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ORIGINAL RESEARCH

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Quality indicators for a geriatric emergency care (GeriQ-ED) – an evidence-based delphi consensus approach to improve the care of geriatric patients in the emergency department

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Abstract

Introduction: In emergency care, geriatric requirements and risks are often not taken sufficiently into account. In addition, there are neither evidence-based recommendations nor scientifically developed quality indicators (QI) for geriatric emergency care in German emergency departments. As part of the GeriQ-ED© research project, quality indicators for geriatric emergency medicine in Germany have been developed using the QUALIFY-instruments.

Methods: Using a triangulation methodology, a) clinical experience-based quality aspects were identified and verified, b) research-based quality statements were formulated and assessed for relevance, and c) preliminary quality indicators were operationalized and evaluated in order to recommend a feasible set of final quality indicators.

Results: Initially, 41 quality statements were identified and assessed as relevant. Sixty-seven QI (33 process, 29 structure and 5 outcome indicators) were extrapolated and operationalised. In order to facilitate implementation into daily practice, the following five quality statements were defined as the GeriQ-ED© TOP 5: screening for delirium, taking a full medications history including an assessment of the indications, education of geriatric knowledge and skills to emergency staff, screening for patients with geriatric needs, and identification of patients with risk of falls/ recurrent falls.

Discussion: QIs are regarded as gold standard to measure, benchmark and improve emergency care. GeriQ-ED© QI focused on clinical experience- and research-based recommendations and describe for the first time a standard for geriatric emergency care in Germany. GeriQ-ED© TOP 5 should be implemented as a minimum standard in geriatric emergency care.

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Introduction

Every third patient admitted to prehospital emergency medicine and clinical emergency medicine is older than 65 years old [1–3]. Demographic changes have led to unique challenges faced by emergency care.

Functional decline, cognitive impairments, such as delirium or dementia, multiple comorbidities, frailty, falls and polypharmacy often result in negative health outcomes [4–8]. It is known that in geriatric emergency patients, the risk of adverse outcomes such as hospital (re) admission, institutionalisation and mortality are increased compared to younger patients [9, 10].

The American College of Emergency Physicians (ACEP), The American Geriatrics Society (AGS), the Emergency Nurses Association (ENA) and the Society for Academic Emergency Medicine (SAEM) have developed guidelines for the care of older people in the emergency department (ED) [11]. However, in Australia and Europe, there are currently no consensus on which aspects of care to be included [7, 8, 12, 13]. To bring together both disciplines, geriatrics and emergency medicine, a European curriculum in geriatric emergency medicine was developed and approved by the European Union of Medical Specialists (UEMS) [14]. Additionally, a position paper by the German Society of Emergency Medicine (DGINA), the German Society of Geriatrics (DGG), the German Society of Gerontology and Geriatrics (DGGG), the Austrian Society of Geriatrics and Gerontology (ÖGGG) and the Swiss Society for Geriatrics (SFGG) have identified the need for further research and objective quality indicators (QIs) for geriatric emergency care [15]. A recent review highlighted that “a balanced, methodologically robust set of QIs for care of older persons in the ED” is needed [16]. Well-defined QIs will enable the assessment, benchmarking, and improvement of quality of care for geriatric emergency care patients [17].

During the development of the QIs, the following quality criteria were considered: scientific character, relevance and feasibility [18].

The aim of this paper is to describe the development process of QIs for the management of geriatric emergency patients and to provide a set of structure, process and outcome QIs (GeriQ-ED®).

Methods

Triangulation methodology was applied for the development of the quality indicators, based on exploration of current evidence through a systematic literature search, and expert opinion from an interdisciplinary and inter-professional expert panel.

Action steps (Fig. 1):

- clinical experience-based quality aspects (QA) were identified and verified,
- evidence-based quality statements (QS) were formulated and assessed for relevance,
- preliminary quality indicators (QI) were operationalized and evaluated in order to recommend a feasible set of final quality indicators.

An exploratory literature review was conducted between 09/2014–10/2014 and an expert panel ($n = 11$) was established to contribute with its expertise on geriatric emergency care through a Delphi process [19]. The expert panel consisted of three emergency physicians and specially trained nurses, a geriatrician, a pharmacologist, a health economist and two participants who represented the views of older emergency patients.

At the first expert meeting (11/2014) a qualitative group discussion among the expert panel was conducted to identify relevant quality aspects of care for geriatric emergency patients. These quality aspects were evaluated using qualitative content analysis according to

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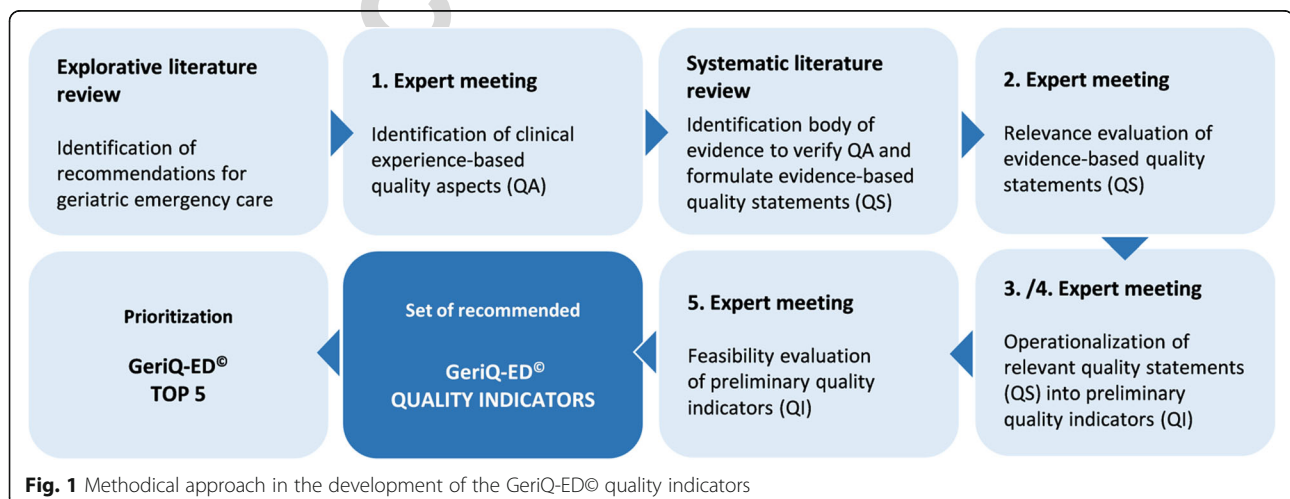


Fig. 1 Methodical approach in the development of the GeriQ-ED® quality indicators

106 Mayring supported by MAXQDA [20]. A second sys-
 107 tematic literature review (12/2014–03/2015) [search
 108 terms: `geriatric OR elderly OR senior` AND `emer-
 109 gency department`; databases: PubMed and CINAHL;
 110 inclusion criteria: published scientific papers, reviews,
 111 systematic reviews and meta-analyses between 2010
 112 and 2015] was conducted to explore evidence for the
 113 potentially relevant quality aspects identified by the
 114 expert panel. Another aim of this systematic literature
 115 review was to verify the clinical experience-based
 116 quality aspects and to formulate evidence-based qual-
 117 ity statements. During the second expert meeting (03/
 118 2015) an anonymized assessment of the relevance of
 119 all quality statements was conducted by the panel
 120 using a four-staged Likert-scale. The assessment took
 121 into consideration the importance, benefit and risk of
 122 each quality statement, based on the QUALIFY- in-
 123 strument [19]. During the operationalisation process
 124 (third and fourth expert meeting - 05/2015 and 06/
 125 2015) preliminary quality indicators (structural,
 126 process or outcome indicators) including respective
 127 reference ranges were defined for every quality state-
 128 ment that was classified as relevant. To facilitate im-
 129 plementation of the preliminary quality indicators
 130 (QIs) into daily practice, QIs were assessed for their
 131 feasibility. To find a consensus during the fifth meet-
 132 ing (12/2015), experts used the anonymized two-step
 133 approach by RAND UCLA [21]. Finally, the panel was
 134 asked to define the QIs of five quality statements they
 135 regarded to be most important. These were priori-
 136 tized as the “top five”.

137 Results

138 The explorative literature review identified defined
 139 topics of geriatric emergency care [7, 8] QIs for selected
 140 areas in the field [13] and guidelines for geriatric emer-
 141 gency departments (ED) [11]. The potentially relevant
 142 quality aspects that were discussed during the first ex-
 143 pert meeting were summarized into twelve different

144 categories: education, staff, equipment, communication/
 145 information transfer, nursing care, medical treatment,
 146 geriatric screening, and risk factors such as falls, pain,
 147 cognitive impairment, medication and care needs (in-
 148 continence and the development of pressure sores).

149 The systematic literature review of potentially rele-
 150 vant quality aspects identified nine reviews, seven sys-
 151 tematic reviews and two meta-analyses. Based on
 152 these results 41 quality statements were formulated.
 153 At the second meeting of the expert panel all 41
 154 quality statements were assessed as being relevant.
 155 The following quality statements were rated as most
 156 relevant (\bar{X} = mean value):

- screening for delirium (\bar{X} 3,93) 157
- professional training requirements for emergency 158
care staff (\bar{X} 3,90) 159
- barrier-free access to toilets with the possibility of 160
supported transfer (\bar{X} 3,90) 161
- repetitive pain assessment including appropriate use 162
of analgesics (\bar{X} 3,90) 163

164 During their third and fourth meeting the expert
 165 panel operationalized the 41 quality statements into
 166 69 QIs. Apart from the statement ‘to implement a
 167 separate waiting area for geriatric patients’, the expert
 168 panel considered all other QIs as feasible at the fifth
 169 expert meeting.

170 Finally, a set of 67 clinical experience- and evidence-
 171 based GeriQ-ED© QIs (33 process QI, 29 structural QI
 172 and 5 outcome QI), which were relevant and feasible,
 173 were developed and operationalized (English translation
 174 of GeriQ-ED© available under [additional online mater-
 175 ial](#)). In 2017 GeriQ-ED© QIs have been published and
 176 are available for free on the website of the German Soci-
 177 ety of Emergency Medicine (DGINA) [22].

178 Table 1 shows an example of a GeriQ-ED© quality in-
 179 dicator regarding cognitive impairment/ delirium: 179

T1

1.1 **Table 1** Example for GeriQ-ED©: cognitive impairment/delirium

Quality statement	Process indicator (incl. reference range of fulfilment)	Structural indicator
The presence of delirium in geriatric patients should be actively excluded during their stay in the emergency department.	Process indicator (70 – 100%) Number of performed and documented screenings for delirium ----- Number of all patients \geq 75 yrs., (excluded: patients with highest priority categorization during triage [5-stage triage instrument] and patients admitted only for administrative reasons)	A reliable delirium screening tool for the identification of (possible) delirium including a standard operating procedure has been implemented.

180 In order to facilitate implementation into daily prac-
181 tice, the following five quality statements (associated
182 with twelve quality indicators [22]) were defined as the
183 GeriQ-ED© TOP 5:

- 184 1. screening for delirium
- 185 2. taking a full medication history including an
186 assessment of the indications
- 187 3. education of geriatric knowledge and skills to
188 emergency staff
- 189 4. screening for patients with geriatric needs
- 190 5. identification of patients with risk of falls/
191 recurrent falls

192 TOP 1: screening for delirium

193 Consequences of an undetected delirium include pro-
194 gressive deterioration of functional and cognitive impair-
195 ment, and an increased risk of mortality [23, 24]. Studies
196 show a strong association between the duration of delir-
197 ium and mortality [25, 26]. Thus early detection of delir-
198 ium in the emergency care setting is essential. Currently
199 only a few screening-tools are validated and feasible in
200 daily practice in the ED, such as the Confusion Assess-
201 ment Method (CAM), the modified CAM-ED (mCAM-
202 ED) [27, 28] and the 4-AT [29].

203 According to GeriQ-ED©, a standardized screening of
204 delirium is recommended using a validated instrument
205 that is feasible in the department settings. Although the
206 exact timing of the screening in the emergency care
207 process was not defined by the expert panel, delirium
208 should be screened at the earliest time that is feasible in
209 the ED management of the patient. In patients directly
210 discharged from the ED, screening should be conducted
211 prior to discharge. In addition, GeriQ-ED© recommends
212 the implementation of a standardized management for pa-
213 tients at risk of delirium or patients with delirium includ-
214 ing the documentation of risk factors as well as initial
215 management of risk reduction as feasible in the ED [22].

216 TOP 2: medication history including indications

217 Polypharmacy is common among older adults and is as-
218 sociated with an increased risk of adverse outcomes such
219 as adverse drug reactions or medication errors. Adverse
220 drug events (ADR) are a major cause of ED visits among
221 older people [8, 30–32]. Nevertheless, most ADR are not
222 detected. Studies have shown that up to 60% of all ADR
223 are potentially avoidable [33]. Special attention should
224 be given to the intake of anticoagulants, benzodiazep-
225 ines, non-steroidal anti-inflammatory drugs, diuretics
226 and antidepressants. These classes of drugs have in
227 many cases been associated with complaints from older
228 people who have been admitted to ED. [32, 34–37].

229 Good clinical practice for the detection and prevention
230 of ADRs in vulnerable patients include a detailed

documentation and regular review of prescribed as well 231
as over-the-counter medication by using a standardized 232
medication reconciliation [38]. 233

GeriQ-ED© recommends the implementation of a 234
comprehensive medication management, including a 235
detailed documentation of the current medication as 236
well as a possible indication for each medication. 237
Medication history and possible missing information 238
on current medication should also be documented in 239
the ED [22]. 240

TOP 3: staff education on geriatric knowledge and skills 241

Staff education level affects clinical outcomes in the 242
emergency management [39]. In 2015 the Geriatric 243
Section of the European Society for Emergency Medi- 244
cine (EUSEM) together with the European Geriatric 245
Medicine Society (EUGMS) established a joint task 246
force to develop a curriculum for the care of older 247
emergency patients (European Taskforce on Geriatric 248
Emergency Medicine, ETFGEM). The aim was to out- 249
line relevant competencies in the care of older people, 250
especially those with frailty. The curriculum incorpo- 251
rates knowledge on the physiology of ageing, common 252
and atypical complaints, and the identification of 253
geriatric syndromes or psychiatric needs of geriatric 254
patients [14]. 255

GeriQ-ED© confirms the need for an improvement in 256
relevant competencies (knowledge and skills) of staff 257
members who are involved in the care of older emer- 258
gency patients and recommends for least 60% of the ED 259
staff (physicians and nurses) the participation in at least 260
one special geriatric training every year [22]. 261

TOP 4: screening for patients with geriatric needs 262

A recent meta-analysis showed that risk stratification of 263
geriatric emergency patients is strongly limited by the 264
lack of feasible and validated instruments. Existing in- 265
struments designed for risk stratification of older ED pa- 266
tients do not distinguish precisely between high- or low- 267
risk groups [40]. However, as long as no better screening 268
instruments are developed, it is recommended to use 269
established and validated instruments [41]. 270

GeriQ-ED© proposes the use one of the currently rec- 271
ommended evidence-based screening-tools in the ED to 272
identify geriatric needs for action. Comprehensive geri- 273
atric assessment and extrapolated management have been 274
shown to improve the outcome of older multimorbid 275
people [42]. Further, GeriQ-ED© recommends a stan- 276
dardized implementation of management including 277
screening of geriatric needs, and accurate documentation 278
and information transfer. The timing to screen for geri- 279
atric needs was not defined [22]. 280

281 TOP 5: identification of patients with risk of falls/ 282 recurrent falls

283 Appropriate evaluation of a fallen patient not only im-
284 plies a thorough assessment for traumatic injuries, but
285 also an assessment of potential causes and a stratifica-
286 tion of future risk of falling [43, 44]. A proper assess-
287 ment often requires a multidisciplinary team-approach.
288 Currently no specific tools are recommended for the
289 identification of potential risk factors [11]. The German
290 Expert's Standard for Fall and Fracture Prevention rec-
291 ommends an evaluation of person-, medication- and
292 environmental-related risk factors such as fall history,
293 the use of walking aids, depression, cognitive impair-
294 ment and the long-term use of more than six different
295 drugs [45].

296 GeriQ-ED© recommends the assessment and docu-
297 mentation of risk factors for falling during patient's
298 stay in the ED. The corresponding quality indicator
299 recommends the documentation of >80% of all pa-
300 tient cases in ED patients older than 70 years. Fur-
301 thermore, it is recommended that every year more
302 than 80% of the emergency nurses are trained on risk
303 factors for falls [22].

304 Discussion

305 High-quality geriatric emergency care is needed to en-
306 sure patient safety for this high-risk group. QIs are
307 regarded as gold standard to measure, benchmark and
308 improve emergency care. GeriQ-ED© focused on clinical
309 experience and evidence-based recommendations and
310 addressed the knowledge gap in this area. The proposed
311 set of 67 GeriQ-ED© QIs serves as a guidance for geri-
312 atric emergency care to ensure quality of care [7, 8, 46]
313 and meets the recommendations made by the German
314 position paper. For the first time QIs were developed
315 that cover comprehensive geriatric emergency care and
316 not only selected syndromes or fields of interest among
317 geriatric emergency patients [13, 25, 47]. The operatio-
318 nalisation of quality statements into QIs enables an inte-
319 gration of them in existing documentation systems. The
320 classification of quality aspects into twelve categories fa-
321 cilitates a thematic selection for special nursing or med-
322 ical care issues.

323 In order to facilitate the implementation of QIs for
324 older patient's emergency care, the expert panel defined
325 the top 5 out of the assigned 67 QIs.

326 Implications for emergency care

327 GeriQ-ED© provide a set of 67 QIs including 33 process,
328 29 structure and 5 outcome indicators. They are
329 intended as a framework for the provision of high qual-
330 ity geriatric emergency medicine adapted to the German
331 emergency care. The QIs are intended to give the oppor-
332 tunity to assess own geriatric emergency care and to

benchmark with other EDs. The QIs also give the oppor- 333
tunity to set individual goals for quality improvement in 334
geriatric emergency care and to document the improve- 335
ment accordingly. 336

To implement the 67 GeriQ-ED© QIs in the emer- 337
gency care setting, further structural adaptations will be 338
necessary. Individualised care of geriatric patients in 339
order to improve the quality of care will require an 340
adapted calculation of staff numbers in the EDs. Hospital 341
management, leaders of EDs as well as ED nurse man- 342
agers need to recognise that geriatric emergency patients 343
ought to be considered as a highly vulnerable patient 344
group with special needs that have to be addressed dif- 345
ferently from usual care. 346

347 Limitation

348 The process to develop the GeriQ-ED© QIs started in 349
2014. In 2017 the QIs were published in German [22]. 349
Although GeriQ-ED© QIs refer to screening-tools based 350
on current evidence (e.g. to screening for delirium or 351
identification of geriatric needs) literature review for 352
prior QIs had to be updated. In a recent systematic lit- 353
erature review (02/2020) no additional QIs were identi- 354
fied [search terms: 'emergency care' AND 'geriatrics'; 355
database: PubMed; inclusion criteria: published between 356
2015 and 2020]. 357

The majority of the 67 GeriQ-ED© QIs are process- or 358
structure indicators. The small number of outcome indi- 359
cators was discussed with an expert for QI development. 360
It was agreed that in the ED setting it is difficult to de- 361
fine outcome indicators due to the short stay of the pa- 362
tients and also the limited influence on the care received 363
beyond the ED. Therefore, the development of outcome 364
indicators in the field of emergency medicine is only 365
possible with restrictions [12]. 366

367 Conclusions

368 Demographic changes imply big challenges for the emer- 369
gency care. QIs for this special setting offer a solution to 370
improve geriatric emergency care and patient's safety. 371
For the first time, GeriQ-ED© provides a comprehensive 372
set of 67 QIs which addresses the specialist care needs of 373
older people in the ED to improve patient care. 374

The methodical approach used for the development of 375
GeriQ-ED© corresponds to required methodical quality 376
criteria. They are evidence-based, relevant and feasible. 377
GeriQ-ED© is based on a consensus among experts in 378
the field. A prospective study is planned to evaluate the 379
QIs in daily practice with a special focus on measuring 380
criteria and feasibility. 381

However, in German Eds, GeriQ-ED© TOP 5 should 382
be implemented as a minimum standard in geriatric 383
emergency care. 384

384 **Supplementary information**385 **Supplementary information** accompanies this paper at <https://doi.org/10.1186/s13049-020-00756-3>.
386Q10 **Additional file 1.**391 **Authors' contributions**

392 The author(s) read and approved the final manuscript.

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Q12 Q11 **References**

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