Screening is Not Equal to Screening - A Systematic Comparison of 6 Screenings in the Admission Process in 288 Geriatric Patients

Wolfram Weinrebe

Center for Early Rehabilitation, Campus Spital Hirslanden Bern, Switzerland

*Corresponding author
Wolfram Weinrebe, Center for Early Rehabilitation, Campus Spital Hirslanden Bern, Switzerland.

Introduction
The number of elderly patients in the emergency department is increasing annually [1-6]. At the same time, the probability for these elderly patients to be treated as inpatients is increasing [7]. Professional societies call for regulated triage [8]. According to German jurisprudence, acute inpatient care includes early rehabilitation services that are necessary in the individual case and begin at the earliest possible time [9]. For this purpose, the patient must be identified as a geriatric patient. According to the German Society of Geriatrics DGG, the geriatric patient shows geriatric multimorbidity and is of advanced age (> 75 years) or is older than 80 years and shows increased vulnerability due to age-related functional limitations and deterioration of self-help status [10]. The S1 guideline mentions level-1- assessments (standard screenings) as a tool for identifying geriatric patients [11]. In 2012, the position paper of the German Geriatrics Society (DGG), the German Geriatrics Association (BVG), and the German Gerontology and Geriatrics Society (DGGG) recommends the ISAR instrument for use as a level-1-assessment based on the evaluation, the quality of the available evidence, and the practicability [12]. This recommendation is controversial [13]. Other level-1- assessments are available, such as the historically oldest level-1- assessment LACHS from 1990 [14]. The Arbeitsgemeinschaft der Geriatrie in Bayern (AFGIB) created the AFGIB Screening in 2011 and the Baden-Württemberg Hospital Association BWKG created the Geriatrics Check in 2017 [15-17]. Most comprehensively, the ISAR score and the TRST have been studied Internationally, the Fast Trial Risk Screening Tool (TRST) is in use [18-21]. Evaluation studies are available for the Geriatric Check, the GERAMOVER, and the APOP Screening [22-24]. Scientific studies on the LACHS have been obtained from 2001 [25]. The AFGIB screening has not been evaluated to date. GERAMOVER and APOP screening are available as online emergency screenings [26,27]. The present study compared standard screenings and validated online emergency screenings in terms of outcome, recommendations and control potential in the admission situation.

Methods
Study sites: Study site I is a primary and emergency care hospital in North Rhine-Westphalia with its own emergency department with 12 beds, an internal oncology department, a pulmonology department and a large acute geriatric department (56 internal medicine beds, 156 acute geriatric beds, 40 geriatric rehabilitation beds, 10 day hospital beds). Study site II is the largest geriatric clinic in Bavaria. Here you will find an acute department of internal medicine/acute geriatrics (30 beds of internal medicine/acute geriatrics, 10 beds of palliative medicine) with its own admission unit. Spatially separated from this is the rehabilitative-geriatric department (150 beds rehabilitation (geriatric rehabilitation, AHB) with its own admission unit.

Staff Training: At both study sites, admitting nursing, medical, and case management staff received standardized training in a 7-day course. The training matrix aimed to provide structured, symptom-based clinical observation covering all major areas of clinical geriatrics. This involved intensive training in dementia, delirium, depression, locomotion, transfer, autonomy scales, nutrition, dehydration, malnutrition, dysphagia, overall condition with assessment of need for assistance, neglect, social control, geriatric care structures, and geriatric relevant DRGs. The core objective of the training was to recognize typical symptoms of disease entities with the specially imparted knowledge. The training was completed with a multiple choice exam and a pass mark of 60% correctly solved questions. The employees recorded only the observed symptoms in an available database. They did not make diagnoses or suspected diagnoses. The results of the admission process could be completed and thus the recording process "admission". Thus, both sites had identical staff training with comparable knowledge and workflows used for the intake process.

Standard Screenings
AFGIB Screening: The AFGIB screening inquires about 6 different domains (age, reduced mobility, increased need for care, and geriatric multimorbidity with 3 subdomains). If more than 2 of the 6 domains are present, they are considered indicators of a geriatric patient and prompt further diagnostic testing.

FTRST: fast Trial Risk Screening Tool is a 6 question test that asks about cognitive deterioration, difficulty walking, transfers, or recent falls, autonomy in daily living without assistance, and medication (5 or more medications). In addition, it checks if there has been an emergency room visit in the last 30 days or hospital

stay in the last 90 days and if there are concerns from a caregiver about alcohol or other substance use). TRST is 2 affirmative questions is positive.

Geriatric Check: The geriatric check is divided into 2 parts. In part A, the presence of objective criteria is tested, while part B collects the subjective assessment of the patient or his caregiver. Patients are considered likely to be geriatric according to the Geriatrics Check if one point is already scored in subarea A. In this case, the test can be terminated. In this case, the test can be terminated, which is expected to save time in clinical practice. If not, part B is performed, which examines the patient's premorbid health status directly before actu admission to the hospital. For this subsection, if at least 2 subcategories are scored positive, it is assumed that the patient is likely geriatric.

ISAR: Identification of Seniors at Risk screens for 6 domains (need for assistance, acute changes in need for assistance, hospitalizations, sensory and cognitive impairment, and multimorbidity) and is positive for scores of 2 or more.

LACHS: The LACHS screening addresses the following problem areas with 15 yes/no questions: Vision, Hearing, Mobility, Urinary and fecal continence, Nutrition, Cognitive status, Activity, Mood status, Social support, General risk factors: e.g. hospitalization, falls, multimedication, pain. The sum value of the pathological items is of secondary importance. The decisive factor is the orienting assessment of which problem areas should be further clarified in the geriatric assessment.

APOP Screening: The APOP Screening asks 9 domains (age, gender, referral type, assistance before admission, assistance with bathing/showering, within the last 6 months in the hospital, prior dementia, temporal orientation, months backward) and provides information in two domains: Indications for Functional Deterioration and Indications for Cognitive Deterioration.

Geramover: The GERAMOVER (GM) captures a total of 42 symptoms in 5 domains: Cognition, Locomotion, Autonomy, Nutrition, and Overall Condition. Performance of the GM requires specially trained staff. The areas of acute inpatient need of treatment, acute dysfunction in at least two core areas and pre-care needs are recorded and together with the observed symptoms result in the "geriatric patient according to DGG definition", the medical-traumatologic, the acute-geriatric, the rehabilitative-geriatric and the outpatient geriatric patient. In addition, automated recommendations for further treatment are given, including information on assessment activities and coding according to DRG.

The symptoms observed and recorded by the trained intake staff were mapped using the database that stored the criteria of the different standard and online screenings. The seven screenings are presented below alphabetically with creation time, availability, and cost (Table1).

Table 1: Assessments Compared (Time of Origin, Outcome, Availability, Cost)

Screening (Alphabetical)	Since/from	Available	Cost
APOP	2018 de Gelder	web-based, online	free
AFGIB	2011 AFGIB	paper-based	free
GERAMOVER	2012 Weinrebe	web-based, online	free
fTRST	2006 Kenis	paper-based	free
Geriatrie Check	2017 BWKG	paper-based	free
ISAR	1999 Mc Cusker	paper-based	free
LACHS	1990 Lachs	paper-based	free

Source: Own Presentation

Retrospective Data Selection: One hundred files of discharged patients were drawn from each of the three admission areas in a defined time window for retrospective analysis. Due to missing data, 10 patient files had to be excluded, leaving 99 patients from the internal medicine emergency department, 94 patients from the acute geriatric emergency department, and 95 patients from the rehabilitative geriatric admission. Because of the retrospective study design, there was no influence of therapy or diagnosis in the patients concerned.

Statistics: Statistical methods used for calculation were Cohen's Kappa test, McNemar test, Wilcoxon test, and T test as comparative tests in addition to simple statistical values (mean, standard deviation, median, minimum, and maximum).

Ethics Committee: A positive ethics committee vote dated 04/18/2017 for retrospective data collection was available from both sites.

Results

Of the 288 patients, 30.2% were men aged 81.9 ± 5.52 years and 69.8% were women aged 83.0 ± 5.7 years.

The groups were compared in the areas of age, number of secondary diagnoses, number of medications at admission, and Barthel index at admission differed. The groups differed significantly except for the number of medications in all areas. The emergency department of internal medicine had the highest-functioning patients (highest Barthel Index) with the most secondary diagnoses and the highest age. The most secondary diagnoses were found in acute care internal medicine and acute care geriatrics. Barthel indices were worst in acute geriatrics, with 29 out of a possible 100 points. (see Table 2) During the symptom-based intake assessment, trained staff assessed deficits in cognition, locomotion, autonomy, nutrition, and overall health.

Table 2: Age, Number of Secondary Diagnoses (n ND), Number of Medications (n Med), Barthel Index at Admission and Discharge for the Three Groups IM (Internal Medicine). AG (Acute Geriatrics) and GR (Geriatric Rehabilitation) with Mean Values (MW) and Standard Deviations (STABW), Significance Calculation

Groups		Age (years)	Diagnoses (n)	Medication (n)	Barthel Index (points)
IM (n=99)	mean	84,20	10,23	9,11	38,42
	Stand Dev.	5,671	4,746	3.443	31,165
AG (n=94)	mean	81,82	10,20	8,80	29,57
	Stand Dev.	6,096	3,488	3,621	24,436
GR (n=95)	mean	82,91	5,95	8,73	37,58
	Stand Dev.	5,379	3,099	3,334	22,156
Univariate analysis of group differences		p= 0,016	p= 0,000	n.s.	p= 0,039

Source: Own Representation

Table 3: Differences in Deficits in Cognition, Locomotion, Autonomy, Nutrition, and Overall Condition by Admission Site (Im Emergency Internal Medicine Admission, Ag Acute Geriatrics Admission, Gr Geriatric Rehabilitation Admission).

	Cognitive deficits	Locomotor deficits	Autonomy deficits	Nutritive deficits	Overall condition Deficits
all (n=288)	14,9%	49,3%	27,1%	21,5%	22,9%
IM (n=99)	17,2%	44,4%	7,1%	34,3%	0,0%
AG (n=94)	22,3%	63,8%	36,2%	21,3%	31,9%
GR (n=95)	5,3%	40,0%	38,9%	8,4%	37,9%
Asymptotic significance (two-sided)	p=0,003	p=0,002	p=0,000	p=0,000	p=0,000

Across all groups, the most prominent deficits were in locomotion (49.3%) followed by autonomy (27.1%), overall condition (22.9%), nutrition (21.5%). The last was deficits in cognition (14.9%). There were further significant differences between the three admission groups. Significantly, the most cognitive deficits were found in the admission area of the AG (22.3%), the lowest in the area of the GR (5.3%; p=0.003). Locomotor deficits were again highest in the AG (63.8%; p=0.002). Particularly striking was the very low number of autonomy disorders in IM (7.1%) versus AG/GR (36.2%/ 38.9%; p=0.000). The same differences existed in Nutrition deficits: 34.2% IM and 8.4% GR (p=0.000). And finally, in the assessment of the deficits of the overall condition Emergency Internal Medicine was no deficits (0.0%), while Autgeriatrics and Geriatric Rehabilitation showed significant proportion with deficits in this area (31.9 and 37.9%; p=0.000).

Screening Result: Geriatric Patient
The first outcome of all standard screenings is whether this is a geriatric patient. Regardless of the acute nature of the admission site (IM, AG, GR), between 85% and 97% of admission patients are identified as geriatric patients. In 78.8%, the results were identical. The GM can identify the geriatric patient according to DGG. APOP screening does not generate this information (see Table 5).

In comparison, patients identified as geriatric were objectively sicker and had more deficits (more secondary diagnoses (+1.3), more medications (+1.2), and significantly more functional disorders (+4.6).

Screening Result: Query for Geriatric Problem Areas
In a further step, the screenings were compared with regard to the query of the geriatric problem areas delirium, falls, pain, need for care (highlighted in blue). It was examined whether the screenings only asked for the presence of the diagnosis (D) or whether examinations were also made to record the diagnosis. It was also examined whether problem areas such as medication (multimedication/ polypharmacy) and previous hospitalization were queried (see Table 5).

Table 4: Identification "Geriatric Patient" (Gp) In 288 Patients with 7 Different Assessments

all (n=288)	AFGIB	APOP*	fTRST	GeriCheck	GM	ISAR	LACHS
Geriatric patient (n)	264	0	246	280	252	255	262
%	0.91	0	0.85	0.97	0.87	0.88	0.91

Source: Own Representation.

Table 5: Comparison of the Screenings with Regard to the Areas of Delirium, Falls, Pain, Care with the Query: "Does the Patient have the Diagnosis (Q)?" and the Query: "Were Examinations Performed for the Suspected Diagnosis (E)?"; Recording of the Presence of a Multi-medication, of a Previous Hospitalization; Recording of the Time Required Per Screening. *can only be Performed with Trained Personnel **Cognitive Impairment is Recorded

Screening	Delirium (Q/E)	Pain (Q/E)	Schmerz (Q/E)	Nursing needs (Q/E)	Medication	Hospital before	Time requirement (min)
AFGIB	+/-	+/-	+/-	+/-	+	+	5
APOP*	+/-**	-/-	-/-	+/-	-	+	5
FTRST	+/-	+/-	o	+/-	+	+	5
GERAMOVER*	+/+	+/+	+/-	+/+	+	+	5
GeriCheck	+/-	+/-	o	+/-	o	+	5
ISAR	o	o	o	+/-	+	+	5
LACHS	o	+/-	+/-	o	o	+	15

The AFGIB screening asks about all 6 problem areas, but only asks questions about diagnoses or presence. The FTRST queries 5 of the 6 problem areas (except pain), but only asks questions about diagnoses or presence. The Geri Check queries 5 of the 6 problem areas (except for pain), but only asks questions about diagnoses or presence. The ISAR queries 3 of the 6 areas (except for delirium, falls, pain), but only asks questions about diagnoses or presence. The LACHS queries 3 of the 6 domains (except delirium, meds, care needs), but only asks questions about diagnoses or presence. The APOP Screening queries 3 problem areas, asking questions about presence and prompting for testing. The GM inquires about all problem areas, asks questions about the diagnoses and checks the presence. Thus, on the one hand, the presence of "confusion" is queried, on the other hand, whether vigilance disorders and fluctuating course ("falls asleep again and again or dozes off", "is confused, slowed down"), acute onset ("changes have occurred acutely") or attention disorders ("cannot implement things") are present.

Screening Outcome: Recommendations and Potential for Control

AFGIB, GERAMOVER, fTRST, GERAMOVER, Geri Check, ISAR, and LACHS and, if the defined score/yes answers are reached, make a recommendation for further geriatric evaluation or/and a geriatric consultation. GERAMOVER additionally recommends certain assessments (CGA) for focus questions and generates coding recommendations. It may also recommend consideration of early rehabilitation complex therapy. GERAMOVER and APOP Screning provide clear recommendations on acute patient continuing care, management, and environment.

Screening Result: Patient Types

The AFGIB, LACHS, FTRST, GERI CHECK, and ISAR assessments do not provide further outcome differentiation. The GM screening further differentiates the found "geriatric patients" into internal geriatric patients, acute geriatric patients, and geriatric rehabilitative patients. It detected 51 patients as internal medicine patients and 41 as acute geriatric patients in the internal medicine admission setting. He did not find geriatric-rehabilitative or outpatient patients. In the acute geriatrics admission setting, GM screening identified 21 patients as internal medicine patients and 67 as acute geriatric patients. It did not find geriatric rehabilitation or outpatient lead patients. In the admission situation of geriatric rehabilitation, the GM Screening did not find any internal or acute geriatric patients, but 70 geriatric rehabilitative patients and 25 geriatric patients who could have been managed as outpatients.

Discussion

The 288 patients screened in the admission are comparable in medication number, number of diagnoses, and functional disorders, as well as in referral mode, to the patients in the emergency department presented by Huyse et al in a European study [28]. The study group at three admission sites depicted here is thus a typical representative of multimorbid patients with needs for more complex nursing interventions and case management.

Data from the German Ageing Survey (DEAS) demonstrate that the proportion of multimorbid patients (2 or more diseases) increases from 65.5% in the 55- to 69-year-old group to 82.1% in the 70- to 85-year-old group [29]. However, there are no consistent data on the prevalence of multimorbidity. It is common in the elderly population and is a strong predictor of adverse disease outcomes leading to loss of independence and quality of life, resulting in adjustment of outpatient care needs [30]. Geriatric-typical multimorbidity is characterized by the combination of multimorbidity with different feature complexes in the sense of a geriatric syndrome. This includes an increased risk of disease complications [31].

According to Hoogerduijn et al, screenings in this group are clearly indicated to select patients at increased risk for functional decline [32]. In the comparative study, we demonstrated that screenings can, in principle, test the focus areas (loss of autonomy, multimoribidity, need for geriatric treatment , delirium, falls, pain, and need for nursing care) when identifying geriatric patients or finding those in need of geriatric action [33].

The result for the structurally very different assessments used here is clear: they identify about 90% of all screened patients as "geriatric patients" - and all screenings query the required, geriatric focus areas.

The ISAR, recommended by the DGG, also pushes in this direction with its results: according to it, 88% are geriatric. And the ISAR speaks "of high risk patient". Thus, in 288 patients after screening, the study identified about 260 multimorbid, "geriatric" or "high risk patients" for whom a consil or comprehensive geriatric assessemnt (CGA) is required, which is indicated by Ellis et al 2014 in his Cochrane publication with better autonomy scores and higher survival times [34]. Of course, the question arises how a CGA can be realized in 260 elderly patients. Is there a need for a CGA team in the field or are there differences between the groups that might give us clues for further selection?

Close analysis of the three different groups of internal medicine, acute geriatrics, and geriatric rehabilitation demonstrates (without CGA) that the three groups studied have highly significant differences that were not seen or assessed with the standard screenings. Whether it is the number of secondary diagnoses or the level of the Barthel Index, whether it is the much higher autonomy and better overall condition or the much more frequent disturbances of nutrition in the emergency room of the internal medicine department.

Further, this comparative study shows that standard screening focuses only on geriatric symptoms and cannot be expected to objectify existing acute illness or acute dysfunction. There are several reasons for this. First, the use of the assessemnts, which appear self-explanatory, is initially done without supervision, feedback, or training. That may go for an ISAR score that asks four specific questions. But it certainly doesn't work for a screening that openly asks about the existence of diagnoses. The question, "Does the patient have delirium?" implies in responders that they know what delirium is and how to detect it. Active and professional knowledge about delirium and dementia is known to be poor [35]. The likelihood of distinguishing delirium from dementia or separating the two in an emergency department by default has been shown to be low. Accordingly, answers to such a question will be a mixture of bias and partial or ignorance.

Second, there are no scaling effects in the identification process, only yes/no answers. This makes detailed statements impossible. And finally, many symptoms of geriatric patients in emergency departments are nonspecific and unclear [36,37]. As this patient group increases in the emergency department, such "unclear disorders" are to be expected to a large extent in the admission situation.

The GERAMOVER screening verifies a need for acute medical treatment and records acute dysfunctions qualitatively and quantitatively.

Several studies have looked at geriatric patients in the emergency department and various settings [4,38]. Carpenter et al have systematically pursued the question of how to select or detect, as early as possible, those patients in this group who have the highest need for multidisciplinary care [39]. He has made it clear that real change is needed to achieve this. In addition to the quality indicators that need to be redefined, a system redesign of the emergency department in particular needs to be reconsidered so that urgent issues of delirium, multimedication, ambulatory care needs, and falls assessments can be integrated, as the German Society for Interdisciplinary Emergency Medicine (DGINA) also called for in 2016 for delirium, pain, falls, and polypharmacy with GeriQ [40].

Time in emergency departments is precious and scarce, so rapid screenings make sense. In the comparison of Level 1 assessments, except for LACHS, about 5 minutes is reported for screening duration, which is actually good, but in combination with the nonspecific outcome "geriatric patient" still reduces the value of the intervention.

One way out of this impasse for unclear geriatric symptoms is to implement a structured observation unit [41,42]. It also helps with structured continuing care and optimized therapy options for geriatric patients. Social care issues are as important here as medical content.

The GEDI study shows that a combination of observation, nursing knowledge, and telephone follow-up with calls also yields controllable outcomes in the outpatient sector [43].

Important questions in the admission situation of geriatric patients are whether the patient needs acute inpatient internal medicine or acute geriatric care at all, whether critical suspected diagnoses such as delirium, attention deficit disorders, transfer disorders, or nutritional disorders are present that significantly increase the risk of secondary complications - they should be answered.

The question of whether a critical care situation exists is also of central importance and helps to determine whether the patient can remain as an outpatient and which support services might have to be planned.

In addition to the identification of geriatric patients in the first step, the early control, i.e. the management of these complex patients is of decisive importance, so that adequate and best possible care can be provided to these geriatric patients as early as possible [17,44]. The study addressed this question in the second step and tested whether assessments can be used to manage patients. The answer is clearly no.

For the future of care of geriatric patients in the emergency department, a combination of geriatric knowledge, defined quality criteria and structured observation in an environment made available for this purpose and a clarification of acute geriatric or outpatient continuation will be decisive. The diagnosis of a geriatric patient is certainly a building block, but it is only that. Since they are in principle intended to trigger further geriatric assessments, which have been proven to be effective and important, they have their place.

With the help of such observation standards, more specific assessments and the gold standard "geriatric consultation" with a geriatrician, a quick and effective decision could be made in such a pre-selection as to what should happen to the "geriatric patient" or how he should be managed or controlled.

Further studies in a larger patient population would need to further evaluate these management capabilities.

References
1. Pines JM, Mullins PM, Cooper JK, Feng LB, Roth KE (2013) National Trends in Emergency Dept. Use, Care Patterns, and Quality of Care of Older Adults in the US https://doi.org/10.1111/jgs.12072.
2. Pförringer D, Pflüger P, Waehlert l, Andreas B , Fritz S, et al. (2019) Emergency room as primary point of access in the German healthcare system : Objective evaluation and interview of motivation for ER entrance of 235 ER patients in a German hospital. Eur J Trauma Emerg Surg 47: 453-460.

3. Ukkonen M, Jämsen E, Zeitlin R (2019) Emergency department visits in older patients: a population-based survey. BMC Emerg Med 19: 20.

4. Devriendt E, Brauwer IDE, Vandersaenen, Pieter Heeren, Simon Conroy, et al. (2017) Geriatric support in the emergency department: a national survey in Belgium. BMC Geriatr 17: 68.

5. Bielinska AM, Archer S, Obanobi A, Gehan Soosaipillai, Julia Riley, et al. (2021) Advance care planning in older hospitalised patients following an emergency admission: A mixed methods study. PLoS One https://doi.org/10.1371/journal.pone.0273894.

6. Vilpert S, Ruedin HJ, Trueb, Monod-zorzi S, Yersin B, et al. (2013) Emergency department use by oldest-old patients from 2005 to 2010 in a Swiss university hospital. BMC Health Serv Res 13: 344.

7. Schwab C, Hindlet P, Sabatier B, Fernandez C, Korb-savoldelli V (2019) Risk scores identifying elderly inpatients at risk of 30-day unplanned readmission and accident and emergency department visit: a systematic review. BMJ Open 9: e028302.

8. Christ m, Grossmann F, Winter d, Bingisser R, Platz E (2010) Modern triage in the emergency department. Dtsch Arztebl Int 107: 892-898.

9. Federal office of justice 1988. sgb v §39 hospital treatment: s2477

10. dgg. definition of the geriatric patient: 1.

11. krupp S, Frohnhofe H (2019) s1 guideline "geriatric assessment level 2: 1-66.

12. Thiem U, Greuel Hw, Reingräber A, P Koch-Gwinner, R Püllen, et al. (2012) Positionspapier zur Identifizierung geriatrischer Patienten in Notaufnahmen in Deutschland: consensus for the identification of geriatric patients in the emergency care setting in Germany. Z Gerontol Geriatr 45: 310-314.

13. Weinrebe W, Schiefer Y, weckmüller K, RJ Schulz, S Rupp, et al. (2019) Does the identification of seniors at risk (ISAR) score effectively select geriatric patients on emergency admission? Aging Clin Exp Res 31: 1839-1842.

14. Lachs MS, Feinstein AR, Cooney LM, MA Drickamer, RA Marottoli, et al. (1990) A simple procedure for general screening for functional disability in elderly patients. Ann Intern Med 112: 699-706.

15. Working group for geriatrics in Bavaria. afgib geriatric screening 2011: 1.

16. Gerhard T, Mayer K, Braisch U, Dhayana D, Jamour M, et al. (2021) Validierung des Geriatrie-Checks zur Identifikation geriatrischer Patienten in der Notaufnahme. Z Gerontol Geriatr 54: 106-112.

17. Wallis M, Marsden E, Taylor A, Alison Craswell, Marc Broadbent, et al. (2018) The Geriatric Emergency Department Intervention model of care: a pragmatic trial. BMC Geriatr 18: 297.

18. Devriendt E, Deschodt M, Delaere M, Flamaing J, Sabbe M, et al. (2018) Does the get up and go test improve predictive accuracy of the Triage Risk Screening Tool or Rowland questionnaire in older patients admitted to the emergency department? Eur J Emerg Med 25: 46-52.

19. slankamenac K, haberkorn G, meyer O, bischoff-ferrari ha, keller di (2018) Prediction of Emergency Department Re-Visits in Older Patients by the Identification of Senior at Risk (ISAR) Screening. Geriatrics (Basel) 3: 33.

20. Meldon Sw (2003) A Brief Risk-stratification Tool to Predict Repeat Emergency Department Visits and Hospitalizationsin Older Patients Discharged from the Emergency Department. Academic Emergency Medicine 10: 224-232.

21. Scharf AC, Gronewold J, Dahlmann C, Jeanina Schlitzer, Andreas Kribben, et al. (2019) Health outcome of older hospitalized patients in internal medicine environments evaluated by Identification of Seniors at Risk (ISAR) screening and geriatric assessment. BMC Geriatr 19: 221.

22. Gerhard T, Mayer K, Braisch U, Dhayana Dallmeier, Michael Jamour, et al. (2020) Validierung des Geriatrie-Checks zur Identifikation geriatrischer Patienten in der Notaufnahme. Z Gerontol Geriatr 54: 106-112.

23. Kapteina K, Weinrebe W, Karaman M, Mohaupt M (2022) Prospective Emergency Screening Tool Identifies Functional Problems in Geriatric Patients on Admission -: Findings of a Validation Study. Journal for Gerontology and Geriatric research 4.

24. Gelder JDE, Lucke JA, Blomaard LC, Booijen AM, Fogteloo AJ, et al. (2018) Optimization of the APOP screener to predict functional decline or mortality in older emergency department patients: Cross-validation in four prospective cohorts. Exp Gerontol 110: 253-259.

25. Nikolaus T (2001) Das geriatrische Assessment. Aktueller Erkenntnisstand hinsichtlich der Eignungskriterien (Diskrimination, Prädiktion, Evaluation, Praktikabilität). Z Gerontol Geriatr. 34 suppl 1: 36-42.

26. Weinrebe W (2016) Geramover Screening: Hintergründe Entwicklungen Und Fakten. http://www.geramover.de/wp-content/uploads/aufbau.pdf.

27. The Money Apop Screening (2018) https://screener.apop.eu/.

28. Huyse FJ, De Jonge P, Slaets JP, Herzog T, lobo A, et al. (2001) Compri - An Instrument to Detect Patients with Complex Care Needs. Psychosomatics 42: 222-228.

29. German center for geriatric issues (2015) Dza: information service on age issues (ida) - issue 06, november/december.

30. ScheidtNave C, Richter S, Fuchs J, Kuhlmey A (2010) Herausforderungen an die Gesundheitsforschung für eine alternde Gesellschaft am Beispiel "Multimorbidität". Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz 53: 441-450.

31. Fabbri E, Zoli M, Gonzalez-freire M, Salive ME, Studenski SA, et al. (2015) Aging and Multimorbidity: New Tasks, Priorities, and Frontiers for Integrated Gerontological and Clinical Research. J Am Med Dir Assoc 16: 640-647.

32. Hoogerduijn JG, Buurman BM, Korevaar JC, Grobbee DE, Rooij se DE, et al. (2012) The prediction of functional decline in older hospitalised patients. Age Ageing 41: 381-387.

33. Seematter bagnoud, Büla C (2018) Brief assessments and screening for geriatric conditions in older primary care patients: a pragmatic approach. Public Health Rev 39: 8.

34. Ellis G, Marshall T, Ritchie C (2014) Comprehensive geriatric assessment in the emergency department. Clin Interv Aging 9: 2033-2043.

35. Shenkin SD, Fox C, Godfrey M, Najma Siddiqi, Steve Goodacre, et al. (2019) Delirium detection in older acute medical inpatients: a multicentre prospective comparative diagnostic test accuracy study of the 4AT and the confusion assessment method. BMC Med 17: 138.

36. Salvi F, Morichi V, Grilli A, Giorgi R, Tommaso GDE, et al. (2007) The elderly in the emergency department: a critical review of problems and solutions. Intern Emerg Med 4: 292-301.

37. Gray LC, Peel NM, Costa AP, Ellen Burkett, Aparajit B Dey, et al. (2013) Profiles of older patients in the emergency department: findings from the interRAI Multinational Emergency Department Study. Ann Emerg Med 62: 467-474.

38. Sinha SK, Bessman ES, Flomenbaum N, Leff B (2011) A systematic review and qualitative analysis to inform the

development of a new emergency department-based geriatric case management model. Ann Emerg Med 57: 672-682.

39. Carpenter CR, Shelton E, Fowler S, Brian Suffoletto, Timothy F Platts-Mills, et al. (2015) Risk factors and screening instruments to predict adverse outcomes for undifferentiated older emergency department patients: a systematic review and meta-analysis. Acad Emerg Med 22: 1-21.

40. Schuster S, Singler K, Lim S, Machner M, Döbler K, et al. (2020) 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. Scand J Trauma Resusc Emerg Med 28: 68.

41. Heeren P, Hendrikx A, Ceyssens J, Els Devriendt, Mieke Deschodt, et al. (2021) Structure and processes of emergency observation units with a geriatric focus: a scoping review. BMC Geriatr 21: 95.

42. Southerland LT, Vargas AJ, Nagaraj L, Gure TR, Caterino JM (2018) An Emergency Department Observation Unit Is a Feasible Setting for Multidisciplinary Geriatric Assessments in Compliance With the Geriatric Emergency Department Guidelines. Acad Emerg Med 25: 76-82.

43. Morse L, Xiong L, Ramirez zohfeld V, Dresden S, lindquist LA (2019) Tele-Follow-Up of Older Adult Patients from the Geriatric Emergency Department Innovation (GEDI) Program. Geriatrics (Basel) 4: 18.

44. Dent E, Morley JE, Cruz-jentoft AJ, L Woodhouse, L Rodríguez-Mañas, et al. (2019) International Clinical Practice Guidelines for Identification and Management. J Nutr Health Aging 23: 771-787.