PRACTICE GUIDELINE

Comprehensive Geriatric Assessment (CGA) in oncological patients

Version: 20 July 2011

This guideline was established under the auspices of the educational committee of SIOG. The guidelines are available at the SIOG website, and are meant to become an 'uptodate' system where health care workers can add new evidence or information if required. All information or questions can be addressed to SIOG at the email address siog@genolier.net

Concept: **Cindy Kenis** and **Hans Wildiers**

Coworkers: **Ulrich Wedding**, **Martine Extermann**, **Koen Milisen**, **Johan Flamaing**

Content

1 Geriatric oncology

A Comprehensive Geriatric Assessment (CGA) is the most appropriate method to obtain a view on the general health status of an older individuals (including social situation, functionality, falls, cognitive and mood changes, nutritional status, …). It completes history taking and physical examination. It was developed in geriatric medicine as diagnostic tool, as tool to plan care and interventions and as tool to assess quality of care.

A CGA allows to detect multiple problems that are often unknown for the treating oncologist. It allows also to organize specific interventions where needed.

1.1 Comprehensive Geriatric Assessment

The definition of CGA according to the Consensus Conference, supported by the National Institute of Aging in 1989, states the following:

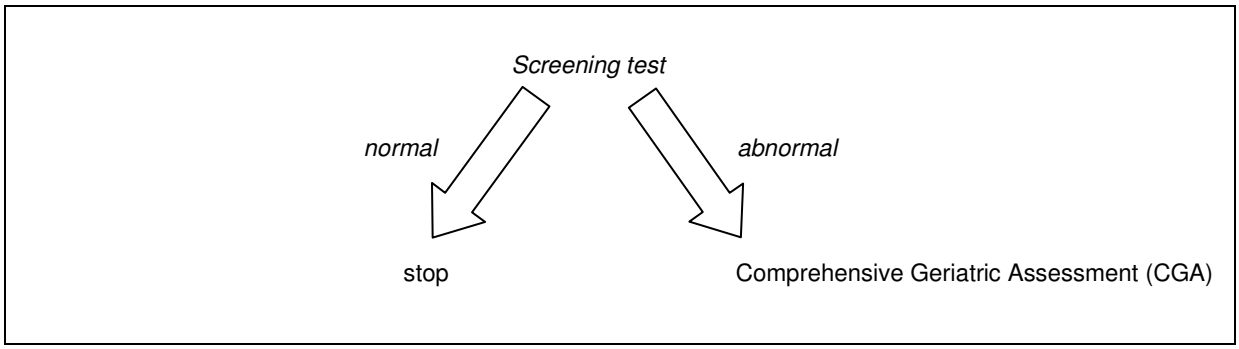
"*CGA is a multidimensional, interdisciplinary patient evaluation that leads to the identification of patient's problems*".

In other words, CGA is characterized by a *multidimensional evaluation of the general health status but also functional, cognitive, social and psychological parameters of older persons.*

1.2 Methodology

A screening instrument can be used initially for risk detection. If the screening indicates the presence of a geriatric risk profile, a CGA can be performed. This 'two-step' approach is recommended in the guidelines of the National Comprehensive Cancer Network (NCCN) (see figure 1).

Figure 1: 2-step approach in geriatric assessment



1.3 Content of a CGA

The CGA consists of different evaluation instruments and is generally performed by interview or by performance tests.

During this contact (+/- 30 to 45 minutes), several core domains are evaluated:

- Demographic data
  - Marital status
  - Living situation
  - Professional home care
  - Level of education
- Functionality including falls
- Cognitive status
- Depression
- Nutritional status

Other relevant domains than can be evaluated are listed below:

- Pain
- Fatigue
- Quality of life
- …

Comorbidity and polypharmacy are also considered to be part of a CGA, but are generally available in the medical file of the patient. However for quantification of comorbidity, validated scales can be used (see further).

2 Evaluation instruments: screening tools

2.1 Overview

Table 1:

DOMAIN	INSTRUMENT
Screening tool	- G8 - Flemish version of the Triage Risk Screening Tool (TRST) - Groninger Frailty Indicator (GFI) - Vulnerable Elders Survey – 13 (VES-13) - Senior Adult Oncology Program 2 (SAOP2) - abbreviated Comprehensive Geriatric Assessment (aCGA)

2.2 G8

Instrument	G8
Abbreviation	G8
Author	Soubeyran et al.
Subject	Screening
Goal	Detection of a geriatric risk profile
Population	Older Cancer Patients
Taken by	Health care professional
Number of items	8
Participation of the patient	Yes
Reference	Soubeyran P, Bellera CA, Gregoire F, et al. Validation of a screening test for elderly patients in oncology. J Clin Oncol 2008; 26(suppl 20): abstr 20568. Soubeyran P, Bellera C, Goyard J ,et al. Validation of the G8 screening tool in geriatric oncology: the ONCODAGE project. J Clin Oncol 2011; abstr 9001.
Instrument can be found at:	www.siog.org www.eortc.be/home/NESG/history.html
Permission required	No
Translations available	- English - French - Dutch - German - …

Goal

The G8 is used for the identification of older persons with cancer with a geriatric risk profile where a full CGA is required.

Target population

The G8 is meant for older persons.

Description

The G8 is a screening instrument based on the MNA, with addition of an age related component.

Method

- Interview

Scoring

- Total score = 17

- Range total score = 0-17
- Cut-off: ≤ 14

Interpretation

- 0 - 14 = presence of a geriatric risk profile
- > 14 = absence of a geriatric risk profile

Instructions

1. Indicate the correct answer for each question.
2. Make a sum of all scores and calculate the total score.

Remarks

1. Validation

The G8 has been prospectively validated in the Oncodage study. The cutoff of 14 or lower was confirmed as the optimal threshold, with a sensitivity of 76,6% and a specificity of 64,4%. Compared to the VES13, the G8 was more sensitive (76.6% versus 68.7%) although its specificity was inferior (64.4% versus 74.3%).

2. User friendliness.

It takes about 2 to 3 minutes to complete the screening.

References

1. Soubeyran P, Bellera CA, Gregoire F, et al. Validation of a screening test for elderly patients in oncology. J Clin Oncol 2008; 26(suppl 20): abstr 20568.
2. Soubeyran P, Bellera C, Goyard J ,et al. Validation of the G8 screening tool in geriatric oncology: the ONCODAGE project. J Clin Oncol 2011; abstr 9001.

Example

G8			
	Items	**Possible answers**	**Score**
A	Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?	**0** = severe reduction in food intake **1** = moderate reduction in food intake **2** = normal food intake	……...
B	Weight loss during the last 3 months?	**0** = weight loss >3kg **1** = does not know **2** = weight loss between 1 and 3 kg **3** = no weight loss	……...
C	Mobility	**0** = bed or chair bound **1** = able to get out of bed/chair but does not go out **2** = goes out	……...
E	Neuropsychological problems	**0** = severe dementia or depression **1** = mild dementia or depression **2** = no psychological problems	……...
F	Body Mass Index (weight in kg/height in m^2)	**0** = BMI <19 **1** = 19 ≤BMI < 21 **2** = 21 ≤ BMI < 23 **3** = BMI ≥23	……...
H	Takes more than 3 medications per day	**0** = yes **1** = no	……...
P	In comparison with other people of the same age, how does the patient consider his/her health status?	**0,0** = not as good **0,5** = does not know **1,0** = as good **2,0** = better	……...
	Age	**0** = >85 **1** = 80-85 **2** = <80	……...
	Total score (0-17)		……...

2.3 Flemish version of the Triage Risk Screening Tool

Instrument	Flemish version of the Triage Risk Screening Tool
Abbreviation	Flemish version of the TRST
Author	Deschodt et al.
Subject	Screening
Goal	Detection of a geriatric risk profile
Population	Older Patients / Older Cancer Patients
Taken by	Health care professional
Number of items	5
Participation of the patient	Yes
Reference	Deschodt, M., Wellens, N., Braes, T., De Vuyst, A., Boonen, S., Flamaing, J., Moons, P., Milisen, K. (2011). Prediction of Functional Decline in Older Hospitalized Patients: a Comparative Multicentre Study of Three Screening Tools. Aging Clinical and Experimental Research (In press).
Instrument can be found at:	/
Permission required	No
Translations available	- Dutch - English

Goal

The Flemish version of the TRST is used for the identification of older persons with a geriatric risk profile where a full CGA is required.

Target population

The Flemish version of the TRST is meant for older persons.

Description

The Flemish version of the TRST is a translation and adaptation of the Triage Risk Screening Tool (Meldon et al., 2003) and includes the following 5 items:

1. Presence of cognitive decline
2. Living alone or no help from family / partner
3. Reduced mobility or fallen in the past 6 months
4. Hospitalized in the past 3 months
5. Polypharmacy (≥ 5 different medications)

Method

- Interview

Scoring

- Total score = 6
- Range total score = 0-6

- Cut-off:
    - ≥ 1 (in oncology)
    - ≥ 2 (in geriatrics)

Interpretation

- Oncology
    - Score 0: absence of a geriatric risk profile
    - Score ≥ 1: presence of a geriatric risk profile
- Geriatrics
    - Score 0 – 1: absence of a geriatric risk profile
    - Score ≥ 2: presence of a geriatric risk profile

Instructions

- Circle the right answer on the different questions.
- Count total score by counting the scores of the different questions.

Remarks

1. User friendliness

It takes less than 1 minute to complete the screening tool.

References

1. Braes, T., Flamaing, J., Sterckx, W., Lipkens, P., Sabbe, M., de Rooij, S., Schuurmans, M., Moons, P., Milisen, K. (2009). Predicting the risk of functional decline in older patients admitted to the hospital: a comparison of three screening instruments. *Age and Ageing, 38* (5), 600-603.

2. Braes T, Milisen K, Vander Elst B, Van Doninck E, Pelemans W & Flamaing J. Identificatie van geriatrische patiënten opgenomen op een niet-geriatrische afdeling: het Geriatrisch Risicoprofiel Instrument (GRP). 28th Winter-Meeting, Belgian Association for Gerontology and Geriatrics. 4-5 March 2005, Oostende, Belgium.

3. Braes, T., Moons, P., Lipkens, P., Sterckx, W., Sabbe, M., Flamaing, J., Boonen, S., Milisen, K. (2010). Screening for risk of unplanned readmission in older patients admitted to the hospital: predictive accuracy of three instruments. *Aging Clinical and Experimental Research, 22*, 345-351.

4. Deschodt, M., Wellens, N., Braes, T., De Vuyst, A., Boonen, S., Flamaing, J., Moons, P., Milisen, K. (2011). Prediction of Functional Decline in Older Hospitalized Patients: a Comparative Multicentre Study of Three Screening Tools. Aging Clinical and Experimental Research (In press).

5. Kenis, C., Schuermans, H., Van Cutsem, E., Verhoef, G., Vansteenkiste, J., Vergote, I., Schöffski, P., Milisen, K., Flamaing, J., & Wildiers, H. (2009). Screening for a geriatric risk profile in older cancer patients: a comparative study of the predictive validity of three screening tools. Critical Reviews in Oncology/Hematology, 72(suppl.1), 22.

6. Meldon SW, Mion LC, Palmer RM, Drew BL, Connor JT, Lewicki LJ, Bass DM, & Emerman CL. A brief risk-stratification tool to predict repeat emergency department visits and hospitalizations in older patients discharged from the emergency department. Academic Emergency Medicine 2003; 10(3):224-232

Example

Flemish version of the TRST		
RISK	**YES**	**NO**
1. Presence of cognitive decline	**2**	**0**
2. Living alone OR no help from family / partner	**1**	**0**
3. Reduced mobility OR fallen in the past 6 months	**1**	**0**
4. Hospitalized in the past 3 months	**1**	**0**
5. Polypharmacy: ≥ 5 medications	**1**	**0**
Total score:	**.....**	

2.4 Groninger Frailty Indicator

Instrument	Groninger Frailty Indicator
Abbreviation	GFI
Author	Slaets JP.
Subject	Screening
Goal	Detection of a geriatric risk profile
Population	Older persons
Taken by	Health care professional
Number of items	15
Participation of the patient	Yes
Reference	Slaets JP. Vulnerability in the elderly: frailty. Medical Clinics of North America 2006, 90:593-601.
Instrument can be found at:	http://www.nardisteverink.nl/materials/GFI_lijst.pdf
Permission required	No
Translations available	- English - Dutch - …

Goal

The GFI is used for the identification of older persons with a geriatric risk profile where a full CGA is required.

Target population

The GFI is meant for older persons.

Description

The GFI is a short, easy to administer 15-item screening tool to determine a person's level of frailty, including psycho-social components.

It screens for diminished abilities and resources in 4 domains of functioning:

- physical (mobility functions, multiple health problems, physical fatigue, vision, hearing)
- cognitive (cognitive functioning)
- social (emotional isolation)
- psychological (depressed mood and feelings of anxiety)

Method

- Interrogation of the patient / proxy

Scoring

- Total score = 15
- Range total score = 0-15
- Cut-off: ≥ 4

Interpretation

- Score 0-3 = absence of a geriatric risk profile
- Score 4-15 = presence of a geriatric risk profile

Instructions

- Circle the answer to the question.
- Use the following scoring rules for counting total score:

- Question 1 to 4	independent (yes) =0	dependent (no) =1
- Question 5	0-6= 1	7-10 = 0
- Question 6 to 9	yes= 1	no = 0
- Question 10	no and sometimes = 0	yes = 1
- Question 11 to 15	no = 0	sometimes and yes =1

Remarks

/

References

1. Slaets JP. Vulnerability in the elderly: frailty. Medical Clinics of North America 2006, 90:593-601.

2. Steverink, N., Slaets, J.P.J., Schuurmans, H., & Lis, M. van (2001). Measuring frailty: development and testing of the Groningen Frailty Indicator (GFI). *The Gerontologist, 41*, special issue 1, 236-237.

3. Schuurmans, H., Steverink, N., Lindenberg, S., Frieswijk, N., & Slaets, J.P.J. (2004). Old or frail: what tells us more? *Journals of Gerontology: Medical Sciences, 59A*, 962-965.

Example

GFI	
Mobility Is the patient able to carry out these tasks without any help? *(the use of help resources, such as walking stick, walking frame, wheelchair, is considered as independent)*	
1. Shopping	Yes – No
2. Walking around outside (around the house or to the neighbors)	Yes – No
3. Dressing and undressing	Yes – No
4. Going to the toilet	Yes – No
Physical fitness	
5. What mark does the patient give him/herself for physical fitness? *(Scale 0 to 10)*	Mark: ……..
Vision	
6. Does the patient experience problems in daily life as a result of poor vision?	Yes – No
Hearing	
7. Does the patient experience problems in daily life because of difficulty hearing?	Yes– No
Nourishment	
8. During the last 6 months has the patient lost a lot of weight unwillingly? *(3kg in 1 month or 6 kg in 2 months)*	Yes – No
Morbidity	
9. Does the patient take 4 or more different types of medicine?	Yes – No
Cognition	
10. Does the patient have any complaints about his/her memory or is the patient knonw to have a dementia syndrome?	No – Sometimes - Yes
Psychosocial	
11. Does the patient sometimes experience an emptiness around him/her?	No – Sometimes – Yes
12. Does the patient sometimes miss people around him/her?	No – Sometimes – Yes
13. Does the patient sometimes feel abandoned?	No – Sometimes – Yes
14. Has the patient recently felt down-hearted or sad?	No – Sometimes – Yes
15. Has the patient recently felt nervous or anxious?	No – Sometimes – Yes
Total score (0-15)	……

2.5 Vulnerable Elders Survey - 13

Instrument	Vulnerable Elders Survey – 13
Abbreviation	VES-13
Author	Saliba et al.
Subject	Screening
Goal	Identification of vulnerable elders
Population	Older persons in the community / Older Cancer Patients
Taken by	Health care professional
Number of items	13
Participation of the patient	- No: when filled in by self-report - Yes: when filled in by interview
Reference	Saliba D, Elliott M, Rubenstein LZ, Solomon DH, Young RT, Kamberg CJ, et al. The Vulnerable Elders Survey: a tool for identifying vulnerable older people in the community. J Am Geriatr Soc 2001 Dec;49(12):1691-9.
Instrument can be found at:	http://www.rand.org/health/projects/acove/survey.html - Accessed 1-18-06
Permission required	- The VES can be used without charge by researchers, health care professionals, and provider organizations. - RAND's (cooperation) only requirement is that proper acknowledgement be given RAND as rights owner, citing the reference noted above.
Translations available	- English - Dutch - …

Goal

The VES-13 is used for the identification of vulnerability by older persons in the community who can have benefit from improved detection and care of prevalent medical and geriatric conditions known to result in functional decline and mortality.

Target population

The VES-13 is meant for older persons.

Description

The VES-13 is a simple function-based screen, which effectively and efficiently identifies older people at risk of functional decline or death over a 2-year period. It aims to identify a group of community-dwelling older people at risk for death or decline and who might therefore benefit from improved detection and care of prevalent medical and geriatric conditions known to result in functional decline and mortality.

This targeting system relies on patients self-report, is easily transportable across settings, and will remain relevant as care systems evolve. It applies across care systems regardless of the quality of administrative data, does not require direct observations or laboratory data, and avoids reliance on utilization patterns or on the quality of condition detection within each system.

Method

- Self-report
- Interview

Scoring

- Total score = 10
- Range total score = 0 – 10
- Cut-off: ≥ 3

Interpretation

- Score 0 – 2: absence of vulnerability
- Score 3 – 10: presence of vulnerability

Instructions

- Cross or fill in the correct answer to the question.
- Use the following scoring rules for counting total score:

- Question 1: age	- 75-84 = 1 point - ≥85 = 3 points
- Question 2: self-rated health	- fair or poor = 1 point
- Question 3: difficulty with one or more physical activities	- stooping, crouching, or kneeling; lifting 10 pounds; reaching above shoulder level; walking one quarter of a mile; heavy housework; writing or grasping small objects - 1 point for each * respons - maximum of 2 points
- Question 4: requiring assistance with any of five activities	- shopping, light housework, finances, walking across room, or bathing - 4 points for one or more * responses

Remarks

1. User friendliness

It takes less than 5 minutes to complete.

References

1. Mohile SG, Bylow K, Dale W, Dignam J, Martin K, Petrylak DR, et al. A pilot study of the vulnerable elders survey-13 compared with the Comprehensive Geriatric Assessment for identifying disability in older patients with prostate cancer who receive androgen ablation. Cancer 2007 Feb 15;109(4):802-10.

2. Saliba D, Elliott M, Rubenstein LZ, Solomon DH, Young RT, Kamberg CJ, et al. The Vulnerable Elders Survey: a tool for identifying vulnerable older people in the community. J Am Geriatr Soc 2001 Dec;49(12):1691-9

Example

VES-13

1. Age: ……..

2. In general, compared to other people your age, would you say that your health is:

- □ Poor *
- □ Fair *
- □ Good
- □ Very good
- □ Excellent

3. How much difficulty, on average, do you have with the following physical activities:

		No difficulty	A little difficulty	Some difficulty	A lot of difficulty	Unable to do
a.	stooping, crouching or kneeling?	□	□	□	□ *	□ *
b.	lifting, or carrying objects as heavy as 10 pounds?	□	□	□	□ *	□ *
c.	reaching or extending arms above shoulder level?	□	□	□	□ *	□ *
d.	writing, or handling and grasping small objects?	□	□	□	□ *	□ *
e.	walking a quarter of a mile?	□	□	□	□ *	□ *
f.	heavy housework such as scrubbing floors or washing windows?	□	□	□	□ *	□ *

4. Because of your health or a physical condition, do you have any difficulty:

a. shopping for personal items (like toilet items or medicines)?

□ YES → Do you get help with shopping? □ YES * □ NO

□ N

□	DON'T DO	→	Is that because of your health?	□	YES *	□	NO

b. managing money (like keeping track of expenses or paying bills)?

□	YES	→	Do you get help with managing money?	□	YES	□	NO
□	NO						
□	DON'T DO	→	Is that because of your helth?	□	YES *	□	NO

c. walking across the room? USE OF CANE OR WALKER IS OK.

□	YES	→	Do you get help with walking?	□	YES *	□	NO
□	NO						
□	DON'T DO	→	Is that because of your health	□	YES *	□	NO

d. doing light housework (like washing dishes, straightening up, or light cleaning)?

□	YES	→	Do you get help with light housework?	□	YES *	□	NO
□	NO						
□	DON'T DO	→	Is that because of your health?	□	YES *	□	NO

e. bathing orshowering?

□	YES	→	Do you get help with bathing or showering?	□	YES *	□	NO
□	NO						
□	DON'T DO	→	Is that because of your health?	□	YES *	□	NO

2.6 Senior Adult Oncology Program 2

Instrument	Senior Adult Oncology Program 2 screening questionnaire
Abbreviation	SAOP2
Author	Extermann et al.
Subject	Screening
Goal	Identification of older persons for a multidisciplinary team consultation
Population	Older Cancer Patients
Taken by	Health care professional
Number of items	15
Participation of the patient	Yes
Reference	Extermann M, Green T, Tiffenberg G, Rich CJ. Validation of the Senior Adult Oncology Program (SAOP)2 screening questionnaire. International Society of Geriatric Oncology (SIOG) conference, Montreal, Oct 16-18, 2008. Crit Rev Oncol Hematol 69(2): 185, 2009
Instrument can be found at:	http://www.siog.org/images/SIOG_documents/geriatricassessmentsaop2.pdf or www.moffitt.org/saoptools
Permission required	No
Translations available	- English - …

Goal

The SAOP2 is used for the identification of older persons with cancer where a multidisciplinary team consultation was required.

Target population

The SAOP2 is meant for older persons.

Description

The SAOP2 was developed by the multidisciplinary clinical team of the SAOP at Moffitt to determine when a multidisciplinary team consultation was required in new patients. In addition to function, depression, and cognitive screening, the screening includes questions regarding quality of life, self-rated health, falls, nutrition, sleep, polypharmacy, and social questions (drug payment and caregiver availability).

Method

- Self-report + interview

Interpretation

- If one item is positive, the respectively specialist is called in.
- If several items are impaired, the multidisciplinary team is called in or a geriatric referral is made for a CGA.

Instructions

- The first pages are answered by self-report (patient) and the last page is administered by the clinic staff.

Remarks

1. **Validation**
    - After more than 5 years of clinical use, this screen has demonstrated face validity, finding that 63% of senior cancer patients needed psychosocial counseling, 40% dietary intervention, and 14% medication counseling and assistance (the latter probably underestimated).
    - Its performance was validated against a Multidimensional Geriatric Assessment (MGA).

References

1. Extermann M, Green T, Tiffenberg G, Rich CJ. Validation of the Senior Adult Oncology Program (SAOP)2 screening questionnaire. International Society of Geriatric Oncology (SIOG) conference, Montreal, Oct 16-18, 2008. Crit Rev Oncol Hematol 69(2): 185, 2009

2. Johnson D, Blair J, Balducci L, Extermann M, Crocker T, McGinnis M, Vranas P. The assessment of clinical resources in a Senior Adult Oncology Program. European Oncology Nursing Society Meeting, Innsbruck, Austria, April 22, 2006

Example

SAOP2		
Name:	UR#:	Age:
Diagnosis:	MD:	

1. If it was necessary, is there someone who could help take care of you?	Yes	No
2. Do you feel sad more days than not?	Yes	No
3. Have you lost interest in things you used to enjoy (hobbies, food, sex, being with friends/family)?	Yes	No

4. On a scale of 1 to 10, rate your *present* quality of life (10 is the best life, 1 is the worst)

1 2 3 4 5 6 7 8 9 10

worst **best**

5. On a scale of 1 to 10, rate your *present* overall health (10 is the excellent, 1 is the poor)

1 2 3 4 5 6 7 8 9 10

worst **best**

6. Activities of Daily Living

Can you dress yourself completely?	Yes	Yes but with help	No
Can you feed yourself?	Yes	Yes but with help	No
Do you use a cane, walker, or wheelchair?..	Yes	Yes, occasionally	No
Do you need help to get out of bed/chair?…	Yes	Yes but with help	No
Are you incontinent of urine?	Yes	Occasionally	No
Do you need help taking a shower or a bath?	Yes	Occasionally	No
Have you tripped or fallen in the past year?..	Yes		No
Are you able to drive?	Yes	Have never driven	No
Are you able to prepare your own meals?…	Yes	Yes but with help	No
Are you able to go shopping?	Yes	Yes but with help	No
Can you take care of your finances?……	Yes	Yes but with help	No
Can you use the telephone?	Yes	Yes but with help	No
Do you remember to take your medications?	Yes	Yes but with help	No

7. Have you lost 5 or more pounds in the past 6 months without dieting?	Yes	No
8. Has your appetite decreased in the last 3 months?	Yes	No
9. Has there been a change in the *types* of foods you are able to	Yes	No

eat?		
10. Are you always able to pay for your prescription medications?	Yes	No
11. Do you feel you are sleeping well?	Yes	No

Please stop here. Thank you!

***I am going to name 3 objects (pencil, truck, book) and ask you to repeat them now and a few minutes from now to test your memory.

12. Spell the word “clown” backwards. n-w-o-l-c……..	5 points=____
13. What is today’s date and day? Mth.___Date___Yr.___, Day_____...	4 points=____
14. Can you repeat the 3 objects I mentioned earlier? 1[ ] 2[ ] 3[ ]…….	3 points=____
	Total= _____
15. How many medications/herbals/vitamins are you taking? _____	None [ ]

Additional information:

ECOG PS:_____	Usual weight=_____	Current weight=_____
Nutrition: BMI_____	MNAs_____	Referral: No - Yes
SW: GDS_____	MMSE_____	Referral: No - Yes

2.7 Abbreviated Comprehensive Geriatric Assessment

Instrument	abbreviated Comprehensive Geriatric Assessment
Abbreviation	aCGA
Author	Overcash et al.
Subject	Screening
Goal	Detection of a geriatric risk profile
Population	Older Cancer Patients
Taken by	Health care professional
Number of items	15
Participation of the patient	Yes
Reference	Overcash JA, Beckstead J, Extermann M, et al: The abbreviated comprehensive geriatric assessment (aCGA): a retrospective analysis. Crit Rev Oncol Hematol 54:129-36, 2005
Instrument can be found at:	/
Permission required	No
Translations available	- English - …

Goal

The aCGA is used for the identification of older persons with cancer with a geriatric risk profile where a full CGA is required.

Target population

The aCGA is meant for older persons.

Description

The aCGA includes 15 items which were isolated within the findings of a MGA in a large database of older patients with cancer who underwent a CGA as part of their oncology evaluation:

- 3 questions about ADL
- 4 questions about IADL
- 4 questions from the Mini Mental Status Examination
- 4 questions from the Geriatric Depression Scale

Method

- Interview

Scoring

- GDS:
  - On each question, ‘yes’ or ‘no’ needs to be answered, according to the mood of the patient.
  - Calculation of the score:

	YES	NO
1. Do you feel that your life is empty?	**1**	0
2. Do you feel happy most of the time?	0	**1**
3. Do you often feel helpless?	**1**	0
4. Do you feel pretty worthless the way you are now?	**1**	0

- ADL / IADL
    - Cross the correct answer
    - If any impairment is present: see instructions.

- MMSE

Question	Timelimit	Scoring
• Serial sevens	30 sec	• Score the total number of times that 7 is substracted correctly. • Examples: 93, 86, 79, 72, 65 = 5 points (all good) 93, 88, 81, 74, 67 = 4 points (4 good, 1 false) 92, 85, 78, 71, 64 = 4 points (4 good, 1 false) 93, 87, 80, 73, 64 = 3 points (3 good, 2 false) 92, 85, 78, 71, 63 = 3 points (3 good, 2 false) 93, 87, 80, 75, 67 = 2 points (2 good, 3 false) 93, 87, 81, 75, 69 = 1 point (1 good, 4 false)
• Spell the word "WORLD"	30 sec	• The score is the number of letters in correct order, e.g. dlrow = 5; dlorw =3.
When the patient cannot or will not perform the task with serial sevens or didn't perform it completely correct, ask him/her to perform the spelling exercise. Compare both scores to each other and the highest score will count for the total result of the MMSE.		
• Reading	10 sec	• Score one point only if the subject closes eyes. • The subject does not have to read aloud.
• Writing	30 sec	• Score one point for writing a sentence. • The sentence must make sense and has to contain a subject and a verb. • Ignore spelling errors.
• Copying	1 min maximum	• Score one point for a correctly copied diagram. • The person must have drawn a four-sided figure between two five-sided figures. • Tremor and rotation are ignored.

Instructions

- GDS score ≥ 2: complete full 15-item GDS
- ADL: any impairment: complete full ADL
- IADL: any impairment: complete full IADL
- Cognitive screening score ≤ 6: complete full MMSE

Remarks

/

References

1. Overcash JA, Beckstead J, Extermann M, et al: The abbreviated comprehensive geriatric assessment (aCGA): a retrospective analysis. Crit Rev Oncol Hematol 54:129-36, 2005

2. Overcash JA, Beckstead J, Moody L, et al: The abbreviated comprehensive geriatric assessment (aCGA) for use in the older cancer patient as a prescreen: scoring and interpretation. Crit Rev Oncol Hematol 59:205-10, 2006

Example

aCGA
Patient identifier:…….

GDS **To score the GDS (items 1 – 4) circle yes or no.**		
1. Do you feel that your life is empty?	Yes	No
2. Do you feel happy most of the time?	Yes	No
3. Do you often feel helpless?	Yes	No
4. Do you feel pretty worthless the way you are now?	Yes	No

ADL **To score the ADL (items 5 – 7) check which level of assistance applies.**	
5. Bathing (Sponge bath, tub bath or shower)	Receive no assistance (gets into and out of tub by self if tub is the usual means of bathing) Receives assistance in bathing only one part of the body (such as back or a leg) Receives assistance in bathing more than one part of the body (or not bathed)
6. Transfer	Moves into and out bed as well as into and out of chair without assistance (May use object such as cane or walker for support) Moves into or out of bed or chair with assistance Doesn't get out of bed
7. Continence	Controls urination and bowel movement completely by self Has occasional accidents Supervision helps keep control of urination or bowel movement or catheter is used or is incontinence

IADL **To score the IADL (items 8 – 11) circle the number which reflects the ability.**		
8. Can you go shopping for groceries?	Without help With some help Are you completely unable to do any shopping?	3 2 1
9. Can you prepare your own meals?	Without help With some help Are you completely unable to prepare any meals?	3 2 1
10. Can you do your own housework?	Without help	3

	With some help Are you completely unable to do any housework?	2 1
11. Can you do your own laundry?	Without help With some help Are you completely unable to do any laundry at all?	3 2 1

MMSE **Score as indicated on each item.**		
12. Attention and calculation	- Begin with 100 and count backward by 7 (stop after 5 answers): 93-86-79-72-65. Score one point for each correct answer. - If the patient will not perform this task, ask the person to spell 'WORLD' backwards (DLROW). Record the patients spelling. Score one point for each correctly placed letter.	Score:
13. Reading	Read and obey the following: Close your eyes (show the patient the item on the attached paper)	Circle the score: 1 / 0
14. Writing	Write a sentence (on the attached paper)	Circle the score: 1 / 0
15. Copying	Copy the design of the intersecting pentagons	Circle the score: 1 / 0

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3 Evaluation instruments: CGA

3.1 Overview

Table 2:

DOMAIN	EVALUATION INSTRUMENTS
Functional status	- Activities of Daily Living (ADL) (Katz et al., 1963) - Barthel Index (BI) (Barthel et al., 1969) - Instrumental Activities of Daily Living (IADL) (Lawton & Brody, 1969)
Falls	- Falls (Lamb et al., 2005)
Cognitive status	- Mini Mental State Examination (MMSE) (Folstein et al., 1975) - Clock Drawing Test (Sunderland et al., 1989)
Depression	- Geriatric Depression Scale (GDS) (Yesavage et al., 1983)
Nutrition	- Mini Nutritional Assessment (MNA) (Guigoz et al., 1997) - Mini Nutritional Assessment – Short Form (MNA-SF) (Guigoz et al., 1997)
Comorbidity	- Charlson Comorbidity Index (CCI) (Charlson et al, 1997) - Cumulative Illness Rating Scale – Geriatrics (Linn et al., 1968)

3.2 Activities of Daily Living

Instrument	Katz index of Independance in Activities of Daily Living
Abbreviation	KATZ or ADL
Author	Katz et al.
Subject	Functional evaluation
Goal	Evaluation of the capacities of daily living
Population	Mainly older persons
Taken by	Health care professional
Number of items	6
Participation of the patient	Yes
Reference	Katz S, Ford AB, Moskowitz RW, et al. Studies of illness in the aged. The Index of the ADL: a standardized measure of biological and psychosocial function. JAMA 1963;185:914-919.
Instrument can be found at:	http://www.geronurseonline.org
Permission required	No
Translations	- English - French - Dutch - …

Goal

The Katz-scale is used for the objective evaluation of the functional condition by measuring the level of autonomy for the performance of daily activities. This index wants to measure the physical functioning of older individuals and individuals with chronic diseases.

Target population

The Katz-scale is mainly used for the functional evaluation of older individuals.

Description

This scale is used for the detection of problems with functionality, and for establishing a care plan for the different topics.

The Katz-index measures the performance in 6 functions:

- Bathing
- Dressing
- Toileting
- Transferring
- Continence
- Feeding

In the original version, the scoring is binary, with score 0 for dependence and 1 for indepence. A low score indicates a strong dependence. More recently, there are scores with more specification (3 item: 0-0.5-1 per item; 4 item: 1-2-3-4 per item, eg. Belgian Katz scale).

Method

- Interview
- Observation

Scoring

For 2-item:

- Range total score = 0 – 6
- For each domain (6) there are 2 levels of dependency with specific criteria.
  - Score 1 if the patient can perform the task with no supervision.
  - Score 0 if the patient can only perform the task with supervision.
  - The patient receives a score for each of the 6 domains.

Interpretation

- The scores of the different domains are added to obtain the total score
- Original version: score 0 was completely dependent, and score 6 completely independent.
- In contrast: adapted versions where interpretation score is often opposite.

Instructions

- The 6 items are assessed one by one by the health care worker based on observation or interview of the patient or relative.

Remarks

1. **User friendliness**
   - The performance of the Katz-scale is very simple.
   - It is based on observations while the patient performs activities of daily living or taken by interview.
2. **General remarks**
   - The Katz-scale is the most commonly used scale for decades to evaluate the functional condition of the older population. Validity and reliability data for the original version of the Katz were not found in the literature.
   - The Katz-scale has undergone multiple changes during the years, depending on the domain where it is used.
   - The way of scoring is also changed in different versions, so it is important to use the rules that are relevant for the version used.
   - Results may differ because patients tent to overestimate their abilities.

References

1. Asberg KH. Disability as a predictor of outcome for the elderly in a department of internal medicine. Scand J Soc Med 1987;15:261-265.

2. Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu. http://www.best.ugent.be

3. Katz S, Vignos PJ, Moskowitz RW, et al. Comprehensive outpatient care in rheumatoid arthritis: a controlled study. JAMA 1986;206:1249-1254.

4. Katz S, Ford AB, Chinn AB, et al. Prognosis after strokes: II. Long-term course of 159 patients with stroke. Medicine 1966;45:236-246.

5. Katz S, Ford AB, Moskowitz RW, et al. Studies of illness in the aged. The Index of the ADL: a standardized measure of biological and psychosocial function. JAMA 1963;185:914-919.

6. Katz. S. Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living. J.Am.Geriatr.Soc. 31 (12):721-727, 1983.

7. Reijneveld SA. Spijker J. Dijkshoorn H. Katz' ADL index assessed functional performance of Turkish, Moroccan, and Dutch elderly. [Journal Article. Research Support, Non-U.S. Gov't] *Journal of Clinical Epidemiology. 60(4):382-8, 2007 Apr*

Example 2-item ADL

ACTIVITIES POINTS (1 OR 0)	INDEPENDENCE: (1 POINT) NO supervision, direction or personal assistance	DEPENDENCE: (0 POINTS) WITH supervision, direction, personal assistance or total care
BATHING POINTS:_____	**(1 POINT)** Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	**(0 POINTS)** Needs help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing.
DRESSING POINTS:_____	**(1 POINT)** Gets clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	**(0 POINTS)** Needs help with dressing self or needs to be completely dressed.
TOILETING POINTS:_____	**(1 POINT)** Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	**(0 POINTS)** Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING POINTS:_____	**(1 POINT)** Moves in and out of bed or chair unassisted. Mechanical transferring aides are acceptable.	**(0 POINTS)** Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE POINTS:_____	**(1 POINT)** Exercises complete self control over urination and defecation.	**(0 POINTS)** Is partially or totally incontinent of bowel or bladder.
FEEDING POINTS:_____	**(1 POINT)** Gets food from plate into mouth without help. Preparation of food may be done by another person.	**(0 POINTS)** Needs partial or total help with feeding or requires parenteral feeding.

TOTAL POINTS = _____	6 = High (patient independent) 0 = Low (patient very dependent)

Example 3-item ADL

Bathing (sponge, shower, or tub):		
	I:	receives no assistance (gets in and out of tub if tub is the usual means of bathing)
	A:	receives assistance in bathing ony one part of the body (such as the back or leg)
	D:	receives assistance in bathing more than one part of the body (or not bathed)
Dressing:		
	I:	gets clothes and gets completely dressed without assistance
	A:	gets clothes and gets dressed without assistance except in tying shoes
	D:	receives assistance in getting clothes or in getting dressed or stays partly or completely underdressed
Toileting:		
	I:	goes to "toilet room", cleans self, and arranges clothes without assistance (may use object for support such as cane, walker, or wheelchair and my manage night bedpan or commode, emptying in the morning)
	A:	receives assistance in going to "toilet room" or in cleansing self or in arranging clothes after elimination or in use of night bedpan or commode
	D:	doesn't go to room termed "toilet" for the elimination process
Transferring:		
	I:	moves in and out of bed as well as in and out of chair without assistance (may be using object for support such as cane or walker)
	A:	moves in and outof bed or chair with assistance
	D:	doesn't get out of bed
Continence:		
	I:	controls urination and bowel movement completely by self
	A:	has occasional "accidents"
	D:	supervision helps keep urine or bowel control; catheter is used, or is incontinent
Feeding:		
	I:	feeds self without assistance
	A:	feeds self except for getting assistance in cutting meat or buttering bread
	D:	receives assistance in feeding or is fed partly or completely by using tubes or intravenous fluids

3.3 Barthel Index

Instrument	Barthel Index
Abbreviation	BI
Author	Mahoney & Barthel
Subject	Functional evaluation
Goal	Evaluation of daily activities
Population	- Chronically ill patients - Older persons
Taken by	Health care worker
Number of items	- Original version: 10 items - 5-item is also existing
Participation of the patient	No
Reference	Mahoney, F. I. and Barthel, D. W. 1965. "Functional evaluation: the Barthel Index." *Md State Med.J.* 1461-65.
Instrument can be found at:	Mahoney, F. I. and Barthel, D. W. 1965. "Functional evaluation: the Barthel Index." *Md State Med.J.* 1461-65. http://www.strokecenter.org/trials/scales/barthel.pdf
Permission required	- The Maryland State Medical Society holds the copyright for the Barthel Index. It may be used freely for noncommercial purposes with the following citation: Mahoney FI, Barthel D. "Functional evaluation: the Barthel Index." *Maryland State Med Journal* 1965;14:56-61. Used with permission. - Permission is required to modify the Barthel Index or to use it for commercial purposes.
Translations	- English - …

Goal

The Barthel Index (BI) is developed to assess basic problems in chronically ill patients according to daily activities.

Target population

Originally the BI was used to assess the functional condition of patients with all chronic diagnosis. Currently the BI is used as indicator in persons with a decline in mobility, more specific older persons.

Description

The BI consists of 10 items that measure a person's daily functioning specifically the activities of daily living and mobility:

- Feeding
- Bathing

- Grooming
- Dressing
- Bowels
- Bladder
- Toilet use
- Transfers (bed to chair and back)
- Mobility (on lever surfaces)
- Stairs

The assessment can be used to determine a baseline level of functioning and can be used to monitor improvement in activities of daily living over time. The items are weighted according to a scheme developed by the authors.

Method

- Interview
- Observation

Scoring

- Total score = 100
- Range total score = 0 - 100

Interpretation

A score of 100 indicates independency for ADL
Lower scores indicate increasing deficiencies in ADL.

Instructions

- The index should be used as a record of what a patient does, not as a record of what a patient could do.
- The main aim is to establish degree of independence from any help, physical or verbal, however minor and for whatever reason.
- The need for supervision renders the patient not independent.
- A patient's performance should be established using the best available evidence. Asking the patient, friends/relatives and nurses are the usual sources, but direct observation and common sense are also important. However direct testing is not needed.
- Usually the patient's performance over the preceding 24-48 hours is important, but occasionally longer periods will be relevant.
- Independence means that the person needs no assistance at any part of the task.
- Middle categories imply that the patient supplies over 50% of the effort.
- Use of aids to be independent is allowed.
- The scores for each of the items are summed to create a total score.
- The higher the score the more "independent" the person.

Remarks

1. **Reliability**
    - The internal consistency is sufficient, expressed as a Cronbach alpha of 0,84 (Hsueh et al.2002).

- The stability of the BI is demonstrated by Ganger et al. by estimating the correlation of two measurements of the BI performed by the same investigator. The Test-Retest result was 0;89 which stands for a good stability.
- Ganger et al. has also defined the interobserver reliability with a correlation coefficient of 0,95. This results indicates comparable scores with multiple investigators (Equivalence).

2. Validation

- The Concurrent Validity has been demonstrated in several studies. It was verified by comparing the BI with other evaluation instruments like the FIM. Hsueh et al. (2002) showed a good correlation coefficient by comparing the FIM motor subscale and the BI (r= 0,92). Another study (2001) showed also a good correlation with the FIM (r= 0,93) and a moderate correlation coefficient with SF-36 (r = 0,22) (Hobart & Thompson, 2001).

3. User friendliness

- It takes about 5 to 10 minutes to complete the BI.
- Each question includes specific definitions which facilitate the scoring.

4. Variants

- Different versions of the BI exist, for example the 5-item (BI-5).
- The BI-5 is derived from the original BI with 10 items. This simplifies the test and less time is needed to complete (Hsueh et al.2002). The 5 items of the BI-5 are: transfer, grooming, toilet use, stairs and mobility. The internal consistency of the BI-5 (0,71) is less in comparison with the BI (0,92) but stays correct (Hsueh et al.2002).
- The BI-5 shows a strong correlation with the original BI (0,96) what expresses the validity of the selected items in the BI-5 (Hobart and Thompson2001). This study (2001) shows also a good correlation of the BI-5 with the FIM (r = 0,92) and has, just like the BI from which it is derived, a moderate correlation coefficient with the SF-36 (r= 0,22) (Hobart and Thompson2001).

5. General remarks

- Some authors (Formiga, Mascaro, and Pujol, 2005) suggest to foresee a training in the use of the BI for investigators. This would result in a better Equivalence of the index.
- Depending on the version of the BI that is used, there are different rules for scoring. It is important to keep this in mind if the BI is included in the geriatric evaluation.

References

1. Calmels, P., Bethoux, F., Le-Quang, B., Chagnon, P. Y., and Rigal, F. 2001. "[Functional Assessment Scales and Lower Limb Amputation]." Ann.Readapt.Med.Phys. 44(8):499-507.

2. Collin C, Wade DT, Davies S, Horne V. “The Barthel ADL Index: a reliability study.” *Int Disability Study.*1988;10:61-63.

3. Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu. http://www.best.ugent.be

4. Formiga, F., Mascaro, J., and Pujol, R. 2005. "Inter-Rater Reliability of the Barthel Index." Age Ageing 34(6):655-56.

5. Gresham GE, Phillips TF, Labi ML. “ADL status in stroke: relative merits of three standard indexes.” *Arch Phys Med Rehabil.* 1980;61:355-358.

6. Hobart, J. C. and Thompson, A. J. 2001. "The Five Item Barthel Index." J.Neurol.Neurosurg.Psychiatry 71(2):225-30.

7. Hsueh, I. P., Lin, J. H., Jeng, J. S., and Hsieh, C. L. 2002. "Comparison of the Psychometric Characteristics of the Functional Independence Measure, 5 Item Barthel Index, and 10 Item Barthel Index in Patients With Stroke." J.Neurol.Neurosurg.Psychiatry 73(2):188-90.

8. Loewen SC, Anderson BA. “Predictors of stroke outcome using objective measurement scales.” *Stroke.* 1990;21:78-81.

9. Mahoney, F. I. and Barthel, D. W. 1965. "Functional Evaluation: The Barthel Index." Md State Med.J. 1461-65.

Example Barthel Index

THE BARTHEL INDEX

Patient Name: _____

Rater Name: _____

Date: _____

Activity	Score
FEEDING 0 = unable 5 = needs help cutting, spreading butter, etc., or requires modified diet 10 = independent	_____
BATHING 0 = dependent 5 = independent (or in shower)	_____
GROOMING 0 = needs to help with personal care 5 = independent face/hair/teeth/shaving (implements provided)	_____
DRESSING 0 = dependent 5 = needs help but can do about half unaided 10 = independent (including buttons, zips, laces, etc.)	_____
BOWELS 0 = incontinent (or needs to be given enemas) 5 = occasional accident 10 = continent	_____
BLADDER 0 = incontinent, or catheterized and unable to manage alone 5 = occasional accident 10 = continent	_____
TOILET USE 0 = dependent 5 = needs some help, but can do something alone 10 = independent (on and off, dressing, wiping)	_____
TRANSFERS (BED TO CHAIR AND BACK) 0 = unable, no sitting balance 5 = major help (one or two people, physical), can sit 10 = minor help (verbal or physical) 15 = independent	_____
MOBILITY (ON LEVEL SURFACES) 0 = immobile or < 50 yards 5 = wheelchair independent, including corners, > 50 yards 10 = walks with help of one person (verbal or physical) > 50 yards 15 = independent (but may use any aid; for example, stick) > 50 yards	_____
STAIRS 0 = unable 5 = needs help (verbal, physical, carrying aid) 10 = independent	_____
TOTAL (0–100):	_____

3.4 Instrumental activities of Daily Living

Instrument	The Lawton Instrumental Activities of Daily Living Scale
Abbreviation	IADL
Author	Lawton, M.P. & Brody, E.M.
Subject	Functional evaluation
Goals	Evaluation of the performance in instrumental activities of daily living
Population	General population
Taken by	Health care professional
Number of items	- First version: 5 items for men, 8 items for women - Subsequent versions: 9 items
Participation of the patient	Yes
Reference	Lawton, M. P. and Brody, E. M. 1969. "Assessment of Older People: Self-Maintaining and Instrumental Activities of Daily Living." Gerontologist 9(3):179-86.
Instrument can be found at:	http://www.geronurseonline.org
Permission required	No
Translations	- English - French - Dutch - German - …

Goal

The IADL is an instrument that can be used for the evaluation of more complex activities that require cognitive functions.

Target population

This instrument is developed for use by older individuals and can be used in the hospital.

Description

The evaluation of the instrumental activities of daily living relates to the evaluation of complex activities (meaning that they require certain skills, a certain autonomy, an appropriate judgment, and the capability of structuring tasks) mainly driven by cognitive functions.

The scale describes a dimension of physical, mental and social functioning by evaluating different activities:

- Ability to use telephone
- Shopping
- Food preparation
- Housekeeping
- Laundry
- Mode of transportation

- Responsibility for own medication
- Ability to handle finances

In the original version, 8 instrumental activities are evaluated with score 0 or 1 depending on whether the tasks can be performed independently. Score 1 indicates an autonomy, and score 0 indicates a certain dependence. The total score can vary from 0 to 5 for men, and 0 to 8 for women. Laundry, housekeeping and cooking were considered to be not relevant for males, and were not counted in the score. In more recent versions, the distinction between male and female was abandoned. In some subsequent versions, a ninth item was added (doing handyman work). Most recent versions quote each item on 4 levels, some score from 0 to 3, others give 0 or 1 for the 4 levels with a certain cutoff.

In the latest version, it was suggested to indicate for every item whether that item was considered relevant for that particular individual, and then only count the scores for the relevant items.

The example below is the original IADL version (scores from 0 (completely dependent) to 8 (completely independent)) and the IADL version used by EORTC.

Methodology

- Interview
- (Observation)

Scoring

- Original version (women)
    - Total score = 8
    - Range total score = 0 – 8
- Original version (men)
    - Total score = 5
    - Range total score = 0 – 5

Interpretation

- Score 0 = completely dependent
    - Low score = higher dependence
- Score 5 or 8 = completely independent
    - High score = higher independence

Instructions

- The items are assessed one by one by the health care worker based on observation or interview of the patient or relative.

Remarks

1. **Reliability**
    - Literature does not give information on the internal consistency and stability of the IADL scale.
    - Reliability of the test has been demonstrated by an inter observer reliability of 0,85.
    - In 2003, Cromwell et al found an internal consistency of the IADL, expressed as Cronbach alpha of 0,70 – 0,74.
2. **Validation**

- The validity of the IADL has been shown by correlating it to other scales in the functiontal domains. This validity has been expressed as a correlation coefficient of 0.38 and 0.61 according to the parts of the scale that were judged.
- The IADL can be used for the evaluation of cognitive functions, with very good diagnostic validity, expressed as a sensitivity of 62% and specificity of 80% for the diagnosis of cognitive problems.

3. User friendliness

- It takes about 10 minutes to do the test, but training is required for the health care worker.

4. **General remarks**

- There are very few studies that looked at psychometric properties of the IADL from Lawton.
- This evaluation instrument is widely used in research and clinical practice.

Note: IADL of the EORTC

Interpretation

- The difficulty with IADL is that some domains may not be informative for all people.
- For example some men (for cultural reasons) may not do the laundry.
- Therefore it has been suggested that each question is preceded by a **screening question**, to assess relevance.

Instructions

- Register the number of domains that cannot be scored since the person has never performed this kind of activities.
- Score the number of remaining domains according to the level at which the patient functions (score 0 – 1)
- Calculate the total score based on the number of items that are relevant for that particular individual.
- The score can be indicated as a percentage, based on the score divided by the number of items taken into account.

References

1. Barberger-Gateau, P. , Commenges, D. , Gagnon, M. , Letenneur, L. , Sauvel, C. , Dartigues, J.-F. Instrumental Activities of Daily Living as a screening tool for cognitive impairment and dementia in elderly community dwellers Journal of the American Geriatrics Society Volume 40, Issue 11, 1992, Pagina's 1129-1134

2. Cromwell, D. A., Eagar, K., and Poulos, R. G. 2003. "The Performance of Instrumental Activities of Daily Living Scale in Screening for Cognitive Impairment in Elderly Community Residents." J.Clin.Epidemiol. 56(2):131-37.

3. Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu.

http://www.best.ugent.be

4. Guelfi J.D., L'évaluation clinique standardisée en psychiatrie, éditions médicales Pierre Fabre, tome II, 1996. Article de L. Israël, Évaluation de l'autonomie, Les activités instrumentales de la vie quotidienne, IADL, p 477-480.

5. Lawton, M. P. and Brody, E. M. 1969. "Assessment of Older People: Self-Maintaining and Instrumental Activities of Daily Living." Gerontologist 9(3):179-86.

Example – original version

IADL	
	Score
ABILITY TO USE TELEPHONE	
Operates telephone on own initiative, looks up and dials numbers, etc.	1
Dials a few well known-numbers	1
Answers telephone but does not dial	1
Does not use telephone at all	0
SHOPPING	
Takes care of all shopping needs independently	1
Shops independently for small purchases	0
Needs to be accompanied on any shopping trip	0
Completely unable to shop	0
FOOD PREPARATION	
Plans, prepares and serves adequate meals independently	1
Prepares adequate meals if supplied with ingredients	0
Heats, serves, and prepares meals but does not maintain adequate diet	0
Needs to have meals prepared and served	0
HOUSEKEEPING	
Maintains house alone or with occasional assistance (e.g. “heavy work domestic help”)	1
Performs light daily tasks such as dish-washing, bed-making	1
Performs light daily tasks but cannot maintain acceptable level of cleanliness	1
Needs help with all home maintenance tasks	1
Does not participate in any housekeeping tasks	0

LAUNDRY	
	1
Does personal laundry completely	1
Launders small items-rinses socks, stocking, etc.	0
All laundry must be done by others	
MODE OF TRANSPORTATION	
Travels independently on public transportation or drives own car	1
Arranges own travel via taxi, but does not otherwise use public transportation	1
Travels on public transportation when accompanied by other	1
Travel limited to taxi or automobile with assistance of another	0
Does not travel at all	0
RESPONSIBILITY FOR OWN MEDICATION	
Is responsible for taking medication in correct dosages at correct time	
Takes responsibility if medication is prepared in advance in separate dosage	1
Is not capable of dispensing own medication	0
	0
ABILITY TO HANDLE FINANCES	
Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to the bank), collects and keeps track of income	1
Manages day to day purchases, but needs help with banking, major purchases, etc.	1
Incapable of handling money	0
Total score (0-8)	……....
Total score women (0-8)	…….
Total score men (0-5) without food preparation, housekeeping, laundry	……...

Example – EORTC version

IADL

	Score
ABILITY TO USE TELEPHONE	
Has never used the telephone	N/R
Operates telephone on own initiative, looks up and dials numbers, etc.	1
Dials a few well known-numbers	1
Answers telephone but does not dial	1
Does not use telephone at all	0
SHOPPING	
Has never done the shopping	N/R
Takes care of all shopping needs independently	1
Shops independently for small purchases	0
Needs to be accompanied on any shopping trip	0
Completely unable to shop	0
FOOD PREPARATION	
Has never done the food preparation	N/R
Plans, prepares and serves adequate meals independently	1
Prepares adequate meals if supplied with ingredients	0
Heats, serves, and prepares meals but does not maintain adequate diet	0
Needs to have meals prepared and served	0
HOUSEKEEPING	
Has never done the housekeeping	N/R
Maintains house alone or with occasional assistance (e.g. “heavy work domestic help”)	1
Performs light daily tasks such as dish-washing, bed-making	1
Performs light daily tasks but cannot maintain acceptable level of cleanliness	1
Needs help with all home maintenance tasks	1
Does not participate in any housekeeping tasks	0

LAUNDRY	
Has never done the laundry	N/R
	1
Does personal laundry completely	1
Launders small items-rinses socks, stocking, etc.	0
All laundry must be done by others	
MODE OF TRANSPORTATION	
Has never travelled independently	N/R
Travels independently on public transportation or drives own car	1
Arranges own travel via taxi, but does not otherwise use public transportation	1
Travels on public transportation when accompanied by other	1
Travel limited to taxi or automobile with assistance of another	0
Does not travel at all	0
RESPONSIBILITY FOR OWN MEDICATION	
Does not take tablets currently	N/R
Is responsible for taking medication in correct dosages at correct time	
Takes responsibility if medication is prepared in advance in separate dosage	1
Is not capable of dispensing own medication	0
	0
ABILITY TO HANDLE FINANCES	
Never handled the finances	N/R
Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to the bank), collects and keeps track of income	1
Manages day to day purchases, but needs help with banking, major purchases, etc.	1
Incapable of handling money	0
Total domains which are not relevant (N/R) (0-8)	……
Total domains which are relevant (0-8)	……
Domains in which the patient is dependent for the relevant domains (0-X)	……

3.5 Falls

Falls can be evaluated by asking the presence of falls during the last year.

Definition of 'fall':

"an unexpected event in which the older person comes to rest on the ground, floor, or lower level.."

If presence of falls is detected, also the nature of injuries is evaluated.

Minor injury is defined as:

- scratches
- bruises
- superficial wounds that do not/minimally require medical care

Major injury is defined as:

- sprains
- severe soft tissue bruises
- severe wounds of the head
- distortion or dislocation of joints
- cuts
- loss of conscience
- fractures

• Did you have a fall last year? **IF YES**: how often?:……	**YES**	**NO**
• Did you encounter injuries after the fall? **IF YES**: which injuries? - **'Minor' injuries** ***Definition**:* scratches, bruises, superficial wounds that do not/minimally require medical care. - **'Major' injuries** ***Definition**:* sprains, severe soft tissue bruises, severe wounds of the head, distortion or dislocation of joints, cuts, loss of conscience, fractures	**YES**	**NO**

References

1. Lamb SE, Jørstad-Stein EC, Hauer K, Becker C. 2005. Development of a common outcome data set for fall injury prevention trials: the Prevention of Falls Network Europe consensus; Prevention of Falls Network Europe and Outcomes Consensus Group. J Am Geriatr Soc. 53(9):1618-22.

3.6 Mini Mental State Examination

Instrument	Mini Mental State Examination
Abbreviation	MMSE
Author	Folstein et al.
Subject	Cognition / desorientation
Goals	Investigation of cognitive functions
Population	Main categories, mainly older population
Taken by	Trained health care worker
Number of items	30
Participation of the patient	Yes
Reference	Folstein MM, Folstein SE, Mc Hugh PR (1975), « Mini-Mental State»: a pratical method for grading the cognitive state of patients for the clinical. J Psychiatr Res 1975 Nov; 12(3): 189-98
Evaluation instrument can be found at:	Folstein MM, Folstein SE, Mc Hugh PR (1975), 'Mini-Mental State': a pratical method for grading the cognitive state of patients for the clinical. J Psychiatr Res 1975 Nov; 12(3): 189-98
Permission required	No
Translations	- English - French - Dutch - …

Goal

The MMSE aims to screen orientation, memory, concentration, language, apraxia (cognitive functions). It is not specifically meant for measuring the degree of desorientation or fluctuations in orientation.

Target population

The MMSE is meant for all categories of patients. It was originally used only in patients with psychiatric pathologies, but later also more and more used in the general older population or in cancer patients.

Description

The MMSE consists of a series of questions and tests addressing different topics:

- Orientation in time
- Orientation in space
- Registration
- Calculation and attention
- Memory
- Language
- Constructive ability

The test is not meant for measuring changes in mood, mental disturbance, or reasoning. The items of the questionnaire are addressed one by one, and a score for each item is immediately given. In order to have the

patient collaboration, the patient should be comfortable and should be encouraged. It is important not to influence the replies and avoid to put pressure on items where the patient encouters difficulties.
The MMSE consists of 2 parts. The first part requires oral replies and the maximum score is 21. The second item requires reading and writing. Patients with visual problems could encounter difficulties with this part. The maximum score for the second part is 9. The maximum score of part 1 and 2 together, is 30. A score below 24 indicates a cognitive problem (5 % false-negatives).

Methodology

- Interview

Scoring

- Total score = 30
- Range total score = 0 – 30
- Cut-offs:
    - ≤ 23
    - ≤ 17

Interpretation

- 24 – 30 = normal cognitive status
- 18 – 23 = mild cognitive decline
- 0 – 17 = severe cognitive decline

Instructions

- **Basic information**
    - The timelimits noted by each question are guidelines. They are not compelling.
    - The scoring rules are compelling.

- **Specific information**

a. Orientation in time and place

Question	Timelimit	Scoring
- What year is this?	10 sec	• Accept exact answer only
- What season is this?	10 sec	• Accept either: last week of the old season or first week of a new season
- What month is this?	10 sec	• Accept either: the first day of a new month or the last day of the previous month
- What is today's date?	10 sec	• Accept previous or next date
- What day of the week is this?	10 sec	• Accept exact answer only
- What country are we in?	10 sec	• Accept exact answer only
- What province are we in?	10 sec	• Accept exact answer only
- What city/town are we in?	10 sec	• Accept exact answer only
- What is the name of this building?	10 sec	• Accept exact name of institution only
- What floor of the building are we on?	10 sec	• Accept exact answer only

b. Registration

Question	Timelimit	Scoring
• Repeating and remembering the names of three unrelated objects	20 sec	• Score one point for each correct reply on the first attempt. • If the person did not repeat all three, repeat until they are learned or up to a maximum of five times (but only score first attempt).

c. Calculation and attention

Question	Timelimit	Scoring
• Serial sevens	30 sec	• Score the total number of times that 7 is substracted correctly. • Examples: 93, 86, 79, 72, 65 = 5 points (all good) 93, 88, 81, 74, 67 = 4 points (4 good, 1 false) 92, 85, 78, 71, 64 = 4 points (4 good, 1 false) 93, 87, 80, 73, 64 = 3 points (3 good, 2 false) 92, 85, 78, 71, 63 = 3 points (3 good, 2 false) 93, 87, 80, 75, 67 = 2 points (2 good, 3 false) 93, 87, 81, 75, 69 = 1 point (1 good, 4 false)
• Spell the word "WORLD"	30 sec	• The score is the number of letters in correct order, e.g. dlrow = 5; dlorw =3.
When the patient cannot or will not perform the task with serial sevens or didn't perform it completely correct, ask him/her to perform the spelling exercise. Compare both scores to each other and the highest score will count for the total result of the MMSE.		

d. Memory / Recall

Question	Timelimit	Scoring
• Repetition of the three objects that were previously asked to the patient to remember	10 sec	• Score one point for each correct answer regardless of order.

e. Language and constructive ability

Question	Timelimit	Scoring
• Naming: o "watch" o "pencil"	10 sec	• Score one point for correct response
• Repetition of phrase	10 sec	• Score one point for a correct repetition. • Must be completely exact.
• 3-stage command	30 sec	• Score one point for each instruction executed correctly.
• Reading	10 sec	• Score one point only if the subject closes eyes. • The subject does not have to read aloud.

• Writing	30 sec	• Score one point for writing a sentence. • The sentence must make sense and has to contain a subject and a verb. • Ignore spelling errors.
• Copying	1 min maximum	• Score one point for a correctly copied diagram. • The person must have drawn a four-sided figure between two five-sided figures. • Tremor and rotation are ignored.

Remarks

1. **Reliability**
   - The internal consistenty is sufficient and expressed as a Cronbach's alpha between 0,54-0,96.
   - The reliability of the MMSE is shown by repeating the test after 24h and 28 days.
   - The Test-Retest (*Stability*) is excellent. If the MMSE is taken twice in the same person with 24h interval, the correlation coefficient between the 2 measurements is 0,887. There is no significant difference after 28 days.
   - The interobserver reliability is excellent, the correlation coefficient is 0,827.
   - These results resemble the scores with multiple investigators (Equivalence).
2. **Validation**
   - The MMSE is a valid test for measuring cognitive function. The obtained scores are comparable with the Weschler Adult Intelligence Scale (WAIS). The Pearson correlation-coefficients (*Concurrent Validity*) between the MMSE and the WAIS are 0,776 ($p<0,001$) for the first part and 0,660 ($p<0,001$) for the second part.
   - The MMSE is used for the estimation of severe cognitive deficits, but also for changes in cognitive function. The obtained values of the MMSE correspond with the clinical opinion on presence of cognitive deficits (*Convergent Validity*).
   - The obtained means in patients below or above age 60 years, are not different in patients within the same disease category.
   - The validity of the MMSE decreases slightly if the patient has low level education or low literacy, or if the patient has aphasia, hearing problems or visual problems. The language barrier can also decrease the validity of the instrument.
   - The MMSE has become one of the most frequently used neurophychological tests. It is easy to use and has an excellent validity but low diagnostic value.
   - The MMSE has become a 'gold standard' and is very popular, but compared to other evaluation instruments, it does not have superior psychometric capacities.
   - The MMSE can have low sensitivity in some types of cognitive dysfunction, which can induce 'false negatives'.
3. **User friendliness**
   - It takes +/- 10 minutes to complete the questionnaire.
4. **General remarks**
   - The MMSE is frequently used as a reference for the validation of other evaluation instruments.
   - There are several derived versions of the MMSE:
     - Short version: the MMSE-12 (a version with 12 items, maximum score 12), the MMSE-ALFI (version with 14 items, maximum score 22).
     - Longer version: the Modified Mini Mental Test (3MS)

References

1. Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu. http://www.best.ugent.be

2. Fayers, P. M., Hjermstad, M. J., Ranhoff, A. H., Kaasa, S., Skogstad, L., Klepstad, P., and Loge, J. H. 2005. "Which Mini-Mental State Exam Items Can Be Used to Screen for Delirium and Cognitive Impairment?" J.Pain Symptom.Manage. 30(1):41- 50.

3. Folstein, M. F., Folstein, S. E., and McHugh, P. R. 1975. ""Mini-Mental State". A Practical Method for Grading the Cognitive State of Patients for the Clinician." J.Psychiatr.Res. 12(3):189-98.

4. Smith, M. J., Breitbart, W. S., and Platt, M. M. 1995. "A Critique of Instruments and Methods to Detect, Diagnose, and Rate Delirium." J.Pain Symptom.Manage. 10(1):35-77.

5. Song, J. A., Algase, D. L., Beattie, E. R., Milke, D. L., Duffield, C., and Cowan, B. 2003. "Comparison of U.S., Canadian, and Australian Participants' Performance on the Algase Wandering Scale-Version 2 (AWS-V2)." Res.Theory.Nurs.Pract. 17(3):241-56.

Example

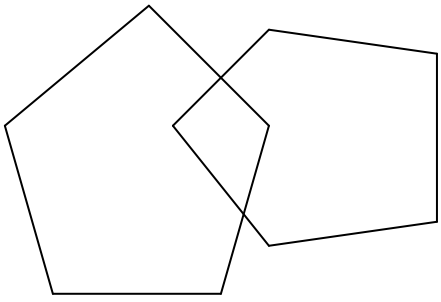
	Maximum score	Score
ORIENTATION		
- What year is this?	1	
- What season is this?	1	
- What month is this?	1	
- What is today's date?	1	
- What day of the week is this?	1	
- What country are we in?	1	
- What province are we in?	1	
- What city/town are we in?	1	
- What is the name of this building?	1	
- What floor of the building are we on?	1	
REGISTRATION		
Ask the patient if you may test his memory. Name 3 objects: house, bread, cat (1 second to say each). Then ask the patient all 3 after you named them. Give 1 point for each correct answer. Then repeat them until he learns all 3. (house / bread / cat)	3 Count trials and record:	
CALCULATION AND ATTENTION		
Ask the patient to begin with 100 and count backwards by 7. Stop after 5 subtraction. Score the total number of correct answers. (93 86 79 72 65) … … … … …	5	
If the patient cannot or will not perform this task, ask him to spell the word "W O R L D" backwards. The score is the number of the letters in correct order. D L R O W … … … … …	5	
MEMORY		
Ask for the three objects repeated above. Give 1 point for each one.	3	

(house, bread, cat)		
LANGUAGE		
- Name a watch.	1	
- Name a pencil.	1	
- Repeat the following “No ifs, ands or buts”.	1	
- Follow a three stage command: *“take a paper in your right hand (1), fold it in half (2), and put it on the floor”*.	3	
- Read and obey the following: “Close your eyes”	1	
- Write a sentence.	1	
CONSTRUCTIVE ABILITY		
- Copy the following drawing.	1	
Total score (0 – 30)		……

Close your eyes

WRITE A SENTENCE

COPY THIS FIGURE



3.7 Clock Drawing Test

Instrument	Clock Drawing Test
Abbreviation	CDT
Author	- Sunderland et al. (1989) - Wolf-Klein et al. (1989) - Watson et al. (1993) - Manos & Wu (1994) - Freund et al. (2005)
Subject	Cognitive evaluation
Goal	Evaluation of cognitive decline, memory and constructive capacity
Population	- Older persons - Persons with dementia - Persons with cognitive disorders
Taken by	Health care worker
Number of items	Depending on the method used
Participation of the patient	Yes
Reference	Original: Sunderland, T., Hill, J. L., Mellow, A. M., Lawlor, B. A., Gundersheimer, J., Newhouse, P. A., and Grafman, J. H. 1989. "Clock Drawing in Alzheimer's Disease. A Novel Measure of Dementia Severity." J.Am.Geriatr.Soc. 37(8):725-29.
Instrument can be found at:	- /
Permission required	No
Translations	- Not applicable

Goal

The CDT is used for the investigation of cognitive decline, disorders in orientation in time and neglect. Originally it was used for the assessment of visual constructive capacities but was later generalized for all cognitive impairments.

Target population

Older persons, persons with dementia and persons with cognitve disorders are the target population for the CDT. The test can be performed by persons of different cultures and nationalities (Philpot, 2004). Some authors indicate the correlation between the score and the age / level of education of the patient (Seigerschmidt et al., 2002).

Description

The CDT can be performed in different ways and the way of scoring has to be adapted to the version that is used. Some versions show the patient a circle on a paper. The circle is standing for a clock. The patient receives verbal instructions for the performance of the test. The instructions are also different depending on the version

that is used. The instructions can be repeated if necessary. In other versions the patient has to drawn the circle himself and then complete according to the instructions of the investigator.
The performance of the test requires verbal insight, memory, visuo-spatial abilities and constructive qualifications of the patient. Level of education, age and mood can influence the test results (Agrell & Dehlin, 1998).

Method

- Performance by patient

Scoring

- See 'Variants'

Interpretation

- See 'Variants'

Instructions

- See 'Variants'

Variants

1. **Clock Drawing Test by Freund (Freund et al.2005)**
    - **Instructions:**
      The patient receives a drawn circle which is standing for a clock. The requested hour is 11.10. 11.10 is acknowledged as the hour with the best sensitivity for detecting neurocognitive impairments.
    - **Scoring:**
        - Total score = 7
        - Range total score = 0 to 7
        - The scoring system of this version is based on 7 points:
            - Indicating the hour (3 points)
                - One of the hands of the clock is pointing number 2.
                - The two hands of the clock are standing completely correct.
                - There is no intrusion (writing, wrong hands of the clock, one of the hands is pointing number 10, the hour is written in text,…)
            - Numbers (2 points)
                - The numbers are outside the circle.
                - All numbers are present (1 – 12). None of numbers is standing double and none of the numbers is forgotten.
            - Interspace (2 points)
                - The numbers have the same or almost equal interspaces.
                - The numbers have the same or almost equal interspaces in comparison with the circle edge.

2. **Clock Drawing Test by Manos (Manos & Wu, 1994)**
    - **Instructions:**

The patient receives a drawn circle.

- **Scoring:**
  - Total score = 10
  - Range total score = 0 – 10
  - One point is given for the correct position of the numbers 1, 2, 4, 5, 7, 8, 10 en 11 and for the position of the hands of the clock.
- **Interpretation:**

  A high score is standing for a good performance.

3. Clock Drawing Test by Sunderland (Sunderland et al.,1989)

- **Instructions:**

  The test is running in 3 steps:
  - Step 1. Ask the patient to draw a circle on a piece of paper. This first part is standing on 2 points depending on the completeness of the circle.
  - Step 2. The following task to perform is putting the numbers of the clock into the circle. This part is standing on 4 points, depending on the presence and composition of all numbers.
  - Step 3. The patient receives a third instruction: 'put the hands of the clock on the hour 11.10'. this part is also standing on 4 points.

  All instructions may be repeated if the patients doesn't understand the request. There is no timeline for the performance of the test.
- **Scoring:**
  - Total score = 10
  - Range score = 0 - 10
  - The first 5 points are given for the drawing of the circle and the correctly filled in numbers. The following 5 points are given for the proper positioning of the hands of the clock.
- **Interpretation:**
  - A high score is standing for a good performance.
  - A cut-off point of 6 is considered as standard (Shulman, 2000).

4. Clock Drawing Test by Watson (Watson, Arfken, and Birge,1993)

- **Instructions:**

  The patient receives a circle to perform the test. The patient has to put the numbers into the circle but doesn't have to place the hands of the clock.
- **Scoring:**
  - Total score = 7
  - Range total score = 0 - 7
  - Divide the circle in 4 equal quadrants by drawing a line through the center of the circle and the number 12 and a second line through the center of the circle and the number 3.
  - Count the amount of numbers in each quadrant of the circle clockwise, starting with the number corresponding number 12. Each number is just counted once. If a number is falling on the reference lines, it is counted with the quadrant that is following clockwise. A total of three number in each quadrant is considered correct.

- For faults in the amount of numbers in the first, second or third quadrant of the circle, is counted 1 point (the amount of faults is not important). The faults in the amount of numbers in the fourth quadrant is counting for 4 points.

- **Interpretation:**
  - Normal score is ranging from 0 to 3.
  - In persons with dementia the score is ranging from 4 to 7.
  - In this version a high score is standing for a severe cognitive impairment.

5. Clock Drawing Test by Pfizer Inc. and Eisai Inc.

- **Instructions:**

  The patient has to draw a circle which is standing for a clock. Afterwards he has to place the hands of the clock on 10.10.

- **Scoring:**
  - Total score = 4
  - Range total score = 0 - 4
  - Scoring rules:
    - 1 point: drawing a closed circle
    - 1 point: putting the numbers on the right place
    - 1 point: completing the proper 12 numbers
    - 1 point: placing the hands of the clock in the right position
- **Interpretation:**

  A high score is standing for a good performance.

6. Clock Drawing Test by Wolf-Klein (Wolf-Klein et al., 1989)

- **Instructions:**

  The patient receives a drawn circle and has to put the numbers to complete.

- **Interpretation:**

  The cut-off score is 7. A score ≥ 7 means a good performance. A score < 7 means presence of a cognitive impairment (Shulman, 2000).

Remarks

1. Reliability

- The reported correlation coefficients for repeated measures (test retest) in patients with Alzheimer dementia was between 0,70 and 0,78 (Stability) without adaptation for cognitive capacities of the patient. Manos et Wu describe a correlation coefficient for 'test-retest' at 2 days (r = 0,87 tot 0,94); for a 'test-retest' at 4 days, Tuokko reports results of r=0,70; Mendez et al report a result of 0,78 at 3 months.
- The clock drawing test shows a good correlation between the different items with a coëfficiënt r= 0,91 – 0,97 (Powlishta et al.2002).
- South and coworkers determined inter – class coëfficiënts (ICC) vfor 3 versions of the clock test and obtained very good coefficients(Shulman 2000): Libon Revises system ICC: r = 0,59 – 0,90; Rouleau & al. ICC: r= 0,70-0,93; Freedman & al. ICC: r= 0,52-0,91.
- If the test is taken by different observers (Equivalence), Sunderland et al. Found an excellent result with a Spearman coëfficiënt between 0,86 and 0,97; Mendez et al: 0,94.; Tuokko: from 0,94 to 0,97.

- Seigerschmidt et al. Studied the 'inter rater reliability' in 4 versions of the clock test an obtained high correlation coefficients: Manos & Wu: r= 0,95; Watson & al.: r=0,90; Wolf-Klein & al.: r = 0,82; Shulman & al. r= 0,85 (Seigerschmidt et al.2002)
- Sunderland et al found no difference between clinical and non-clinical observers (with respective Spearman coëfficiënt of 0,84 and 0,86).

2. Validation

- The clock test is a good test for the determination of cognitive capacities. It shows an acceptable correlation coefficient with the MMSE (r= 0,32 to r= 0,69) and with other tests that evaluate cognitive dysfunction (Concurrent Validity).
- The test has good diagnostic validity. The sensitivity in the version of Sunderland is 78% and the specificity 96 % (Sunderland et al.1989).
- According to the scoring system of Watson, a score of 4 or more has a sensitivity of 87 % and a specificity of 82 % (Watson, Arfken, and Birge1993). For the detection of Alzheimer disease, a sensitivity of 86,7 % and specificity of 92,7 % were reached (Wolf-Klein et al.1989).
- Powloski showed a negative association between dementia and the score of the clock test, with a Spearman correlation coefficient between -0,69 and -0,74. (Powlishta et al.2002). (Divergent validity)
- Nishiwaki et al. showed that if the test is done by a nurse, and with a cutoff of 1 or lower, the sensitivity and specificity are 46,3 % and 96,2 %, which is a lower sensitivity than the MMSE (sensitivity 76 %; specificity 87,1 %).
- With a cutoff of 3 or lower, the sensitivity and specificity are 92,7 % and 68,1 %, which means a lower specificity and more 'false positives'. (Nishiwaki et al.2004)
- The different versions of the 'Clock drawing test' show similar psychometric properties.(Powlishta et al.2002)
- The interrater reliability (*Equivalence)* is high (0,97) and does not depend on clinical and non-clincal health care workers (Freund et al.2005).

3. User friendliness

- Regardless the version that is used, the CDT takes less than 5 minutes to complete. The CDT is easy in use and there is no training necessary for the investigator (Powlishta et al., 2002).
- As an evaluation instrument for the detection of cognitive impairments the CDT is considered as a quick, easy and reliable instrument (Nishiwaki et al.2004).

4. General remarks

- /

References

1. Agrell B. and Dehlin O. 1998. "The Clock-Drawing Test." Age and Ageing 27399-403.

2. Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu. http://www.best.ugent.be

3. Freund, B., Gravenstein, S., Ferris, R., Burke, B. L., and Shaheen, E. 2005. "Drawing Clocks and Driving Cars." J Gen.Intern.Med. 20(3):240-244.

4. Manos, P. J. and Wu, R. 1994. "The Ten Point Clock Test: a Quick Screen and Grading Method for Cognitive Impairment in Medical and Surgical Patients." Int.J.Psychiatry Med. 24(3):229-44.

5. Nishiwaki, Y., Breeze, E., Smeeth, L., Bulpitt, C. J., Peters, R., and Fletcher, A. E. 15-10-2004. "Validity of the Clock-Drawing Test As a Screening Tool for Cognitive Impairment in the Elderly." Am J Epidemiol. 160(8):797-807.

6. Philpot, M. 2004. "The Clock-Drawing Test: a Critique." Int.Psychogeriatr. 16(3):251-56.

7. Powlishta, K. K., Von Dras, D. D., Stanford, A., Carr, D. B., Tsering, C., Miller, J. P., and Morris, J. C. 24-9-2002. "The Clock Drawing Test Is a Poor Screen for Very Mild Dementia." Neurology 59(6):898-903.

8. Seigerschmidt, E., Mosch, E., Siemen, M., Forstl, H., and Bickel, H. 2002. "The Clock Drawing Test and Questionable Dementia: Reliability and Validity." Int.J.Geriatr.Psychiatry 17(11):1048-54.

9. Shulman, K. I. 2000. "Clock-Drawing: Is It the Ideal Cognitive Screening Test?" Int.J.Geriatr.Psychiatry 15(6):548-61.

10. Sunderland, T., Hill, J. L., Mellow, A. M., Lawlor, B. A., Gundersheimer, J., Newhouse, P. A., and Grafman, J. H. 1989. "Clock Drawing in Alzheimer's Disease. A Novel Measure of Dementia Severity." J.Am.Geriatr.Soc. 37(8):725-29.

11. Tuokko, H., Hadjistavropoulos, T., Miller, J. A., and Beattie, B. L. 1992. "The Clock Test: a Sensitive Measure to Differentiate Normal Elderly From Those With Alzheimer Disease." J.Am.Geriatr.Soc. 40(6):579-84.

12. Watson, Y. I., Arfken, C. L., and Birge, S. J. 1993. "Clock Completion: an Objective Screening Test for Dementia." J.Am.Geriatr.Soc. 41(11):1235-40.

13. Wolf-Klein, G. P., Silverstone, F. A., Levy, A. P., and Brod, M. S. 1989. "Screening for Alzheimer's Disease by Clock Drawing." J.Am.Geriatr.Soc. 37(8):730-734.

3.8 Geriatric Depression Scale

Instrument	Geriatric Depression Scale		
Abbreviation	GDS		
Author	Yesavage et al		
Subject	Psycho-social evaluation		
Goal	Evaluation of depression		
Population	General population		
Taken by	Health care worker		
Number of items	- Different version available: 4 – 10 – 15 – 30 - Most commonly used: GDS-15		
Participation of the patient	Yes Some versions are to be filled in by the patient independently.		
Reference	Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., and Leirer, V. O. (1982). "Development and Validation of a Geriatric Depression Screening Scale: a Preliminary Report." J.Psychiatr.Res. 17(1):37-49.		
Instrument can be found at:	www.stanford.edu/~yesavage		
Permission required	No		
Translations	- Arab - Chinese - Creole - Danish - Dutch - Farsi - French - German - Greek - Hebrew - Hindi	- Hungarian - Icelandic - Italian - Japanese - Korean - Lithuania - Malay - Maltse - Norwegian - Portuguese	- Rumanian - Russian - Ukraine. - Serbian - Spanish - Swedish - Thai - Turkish - Vietnamese - Yiddish

Goal

The GDS has been developed to detect whether a person is (possibly) depressive.

Target population

The GDS can be used in healthy populations and in patient groups with illnesses, and even in populations with mild to severe cognitive deficits.

Description

The original version consists of 30 questions. A score from 0 to 9 is considered normal, 10-19 indicates presence of a moderate depression, 20-30 indicates severe depression. Since fatigue or lack of concentration can sometimes make it difficult for older individuals to reply 30 questions, the authors propose a shorter version with

15 items. This 15 item scale is the most commonly used version, and details on scoring and interpretation are below.

Methodology

- Self report
- Interview

Scoring (GDS-15)

- Total score = 15
- Range total score = : 0 – 15
- Cut-off: ≥ 5

Interpretation (GDS-15)

- Score 0 – 4 = not at risk for depression
- Score 5 – 15 = at risk for depression

Instructions

- On each question, 'yes' or 'no' needs to be answered, according to the mood of the patients.
- Calculation of the score:

	YES	NO
1. Are you basically satisfied with your life?	0	**1**
2. Have you dropped many of your activities and interests?	**1**	0
3. Do you feel that your life is empty?	**1**	0
4. Do you often get bored?	**1**	0
5. Are you in good spirits most of the time?	0	**1**
6. Are you afraid that something bad is going to happen to you?	**1**	0
7. Do you feel happy most of the time?	0	**1**
8. Do you often feel helpless?	**1**	0
9. Do you prefer to stay at home, rather than going out and doing new things?	**1**	0
10. Do you feel you have more problems with memory than most?	**1**	0
11. Do you think it is wonderful to be alive?	0	**1**
12. Do you feel pretty worthless the way you are now?	**1**	0
13. Do you feel full of energy?	0	**1**
14. Do you feel your situation is hopeless?	**1**	0
15. Do you think that most people are better off than you are?	**1**	0

Remarks

1. **Reliability**
   - The reliability of the GDS-15 is shown by a good internal consistency expressed by Chronbach alpha of 0.8.
2. **Validation**
   - The diagnostic validity of the GDS-15 is moderate: sensitivy is 67% and specificity 73%.
   - The validity of the test is shown by looking at the correlation between GDS-15 and other evaluation instruments of depression.

- The results are excellent with correlation coefficients of 0.88 with the Zung Rating Scale and 0,77 with the Hamilton Rating Scale. On the other hand, the correlation between GDS and the Cornell Scale is moderate (r= 0,37).

3. User friendliness

- The GDS-15 can be taken in 5 to 7 minutes.
- When patients are asked about their experience after having done a GDS evaluation, 87.6% find this test acceptable, 3.6% experienced it as difficult or stressing.

4. Variants

- Other shorter versions have been proposed by other authors (GDS-10; GDS-5; GDS-4; GDS-1).
- The correlation between the different variants of the test is very good.

5. General remarks

- At the initial development of the test, there were 100 items.
- For the original version, the 30 questions with the best correlations with the total score were selected to make the final GDS.
- The GDS has been translated into many languages.

References

6. Agrell, B. and Dehlin, O. 1989. "Comparison of Six Depression Rating Scales in Geriatric Stroke Patients." Stroke 20(9):1190-1194.

7. D'Ath, P., Katona, P., Mullan, E., Evans, S., and Katona, C. 1994. "Screening, Detection and Management of Depression in Elderly Primary Care Attenders. I: The Acceptability and Performance of the 15 Item Geriatric Depression Scale (GDS15) and the Development of Short Versions." Fam.Pract. 11(3):260-266.

8. Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu. http://www.best.ugent.be

9. Hammond, M. F. 2004. "Doctors' and Nurses' Observations on the Geriatric Depression Rating Scale." Age Ageing 33(2):189-92.

10. Meara, J., Mitchelmore, E., and Hobson, P. 1999. "Use of the GDS-15 Geriatric Depression Scale As a Screening Instrument for Depressive Symptomatology in Patients With Parkinson's Disease and Their Carers in the Community." Age Ageing 28(1):35-38.

11. Salamero, M. and Marcos, T. 1992. "Factor Study of the Geriatric Depression Scale." Acta Psychiatr.Scand. 86(4):283-86. [abstract]

12. Van Marwijk, H. W., Wallace, P., de Bock, G. H., Hermans, J., Kaptein, A. A., and Mulder, J. D. 1995. "Evaluation of the Feasibility, Reliability and Diagnostic Value of Shortened Versions of the Geriatric Depression Scale." Br.J.Gen.Pract. 45(393):195- 99.

13. Wancata, J., Alexandrowicz, R., Marquart, B., Weiss, M., and Friedrich, F. 2006. "The Criterion Validity of the Geriatric Depression Scale: a Systematic Review." Acta Psychiatr.Scand. 114(6):398-410.

14. Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., and Leirer, V. O. 1982. "Development and Validation of a Geriatric Depression Screening Scale: a Preliminary Report." J.Psychiatr.Res. 17(1):37-49.

Example

GDS-15		
	YES	**NO**
1. Are you basically satisfied with your life?		
2. Have you dropped many of your activities and interests?		
3. Do you feel that your life is empty?		
4. Do you often get bored?		
5. Are you in good spirits most of the time?		
6. Are you afraid that something bad is going to happen to you?		
7. Do you feel happy most of the time?		
8. Do you often feel helpless?		
9. Do you prefer to stay at home, rather than going out and doing new things?		
10. Do you feel you have more problems with memory than most?		
11. Do you think it is wonderful to be alive now?		
12. Do you feel pretty worthless the way you are now?		
13. Do you feel full of energy?		
14. Do you feel that your situation is hopeless?		
15. Do you think that most people are better off than you are?		
Total score	.....	

3.9 Mini Nutritional Assessment

The MNA® is a validated nutrition screening and assessment tool that can identify geriatric patients age 65 and above who are malnourished or at risk of malnutrition. Recent research has resulted in the launch of a new, revised MNA®-Short Form. First the original MNA is presented, followed by the revised MNA® – Short Form.

3.9.1 Mini Nutritional Assessment (MNA)

Instrument	Mini Nutritional Assessment		
Abbreviation	MNA®		
Author	Guigoz et al.		
Subject	Malnutrition		
Goals	Detection of malnutrition		
Population	Older persons		
Taken by	Health care worker		
Number of items	18		
Participation of the patient	Yes		
Reference	Guigoz Y., Vellas B. & Garry P.J. (1994) Mini Nutritional Assessment: a practical assessment tool for grading the nutritional state of elderly patients. Nutrition, Facts and research in gerontology, supplement no.2.		
Evaluation instrument can be found at:	http://www.mna-elderly.com/mna_forms.html		
Permission required	Yes Explanation: The MNA® form is protected by copyright laws and **MNA** is also a registered trademark of Société des Produits Nestlé S.A. By downloading the MNA® form you agree to keep the original form downloaded unchanged. This means that you are not entitled to modify at all the external appearance of the form nor the order of the questions. In addition, all references and logos may not be altered in any way nor removed.		
Translations	- English - Arabic - Chinese - Chinese simplified - Czech - Danish - Dutch - Farsi	- Finnish - French - German - Greek - Hungarian - Italian - Japanese - Latvian	- Norwegian - Portuguese - Sinhala - Slovenian - Spanish - Swedish - Turkish - Thai

Goal

The goal of the MNA® is to evaluate the risk of malnutrition and to identify persons who can have benefit from early intervention.

Target population

The MNA® has been developed for older persons and for different settings:

- home care (for older individuals who live independently, for the general practitioner)
- psychogeriatric setting (for instance patients with Alzheimer disease)
- *hospitals* and other institutions (long term stay institutions)

Description

The MNA® consists of 18 questions divided in 4 topics:

- *Antropometric parameters*: weight, length, Body Mass Index (BMI), calf and upper arm circumference, and weight loss
- *General judgement* in relation to life style, medication, physicial and mental status.
- *Nutritional evaluation*: number of meals per day, eating problems
- *Subjective evaluation*: a question about self perception and a question about health status

Method

- Interview

Scoring

- Total score = 30
- Range total score = 0 – 30
- Cut-offs:
  - < 24
  - < 17

Interpretation

- 24-30: no risk / normal nutritional status
- 17-23.5: risk of malnutrition
- < 17: malnutrition / bad nutritional status

Instructions

- Complete the MNA-SF en count the screening score.
  - Score 12-14 = normal nutritional status
  - Score ≤ 11 = risk of malnutrition
- If the score is 11 or less, proceed with the completion of the full MNA.
- Count total score (sum of MNA-SF and full assessment).

Remarks

1. **Reliability**
   - The internal consistency of the MNA® was high (α= 0.68 - 0.865). This is also the case for the m-MNA® (α= 0.60) (3;11) and the MNA®-SF (α =0.843).
   - The values expressing equivalence are different. Under the name of interrater reliability very low to high kappa values were noted for the MNA® (κ=0.04 to 0.80). In a study from Baath et al. (2008), a

good interrater reliability was reported for the MNA®-SF (κ= 0.531-1.000) compared to the total MNA®-SF score.

- Finally, also the stability of the MNA® was high with a kappa value of 0.78.
- The intraclass correlation coefficient (ICC) is 0.89 for the total MNA®-score.

2. Validation

- The validation of the MNA® was initially done in 600 older persons. Concurrent validity was demonstrated.
- A high sensitivity, an important factor for screening instruments like this one for malnutrition, was found (mostly between 72 and 100%, but some studies showed values only between 27 en 57%).
- Altering the cut-off can change the sensitivity and specificity. The specificity is between 60 and 100%. Some studies indicated a specificity of lower than 47% (changing of the cut-off and inclusion of different populations were mentioned as causes for the lower specificity). Studies have shown good correlations between serum albumine and MNA® (r= 0.699 en 0.811). Low specificity ratios indicate that too many patients are falsely classified as undernourished.
- Values of positive predictive value were variable, between 16.3 % to 77%. Also the negative predictive value varies (47% to 98%).
- The mortality rate was significantly higher for residents who were malnourished (predictive validity). Discriminant validity was shown compared to the cognitive score (r= -0.31). A principal component analysis has been done, allowing to show construct validity.

3. User friendliness

- The completion of the MNA® takes 10 to 15 minutes.
- Murphy et al. (2000) indicated 30 minutes to complete the MNA®. (mainly to obtain the anthropometric data).

4. Variants: modified-MNA (m-MNA)

The m-MNA® is suitable for older individuals with cognitive dysfunction and other specific disease settings. This variants consists of 7 items (weight loss, mobility, BMI, number of full meals, amount of fluid intake, modality of feeding, health status). This version has specific cut-off scores: 12,5 to 15 indicates a good nutritional status, a score between 9 and 12 indicates a risk on malnutrition and a score below 9 indicates malnutrition.

5. General remarks

- The MNA® was not shown to be a reliable instrument for patients who are not capable of adequate self judgment (confused patients, advanced dementia, aphasia or apraxia after CVA, or patients with severe or acute illnesses like pneumonia).
- An adapted form of the MNA®, the m-MNA® can be a solution for such patients, since it can be used for patients with cognitive dysfunction or other specific disease settings.

3.9.2 Mini Nutritional Assessment – Short Form (MNA-SF)

Instrument	Mini Nutritional Assessment – Short Form		
Abbreviation	MNA-SF®		
Author	Guigoz P.J., Vellas B.J. & Garry, P.J.		
Subject	malnutrition		
Goals	Detection of malnutrition		
Population	Older persons		
Taken by	Health care worker		
Number of items	6		
Participation of the patient	Yes		
Reference	Guigoz Y., Vellas B. & Garry P.J. (1994) Mini Nutritional Assessment: a practical assessment tool for grading the nutritional state of elderly patients. Nutrition, Facts and research in gerontology, supplement no.2.		
Evaluation instrument can be found at:	http://www.mna-elderly.com/mna_forms.html		
Permission required	Yes Explanation: The MNA® form is protected by copyright laws and **MNA** is also a registered trademark of Société des Produits Nestlé S.A. By downloading the MNA® form you agree to keep the original form downloaded unchanged. This means that you are not entitled to modify at all the external appearance of the form nor the order of the questions. In addition, all references and logos may not be altered in any way nor removed.		
Translations	- English - Arabic - Chinese - Chinese simplified - Czech - Danish - Dutch - Farsi	- Finnish - French - German - Greek - Hungarian - Italian - Japanese - Latvian	- Norwegian - Portuguese - Sinhala - Slovenian - Spanish - Swedish - Turkish - Thai

Goal

The MNA-SF® is to evaluate the risk or presence of malnutrition and to identify persons who can have benefit from early intervention.

Target population

The MNA® has been developed for older persons and for different settings:

- home care (for older individuals who live independently, for the general practitioner)
- psychogeriatric setting (for instance patients with Alzheimer disease)
- hospitals and other institutions (long term stay institutions)

Description

The MNA®-SF is a shortened form of the MNA® that provides an easy way to screen elderly patients for malnutrition. The shortened MNA-SF® comprises six questions that were found to strongly correlate with the total MNA® and clinical judgment of nutritional status. This MNA® Short Form is now validated as a stand-alone tool. Calf circumference has been determined to be a valid alternative when BMI is not available. The MNA® Short Form now also classifies the elderly as well-nourished, at risk, or malnourished versus completion of the full MNA® for nutritional status classification. These changes to the MNA® Short Form facilitate its use across care settings and make it much more user friendly.

Method

- Interview

Scoring

- Total score = 14
- Range total score = 0 – 14

Interpretation

- 12 or more: normal nutritional status
- 8 - 11: risk of malnutrition
- 0 – 7: malnourished

Instructions

- Complete the screen by filling in the boxes with the appropriate numbers.
- Total the numbers for the final screening score.

Remarks

1. **Validation**
   - For the MNA®- SF, sensitivity was between 85.6 and 100%.
   - Specificity was between 69.5% and 100%, with the exception of a study of Ranhoff et al with specificity of 38%.
   - The high sensitivity and specificity of the MNA®-SF compared with the MNA® or other nutritional parameters indicate that the MNA®-SF is a valid screening tool for malnutrition in the older person.
2. **User friendliness**
   - The MNA®-SF takes less than 5 minutes.
   - The training time required for the use of the MNA®-SF was shown to be shorter than for the MNA®.
3. **General remarks**
   - The MNA® is a reliable two-step screening test to assess the risk of malnutrition in the older person.
     - In the first step, the MNA®-SF serves as a simple valid tool to rapidly screen patients for risk of malnutrition.
     - In the second step, the full MNA® is used to assess nutritional status and facilitate nutritional intervention.
   - The full MNA® should be used as a guide for nutritional interventions.
   - It is important that the MNA® is completed at regular intervals for continuous assessment of the patient.

References

1 Baath, C., Hall-Lord, M., Idvall, E., Wiberg-Hedman, K., & Larsson, B. W. (2008). Interrater Reliability Using Modified Norton Scale, Pressure Ulcer Card, Short Form-Mini Nutritional Assessment By Registered And Enrolled Nurses In Clinical Practice. Journal Of Clinical Nursing, 17, 618-626.

2 Bauer, J. M., Vogl, T., Wicklein, S., Trogner, J., Muhlberg, W., & Sieber, C. C. (2005). Comparison Of The Mini Nutritional Assessment, Subjective Global Assessment, And Nutritional Risk Screening (Nrs 2002) For Nutritional Screening And Assessment In Geriatric Hospital Patients. Z.Gerontol.Geriatr., 38, 322-327.

3 Bleda, M. J., Bolibar, I., Pares, R., & Salva, A. (2002). Reliability of the mini nutritional assessment (MNA) in institutionalized elderly people. *J.Nutr.Health Aging, 6,* 134-137.

4 Charlton, K. E., Kolbe-Alexander, T. L., & Nel, J. H. (2007). The Mna, But Not The Determine, Screening Tool Is A Valid Indicator Of Nutritional Status In Elderly Africans. Nutrition, 23, 533-542.

5 Christensson, L., Unosson, M., & Ek, A. C. (2002). Evaluation Of Nutritional Assessment Techniques In Elderly People Newly Admitted To Municipal Care. Eur.J.Clin.Nutr., 56, 810-818.

6 Cohendy, R., Rubenstein, L. Z., & Eledjam, J. J. (2001). The Mini Nutritional Assessment-short form for pre-operative nutritional evaluation of elderly patients. *Aging, 13,* 293-297.

7 Daem, M., Piron, C., Lardennois, M., Gobert, M., Folens, B., Vanderwee, K., Grypdonck, M., & Defloor T. (2007). Opzetten van een databank met gevalideerde meetinstrumenten: BEST-project. Brussel, Federale Overheidsdienst Volksgezondheid, Veiligheid van de voedselketen en Leefmilieu. http://www.best.ugent.be

8 De Groot, L. C. P. G. & Beck, A. M. (1998). Evaluating The Determine Your Nutrutional Health Checklist And The Mini Nutritional Assessment.. European Journal Of Clinical Nutrition, 52, 877.

9 Ferreira, L. S., Nascimento, L. F. C., & Marucci, M. F. N. (2008). Use of the mini nutritional assessment tool in elderly people from long-term care institutions of southeast of Brazil. *The Journal of Nutrition, Health and Aging, 12,* 213-217.

10 Guigoz, Y., Vellas, B., & Garry, P. J. (1994). Mini Nutritional Assessment: a practical assessment tool for grading the nutritional state of elderly patients. *Nutrition, Facts and research in gerontology, supplement no.2*.

11 Harris, D. G., Davies, C., Ward, H., & Haboubi, N. Y. (2008). An Observational Study Of Screening For Malnutrition In Elderly People Living In Sheltered Accommodation. J.Hum.Nutr.Diet., 21, 3-9.

12 Hengstermann, S., Nieczaj, R., Steinhagen-Thiessen, E., & Schulz, R. J. (2008). Which are the most efficient items of mini nutritional assessment in multimorbid patients? *J.Nutr.Health Aging, 12,* 117-122.

13 Kaiser MJ, Bauer JM, Ramsch C et al. Validation of the mini nutritional assessment short-form (MNA-SF): a practical tool for identification of nutritional status. J Nutr Health Aging. 2009; 13: 782-8.

14 Murphy, M. C., Brooks, C. N., & Lumbers, M. L. (2000). The Use Of The Mini-Nutritional Assessment (MNA) Tool In Elderly Orthopaedic Patients. Eur J Clin Nutr., 54, 555-562.

15 Persson, M. D., Brismar, K. E., Katzarski, K. S., Nordenstrom, J., & Cederholm, T. E. (2002). Nutritional Status Using Mini Nutritional Assessment And Subjective Global Assessment Predict Mortality In Geriatric Patients. *J.Am.Geriatr.Soc., 50,* 1996-2002.

16 Ranhoff, A. H., Gjoen, A. U., & Mowe, M. (2005). Screening for malnutrition in elderly acute medical patients: the usefulness of MNA-SF. *J.Nutr.Health Aging, 9,* 221-225.

17 Rubenstein, L. Z., Harker, J., & Guigoz, Y. V. B. (1999). Comprehensive geriatric assessment (CGA) and the MNA: an overview of CGA, nutritional assessment, and development of a shortened version of the MNA. *Mini Nutritional Assessment (MNA): Research and Practice in the Elderly, ed B Vellas, PJ Garry & Y Guigoz, Nestlé Workshop Series Clinical &Performance Programme.Basel Nestlé, 1,* 101-116.

18 Rubenstein, L. Z., Harker, J. O., Salva, A., Guigoz, Y., & Vellas, B. (2001). Screening For Undernutrition In Geriatric Practice: Developing The Short-Form Mini-Nutritional Assessment (Mna-Sf). J.Gerontol.A Biol.Sci.Med.Sci., 56, M366-M372.

19 Vellas, B., Guigoz, Y., Baumgartner, M., Garry, P. J., Lauque, S., & Albarede, J. L. (2000). Relationships Between Nutritional Markers And The Mini-Nutritional Assessment In 155 Older Persons. *J.Am.Geriatr.Soc., 48,* 1300-1309.

20 Wikby, K. & Christensson, L. (2008). The Two-Step Mini Nutritional Assessment Procedure In Community Resident Homes. Journal Of Clinical Nursing, 17, 1211-1218.

Example: MNA

Nestlé Nutrition Institute

Mini Nutritional Assessment
MNA®

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers. Add the numbers for the screen. If score is 11 or less, continue with the assessment to gain a Malnutrition Indicator Score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3kg (6.6lbs)
1 = does not know
2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F Body Mass Index (BMI) (weight in kg) / (height in m^2)
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

Screening score ☐☐
(subtotal max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes 0 = no ☐

H Takes more than 3 prescription drugs per day
0 = yes 1 = no ☐

I Pressure sores or skin ulcers
0 = yes 1 = no ☐

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals ☐

K Selected consumption markers for protein intake
- At least one serving of dairy products (milk, cheese, yoghurt) per day yes ☐ no ☐
- Two or more servings of legumes or eggs per week yes ☐ no ☐
- Meat, fish or poultry every day yes ☐ no ☐

0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes ☐.☐

L Consumes two or more servings of fruit or vegetables per day?
0 = no 1 = yes ☐

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups ☐.☐

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem ☐

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem ☐

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better ☐.☐

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC 22 or greater ☐.☐

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater ☐

Assessment (max. 16 points) ☐☐.☐

Screening score ☐☐.☐

Total Assessment (max. 30 points) ☐☐.☐

Malnutrition Indicator Score

24 to 30 points	☐	normal nutritional status
17 to 23.5 points	☐	at risk of malnutrition
Less than 17 points	☐	malnourished

Ref. Vellas B, Villars H, Abellan G, et al. *Overview of MNA® - Its History and Challenges.* J Nut Health Aging 2006; 10: 456-465.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. Screening for Undernutrition in Geriatric Practice: *Developing the Short-Form Mini Nutritional Assessment (MNA-SF).* J. Geront 2001; 56A: M366-377.
Guigoz Y. The Mini-Nutritional Assessment (MNA®) *Review of the Literature – What does it tell us?* J Nutr Health Aging 2006; 10: 466-487.

For more information: www.mna-elderly.com

Example: MNA-SF

Nestlé Nutrition Institute

Mini Nutritional Assessment MNA®

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F1 Body Mass Index (BMI) (weight in kg) / (height in m^2)
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score ☐☐
(max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

Ref. Vellas B, Villars H, Abellan G, et al. *Overview of the MNA® - Its History and Challenges.* J Nutr Health Aging 2006;10:456-465.

Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. *Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF).* J. Geront 2001;56A: M366-377.

Guigoz Y. *The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us?* J Nutr Health Aging 2006; 10:466-487.

For more information: www.mna-elderly.com

3.10 Charlson Comorbidity Index (CCI)

Instrument	Charlson Comorbidity Index
Abbreviation	CCI
Author	Charlson ME et al.
Subject	Comorbidities
Goal	Severity of comorbidities
Population	General population
Taken by	- Clinician - Trained coder
Number of items	19
Participation of the patient	No
References	Charlson ME, Pompei P, Ales KL, Mackenzie CR: A New Method of Classifying Prognostic Co-Morbidity in Longitudinal-Studies - Development and Validation. *Journal of Chronic Diseases* 1987, 40:373-383.
Instrument can be found at:	Charlson ME, Pompei P, Ales KL, Mackenzie CR: A New Method of Classifying Prognostic Co-Morbidity in Longitudinal-Studies - Development and Validation. *Journal of Chronic Diseases* 1987, 40:373-383.
Permission required	No
Translations available	Not available

Goal

The Charlson Comorbidity Index (CCI) assesses comorbidity level by taking into account both the number and severity of 19 pre-defined comorbid conditions.

Target population

The CCI can be used in the general population.

Description

- The CCI provides a weighted score of a client's comorbidities which can be used to predict short- and long-term outcomes such as function, hospital length of stay and mortality rates.
- The CCI is comprised of 19 comorbid conditions: myocardial infarct, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, connective tissue disease, ulcer disease, mild liver disease, diabetes, hemiplegia, moderate or several renal disease, diabetes with end organ damage, any tumor, leukemia, lymphoma, moderate or severe liver disease, metastatic solid tumor, AIDS.

- Each disease is given a different weight based on the strength of its association with 1-year mortality as follows (2):

Assigned weights for diseases	Comorbid Conditions
1	Myocardial infarct, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, connective tissue disease, ulcer disease, mild liver disease, diabetes
2	Hemiplegia, moderate or several renal diseases, diabetes with end organ damage, any tumor, leukemia, lymphoma
3	Moderate or severe liver disease
6	Metastatic solid tumor, AIDS

Method

- medical records
- administrative databases

Scoring

- The total score in the CCI is derived by summing the assigned weights of all comorbid conditions presented by the patient.

Interpretation

- Higher scores indicate a more severe condition and consequently, a worse prognosis [3].

Instructions

- **B**

  asic information

  - If you include a patient with metastatic colorectal carcinoma and he has in addition a metastatic prostate cancer: this is counted as a comorbidity (= 2nd malignancy).
  - The tumor type leading to inclusion in the trial is not.

- **S**

  pecific information

	Description
Myocardial infarction	History of medically documented myocardial infarction
Congestive heart failure	Symptomatic CHF with response to specific treatment
Peripheral vascular disease	Intermittent claudication, peripheral arterial bypass for insufficiency, gangrene, acute arterial insufficiency, untreated aneurysm (> 6 cm)
Cerebrovascular disease (except hemiplegia)	History of TIA, or CVA with no or minor sequellae
Dementia	Chronic cognitive deficit
Chronic pulmonary disease	Symptomatic dyspnoea due to chronic respiratory conditions (including asthma)
Connective tissue disease	SLE, polymyositis, mixed CTD, polymyalgia rheumatica, moderate to

	severe RA
Ulcers	Patients who have required treatment for PUD
Mild liver disease	Cirrhosis without PHT, chronic hepatitis
Diabetes (without end-organ damage)	Diabetes with medication
Diabetes (with end organ damage)	Retinopathy, neuropathy, nephropathy
Hemiplegia (or paraplegia)	Hemiplegia or paraplegia
Moderate or severe chronic renal failure	Creatinine > 3 mg/dl (265 gmol/l), dialysis, transplantation, uremic syndrome
2nd malignancy (non metastatic)	Initially treated in the last 5 years. Exclude: non-melanomatous skin cancers and in situ cervical carcinoma.
Leukaemia	CML, CLL, AML, ALL, PV
Lymphoma	Non-Hodgkin's lymphoma (NHQ, Hodgkin's, Waldenstrom, multiple myeloma)
Moderate or severe liver disease	Cirrhosis with PHT + /- variceal bleeding
2nd metastatic malignancy	Self-explaining
AIDS	AIDS and AIDS-related complex Suggested: as defined in latest definition

Abbrevations:

- CHF: congestive heart failure
- TIA: transient ischemic attack
- CVA: cerebro-vascular accident
- SLE: systemic lupus erythematosus
- CTD: connective tissue disease
- RA: rheumatoid arthritis
- PUD: peptic ulcer disease
- PHT: portal hypertension
- CML: chronic myeloid leukaemia
- CLL: chronic lymphoid leukaemia
- AML: acute myeloid leukaemia
- ALL: acute lymphoblastic leukaemia
- PV: polycythemia vera.

Remarks

- The CCI is the most widely used scoring system for comorbities used by researchers and clinicians.
- The CCI has a weighted age version, two adaptations to be used with ICD-9 databases, and one version to be used with clients with amputations.

References

1. B
ravo, G., Dubois, M.F., Hebert, R., De Wals, P., & Messier, L. (2002). A perspective evaluation of the Charlson Comorbidity Index for use in long-term care patients. *JAGS*, 50, 740-745.

2. Charlson ME, Pompei P, Ales KL, Mackenzie CR: A New Method of Classifying Prognostic Co-Morbidity in Longitudinal-Studies - Development and Validation. Journal of Chronic Diseases 1987, 40:373-383.

3. Charlson, M., Szatrowski, T.P., Peterson, J., & Gold, J. (1994). Validation of a Combined Comorbidity Index. *Journal of Clinical Epidemiology*, 47(11), 1245-1251.

4. Deyo, R.A., Cherkin, D.C., & Ciol, M.A. (1992). Adapting a clinical comorbidity index for use with ICD-9-CM administrative databases. *Journal Clinical Epidemiology*, 45, 613-619.

5. Elixhauser, A., Steiner, C., Harris, D.R., & Coffey, R.M. (1998). Comorbidity measures for use with administrative data. Medical Care, 36(1), 8-27.

6. Launay-Vacher V, et al; International Society of Geriatric Oncology. Renal insufficiency in elderly cancer patients: International Society of Geriatric Oncology clinical practice recommendations. Ann Oncol. 2007 Aug;18(8):1314-21.

7. Romano, P.S., Roos, L.L., & Jollis, J.G. (1993). Adapting a clinical comorbidity index for use with ICD-9-CM administrative data: differing perspectives. *Journal of clinical epidemiology*, 46 (10) 1075-1079.

Example

Charlson Comorbidity Index (CCI)		
Co-morbidities	**Present**	**Points**
1. Myocardial infarction		1
2. Congestive cardiac failure		1
3. Peripheral vascular disease		1
4. Cerebrovascular disease (except hemiplegia)		1
5. Dementia		1
6. Chronic obstructive pulmonary disease		1
7. Connective tissue disease		1
8. Ulcers		1
9. Mild liver disease		1
10. Diabetes Mellitus (without end-organ damage)		1
11. Diabetes Mellitus (with end-organ damage)		2
12. Hemiplegia		2
13. Moderate / Severe chronic renal failure		2
14. Second malignancy (non metastatic)		2
15. Leukaemia		2
16. Lymphoma		2
17. Moderate / Severe liver disease		3
18. Second malignancy (metastatic)		6
19. AIDS		6
Total score (0-37)		.....

3.11 Cumulative Illness Rating Scale for Geriatrics

Instrument	Cumulative Illness Rating Scale for Geriatrics
Abbreviation	CIRS-G
Author	Linn et al (1968)
Subject	Comorbidities
Goal	Severity of comorbidities
Population	General population
Taken by	- Clinician - Trained coder
Number of items	14 items
Participation of the patient	No
Reference	Linn BS, Linn MW & Gurel L: Cumulative illness rating scale. Journal of the American Geriatric Society 1968; 16:622-626.
Instrument can be found at:	…
Permission required	…
Translations	- English - French - Dutch - …

Goal

Target population

Description

- The CIRS-G is developed to meet the need for a brief, comprehensive and reliable instrument for assessing physical impairment.
- It classifies comorbidities by organ systems and grades each condition from 0 (no problem) to 4 (Extremely Severe / immediate treatment required / end organ failure / severe impairment in function).

Method

- medical records
- administrative databases

Scoring

- See scoring manual: the scoring, interpretation, and instructions are very complex, and can be found in detail in a specific manual (hopefully soon available online)

Interpretation

- See scoring manual

Instructions

- See scoring manual

Remarks

/

References

1. Linn BS, Linn MW & Gurel L: Cumulative illness rating scale. Journal of the American Geriatric Society 1968; 16:622-626.

2. Miller MD, Paradis CF, Houck PR, Mazumdar S, Stack JA, Rifai AH, Mulsant B & Reynolds CF. Rating chronic medical illness burden in geropsychiatric practice and research: application of the Cumulative Illness Rating Scale. Psychiatry Research 1992; 41(3): 237-248.

3. Salvi F, Miller MD, Grilli A, Giorgi R, Towers AL, Morichi V, Spazzafumo L, Mancinelli L, Espinosa E, Rappelli A, Dessì-Fulgheri P. A manual of guidelines to score the modified cumulative illness rating scale and its validation in acute hospitalized elderly patients. J Am Geriatr Soc. 2008 Oct;56(10):1926-31.

Example

Scoring Sheet

CUMULATIVE ILLNESS RATING SCALE FOR GERIATRICS (CIRS-G)

Miller, Paradis, and Reynolds 1991

PATIENT_____**AGE**_____

RATER_____**DATE**_____

Instructions: Please refer to the CIRS-G Manual. Write brief descriptions of the medical problem(s) that justified the endorsed score on the line following each item. (Use the reverse side for more writing space).

RATING STRATEGY

0 - No Problem
1 - Current mild problem or past significant problem
2 - Moderate disability or morbidity/requires "first line" therapy
3 - Severe/constant significant disability/"uncontrollable" chronic problems
4 - Extremely Severe/immediate treatment required/end organ failure/severe impairment in function

	SCORE
HEART	____
VASCULAR	____
HEMATOPOIETIC	____
RESPIRATORY	____
EYES, EARS, NOSE AND THROAT AND LARYNX	____
UPPER GI	____
LOWER GI	____
LIVER	____
RENAL	____
GENITOURINARY	____
MUSCULOSKELETAL/INTEGUMENT	____
NEUROLOGICAL	____
ENDOCRINE/METABOLIC AND BREAST	____
PSYCHIATRIC ILLNESS	____
TOTAL NUMBER CATEGORIES ENDORSED	____
TOTAL SCORE	____
Severity Index: (total score/total number of categories endorsed)	____
Number of categories at level 3 severity	____
Number of categories at level 4 severity	____

4 Practical issues

This chapter will describe the practical issues for starting the implemention of a screening +/- CGA by oncological patients.

4.1 Which patients to evaluate?

In the guidelines of SIOG, the National Comprehensive Cancer Network (NCCN) and the EORTC-Task Force Cancer in the Elderly, it has recommended that all patients 70 years or older, with diagnosis of cancer, should undergo some form of geriatric assessment.

Besides that, it is also reasonable to perform a geriatric evaluation in patients with known cancers, but where treatment decisions need to be taken. Here below are some situations where a geriatric evaluation can be considered. Of course, there can be specific/acute situations where such an evaluation is not appropriate.

Which patients to evaluate?

- Patients with an oncological diagnosis (solid malignant tumor / haematological malignancy)
    - New diagnosis
    - Progressive after/under a certain form of therapy
        - Surgery
        - Chemotherapy
        - Radiotherapy
        - Hormonal therapy
        - Targeted therapy
        - …
    - Relapse

- Patients 70 years or older

- Patients present in the hospital
    - Ambulatory
    - Hospitalized

4.2 Methodology

- Screening:
  - Depending on the screening tool that is chosen, screening is performed by self-report or interview.

- CGA:
  - In clinical practice it is recommended to perform the CGA by interview.

4.3 Organizational conditions

Individual level

- Education and training for developing expertise in performing a CGA

- Presence of care givers when performing the screening +/-CGA
  - The presence of care givers (partner / children / family members / others) is accepted during the performance of a CGA.
  - Clear instructions of the health care professional are required in view of the fact that certain evaluation instruments can be fulfilled by the older person only (eg. MMSE).
  - In some situations, eg. older person with Alzheimer, the presence of a care giver is required to receive correct information concerning the actual condition of the older person.

- Language barrier
  - The screening +/- CGA can be performed best in mother language of the older person unless the necessary knowledge of the other language is present. If this isn't the case, an interpreter can be required.

Institutional level

- Requirements for the performance of a CGA:
  - Room where the necessary privacy can be foreseen during the interview
  - Computer

- Material necessary for the performance of a CGA:
  - Paper and pen
  - Measuring tape
  - Watch
  - Pencil
  - Clipmap

- Organizational information sessions to the involved physicians and health care professionals for information and sensibilisation

4.4 Way of reporting

When screening +/- CGA are performed, the results should be made available to the treating physician. It is advised to make a short summary and to mention advices for intervention and follow-up.

Because the treating physician / health care worker will not always be known with the geriatric evaluation instruments that are used, it is important to mention:

- Full name of the evaluation instrument
- Total score of each instrument + range of the score
- Scores identifying problems/deficits
- Number of scores identifying problems
- Subareas + specific subscore (eg. items of the ADL)
- Interpretation of the score

4.5 Interventions

Based on the implementation of a CGA, there are often problems detected by the older person that were not previously known. After detection, specific interventions can be planned like involvement of other health care workers or referral to specific services. If possible the patients situation should be discussed in a team conference.

- Involvement other health care workers
    - Social worker
    - Occupational therapist
    - Physical therapist
    - Dietician
    - Psychologist
    - Geronto-psychiatrist

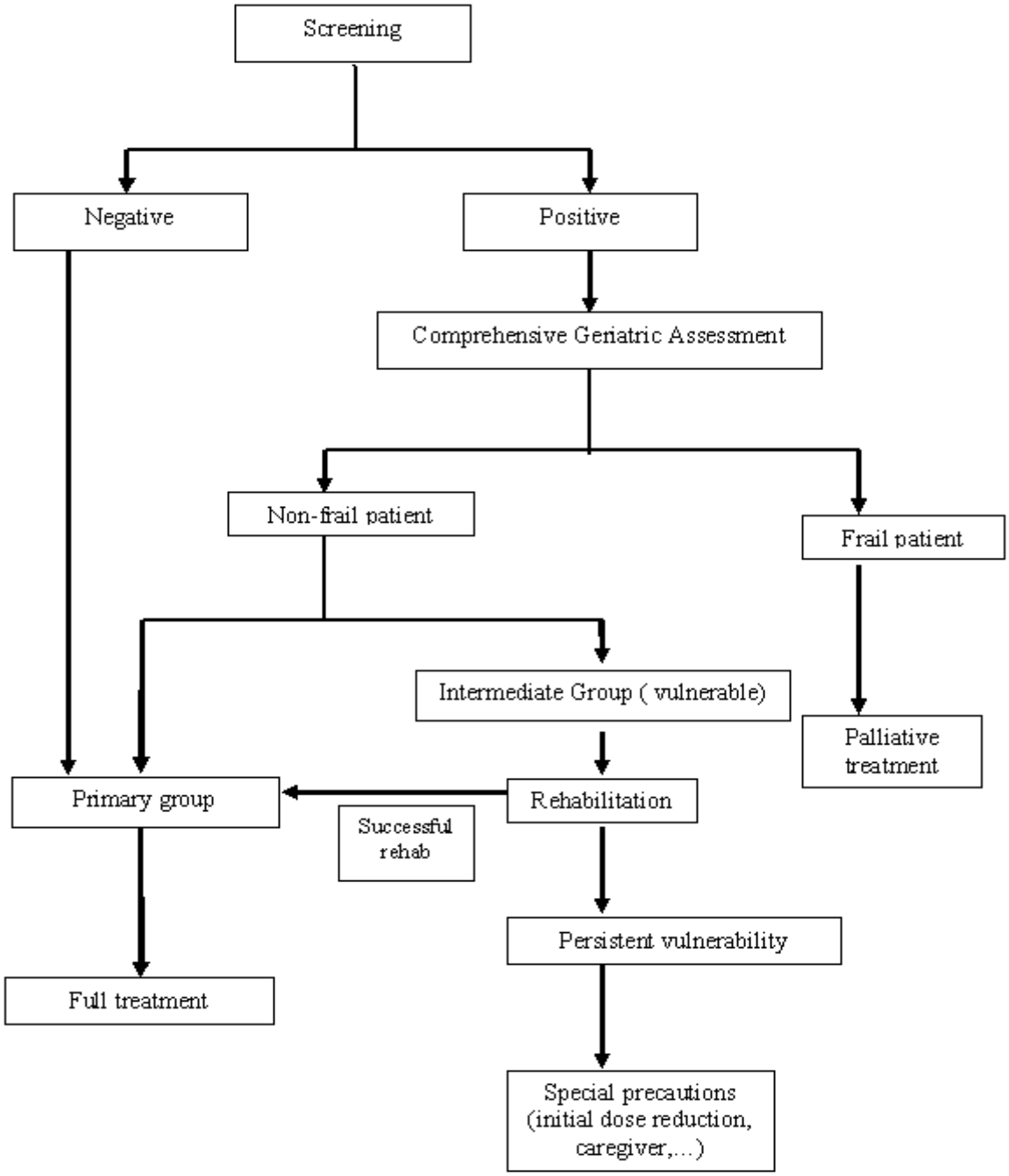
- General practitioner
- …

- Referral
  - Geriatric day clinic
  - Fall clinic
  - …

4.6 Use in clinical practice

The CGA offers the best way of working to provide an excellent view on the general condition of the older person. The algorithm below shows how you can use the screening +/- CGA in daily practice in the treatment decision plan of the older person (see figure 1).

Figure 1 : Algoritm for CGA



Adaptation of Balducci, L. (2003). Geriatric oncology. Critical Reviews in Oncology / Hematology, 46, 211-220.

5 Case presentation

General information

- Age: 80 years
- Gender: Female
- ECOG-PS or Karnofsky-PS
- Diagnosis:
  o New diagnosis breast cancer 07/2010, cT3N1M0, for which she receives:
  ▪ mastectomy and axillary dissection
  ▪ Pathological analysis show a pT1cN2aM0 grade III tumor
  • ER/PR negative
  • HER2 negative

- Indication for CGA:
  o New oncological diagnosis
  o Older than 70 years
  o Ambulant setting: patient is seen at the consultation unit

Results Screening + CGA	Methodology

SCREENING
- G8 (0-17): 14/17
  o < of = 14: presence of a geriatric risk profile
  o > 14: absence of a geriatric risk profile
	Interview

PAIN
- VAS (0-10): 3/10
  o 0: no pain
  o 1-10: presence of pain increasingly
	Interview

DEMOGRAPHIC DATA - Marital status: Married - Living situation: At home with partner - Education: Higher secondary education - Profession: Teacher Physical Activity	Interview

FUNCTIONALITY
- ADL (0-6): 5/6
  * Bathing: 1/1
  * Dressing: 1/1
	Interview

* Transferring: 1/1 * Toileting: 1/1 * Continence: 0/1 * Feeding: 1/1 o 6: independent o 0-5: dependent in x activities of daily living	
FUNCTIONALITY - IADL (0-8): 8/8 * Ability to use telephone: 1/1 * Shopping: 1/1 * Food preparation: 1/1 * Housekeeping: 1/1 * Laundry: 1/1 * Mode of transportation: 1/1 * Responsability for own medication: 1/1 * Ability to handle finances: 1/1 o 8: independent o 0-7: dependent in x instrumental activities of daily living	Interview
FALLS - Falls: NO * Injuries: NO - Minor: NO - Major: NO	Interview
COGNITIVE STATUS - MMSE (0-30): 30/30 * Orientation in time: 5/5 * Orientation in place: 5/5 * Registration: 3/3 * Calculation and attention: 5/5 * Memory: 3/3 * Language: 8/8 * Constructive ability: 1/1 o 24 – 30 = normal cognitive situation o 18 – 23 = mild cognitive deterioration o 0 – 17 = severe cognitive deterioration	Interview
DEPRESSION - GDS (0-15): 1/15 o 0-4: no depression o 5-15: at risk for depression	Interview
NUTRITIONAL STATUS - MNA screening (0-14): 11/14 o 12 or more: no risk / normal nutritional status o 11 or less: risk of malnutrition - MNA full assessment (0-30): 25.5/30 o 24-30: no risk / normal nutritional status	Interview

○ 17-23.5: risk of malnutrition ○ < 17: malnutrition / bad nutritional status	
SUMMARY - Screening: presence of a geriatric risk profile - CGA: pain, ADL dependent (incontinence), IADL independent, no falls, normal cognitive situation, no depression, normal nutritional status	

Treatment decision for this patient
1. What would be your oncological treatment proposal in case the patient was **55 years without other comorbidity**? ○ Surgery ○ Radiotherapy ○ Chemotherapy: FEC - Taxotere
2. Is this different from your oncological treatment proposal for **this patient** according to the age of the patient **without** information of the **geriatric assessment**? **YES**: Only surgery and radiotherapy
3. Is this different from your current oncological treatment proposal for **this patient** according to the age of the patient **with** the knowledge of **geriatric assessment**? **YES**: Surgery / Radiotherapy / Chemotherapy: Taxotere - Cyclofosfamide **WHY**? Very good assessment, good life expectancy (not taking into account breast tumor), with relevant risk of dying of breast cancer in the next few years.

6 Prediction of toxicity with geriatric assessment

CRASH Score Calculator

This score stratifies patients in 4 risk categories of severe toxicity for older patients receiving chemotherapy. The tool includes chemotherapy risk (0-1-2 depending on MAX-2 score), hematologic risk factors (diastolic blood pressure, IADL, LDH) and non-hematologic risk factors (ECOG PS, MMS, MNA), and allows to predict toxicity of a specific chemotherapy regimen. Formal clinical applications of the score still need to be studied.
The calculator is available at www.moffitt.org/saoptools

Reference for derivation and validation results: Extermann et al. Proc Am Soc Clin Oncol. Vol 28, abstr 9000, 2010.

7 Usefull information

International websites:

www.siog.org

Belgian websites:

www.best.ugent.be
www.geriatrie.be
www.valpreventie.be

Scientifical journals:

- Journal of Geriatric Oncology
- Critical Reviews in Oncology / Hematology
- European Journal of Cancer
- Journal of Clinical Oncology

Books:

ESMO Handbook of Cancer in the Senior Patient
By D. Schrijvers, M. Aapro, B. Zakotnik, R. Audisio, H. van Halteren, A. Hurria
ISBN: 978-184184708-5

8 References

Carreca I, Balducci L, Extermann M. Cancer in the older person. Cancer Treatment Reviews 2005 Aug;31(5):380-402.

Extermann M. Geriatric Oncology: An Overview of Progresses and Challenges. Cancer Res Treat 2010 Jun; 42(2), 61-68.

Extermann M, Hurria A. Comprehensive geriatric assessment for older patients with cancer. Journal of Clinical Oncology 2007; 25: 1824-1831.

Extermann M, Meyer J, McGinnis M, et al. A comprehensive geriatric intervention detects multiple problems in older breast cancer patients. Critical Reviews in Oncology Hematology 2004 Jan,49(1), 69-75.

Lekan-Rutledge D. Functional assessment. In: Matteson MA, McConnel ES, Linton AD, editors. Gerontological nursing: concepts and practice. 2nd edition. Philadelphia: WB Saunders 1997; 67–111.

Stuck AE, Slu AL, Wieland GD, Adams J, Rubenstein LZ. Comprehensive geriatric assessment: a meta-analysis of controlled trials. Lancet 1993; 342: 1032-1036.