionals were busy and therefore accepted that they did not have much time for them  
11 264 except from carrying out their routines. Some participants were also aware of the ED's triage process,  
12 265 accepting that patients who were worse off than themselves were given priority.

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### 16 267 Previous ED experiences

17 268 Some participants had built up care expectations based on previous ED experiences, which determined  
18 269 how they evaluated their present experience. (Q#13) Those with no previous experiences had no material  
19 270 for comparison and indicated that they did not know what to expect.

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## 23 24 272 **5. Patient condition**

### 25 273 Physical and emotional impact

26 274 Most participants arrived at the ED in pain. They preferred health care professionals to anticipate on  
27 275 their pain by actively offering them analgesics instead of having to ask for it themselves. The emotional  
28 276 impact of their ED visit varied from person to person. In general, the participants felt vulnerable not  
29 277 knowing what they were up to. Some participants mentioned that they were stressed and anxious. They  
30 278 valued the ability of health care professionals to acknowledge and address their vulnerabilities. (Q#14)

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## 34 280 **6. Care coordination**

### 35 281 Health care professionals teamwork

36 282 In general, the participants experienced effective and efficient teamwork among health care  
37 283 professionals. Inconsistencies between the instructions of different health care professionals led to  
38 284 dissatisfaction. (Q#15). Some participants indicated that they experienced fragmentation of care during  
39 285 their ED visit, with different health care professionals (e.g. ED nurses, radiologists) working in their  
40 286 own silos. They missed someone who was primarily responsible for their case. (Q#16)

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### 44 288 Correspondence

45 289 Some participants mentioned that the hospital sent a large volume of appointment notification emails,  
46 290 causing them to lose the overview. (Q#17) Moreover, the purpose of these appointments was not always  
47 291 clear. They would have preferred more information about this before leaving the hospital. One  
48 292 participant recounted receiving an email about an appointment with a surgeon within a few days, lacking  
49 293 any additional context. As a result, the participant assumed that she needed surgery. This caused this  
50 294 participant to worry, only to learn during that phone call that surgery was, in fact, not required.

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## 7. Care environment

### Hospital ambience

In general, the participants were satisfied with the hospital ambience. Some participants stressed the importance of a patient-friendly care environment with visual and auditory privacy. (Q#18)

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### Facilities

The participants valued facilities such as the availability of hospital beds and blankets to keep them comfortable. (Q#19) One participant was dissatisfied with the hospital's high parking costs.

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## **Discussion**

This study identified factors influencing orthopedic trauma patients' experiences and with ED care and follow-up through VFC. A variety of influential factors were identified and categorized into seven themes, namely: 1) waiting time; 2) information provision; 3) health care professionals communication; 4) care expectations; 5) patient condition; 6) care coordination and 7) care environment. It is important to note that no influential factor is solely responsible for shaping the patient perspective. Our results show that patients were generally satisfied with the received care. The VFC review workflow addresses the majority of the identified influential factors, contributing to the positive feedback from participants.

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Waiting time influences patient experiences, with less time spent waiting resulting in more positive perception of care. Additionally, our results indicate the way patients perceive their waiting time is of greater influence on their satisfaction than the absolute amount of time spent waiting. These results are in accordance with current literature. (9, 14-17) Health care professionals can potentially reduce perceived waiting time in the ED by actively providing clarity about ED processes, expectations and addressing their concerns, and by timely providing analgesics. (5, 17-19) Furthermore, patients preferred clarity about their diagnosis and follow-up treatment plan as soon as possible. The VFC review workflow accommodates this by providing patients with a complete and supervised treatment plan on the first workday after their ED visit. This was perceived as timely and was highly valued by our patients.

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Patient experiences are also influenced by the type of information they receive and how this is communicated by health care professionals. (20-22) Patients highly valued health care professionals who make an effort to understand and address their personal situation and actively involve them in the decision making process (e.g. showing and explaining medical images). (5, 19, 23, 24) Additionally, it is not the mode of delivery that affected patient satisfaction regarding communication with health care professionals, but rather that their questions and needs were addressed sufficiently. (4, 5, 21, 24) These findings are also supported by several studies stating that remote care is a satisfactory alternative to face-

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3 331 to-face care. (25-27) Interpersonal interaction, patient involvement in the treatment process, and  
4 332 communication are therefore key determinants of patient satisfaction both in the ED and with the remote  
5 333 care through VFC review.  
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9 335 It is important to note that information needs in the ED may differ from those at home, after patients  
10 336 have had time to reflect and become aware of their situation. Furthermore, an ED visit can be stressful  
11 337 and patients' capacity to process and retain information may be impaired. (28, 29) The VFC workflow  
12 338 addresses these challenges, as patients receive only the necessary information in the ED and are provided  
13 339 with (digital) leaflets containing information on the VFC review workflow, immobilization material  
14 340 (brace or cast) and general information about their injury. After a one-workday interval, they are  
15 341 informed of their definitive diagnosis and further treatment. This process allows patients the opportunity  
16 342 to review relevant information, address remaining or newly arisen concerns, needs or questions, and  
17 343 receive further treatment information in a less stressful setting. (30) This was specifically valued by the  
18 344 study participants. The VFC review workflow also enhances the information provision by enabling  
19 345 health care professionals to timely inform patients of their entire follow-up treatment from start to finish,  
20 346 rather than just the next step in treatment. This may help patients timely shape realistic expectations for  
21 347 the complete treatment process, potentially increasing satisfaction and enabling self-care.  
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31 349 Although the VFC review workflow responds to several of the identified influential factors, others  
32 350 remain that are not addressed or altered by its implementation (e.g. interpersonal skills, patient-centred  
33 351 communication, medical capabilities of health care professionals, hospital ambience and facilities,  
34 352 physical and emotional impact of injuries). The patient's perspective is shaped by the sum of all  
35 353 influential factors, rather than a selected few, and every patient attributes a different measure of  
36 354 relevance to each different factor. (9, 14, 17, 19) Therefore, patient experiences can only be optimized  
37 355 if health care professionals keep investing in all identified factors. Based on our results, potential for  
38 356 further improvement of ED care and the VFC review workflow lies in more individually tailored  
39 357 communication and information, and adequate coordination between different types of caregivers, such  
40 358 as the administrative outpatient clinic assistant and the health care professionals who performs the VFC  
41 359 phone call. It is important to consider the effects of new workflows on all of these factors and try to find  
42 360 the optimal balance between them.  
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51 362 This study had several strengths. First, several qualitative research techniques were used to assure the  
52 363 rigor of this study. We selected a heterogeneous sample in terms of gender, age, type of injury and  
53 364 treatment strategy and sampling and data collection continued until the point of data saturation. The  
54 365 interviews were conducted by two independent researchers, which was emphasized to the participants  
55 366 to encourage them to speak frankly. Second, the semi-structured nature of the interviews enabled  
56 367 uncovering further potential off-topic information. Finally, , involvement of different types of health

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3 368 care professionals in the development of the topic list enhanced the variety of addressed perspectives in  
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5 369 the topics. The analysis was independently conducted by two researchers (i.e. researcher triangulation)  
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7 370 and relevant quotes were selected to illustrate results, contributing to the analysis' transparency.  
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11 372 However, several limitations also applied to this study. Firstly, since this study was conducted among  
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13 373 patients who received care according to a specific workflow (i.e. the VFC review workflow), the results  
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15 374 may not be transferable to settings with other workflows. Secondly, we only addressed the perspective  
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17 375 of patients. Addressing the perspective of both patients and health care professionals could help  
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19 376 substantiate feasible points of improvement and highlight potential discrepancies between these two  
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21 377 stakeholder groups. Finally, although this study identified a variety of factors influencing patient  
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23 378 experiences, the explorative, qualitative study design did not allow us to examine the relative importance  
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25 379 of these factors and was not designed to compare the VFC review workflow to other workflows. Future  
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27 380 research utilizing a quantitative study design for this purpose could provide valuable data in this regard.  
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31 382 **Conclusion**

32 383 Patient experiences with ED care and follow-up through a VFC review workflow are shaped by several  
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34 384 factors that can be categorized into seven generic themes. The VFC review workflow effectively  
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36 385 addresses the majority of the identified influential factors, contributing to the positive feedback from  
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38 386 participants. To improve patient experiences when restructuring similar trauma care workflows,  
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40 387 recommendations include 1) anticipating the evolving information needs post-ED visit, 2) actively  
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42 388 engaging patients early in the ED process to clarify care processes and shape expectations, 3) actively  
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44 389 involving patients in treatment steps and the decision making process (such as showing and explaining  
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46 390 medical images), and 4) expanding the scope of information provision and treatment scheduling across  
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48 391 the entire pathway.  
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466 **Tables 1 + 2:****Table 1. Baseline characteristics of study participants (n=15)**

Sex, n (%)	
Male	7 (47)
Female	8 (53)
Age, median (range)	
	42 (23-66)
Type of injury, n (%)	
Acromioclavicular joint dislocation	1 (7)
Mid-shaft clavicle fracture	1 (7)
Glenohumeral joint dislocation + humerus fracture	1 (7)
Humerus fracture	2 (13)
Metatarsal shaft fracture	2 (13)
Distal Phalanx fracture	1 (7)
Distal radius fracture	3 (20)
Radial head fracture	1 (7)
Talus fracture	1 (7)
Triquetrum fracture	2 (13)
Treatment strategy, n (%)	
Non-operative	10 (67)
Operative	5 (33)

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3 **Table 2. Quotes per identified theme**

Theme	#	Participant	Quote
<b>Waiting times</b>			
ED length of stay	#1	Participant 5, M, 35 years	"I was positively surprised that everything went as quickly as it did. I imagined this long queue at the emergency department with ambulances rushing in with patients who were worse off than me. However, nothing could be further from the truth. I was in and out of the emergency department within 2 hours."
	#2	Participant 15, F, 26 years	"At one point, my partner asked me: What are we actually waiting for? That might be something that could be improved. Since it was my first time there, I had no idea how long such a visit would take."
	#3	Participant 7, M, 39 years	"Well, the fact that the pain was much less, that certainly made a lot of difference. When you are continuously in pain, it makes something like this feel like a lot longer."
Follow-up care	#4	Participant 14, F, 32 years	"It is very important to have information in a timely manner. For example, if I needed surgery or not. I was glad that I did not have to leave the house for this information. I was not that mobile."
<b>Information provision</b>			
Type, amount and frequency	#5	Participant 14, F, 32 years	"For example, my wrist is still swollen. Is that because of the oedema or is it because of something else? Can I maybe do more than just keeping my wrist elevated? Is it useful to put some ice on it? Maybe some tips for a better recovery would have been nice."
	#6	Participant 1, M, 51 years	"I can imagine that if you are there alone (ED), things will pass you by. Because you have so many other things going through your mind. What about work? And things at home? A thousand and one things are going through your mind. So it was very nice that you also got an information leaflet with you. And yes, the phone call with the doctor the next morning. Of course, afterwards (after the ED visit), I had a little more time to write down one or two other questions that I could ask the doctor during the phone call the next day."
Delivery mode	#7	Participant 10, M, 30 years	"It is always very nice if you can read back some information afterwards"
<b>Healthcare professional communication</b>			
Interpersonal skills	#8	Participant 14, F, 32 years	"You couldn't really tell that they were busy. They were just focused on me and engaged with me at that time. So I thought that was really nice."
Medical capabilities	#9	Participant 2, F, 59 years	"At that time, you are in a lot of pain. If someone then tells you what needs to be done and how, and that it is going to be incredibly painful, but that the pain will be over afterwards...At that point...well...you leave yourself in their hands, because you think: this person knows what she is doing."
Patient-centeredness	#10	Participant 4, F, 58 years	"Also with the second X-ray, they said: oh, the fracture is clearly visible. But unfortunately, I did not see it for myself. That was a shame, I would have liked to see it. That is something that they could pay more attention to."
<b>Care expectations</b>			
Personal preference	#11	Participant 9, F, 56 years	"Just giving you a glass of water after you just threw up. Well, I think you really shouldn't have to ask for that."
Relativism	#12	Participant 10, M, 30 years	"And I do not feel like it was that bad. I also felt like it was going to be okay the whole time (during ED visit)."
Previous ED experiences	#13	Participant 6, F, 44 years	"I had something entirely else some time ago, at the start of this year. When I compare that situation to this one, I'm like wow, I got so much attention now! That would have been nice the last time. So I experienced a lot of luxury this time."
<b>Patient condition</b>			
Physical and emotional impact	#14	Participant 9, F, 56 years	"Well, I mean...it's obviously a huge event for me, you know. And for them...well, a broken shoulder is probably not that exciting for them. But to me, it meant a lot."
<b>Care coordination</b>			
Healthcare professional teamwork	#15	Participant 3, M, 26 years	"When I arrived, I was told to walk all the way to the end of the hallway after the first conversation. And it was not until after the radiographs were made, that I heard I shouldn't walk anymore. So, I had to limp all the way back."
	#16	Participant 5, M, 36 years	"What I noticed was that everyone in the hospital has their own specific tasks, which is really great. However, for me, a broader view is required at a certain point, like what is specifically going on and what does this actually mean? So, kind of like...who is in charge?"



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Correspondence	#17	Participant 4, F, 58 years	“Well, I think I've received about ten or eleven emails from the [hospital], and new information in my patient portal: appointment scheduled, appointment canceled. Just a lot of emails. It could be better because now you can't see the wood for the trees.”
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**5 Care environment**

Hospital ambience	#18	Participant 6, F, 44 years	“I think that if you are surrounded by screaming people with all sorts of open wounds... that it would be hard to relax. And, that this would also influence the conversations that you have afterwards. So, I think the waiting area should help you feel as comfortable as possible.”
Facilities	#19	Participant 7, M, 39 years	“I found it very cold in that room. But that might also have been because I had just sustained that injury, and at some point, I did get a blanket, so that was well arranged, which was nice”

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ED = Emergency Department

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For peer review only

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3 **469 Figure legends**  
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5 470 Figure 1. An overview of the identified themes with the relevant influential factors. ED = Emergency  
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7 471 Department, VFC = Virtual Fracture Care  
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11 **473 Author Statement**  
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13 474 1. GJA Willinge: Active involvement in the design, data collection, data analysis, interpretation of data  
14 475 and drafting of the manuscript

15  
16 476 2. JF Spierings: Active involvement in the design, data analysis, interpretation of data and drafting of  
17 477 the manuscript

18  
19 478 3. EGE Mathijssen: Active involvement in the design, data analysis, interpretation of data and drafting  
20 479 of the manuscript

21  
22 480 4. JC Goslings: Active involvement in the interpretation of data and critical revision of the manuscript.

23  
24 481 5. BA Twigt: Active involvement in the study design, interpretation of data and critical revision of the  
25 482 manuscript.

26  
27 483 6. RN van Veen: Active involvement in the study design, interpretation of data and critical revision of  
28 484 the manuscript.

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31  
32 486 All contributing authors have approved this version of the manuscript for publication and agree to be  
33 487 accountable for all aspects of the work  
34

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37  
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39  
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41  
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43  
44 492 VFC project.  
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46  
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53 496 collecting and analyzing of the qualitative data.  
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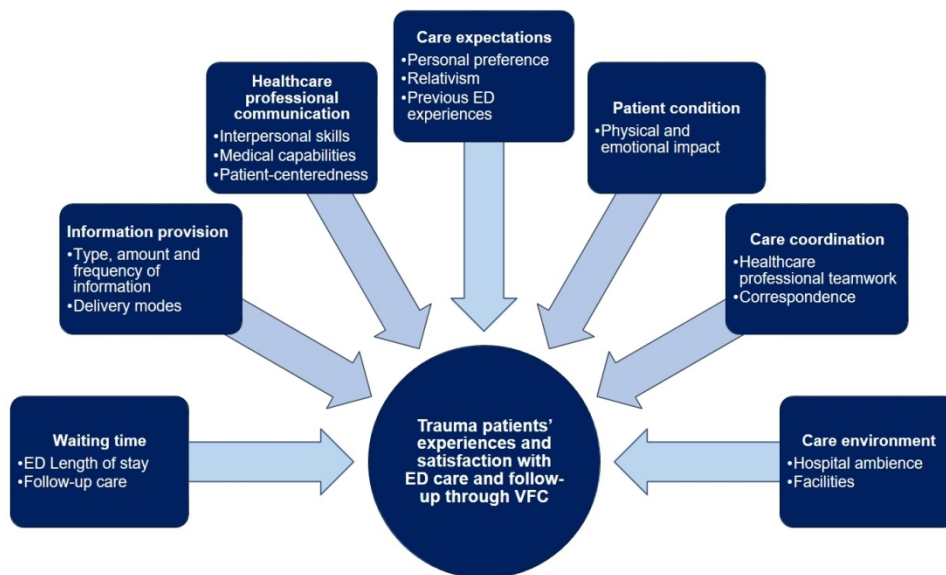


Figure 1. An overview of the identified themes with the relevant influential factors. ED = Emergency Department, VFC = Virtual Fracture Care

246x140mm (150 x 150 DPI)

No.	Topic	Item
S1	<b>Title/abstract</b> Title	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
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions
1		
2	<b>Introduction</b>	
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement
3		
S4	Purpose or research question	Purpose of the study and specific objectives or questions
4	<b>Methods</b>	
S5	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 <sup>b</sup>
5		
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S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability
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S7	Context	Setting/site and salient contextual factors; rationale <sup>b</sup>
9		
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale <sup>b</sup>
10		
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues
11		
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S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale <sup>b</sup>
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S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study
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S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)
16		
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts
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18		
S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale <sup>b</sup>
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S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale <sup>b</sup>
21		
22	<b>Results/findings</b>	
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory
23		
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings
24		
25	<b>Discussion</b>	
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field
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27		
S19	Limitations	Trustworthiness and limitations of findings
28	<b>Other</b>	
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed
29		
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting
30		

The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and best practices from the qualitative research, health services research, and clinical research communities, and consulting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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.

## Topic list

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- How did you end up at the emergency department (ED)?
  - Could you give a brief overview of how your ED visit unfolded?
  - What did you expect from your ED visit?
  - To what extent where your expectations met?
  - How would you describe the interactions with the healthcare professionals during your ED visit?
  - To what extent did you feel involved in the care during your ED visit?
  - Wat information did you receive during your ED visit (regarding your initial diagnosis and treatment options)?
  - How do you look back on the telephone call with the doctor the next day (regarding your definite diagnose and treatment)?
  - If you had to give a score for your satisfaction with the received care, what score would you give (1 = least satisfied, 10 = most satisfied)?
  - Could you elaborate on this score?
  - How could this score be increased by 1 point?
  - Do you have any further improvement suggestions?
-

# BMJ Open

## Orthopaedic trauma patients' experiences with emergency department care and follow-up through Virtual Fracture Care review: a qualitative study

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<b>Primary Subject Heading</b>:	Surgery
Secondary Subject Heading:	Qualitative research, Patient-centred medicine, Emergency medicine
Keywords:	ACCIDENT & EMERGENCY MEDICINE, Orthopaedic & trauma surgery < SURGERY, Trauma management < ORTHOPAEDIC & TRAUMA SURGERY

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3 1 **Orthopaedic trauma patients' experiences with emergency department care and follow-up**  
4 **through Virtual Fracture Care review: a qualitative study**  
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9 4 **Author list and contributions**

10 5 GJA Willinge<sup>1</sup>, MD e-mail: g.j.a.willinge@olvg.nl  
11 6 JF Spierings<sup>2</sup>, MD e-mail: j.spierings@antoniuziekenhuis.nl  
12 7 EGE Mathijssen<sup>3</sup>, PhD e-mail: e.g.e.Mathijssen-2@umcutrecht.nl  
13 8 JC Goslings<sup>1</sup>, MD, Professor e-mail: j.c.goslings@olvg.nl  
14 9 BA Twigt<sup>1</sup>, MD, PhD e-mail: b.twigt@olvg.nl  
15 10 RN van Veen<sup>1</sup>, MD, PhD e-mail: r.n.vanveen@olvg.nl  
16  
17  
18  
19

20 11

21 12 **Institution:**

22  
23 13 <sup>1</sup> OLVG Hospital, Amsterdam, Department of Trauma surgery,  
24 14 Jan Tooropstraat 164, 1061 AE, Amsterdam, The Netherlands

25  
26 15 <sup>2</sup> St. Antonius Hospital Utrecht, Department of Trauma surgery;  
27 16 Koekoekslaan 1, 3435CM Nieuwegein, The Netherlands.

28  
29 17 <sup>3</sup> The Healthcare Innovation Centre, Julius Centre for Health Sciences and Primary Care, University  
30 18 Medical Centre Utrecht, Heidelberglaan 100, 3584 CX, Utrecht, The Netherlands  
31  
32

33 19

34 20 **Corresponding author:**

35  
36 21 Gijs Willinge, OLVG Hospital, Department of Trauma Surgery  
37 22 Jan Tooropstraat 164  
38 23 1061 AE Amsterdam, The Netherlands  
39 24 Tel: +316 15489516  
40 25 Email: g.j.a.willinge@olvg.nl  
41  
42  
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## 26 **Abstract**

### 27 **Objectives**

28 This study aimed to identify factors influencing orthopedic trauma patients' experiences and  
29 satisfaction with emergency department (ED) care and follow-up through a Virtual Fracture Care  
30 (VFC) review workflow.

### 31 **Design**

32 This study employed an explorative, descriptive, qualitative design using individual, semi-structured  
33 interviews.

### 34 **Setting**

35 An urban Level-2 trauma centre and teaching hospital in Amsterdam, the Netherlands.

### 36 **Participants**

37 Eligible patients were Dutch- or English-speaking orthopedic trauma patients, aged 18 years or above,  
38 who visited the hospital's ED between June and September 2022, and were treated through a VFC  
39 review workflow. Exclusion criteria were: reason for follow-up other than injury, Eye/Motor/Verbal  
40 score <15 at ED admission, follow-up treatment in another hospital, treatment initiated in another  
41 hospital, acute hospital admission (<24hrs). Twenty-three patients were invited for participation, of  
42 whom 15 participated and were interviewed.

### 43 **Results**

44 Several influential factors contributed to seven generic themes: 1) waiting times; 2) information  
45 provision; 3) health care professional communication; 4) care expectations; 5) care coordination; 6) care  
46 environment; and 7) patient condition. Overall, participants were satisfied with received care.  
47 Interpersonal skills of health care professionals, and timing and content of provided information were  
48 specifically valued. Additionally, patients stated that their needs in the ED differed from those after ED  
49 discharge, and appreciated the way the VFC review workflow addressed this. Points of improvement  
50 included more active involvement of patients in the care process and prevention of inconsistent  
51 instructions by different health care professionals.

### 52 **Conclusions**

53 Patient experiences with ED care and VFC review follow-up are influenced by factors categorized into  
54 seven themes. The VFC review workflow effectively addresses these factors, leading to positive  
55 feedback. Recommendations for health care professionals include anticipating evolving post-ED  
56 information needs, engaging patients early to provide clarity about the care process, involving them in  
57 treatment decisions, and expanding information provision across the entire care pathway.

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3 58 **Strengths and limitations of this study**  
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- 5 59 • Heterogeneous sample in terms of gender, age, type of injury and treatment strategy with  
6 60 continuance of data collection until the point of data saturation  
7  
8 61 • Interviews were conducted by two independent researchers, not involved in the  
9 62 development of the VFC review workflow or daily clinical care, which was emphasized to  
10 63 the participants to encourage them to speak frankly, with the semi-structured nature of the  
11 64 interviews enabling uncovering of further potential off-topic information  
12  
13 65 • Involvement of different types of health care professionals in the development of the topic  
14 66 list enhanced the variety of addressed perspectives in the interviews  
15  
16 67 • Since this study was conducted among patients who received care according to a specific  
17 68 workflow (i.e. the VFC review workflow), the results may not be transferable to settings  
18 69 with other workflows.  
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20 70 • The explorative, descriptive, qualitative study design did not allow examination of the  
21 71 relative importance of influential factors  
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28 73 **Funding statement:**

29 74 No funding was received for this study  
30  
31 75

32 76 **Competing interest statement:**

33 77 There are no competing interests to declare  
34  
35 78

36  
37 79 **Word count:** 3316  
38  
39 80

40 81 **Keywords:** Orthopaedic Trauma, Patient experience, Emergency department, Virtual Fracture Care,  
41 82 Virtual Fracture Clinic  
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45 84 **Data statement:**

46 85 Study data will be saved on a secure drive of the UMC Utrecht, and will be available upon reasonable  
47 86 request.  
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## 87 **Introduction**

88 In the Netherlands (NL), orthopedic trauma patients accounted for one-third of Emergency Department  
89 (ED) visits in 2022 (661.000/1.800.000), and this number has increased over the years. (1) This increase  
90 poses significant challenges to the already strained ED healthcare services in providing timely and high-  
91 quality care to orthopedic trauma patients. (2, 3) Patient satisfaction and experiences are critical  
92 indicators of the quality of care delivered by EDs, emphasizing the need to evaluate the impact of this  
93 increasing burden on these outcomes for this population. (4, 5)

94  
95 To maintain high-quality orthopedic trauma care, innovative workflows have been introduced in the  
96 Netherlands, including the Virtual Fracture Care (VFC) review workflow. (6) With VFC review, ED  
97 health care professionals electronically refer patients to a multidisciplinary VFC meeting on the next  
98 workday for review and treatment planning by the attending (orthopaedic) trauma surgeon. Immediately  
99 following the VFC review meeting, patients are contacted by phone to inform them of their definitive  
100 diagnosis, treatment and complete follow-up plan. This workflow aims to streamline orthopedic trauma  
101 care by transferring part of the diagnostic phase from the ED visit to an organized, supervised setting on  
102 the next workday and by directly scheduling follow-up appointments with appropriate health care  
103 professionals. Previous studies have demonstrated positive results regarding patient satisfaction with  
104 ED care and follow-up through similar VFC workflows, but an exploration of patients' experiences is  
105 lacking. (7, 8)

106  
107 A qualitative analysis of these experiences would complement quantitative studies and inform  
108 interventions to enhance patient experiences and satisfaction by providing a deeper understanding of the  
109 perceived quality of care and patients' needs and expectations. (9) Therefore, the aim of this study was  
110 to identify factors influencing orthopedic trauma patients' experiences and satisfaction with ED care  
111 and follow-up through the VFC review workflow.

## 112 **Methods**

### 113 **Study design and setting**

114 This was an explorative, descriptive study using a generic qualitative design. This study was conducted  
115 in an urban Level-2 trauma centre and teaching hospital in Amsterdam, NL. Approximately 85.000  
116 patients visit the ED of this hospital annually. Patients were eligible for participation in this study if they  
117 were Dutch- or English-speaking orthopedic trauma patients, aged 18 years or above, who visited the  
118 hospital's ED between June and September 2022, and who were treated through the VFC review  
119 workflow. Exclusion criteria were: reason for follow-up other than the injury (e.g., social care reasons),  
120 Eye/Motor/Verbal score <15 at ED admission, follow-up treatment in another hospital, treatment  
121 initiated at another hospital, direct hospital admission (<24hrs). One of the researchers (GW) contacted  
122 patients on the next workday after their ED visit to inform them about the study and provide them with  
123 an information letter and consent form. Patients were selected using a purposive maximum variation  
124 sampling method to ensure a heterogeneous sample in terms of gender, age, type of injury and treatment  
125 strategy. The sample size was determined by the principle of data saturation. (10) This study was  
126 reported according to the Standards for Reporting Qualitative Research (SRQR) (appendix A). (11)

### 128 **The Virtual Fracture Care workflow**

129 At the study institution, orthopedic trauma patients who require follow-up treatment (non-operative and  
130 scheduled operative treatment) are managed through the VFC review workflow. (6) ED health care  
131 professionals provide patients with appropriate immobilization measures and refer them to a VFC  
132 review meeting scheduled for the next workday via the electronic patient record. Upon referral to the  
133 VFC review meeting, patients receive information leaflets regarding the VFC workflow and their injury.  
134 During the VFC review meeting, a multidisciplinary team (consisting of a comprising a casting  
135 technician, surgical resident, orthopedic trauma surgeon and administrative outpatient clinic assistant)  
136 reviews all referrals (approximately 30 patients per meeting) and assigns predefined digital trauma care  
137 protocols to each patient via dropdown menus within the electronic patient records. These protocols  
138 provide an extensive treatment plan for the entire follow-up treatment, including all follow-up  
139 appointments and radiographic imaging. The VFC team can further tailor these protocols to specifically  
140 fit each patients situation if necessary. After VFC review, patients are contacted by phone to provide  
141 information about their injury, treatment plan, and to reach consent on the definitive treatment. Patients  
142 then receive their follow-up treatment plan by mail or via their electronic patient record within one  
143 workday after their ED visit.

### 145 **Data collection**

146 Data were collected using individual, semi-structured interviews. The interviews were conducted using  
147 the online video-communication platform Microsoft Teams. Participants who were not able to use  
148 Teams were interviewed by telephone. Two experienced researchers (EM and IK) who were not part of

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3 149 the medical team conducted the interviews, using a topic list with several open-ended questions  
4 150 (Appendix B). The research team piloted the topic list to ensure its clarity and comprehensiveness, and  
5 151 subsequently modified it as necessary. Field notes were taken to document contextual information after  
6 152 each interview. Verbatim transcriptions of the audio recordings were obtained, using a professional  
7 153 transcription service.  
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### 12 155 **Data analysis**

13 156 The transcripts and fields notes were analysed by the same researchers who conducted the interviews.  
14 157 The six steps of inductive, thematic analysis as described by Braun and Clarke (2006) were followed,  
15 158 namely: 1) becoming familiar with the data; 2) generating initial codes; 3) searching for themes; 4)  
16 159 reviewing themes; 5) defining and naming themes; and 6) writing up the results. (12) Researcher  
17 160 triangulation (between EM and IK) was used to increase the quality and credibility of the data analysis.  
18 161 (13) The researchers independently analysed data, discussed discrepancies and reached consensus about  
19 162 the final themes and interpretations. Memos were written to help the researchers keep track of decisions  
20 163 made during data analysis. The data analysis was facilitated by NVivo version 12 (QSR International  
21 164 Pty Ltd. NVivo. (2020).  
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### 31 166 **Ethical considerations**

32 167 The study was not subject to the Dutch Medical Research involving Human Subjects Act. Therefore, a  
33 168 waiver for ethical approval was provided by the Medical Research Ethics Committee; NedMec in  
34 169 Utrecht, NL (document number 22/034). The participants provided written informed consent prior to  
35 170 the interviews. Data were handled according to the Dutch Implementation Act of the General Data  
36 171 Protection Regulation (GDPR).  
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### 42 173 **Patient and public involvement**

43 174 Patients were not involved in the design, intervention, research question or outcome measures of the  
44 175 current study. Health care professionals were involved in the design of the topic lists for the semi-  
45 176 structured interviews.  
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### 50 178 **Results**

51 179 In total, 23 patients were invited for participation. Fifteen patients chose to participate and eight patients  
52 180 chose to refrain from participation or did not respond to the invitation. Characteristics of the participants  
53 181 ( $n=15$ ) are shown in Table 1. The median length of the interviews was 27 minutes and ranged from 16  
54 182 to 33 minutes. Three interviews were conducted by telephone. Data saturation was achieved after 15  
55 183 interviews.  
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3 185 A variety of factors influencing orthopedic trauma patients' experiences and with ED care and follow-  
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5 186 up through VFC review were identified and subsequently categorized into seven generic themes,  
6  
7 187 namely: 1) waiting times; 2) information provision; 3) health care professional communication 4) care  
8  
9 188 expectations; 5) patient condition; 6) care coordination and 7) care environment; (Figure 1). Relevant  
10  
11 189 quotes were selected to illustrate the results (Table 2).

## 12 13 191 **1. Waiting times**

### 14 192 ED length of stay

15  
16 193 Most participants indicated that they were positively surprised about the length of stay at the ED. Their  
17  
18 194 waiting time was shorter than expected and they were able to leave the hospital in a timely manner.  
19  
20 195 Participants whose waiting time was longer than expected were less satisfied. The participants mainly  
21  
22 196 attributed waiting times to the volume of activity at the time of their ED visit (i.e., on a weekday or at  
23  
24 197 the weekend and at day- or night-time) (Q#1). Some participants would have preferred more information  
25  
26 198 about the underlying reason for waiting and how long they were expected to wait, since being  
27  
28 199 uninformed makes waiting feel longer. (Q#2) Furthermore, the participants preferred interaction with  
29  
30 200 health care professionals when waiting by themselves. This provided distraction and prevented them  
31  
32 201 from worrying. Participants who were accompanied by a family member or friend valued their  
33  
34 202 companionship for this same distraction. The participants' perceived waiting time was also influenced  
35  
36 203 by their physical comfort. The presence of pain was particularly mentioned as a factor that contributes  
37  
38 204 to the feeling of time moving slowly. (Q#3)

### 39 205 40 206 Follow-up care

41  
42 207 The participants preferred short time intervals between their ED visit and follow-up care. Clarity about  
43  
44 208 follow-up care (e.g. operative vs. non-operative treatment, follow-up appointments, immobilization  
45  
46 209 method) was important to them, since they wanted to know what to expect as soon as possible. All  
47  
48 210 participants valued the VFC phone call in this regard. Some participants requiring surgery also indicated  
49  
50 211 that they were glad about not having to wait long for their surgery to take place. (Q#4)

## 51 212 52 213 **2. Information provision**

### 53 214 Type, amount and frequency of information

54  
55 215 In general, the participants were satisfied with the type and amount of information that was provided to  
56  
57 216 them both during their ED visit and the next workday during the VFC phone call. They indicated that  
58  
59 217 the information on various topics was relevant, sufficient and timely. Some participants mentioned that  
60  
218 they missed individually tailored information, particularly regarding their recovery process. (Q#5) The  
219 participants also valued the opportunity to ask questions the next day during the VFC phone call, since  
220 new questions often arose some time after leaving the ED. (Q#6)

### 222 Delivery mode

223 The participants valued the provision of information leaflets. This allowed them to go through the  
224 information at their own pace and convenience. Some participants stressed the importance to read back  
225 information that was provided to them during their ED visit, since it is hard to remember everything at  
226 once. (Q#7) In general, the delivery mode (face-to-face or by telephone) made no difference to the  
227 participants. Saving time was mentioned as an advantage of a telephone consultation. Moreover, the  
228 participants' mobility was often limited by their injury making a telephone consultation a much more  
229 practical alternative to a face-to-face consultation.

230

## 231 **3. Health care professional communication**

### 232 Interpersonal skills

233 In general, the participants were satisfied with the interpersonal skills of health care professionals. They  
234 described them as being very friendly, honest and empathic. Most participants indicated that health care  
235 providers took the time to listen to them. They were given plenty of opportunity to ask questions and  
236 their questions were adequately answered. The participants valued the efforts of health care  
237 professionals to understand their specific needs. (Q#8) Some participants mentioned that specifically  
238 humour used by health care professionals could help to reframe tense situations.

239

### 240 Medical capabilities

241 All participants indicated that they felt like they were in good hands. Health care professionals clearly  
242 explained their actions, which strengthened the participants' confidence in their medical capabilities.  
243 (Q#9)

244

### 245 Patient-centeredness

246 Most participants preferred health care professionals to involve them in the different stages of the care  
247 process. However, they had different preferences for the exact level of involvement. While some  
248 participants preferred as much involvement as possible, others explicitly stated that they did not want to  
249 know or see everything. Sharing medical images was particularly mentioned as something that facilitates  
250 involvement and could help someone to better understand their injury. (Q#10) Some participants  
251 stressed the importance of the use of plain language (i.e., the avoidance of medical jargon) to increase  
252 their understanding of what exactly was said.

253

## 254 **4. Care expectations**

### 255 Personal preference

256 All participants expected to receive the best possible care. However, personal preference determined  
257 what exactly was important to someone. While some participants focused on the treatment of their

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3 258 injury, the focus of others was on other care aspects such as its personal touch. In general, participants'  
4 259 care expectations were met. Unmet care expectations led to dissatisfaction (Q#11).

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### 7 8 261 Relativism

9 262 Care expectations were also shaped by relativism. (Q#12) In general, the participants recognized that  
10 263 health care professionals were busy and therefore accepted that they did not have much time for them  
11 264 except from carrying out their routines. Some participants were also aware of the ED's triage process,  
12 265 accepting that patients who were worse off than themselves were given priority.

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14 266

### 15 16 267 Previous ED experiences

17 268 Some participants had built up care expectations based on previous ED experiences, which determined  
18 269 how they evaluated their present experience. (Q#13) Those with no previous experiences had no material  
19 270 for comparison and indicated that they did not know what to expect.

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## 22 23 272 **5. Patient condition**

### 24 25 273 Physical and emotional impact

26 274 Most participants arrived at the ED in pain. They preferred health care professionals to anticipate on  
27 275 their pain by actively offering them analgesics instead of having to ask for it themselves. The emotional  
28 276 impact of their ED visit varied from person to person. In general, the participants felt vulnerable not  
29 277 knowing what they were up to. Some participants mentioned that they were stressed and anxious. They  
30 278 valued the ability of health care professionals to acknowledge and address their vulnerabilities. (Q#14)

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## 33 34 280 **6. Care coordination**

### 35 36 281 Health care professionals teamwork

37 282 In general, the participants experienced effective and efficient teamwork among health care  
38 283 professionals. Inconsistencies between the instructions of different health care professionals led to  
39 284 dissatisfaction. (Q#15). Some participants indicated that they experienced fragmentation of care during  
40 285 their ED visit, with different health care professionals (e.g. ED nurses, radiologists) working in their  
41 286 own silos. They missed someone who was primarily responsible for their case. (Q#16)

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43 287

### 44 45 288 Correspondence

46 289 Some participants mentioned that the hospital sent a large volume of appointment notification emails,  
47 290 causing them to lose the overview. (Q#17) Moreover, the purpose of these appointments was not always  
48 291 clear. They would have preferred more information about this before leaving the hospital. One  
49 292 participant recounted receiving an email about an appointment with a surgeon within a few days, lacking  
50 293 any additional context. As a result, the participant assumed that she needed surgery. This caused this  
51 294 participant to worry, only to learn during that phone call that surgery was, in fact, not required.



295

## 7. Care environment

### Hospital ambience

In general, the participants were satisfied with the hospital ambience. Some participants stressed the importance of a patient-friendly care environment with visual and auditory privacy. (Q#18)

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### Facilities

The participants valued facilities such as the availability of hospital beds and blankets to keep them comfortable. (Q#19) One participant was dissatisfied with the hospital's high parking costs.

304

## **Discussion**

This study identified factors influencing orthopedic trauma patients' experiences and with ED care and follow-up through VFC. A variety of influential factors were identified and categorized into seven themes, namely: 1) waiting time; 2) information provision; 3) health care professionals communication; 4) care expectations; 5) patient condition; 6) care coordination and 7) care environment. It is important to note that no influential factor is solely responsible for shaping the patient perspective. Our results show that patients were generally satisfied with the received care. The VFC review workflow addresses the majority of the identified influential factors, contributing to the positive feedback from participants.

313

Waiting time influences patient experiences, with less time spent waiting resulting in more positive perception of care. Additionally, our results indicate the way patients perceive their waiting time is of greater influence on their satisfaction than the absolute amount of time spent waiting. These results are in accordance with current literature. (9, 14-17) Health care professionals can potentially reduce perceived waiting time in the ED by actively providing clarity about ED processes, expectations and addressing their concerns, and by timely providing analgesics. (5, 17-19) Furthermore, patients preferred clarity about their diagnosis and follow-up treatment plan as soon as possible. The VFC review workflow accommodates this by providing patients with a complete and supervised treatment plan on the first workday after their ED visit. This was perceived as timely and was highly valued by our patients.

323

Patient experiences are also influenced by the type of information they receive and how this is communicated by health care professionals. (20-22) Patients highly valued health care professionals who make an effort to understand and address their personal situation and actively involve them in the decision making process (e.g. showing and explaining medical images). (5, 19, 23, 24) Additionally, it is not the mode of delivery that affected patient satisfaction regarding communication with health care professionals, but rather that their questions and needs were addressed sufficiently. (4, 5, 21, 24) These findings are also supported by several studies stating that remote care is a satisfactory alternative to face-

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3 331 to-face care. (25-27) Interpersonal interaction, patient involvement in the treatment process, and  
4 332 communication are therefore key determinants of patient satisfaction both in the ED and with the remote  
5 333 care through VFC review.  
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8 334  
9 335 It is important to note that information needs in the ED may differ from those at home, after patients  
10 336 have had time to reflect and become aware of their situation. Furthermore, an ED visit can be stressful  
11 337 and patients' capacity to process and retain information may be impaired. (28, 29) The VFC workflow  
12 338 addresses these challenges, as patients receive only the necessary information in the ED and are provided  
13 339 with (digital) leaflets containing information on the VFC review workflow, immobilization material  
14 340 (brace or cast) and general information about their injury. After a one-workday interval, they are  
15 341 informed of their definitive diagnosis and further treatment. This process allows patients the opportunity  
16 342 to review relevant information, address remaining or newly arisen concerns, needs or questions, and  
17 343 receive further treatment information in a less stressful setting. (30) This was specifically valued by the  
18 344 study participants. The VFC review workflow also enhances the information provision by enabling  
19 345 health care professionals to timely inform patients of their entire follow-up treatment from start to finish,  
20 346 rather than just the next step in treatment. This may help patients timely shape realistic expectations for  
21 347 the complete treatment process, potentially increasing satisfaction and enabling self-care.  
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30 348  
31 349 Although the VFC review workflow responds to several of the identified influential factors, others  
32 350 remain that are not addressed or altered by its implementation (e.g. interpersonal skills, patient-centred  
33 351 communication, medical capabilities of health care professionals, hospital ambience and facilities,  
34 352 physical and emotional impact of injuries). The patient's perspective is shaped by the sum of all  
35 353 influential factors, rather than a selected few, and every patient attributes a different measure of  
36 354 relevance to each different factor. (9, 14, 17, 19) Therefore, patient experiences can only be optimized  
37 355 if health care professionals keep investing in all identified factors. Based on our results, potential for  
38 356 further improvement of ED care and the VFC review workflow lies in more individually tailored  
39 357 communication and information, and adequate coordination between different types of caregivers, such  
40 358 as the administrative outpatient clinic assistant and the health care professionals who performs the VFC  
41 359 phone call. It is important to consider the effects of new workflows on all of these factors and try to find  
42 360 the optimal balance between them.  
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50 361  
51 362 This study had several strengths. First, several qualitative research techniques were used to assure the  
52 363 rigor of this study. We selected a heterogeneous sample in terms of gender, age, type of injury and  
53 364 treatment strategy and sampling and data collection continued until the point of data saturation. The  
54 365 interviews were conducted by two independent researchers, which was emphasized to the participants  
55 366 to encourage them to speak frankly. Second, the semi-structured nature of the interviews enabled  
56 367 uncovering further potential off-topic information. Finally, , involvement of different types of health

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3 368 care professionals in the development of the topic list enhanced the variety of addressed perspectives in  
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5 369 the topics. The analysis was independently conducted by two researchers (i.e. researcher triangulation)  
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7 370 and relevant quotes were selected to illustrate results, contributing to the analysis' transparency.  
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10 371  
11 372 However, several limitations also applied to this study. Firstly, since this study was conducted among  
12  
13 373 patients who received care according to a specific workflow (i.e. the VFC review workflow), the results  
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15 374 may not be transferable to settings with other workflows. Secondly, we only addressed the perspective  
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17 375 of patients. Addressing the perspective of both patients and health care professionals could help  
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19 376 substantiate feasible points of improvement and highlight potential discrepancies between these two  
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21 377 stakeholder groups. Finally, although this study identified a variety of factors influencing patient  
22  
23 378 experiences, the explorative, qualitative study design did not allow us to examine the relative importance  
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25 379 of these factors and was not designed to compare the VFC review workflow to other workflows. Future  
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27 380 research utilizing a quantitative study design for this purpose could provide valuable data in this regard.  
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29 381

## 382 **Conclusion**

383 Patient experiences with ED care and follow-up through a VFC review workflow are shaped by several  
384  
385 factors that can be categorized into seven generic themes. The VFC review workflow effectively  
386  
387 addresses the majority of the identified influential factors, contributing to the positive feedback from  
388  
389 participants. To improve patient experiences when restructuring similar trauma care workflows,  
390  
391 recommendations include 1) anticipating the evolving information needs post-ED visit, 2) actively  
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393 engaging patients early in the ED process to clarify care processes and shape expectations, 3) actively  
394  
395 involving patients in treatment steps and the decision making process (such as showing and explaining  
396  
397 medical images), and 4) expanding the scope of information provision and treatment scheduling across  
398  
399 the entire pathway.  
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## 401 **Contributorship statement:**

402 GJA Willinge, JF Spierings, RN van Veen conceived the idea for this study. Together with EGE  
403  
404 Mathijssen and BA Twigt, the study design was set up, the study protocol was written and conductance  
405  
406 of the study was planned. Approval for the study was requested by GJA Willinge. Data were then  
407  
408 collected and analyzed by GJA Willinge, EGE Mathijssen and JF Spierings. Substantial contributions  
409  
410 to detailed interpretation of the data were consequently made by BA Twigt, RN van Veen en JC  
411  
412 Goslings. The first draft for the manuscript was written by GJA Willinge, JF Spierings and EGE  
413  
414 Mathijssen. JC Goslings, BA Twigt, RN van Veen critically revised this manuscript and revisions were  
415  
416 performed by GJA Willinge and EGE Mathijssen. All authors approved the final version of the  
417  
418 manuscript for publication and agreed to be accountable for all aspects of the work in ensuring that  
419  
420 questions related to the accuracy or integrity of any part of the work are appropriately investigated and  
421  
422 resolved.

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4 406 **Competing interest statement:**

5 407 All authors have no competing interests to declare

6 408

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9 411 profit sector

10 412

11 413 **Data sharing statement:**

12 414 Data will be made available upon reasonable request

13 415

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490 **Tables 1 + 2:****Table 1. Baseline characteristics of study participants (n=15)**

Sex, n (%)	
Male	7 (47)
Female	8 (53)
Age, median (range)	
42 (23-66)	
Type of injury, n (%)	
Acromioclavicular joint dislocation	1 (7)
Mid-shaft clavicle fracture	1 (7)
Glenohumeral joint dislocation + humerus fracture	1 (7)
Humerus fracture	2 (13)
Metatarsal shaft fracture	2 (13)
Distal Phalanx fracture	1 (7)
Distal radius fracture	3 (20)
Radial head fracture	1 (7)
Talus fracture	1 (7)
Triquetrum fracture	2 (13)
Treatment strategy, n (%)	
Non-operative	10 (67)
Operative	5 (33)

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3 **Table 2. Quotes per identified theme**

Theme	#	Participant	Quote
<b>Waiting times</b>			
ED length of stay	#1	Participant 5, M, 35 years	"I was positively surprised that everything went as quickly as it did. I imagined this long queue at the emergency department with ambulances rushing in with patients who were worse off than me. However, nothing could be further from the truth. I was in and out of the emergency department within 2 hours."
	#2	Participant 15, F, 26 years	"At one point, my partner asked me: What are we actually waiting for? That might be something that could be improved. Since it was my first time there, I had no idea how long such a visit would take."
	#3	Participant 7, M, 39 years	"Well, the fact that the pain was much less, that certainly made a lot of difference. When you are continuously in pain, it makes something like this feel like a lot longer."
Follow-up care	#4	Participant 14, F, 32 years	"It is very important to have information in a timely manner. For example, if I needed surgery or not. I was glad that I did not have to leave the house for this information. I was not that mobile."
<b>Information provision</b>			
Type, amount and frequency	#5	Participant 14, F, 32 years	"For example, my wrist is still swollen. Is that because of the oedema or is it because of something else? Can I maybe do more than just keeping my wrist elevated? Is it useful to put some ice on it? Maybe some tips for a better recovery would have been nice."
	#6	Participant 1, M, 51 years	"I can imagine that if you are there alone (ED), things will pass you by. Because you have so many other things going through your mind. What about work? And things at home? A thousand and one things are going through your mind. So it was very nice that you also got an information leaflet with you. And yes, the phone call with the doctor the next morning. Of course, afterwards (after the ED visit), I had a little more time to write down one or two other questions that I could ask the doctor during the phone call the next day."
Delivery mode	#7	Participant 10, M, 30 years	"It is always very nice if you can read back some information afterwards"
<b>Healthcare professional communication</b>			
Interpersonal skills	#8	Participant 14, F, 32 years	"You couldn't really tell that they were busy. They were just focused on me and engaged with me at that time. So I thought that was really nice."
Medical capabilities	#9	Participant 2, F, 59 years	"At that time, you are in a lot of pain. If someone then tells you what needs to be done and how, and that it is going to be incredibly painful, but that the pain will be over afterwards...At that point...well...you leave yourself in their hands, because you think: this person knows what she is doing."
Patient-centeredness	#10	Participant 4, F, 58 years	"Also with the second X-ray, they said: oh, the fracture is clearly visible. But unfortunately, I did not see it for myself. That was a shame, I would have liked to see it. That is something that they could pay more attention to."
<b>Care expectations</b>			
Personal preference	#11	Participant 9, F, 56 years	"Just giving you a glass of water after you just threw up. Well, I think you really shouldn't have to ask for that."
Relativism	#12	Participant 10, M, 30 years	"And I do not feel like it was that bad. I also felt like it was going to be okay the whole time (during ED visit)."
Previous ED experiences	#13	Participant 6, F, 44 years	"I had something entirely else some time ago, at the start of this year. When I compare that situation to this one, I'm like wow, I got so much attention now! That would have been nice the last time. So I experienced a lot of luxury this time."
<b>Patient condition</b>			
Physical and emotional impact	#14	Participant 9, F, 56 years	"Well, I mean...it's obviously a huge event for me, you know. And for them...well, a broken shoulder is probably not that exciting for them. But to me, it meant a lot."
<b>Care coordination</b>			
Healthcare professional teamwork	#15	Participant 3, M, 26 years	"When I arrived, I was told to walk all the way to the end of the hallway after the first conversation. And it was not until after the radiographs were made, that I heard I shouldn't walk anymore. So, I had to limp all the way back."
	#16	Participant 5, M, 36 years	"What I noticed was that everyone in the hospital has their own specific tasks, which is really great. However, for me, a broader view is required at a certain point, like what is specifically going on and what does this actually mean? So, kind of like...who is in charge?"

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3	Correspondence	#17	Participant 4, F, 58 years	“Well, I think I've received about ten or eleven emails from the [hospital], and new information in my patient portal: appointment scheduled, appointment canceled. Just a lot of emails. It could be better because now you can't see the wood for the trees.”
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**5 Care environment**

6	Hospital ambience	#18	Participant 6, F, 44 years	“I think that if you are surrounded by screaming people with all sorts of open wounds... that it would be hard to relax. And, that this would also influence the conversations that you have afterwards. So, I think the waiting area should help you feel as comfortable as possible.”
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8	Facilities	#19	Participant 7, M, 39 years	“I found it very cold in that room. But that might also have been because I had just sustained that injury, and at some point, I did get a blanket, so that was well arranged, which was nice”
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9 ED = Emergency Department

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3 493 **Figure legends**  
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5 494 Figure 1. An overview of the identified themes with the relevant influential factors. ED = Emergency  
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7 495 Department, VFC = Virtual Fracture Care  
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11 497 **Acknowledgements:**  
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13  
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19  
20 501 VFC project.  
21  
22

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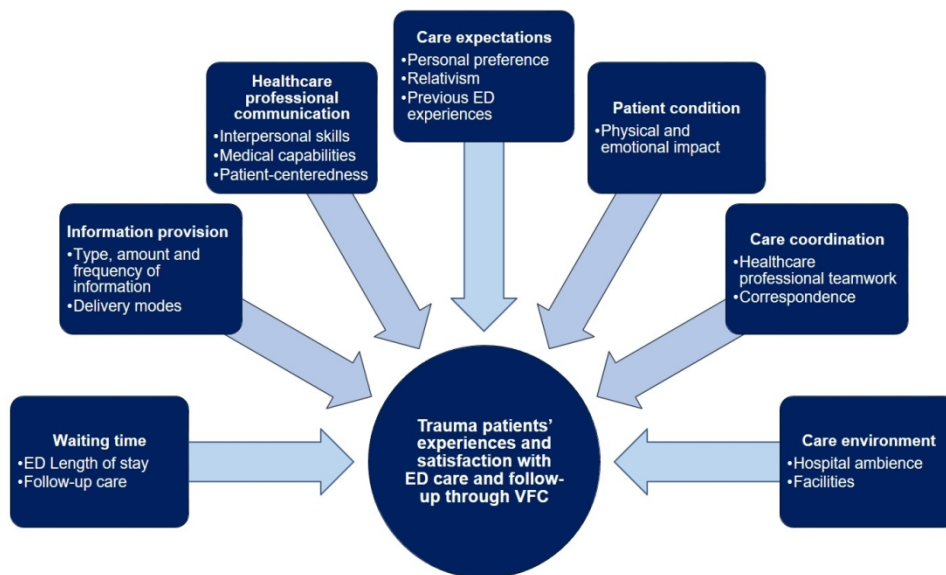


Figure 1. An overview of the identified themes with the relevant influential factors. ED = Emergency Department, VFC = Virtual Fracture Care

246x140mm (150 x 150 DPI)

No.	Topic	Item
S1	<b>Title/abstract</b> Title	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
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions
1		
2	<b>Introduction</b>	
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement
3		
S4	Purpose or research question	Purpose of the study and specific objectives or questions
4	<b>Methods</b>	
S5	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 <sup>b</sup>
5		
6		
S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability
7		
8		
S7	Context	Setting/site and salient contextual factors; rationale <sup>b</sup>
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale <sup>b</sup>
9		
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues
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S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale <sup>b</sup>
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S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study
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S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)
16		
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts
17		
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S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale <sup>b</sup>
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S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale <sup>b</sup>
21		
22	<b>Results/findings</b>	
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory
23		
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings
24		
25	<b>Discussion</b>	
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field
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S19	Limitations	Trustworthiness and limitations of findings
28	<b>Other</b>	
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed
29		
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting
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The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and best practices from the qualitative research, including grounded theory, phenomenology, and case study, and consulting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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.

## Topic list

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- How did you end up at the emergency department (ED)?
  - Could you give a brief overview of how your ED visit unfolded?
  - What did you expect from your ED visit?
  - To what extent were your expectations met?
  - How would you describe the interactions with the healthcare professionals during your ED visit?
  - To what extent did you feel involved in the care during your ED visit?
  - What information did you receive during your ED visit (regarding your initial diagnosis and treatment options)?
  - How do you look back on the telephone call with the doctor the next day (regarding your definite diagnosis and treatment)?
  - If you had to give a score for your satisfaction with the received care, what score would you give (1 = least satisfied, 10 = most satisfied)?
  - Could you elaborate on this score?
  - How could this score be increased by 1 point?
  - Do you have any further improvement suggestions?
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