



Kessler Foundation Neglect Assessment Process

KF-NAP™ 2015 Manual

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It is recommended that the KF-NAP™ be administered by trained individuals only. The KF-NAP™ may help clinicians to make a diagnosis related to spatial neglect. The Kessler Foundation is not responsible for a clinical diagnosis.

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Preface

During the 2011 annual joint meetings of the American Congress of Rehabilitation Medicine – American Society for Neurorehabilitation (ACRM-ASNR), we and our colleagues, Ms. Robin Hedeman and Dr. A.M. Barrett, introduced our method in using the Catherine Bergego Scale (CBS).^{1,2} This method determined that additional instructions were needed for reliable CBS administration. Many people in the audience shared our passion about improving care for spatial neglect, and encouraged us to standardize the administrative procedure and scoring criteria of the CBS in the form of a manual.

In 2012, we published the first edition of the KF-NAP™ manual in an article titled “Functional assessment of spatial neglect: A review of the Catherine Bergego Scale and an introduction of the Kessler Foundation Neglect Assessment Process” in the journal *Topics in Stroke Rehabilitation*.³ In this article, we reviewed the importance of assessing spatial neglect during activities of daily living and included a one-page KF-NAP instruction sheet describing how to score each category. In addition, the labels of several CBS categories were changed in order to better convey the purpose of an observation, to include the assessment for right-sided neglect symptoms, or to shorten the wording for simplification. For example, “knowledge of left limbs” on the CBS¹ is revised to “limb awareness” on the KF-NAP™. At this time, we started a website to publicize the manual and to make announcements of our research activities related to spatial neglect.

<https://kesslerfoundation.org/researchcenter/stroke/networkforspatialneglect.php>

We reached out to occupational therapists who might be interested in refining the manual by conducting a research project. From July 2012 to March 2014, Gretchen March, Sharon Holman, Courtney Silviotti, Lindsay Comardo, Yamiley Lemoine, and Shira Schwarz learned from us (mostly Kimberly Hreha) how to use the KF-NAP™ assessment process. At the same time, they collected valuable information on how spatial neglect affected rehabilitation outcomes. During this period, numerous clinicians and students in the US, and foreign clinicians from Italy, India, and South Korea came to the Kessler Foundation to learn the KF-NAP™. All these activities enhanced our ability to further clarify our instructions and to refine the assessment process again.

In the spring of 2014, we released the KF-NAP™ 2014 Manual,⁴ which was much more than a “one-pager”. Dr. Marco Pitteri encouraged us to refine the instructions so that the assessment process and scoring criteria were very detailed. Thus we would like to not only recognize him as one of the authors of the 2014 Manual but thank him for his enthusiasm in making the KF-NAP™ better. In this manual we described how to assign a score of 0, 1, 2, or 3 for observation of each category. We also provided general principles across all categories. In addition, the KF-NAP™ 2014 Manual specified the environment where the observation takes place and how to observe left vs. right asymmetric performance in a given category.

Even though the 2014 Manual is detailed, hands-on training programs on how to use assessments can be more effective. However, they can also be costly and time consuming. Thus, we produced a series of training videos to use in conjunction with the Manual. Again, during this time of detailed attentiveness to the process, we found the Manual could be refined even further. We decided to make four major changes: 1) the order of the categories, 2) the presentation of the scoring sheet, 3) the organization of scoring criteria in each category, and 4) we renamed “Eating” as “Meals” because during this observation, you are *not* assessing the ability to chew or swallow (which also may be impaired). We hope you find the KF-NAP 2015 Manual and its Video Tutorial helpful in your assessment of spatial neglect during activities of daily living.

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I. INTRODUCTION

Spatial neglect is a neurocognitive disorder of spatial attention and intention, affecting spatial perception and representation, mental imagery, and motor action planning. Individuals with spatial neglect show a failure or slowness to report, respond, orient, or initiate action towards stimuli in the side of space opposite to the primary brain injury.⁵ Neglect of the left side often occurs following right brain damage, whereas neglect of the right side is a result of left brain damage. According to our and others' studies, spatial neglect occurs in approximately 50% of stroke survivors with right brain damage and 30% of those with left brain damage.⁶ The terms "left-sided neglect" and "right-sided neglect" are related to the patient's body (so-called "body-centered neglect"). There are other forms of spatial neglect based on different frames of references, such as object-centered neglect.⁷ This assessment concerns only the body-centered neglect.

To make this manual easier to follow, we will focus on left-sided neglect, which occurs after right brain damage. However, the examiner can use the same principles to assess individuals with left brain damage who may neglect the right side. The scoring sheet is applicable to both left and right-sided neglect.

Eligible Patients

You may use the KF-NAP™ to assess individuals who suffer from brain damage or injuries after a cardiovascular accident (stroke), traumatic brain injury (TBI), surgical procedures, etc.

Setting

The KF-NAP™ can be administered in a variety of settings. You can use the KF-NAP™ in the patient's home, an acute care hospital, an inpatient rehabilitation facility, or an outpatient clinic. This manual is focused on the inpatient rehabilitation setting. However, if the assessment is being conducted in an outpatient clinic, it is important to have the patient bring a few personal belongings such as a coat, glasses, a handbag or a backpack, which will help the assessment of Personal Belongings. In addition, the patient should bring in a full meal to use for the Meals category. To provide you with the additional information about the items to use in the outpatient setting, please see the KF-NAP™ Examiner's Kit.

General Principles

1. No lateralized cue

Being a rehabilitation clinician, such as an occupational therapist, you may often give your patients verbal instructions to initiate, or *try* to initiate, certain behaviors or engage them in a task during a therapy session.

During the KF-NAP, however, it is extremely important that the verbal instructions should not involve spatial cues and not give any type of cue to elicit a response that will help improve spatial attention. For example, phrases like: "look more to the left" or "what is on the left of the tray?" may prompt false responses to what should be an observed presentation. To avoid this, allow time for the patient to spontaneously explore the environment, and permit them to freely use their limbs and move their eyes.

2. Look for lateralized or asymmetrical behavior

You must look for patient behavior that is biased toward one side of space. That is, whether their eyes, limbs, or body often move toward one side but pay less attention to the other side. It is important that both

the left and right sides are equally assessed before you come to the conclusion that the patient shows left-sided or right-sided spatial neglect.

3. Score the deficits

We suggest that you score the categories in the order found on the scoring sheet. Although this is not absolutely critical, the order follows a natural progression. For instance, the category that takes the most amount of time is Meals, and so we suggest you observe it at the end of the assessment. If the KF-NAP™ is used in follow-up assessments, we recommend you observe the patient at the same time of the day and in the same location as that first session. By doing so, you will reduce the effect of wakefulness, mood, or motivation, all factors that may fluctuate throughout the day and influence the accuracy of the assessment. Also, all ten categories should be observed during the same session.

A category is scored from 0 to 3. Zero represents no neglect. Three indicates severe neglect. That is, a greater score means a more severe deficit or symptom.

In this manual, the severe symptom, that is, what calls for a score of 3, is described first to begin the scoring instruction of each category, followed by the moderate and mild symptom's description. Lastly, we clarified what is not a symptom of spatial neglect (score of 0).

Giving a score of 3 or 0 is usually easier than 2 or 1. Many times, the difference between 2 and 1 is a matter of degree in the presentation of a specific symptom. In the scoring instruction of each category, you will sometimes see the description of "2" is continued onto "1". There are a few suggestions for you to make the assessment easier.

- Take the entire session as a continuous time period. If the patient shows left-right asymmetric performance in two thirds of the session, you rate a given category with a score of 2; if the left-right asymmetric performance occurs one third of the session, the patient receives a score of 1. This principle can be helpful in observing Gaze Orientation and Limb Awareness.
- When having doubt, you may ask yourself if "ineffective and incomplete" describes the patient's performance. If so, you should probably give him/her a score of 2 rather than 1 in a given category. This could be helpful in observing Dressing, Grooming, Meals, or Cleaning after Meals.

II. INSTRUCTIONS

In this manual, we provide instructions for assessing *left-sided* spatial neglect, commonly occurring after right brain damage. However, you may use the same principles to assess *right-sided* neglect, commonly occurring after left brain damage. The scoring sheet is applicable to both left and right-sided spatial neglect.

1. **Gaze Orientation** -- *observe throughout the entire session*

Before you start this assessment, make sure that the patient does not have any deficits that critically impair eye movement. If you do determine such deficits, you will be unable to perform this assessment, and you need to make a note on the scoring sheet.

Throughout the entire session, observe how the patient spontaneously shifts his/her gaze. Observe how he/she explores the space.

Does the patient move his/her head when you are talking? Does the patient look toward you with his/her eyes? Does the patient look around the room?

Take notes of how much time the patient is engaged in exploring both the left and the right sides of the space.

Score Assignment

Score = 3 The patient is easily able to direct his gaze toward the right side of space but does not attempt to orient the eyes toward the left side.

Score = 2 There are constant and clear asymmetries in the gaze direction toward the left and right sides of space. The patient explores the environment by looking toward the right first, and after a long delay, slowly looks toward the left. During the entire session, the patient spends much more time looking to his right side.

Score = 1 There are inconsistent but observable asymmetries in the gaze direction toward the left and right sides of space. The patient explores an environment by looking toward the right first, and then slowly toward the left with some hesitation. During the entire session, the patient looks toward the right more often than the left.

Score = 0 The patient spontaneously directs his/her gaze toward the right and left sides of space without hesitation and without any prompting.

2. **Limb Awareness** -- observe throughout the entire session

Depending on the activity being assessed, the term limb or limbs can refer to either the upper or lower extremities, or both.

Because of the right-brain stroke, patients may have significant weakness in their left arm and leg. However, this does not mean all stroke patients neglect their weak arms or legs. If that is the case, you may then see the patient passively straighten out the fingers of the left hand to avoid cramping or discomfort. The same may be observed for the left leg as well because attention to left limbs is normal.

Score Assignment

Score = 3 The patient completely ignores the left limbs and never attempts, with the assistance of the right hand, to move the left arm or and leg, or verbally acknowledge any discomfort in the left arm and leg. You cannot observe any spontaneous caring for the left limbs.

Score = 2 Time spent in caring for the left limbs is short with incomplete performance. For example, during the entire session, he/she cares for his/her left arm once, by moving it over to the arm rest, but for the rest of the session, he/she does not care much for it and lets it accidentally hang outside the chair. Another example is when asked to wash his/her hands, he/she does not wash his/her left hand or only wash it incidentally. Or you may think of the entire session in a continuous time period. If the patient takes care of his/her left limbs only one third of time, you give him/her a score of 2.

Score = 1 ... If the patient takes care of his/her left limbs two thirds of time, you give him/her a score of 1.

Score = 0 The patient pays attention and cares for his/her left limbs or as much as he/she does for his/her right limbs. The patient receives a score of 0, even if he/she complains of difficulty in moving the left limbs and may even ask for help, because it means he/she does pay attention to the left limbs.



Is the patient aware of his/her limb hanging outside the wheelchair?

3. Auditory Attention -- *observe when making loud noise*

Make sure that the patient does not have a severe hearing loss in both ears. Such bilateral hearing deficit makes it difficult to hear anything at all, and you will be unable to assess this category. Be sure to note the hearing loss on the scoring sheet. However, even with loss of hearing in one ear, you can still perform the assessment because impairment in one ear does not necessarily impair the ability to locate the source of a sound.

To observe this category, make sure to be out of the patient's sightlines, and then, without warning, make a loud noise to the patient's right or left side. You can drop an object, like a trash can, or clap loudly. Do it once to the right side. Do it again to the left side later in the session.

Observe whether the patient shows any immediate reaction. An immediate reaction can be a startle reaction like blinking or wincing. Another example could be a quick turn of the head toward the location of the sound.

Score Assignment

Score = 3 The patient shows an immediate reaction to the sound from the right side but no reaction from the left side at all.

Score = 2 The patient shows an immediate reaction to the sound from the right side, but the reaction to the sound from the left is inadequate and incorrect. For example, the patient may state that he/she heard something but is not able to identify the location of the noise that was made on his/her left side. Or he/she shifts his/her eye, head, or body to his/her right when the noise is actually coming from the left.

Score = 1 The patient immediately reacts to the sound from the right correctly but takes an observably longer time or hesitates to the sound from the left.

Score = 0 All the reactions observed are correct and immediate on both left and right sides.

4. Personal Belongings -- observe by asking for locations of 3 personal belongings on patient's right, and 3 on patient's left

An object can be considered as "personal belonging" for the purpose of this assessment only if it is almost always kept at a certain location by the patient. For example, if the patient always hangs his coat in a specific closet. Another example could be the reading glasses are always in a specific drawer, or the flowers are always by the window. Observe if the patient can tell you where the personal objects are located. He/she may answer you verbally or point to the location. Personal belongings are objects that are used by the patient regularly and are likely to stay in the same location. These objects may include a handbag, eye glasses, toothbrush, picture frames, clothing, flowers, greeting cards, and so on.

When observing this category, do not hide or arrange the objects for the patient to find. The preferred locations for these objects should be determined by the patient, whether conducted at a facility or the patient's home.

Make sure you ask for the same number of objects on the patient's left and right sides. We suggest you ask 3 or 6 objects on each side in order to make it easy for you to determine which score to assign to the patient. If there are a limited number of objects, you may ask for the same objects later in the session when the patient's position relative to the object has changed. For example, at the beginning of the session, the patient was facing the door, with toothbrush and reading glasses on the left and sweater on the right. Later in the session, when the patient has turned around, the relationship to the objects is reversed: the sweater is now on the left, and toothbrush and reading glasses are on the patient's right.

In asking the patient to locate these objects, it is important not to phrase your question in such a way that shows spatial bias. For example, rather than saying "Can you tell me whether your glasses are on your right or on your left?" you should say "I can't find your reading glasses. Can you tell me where they are?"

As part of your observation, you can take note of how the patient looks around to locate the object and explore their environment. You may notice that the patient moves his or her eyes toward one side or keeps their head positioned to the right side. Such observations could then provide additional information to better score "Gaze Orientation." As the part of the Personal Belongings assessment, you can ask the patient to locate his or her coat and then move on to the "Dressing" category.

Score Assignment

Score = 3 The patient always locates and points to the objects on his/her right side but fails to locate any object on the left side.

Score = 2 The patient always locates and points to the objects on his/her right side but fails to locate two-thirds of the objects on the left side.

Score = 1 The patient always locates and points to the objects on his/her right side but fails to locate and point to one-third of the objects on the left side.

Score = 0 The patient does not hesitate to locate and point toward all objects on the right and left side.

5. Dressing -- observe by asking patient to put on an open-front shirt or coat

Use an open-front shirt or a button-down coat in this assessment. You can say to the patient "Would you please put this on?" Or you can say "Show me how you would put this on."

Observe how the patient goes about the task. Look for differences in performance on the left and right sides of the body.

Score Assignment

Score = 3 The patient only attempts to dress the right arm, and completely ignores the left, making no attempt to put the left arm through the sleeve, and does not acknowledge a need for help.

Score = 2 The patient does not acknowledge a need for help. He/she starts by putting his/her right arm in the sleeve and continues to the left. However, he/she spends significantly less time in dressing his/her left arm, and the shirt is very messy on the left side. In the end, the performance on the left side is incomplete and ineffective

Score = 1 The difference between a score of 1 and 2 is a matter of degree. In assigning a score of 1, the patient, again, does not acknowledge a need for help. He/she may first attend to his/her right side, putting his/her right arm in the sleeve and eventually with some hesitation, work the left arm into its sleeve as well. In the end, the patient is able to put on the shirt, but the left side is not completely pulled down or does not appear as nicely as the right side. The patient does not acknowledge a need for help.

Score = 0 The patient asks for help with the left side of the body, and is paying attention to his/her left arm by trying hard to complete the task on the left side.

This may be confusing. Why might you give a score of 0 to someone who is unable to complete the task? That's because you are not assessing the ability to dress but rather the awareness of the disability. This is important. If the patient is physically unable to put on the shirt over the left shoulder or onto the left arm, but is aware of their disability and asks for help, then it indicates that the patient does not neglect the left arm during the dressing activity. If asked, go ahead and give some assistance

6. Grooming -- *Observe by asking patient to perform 3 grooming tasks*

This category will be assessed by a sink and the mirror over the sink. Usually, they are located in the hospital room you are already in, or the bathroom in the patient's home. If the bathroom or sink is in another room, you may assess "Navigation" and "Collisions" prior to "Grooming."

If you're at the patient's home during this grooming observation, you can also ask the patient to search for personal belongings in their own bathroom – a toothbrush, towel, comb and so on. This will help you in scoring "Personal Belongings". However, DO NOT assess "Personal Belongings" while observing "Grooming" if the assessment does not take place at the patient's home. In other settings such as a clinic or hospital, it is likely that toiletries will be moved about without the patient's awareness.

During grooming, you can also ask patients to wash their hands and observe if they take care of both hands or ignore the left or the right hand. This will help the observation of "Limb Awareness".

Alright, let's focus on "Grooming" now. In assessing spatial neglect in grooming activities, you will need some supplies such as a comb, a hair brush, soap, cloth or paper towels. If applicable, you can provide an electric shaver. However, if the bathroom or any sink is not accessible like in an outpatient examination room, you should set up the environment to accommodate the grooming tasks. For more information, see "KF-NAP™ Examiner's Kit".

We suggest that you ask the patient to perform 3 grooming tasks before assigning a score. You can ask the patient to wash his/her face, to wipe clean and dry his/her face, and to comb or brush his/her hair.

Score Assignment

Score = 3 In all three tasks, the patient only pays attention to the right and always ignores the left side.

Score = 2 The patient always takes care of the right side first, and miss the left side in at least one of the tasks.

Score = 1 The patient completes all three tasks in a satisfactory manner. He/she always takes care of the right side first, and spends significantly shorter time and puts in less effort on the left.

Score = 0 The patient completes all three tasks with no apparent left-right asymmetry.



Does the patient brush his/her hair on both sides?

7. Navigation -- *Observe by asking patient directions to a familiar place, with equal numbers of left and right turns*

Before observing "Navigation", make sure that the functional level of the patient is known. Consult with the therapy team, the doctor or family members to determine the extent of the patient's mobility. If you are not trained in how to ambulate or transfer a person who may need help, please ask for proper assistance.

Ask the patient to find his way to a familiar place. The patient may be walking or wheelchair-bound. In the inpatient setting, it is likely that the patient has to stay in the wheelchair. Depending on the facility policy or patient's physical condition, he may walk with or without assistance, or he may use the wheelchair by hand or by foot. You can always push the patient's wheelchair while he directs you to the familiar location. He can direct you by hand gestures and oral suggestions.

If there is plenty of space navigating in the patient's room, you can ask him to navigate to the bathroom or the sink as a transition to "Grooming" assessment. When grooming activities are over, you can ask him to navigate back to the bed. But it is better to choose a location outside the patient's room, so that you can observe the ability of navigation better. Familiar location beyond the patient's room can be the cafeteria or therapy gym. You can say "Can you take me to the therapy gym?"

It is best if this location requires an equal number of "right" and "left-turn" options. When there are a limited number of turns on the route, you may ask the patient to find the way to the destination, and then back to the original location. It is best if the distance traveled between locations is far enough to determine if there is a deficit in spatial awareness.

Score Assignment

Score = 3 The patient only tries to do right turns to get to the final destination. The patient usually is unable to reach the final destination.

Score = 2 The patient makes more right turns than necessary and only turns left when there is no other option. At a left turn, he/she may hesitate for several seconds or more, and may take a longer route than necessary because of a preference to turn right. In the end, the patient may not be able to reach the final destination.

Score = 1 The patient makes more right turns than necessary and some left turns to get to the final destination. He/she hesitates at left turns and may take a longer route than necessary because of a preference to turn right. In the end, the patient may be able to reach the final destination..

Score = 0 The patient employs approximately an equal number of left and right turns to get to the final location. He/she is able to reach the final destination correctly.

8. Collisions -- observe when patient moves from one location to another by him/herself

The objective of this assessment is to determine whether the patient can navigate in the environment without colliding with an object.

What about veering when patients are supposed to walk straight? Veering and collisions are different. Patients with spatial neglect can veer right or left when they are supposed to walk straight. Therefore, veering is not the best way to determine if patients neglect one side or the other. However, colliding with an object usually occurs on the left side, the side where patients pay little attention to.

So we are focusing on the observation of collisions. If the patient has a cardiac deficit, or cannot walk even with an assistance device, or cannot use a wheelchair, and is unable to push the wheelchair independently, then mark this category on the scoring sheet as “n/a” for “not applicable” and write down the reason.

Collisions are most likely to be observed when the patient makes a left or right turn. Collisions are also likely to be observed when there are objects along a straight path. You can strategically place items along the path of the patient. It is important that an equal number of these obstacles be placed on the right and left sides of the patient.

If, at any time during the observation, the patient places himself in harm’s way, and is in obvious and immediate danger of crashing into a wall or piece of furniture, please step in and prevent that from happening. If it is obvious to you that a collision would have taken place without your help, you can record the incident as a collision as part of this assessment.

Score Assignment

Score = 3 The patient bumps into objects or walls on the left side with almost every turn and movement.

Score = 2 The patient bumps into objects or walls on the left side frequently and much more often than items on the right side.

Score = 1 The patient bumps into objects or walls on the left side infrequently, but more often than into items on the right side.

Score = 0 The patient does not collide into any objects along the path.



Does the patient collide to one side when going through the door way?

9. **Meals** -- observe when patient is having a meal

The following categories “Meals” and “Cleaning after Meals” can be observed at the same time. In this category of Meals, you’ll observe and assess the patient’s attempt to eat a meal or large snack. However, you are not assessing ability to chew or swallow, which also may be impaired. You are assessing how the patient locates items on the tray.

Make sure to prepare and arrange items on the food tray before presenting it to the patient. All the related items, the food, the utensils, the spices, the coffee and creamer should be organized on the tray in a conventional manner. However, it must be as symmetrical as possible.

We recommend that you observe this category during the actual meal time if it is the inpatient rehabilitation setting. If the setting is a clinic, you may ask the patient or their caregiver to bring in food items. If the patient only brings a snack, you should have extra plates, utensils and even additional food on hand to provide an adequate number of items for the assessment.

In this tutorial, we focus on the inpatient setting. You can sit down and carry casual conversations with the patient while he is having a meal like breakfast or lunch. When the patient is asking you for a certain item, you should give an unbiased response. For example, you may observe that the patient looks around to locate a particular item on the tray. These observations will help in scoring “Gaze Orientation”. If the patient takes a long pause and stops eating, it is permissible for you to ask “Are you finished or would you like something else?”

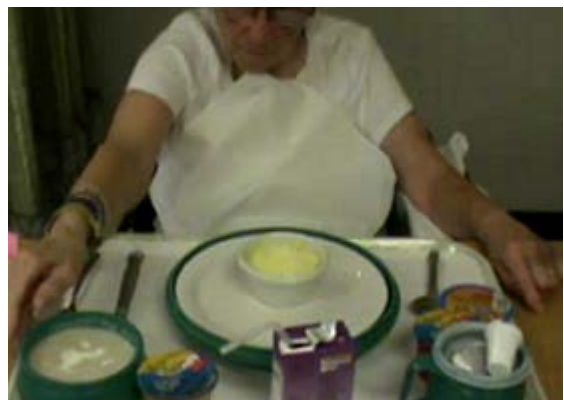
Score Assignment

Score = 3 The patient eats food only on the right side and is unable to find items on the left. For example, he/she asks for coffee despite it being on the tray. Once told that coffee is on the tray, he/she remains unable to look toward the left or find it.

Score = 2 The patient eats food mainly on the right side and rarely eats food on the left side. The patient searches food or other items from right to left, but he/she has a hard time finding items on the tray. He/she does not always find items on the left.

Score = 1 The patient eats food mainly from the right side of the array and hesitates to have food on the left side. The patient searches food or other items from right to left.

Score = 0 The patient finds/eats food on his/her right and left sides without any difficulty or observable asymmetry. He/she is able to find, touch or acknowledge all the items on the plate and on the tray.



Does the patient eat or reach for all the items on the food tray?

10. Cleaning after Meals -- observe when patient is having a meal and at the end of a meal

You will observe whether the patient wipes and cleans both sides of their mouth spontaneously during and after a meal.

Score Assignment

Score = 3 The patient only wipes and cleans the right side of his/her mouth. During the meal, the patient rarely perceives the need to wipe his/her mouth, and some food could remain on the left corner of the mouth both during and after the meal.

Score = 2 The patient wipes and cleans the right side of his/her mouth, but shows an incomplete and ineffective effort in cleaning the left side. The patient wipes the left side of the mouth a few times, but as many times or as thoroughly as he/she does on the right side. At the end of the meal, there may be food at the left corner of his/her mouth.

The difference between scores of 1 and 2 is a matter of degree. If quantifying it, for the score of 2, the patient wipes the right side roughly 3 times more often than the left, and ...

Score = 1 the patient wipes the right side 2 times more often than the left. The left side, if wiped, is not as clean as the right.

Score = 0 The patient cleans both the right and left sides of his/her mouth during and after the meal, and leaves no food on or around the mouth.



Does the patient acknowledge a need for help dressing his/her left side?

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