

**Algorithm for  
Facial-Oral Tract  
Therapy (F.O.T.T.®)**

**2019**

## **F.O.T.T. ® Algorithm 2019.**

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# 1. Introduction to the F.O.T.T.® algorithm: A model for assessment and treatment of the facial oral tract

## About the F.O.T.T.® concept

F.O.T.T.® was developed by the British speech and language therapist and Bobath –Tutor Kay Coombes, on the base of the Bobath concept (Vaughan Graham 2015, 2016, Gjelsvik 2015, Raine 2012), and has been developed further by Kay Coombes and colleagues. The concept is a structured approach to assess and treat patients with problems in the facial oral tract, caused by acquired or inherent brain damage.

F.O.T.T.® is used in Austria, Denmark, Finland, Germany, Great Britain, Norway and Switzerland. F.O.T.T. is taught in basic courses of five days duration or advanced courses with several specific topics, of three or four days duration, by Kay Coombes or certified F.O.T.T. instructors. The knowledge, understanding and skills taught on the basic course are prerequisites to use the algorithm.

### **In F.O.T.T.®, there are four areas concerning assessment and treatment:**

- Swallowing (of saliva), eating and drinking
- Facial expression / facial movement
- Oral hygiene
- Breathing, voice and articulation

The F.O.T.T.® concept is complex, and includes principals, techniques and methods, some have their origin in the theoretical framework, which are the fundamental ideas and thoughts of the concept. The F.O.T.T.® concept is based on knowledge and experiences about motor development and motor learning, movement science and knowledge about changes in patterns of movements in patients with brain damage. F.O.T.T.® is characterized by a holistic point of view.

The model of the F.O.T.T.® algorithm (figure 1) is modified after Coombes and Davies (1987). The F.O.T.T. algorithm and the manual was developed by Trine Schow, occupational Therapist and Ph.d. in Denmark and Daniela Jakobsen, occupational therapist and F.O.T.T.® Senior instructor, Denmark (Hansen 2010). The Algorithm was revised in 2017 by Daniela Jakobsen, Brit Steen Langhorn, occupational therapist and F.O.T.T.® Instructor and Marianne Falkengaard, occupational therapist.

## The objective of the F.O.T.T.® Algorithm

The algorithm (figure 1) is meant to visualize and simplify processes about clinical reasoning in the assessment and treatment of people with problems in the facial oral tract. Both, the unexperienced and the experienced therapist, are guided through the process of assessing, analysing, making working hypothesis, goal setting and treating the patient and evaluating his response to the treatment. The manual of the algorithm includes a description of the most important interventions in the F.O.T.T.® concept, and criteria when and how to use and to graduate them. Furthermore, it might help to evaluate the patient's response to the treatment. The algorithm should support the therapist to set appropriate goals on the ICF's activity- and participation level, together with the patient and eventually his relatives.

The algorithm reflects the change and the interrelationship between the clinical assessment and treatment, based on clinical reasoning.

To ease readability, the patient is male and the therapist always female. Furthermore, the word “therapist” is used for both, nursing staff and therapists, who work with F.O.T.T.®.

## 2. The F.O.T.T.® algorithm: A model for the process of assessment and treatment

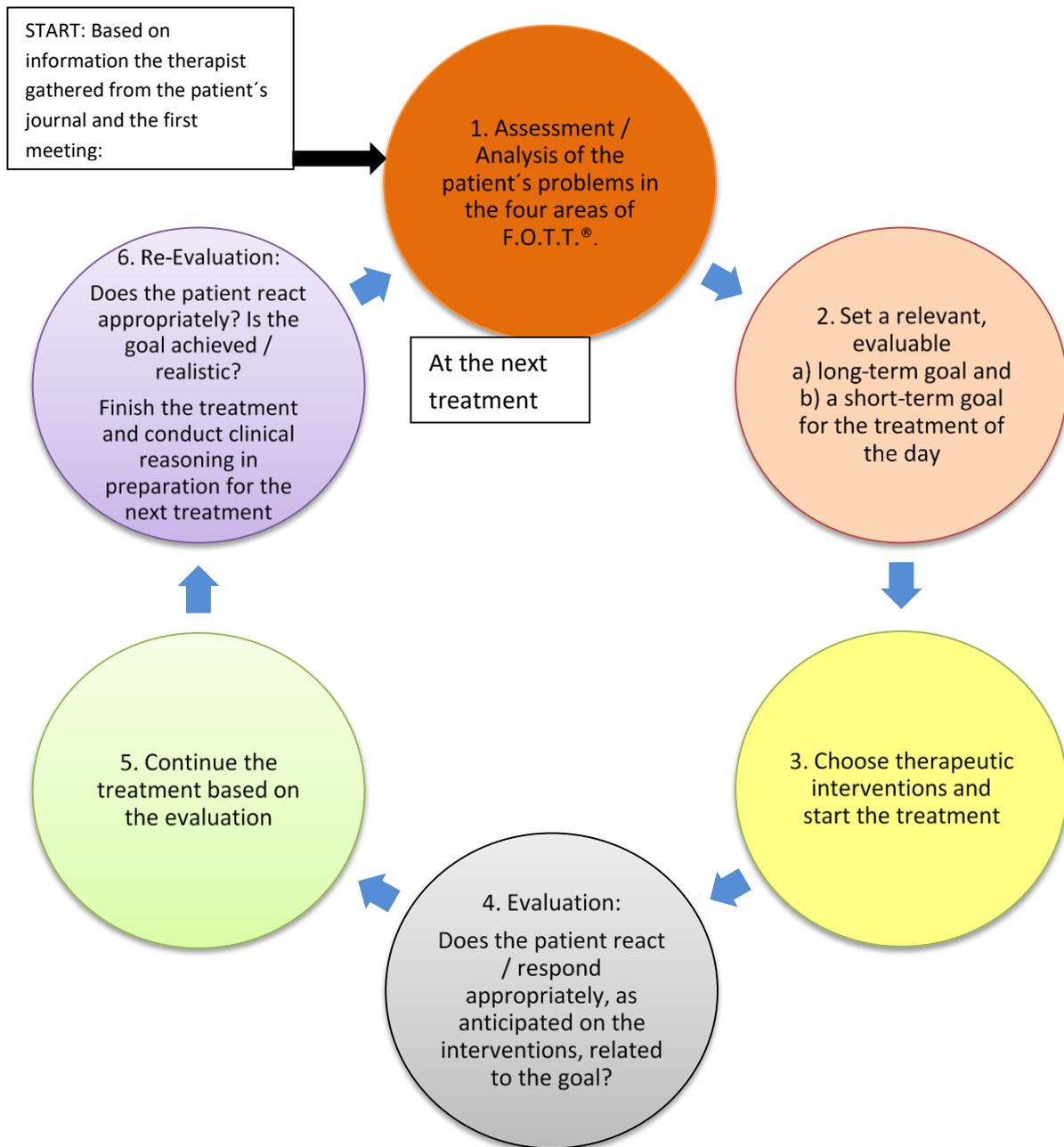


Figure 1. Model of assessment and treatment modified and translated from Coombes and Davies (1987) by Schow, Jakobsen 2010/2017.

Explanation for the model (figure 1): Clinical reasoning already begins before the therapist meets the patient physically: Based on the information the therapist gathered from the patient's journal, she already has one or more hypotheses about the patient's main problems, the underlying reasons and the patient's resources.

The therapist's **first impression** from the patient already can confirm or invalidate his hypothesis, and help the therapist either to use them or to establish new ones. For example, the therapist would when greeting the patient, observe clinical sign for cognitive problems, problems with postural control and selective movements (Vaughan Graham 2009). The therapist would evaluate, if the patient is able to keep eye contact, his reactions to visual, verbal or tactile information and his abilities for verbal communication in a social context. At the same time, the therapist registers clinical signs of impaired protection of the airway, such as wet voice or gurgling sounds during breathing.

### 1. Assessment / Analysis of the patient's problems in the four areas of F.O.T.T.®

The clinical findings and observations from the therapist's first impression of the patient are the base for a more in-depth going assessment and analysis of the patient's problems and resources. This analysis leads the therapist and, if possible together with the patient and eventually the relatives to the goalsetting.



### 2. Set a relevant, evaluable a) long-term goal and b) a short-term goal for the treatment of the day.

The goal should be relevant for the patient and his context. The goal should be: related to everyday life activities, realistic and evaluable and - depending on the patient's actual abilities- set for him or together with him. The relatives might be included, too, if this is relevant.



### 3. Choose therapeutic interventions and start the treatment

If the goal is set, the therapist plans the treatment. She makes decisions about the interventions necessary to reach the goal. Here, the therapist chooses from the algorithm's manual in what environment the treatment should take place, helpful position(s) for the patient and the method she will use to reach the goal, both for the treatment of the day and the long-term goal. Hereunder she considers the level of the interventions, e.g. the intensity of facilitation or the requirements to the patient's postural control. Motor learning is depending from multi-sensory (Mulder 2001, Vaughan Graham 2009, 2016). This input should be variable, meaningful and relevant for everyday life. When the therapist had started the treatment, she continuously observes the patient's response on each intervention. The change between assessment and treatment is fluently. The therapist tries to influence unexpected and unhelpful reactions of the patient as soon as they appear. If a patient reacts inappropriately, or much different than anticipated, (e.g. with massive biting reactions on tactile oral stimulation), the therapist immediately modifies her technique in order to see, if this has influence on the patient's reaction in a helpful way.



### 4. Evaluation: Does the patient react / respond appropriate, as anticipated on the interventions, related to the goal?

Here, the therapist evaluates her observations she has been collecting until now: Does the treatment seem appropriate, so far? Is the goal for the treatment of the day still realistic? Is the goal achieved already? Here, the therapist should answer YES or NO (see also the Charts for the four areas of F.O.T.T.)



### 5. Continue treatment based on the evaluation

If the answer is **YES**, the goal still is realistic, the therapist should work further towards the goal. If the goal already is achieved, the therapist works with repetition or shaping. Shaping means to work on the patient's individual limit, neither on too high or too low level. This could be to increase requirements or offer the patient less base of support, e.g.. less facilitation (Gjelsvik 2016), or a higher position (sitting instead of lying). Shaping is an important method to encourage motor learning (Vögele 2015). Repetition might include different aspects. Asking the patient to perform the same movement / sequence of movement / activity again under the same condition will show, if he is able to do it in the same quality and encourage motor learning. Repetition might also happen under different conditions, e.g.. in a different context or activity, speed, position, range of movement (ROM), and so on (Vögele 2015). Motor learning is assumed to be most effective, when repetition is variable.

*Example: The goal for the treatment was, that the patient in sitting position, with support by the therapist, is able to eat a portion of apple sauce safely. (Safe means with sufficient protection of the airway). The goal is achieved and the therapist makes the hypothesis, that the patient also will be able to drink thickened liquid, supported by the therapist. The therapist establishes this hypothesis based on her actual information about the patient's problems and resources within the swallowing sequence.*

**If the answer is NO** (the goal is not realistic), the therapist should consider, how she must increase her support for the patient, e.g. by bringing him into a lower position with more base of support or using more intense facilitation. If it is quite doubtful to reach the goal of the day, the therapist should modify the goal to the patient actual status and problems.

*Example: The goal for today was that the patient in sitting position could chew some fresh apple in gauze safely (includes that the juice from the piece of apple and the saliva produced during chewing can be swallowed safely). However, the patient, as early as during tactile oral stimulation shows clearly signs of aspiration of saliva and coughs insufficiently. The therapist realizes that the goal was too high and aims to achieve, that the patient is able to swallow his saliva safely. She brings the patient into side lying position and facilitates swallowing whenever necessary. As a new intervention, she mobilises his tongue passively. Afterwards, she facilitates active tongue movements.*



**6. Re-Evaluation: Does the patient react / respond appropriate / as anticipated on the used interventions? Is the goal for the treatment achieved? Is the goal still realistic? Finish the treatment and make some clinical reasoning in preparation for the next treatment.**

At the end of the treatment, the therapist re-evaluates about, how the modification of intervention and/or the use of new interventions went. The following aspects are relevant to consider:

- Were the therapeutic interventions appropriate in relation to the patient's problems and the underlying causes?
- Did the interventions had a proper level / intensity?
- What kind of interventions were most helpful for the patient to move more selective and functional?
- If the goal for the treatment of the day not has been achieved today: is it still realistic / relevant to go for in the next treatment?

- Is the long-term goal still relevant / realistic?
- Which reflections and experiences from the treatment today are relevant to consider before the next treatment, when the process of assessment, analysis, treatment and evaluation starts again?

### 3. The Process of Assessment

#### The model for assessment (Figure 2)

Which area the therapist starts to assess the patient in depends from the information gathered beforehand from the patient's journal and the first impression the therapist gets of the patient. It is fundamental to assess if there are any problems with postural control and how this interfere function and activity in the facial oral tract (Vaughan Graham 2009). The model allows moving from one area to another with assessment and treatment, depending on the patient's problems and response to therapeutic interventions.

Clinical assessment in F.O.T.T.® always include to collect information, how the patient reacts on the treatment. This information has great importance for goal setting and treatment planning.

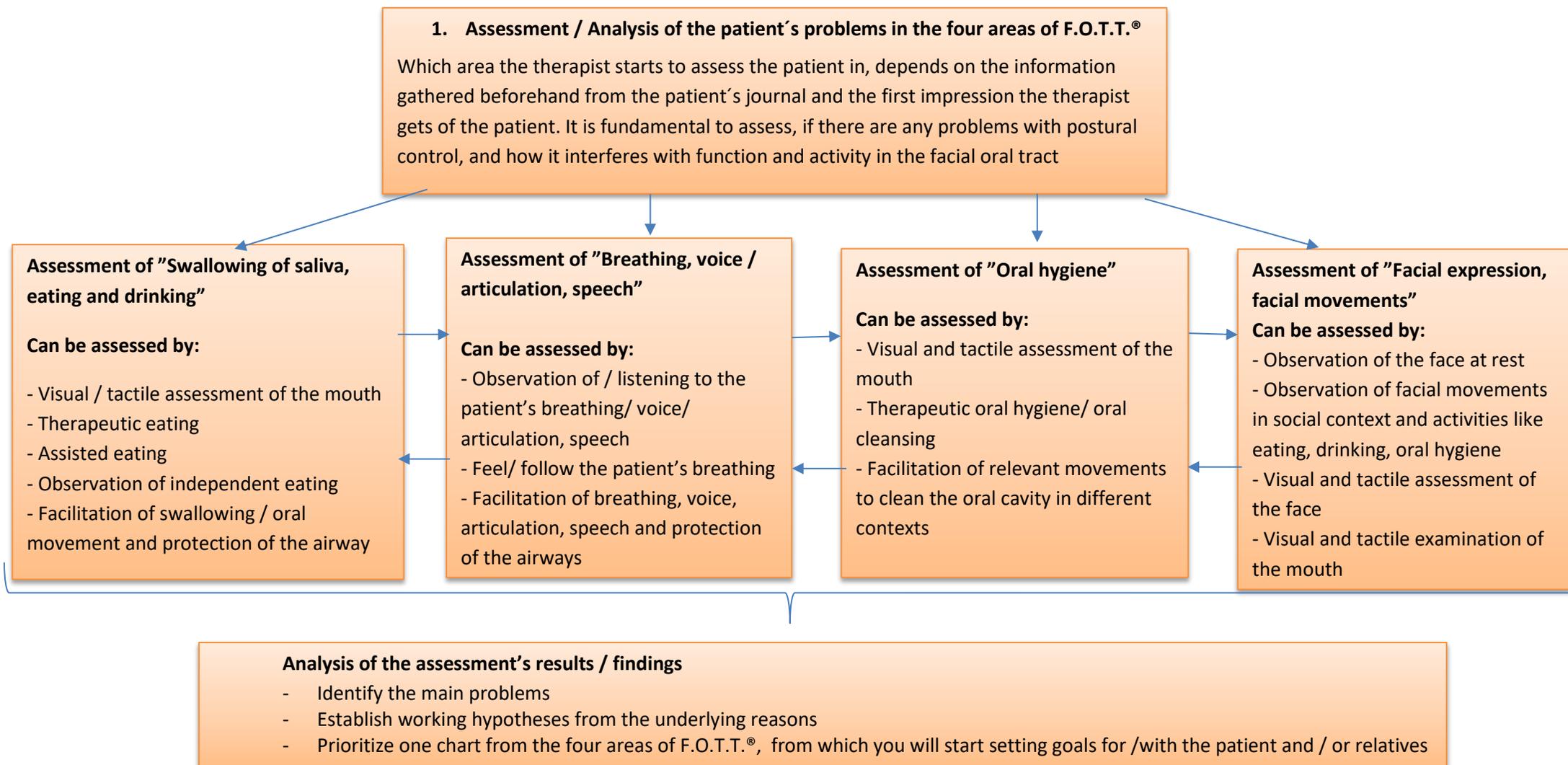
#### Assessment ↔ Treatment

The change between assessment and treatment is complex and requires detailed observation of symptoms and interpretation of the possible underlying causes: What is the problem? Example: Saliva runs out of the patient's mouth (assessment). What are the underlying causes? E.g.: hyposensibility in the face and mouth and a lack of transport movements of the tongue. Does it help to give the patient input on his tongue and facilitate the closure of the mouth? (treatment). Afterwards, the patient's response is evaluated: Is he able to swallow his saliva spontaneously or can he be facilitated to do so? (assessment).

In the boxes for the several areas of F.O.T.T., there are keywords for, how and in what context the patient's problems might be assessed, for example by visual or tactile oral assessment. It is possible and might be necessary to assess the same function or activity (e.g. selective facial movements) in different positions, like in sitting or side lying.

The methods and techniques to assess and treat patients with problems in the facial oral tract are taught on F.O.T.T.® basic courses. They are briefly described in the algorithm manual. In the following analysis the therapist identifies the patient's resources and the main problems, establishes working hypothesis and sets goals, if possible and relevant with the patient and / or the relatives

Assessment ↔ Treatment Figure 2



## 4. Chart and manual: "Swallowing of saliva and eating / drinking"

2a. Set a relevant, evaluable long-term goal, if possible together with the patient / the relatives

1. Assessment and Analysis, Chart 1

2b. Set a goal for the F.O.T.T. treatment of the day, if possible and relevant together with the patient / the relative(s)

3. Choose therapeutic interventions for postural control and selective movements / activity, related to the goal and start the treatment

<b>Adapt environmental factors</b> - Place / room / furniture - Objects - Helping aids	<b>Levels for facial and tongue movements</b> - Passive - Partially active - Active (selective movement) - Active movement sequence in activity	<b>Use of consistencies</b> - Puree - Mashed - Soft - Unmodified (normal)	<b>Levels for eating /drinking</b> - Therapeutic eating - Assisted eating - Independent with / without supervision - Independent / in a group	<b>Methods/ Techniques</b> Positioning Mobilization Guiding Facilitation: - Continuous - Initiated - Over short sequences	<b>Actions to facilitate protection of the airways</b> - Facilitation of sufficient clearing of the throat / cough - Facilitation of cleansing of the throat, spitting out, rinsing / blowing the nose - Oral cleansing with gauze / oral hygiene
<b>Choose positions, appropriate for the patient and the interventions</b> - Lying - Half sitting - Sitting - Standing	<b>Guidance/ Instruction /supervision of the patient and / or the relative(s)/ nursing staff / carers</b>	<b>Liquid</b> - High viscosity - Moderate viscosity - Low viscosity - Unmodified (normal)	<b>Preparing for eating and drinking</b> - Involving the patient in the pre-oral faze - Cleaning the mouth with gauze - Tactile oral stimulation	<b>Facilitation to swallow by:</b> - Facilitation at the floor of the mouth - Stabilization of the lower jaw - Passive and active tongue movements - Facilitation of breathing / voice - Mobilization of the body or body segments	

4. Evaluation: Does the patient react / respond appropriately / as expected to the chosen interventions – related to the goal?

YES

NO

5. Continue treatment based on the evaluation

- Pursue the goal
- Repetition
- Shaping (increase demands, less support)

5. Continue treatment based on the evaluation

- Shaping (less demands / increase support)
- Initiate new / other interventions
- Reassess the goal and modify it to current context

6. Re-Evaluation

- Does the patient react / respond appropriately / as expected to the chosen interventions?
- Has the goal for the treatment been reached? Is the goal still realistic?
- Conclude the treatment for the day
- Reasoning / planning of the next treatment

## 4.1 Assessment and Analysis

See figure 2, page 9

## 4.2 Goal setting

### 4.2.1 Setting a relevant, evaluable long-term goal, if possible together with the patient / the relatives, based on "Assessment and Analysis" Chart 1.

A long-term goal should be relevant for the patient's context, related to activity and participation. The goal should be evaluable, too.

*Examples:*

- *The patient is able to eat food of all consistencies and drink all consistencies of liquid safely, at discharge to his own place.*
- *Sitting in the wheelchair, the patient is able to eat pureed consistency and drink thickened liquid safely with supervision by the nursing staff at the residential nursing care home and his relatives.*
- *The patient is able to swallow saliva in sitting and lying position and is able to protect the airway sufficiently in case of penetration and/ or aspiration.*

### 4.2.2 Setting goal for the F.O.T.T. treatment of the day, if possible and relevant together with the patient / the relative(s)

For the treatment of the day, there is set a short-term goal, if possible and relevant together with the patient and / or the relative(s). The goal should be evaluable, relevant for the patient, realistic and related to his level of function, activity or participation.

*Examples:*

- *In sitting position, with a table in front, the patient is able to drink 150 ml cold juice safely, with facilitation to clearing the throat and cleaning swallows.*
- *In half sitting position, during tactile oral stimulation with coffee, the patient is able to swallow at least five times.*

## 4.3 Choosing therapeutic interventions for postural control and selective movements / activity, related to the goal and starting treatment

At this point, the therapist chooses an environment and the therapeutic interventions she thinks are relevant to achieve the goal and plans the treatment. She also considers, how to modify and grade the interventions.

Remark, that there is mandatory content in each chart. The boxes: "Adopt environmental factors", "Choice of position", "Methods and techniques", Guidance / Instruction / supervision of the patient and / or relatives, nursing staff / helpers", "Levels for facial movements" are relevant content in each area of F.O.T.T.®. Furthermore, the boxes: "Facilitation of Swallowing" and "Protection of the airway" are essential in F.O.T.T.®. Therefore, they appear on each chart. In "real life" this means, as soon as the patient needs facilitation of swallowing or help to protect the airway, the therapist takes this into account and prioritizes this.

First, the therapist chooses the goal, and then considers the environment and the position she will start to treat the patient. Then, the therapist thinks about: the interventions and how to grade them, the consistencies to use, to work at the patient's individual limit and towards the goal.

In F.O.T.T.®, there is a method used, called "elicitation". This means: to bring out, to waken, to cause, to release". By choosing an appropriate environment, position, interventions, use of own language, etc. a helpful, appropriate response or motor behavior by the patient might be elicited.

*Example: The patient has a wet voice after drinking coffee. He does not clear his throat spontaneously. The therapist asks him to clear his throat, and the patient says "Yes", but does not do it. The therapist puts his one hand on the patient's sternum, the other on the right side of the more affected right side of the thorax. She feels, when the patient is at the end of an inspiration phase and clears the throat by herself. At the same time, she vibrates with her hand on the patient's sternum, when he starts an expiration phase. Her other hand stabilises the patient's ribs. The patient gets the idea and clears his throat. The therapist facilitates a clearing swallow.*

The therapeutic interventions from the several boxes in the Chart: Swallowing of saliva and eating / drinking" are described here:

### **Box: "Adapt environmental factors"**

The environment, where the treatment takes place, is important to bring the patient in a situation, where he can act and interact in a helpful and functional way. Factors as noises, other persons, colours, smell, temperature, furniture and the function of the room (e.g. a therapy kitchen) can contribute to the patient's ability to learn, concentrate, interact and encourage appropriate response. (Vaughan Graham 2009).

The environment for the treatment should be suitable for the patient and the goal, as far as possible, e.g.. In the patient's room, a dining room, where activities as eating and drinking are obvious.

### **Objective**

- To encourage motor learning by suitable context: The patient uses his more affected side of the body and moves as normal as possible
- The patient expands his repertoire of functional movements and patterns of movements
- To avoid unhelpful and unfunctional habits and compensatory strategies

### Choice of place/room

- **A known versus unknown room:** Consider, if the patient needs familiar surroundings, because he has problems in new, unknown situations, or if an unknown room might help to expand the patient's repertoire and encourage learning instead of clutching in habits or unhelpful strategies avoiding learning
- **Room related to the activity versus a room not related to the activity:** Does the patient need clear context given by the function of a room in order to understand the activity / situation? Does the planned activity or intervention require e.g. a kitchen or a bathroom? Does the patient's condition allow that he leaves his own room and gets transported into another room
- **A niche versus out in the room:** A niche is defined as a position, where the patient has a stable base of support and to stable sides. A niche might convey safety for patients with perceptive / cognitive or massive senso-motorical problems, e.g. disturbed body schema, lack of balance or lack of attention towards the more affected side of the body. Treating the patient out in the room might be useful for patients with sufficient postural control and perceptive and cognitive abilities. Sometimes, it might be necessary to be able to move freely around the patient.
- **One –to –one situation versus group situation:** One –to one situations during eating and drinking might be helpful, when the patient is easy to distract or has problems with concentrating. It might give the patient a feeling of safety, if he needs intensive support or facilitation. Last but not least, the therapeutic interventions, e.g. cleaning the patient's mouth, require privacy. However, group situations create a social context, where the patient must coordinate facial expression, verbal communication and eating / drinking. This is an option, when the patient is able to manage several visual and auditive input and can change focus from eating and drinking to communication with others and vice versa.

### Adapt furniture

Furniture is an important factor to support and promote the patients position and postural control. Furniture should give the patient a base for selective movement, as normal as possible, during treatment / the activity. Furniture should give enough support for the patient to move against gravity, but not too much support, because this might make him passive. A dynamic – stable position might help the patient to get some new experiences when moving and tactile information about his own body in the environment and the activity.

### Adapt objects

The objects chosen should as far as possible support active movement and patterns of movement, as normal as possible.

*Example: A patient after acquired brain trauma has problems to grasp and let go objects. He cannot dose the power for grasping and uses too much effort. Therefore, a disposable plastic beaker for drinking is unhelpful, he spills. The therapist uses a stable glass or a normal mug.*

### Helping aids

Helping aids are used to compensate for a lack of function. A helping aid might allow the patient to perform an activity independently. This can have great importance for the patient's level of participation.

Helping aids can be used, when:

- A movement is not possible for the patient.  
*For example: The patient cannot flex his elbow enough to take a spoon towards his mouth. To*

*compensate for that, he flexes his trunk instead and takes the head very much forward during eating. The use of a spoon with a long handle enables him to eat with a helpful alignment in his trunk and neck.*

- They enable the patient to move in a normal pattern of movement, using his more affected side instead of compensation with the less affected side of the body in unhelpful strategies.

*For example: A patient drinks with a feeding cup. By doing so, the liquid runs rather quickly towards the pharynx and the patient aspirates. When using a Heidi cop, the pattern for drinking is different: he sucks the liquid actively in and can control it better in the oral cavity. This minimises the risk of aspiration.*

## Evaluation

### Signs that the environmental factors are appropriate:

- The patient reacts as expected / as intended
- The patient is active
- The patient understands the situation / activity
- The goal can be achieved

### Signs that the environmental factors are not appropriate / helpful:

- The patient reacts not as expected / intended and uses unhelpful compensatory strategies, restlessness, associated reactions, increased tone, lack of concentration
- The goal can not be achieved

In this case, the therapist should try to change one or more environmental factors and evaluate the patient's response again.

### **Box: "Choose of position(s), appropriate for the patient and the interventions"**

In general, if a patient obviously is uncomfortable in a given position (seen by restlessness, increased tone, vegetative reactions...) the position needs to be changed. Some patients have restriction regarding positioning, e.g. because of fractures, craniectomy or skin lesions. The therapist has to adhere to these. The here described aspects for positioning are only recommendations.

A position has to be dynamic and stable at the same time, never fixed. Before positioning a patient, the therapist should work with postural control. Changes of position might only be necessary within one position, (e.g. in lying, the patient's trunk is adjusted), or it might be necessary to change the whole position, e.g. from lying to sitting.

No matter in which position the patient is, it is always important to optimize the alignment in a way, that support swallowing.

- **Supine** position can increase the risk of aspiration, especially when the patient's neck is extended. Here, saliva runs with the gravity towards the pharynx and from there into the airway, before the patient is able to swallow it. However, if the risk of aspiration is low, and the patient is positioned in good alignment (Vaughan Graham 2009), supine position might be used for work with breathing, postural control and relevant structures as the neck, the hyoid bone or the larynx

- **Half sitting** position, e.g. in bed can be suitable, when there is helpful alignment. Half sitting is likely to involve the patient's arms and hands, which is important in the pre-oral stage of therapeutic eating.
- **Side lying** offers patients with high tone or low postural control in general, much base of support. Saliva that might not be swallowed, will be collected in the patient's cheek and can be removed by the therapist, e.g. with gauze (see box: Interventions to protect the airway).
- **Sitting** position (e.g. on a plinth or on a chair, with individual support) requires a certain amount of postural control and a stabile vegetative state. Sitting is useful for interventions involving eating and / or drinking. The contact and the support from a table in front of the patient might influence the alignment of the trunk and neck positive and create trunk activity.
- **Standing** position with or without helping aids (e.g. a standing frame) might elicit helpful alignment in the trunk and pelvis, ease respiration and increase arousal. See also the box: "Methods / techniques".

### **Box: "Preparing for eating and drinking"**

The preparation for eating and drinking is an important part for patients with problems to understand situations, risk of penetration and aspiration or hypersensitivity when touching hands, face and mouth. Depending on the patient's problems, the therapist chooses several interventions.

#### **Objective**

- To enable the patient to understand the situation
- To avoid hypersensitive reactions when touching the hands, face and mouth
- To facilitate anticipation in the context of eating and drinking
- To create the prerequisite for a safe and sufficient oral and pharyngeal phase by giving input in the pre-oral phase
- To prevent penetration/aspiration
- To remove residues of saliva in the mouth and/or pharynx
- To initiate swallowing
- To increase arousal/attention

#### **Involving the patient in the pre-oral phase**

To involve the patient in the pre-oral phase, guiding (Affolter-Modell®) might be helpful in the preparation of eating. The patient can be guided to cut some bread, pour something to drink in a glass or to press some fresh orange juice. The patient should be involved as much as possible in order to provide relevant information (tactile, visual, gustatory) about the activity eating and drinking.

#### **In general, involving the patient in the pre-oral phase should happen when the patient suffers from senso-motory, perceptive and / or cognitive problems like:**

- Lack of understanding situations
- Dyspraxia or apraxia for preparation and handling food and drink
- Hypersensitivity reactions when touching hands, face and mouth
- Low arousal / attention
- Motor restlessness
- Problems in the oral and pharyngeal phase of the swallowing sequence

## Evaluation

### Signs that involving the patient in the pre-oral phase is appropriate:

- The patient's arousal and attention increases
- The patient shows signs of understanding for the activity, like adapting tonus, looking towards the activity, change of the motor behavior towards the normal
- The patient takes over in the activity and starts to use objects relevant

### Signs that involving the patient in the pre-oral phase is not appropriate / helpful:

- The patient gets or stays restless
- The tension/ tone increases
- The patient shows signs that he does not understand the situation: he might leave the treatment area, put objects away, shakes with the head

## Cleaning of the mouth with gauze

Using this technique, the therapist removes, in a structured way secretions or residues of food or drink from the oral cavity

### Objective

- To prevent penetration/aspiration of saliva or secretions, residues of food or drink
- To give the patient structured input during cleaning the mouth
- To keep the oral cavity clean and healthy
- To prevent infections of mucosa and gums

### Cleaning the mouth with gauze can be used when the patient:

- Has many residues in the mouth which might get difficult to remove with the toothbrush
- Is at risk for penetration / aspiration
- Does not tolerate the toothbrush, but can tolerate to be touched by the therapist's finger with gauze around

## Evaluation

### Signs that cleaning of the mouth with gauze is appropriate/helpful:

- The patient can tolerate the intervention
- The patient is able to adapt his tone in the face and mouth during cleaning
- The patient is able to cooperate, e.g. helps to push the secretions forward/out of the mouth

### Signs that cleaning of the mouth is not appropriate/helpful:

- The patient shows reactions of hypersensitivity (turns the head away, takes the therapist's hand and pulls it away, breathing frequency increases, tonus increases, other vegetative reactions)
- The patient shows biting reactions

In this case, the therapist should consider if she should modify her technique, e.g. in relation to tempo or pressure, or if the technique itself is contraindicated.

### **Box: "Tactile oral stimulation"**

#### **Tactile oral stimulation with water**

Tactile oral stimulation is a technique to assess and treat problems with tone, sensibility and / or swallowing of saliva.

#### **Objective**

- To give structured input to the face and mouth
- To facilitate swallowing
- To assess / regulate tonus, sensibility in the facial oral tract
- To facilitate functional oral movements, e.g. for bolus transport in the oral and pharyngeal phase
- To stimulate the production of saliva
- To increase circulation / blood flow in the gums
- To prepare the patient for eating and drinking

#### **Tactile oral stimulation can be used when the patient:**

- Shows hypersensitive reactions when touching the face and the mouth
- Reacts hyposensitive to touch in the facial oral tract
- Has problems with hypertonus / hypotonus / active movements in the face, the tongue and / or the jaw muscles
- Has impaired quality of swallowing saliva or low swallowing frequency
- Is at high risk for penetration / aspiration and no therapeutic eating is used yet

#### **Tactile oral stimulation with cold water**

The water used for the stimulation can be added an ice cube or it is taken from the fridge. This might be helpful for patients with hyposensitivity. The advantage is the additional thermic input to the tactile input. Contraindications for the use of cold water are hypersensitivity, biting reactions, exposed dental necks or damage to the dental enamel.

#### **Evaluation**

#### **Signs that tactile oral stimulation with (cold) water is appropriate / helpful:**

- The patient's tonus, activity and sensibility in the relevant structures can be regulated to more normal
- The swallowing frequency increases
- The production of saliva increases
- The patient swallows more effectively, which means less penetration and / or aspiration

#### **Signs that tactile oral stimulation with (cold) water is not appropriate/helpful:**

- The patient verbalises or shows that he is uncomfortable or seems not to understand the situation
- His tone or activity increase in an unhelpful way
- The patient does not swallow
- The patient shows penetration / aspiration

In this case, the therapist should consider if she should modify her technique, e.g. in relation to tempo, pressure, the temperature of the water, or if the technique itself is contraindicated.

### **Tactile oral stimulation with (cold) liquid with taste**

Using beverage with taste for tactile oral stimulation adds olfactory and gustatory stimulation to the tactile and eventually thermal stimulation.

#### **Objective**

- To provide structured input to the face and mouth
- To facilitate swallowing
- To assess and regulate / normalise tonus, sensibility in the facial oral tract
- To facilitate functional oral movements
- To increase the production of saliva
- To increase the circulation / blood flow in the gums
- To prepare the patient to eating and drinking

#### **Tactile oral stimulation with beverage with taste can be used when:**

- The patient is hyposensitive in the face and mouth
- The patient has problems with hypertonus / hypotonus / active movements in the face, tongue and lower jaw
- Has impaired quality of swallowing saliva or low swallowing frequency
- The patient is not at high risk for penetration / aspiration

### **Tactile oral stimulation with cold beverage with taste**

The beverage with taste is added an ice cube or it is taken from the fridge. It can be used to patients with hyposensitivity. The advantage is the additional thermic input to the tactile and the gustatory / olfactory input. The use of cold beverage is contraindicated in patients at high risk for penetration / aspiration, hypersensitive reactions, increased production of saliva, biting reactions, exposed dental necks or damage to the dental enamel. Beverage that contains sugar or fruit acid can be unhelpful for patients with lesions of the intraoral mucosa or infections in the oral cavity. Remember to clean the patient's mouth after using beverages to avoid tooth decay, microaspiration and fungal infection.

#### **Evaluation**

##### **Signs that tactile oral stimulation with (cold) beverage with taste is appropriate:**

- The patient's tonus, activity and sensibility in the relevant structures can be regulated to more normal
- The swallowing frequency increases
- The produktion of saliva increases
- The patient swallows more effectively, which means less penetration and / or aspiration

##### **Signs that tactile oral stimulation with (cold) beverage with taste is not appropriate/helpful:**

- The patient verbalises or shows that he is uncomfortable or seems not to understand the situation
- His tone or activity increase in an unhelpful way

- The patient does not swallow
- The patient shows penetration/aspiration

In this case, the therapist should consider if she should modify her technique, e.g. in relation to tempo, pressure, the temperature of the beverage, or if the technique itself is contraindicated.

### **Box: "Levels for facial and tongue movements"**

In sum: The quality of the movement is more important than the quantity!

#### **Facial movements:**

Quality of facial movement can be evaluated by different parameters. Is the movement selective? How is the range of movement? Is there a clear start and stop of the movement? Can it be repeated (e.g. facial movements) up to five times in the same quality?

Selective facial movements require a dynamic stable position, not only of the body, but also of the head and the lower jaw. Hyperactivity in the less affected side of the face avoids selective movement and must be inhibited first. To facilitate facial movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive information). Often, those several options are combined. To work with facial movements can be relevant to facilitate oral movements for swallowing, eating/drinking or protection of the airways.

#### **Passive mobilisation of the face**

At this level, the therapist performs/conducts the movement for the patient (e.g. frowning or pursing the lips) in a structured way.

#### **Objective**

- To give structured input to the face as a basis for active movement
- To keep the mobility of the facial muscles and other structures of the face (e.g. connective tissue)
- To prevent hypersensitive reactions on touch on the face

#### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active facial movements
- The patient needs the input from the passive movement to get into an active movement. The passage to the next level might be fluent.

#### **Partial active facial movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

#### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement

#### **This level can be used when:**

- The patient has the ability for active movement, but need the "idea" of how to (perform it) do it
- The patient has problems to initiate selective movements and instead moves other parts of the face, especially when just asked verbally to perform a movement

### Active facial movements

At this level, the patient is able to perform active facial movements, but the quality is decreased

#### Objective

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement

#### This level can be used, when:

- The quality of the facial movement is still decreased or gets worse during repetition or there are problems to clearly start and stop a movement

### Active facial movement in a sequence or activity that is related to everyday life

On this level, active facial movements are embedded into a sequence of an activity or an activity

#### Objective

- To transfer the ability to perform selective facial movements into a meaningful context/activity

#### This level can be used when:

- The patient is already able to perform facial movements, but still has problems utilizing them in everyday life activities
- The patient needs the context of an activity to be able to perform facial movements, since he might not be able to work in 'abstract' context with facial movements

*Example: A patient with a right-sided hemiparesis is not able to pucker the lips. He just opens his mouth wide and extends his neck. The therapist tries to facilitate the movement tactilely and by being a visual model for the patient, without success. The therapist guides the patient to cut an orange into pieces and helps him to suck some juice out of a piece of orange. The patient is able to form his lips around the orange symmetrically.*

### Evaluation of the chosen level to work with facial movements regarding the parameters for quality of movements:

Selectivity, range of movement, repetitions are possible three to five times with the same quality, there is a clear start and stop of the movement

A position with more base of support might improve the patient's ability to perform selective movements!

#### Tongue movements:

Selective tongue movements require a dynamic- stable position of the body, the head and the lower jaw.

To facilitate tongue movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive (see above))

information). Often, those options are combined. To work on tongue movements can be relevant to elicit or facilitate oral movements for swallowing, eating/drinking, cleaning the mouth for remains of food and saliva, or protection of the airways.

### **Passive mobilisation of the tongue**

At this level, the therapist performs/conducts the movement for the patient (e.g. moving the tongue within the oral cavity forward or to the side; or bring it outside of the mouth towards the side or towards the upper lip in a structured way).

#### **Objective**

- To give structured input to the tongue as a basis for active movement/swallowing
- To keep mobility of the tongue
- To prevent or treat hypo-or hypersensitivity

#### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active tongue movements
- The patient needs the input from the passive movement to get into an active movement

The passage to the next level might be fluent.

### **Partial active tongue movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

#### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement
- To prevent or treat hypo-or hypersensitivity

#### **This level can be used when:**

- The patient has the ability for active movement, but needs the "idea" of how to do it
- The patient has problems to initiate selective movements and instead moves other structures, e.g. the neck or the jaw, especially when just asked verbally to perform a tongue movement
- The patient is hypo- or hypersensitive in the face/mouth

The passage to the next level might be fluent.

### **Active tongue movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased.

#### **Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement

- To prevent or treat hypo- or hypersensitivity

**This level can be used, when:**

- The quality of the tongue movement is still decreased or gets worse during repetition
- There are problems to clearly start and stop a movement
- The patient shows hypo- or hypersensitivity in the face/ mouth

The passage to the next level might be fluent.

**Active tongue movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity.

**Objective**

- To transfer the ability to perform selective tongue movements into a meaningful context/activity
- To treat or prevent hypo- or hypersensitivity

**This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilising them in everyday life activities
- The patient needs the context of an activity to be able to perform tongue movements, since he might not be able to perform tongue movements in 'abstract' contexts, e.g. on verbal request

**Evaluation of the chosen level to work with tongue movements, regarding the parameters for quality of movements:**

- Selectivity
- Range of movement
- Repetitions are possible with the same quality
- There is a clear start and stop of the movement.

A position with more base of support might improve the patient's ability to perform selective movements!

**Box: "Levels for eating / drinking"**

The activity "Eating and drinking" can be used as a therapeutic medium on different levels in terms of the amount of food, the consistency and the intensity of support to the patient

**Objective**

- To encourage "readiness" and anticipation in the pre-oral phase
- To encourage / facilitate oral and pharyngeal transport movements for eating and drinking in a context that is related to an activity
- To increase the patient's quality of life
- To transfer functions to a context which is related to activity or participation
- To encourage safe and sufficient eating and drinking

**Therapeutic eating**

Is used to work with different consistencies on problems in the swallowing sequence in a controlled situation. There can be used firm consistencies, such as e.g. pieces of apple, wrapped in gauze, to chew on; pureed, homogeneous consistencies or liquid. A few drops of liquid might be offered to the patient from a straw, used as a pipette, or offered from a normal beaker or a Heidi Cup.

**Therapeutic eating can be used when the patient:**

- Has the prerequisites / requirements for therapeutic eating (taught on the F.O.T.T.® basic course)
- Has problems in one or more phases of the swallowing sequence (e.g.: disturbed hand- mouth- coordination, lack of lateral tongue movements for chewing, pumping jaw movements to initiate swallowing,...)

**Evaluation****Signs that therapeutic eating is appropriate / helpful:**

- The patient can be facilitated to functional movements / reactions, related to the activity in the pre-oral, oral and pharyngeal phase (e.g.: closure of the lips, chewing, lateral tongue movements, swallowing)

**Signs that therapeutic eating is not appropriate / helpful:**

- The patient's motor response does not change
- The patient's tone increases
- The patient shows signs of strain
- The patient loses postural control
- The patient cannot spontaneously protect his airway and can neither be facilitated to it

**Assisted eating**

Is used for patients who already are able to eat a meal safely (within maximum 45 minutes), but still need support e.g. for their position during eating, protection of airway or for structuring the situation. The intensity of support might be individually different

**Objective**

- To make sure that the patient can eat and drink with sufficient protection for the airway
- To create a situation, where the patient repeats functional movements and sequences of movement in an everyday life activity

**Assisted eating is used when the patient:**

- Has the prerequisites for eating and drinking (taught in the F.O.T.T.® basic course)
- Has slightly to moderate problems in one or more phases of the swallowing sequence, demanding professional support
- Does not eat and drink safely enough yet to just be supervised or eat independently

- Still needs repetition of functional sequences of movements (e.g. chewing, swallowing, collecting remains of food and clearing swallowing) in different context of eating and drinking to encourage motor learning

### **Evaluation**

#### **Signs that assisted eating is appropriate/helpful:**

- With the support offered, the patient is able to eat and drink a suitable amount of food / drink safely within maximum 45 minutes

#### **Signs that assisted eating is not appropriate/helpful:**

- The patient's tonus increases
- He seems strained
- The patient loses postural control
- The patient shows signs of penetration and / or aspiration
- The patient is not able to eat / drink a suitable amount safely within maximum 45 minutes

Here, the therapist should consider to modify the offered support and facilitation for the patient, or if assisted eating in general is a too high level of eating and drinking for the patient yet

#### **Independent eating with / without supervision**

Here, the patient is able to eat independently, without physical help, but there is still a person / staff around him (supervision). This is the last step before the patient can eat and drink all consistencies safely independently.

#### **Objective**

- To make the patient feel safe during eating / drinking
- To be able to give support to the patient (e.g. by reminding him to rinse his mouth after eating) to protect his airway
- To make sure that the patient eats and drinks the appropriate amount and consistencies
- To supervise, if the patient uses learned and helpful strategies (e.g. when he is discharged to his own place real soon now)

### **Evaluation**

#### **Signs that eating with supervision is appropriate / helpful**

- The patient feels safe during eating and drinking
- The patient eat and drink safely suitable amounts

#### **Signs that eating with supervision is not appropriate / helpful**

- The patient shows clinical signs of penetration / aspiration
- The patient seems to need more (physical) support
- The patient does not eat sufficiently or needs more time to eat and drink

- The patient seems to be exhausted

### **Eating / drinking in a group situation**

This method might be used, to work on the patient's problems in the swallowing sequence in the situation of participation, (e.g.. together with the patient's relatives or other patients).

#### **Objective**

- The patient learns to coordinate several functions of the facial oral tract in a context, related to an everyday life activity, including social interaction.

#### **Eating / drinking in a group situation can be used when:**

- The patient is able to interact socially and can tolerate to be together with other persons due to own psychic, perceptive and cognitive abilities
- The patient should learn to coordinate eating and drinking safely with (non) verbal communication

#### **Evaluation**

##### **Signs that eating / drinking in a group situation is appropriate/helpful:**

- The patient eats and drinks safely and can interact socially with others

##### **Signs that eating and drinking in a group situation is not appropriate/helpful:**

- The patient has more clear signs of penetration/aspiration, compared to situations where he is eating and drinking alone and in quite surroundings
- The patient does not eat and drink sufficiently, seems distracted
- The patient seems overstimulated and cannot interact socially
- The patient withdraws from the situation

Here, the therapist should consider if the situation and the support for the patient can be modified (e.g. to limit the amount of persons around or structure the situation more, or if eating and drinking in a group situation is a too high level for the patient yet.

### **Box: "Methods/ Techniques"**

#### **Positioning**

Means, that all body segments (pelvis, thorax, shoulder girdle, head and extremities) are being brought in an appropriate position to each other, to the base of support, the gravity and the activity. Each position chosen must be safe (without risk for falling or aspirate saliva). A position should never be uncomfortable or painful. Before positioning, the patient should be mobilised and postural control should be facilitated, to create optimal alignment. For patients with rather severe problems of perception, guiding (Affolter Model®) might be useful, to achieve the new position (e.g. from sitting to side lying).

#### **Objective**

- To create a dynamic- stable position in an appropriate alignment to encourage postural control and selective movements of the extremities and in the facial oral tract.

**Positioning can be used when the patient shows:**

- Mal-alignment because of altered tonus / lack of postural control
- Problems with perception
- Lack of endurance
- Low arousal
- Lack of selective movements in the trunk, the extremities and /or the facial oral tract
- Insufficient respiration

**Evaluation****Signs that a position is appropriate / helpful:**

- Changes of the patient's motor behaviour (the patient gets active and movement becomes more easy and selective)
- The patient's tone and alignment are optimal
- The patient is more awake and alert, more calm and concentrated
- The patient's respiration is more normal

**Signs that a position is not appropriate/helpful:**

- The patient's tone increases in an unhelpful way in one or more muscles
- The patient shows associated reactions when he is trying to move
- The patient remains passive, arousal decreases
- Vegetative reactions: Sweating, increasing or decreasing blood pressure, saturation decreases, respiratory frequency increases or decreases
- The patient loses concentration, becomes restless and/or the facial expression gets tensed
- The patient has problems to perform selective movements, which otherwise are possible in a lower position
- The patient shows signs of penetration/aspiration
- The patient's respiration becomes insufficient

*Example: In half sitting position, the patient is neither able to swallow his saliva spontaneously, nor can he be facilitated to it. However, in side lying position, the therapist can at least facilitate swallowing.*

When one or more signs appear, the therapist has to consider, if the position itself is inappropriate, or if he has been too long in the same position. Is there a need to find a new position for the patient, or would small changes in the actual position be adequate?

**Mobilisation**

Means to move the whole body (e.g. for coming from one position into another), or parts of the body or extremities or specific structures, as muscles, joints or connective tissue.

**Objective**

- To achieve more postural control, facilitate selective movements, higher range of movement (ROM),

- Normalize tone, optimize alignment
- Increase arousal

#### **Mobilisation can be used when the patient has:**

- Senso-motory problems (lack of postural control or problems with selective movements of extremities or in the facial oral tract)
- Increased mobility, that influences selective movement
- Cognitive and / or perceptive problems, e.g. decreased arousal, neglect, lack of attention

#### **Evaluation**

##### **Signs that mobilisation has the required impact**

- Movement gets possible, easier, more selective
- Range of Movement (ROM) increases
- More optimal alignment
- The patient does feel the mobilised part of the body better and / or uses it
- The patient is more awake / attentive, alert or concentrated

##### **Signs that the mobilisation does not have the intended impact:**

- The patient has pain or feels uncomfortable
- ROM become smaller or there is no change at all
- Alignment or tone does not change or become unhelpful, no chance for movement
- No change in sensibility or proprioception
- The patient stays or become restless, loses concentration
- No change in arousal

#### **Guiding**

The term "guiding" refers to the Affolter Modell® ([www.apwschweiz.ch](http://www.apwschweiz.ch)). Here, the therapist physically guides the patient's body and hands in problem solving everyday life activities. The goal is to provide tactual information to the patient, about the position of his body in the environment and the activity. There are two methods for guiding, nursing and elementary guiding, both described in Affolter (1991, 2000)

#### **Objective**

- To provide relevant tactile information in a structured way to the patient about his body in the environment and the ongoing activity.
- To encourage problem solving processes and formation of hypotheses in everyday life activities

#### **Guiding can be used, when:**

- The patient has perceptive / cognitive problems
- The searching, acquiring, and treating of information from the environment is disturbed. This leads to decreased ability to problem solving in everyday life activities.

#### **Evaluation**

##### **Signs that guiding is appropriate / helpful:**

- The patient pays attention to the ongoing activity
- The patient seems to understand the activity (comprehension)
- The patient adapt his tone in the activity or pursues movements by himself
- The patient executes the next step in the activity
- The patient's behaviour changes towards normal behaviour, required for the context

#### **Signs that guiding is not appropriate / helpful**

- The patient becomes (more) restless
- His tension / tone increases
- No changes in the patient's behaviour

Here, the therapist should consider, if the level or the way of guiding should be modified or if guiding is an adequate intervention in that context.

#### **Facilitation**

Facilitation is a technique, where- most of the time via manual contact- the sensory and proprioceptive systems is activated. Facilitation is an active learning process, helping a person to overcome inertia, continue or terminate functional tasks (Vaughan Graham 2009, 2016, Gjelsvik 2016). Facilitation is never passive. The therapist uses facilitation, when she wants to work on the patient's postural control or selective, functional movements in the facial oral tract. The place, direction and duration of facilitation might vary.

#### **Objective**

- To allow / facilitate movement and change motor behaviour

#### **Facilitation can be used, when the patient has:**

- Inadequate motor behaviour
- Decreased / lack of postural control
- Problems to perform selective movement

#### **The various intensity of facilitation**

##### **Continuous facilitation**

The therapist chooses to facilitate continuously, when the patient:

- Loses postural control when the therapist stops to facilitate ("hands off")
- Does not have the idea to or the possibility to initiate, accomplish or complete a movement / function / activity
- When the therapist stops to facilitate, selective movements are not possible AND / OR mass movements or associated reactions appear
- In general, the quality of movement decreases without facilitation

##### **Facilitation in between, over short sequences**

The therapist chooses to facilitate in between, if:

- The patient can keep up postural control over a short while

- The patient takes over, initiates or completes a movement / function or activity in an adequate quality / quantity spontaneously

### **Facilitation to initiate movement or patterns of movement**

The therapist facilitates to initiate movement / function / activity, if:

- The patient has sufficient postural control and is able to keep it to take over, continue and to finish / complete a movement, function/ activity / task
- The patient is able to perform spontaneous, selective movement in the facial oral tract

### **Evaluation**

#### **Signs that facilitation is appropriate / helpful:**

- Motor behaviour changes
- The patient become (more) active
- Movement become easier, more selective

#### **Signs that facilitation is not appropriate / helpful:**

- The patient's tone increases in an unhelpful way
- Associated reactions occur when the patient tries to move
- Motor behaviour does not change
- The patient remains passive

### **Box: "Guidance/ instruction/supervision of the patient and/ or the relatives"**

Guidance can be offered to certain problems in activities. For example, if the patient has trouble dealing with doughy secretions in his pharynx, he or relevant staff or relatives might be instructed to helpful interventions, such as clearing the throat by gargling and spitting out. It might also be, that relevant staff or relatives are supervised, if they perform the learned interventions in a correct manner.

Guidance/instruction/supervision of the patient/nursing staff/helpers/and/or relatives includes both, verbal and written explanations, supplied by practical exercises of the interventions chosen. When relevant, the use of pictures or photographs might be beneficial, too. It is the therapist's responsibility to perpetual makes sure, that the interventions are performed in a correct manner and to adopt the interventions towards the patient's current need. The patient / relatives / helpers or nursing staff should have the possibility to contact the therapist in case of questions or if there are problems, when running the interventions.

#### **Objective**

- To involve the patient / relatives /nursing staff / helpers as far as adequate and possible, to prevent complications, e.g.. malnutrition, pneumonia, hypersensitivity in the facial oral tract
- To enable optimal activity and participation in a quality as good as possible (e.g. to be able to eat together with others and enjoy it)
- To promote learning / establishing of functional movement / patterns of movement (e.g. to clean the mouth for remains/ residues during eating)

- To ensure helpful and structured input to the facial-oral tract (e.g. by using tactile oral stimulation or facilitation of active tongue movement)
- To inaugurate relevant interventions into the patient's everyday life, aiming towards optimal function, and activity (e.g. make sure that the patient has had a rest before eating and drinking)

**Guidance / instruction / supervision can be used, when the patient:**

- Has the prerequisites (perceptive, cognitive and senso-motory) to be responsible for own training / treatment
- Is not able to independently perform training / treatment by himself, but the relatives / nursing staff / helpers are resources that could be involved

**Evaluation**

**Signs that guidance/instruction/supervision of the patient and/or relatives/helpers/nursing staff is appropriate:**

- The patient's level of function increases
- No or less complications occur
- Unwanted / unhelpful symptoms (e.g.. hyperactivity) are reduced or disappear

**Signs that guidance / instruction / supervision of the patient and / or the relatives / nursing staff / helpers does not have the required effect or should be modified:**

- Complications or unwanted symptoms do appear, e.g.. pain or hyperactivity
- The self training is not at all carried out or only infrequently, because the patient or the relatives / nursing staff / helpers are wary about how to do it or they do not have the resources to do it

**Box: "The use of consistencies"**

The definitions for food and drink are identic with the Danish Recommendations for diet in institutions, published by the Danish National Board of Health [http://bedremaaltider.dk/fileadmin/user\\_upload/Bedremaaltider/Mere\\_viden/Anbefalinger\\_institutionskost.pdf](http://bedremaaltider.dk/fileadmin/user_upload/Bedremaaltider/Mere_viden/Anbefalinger_institutionskost.pdf). These definitions might differ from those of other countries.

The consistencies always have to be chosen according to the patient's resources and problems in the swallowing sequence.

There are mashed, soft and unmodified consistencies. Liquid can be of light, moderate or high viscosity. When no thickener is added at all, e.g. in water, this is called unmodified consistency (according to the definitions used in Denmark)

**Objective**

- To find and offer the patient those consistencies, he is able to eat and drink safely.

Remember, that just / only modifying consistencies cannot be the only intervention to warrant safe eating and drinking in patients with dysphagia!

**Modifying consistencies should be used when:**

- The patient lacks several teeth or has a bad dental chart
- The patient has a fracture in the upper or lower jaw / pain in the oral cavity/jaw

- The patient is hyposensitive in his mouth and at risk for biting lesions in the cheek or the tongue, when chewing hard consistencies (unmodified diet)
- The patient lacks endurance for a whole mealtime and gets tired towards the end of a meal with increasing risk for aspiration
- The patient lacks oral/pharyngeal movements to form and transport a bolus
- The patient has problems to coordinate the oral and pharyngeal phase with the risk of penetration/aspiration, when drinking consistencies with light viscosity

## Evaluation

### Signs that the chosen consistencies are appropriate / helpful:

- The patient eats / drinks safely
- The patient is able to ingest a sufficient amount of food and / or drink

**Signs that the chosen consistencies are not appropriate (remember that these signs might have other reasons, too). That is, why the therapist carefully has to evaluate, when one or more of the following criteria occur:**

- The patient shows signs of penetration/aspiration
- A mealtime takes more time than usually
- The patient "flushes down" hard food consistencies with liquid/drinks
- The patient has a lot of residues in the mouth, and might not realize it/not remove it
- The patient seems overstrained

## Box "Facilitation to swallowing"

Facilitation to swallowing is an important method and technique that might prevent penetration and / or aspiration. Here, the therapist stabilises structures, relevant for swallowing (e.g. head and jaw) or moves structures relevant for swallowing (e.g. the tongue) with specific handling. This handling is taught at the F.O.T.T. basic courses. Facilitation to swallowing might be individual different, depending on the patient and his problems.

The technique should be used, as soon as the patient tries to initiate swallowing (often seen in pumping jaw movements), or if the patient should swallow, but does not initiate it.

### Objective

- To increase the rate and quality of swallowing
- The patient learns to swallow spontaneous and sufficient again
- To prevent penetration/aspiration

### Techniques to facilitate swallowing

- The therapist stabilises the patient's head and the lower jaw in an optimal alignment
- The therapist facilitates the first third of the tongue upwards, towards the hard palate, from the outside of the floor of the mouth

- The therapist facilitates the second third of the tongue upwards towards the soft palate, from the outside of the floor of the mouth
- The therapist gives an input from the floor of the mouth towards the region of the vallecular space, so the patient is able to feel remains of saliva
- The therapist mobilizes the patient's tongue within or outside of the mouth, to prepare the pharyngeal stage of the swallowing sequence
- The therapist facilitates active tongue movements within or outside the mouth, as a preparation for the pharyngeal stage of swallowing
- The patient gets input to feel saliva, that might sit in the pharynx, e.g. by working in the expiration phase of the respiration cycle. If possible, the patient's voice might get used for that input, too.
- The therapist mobilizes the patient or parts of his body, e.g. the upper trunk or the head, to "disturb" remains of saliva that might sit in the mouth or pharynx, to elicit a swallowing response

#### **Facilitation to swallowing can be used when the patient:**

- Does not swallow spontaneously (he initiates swallowing with pumping jaw movements or does not swallow at all)
- Does not swallow sufficiently, e.g. the patient's tongue pushes forward when swallowing, and saliva is not transported towards the pharynx, but rather out of the mouth. Other signs of insufficient swallowing: a wet voice, coughing after swallowing or saliva running out of the mouth after swallowing

#### **Evaluation**

##### **Signs that facilitation of swallowing is appropriate/helpful:**

- The patient swallow
- The patient does show less or no pumping jaw movements before swallowing
- The patient's voice is not wet/he does not cough after swallowing
- Saliva is getting transported more sufficient/there are less remains of saliva in the cheek (s) or on the tongue

##### **Signs that facilitation of swallowing does not have the required effect/is not appropriate:**

- The patient does not swallow
- The patient shows (many) jaw pumping movements, that might not be followed by a swallow
- There are signs of penetration / aspiration (wet voice / coughing)
- The patient has many remains of saliva in the mouth or saliva runs out of the mouth
- The patient removes the therapist's hands from the floor of the mouth / jaw or turns his head away

Here, the therapist should consider, if she should modify the technique of facilitation, or if the patient does need a different support to swallow. See "**Techniques to facilitate swallowing**" on page 35.

### **Box: "Interventions for protection of the airway"**

Protection of the airway is an important method and technique to encourage and facilitate sufficient reactions, when there are clinical signs of penetration and / or aspiration of saliva / food / liquid.

Patients, who do not perceive that they need to clear / protect the airway, do not benefit from verbal requests to cough or clear their throat. With the here described techniques, the therapist always should facilitate patients, when they: initiate cough, have rattling breathing sounds (clinical sign of aspiration), have wet voice or try to clear their throat (clinical sign of penetration). Often, several techniques might be used as a combination.

### Objective

- Sufficient protection of the airway
- Prevention of complications, as aspiration pneumonia
- Learning of functional, effective movements / patterns of movement to react on penetration/ aspiration

### Techniques to encourage protection of the airway:

- **Facilitation to sufficient clearing of the throat / cough:**  
Facilitation of the abdominal and intercostal muscles for a sufficient cough. This includes support of the thorax/trunk to come forward and support to swallow after coughing or clearing the throat. If there are rubbery, doughy secretions in the oral cavity, the patient should be supported to spit them out instead of swallow them, or they are removed from the oral cavity, e.g.. with gauze. If necessary, the patient should be facilitated either to spit out or to swallow (see also box: "Facilitation to swallow").
- **Facilitation to clear throat, spit out, blow one's nose**  
If there are remains of saliva / food /liquid in the pharynx, around the pharyngeal wall, the most effective way to get rid of it, would be to clear the pharynx and spit out. Secretions in the nose should be removed, either by the therapist with cotton buds, or the patient is facilitated to blow his nose.
- **Cleaning the mouth with gauze / oral hygiene:** Secretions / remains of saliva / food / liquid that has been collected in the cheeks, on the tongue or on the soft palate, should be removed with gauze. For doing so, the therapist wraps gauze around her finger and removes the material in a structured way from the oral cavity.
- **Cleaning of the mouth in patients with more abilities to be active:** The patient's finger can be guided towards his mouth, so he can feel the rests by himself. Then, he might be facilitated to remove them, swallowing or spitting out. Another way could be, to support the patient to find remains with the tongue, swallowing them or spit them out.

### Interventions to protect the airway can be used when the patient:

- Shows signs of penetration / aspiration without spontaneous reactions for protection of the airway
- Has insufficient (e.g.. weak cough, lack of clearing swallow, remains of material in the oral cavity) or unhelpful reactions on penetration / aspiration (e.g. wants to drink something, despite the airway still is not free, and the patient still is coughing)

### Signs that facilitation of protection of the airway is appropriate / helpful

- The patient's voice does sound clear
- The upper and lower airway is free from secretions
- The patient coughs rather loud and powerful and can be facilitated to swallow or spit out afterwards (or does it spontaneously)

- There are no remains of food, secretions, liquid in the oral cavity

#### Signs that facilitation of protection of the airway does not have the required effect / is not appropriate:

- The patient's voice sounds wet
- Secretions in the upper and lower airway are to be heard during respiration
- There is no spontaneous clearing swallow / spitting out after coughing / the patient cannot be facilitated to do so
- There are remains of secretions / food / liquid in the oral cavity
- Coughing sounds rather weak / the patient continues to cough or clear the throat

### 4.4 Evaluation: Does the patient react/respond appropriate/as expected on the chosen interventions – related towards the goal?

Here, the therapist collects her observations made since the beginning of the treatment:

- Does the treatment still seem appropriate?
- Does the goal for today's treatment still seems realistic to achieve? Or is the goal already achieved?
- Should the therapist adhere to her original plan / the interventions started up or does the patient's response require to set in with different therapeutic interventions?

Here, the therapist should answer YES or NO.

### 4.5 Continuing the treatment in view of the evaluation

If the answer is **YES**, the therapist either should work towards the goal or, if it already is achieved, work with **repetition** and / or **shaping**. Shaping means to work on the patient's individual "limit", neither on a too high nor on a too low level. This is done by increasing requirements, or offer the patient less support, (e.g. less facilitation (Gjelsvik 2016), or a position with less base of support. Shaping is an important method to encourage motor learning (Vögele 2015).

Repetition might contain different aspects: To let the patient repeat the same movement / sequence movement / activity under the same conditions gives the therapist information if the patient can keep up the quality of the movement and encourages learning. Repetition also might be used under different conditions (e.g. changed context, speed, position, range of movement, etc. (Vögele 2015). Motor learning is assumed to be most effective, when repetition is done in varied context.

*Example: The goal for today's treatment is: The patient is able, in sitting position to drink a glass of juice safely, when facilitated to clearing swallows by the therapist. After a few sips, the patient spontaneously shows clearing swallows. The therapist therefore stops facilitation and observes carefully, if the patient does continue with the clearing swallows, and if there are clinical signs of aspiration or penetration.*

If the answer is **NO**, the therapist should consider, how to increase support for the patient, e.g. by offering him a position with more base of support, more facilitation, or set the goal lower for the

patient. If it seems unrealistic to achieve the goal at all, the therapist should set a goal that is realistic and achievable in relation to the patient's current condition and difficulties.

*Example: The goal for today's treatment was, that the patient in sitting position is able to drink a glass of juice safely, with spontaneous clearing swallows. After drinking of a half glass, the patient stops with the clearing swallows. The therapist reacts by increasing her support, and starts to facilitate the clearing swallows.*

#### **4.6 Re-Evaluation: Does the patient react / respond appropriately / as expected on the chosen interventions? Is the goal for today's treatment reached? Is the long- term goal still realistic? Finish today's treatment. Clinical reasoning about the next treatment.**

Towards the end of today's treatment, the therapist does "re"-evaluate, how the modification of the chosen interventions or the onset of new interventions succeeded. For evaluation, the therapist analyses the patient's response. The following reflections might become relevant:

- Were the therapeutic interventions appropriate related to the patient's problems and the underlying causes?
- Were the interventions carried out on the right level / in the right intensity?
- What kind of interventions are most helpful for the patient, to bring out the best / most optimal selective / functional movement?
- If the goal for today's treatment was not achieved – is it still realistic / relevant for the next treatment?
- Is the long-term goal still relevant / realistic?
- Which considerations and experiences from today's treatment are relevant for the next treatment, when the process of assessment, analysis, treatment and evaluation starts again?

## 5. Chart and manual "Breathing, voice and articulation"

- 2a. Set a relevant, evaluable long-term goal, if possible together with the patient / the relatives
- 2b. Set a goal for the F.O.T.T. treatment of the day, if possible and relevant together with the patient / the relative(s)

1. Assessment and Analysis, Chart 1

### 3 Choose therapeutic interventions for postural control and selective movements / activity, related to the goal and start the treatment

<b>Work areas for breathing, voice, articulation</b> - Facilitation of sufficient breathing - Facilitation of voice and articulation movement - Facilitation of coordination between movement / movement sequences, breathing, voice and articulation		<b>Tactile oral stimulation</b> - With (cold) water - With (cold) liquid with taste	<b>Guidance/ Instruction /supervision of the patient and / or the relative(s)/ nursing staff / carers</b>	<b>Levels for facial and tongue movements</b> - Passive - Partially active - Active (selective movement) - Active movement sequence in activity	<b>Methods / Techniques</b> Positioning Mobilization Guiding Facilitation: - Continuous - Initiated - Over short sequences
<b>Adapt environmental factors</b> - Place / room / furniture - Objects - Helping aids	<b>Choose positions appropriate for the patient and intervention</b> - Lying - Half sitting - Sitting - Standing	<b>Facilitation to swallow by:</b> - Facilitation at the floor of the mouth - Stabilization of the lower jaw - Passive or active tongue movements - Facilitation of breathing /voice - Mobilization of the body or body segments		<b>Actions to facilitate protection of the airway</b> - Facilitation of sufficient clearing of the throat / cough - Facilitation of cleansing of the throat, spitting out, rinsing / blowing the nose - Oral cleansing with gauze/ oral hygiene	

4. Evaluation: Does the patient react / respond appropriately / as expected to the chosen interventions – related to the goal?

YES NO

5. Continue treatment based on the evaluation
- Pursue the goal
  - Repetition
  - Shaping (increase demands, less support)

5. Continue treatment based on the evaluation
- Shaping (less demands / increase support)
  - Initiate new / other interventions
  - Reassess the goal and modify it to current context

6. Re-Evaluation
- Does the patient react / respond appropriately / as expected to the chosen interventions?
  - Has the goal for the treatment been reached? Is the goal still realistic?
  - Conclude the treatment for the day
  - Reasoning / planning of the next treatment

1. Assessment and Analysis, Chart 1

## 5.1. Assessment / analysis, see chart 1.

## 5.2. Goalsetting

### 5.2.1. Goal setting. Setting a relevant, evaluable long-term goal, if possible together with the patient / the relatives, based on "Assessment and Analysis" Chart 1.

A long-term goal should be relevant for the patient's context, related to activity and participation. The goal should be evaluable, too.

*Examples:*

- *The patient is able to clear the airway by coughing sufficiently instead of requiring suctioning.*
- *The patient is able to speak clearly / understandable on the phone with his relatives*

### 5.2.2. Setting goal for the F.O.T.T. treatment of the day, if possible together with the patient / eventually the relative(s)

For the treatment of the day, there is set a short-term goal, if possible and relevant together with the patient and / or the relative(s). The goal should be evaluable, relevant for the patient, realistic and related to his level of function, activity or participation.

*Examples:*

- *The patient is with facilitation, able to produce voice (e.g. "ha", "ho"), instead of whispering.*
- *In sitting position, the patient is able to speak a whole sentence, consisting of five words in one expiration phase, without facilitation.*

## 5.3. Choosing therapeutic interventions for the treatment for postural control and selective movements / activity, related to the goal and starting treatment

At this point, the therapist chooses an environment and the therapeutic interventions she thinks are relevant to achieve the goal and plans the treatment. She also considers, how to modify and grade the interventions.

Remark, that there is mandatory content in each chart. The boxes: "Adapt environmental factors", "Choice of position", "Methods and techniques", Guidance / Instruction / supervision of the patient and / or relatives, nursing staff / helpers", "Levels for facial movements" are relevant content in each area of F.O.T.T.®. Furthermore, the boxes "Facilitation of Swallowing" and "Protection of the airway" are essential in F.O.T.T.®. Therefore, they appear on each chart. In "real life" this means, as soon as the patient needs

facilitation of swallowing or help to protect the airway, the therapist takes this into account and prioritizes this.

First, the therapist chooses the goal, and then considers the environment and the position she will start to treat the patient. Then, the therapist thinks about: the interventions and how to grade them, the consistencies to use, to be able to work at the patient's individual limit and to achieve the goal.

In F.O.T.T.<sup>®</sup>, there is a method used, called "elicitation". This means: to bring out, to waken, to cause, to release". By choosing an appropriate environment, position, interventions, use of own language, etc. a helpful, appropriate response or motor behavior by the patient might be elicited.

*Example: After a stroke, a patient is not able anymore to coordinate to produce voice in the expiration phase of respiration. However, when speaking a sentence, he needs to take a new breath several times, because he has not enough air for more than one or two words. When the patient is in sitting position, his therapist places her hands on his sternum and the thorax and works on elongation of the expiration phase. Then, she gives the patient a signal at the beginning of the expiration phase, both with her own voice and by vibrating on his sternum. By doing so, a clear start and timing of the voice in relation to respiration might be elicited.*

The therapeutic interventions from the boxes in the Chart: "Breathing, voice and articulation are described here:

### **Box: "Adapt environmental factors"**

The environment, where the treatment takes place, is important to bring the patient in a situation, where he can act and interact in a helpful and functional way. Factors as noises, other persons, colours, smell, temperature, furniture and the function of the room (e.g.. a therapy kitchen) can contribute to the patient's ability to learn, concentrate, interact and encourage appropriate response. (Vaughan Graham 2009).

The environment for the treatment should be suitable for the patient and the goal, as far as possible, e.g.. In the patient's room, a dining room, where activities as eating and drinking are obvious.

### **Objective**

- To encourage motor learning by suitable context: The patient uses his more affected side of the body and moves as normal as possible
- The patient expands his repertoire of functional movements and patterns of movements
- To avoid unhelpful and unfunctional habits and compensatory strategies

### **Choice of place/room**

- **A known versus unknown room:** Consider, if the patient needs familiar surroundings, because he has problems in new, unknown situations, or if an unknown room might help to expand the patient's repertoire and encourage learning instead of clutching in habits or unhelpful strategies avoiding learning
- **Room related to the activity versus a room not related to the activity:** Does the patient need clear context given by the function of a room in order to understand the activity / situation? Does the

planned activity or intervention require e.g. a kitchen or a bathroom? Does the patient's condition allow that he leaves his own room and gets transported into another room?

- **A niche versus out in the room:** A niche is defined as a position, where the patient has a stable base of support and to stable sides. A niche might convey safety for patients with perceptive / cognitive or massive senso-motorical problems, e.g. disturbed body schema, lack of balance or lack of attention towards the more affected side of the body. Treating the patient out in the room might be useful for patients with sufficient postural control and perceptive and cognitive abilities. Sometimes, it might be necessary to be able to move freely around the patient.
- **One –to -one situation versus group situation:** One –to one situations during eating and drinking might be helpful, when the patient is easy to distract or has problems with concentrating. It might give the patient a feeling of safety, if he needs intensive support or facilitation. Last but not least, therapeutic interventions, e.g. cleaning the patient's mouth, might require privacy. However, group situations create a social context, where the patient must coordinate facial expression, verbal communication and eating / drinking. This is an option, when the patient is able to manage several visual and auditive input and can change focus from eating and drinking to communication with others and vice versa.

### Adapt furniture

Furniture is an important factor to support and promote the patients position and postural control. Furniture should give the patient a base for selective movement, as normal as possible, during treatment / the activity. Furniture should give enough support for the patient to move against gravity, but not too much support, because this might make him passive. A dynamic – stable position might help the patient to get some new experiences when moving and tactile information about his own body in the environment and the activity.

### Adopt objects

The objects chosen should as far as possible support active movement and patterns of movement, as normal as possible.

*Example: The treatment aims to elongate the patient's expiration phase as a prerequisite for producing voice. The patient should blow a piece of cotton wool from his hand. At the first time, the piece of cotton wool was too big and too heavy and the patient had to make too much effort to blow it away. For the second sequence, the therapist chooses confetti instead of cotton wool and the patient succeeded without effort and unhelpful increase of tone in his neck muscles.*

### Helping aids

Helping aids are used to compensate for a lack of function. A helping aid might allow the patient to perform an activity independently. This can have great importance for the patient's level of participation.

Helping aids can be used, when:

- A movement is not possible for the patient.
- They enable the patient to move in a normal pattern of movement, using his more affected side instead of compensation with the less affected side of the body in unhelpful strategies.

*Example: For patients with a lack of postural control. leading to insufficient coughing, it might be helpful to use a brace to stabilise the trunk.*

## Evaluation

### Signs that the environmental factors are appropriate:

- The patient reacts as expected / as intended
- The patient is active
- The patient understands the situation / activity
- The goal can be achieved

### Signs that the environmental factors are not appropriate / helpful:

- The patient reacts not as expected / intended and uses unhelpful compensatory strategies, restlessness, associated reactions, increased tone, lack of concentration
- The goal cannot be achieved

In this case, the therapist should try to change one or more environmental factors and evaluate the patient's response again.

### Signs that the environmental factors are appropriate:

- The patient reacts as expected / as intended
- The patient is active
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### Signs that the environmental factors are not appropriate / helpful:

- The patient reacts not as expected / intended and uses unhelpful compensatory strategies, restlessness, associated reactions, increased tone, lack of concentration
- The goal cannot be achieved

In this case, the therapist should try to change one or more environmental factors and evaluate the patient's response again.

## **Box: "Choose of position(s), appropriate for the patient and the interventions"**

In general, if a patient obviously is uncomfortable in a given position (seen by restlessness, increased tone, vegetative reactions...) the position needs to be changed. Some patients have restriction regarding positioning, e.g. because of fractures, craniectomy or skin lesions. The therapist has to adhere to these. The here described aspects for positioning are only recommendations.

A position has to be dynamic and stable at the same time, never fixed. Before positioning a patient, the therapist should work with postural control. Changes of position might only be necessary within one position, (e.g.. in lying, the patient's trunk is adjusted), or it might be necessary to change the whole position, e.g. from lying to sitting.

No matter in which position the patient is, it is always important to optimize the alignment in a way, that support swallowing.

- **Supine** position can increase the risk of aspiration, especially when the patient's neck is extended. Here, saliva runs with the gravity towards the pharynx and from there into the airway, before the patient is able to swallow it.  
However, if the H risk of aspiration is low, and the patient is positioned in good alignment (Vaughan Graham 2009, supine position might be used for work with breathing, postural control and relevant structures as the neck, the hyoid bone or the larynx
- **Half sitting** position, e.g. in bed can be suitable, when there is good alignment. Half sitting is likely to involve the patient's arms and hands, which is important in the pre-oral stage of therapeutic eating.
- **Side lying** offers patients with high tone or low postural control in general, much base of support. Saliva that might not be swallowed, will be collected in the patient's cheek and can be removed by the therapist, e.g. with gauze (see box: Interventions to protect the airway).
- **Sitting** position (e.g. on a plinth or on a chair, with individual support) requires a certain amount of postural control and a stabile vegetative state. Sitting is useful for interventions involving eating and/or drinking. The contact and the support from a table in front of the patient might influence the alignment of the trunk and neck positive and create trunk activity.
- **Standing** position with or without helping aids (e.g. a standing frame) might elicit helpful alignment in the trunk and pelvis, ease respiration and increase arousal. See also the box: "Methods / techniques".

See also the chapter "positioning" in the box: "Methods / techniques".

### **Box "Working areas for breathing, voice and articulation "**

Usually, we do not think about how we breathe. As soon as we get aware of our breathing, or that somebody is observing our breathing, it will change. Therefore, it is important for the therapist to consider if she will tell her patient that she now is going to assess and / or watch his respiration.

#### **Facilitation of sufficient breathing**

##### **Objective**

- To optimise respiration in relation to localisation (costo-abdominal), rhythm, rate and coordination with swallowing, as a prerequisite for protection of the airway, producing voice and speaking.

##### **Facilitation of sufficient breathing can be used when the patient shows:**

- Impaired, affected rhythm, rate or localisation of respiration (e.g. use of the accessory breathing muscles)
- Impaired coordination between breathing and swallowing
- Impaired coordination between breathing and voice production
- Decreased rate of swallowing

##### **Techniques to work on respiration:**

Make working hypotheses about the reasons for altered respiration (e.g. pain, discomfort, secretions in the airway, lack of postural control) and try to address them with treatment

- Using positions that are helpful for the work on breathing
- Create a helpful alignment (see also boxes: "Methods and techniques" and "Choose positions helpful for the patient and the interventions")
- The therapist positions her hands on the patient's thorax, stomach or the flanks for inspiration and expiration
- Stabilisation of the ribs, the sternum and the trunk
- Elongation of the expiration phase, e.g. by vibration
- Facilitation of voice and articulation movements
- Specific exercises (e.g. puffing) for elongation and intensification of expiration

## Evaluation

### Signs that facilitation of sufficient respiration are appropriate/ helpful:

- One or more parameters of respiration change towards the normal
- The patient's swallowing rate increases
- Breathing and swallowing become coordinated normally
- The patient coughs sufficiently
- Breathing, voice and / or articulation become coordinated in a functional way

### Signs that facilitation of sufficient respiration is not appropriate / helpful:

- The chosen parameters do not change towards the normal
- The patient's swallowing rate does not increase or decreases
- There are signs of penetration/ aspiration
- The patient coughs insufficiently
- Breathing and swallowing are discoordinated
- Breathing, voice and/or articulation become discoordinated

In this case, the therapist should consider if she should modify her technique, e.g. in relation to the position, the tempo or the timing, or if the technique itself is contraindicated.

## Facilitation of voice and articulation movements

Voice is produced in the larynx. Articulation means to form the sound with the help of the palate, the pharynx, the lips, the jaw, the teeth and the tongue. Producing voice and articulation movements are used to speak. During speaking, the air in the expiration phase needs to be dosed, the vocal cords must swing and the structures in the oral cavity and the pharynx have to interact in a dynamic stability to form the sounds (=articulate). For patients with neurological diseases, this complex coordination often is disturbed.

## Objective

- To encourage the production of voice for verbal communication and protection of the airway
- To facilitate articulation movements for verbal communication and functional oral transport movements ("n-g")

## Techniques to facilitate production of voice and articulation movements

- Support a dynamic- stable position of the head and the jaw
- Support sufficient respiration

- Provide signals to the patient for a clear start and stop of the voice during expiration
- Bring the tongue and the lips in a helpful position for articulation movements (e.g. the tip of the tongue behind the upper front teeth for "n" or the lips together for "m" or forward to pronounce "o")

### Evaluation

#### Signs that facilitation of production of voice and articulation is appropriate/ helpful

- The patient is able to make sounds
- The patient is able to produce and eventually repeat articulation movements
- The patient becomes aware if his voice is wet and show protection reactions of the lower airway, e.g. clearing the throat, coughing followed by swallowing

#### Signs that facilitation of production of voice and articulation is not appropriate / helpful:

- The patient is not able to make sounds
- The patient is not able to produce articulation movements
- The tension / tonus increases, the patient is fixating himself
- The patient starts to refuse
- The patient get restless

In this case, the therapist should consider if she should modify her technique, e.g. in relation to the position, the tempo or the timing, or if the technique itself is contraindicated.

### Facilitation of coordination between movement/sequences of movement, breathing, voice and articulation

Facilitation of the coordination of these functions are an important aspect for participation: to be able to conduct an activity or go for a walk and at the same time be able to talk to others.

#### Objective:

- To enhance/ augment the patient's ability to coordinate moving and speaking

### Facilitation of coordination between movement / sequences of movements, breathing voice and articulation can be used when:

- There is a discoordination between breathing, voice and articulation
- The patient often stops from moving, when is he going to say something
- The patient holds his breath or stops talking when he is supposed to change his position or executing an activity

### Techniques for facilitation of coordination between movements / sequences of movement, breathing, voice and articulation:

- Stabilising relevant structures, e.g. the trunk, the head, the jaw
- Encourage postural control
- Facilitation of the "timing" of movement and voice / articulation movement

## Evaluation

### Signs that facilitation of coordination between movements / sequences of movement, breathing, voice and articulation are appropriate / helpful:

- The coordination between breathing, voice and articulation changes towards the normal

### Signs that facilitation of coordination between movements / sequences of movement, breathing, voice and articulation are not appropriate / helpful:

- The coordination between breathing, voice and articulation does not change towards the normal
- The patient's tension / tone increases

In this case, the therapist should consider if she should modify her technique, e.g. in relation to the position, the tempo or the timing, or if the technique itself is contraindicated.

## Box: "Levels for facial and tongue movements"

In sum: The quality of the movement is more important than the quantity!

### Facial movements:

Quality of facial movement can be evaluated by different parameters. Is the movement selective? How is the range of movement? Is there a clear start and stop of the movement? Can it be repeated (e.g. facial movements) up to five times in the same quality?

Selective facial movements require a dynamic stable position, not only of the body, but also of the head and the lower jaw. Hyperactivity in the less affected side of the face avoids selective movement and must be inhibited first. To facilitate facial movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive information). Often, those several options are combined. To work with facial movements can be relevant to facilitate oral movements for swallowing, eating/drinking or protection of the airways.

### Passive mobilisation of the face

At this level, the therapist performs/conducts the movement for the patient (e.g. frowning or pursing the lips) in a structured way.

### Objective

- To give structured input to the face as a basis for active movement
- To keep the mobility of the facial muscles and other structures of the face (e.g. connective tissue)
- To prevent hypersensitive reactions on touch on the face

### This level can be chosen when:

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active facial movements
- The patient needs the input from the passive movement to get into an active movement. The passage to the next level might be fluent.

**Partial active facial movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

**Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement

**This level can be used when:**

- The patient has the ability for active movement, but need the "idea" of how to (perform it) do it
- The patient has problems to initiate selective movements and instead moves other parts of the face, especially when just asked verbally to perform a movement

**Active facial movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased

**Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement

**This level can be used, when:**

- The quality of the facial movement is still decreased or gets worse during repetition or there are problems to clearly start and stop a movement

**Active facial movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity

**Objective**

- To transfer the ability to perform selective facial movements into a meaningful context/activity

**This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilizing them in everyday life activities
- The patient needs the context of an activity to be able to perform facial movements, since he might not be able to work in 'abstract' context with facial movements

*Example: A patient with a right-sided hemiparesis is not able to pucker the lips. He just opens his mouth wide and extends his neck. The therapist tries to facilitate the movement tactilely and by being a visual model for the patient, without success. The therapist guides the patient to cut an orange into pieces and helps him to suck some juice out of a piece of orange. The patient is able to form his lips around the orange symmetrically.*

### **Evaluation of the chosen level to work with facial movements regarding the parameters for quality of movements:**

Selectivity, range of movement, repetitions are possible three to five times with the same quality, there is a clear start and stop of the movement

A position with more base of support might improve the patient's ability to perform selective movements!

### **Tongue movements:**

Selective tongue movements require a dynamic- stable position of the body, the head and the lower jaw.

To facilitate tongue movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive (see above) information). Often, those options are combined. To work on tongue movements can be relevant to elicit or facilitate oral movements for swallowing, eating/drinking, cleaning the mouth for remains of food and saliva, or protection of the airways.

### **Passive mobilisation of the tongue**

At this level, the therapist performs/conducts the movement for the patient (e.g. moving the tongue within the oral cavity forward or to the side; or bring it outside of the mouth towards the side or towards the upper lip in a structured way).

### **Objective**

- To give structured input to the tongue as a basis for active movement/swallowing
- To keep mobility of the tongue
- To prevent or treat hypo-or hypersensitivity

### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active tongue movements
- The patient needs the input from the passive movement to get into an active movement

The passage to the next level might be fluent.

### **Partial active tongue movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement
- To prevent or treat hypo-or hypersensitivity

### **This level can be used when:**

- The patient has the ability for active movement, but needs the "idea" of how to do it

- The patient has problems to initiate selective movements and instead moves other structures, e.g. the neck or the jaw, especially when just asked verbally to perform a tongue movement
- The patient is hypo- or hypersensitive in the face/mouth

The passage to the next level might be fluent.

### **Active tongue movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased.

#### **Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement
- To prevent or treat hypo- or hypersensitivity

#### **This level can be used, when:**

- The quality of the tongue movement is still decreased or gets worse during repetition
- There are problems to clearly start and stop a movement
- The patient shows hypo- or hypersensitivity in the face/ mouth

The passage to the next level might be fluent.

### **Active tongue movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity.

#### **Objective**

- To transfer the ability to perform selective tongue movements into a meaningful context/activity
- To treat or prevent hypo- or hypersensitivity

#### **This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilising them in everyday life activities
- The patient needs the context of an activity to be able to perform tongue movements, since he might not be able to perform tongue movements in 'abstract' contexts, e.g. on verbal request

### **Evaluation of the chosen level to work with tongue movements, regarding the parameters for quality of movements:**

- Selectivity
- Range of movement
- Repetitions are possible with the same quality
- There is a clear start and stop of the movement.

A position with more base of support might improve the patient's ability to perform selective movements!

## **Box: "Methods/ Techniques"**

### **Positioning**

Means, that all body segments (pelvis, thorax, shoulder girdle, head and extremities), are being brought in an appropriate position to each other, to the base of support, the gravity and the activity. Each position chosen must be safe (without risk for falling or aspirate saliva). A position should never be uncomfortable or painful. Before positioning, the patient should be mobilised and postural control should be facilitated, to create optimal alignment. For patients with rather severe problems of perception, guiding (Affolter Model®) might be useful, to achieve the new position (e.g. from sitting to side lying).

### **Objective**

- To create a dynamic- stable position in an appropriate alignment to encourage postural control and selective movements of the extremities and in the facial oral tract.

### **Positioning can be used when the patient shows:**

- Mal-alignment because of altered tonus / lack of postural control
- Problems with perception
- Lack of endurance
- Low arousal
- Lack of selective movements in the trunk, the extremities and /or the facial oral tract
- Insufficient respiration

### **Evaluation**

#### **Signs that a position is appropriate / helpful:**

- Positive change of the patient's motor behaviour (patient become active, moves more easy, selective)
- The patient's tone and alignment are optimal
- The patient is more awake and alert, more calm and concentrated
- The patient's respiration is more normal

#### **Signs that a position is not appropriate / helpful:**

- The patient's tone increases in an unhelpful way in one or more muscles
- The patient shows associated reactions when he is trying to move
- The patient remains passive, arousal decreases
- Vegetative reactions: Sweating, increasing or decreasing blood pressure, saturation decreases, respiratory frequency increases or decreases
- The patient loses concentration, becomes restless and / or the facial expression gets tensed
- The patient has problems to perform selective movements, which otherwise are possible in a lower position
- The patient shows signs of penetration / aspiration
- The patient's respiration becomes insufficient

*Example: In half sitting position, the patient is neither able to swallow his saliva spontaneously, nor can he be facilitated to it. However, in side lying position, the therapist at least can facilitate swallowing.*

When one or more signs appear, the therapist has to consider, if the position itself is inappropriate, or if he has been too long in the same position. Is there a need to find a new position for the patient, or would small changes in the actual position be adequate?

### **Mobilisation**

Means to move the whole body (e.g. for coming from one position into another), or parts of the body or extremities or specific structures, as muscles, joints or connective tissue.

### **Objective**

- To achieve more postural control, facilitate selective movements, higher range of movement (ROM),
- Normalize tone, optimize alignment
- Increase arousal

### **Mobilisation can be used when the patient has:**

- Senso-motory problems (lack of postural control or problems with selective movements of extremities or in the facial oral tract)
- Increased mobility, that influences selective movement
- Cognitive and / or perceptive problems, e.g. decreased arousal, neglect, lack of attention

### **Evaluation**

#### **Signs that mobilisation has the required impact/ is appropriate / helpful**

- Movement gets possible, easier, more selective
- Range of Movement (ROM) increases
- More optimal alignment
- The patient does feel the mobilised parts of the body better and / or uses them
- The patient is more awake / attentive, alert or concentrated

#### **Signs that the mobilisation does not have the intended impact:**

- The patient has pain or feels uncomfortable
- ROM become smaller or there is no change at all
- Alignment or tone does not change or become unhelpful, no chance for movement
- No change in sensibility or proprioception
- The patient stays or become restless, loses concentration
- No change in arousal

### **Guiding**

The term "guiding" refers to the Affolter Model® ([www.apwschweiz.ch](http://www.apwschweiz.ch)). Here, the therapist physically guides the patient's body and hands in problem solving everyday life activities. The goal is to provide tactual information to the patient, about the position of his body in the environment and the activity. There are two methods for guiding, nursing and elementary guiding, described in Affolter 1991 and 2000.

**Objective**

- To provide relevant tactual information in a structured way to the patient about his body in the environment and the ongoing activity.
- To encourage problem solving processes and formation of hypotheses in everyday life activities

**Guiding can be used, when:**

- The patient has perceptive / cognitive problems
- The searching, acquiring, and treating of information from the environment is disturbed. This leads to decreased ability to problem solving in everyday life activities.

**Evaluation****Signs that guiding is appropriate / helpful:**

- The patient pays attention to the ongoing activity
- The patient seems to understand the activity (comprehension)
- The patient adopt his tone in the activity or pursues movements by himself
- The patient executes the next step in the activity
- The patient's behaviour changes towards normal behaviour, required for the context

**Signs that guiding is not appropriate / helpful**

- The patient becomes (more) restless
- His tension / tone increases
- No changes in the patient's behaviour

Here, the therapist should consider, if the level or the way of guiding should be modified or if guiding is an adequate intervention in that context.

**Facilitation**

Facilitation is a technique, where- most of the time via manual contact- the sensory and proprioceptive systems is activated. Facilitation is an active learning process, helping a person to overcome inertia, continue or terminate functional tasks (Vaughan Graham 2009, 2016, Gjelsvik 2016). Facilitation is never passive. The therapist uses facilitation, when she wants to work on the patient's postural control or selective, functional movements in the facial oral tract. The place, direction and duration of facilitation might vary.

**Objective**

- To allow / facilitate movement and change motor behaviour

**Facilitation can be used, when the patient has:**

- Inadequate motor behaviour
- Decreased / lack of postural control
- Problems to perform selective movement

**The various intensity of facilitation**

**Continuous facilitation**

The therapist chooses to facilitate continuously, when the patient:

- Loses postural control when the therapist stops to facilitate ("hand off")
- Does not have the idea to or the possibility to initiate, accomplish or complete a movement / function / activity
- When the therapist stops to facilitate, selective movements are not possible AND / OR mass movements or associated reactions appear
- In general, the quality of movement decreases without facilitation

**Facilitation in between, over short sequences**

The therapist chooses to facilitate in between, if:

- The patient can keep up postural control over a short while
- The patient takes over, initiates or completes a movement / function or activity in an adequate quality / quantity spontaneously

**Facilitation to initiate movement or patterns of movement**

The therapist facilitates to initiate movement / function / activity, if:

- The patient has sufficient postural control and is able to keep it to take over, continue and to finish/ complete? a movement, function/ activity / task
- The patient is able to perform spontaneous, selective movement in the facial oral tract

**Evaluation****Signs that facilitation is appropriate / helpful:**

- Motor behaviour changes
- The patient become (more) active
- Movement become easier, more selective

**Signs that facilitation is not appropriate / helpful:**

- The patient's tone increases in an unhelpful way
- Associated reactions occur when the patient tries to move
- Motor behaviour does not change
- The patient remains passive

**Box: "Guidance/ instruction / supervision of the patient and / or the relatives"**

Guidance can be offered to certain problems in activities. For example, if the patient has trouble dealing with doughy secretions in his pharynx, he or relevant staff or relatives might be instructed to helpful interventions, such as clearing the throat by gargling and spitting out. It might also be, that relevant staff or relatives are supervised, if they perform the learned interventions in a correct manner.

Guidance / instruction / supervision of the patient / nursing staff / helpers / and / or relatives includes both, verbal and written explanations, supplied by practical exercises of the interventions chosen. When relevant, the use of pictures or photographs might be beneficial, too. It is the therapist's responsibility to perpetual make sure, that the interventions are performed in a correct manner and to adopt the interventions towards the patient's current need. The patient / relatives / helpers or nursing staff should have the possibility to contact the therapist in case of questions or if there are problems, when running the interventions.

### **Objective**

- To involve the patient / relatives / nursing staff / helpers as far as adequate and possible, to prevent complications, e.g.. malnutrition, pneumonia, hypersensitivity in the facial oral tract
- To enable optimal activity and participation in a quality as good as possible (e.g. to be able to eat together with others and enjoy it)
- To promote learning / establishing of functional movement / patterns of movement (e.g. to clean the mouth for remains/ residues during eating)
- To ensure helpful and structured input to the facial-oral tract (e.g. by using tactile oral stimulation or facilitation of active tongue movement)
- To inaugurate relevant interventions into the patient's everyday life, aiming towards optimal function, and activity (e.g. make sure that the patient has had a rest before eating and drinking)

### **Guidance / instruction / supervision can be used, when the patient:**

- Has the prerequisites (perceptive, cognitive and senso-motory) to be responsible for own training / treatment
- Is not able to independently perform training / treatment by himself, but the relatives / nursing staff / helpers are resources that could be involved

### **Evaluation**

#### **Signs that guidance / instruction / supervision of the patient and / or relatives / helpers / nursing staff is appropriate:**

- The patient's level of function increases
- No or less complications occur
- Unwanted / unhelpful symptoms (e.g.. hyperactivity) are reduced or disappear

#### **Signs that guidance / instruction / supervision of the patient and / or the relatives / nursing staff / helpers does not have the required effect or should be modified:**

- Complications or unwanted symptoms do appear, e.g.. pain or hyperactivity
- The self training is not at all carried out or only infrequently, because the patient or the relatives / nursing staff / helpers are wary about how to do it or they do not have the resources to do it

### **Box: "Tactile oral stimulation"**

#### **Tactile oral stimulation with water**

Tactile oral stimulation is a technique to assess and treat problems with tone, sensibility and / or swallowing of saliva. With his technique, the therapist might influence problems with breathing due to retentions of saliva or secretions in the mouth or the pharynx.

**Objective**

- To give structured input to the face and mouth
- To facilitate swallowing
- To assess/regulate tonus, sensibility in the facial oral tract
- To facilitate functional oral movements, e.g. for bolus transport in the oral and pharyngeal phase
- To stimulate the production of saliva
- To increase circulation/blood flow in the gums
- To minimize the risk of penetration / aspiration

**Oral tactile stimulation can be used when the patient:**

- Shows hypersensitive reactions when touching the face and the mouth
- Reacts hyposensitive to touch in the facial oral tract
- Has problems with hypertonus / hypotonus /active movements in the face, the tongue and/or the jaw muscles
- Has impaired quality of swallowing saliva or low swallowing frequency, which might affect breathing
- Is at risk for penetration/aspiration

**Tactile oral stimulation with cold water**

The water used for the stimulation can be added an ice cube or it is taken from the fridge. This might be helpful for patients with hyposensitivity. The advantage is the additional thermic input to the tactile input. Contraindications for the use of cold water are hypersensitivity, biting reactions, exposed dental necks or damage to the dental enamel.

**Evaluation****Signs that tactile oral stimulation with (cold) water is appropriate / helpful:**

- The patient's tonus, activity and sensibility in the relevant structures can be regulated to more normal
- The swallowing frequency increases
- The produktion of saliva increases
- The patient swallows more effectively, which means less penetration and / or aspiration

**Signs that tactile oral stimulation with (cold) water is not appropriately / helpful:**

- The patient verbalises or shows that he is uncomfortable or seems not to understand the situation
- His tone or activity increase in an unhelpful way
- The patient does not swallow
- The patient shows penetration / aspiration
- The patient shows biting reactions and signs of hypersensibility

In this case, the therapist should consider if she should modify her technique, e.g. in relation to tempo, pressure, the temperature of the water, or if the technique itself is contraindicated.

**Tactile oral stimulation with (cold) liquid with taste**

The beverage with taste is added an ice cube or it is taken from the fridge. It can be used to patients with hyposensitivity. The advantage is the additional thermic input to the tactile and the gustatory / olfactory

input. The use of cold beverage is contraindicated in patients at high risk for penetration / aspiration, hypersensitive reactions, increased production of saliva, biting reactions, exposed dental necks or damage to the dental enamel. Beverage that contains sugar or fruit acid can be unhelpful for patients with lesions of the intraoral mucosa or infections in the oral cavity. Remember to clean the patient's mouth after using beverages to avoid tooth decay, micro aspiration and fungal infection.

### **Objective**

- To provide structured input to the face and mouth
- To facilitate swallowing
- To assess and regulate/normalise tonus, sensibility in the facial oral tract
- To facilitate functional oral movements
- To increase the production of saliva
- To increase the circulation/blood flow in the gums
- To prepare the patient to eating and drinking

### **Tactile oral stimulation with beverage with taste can be used when:**

- The patient is hyposensitive in the face and mouth
- The patient has problems with hypertonus /hypotonus /active movements in the face, tongue and lower jaw
- Has impaired quality of swallowing saliva or low swallowing frequency
- The patient is not at high risk for penetration/aspiration

### **Tactile oral stimulation with cold beverage with taste**

#### **Evaluation**

#### **Signs that tactile oral stimulation with (cold) beverage with taste is appropriate:**

- The patient's tonus, activity and sensibility in the relevant structures can be regulated to more normal
- The swallowing frequency increases
- The produktion of saliva increases
- The patient swallows more effectively, which means less penetration and / or aspiration

#### **Signs that tactile oral stimulation with (cold) beverage with taste is not appropriate / helpful:**

- The patient verbalises or shows that he is uncomfortable or seems not to understand the situation
- His tone or activity increase in an unhelpful way
- The patient does not swallow
- The patient shows penetration/aspiration

In this case, the therapist should consider if she should modify her technique, e.g. in relation to tempo, pressure, the temperature of the beverage, or if the technique itself is contraindicated.

## **Box "Facilitation to swallowing"**

Facilitation to swallowing is an important method and technique that might prevent penetration and / or aspiration. Here, the therapist stabilises structures, relevant for swallowing (e.g. head and jaw) or moves structures relevant for swallowing (e.g. the tongue) with specific handling. These handling is taught at the F.O.T.T. basic courses. Facilitation to swallowing might be individual different, depending on the patient and his problems.

The technique should be used, as soon as the patient tries to initiate swallowing (often seen in pumping jaw movements), or if the patient should swallow, but does not initiate it.

### **Objective**

- To increase the rate and quality of swallowing
- The patient learns to swallow spontaneous and sufficient again
- To prevent penetration/aspiration

### **Techniques to facilitate swallowing**

- The therapist stabilizes the patient's head and the lower jaw in an optimal alignment
- The therapist facilitates the first third of the tongue upwards, towards the hard palate, from the outside of the floor of the mouth
- The therapist facilitates the second third of the tongue upwards towards the soft palate, from the outside of the floor of the mouth
- The therapist gives an input from the floor of the mouth towards the region of the vallecular space, so the patient is able to feel remains of saliva
- The therapist mobilizes the patient's tongue within or outside of the mouth, to prepare the pharyngeal stage of the swallowing sequence
- The therapist facilitates active tongue movements within or outside the mouth, as a preparation for the pharyngeal stage of swallowing
- The patient gets input to feel saliva, that might sit in the pharynx, e.g.. by working in the expiration phase of the respiration cycle. If possible, the patient's voice might get used for that input, too.
- The therapist mobilises the patient or parts of his body, e.g. the upper trunk or the head, to "disturb" remains of saliva that might sit in the mouth or pharynx, to elicit a swallowing response.

### **Facilitation to swallowing can be used when the patient:**

- Does not swallow spontaneously (e.g. he initiates swallowing with pumping jaw movements or does not swallow at all)
- Does not swallow sufficiently, e.g. the patient's tongue pushes forward when swallowing, and saliva is not transported towards the pharynx, but rather out of the mouth. Other signs of insufficient swallowing: a wet voice, coughing after swallowing or saliva running out of the mouth after swallowing

### **Evaluation:**

#### **Signs that facilitation of swallowing is appropriate / helpful:**

- The patient swallows
- The patient does show less or no pumping jaw movements before swallowing
- The patient's voice is not wet / he does not cough after swallowing

- Saliva is getting transported more sufficient/ there are less remains of saliva in the cheek (s) or on the tongue

#### **Signs that facilitation of swallowing does not have the required effect / is not appropriate:**

- The patient does not swallow
- The patient shows (many) jaw pumping movements, that might not be followed by a swallow
- There are signs of penetration / aspiration (wet voice / coughing)
- The patient has many remains of saliva in the mouth or saliva runs out of the mouth
- The patient removes the therapist's hands from the floor of the mouth / jaw or turns his head away

In this case, the therapist should consider, if she should modify the technique of facilitation, or if the patient does need a different support to swallow. See "**Techniques to facilitate swallowing**" on page 35.

#### **Box: "Interventions for protection of the airways"**

Protection of the airway is an important method and technique to encourage and facilitate sufficient reactions, when there are clinical signs of penetration and / or aspiration of saliva / food / liquid.

Patients, who do not perceive that they need to clear / protect the airway, do not benefit from verbal requests to cough or clear their throat. With the here described techniques, the therapist always should facilitate patients, when they: initiate cough, have rattling breathing sounds (clinical sign of aspiration), have wet voice or try to clear their throat (clinical sign of penetration). Often, several techniques might be used in a combination.

#### **Objective**

- Sufficient protection of the airway
- Prevention of complications, as aspiration pneumonia
- Learning of functional, effective movements / patterns of movement to react on penetration/ aspiration

#### **Techniques to encourage protection of the airway:**

- **Facilitation to sufficient clearing of the throat/cough:**  
Facilitation of the abdominal and intercostal muscles for a sufficient cough. This includes support of the thorax / trunk to come forward and support to swallow after coughing or clearing the throat. If there are rubbery, doughy secretions in the oral cavity, the patient should be supported to spit them out instead of swallow them, or they are removed from the oral cavity, e.g.. with gauze. If necessary, the patient should be facilitated either to spit out or to swallow (see also box: "Facilitation to swallow").
- **Facilitation to clear throat, spit out, blow one's nose**  
If there are remains of saliva / food /liquid in the pharynx, around the pharyngeal wall, the most effective way to get rid of it, would be to clear the pharynx and spit out. Secretions in the nose should be removed, either by the therapist with cotton buds, or the patient is facilitated to blow his nose.
- **Cleaning the mouth with gauze / oral hygiene:** Secretions / remains of saliva / food / liquid that has been collected in the cheeks, on the tongue or on the soft palate, should be removed with gauze. For

doing so, the therapist wraps gauze around her finger and removes the material in a structured way from the oral cavity.

- **Cleaning of the mouth in patients with more abilities to be active:** The patient's finger can be guided towards his mouth, so he can feel the rests by himself. Then, he might be facilitated to remove them, swallowing or spitting out. Another way could be, to support the patient to find remains with the tongue, swallowing them or spit them out.

#### **Interventions to protect the airway can be used when the patient:**

- Shows signs of penetration / aspiration without spontaneous reactions for protection of the airway
- Has insufficient (e.g.. weak cough, lack of clearing swallow, remains of material in the oral cavity or unhelpful reactions on penetration / aspiration (e.g. wants to drink something, despite the airway still is not free, and the patient still is coughing)

#### **Signs that facilitation of protection of the airway is appropriate / helpful**

- The patient's voice does sound clear
- The upper and lower airway is free for secretions
- The patient coughs rather loud and powerful and can be facilitated to swallow or spit out afterwards (or does it spontaneously)
- There are no remains of food, secretions, liquid in the oral cavity

#### **Signs that facilitation of protection of the airway does not have the required effect / is not appropriate:**

- The patient's voice sounds wet
- Secretions in the upper and lower airway are to be heard during respiration
- There is no spontaneous clearing swallow / spitting out after coughing / the patient cannot be facilitated to do so
- There are remains of secretions / food / liquid in the oral cavity
- Coughing sounds rather weak / the patient continues to cough or clear the throat

Here, the therapist should consider, if she had used the technique properly or if she should modify it, or if she should choose another technique.

## **5.4 Evaluation: Does the patient react / respond appropriate / as expected on the chosen interventions – related towards the goal?**

Here, the therapist collects her observations made since the beginning of the treatment:

- Does the treatment still seem appropriate?
- Does the goal for today's treatment still seems realistic to achieve? Or is the goal achieved already?
- Should the therapist adhere to her original plan / the interventions started up or does the patient's response require to apply different therapeutical interventions?

Here, the therapist should answer **YES** or **NO**.

## 5.5. Continuing the treatment in view /based on the evaluation

**If the answer is YES**, the therapist either should work towards the goal or, if it already is achieved, work with **repetition** and / or **shaping**.

Shaping means to work on the patient's individual "limit", neither on a too high nor on a too low level. This is done by increasing requirements or offer the patient less support, (e.g. less facilitation (Gjelsvik 2016), or a position with less base of support. Shaping is an important method to encourage motor learning (Vögele 2015).

Repetition might contain different aspects: To let the patient repeat the same movement / sequence movement / activity under the same conditions gives the therapist information if the patient can keep up the quality of the movement and encourages learning. Repetition also might be used under different conditions (e.g. changed context, speed, position, range of movement, etc. (Vögele 2015). Motor learning is assumed to be most effective, when repetition is done in varied context.

*Example: The goal of the treatment of the day was that the patient in sitting position is able to make the sound "o" at the beginning of the exhalation phase, supported by the therapist to shape his lips. When the goal was reached, the therapist reduces her facilitation: she does not facilitate the patient's lips forward anymore, and the patient does it by himself. After doing so, for the next "o", the therapist removes the jaw support. Again, the patient reaches the goal. Finally, the therapist does not use her hands on the patient's thorax anymore to signalise the beginning of the phonation. She just ask him to say "O", observing carefully, if the timing for the expiration and phonation is coordinated in the same helpful manner as before.*

**If the answer is NO**, the therapist should consider, how to increase support for the patient, e.g. by offering him a position with more base of support, more facilitation, or set the goal lower for the patient. If it seems unrealistic to achieve the goal at all, the therapist should set a goal that is realistic and achievable in relation to the patient's current condition and difficulties.

*Example: The patient, a 15 –year old boy with sequelae after an acquired brain injury, was used to play football several times per week. The goal of the treatment of the day was, that he, in sitting position, was able to blow into a whistle, with support for the timing of the blowing. The goal could not be reached, because the patient, instead of blowing, bite into the whistle. The therapist positions the patient in a half sitting position, stabilises his head and jaw and supports the timing for the blowing in the expiration phase.*

## 5.6. Re-Evaluation: Does the patient react / respond appropriately / as expected on the chosen interventions? Is the goal for today's treatment reached? Is the long- term goal still realistic? Finish today's treatment. Clinical reasoning about the next treatment.

Towards the end of today's treatment, the therapist does "re"-evaluate, how the modification of the chosen interventions or the onset of new interventions succeeded. For evaluation, the therapist analyses the patient's response. The following reflections might become relevant:

- 
- Were the therapeutic interventions appropriate related to the patient's problems and the underlying causes?
  - Were the interventions carried out on the right level / in the right intensity?
  - What kind of interventions are most helpful for the patient, to bring out the best / most optimal selective / functional movement?
  - If the goal for today's treatment was not achieved – is it still realistic / relevant for the next treatment?
  - Is the long-term goal still relevant / realistic?
  - Which considerations and experiences from today's treatment are relevant for the next treatment, when the process of assessment, analysis, treatment and evaluation starts again?

## 6. Chart and Manual "Oral hygiene"

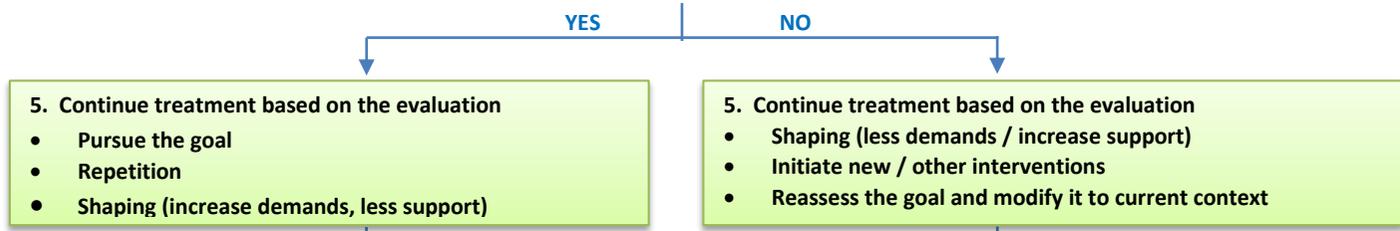
- 2a. Set a relevant, evaluable long-term goal, if possible together with the patient / the relatives
- 2b. Set a goal for the F.O.T.T. treatment of the day, if possible and relevant together with the patient / the relative(s)

1. Assessment and Analysis, Chart 1

**3. Choose therapeutic interventions for postural control and selective movements / activity, related to the goal and start the treatment**

<b>Adapt environmental factors</b> - Place/room/ furniture - Objects - Helping aids	<b>Preparing for oral hygiene</b> - Involving the patient in the pre-oral phase - Cleaning the mouth with gauze - Tactile Oral stimulation with (cold) water	<b>Therapeutic oral hygiene</b> - In need of much support - In need of moderate support - In need of light support	<b>Choose positions appropriate for the patient and intervention</b> - Lying - Half sitting - Sitting - Standing	<b>Levels for facial and tongue movements</b> - Passive - Partially active - Active (selective movement) - Active movement sequence in activity
<b>Methods / Techniques</b> Positioning Mobilization Guiding Facilitation: - Continuous - Initiated - Over short sequences	<b>Facilitation to swallow by:</b> - Facilitation at the floor of the mouth - Stabilization of the lower jaw - Passive or active tongue movements - Facilitation of breathing /voice - Mobilization of the body or body segments		<b>Actions to facilitate protection of the airways</b> - Facilitation of sufficient clearing of the throat / cough - Facilitation of cleansing of the throat, spitting out, rinsing / blowing the nose - Oral cleansing with gauze / oral hygiene	
				<b>Guidance / Instruction / supervision of the patient and / or the relative(s)/ nursing staff / carers</b>

4. Evaluation: Does the patient react / respond appropriately / as expected to the chosen interventions – related to the goal?



**6. Re-Evaluation**

- Does the patient react / respond appropriately / as expected to the chosen interventions?
- Has the goal for the treatment been reached? Is the goal still realistic?
- Conclude the treatment for the day
- Reasoning / planning of the next treatment

1. Assessment and Analysis, Chart 1

## 6.1. Assessment / Analysis, see chart 1.

## 6.2. Goal setting

### 6.2.1 Setting a relevant, evaluable long-term goal, if possible together with the patient/the relatives, based on "Assessment and Analysis" Chart 1

A long-term goal should be relevant for the patient's context, related to activity and participation. The goal should be evaluable, too.

*Examples:*

- *In a patient with massive biting reactions: The staff in the nursing home is able to do sufficient oral hygiene (on all surfaces /structures in the oral cavity), to keep the patient's mouth clean and healthy.*
- *The patient is able to feel remains of food or drink in the mouth during eating and is able to remove them with his tongue.*

### 6.2.2 Setting goal for the F.O.T.T. treatment of the day, if possible together with the patient /evt the relative(s), based on Assessment and Analysis, Chart 1

For the treatment of the day, there is set a short-term goal, if possible and relevant together with the patient and / or the relative(s). The goal should be evaluable, relevant for the patient, realistic and related to his level of function, activity or participation.

*Examples:*

- *The therapist is able to clean all surfaces of the teeth, when the patient is positioned in sidelying, and opening of the mouth is facilitated.*
- *After preparation, the patient is able to, in half sitting position, remove remains of saliva in the cheeks with lateral tongue movements during oral hygiene.*
- *The patient is positioned in front of the sink in the bathroom and sits on a stool. After preparation, the patient is able to brush his teeth with tooth paste and rinse his mouth without aspirating.*

## 6.3. Choosing therapeutic interventions for the treatment for postural control and selective movements / activity, related to the goal and starting treatment

At this point, the therapist chooses an environment and the therapeutic interventions she thinks are relevant to achieve the goal and plans the treatment. She also considers, how to modify and grade the interventions.

Remark, that there is mandatory content in each chart. The boxes: "Adopt environmental factors", "Choice of position", "Methods and techniques", Guidance / Instruction / supervision of the patient and / or

relatives, nursing staff / helpers", "Levels for facial movements" are relevant content in each area of F.O.T.T.®. Furthermore, the boxes "Facilitation of Swallowing" and "Protection of the airway" are essential in F.O.T.T.®. Therefore, they appear on each chart. In "real life" this means, as soon as the patient needs facilitation of swallowing or help to protect the airway, the therapist takes this into account and prioritizes this.

First, the therapist chooses the goal, and then considers the environment and the position she will start to treat the patient. Then, the therapist thinks about the interventions, consistencies to use and how to grade the interventions to be able to work at the patient's individual limit and to achieve the goal.

In F.O.T.T.®, there is a method used, called "elicitation". This means: to bring out, to waken, to cause, to release". By choosing an appropriate environment, position, interventions, use of own language, etc. a helpful, appropriate response or motor behavior by the patient might be elicited.

*Example: During oral hygiene, the patient is not able to spontaneously spit out the water he rinsed his mouth with. He keeps the water in his mouth and nothing happens. The therapist elicits the sequence of movement by doing oral hygiene in the bathroom in front of the sink, in sitting position. When the patient has rinsed his mouth, she facilitates his upper trunk and head forward towards the sink and at the same time makes a noise that reminds of spitting out. The patient gets the idea and*

The therapeutic interventions from the boxes in the chart "Oral hygiene" are described here:

### **Box: "Adapt environmental factors"**

The environment, where the treatment takes place, is important to bring the patient in a situation, where he can act and interact in a helpful and functional way. Factors as noises, other persons, colours, smell, temperature, furniture and the function of the room (e.g. a therapy kitchen) can contribute to the patient's ability to learn, concentrate, interact and encourage appropriate response. (Vaughan Graham 2009).

The environment for the treatment should be suitable for the patient and the goal, as far as possible, e.g.. In the patient's room, a dining room, where activities as eating and drinking are obvious.

#### **Objective**

- To encourage motor learning by suitable context: The patient uses his more affected side of the body and moves as normal as possible
- The patient expands his repertoire of functional movements and patterns of movements
- To avoid unhelpful and unfunctional habits and compensatory strategies

#### **Choice of place / room**

- **A known versus unknown room:** Consider, if the patient needs familiar surroundings, because he has problems in new, unknown situations, or if an unknown room might help to expand the patient's repertoire and encourage learning instead of clutching in habits or unhelpful strategies avoiding learning
- **Room related to the activity versus a room not related to the activity:** Does the patient need clear context given by the function of a room in order to understand the activity / situation? Does the planned activity or intervention require e.g. a kitchen or a bathroom? Does the patient's condition allow that he leaves his own room and gets transported into another room

- **A niche versus out in the room:** A niche is defined as a position, where the patient has a stable base of support and to stable sides. A niche might convey safety for patients with perceptive / cognitive or massive senso-motorical problems, e.g. disturbed body schema, lack of balance or lack of attention towards the more affected side of the body. Treating the patient out in the room might be useful for patients with sufficient postural control and perceptive and cognitive abilities. Sometimes, it might be necessary to be able to move freely around the patient.
- **One –to -one situation versus group situation:** One –to one situations during eating and drinking might be helpful, when the patient is easy to distract or has problems with concentrating. It might give the patient a feeling of safety, if he needs intensive support or facilitation. Last but not least, the therapeutic interventions, e.g. cleaning the patient's mouth, require privacy. However, group situations create a social context, where the patient must coordinate facial expression, verbal communication and eating / drinking. This is an option, when the patient is able to manage several visual and auditive input and can change focus from eating and drinking to communication with others and vice versa.

### **Adapt furniture**

Furniture is an important factor to support and promote the patients position and postural control. Furniture should give the patient a base for selective movement, as normal as possible, during treatment / the activity. Furniture should give enough support for the patient to move against gravity, but not too much support, because this might make him passive. A dynamic – stable position might help the patient to get some new experiences when moving and tactile information about his own body in the environment and the activity.

### **Adapt objects**

The objects chosen should as far as possible support active movement and patterns of movement, as normal as possible.

*Example: A toothbrush is far more reasonable and effective for oral hygiene than gauze swaps or cotton buds.*

### **Helping aids**

Helping aids are used to compensate for a lack of function. A helping aid might allow the patient to perform an activity independently. This can have great importance for the patient's level of participation.

Helping aids can be used, when:

- A movement is not possible for the patient.

*For example:*

- *A patient has impaired opening of the mouth, which makes it difficult to clean his tongue with a normal toothbrush. As an alternative, a children tooth brush or a wooden spatula, wrapped with gauze, could be used to remove coatings from the tongue.*
- *An electric toothbrush might compensate for a lack of selective movement in the more affected hemiparetic upper extremity, and enable the patient to brush his teeth in a sufficient quality.*

- *They enable the patient to move in a normal pattern of movement, using his more affected side instead of compensation with the less affected side of the body in unhelpful strategies.*

### Evaluation

#### Signs that the environmental factors are appropriate:

- The patient reacts as expected / as intended
- The patient is active
- The patient understands the situation / activity
- The goal can be achieved

#### Signs that the environmental factors are not appropriate / helpful:

- The patient reacts not as expected / intended and uses unhelpful compensatory strategies, restlessness, associated reactions, increased tone, lack of concentration
- The goal can not be achieved

In this case, the therapist should try to change one or more environmental factors and evaluate the patient's response again.

### Box: "Choose of position(s), appropriate for the patient and the interventions"

In general, if a patient obviously is uncomfortable in a given position (seen by restlessness, increased tone, vegetative reactions...) the position needs to be changed. Some patients have restriction regarding positioning, e.g. because of fractures, craniectomy or skin lesions. The therapist has to adhere to these. The here described aspects for positioning are only recommendations.

A position has to be dynamic and stable at the same time, never fixed. Before positioning a patient, the therapist should work with postural control. Changes of position might only be necessary within one position, (e.g. in lying, the patient's trunk is adjusted), or it might be necessary to change the whole position, e.g. from lying to sitting.

No matter in which position the patient is, it is always important to optimize the alignment in a way that support swallowing.

- **Supine** position can increase the risk of aspiration, especially when the patient's neck is extended. Here, saliva runs with the gravity towards the pharynx and from there into the airway, before the patient is able to swallow it. It is not helpful for oral hygiene. However, if the risk of aspiration is low, and the patient is positioned in good alignment (Vaughan Graham 2009, supine position might be used for work with breathing, postural control and relevant structures as the neck, the hyoid bone or the larynx
- **Half sitting** position, e.g. in bed can be suitable, when there is good alignment. Half sitting is likely to involve the patient's arms and hands, which is important in the pre-oral stage of therapeutic eating.

- **Side lying** offers patients with high tone or low postural control in general, much base of support. Saliva that might not be swallowed, will be collected in the patient's cheek and can be removed by the therapist, e.g. with gauze (see box: Interventions to protect the airway).
- **Sitting** position (e.g. on a plinth or on a chair, with individual support) requires a certain amount of postural control and a stabile vegetative state. Sitting might be useful, when oral hygiene is supposed to be in a rum, that is related to the activity (bath room). The contact and the support from a table/sink in front of the patient might influence the alignment of the trunk and neck positive and create trunk activity.
- **Standing** position with or without helping aids (e.g. a standing frame) might elicit helpful alignment in the trunk and pelvis, ease respiration and increase arousal. See also the box: "Methods / techniques".

See also the section about positioning in the box: "Methods and Techniques"

### **Box: "Preparation to oral hygiene"**

Preparation to oral hygiene is an important part for patients dealing with impaired comprehension in everyday life situations, patients at high risk for aspiration or patients who react hypersensitive on being touched on the hands or in the face and mouth. Several interventions from this box might be useful to combine.

#### **Objective**

- To provide prerequisites for comprehension for the activity: oral hygiene and for tolerance of oral hygiene
- To encourage anticipation, to "set the scene" for the context of oral hygiene
- To facilitate relevant oral and pharyngeal movements for oral hygiene by giving the patient input in the pre-oral phase of oral hygiene
- To prevent aspiration of saliva/secretions/remains of food or drink in the oral cavity
- To facilitate swallowing of saliva
- To increase arousal/ attention for the activity

#### **Inclusion in the pre-oral phase**

In the activity oral hygiene, there is a kind of pre-oral phase, including everything that must happen, before the toothbrush comes into the patient's mouth. Hereunder counts: the position, hand- hand- -eye and hand- mouth coordination.

To involve the patient, guiding (Affolter- Model®) might be useful, e.g. to open the tube with toothpaste, fill water into the beaker for brushing the teeth). The goal with involving the patient, is to provide relevant tactile, visual and auditive information for the activity oral hygiene. Involvement of the patient might also mean to give him the toothbrush into his hand or let him hold the beaker with water.

#### **Inclusion / involvement in the pre-oral phase can be used when the patient has:**

- Sensomotorical, perceptive or cognitive problems that affect the pre-oral phase, e.g.:
  - Impaired comprehension of everyday life situations
  - Dyspraxic or apraxic components in the preparation of oral hygiene
  - Hypersensitive reactions on touch of the hands, the face and the mouth

- Impaired arousal / attention
- Motorical restlessness /agitation
- Problems in the oral and / or pharyngeal phase

### Evaluation

#### Signs that inclusion in the pre-oral phase is appropriate / helpful

- The patient becomes more awake /aware for the activity
- The patient shows signs of comprehension for the activity by adapting tone, change of viewing direction, change of motorical behaviour towards the normal
- The patient takes over sequences of the activity and interacts relevant with objects

#### Signs that inclusion in the pre-oral phase is not appropriate / helpful

- The patient becomes restless/ motorically agitated
- His tension/ tone increases
- He shows signs of uncomprehending, such as: leaving the room, put away objects, shakes his head, refuses, ...)

### Cleaning the mouth with gauze

With this technique, the therapist –without using suctioning or swabs, removes saliva, secretions or remains of food/ drink in a structured way from the oral cavity.

#### Objective

- To prevent penetration/aspiration of saliva, secretions, remains of food/ drink
- To give the patient structured input during cleaning his mouth
- To keep the oral cavity clean and healthy
- To prevent infections of the oral mucosa/ gingiva
- To prepare tooth brushing

#### Cleaning of the mouth with gauze can be used when the patient

- Has many remains in the mouth, that are difficult to remove with a tooth brush
- Is at high risk for penetration/ aspiration
- Has problems to tolerate tooth brushing, but is able to deal being touched by the therapist's hand / fingers

### Evaluation

#### Signs that cleaning of the mouth with gauze is appropriate / helpful

- The patient can tolerate to be touched in the face and mouth by the therapist
- The patient adapts his tone in the lips / cheeks
- The patient is able to be active and can push secretions forward/ out of the mouth with his tongue

#### Signs that cleaning of the mouth is not appropriate / helpful

- The patient shows hypersensitivity (turns his head away, removes the therapist's hand from his jaw / mouth / face)
- Tone and / or breathing rate increases
- The patient shows other vegetative reactions
- The patient has biting reactions

In this case, the therapist should consider to modify her technique in relation to tempo, pressure, or if the technique itself is contraindicated at the moment.

### **Tactile oral stimulation with water**

Tactile oral stimulation is a technique to assess and treat problems with tone, sensibility and / or swallowing of saliva.

#### **Objective**

- To give structured input to the face and mouth
- To facilitate swallowing
- To assess / regulate tonus, sensibility in the facial oral tract
- To facilitate functional oral movements, e.g. for bolus transport in the oral and pharyngeal phase
- To stimulate the production of saliva
- To increase circulation/blood flow in the gums
- To prepare the patient for eating and drinking
- To minimise the risk of penetration/aspiration

#### **Oral tactile stimulation can be used when the patient:**

- Shows hypersensitive reactions when touching the face and the mouth
- Reacts hyposensitive to touch in the facial oral tract
- Has problems with hypertonus / hypotonus / active movements in the face, the tongue and / or the jaw muscles
- Has impaired quality of swallowing saliva or low swallowing frequency
- Is at high risk for penetration / aspiration and no therapeutic eating is used yet

### **Tactile oral stimulation with cold water**

The water used for the stimulation can be added an ice cube or it is taken from the fridge. This might be helpful for patients with hyposensitivity. The advantage is the additional thermic input to the tactile input. Contraindications for the use of cold water are hypersensitivity, biting reactions, exposed dental necks or damage to the dental enamel.

#### **Evaluation**

##### **Signs that tactile oral stimulation with (cold) water is appropriate / helpful:**

- The patient's tonus, activity and sensibility in the relevant structures can be regulated to more normal
- The swallowing frequency increases
- The produktion of saliva increases
- The patient swallows more effectively, which means less penetration and / or aspiration

**Signs that tactile oral stimulation with (cold) water is not appropriately / helpful:**

- The patient verbalises or shows that he is uncomfortable or seems not to understand the situation
- His tone or activity increase in an unhelpful way
- The patient does not swallow
- The patient shows penetration / aspiration
- The patient shows biting reactions and hypersensitive reactions

In this case, the therapist should consider if she should modify her technique, e.g. in relation to tempo, pressure, the temperature of the water, or if the technique itself is contraindicated.

**Box: "Therapeutic oral hygiene "**

Therapeutic oral hygiene is a structured way to give the patient input in an everyday life activity and clean his mouth. Furthermore, therapeutic oral hygiene includes learning of functional oral movements to remove remains of saliva, secretions or food/ drink, e.g. to remove small crumbs from the lower lip or from the cheeks or the palate. For this function, many structures of the face and oral tract must work together in a well coordinated way (neck, jaw muscles, tongue, lips, cheeks). An important prerequisite for removing remains is, that the patient is able to feel those.

**Therapeutic oral hygiene with comprising support**

Here, the focus is to give the patient with much sensomotory /perceptive and cognitive impairment input and stimulation in a structured way. The therapist cleans the patient's mouth and / or brushes his teeth; still, the patient gets involved as much as possible and meaningful (e.g. getting his toothbrush in the hand, to feel it, hold the glass with the water, or being guidet for a short sequence of tooth brushing).

**Objective**

- To keep the oral cavity clean and healthy
- To increase/encourage arousal /attention
- To facilitate hand- hand- eye and hand- eye- coordination
- To facilitate swallowing
- To facilitate functional movements of the jaw, the lips, the cheeks and the tongue
- To prevent infections in the oral cavity, loss of teeth and aspiration pneumonia
- To prevent/ reduce biting reactions, teeth grinding and hypersensitive reactions

**This working level can be used, when:**

- A patient is maximum depending on help for all kind of oral hygiene
- The patient has complex problems, such as biting reactions, low arousal or hypersensitive reactions

**Evaluation****Signs that therapeutic oral hygiene with comprising/ thorough support is appropriate/ helpful:**

- The patient's arousal/attention increases
- The patient is able to adapt his muscle tone, e.g. when the tooth brush is brought into his mouth

- Hypersensitive reactions become less severe or are not evoked at all

**Signs that therapeutic oral hygiene with comprising/ thorough support is not appropriate/ helpful:**

- The patient is able to perform rather long sequences of oral hygiene by him self
- The patient become restless and unconcentrated
- The patient takes the therapist's hand away from his mouth / face or turns his head away

In this case, the therapist should consider to modify her interventions, or if the technique/ working level itself is contraindicated at the moment.

**Therapeutic oral hygiene with moderate support**

Here, the focus is to "set the scene" for a patient with only moderate need for support because of sensomotory, perceptive or cognitive impairments. Depending on the patient's resources and problems, support might be offered in the form of guiding, support for the position, help to structure oral hygiene, facilitation of arm- and hand movements, stabilisation of the jaw, facilitation for rinsing of the mouth, and so on. The therapist must recognize the individual needed kind of support and facilitation, and optimize the intensity and duration of the support.

**Objective**

- To keep the oral cavity clean and healthy and prevent infections on the mouth, loss of teeth and aspiration pneumonia
- To encourage learning of helpful, functional movements and movement sequences for the activity oral hygiene (both, the brushing of the teeth, rinsing of the mouth and also to clean the mouth for remains with the help of the tongue)
- To prevent unhelpful compensative strategies, e.g. just to move the head from side to side, while the tooth brush is not moved in the mouth
- To involve and integrate the more affected side into the activity oral hygiene
- To encourage that the patient in the long run/ in the future is able to independently perform oral hygiene in a sufficient quality

**This working level can be used when:**

- The patient has sensory motor, perceptive and cognitive prerequisites to perform parts of the oral hygiene by him self
- The patient has endurance to actively participate during oral hygiene
- The patient is not able yet to independently perform oral hygiene in proper/ sufficient quality

**Evaluation**

**Signs that therapeutic oral hygiene with moderate support is appropriate / helpful:**

- The quality of oral hygiene becomes better
- The patient feels and removes remains by himself or with less support
- The patient integrates his more affected side of the body into the activity
- Complications become less or disappear (e.g. irritation of the gums because of an unhelpful brushing technique)

**Signs that therapeutic oral hygiene with moderate support is appropriate / helpful:**

- The patient loses postural control, indicating that the situation is too demanding
- The patient gets restless, unconcentrated
- Tension and muscle tone increase in an unhelpful way
- The patient is using unhelpful compensatory strategies
- The patient removes the therapist's hand away from his face / mouth

Here, the therapist should consider if she should modify her interventions, or if the technique or working level is contraindicated at the moment.

### **Therapeutic oral hygiene with light support**

Here, the focus is to "set the scene" for a patient with only light need for support because of sensory, perceptual or cognitive impairments. Depending on the patient's resources and problems, support might be offered in the form of guiding, support for the position, help to structure oral hygiene or to find helpful strategies and helping aids for the patient to be independent for oral hygiene. See also the box: "Guidance/ instruction / supervision of the patient and / or the relatives / helpers".

#### **Objective**

- To keep the oral cavity clean and healthy and prevent infections, loss of teeth and aspiration pneumonia
- To avoid unhelpful compensatory strategies (e.g. just to move the head from side to side, while the tooth brush is not moved in the mouth)
- To encourage inclusion of the more affected side of the body during oral hygiene
- Find and teach the patient helpful strategies to make sure, that he in the future is able to independently take care of his oral hygiene in a proper quality

#### **This working level can be used, when:**

- The patient has the prerequisites to learn and use helpful strategies for oral hygiene
- The patient is not able yet to independently take care of his oral hygiene and needs guidance/ supervision

#### **Evaluation**

##### **Signs that therapeutic oral hygiene with light support is appropriate/ helpful:**

- Quality of the performance of oral hygiene increases
- The patient feels and remains spontaneously / with light support
- The patient is able to use helpful strategies in proper quality
- Complications become less or disappear (e.g. irritation of the gums, caused by an unhelpful brushing technique)

##### **Signs that therapeutic oral hygiene with light support is not appropriate/ helpful:**

- The patient loses postural control, indicating that the situation is too demanding
- The patient gets restless, unconcentrated
- Complications arise, such as infections in the oral cavity

- Tension/ muscle tone increase in an unhelpful way
- The patient uses unhelpful compensatory strategies
- The patient is not able to learn and use helpful strategies for oral hygiene in a proper quality

Here, the therapist should consider, if she should modify her interventions, or if the technique / working level is contraindicated at the moment.

### **Box: "Levels for facial and tongue movements"**

In sum: The quality of the movement is more important than the quantity!

#### **Facial movements:**

Quality of facial movement can be evaluated by different parameters. Is the movement selective? How is the range of movement? Is there a clear start and stop of the movement? Can it be repeated (e.g. facial movements) up to five times in the same quality?

Selective facial movements require a dynamic stable position, not only of the body, but also of the head and the lower jaw. Hyperactivity in the less affected side of the face avoids selective movement and must be inhibited first. To facilitate facial movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive information). Often, those several options are combined. To work with facial movements can be relevant to facilitate oral movements for swallowing, eating/drinking or protection of the airways.

#### **Passive mobilisation of the face**

At this level, the therapist performs/conducts the movement for the patient (e.g. frowning or pursing the lips) in a structured way.

#### **Objective**

- To give structured input to the face as a basis for active movement
- To keep the mobility of the facial muscles and other structures of the face (e.g. connective tissue)
- To prevent hypersensitive reactions on touch on the face

#### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active facial movements
- The patient needs the input from the passive movement to get into an active movement. The passage to the next level might be fluent.

#### **Partial active facial movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

#### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement

**This level can be used when:**

- The patient has the ability for active movement, but need the "idea" of how to (perform it) ~~do it~~
- The patient has problems to initiate selective movements and instead moves other parts of the face, especially when just asked verbally to perform a movement

**Active facial movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased

**Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement

**This level can be used, when:**

- The quality of the facial movement is still decreased or gets worse during repetition or there are problems to clearly start and stop a movement

**Active facial movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity

**Objective**

- To transfer the ability to perform selective facial movements into a meaningful context/activity

**This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilizing them in everyday life activities
- The patient needs the context of an activity to be able to perform facial movements, since he might not be able to work in 'abstract' context with facial movements

*Example: A patient with a right-sided hemiparesis is not able to pucker the lips. He just opens his mouth wide and extends his neck. The therapist tries to facilitate the movement tactilely and by being a visual model for the patient, without success. The therapist guides the patient to cut an orange into pieces and helps him to suck some juice out of a piece of orange. The patient is able to form his lips around the orange symmetrically.*

**Evaluation of the chosen level to work with facial movements regarding the parameters for quality of movements:**

Selectivity, range of movement, repetitions are possible three to five times with the same quality, there is a clear start and stop of the movement

A position with more base of support might improve the patient's ability to perform selective movements!

**Tongue movements:**

Selective tongue movements require a dynamic- stable position of the body, the head and the lower jaw.

To facilitate tongue movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive (see above) information). Often, those options are combined. To work on tongue movements can be relevant to elicit or facilitate oral movements for swallowing, eating/drinking, cleaning the mouth for remains of food and saliva, or protection of the airways.

### **Passive mobilisation of the tongue**

At this level, the therapist performs/conducts the movement for the patient (e.g. moving the tongue within the oral cavity forward or to the side; or bring it outside of the mouth towards the side or towards the upper lip in a structured way).

#### **Objective**

- To give structured input to the tongue as a basis for active movement/swallowing
- To keep mobility of the tongue
- To prevent or treat hypo-or hypersensitivity

#### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active tongue movements
- The patient needs the input from the passive movement to get into an active movement

The passage to the next level might be fluent.

### **Partial active tongue movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

#### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement
- To prevent or treat hypo-or hypersensitivity

#### **This level can be used when:**

- The patient has the ability for active movement, but needs the "idea" of how to do it
- The patient has problems to initiate selective movements and instead moves other structures, e.g. the neck or the jaw, especially when just asked verbally to perform a tongue movement
- The patient is hypo- or hypersensitive in the face/mouth

The passage to the next level might be fluent.

### **Active tongue movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased.

#### **Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement
- To prevent or treat hypo- or hypersensitivity

**This level can be used, when:**

- The quality of the tongue movement is still decreased or gets worse during repetition
- There are problems to clearly start and stop a movement
- The patient shows hypo- or hypersensitivity in the face/ mouth

The passage to the next level might be fluent.

**Active tongue movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity.

**Objective**

- To transfer the ability to perform selective tongue movements into a meaningful context/activity
- To treat or prevent hypo- or hypersensitivity

**This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilising them in everyday life activities
- The patient needs the context of an activity to be able to perform tongue movements, since he might not be able to perform tongue movements in 'abstract' contexts, e.g. on verbal request

**Evaluation of the chosen level to work with tongue movements, regarding the parameters for quality of movements:**

- Selectivity
- Range of movement
- Repetitions are possible with the same quality
- There is a clear start and stop of the movement.

A position with more base of support might improve the patient's ability to perform selective movements!

**Box: "Methods/ Techniques"**

**Positioning**

Means, that all body segments (pelvis, thorax, shoulder girdle, head and extremities) are being brought in an appropriate position to each other, to the base of support, the gravity and the activity. Each position chosen must be safe (without risk for falling or aspirate saliva). A position should never be uncomfortable or painful. Before positioning, the patient should be mobilised and postural control should be facilitated, to create optimal alignment. For patients with rather severe problems of perception, guiding (Affolter Model®) might be useful, to achieve the new position (e.g. from sitting to side lying).

**Objective**

- To create a dynamic- stable position in an appropriate alignment to encourage postural control and selective movements of the extremities and in the facial oral tract.

**Positioning can be used when the patient shows:**

- Mal-alignment because of altered tonus / lack of postural control
- Problems with perception
- Lack of endurance
- Low arousal
- Lack of selective movements in the trunk, the extremities and /or the facial oral tract
- Insufficient respiration

**Evaluation****Signs that a position is appropriate / helpful:**

- Change of the patient's motor behaviour towards the normal. Movement become more easy and selective
- The patient's tone and alignment are optimal
- The patient is more awake and alert, more calm and concentrated
- The patient's respiration is more normal

**Signs that a position is not appropriate / helpful:**

- The patient's tone increases in an unhelpful way in one or more muscles
- The patient shows associated reactions when he is trying to move
- The patient remains passive, arousal decreases
- Vegetative reactions: Sweating, increasing or decreasing blood pressure, saturation decreases, respiratory frequency increases or decreases
- The patient loses concentration, becomes restless and / or the facial expression gets tensed
- The patient has problems to perform selective movements, which otherwise are possible in a lower position
- The patient shows signs of penetration / aspiration
- The patient's respiration becomes insufficient

*Example: In sitting, a patient is not able to open his mouth, although the therapist tries to facilitate him. He shows biting reactions, when the toothbrush touches the teeth. However, in side lying position, the therapist is able to facilitate the patient to open his mouth to brush the chewing surfaces.*

When one or more signs appear, the therapist has to consider, if the position itself is inappropriate, or if he has been too long in the same position. Is there a need to find a new position for the patient, or would small changes in the actual position be adequate?

**Mobilisation**

Means to move the whole body (e.g. for coming from one position into another), or parts of the body or extremities or specific structures, as muscles, joints or connective tissue.

**Objective**

- To achieve more postural control, facilitate selective movements, higher range of movement (ROM),
- Normalise tone, optimise alignment
- Increase arousal

**Mobilisation can be used when the patient has:**

- Senso-motory problems (lack of postural control or problems with selective movements of extremities or in the facial oral tract)
- Increased mobility, that influences selective movement
- Cognitive and / or perceptive problems, e.g. decreased arousal, neglect, lack of attention

**Evaluation****Signs that mobilisation has the required impact/ is appropriate:**

- Movement gets possible, easier, more selective
- Range of Movement (ROM) increases
- More optimal alignment
- The patient does feel the mobilised part of the body better and / or uses it
- The patient is more awake / attentive, alert or concentrated

**Signs that the mobilisation does not have the intended impact/ is not appropriate:**

- The patient has pain or feels uncomfortable
- ROM become smaller or there is no change at all
- Alignment or tone does not change or become unhelpful, no chance for movement
- No change in sensibility or proprioception
- The patient stays or become restless, loses concentration
- No change in arousal

The term "guiding" refers to the Affolter Model® ([www.apwschweiz.ch](http://www.apwschweiz.ch)). Here, the therapist physically guides the patient's body and hands in problem solving everyday life activities. The goal is to provide tactual information to the patient, about the position of his body in the environment and the activity. There are two methods for guiding, nursing and elementary guiding, both described in Affolter 81991, 2001)

**Objective**

- To provide relevant tactual information in a structured way to the patient about his body in the environment and the ongoing activity.
- To encourage problem solving processes and formation of hypotheses in everyday life activities

**Guiding can be used, when:**

- The patient has perceptive / cognitive problems
- The searching, acquiring, and treating of information from the environment is disturbed. This leads to decreased ability to problem solving in everyday life activities.

## Evaluation

### Signs that guiding is appropriate / helpful:

- The patient pays attention to the ongoing activity
- The patient seems to understand the activity (comprehension)
- The patient adapts his tone in the activity or pursues movements by himself
- The patient executes the next step in the activity
- The patient's behavior changes towards normal behavior, required for the context

### Signs that guiding is not appropriate / helpful

- The patient becomes (more) restless
- His tension / tone increases
- No changes in the patient's behaviour

Here, the therapist should consider, if the level or the way of guiding should be modified or if guiding is an adequate intervention in that context.

## Facilitation

Facilitation is a technique, where- most of the time via manual contact- the sensory and proprioceptive systems is activated. Facilitation is an active learning process, helping a person to overcome inertia, continue or terminate functional tasks (Vaughan Graham 2009, 2016, Gjelsvik 2016). Facilitation is never passive. The therapist uses facilitation, when she wants to work on the patient's postural control or selective, functional movements in the facial oral tract. The place, direction and duration of facilitation might vary.

### Objective

- To allow / facilitate movement and change motor behaviour

### Facilitation can be used, when the patient has:

- Inadequate motor behavior
- Increased/lack of postural control
- Problems to perform selective movement

## The various intensity of facilitation

### Continuous facilitation

The therapist chooses to facilitate continuously, when the patient:

- Loses postural control when the therapist stops to facilitate ("hand off")
- Does not have the idea to or the possibility to initiate, accomplish or complete a movement / function / activity
- When the therapist stops to facilitate, selective movements are not possible AND / OR mass movements or associated reactions appear
- In general, the quality of movement decreases without facilitation

**Facilitation in between, over short sequences**

The therapist chooses to facilitate in between, if:

- The patient can keep up postural control over a short while
- The patient takes over, initiates or completes a movement / function or activity in an adequate quality / quantity spontaneously

**Facilitation to initiate movement or patterns of movement**

The therapist facilitates to initiate movement / function / activity, if:

- The patient has sufficient postural control and is able to keep it to take over, continues and to finish a movement, function/activity/task
- The patient is able to perform spontaneous, selective movement in the facial oral tract

**Evaluation****Signs that facilitation is appropriate/helpful:**

- Motor behaviour changes
- The patient become (more) active
- Movement become easier, more selective

**Signs that facilitation is not appropriate/helpful:**

- The patient's tone increases in an unhelpful way
- Associated reactions occur when the patient tries to move
- Motor behaviour does not change
- The patient remains passive

**Box: "Guidance/ instruction / supervision of the patient and / or the relatives"**

Guidance can be offered to certain problems in activities. For example, if the patient has problems concerning oral hygiene, he or relevant staff or the relatives can be instructed to specific interventions, such as using dental floss or an electrical tooth brush. It might also be, that relevant staff or relatives are supervised, if they perform the learned interventions in a correct manner. Guidance / instruction / supervision of the patient / nursing staff / helpers / and / or relatives includes both, verbal and written explanations, supplied by practical exercises of the interventions chosen. When relevant, the use of pictures or photographs might be beneficial, too. It is the therapist's responsibility to perpetual make sure, that the interventions are performed in a correct manner and to adopt the interventions towards the patient's current need. The patient / relatives / helpers or nursing staff should have the possibility to contact the therapist in case of questions or if there are problems, when running the interventions.

**Objective**

- To involve the patient / relative(s) / nursing staff / helpers as good as possible in order to avoid complications (e.g. infections, hypersensibility or pneumonia)
- To allow activity and participation in as good quality as possible (e.g. to communicate with others with a healthy and well kept mouth)

- To encourage learning /establishing of functional movements / sequences of movement (e.g. to clean the mouth for remains of food after eating)
- To ensure helpful and structured input for the facial oral tract (e.g. by conducting proper oral hygiene)
- To implement relevant interventions into the patient's everyday life to ensure optimal function / activity (e.g. to rinse the mouth after each mealtime, to clean the patient's prosthesis and use it regularly)

**Guidance / instruction / supervision can be used, when the patient:**

- Has the prerequisites (perceptive, cognitive and senso-motory) to be responsible for own training / treatment
- Is not able to independently perform training / treatment by himself, but the relatives / nursing staff / helpers are resources that could be involved

**Evaluation**

**Signs that guidance / instruction / supervision of the patient and / or relatives / helpers / nursing staff is appropriate:**

- The patient's level of function increases
- There are no / or less complications (e.g. mycotic infections, pressure sores from the prosthesis)
- Unhelpful symptoms, such as hypersensitivity, are reduced or disappear

**Signs that guidance/instruction/supervision of the patient and/or the relatives/nursing staff/helpers does not have the required effect or should be modified:**

- Unwanted symptoms or complications appear, e.g. pain or mycotic infections
- The patient does not perform self-training / interventions are not conducted (or only infrequent), because the patient / the relative(s) / nursing staff / helpers are in doubt or do not have the capacity to do it

**Box: "Facilitation to swallowing"**

Facilitation to swallowing is an important method and technique that might prevent penetration and / or aspiration. Here, the therapist stabilises structures, relevant for swallowing (e.g. head and jaw) or moves structures relevant for swallowing (e.g. the tongue) with specific handling. These handling is taught at the F.O.T.T. basic courses. Facilitation to swallowing might be individual different, depending on the patient and his problems.

The technique should be used, as soon as the patient tries to initiate swallowing (often seen in pumping jaw movements), or if the patient should swallow, but does not initiate it.

**Objective**

- To increase the rate and quality of swallowing
- The patient learns to swallow spontaneous and sufficient again
- To prevent penetration / aspiration

**Techniques to facilitate swallowing**

- The therapist stabilises the patient's head and the lower jaw in an optimal alignment

- The therapist facilitates the first third of the tongue upwards, towards the hard palate, from the outside of the floor of the mouth
- The therapist facilitates the second third of the tongue upwards towards the soft palate, from the outside of the floor of the mouth
- The therapist gives an input from the floor of the mouth towards the region of the vallecular space, so the patient is able to feel remains of saliva
- The therapist mobilizes the patient's tongue within or outside of the mouth, to prepare the pharyngeal stage of the swallowing sequence
- The therapist facilitates active tongue movements within or outside the mouth, as a preparation for the pharyngeal stage of swallowing
- The patient gets input to feel saliva, that might sit in the pharynx, e.g. by working in the expiration phase of the respiration cycle. If possible, the patient's voice might get used for that input, too.
- The therapist mobilises the patient or parts of his body, e.g. the upper trunk or the head, to "disturb" remains of saliva that might sit in the mouth or pharynx, to elicit a swallowing response

**Facilitation to swallowing can be used when the patient:**

- Does not swallow spontaneously (e.g. he initiates swallowing with pumping jaw movements or does not swallow at all)
- Does not swallow sufficiently, e.g. the patient's tongue pushes forward when swallowing, and saliva is not transported towards the pharynx, but rather out of the mouth. Other signs of insufficient swallowing: a wet voice, coughing after swallowing or saliva running out of the mouth after swallowing

**Evaluation:**

**Signs that facilitation of swallowing is appropriate / helpful:**

- The patient swallows
- The patient does show less or no pumping jaw movements before swallowing
- The patient's voice is not wet / he does not cough after swallowing
- Saliva is getting transported more sufficient/ there are less remains of saliva in the cheek (s) or on the tongue

**Signs that facilitation of swallowing does not have the required effect / is not appropriate:**

- The patient does not swallow
- The patient shows (many) jaw pumping movements, that might not be followed by a swallow
- There are signs of penetration / aspiration (wet voice / coughing)
- The patient has many remains of saliva in the mouth or saliva runs out of the mouth
- The patient removes the therapist's hands from the floor of the mouth / jaw or turns his head away

Here, the therapist should consider, if she should modify the technique of facilitation, or if the patient does need a different support to swallow. See also "**Techniques to facilitate swallowing**".

**Box: "Interventions for protection of the airways"**

Protection of the airway is an important method and technique to encourage and facilitate sufficient reactions, when there are clinical signs of penetration and / or aspiration of saliva / food / liquid.

Patients, who do not perceive that they need to clear / protect the airway, do not benefit from verbal requests to cough or clear their throat. With the here described techniques, the therapist always should facilitate patients, when they: initiate cough, have rattling breathing sounds (clinical sign of aspiration), have wet voice or try to clear their throat (clinical sign of penetration). Often, several techniques might be used as a combination.

### Objective

- Sufficient protection of the airway
- Prevention of complications, as aspiration pneumonia
- Learning of functional, effective movements / patterns of movement to react on penetration/ aspiration

### Techniques to encourage protection of the airway:

- **Facilitation to sufficient clearing of the throat / cough:**  
Facilitation of the abdominal and intercostal muscles for a sufficient cough. This includes support of the thorax / trunk to come forward and support to swallow after coughing or clearing the throat. If there are rubbery, doughy secretions in the oral cavity, the patient should be supported to spit them out instead of swallow them, or they are removed from the oral cavity, e.g. with gauze. If necessary, the patient should be facilitated either to spit out or to swallow (see also box: "Facilitation to swallow").
- **Facilitation to clear throat, spit out, blow one's nose**  
If there are remains of saliva / food /liquid in the pharynx, around the pharyngeal wall, the most effective way to get rid of it, would be to clear the pharynx and spit out. Secretions in the nose should be removed, either by the therapist with cotton buds, or the patient is facilitated to blow his nose.
- **Cleaning the mouth with gauze / oral hygiene:** Secretions /remains of saliva/food/liquid that has been collected in the cheeks, on the tongue or on the soft palate, should be removed with gauze. For doing so, the therapist wraps gauze around her finger and removes the material in a structured way from the oral cavity.
- **Cleaning of the mouth in patients with more abilities to be active:** The patient's finger can be guided towards his mouth, so he can feel the rests by himself. Then, he might be facilitated to remove them, swallowing or spitting out. Another way could be, to support the patient to find remains with the tongue, swallowing them or spit them out.

### Interventions to protect the airway can be used when the patient:

- Shows signs of penetration / aspiration without spontaneous reactions for protection of the airway
- Has insufficient (e.g.. weak cough, lack of clearing swallow, remains of material in the oral cavity or unhelpful reactions on penetration / aspiration (e.g. wants to drink something, despite the airway still is not free, and the patient still is coughing)

### Signs that facilitation of protection of the airway is appropriate / helpful

- The patient's voice does sound clear
- The upper and lower airway is free for secretions
- The patient coughs rather loud and powerful and can be facilitated to swallow or spit out afterwards (or does it spontaneously)
- There are no remains of food, secretions, liquid in the oral cavity

**Signs that facilitation of protection of the airway does not have the required effect / is not appropriate:**

- The patient's voice sounds wet
- Secretions in the upper and lower airway are to be heard during respiration
- There is no spontaneous clearing swallow / spitting out after coughing / the patient cannot be facilitated to do so
- There are remains of secretions / food / liquid in the oral cavity
- Coughing sounds rather weak / the patient continues to cough or clear the throat

## 6.4. Evaluation: Does the patient react/respond appropriate/as expected on the chosen interventions- related towards the goal?

Here, the therapist collects her observations made since the beginning of the treatment:

- Does the treatment still seem appropriate?
- Does the goal for today's treatment still seems realistic to achieve? Or is the goal achieved already?
- Should the therapist adhere to her original plan / the interventions started up or does the patient's response require to set in with different therapeutic interventions?

Here, the therapist should answer YES or NO.

## 6.5. Continuing the treatment in view of the evaluation

If the answer is **YES**, the therapist either should work towards the goal or, if it already is achieved, work with **repetition** and / or **shaping**. Shaping means to work on the patient's individual "limit", neither on a too high nor on a too low level. This is done by increasing requirements or offer the patient less support, (e.g. less facilitation (Gjelsvik 2016), or a position with less base of support. Shaping is an important method to encourage motor learning (Vögele 2015).

Repetition might contain different aspects: To let the patient repeat the same movement / sequence movement / activity under the same conditions gives the therapist information if the patient can keep up the quality of the movement and encourages learning. Repetition also might be used under different conditions (e.g. changed context, speed, position, range of movement, etc. (Vögele 2015). Motor learning is assumed to be most effective, when repetition is done in varied context.

*Example: The goal for the treatment of this day for a patient with a hemiparesis and a central facial palsy with over activity on the less affected right side was to rinse the mouth in sitting position in front of a sink, without over activity in the right side. The goal is achieved and the therapist facilitate a standing position for the patient (with less base of support), she still inhibits the over activity on the right side, in standing, too. Without inhibiting, the over activity increases again. Now, the therapist knows, that the patient with inhibition in standing position can rinse his mouth, but it is too early yet to have "hands off" totally. This issue, she will work on in the next treatment session.*

If the answer is **NO**, the therapist should consider, how to increase support for the patient, e.g. by offering him a position with more base of support, more facilitation, or set the goal lower for the patient. If it seems unrealistic to achieve the goal at all, the therapist should set a goal that is realistic and achievable in relation to the patient's current condition and difficulties.

## **6.6 Re-Evaluation: Does the patient react /respond appropriate /as expected on the chosen interventions? Is the goal for this treatment achieved? Is the goal still realistic? Conclude the treatment of the day, clinical reasoning about the next treatment**

Towards the end of today's treatment, the therapist does "re"-evaluate, how the modification of the chosen interventions or the onset of new interventions succeeded. For evaluation, the therapist analyses the patient's response. The following reflections might become relevant:

- Were the therapeutic interventions appropriate, related to the patient's problems and the underlying causes?
- Were the interventions carried out on the right level / in the right intensity?
- What kinds of interventions are most helpful for the patient, to bring out the best / most optimal selective / functional movement?
- If the goal for today's treatment was not achieved – is it still realistic / relevant for the next treatment?
- Is the long-term goal still relevant / realistic?
- Which considerations and experiences from today's treatment are relevant for the next treatment, when the process of assessment, analysis, treatment and evaluation starts again?



## 7. Chart and Manual: Facial expressions, facial movement

1. Assessment and Analysis, Chart 1

- 2a. Set a relevant, evaluable long-term goal, if possible together with the patient / the relatives  
 2b. Set a goal for the F.O.T.T. treatment of the day, if possible and relevant together with the patient / the relative(s)

3. Choose therapeutic interventions for postural control and selective movements / activity, related to the goal and start the treatment

**Adapt environmental factors**

- Place / room / furniture
- Objects
- Helping aids

**Oral stimulation with focus on the structures in the face**

- Mobilizing
- Regulate tone/ activity/ sensibility

**Levels for facial and tongue movements**

- Passive
- Partially active
- Active (selective movement)
- Active movement sequence in activity

**Methods / Techniques**

- Positioning
- Mobilization
- Guiding
- Facilitation:
  - Continuous
  - Initiated
  - Over short sequences

**Therapeutic eating / drinking with focus on facilitation of facial movements**

- Firm consistencies (chewing in gauze)
- Pureed consistencies
- Liquid (pipette, glass)

**Facilitation to swallow by**

- Facilitation at the floor of the mouth
- Stabilization of the lower jaw
- Passive or active tongue movements
- Facilitation of breathing / voice
- Mobilization of the body or body

**Choose positions appropriate for the patient and intervention**

- Lying
- Half sitting
- Sitting
- Standing

**Guidance/ Instruction /supervision of the patient and / or the relative(s)/ nursing staff / carers**

**Techniques to inhibit overactivity**

- Choose a position with large base of support
- Contact to the face with the therapist's or patient's hands
- Active movements in the opposite direction of the

**Actions to facilitate protection of the airways**

- Facilitation of sufficient clearing of the throat / cough
- Facilitation of cleansing of the throat, spitting out, rinsing / blowing the nose
- Oral cleansing with gauze / oral hygiene

4. Evaluation: Does the patient react / respond appropriately / as expected to the chosen interventions – related to the goal?

YES

NO

5. Continue treatment based on the evaluation

- Pursue the goal
- Repetition
- Shaping (increase demands, less support)

5. Continue treatment based on the evaluation

- Shaping (less demands / increase support)
- Initiate new / other interventions
- Reassess the goal and modify it to current context

6. Re-Evaluation

- Does the patient react / respond appropriately / as expected to the chosen interventions?
- Has the goal for the treatment been reached? Is the goal still realistic?
- Conclude the treatment for the day
- Reasoning / planning of the next treatment

1. Assessment and Analysis, Chart 1

## 7.1. Assessment, Analysis, see Chart 1

## 7.2. Goalsetting

### 7.2.1. Setting a relevant, evaluable long-term goal, if possible together with the patient / evt. the relative(s), based on Assessment and Analysis, Chart 1

A long-term goal should be relevant for the patient's context, related to activity and participation. The goal should be evaluable, too.

*Examples:*

- *When discharged to his own place, the patient is able to eat and drink all consistencies independently and safe.*
- *The patient is able to perform symmetrical facial movements during nonverbal communication*

### 7.2.2. Setting goal for the F.O.T.T. treatment, if possible together with the patient/evt. the relative(s), based on Assessment and Analysis, chart 1

For the treatment of the day, there is set a short-term goal, if possible and relevant together with the patient and / or the relative(s). The goal should be evaluable, relevant for the patient, realistic and related to his level of function, activity or participation.

*Examples:*

- In half sitting position, with support for the head and the jaw, the patient is able to close his lips symmetrically for swallowing saliva
- In sitting position, the patient after preparation is able to without support, chew firm consistencies (bread) with closed lips, and without bread coming out of his mouth

## 7.3. Choosing therapeutic interventions for the treatment for postural control and selective movement /activity related to the goal and starting treatment

At this point, the therapist chooses an environment and the therapeutic interventions, she thinks are relevant to achieve the goal and plans the treatment. She also considers, how to modify and grade the interventions.

Remark, that there is mandatory content in each chart. The boxes: "Adopt environmental factors", "Choice of position", "Methods and techniques", Guidance/Instruction/supervision of the patient and/or relatives, nursing staff / helpers", "Levels for facial movements" are relevant content in each area of F.O.T.T.®. Furthermore, the boxes "Facilitation of Swallowing" and "Protection of the airway" are essential in F.O.T.T.®. Therefore, they appear on each chart. In "real life" this means, as soon as the patient needs

facilitation of swallowing or help to protect the airway, the therapist takes this into account and prioritises this.

First, the therapist chooses the goal, and then considers the environment and the position she will start to treat the patient. Then, the therapist thinks about the interventions, consistencies to use and how to grade the interventions to be able to work at the patient's individual limit and to achieve the goal.

In F.O.T.T.®, there is a method used, called "elicitation". This means: to bring out, to waken, to cause, to release". By choosing an appropriate environment, position, interventions, use of own language, etc. a helpful, appropriate response or motor behavior by the patient might be elicited.

*Example: On verbal request, a patient is not able to purse the lips in sitting position, he grimaces. The therapist elicits the movement by working in calm surroundings, in the patient's room. She positions him in half sitting, supported by pillows and blankets. Then, she positions herself in front of the patient, at the same eye level as the patient, and supports his jaw with the jaw support grip. With a calm voice she asks the patient to purse the lips, and at the same time she is a visual and auditive model for him (whistling) and elicit the movement by facilitating it and whistling. This helps the patient to get the idea for the movement.*

*The therapeutic interventions from the boxes in the chart "Facial expression and facial movement" is described here:*

### **Box: "Adapt environmental factors"**

The environment, where the treatment takes place, is important to bring the patient in a situation, where he can act and interact in a helpful and functional way. Factors as noises, other persons, colours, smell, temperature, furniture and the function of the room (e.g. a therapy kitchen) can contribute to the patient's ability to learn, concentrate, interact and encourage appropriate response. (Vaughan Graham 2009).

The environment for the treatment should be suitable for the patient and the goal, as far as possible, e.g.. In the patient's room, a dining room, where activities as eating and drinking are obvious.

#### **Objective**

- To encourage motor learning by suitable context: The patient uses his more affected side of the body and moves as normal as possible
- The patient expands his repertoire of functional movements and patterns of movements
- To avoid unhelpful and unfunctional habits and compensatory strategies
  
- **A known versus unknown room:** Consider, if the patient needs familiar surroundings, because he has problems in new, unknown situations, or if an unknown room might help to expand the patient's repertoire and encourage learning instead of clutching in habits or unhelpful strategies avoiding learning
- **Room related to the activity versus a room not related to the activity:** Does the patient need clear context given by the function of a room in order to understand the activity / situation? Does the

planned activity or intervention require e.g. a kitchen or a bathroom? Does the patient's condition allow that he leaves his own room and gets transported into another room

- **A niche versus out in the room:** A niche is defined as a position, where the patient has a stable base of support and to stable sides. A niche might convey safety for patients with perceptive / cognitive or massive senso-motorical problems, e.g. disturbed body schema, lack of balance or lack of attention towards the more affected side of the body. Treating the patient out in the room might be useful for patients with sufficient postural control and perceptive and cognitive abilities. Sometimes, it might be necessary to be able to move freely around the patient.
- **One –to -one situation versus group situation:** One –to one situations might be helpful, when the patient is easy to distract or has problems with concentrating. It might give the patient a feeling of safety, if he needs intensive support or facilitation. Last but not least, the therapeutic interventions, e.g. cleaning the patient's mouth, require privacy. However, group situations create a social context, where the patient must coordinate facial expression, verbal communication and eating / drinking. This is an option, when the patient is able to manage several visual and auditive input and can change focus from eating and drinking to communication with others and vice versa.

### Adapt furniture

Furniture is an important factor to support and promote the patients position and postural control. Furniture should give the patient a base for selective movement, as normal as possible, during treatment / the activity. Furniture should give enough support for the patient to move against gravity, but not too much support, because this might make him passive. A dynamic – stable position might help the patient to get some new experiences when moving and tactile information about his own body in the environment and the activity.

### Adapt objects

The objects chosen should as far as possible support active movement and patterns of movement, as normal as possible.

*Example: A patient with a left side facial palsy and a hyperactive and hypertone less affected right side of the face has trouble drinking liquid, since he is drooling. Although it might be tempting to use a straw for drinking to avoid drooling, it still might be better to use a glass and facilitate symmetrical movement of the lips, since the straw often leads to more hyperactivity in the less affected side of the face. Typically, patients position the straw on that side, where they feel more and are able to move more-the less affected side. Hyperactivity might inhibit activity on the more affected side of the face. However, the use of a glass or a straw has to be carefully evaluated.*

### Helping aids

Helping aids are used to compensate for a lack of function. A helping aid might allow the patient to perform an activity independently. This can have great importance for the patient's level of participation.

Helping aids can be used, when:

- A movement is not possible for the patient.  
*For example: The patient is not able to close his eye because of a periferic facial palsy. To protect the eye against infections and exsiccosis, an eye patch is used, in combination with wetted gauze during the day*
- They enable the patient to move in a normal pattern of movement, using his more affected side instead of compensation with the less affected side of the body in unhelpful strategies.

## Evaluation

### Signs that the environmental factors are appropriate:

- The patient reacts as expected/as intended
- The patient is active
- The patient understands the situation/activity
- The goal can be achieved

### Signs that the environmental factors are not appropriate/helpful:

- The patient reacts not as expected / intended and uses unhelpful compensatory strategies, restlessness, associated reactions, increased tone, lack of concentration
- The goal cannot be achieved

In this case, the therapist should try to change one or more environmental factors and evaluate the patient's response again.

## **Box: "Choose of position(s), appropriate for the patient and the interventions"**

In general, if a patient obviously is uncomfortable in a given position (seen by restlessness, increased tone, vegetative reactions...) the position needs to be changed. Some patients have restriction regarding positioning, e.g. because of fractures, craniectomy or skin lesions. The therapist has to adhere to these. The here described aspects for positioning are only recommendations.

A position has to be dynamic and stable at the same time, never fixed. Before positioning a patient, the therapist should work with postural control. Changes of position might only be necessary within one position, (e.g. in lying, the patient's trunk is adjusted), or it might be necessary to change the whole position, e.g. from lying to sitting. '

No matter in which position the patient is, it is always important to optimize the alignment in a way that support swallowing.

- **Supine** position can increase the risk of aspiration, especially when the patient's neck is extended. Here, saliva runs with the gravity towards the pharynx and from there into the airway, before the patient is able to swallow it.

However, if the H risk of aspiration is low, and the patient is positioned in good alignment (Vaughan Graham 2009, supine position might be used for work with breathing, postural control and relevant structures as the neck, the hyoid bone or the larynx

- **Half sitting** position, e.g. in bed can be suitable, when there is good alignment. Half sitting is likely to involve the patient's arms and hands, which is important when the patient's hands are involved to inhibit overactivity or during the pre-oral phase of oral stimulation.
- **Side lying** offers patients with high tone or low postural control in general, much base of support. Saliva that might not be swallowed, will be collected in the patient's cheek and can be removed by the therapist, e.g. with gauze (see box: Interventions to protect the airway).
- **Sitting** position (e.g. on a plinth or on a chair, with individual support) requires a certain amount of postural control and a stable vegetative state. Sitting is useful for interventions involving eating and / or drinking. The contact and the support from a table in front of the patient might influence the alignment of the trunk and neck positive and create trunk activity.
- **Standing** position with or without helping aids (e.g. a standing frame) might elicit helpful alignment in the trunk and pelvis, ease respiration and increase arousal. See also the box: "Methods / techniques".

### **Box: "Tactile Oral stimulation with focus on the structures of the face"**

There are superficial and deep facial muscles. The deep ones might targeted best by working intraorally. For that, the oral stimulation can be modified in a way, where the facial muscles around the cheeks and mouth are mobilized and activated. Structured input might be helpful, too, to regulate the sensibility in the face and mouth. After this kind of oral stimulation it is helpful to facilitate active movements and sequences of movement (see next box).

#### **Objective**

- To give structured input
- To mobilise relevant structures of the face

#### **Tactile oral stimulation with focus on structures of the face can be used, when:**

- The therapist wants to (re)-assess the patient's reactions on touch in the face and mouth
- The patient reacts hyper- or hyposensitive on touch in the face and mouth
- The patient has problems with hypertonus / hypotonus/ active movements of the face, the tongue, the jaw muscles (e.g. for symmetrical closure of the mouth)
- The patient has increased swallowing rate and / or quality of swallowing

#### **Evaluation**

##### **Signs that tactile oral stimulation with focus on the structures of the face is appropriate / helpful:**

- The patient's tonus, activity and sensibility in the targeted structures do normalises
- Swallowing rate increases
- The patient swallows more sufficiently, and shows less clinical signs of penetration / aspiration

##### **Signs that tactile oral stimulation with focus on the structures of the face is appropriat / helpful:**

- The patient verbalises or show signs that he is not comfortable or a lack of understanding
- His tone and activity increase in an unhelpful way
- The patient shows signs of penetration / aspiration

In that case, the therapist should consider to modify his technique of the intervention (regarding tempo, pressure, ...) or if the technique it self might be contraindicated at the moment.

### **Box: "Levels for facial and tongue movements"**

In sum: The quality of the movement is more important than the quantity!

#### **Facial movements:**

Quality of facial movement can be evaluated by different parameters. Is the movement selective? How is the range of movement? Is there a clear start and stop of the movement? Can it be repeated (e.g. facial movements) up to five times in the same quality?

Selective facial movements require a dynamic stabile position, not only of the body, but also of the head and the lower jaw. Hyperactivity in the less affected side of the face avoids selective movement and must be inhibited first. To facilitate facial movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive information). Often, those several options are combined. To work with facial movements can be relevant to facilitate oral movements for swallowing, eating/drinking or protection of the airways.

#### **Passive mobilisation of the face**

At this level, the therapist performs/conducts the movement for the patient (e.g. frowning or pursing the lips) in a structured way.

#### **Objective**

- To give structured input to the face as a basis for active movement
- To keep the mobility of the facial muscles and other structures of the face (e.g. connective tissue)
- To prevent hypersensitive reactions on touch on the face

#### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active facial movements
- The patient needs the input from the passive movement to get into an active movement. The passage to the next level might be fluent.

#### **Partial active facial movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

#### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement

**This level can be used when:**

- The patient has the ability for active movement, but need the "idea" of how to (perform it) ~~do it~~
- The patient has problems to initiate selective movements and instead moves other parts of the face, especially when just asked verbally to perform a movement

**Active facial movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased

**Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement

**This level can be used, when:**

- The quality of the facial movement is still decreased or gets worse during repetition or there are problems to clearly start and stop a movement

**Active facial movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity

**Objective**

- To transfer the ability to perform selective facial movements into a meaningful context/activity

**This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilizing them in everyday life activities
- The patient needs the context of an activity to be able to perform facial movements, since he might not be able to work in 'abstract' context with facial movements

*Example: A patient with a right-sided hemiparesis is not able to pucker the lips. He just opens his mouth wide and extends his neck. The therapist tries to facilitate the movement tactilely and by being a visual model for the patient, without success. The therapist guides the patient to cut an orange into pieces and helps him to suck some juice out of a piece of orange. The patient is able to form his lips around the orange symmetrically.*

**Evaluation of the chosen level to work with facial movements regarding the parameters for quality of movements:**

Selectivity, range of movement, repetitions are possible three to five times with the same quality, there is a clear start and stop of the movement

A position with more base of support might improve the patient's ability to perform selective movements!

**Tongue movements:**

Selective tongue movements require a dynamic- stable position of the body, the head and the lower jaw.

To facilitate tongue movements, the therapist can use tactile information, she can be a visual model for the patient (visual information) and she can give short and precise verbal cues (auditive (see above) information). Often, those options are combined. To work on tongue movements can be relevant to elicit or facilitate oral movements for swallowing, eating/drinking, cleaning the mouth for remains of food and saliva, or protection of the airways.

### **Passive mobilisation of the tongue**

At this level, the therapist performs/conducts the movement for the patient (e.g. moving the tongue within the oral cavity forward or to the side; or bring it outside of the mouth towards the side or towards the upper lip in a structured way).

#### **Objective**

- To give structured input to the tongue as a basis for active movement/swallowing
- To keep mobility of the tongue
- To prevent or treat hypo-or hypersensitivity

#### **This level can be chosen when:**

- The patient does not have the cognitive, perceptive or sensomotory prerequisites to perform active tongue movements
- The patient needs the input from the passive movement to get into an active movement

The passage to the next level might be fluent.

### **Partial active tongue movements**

At this level, the therapist initiates the movement by tactile facilitation, and the patient can for a short moment, be active and hold the movement.

#### **Objective**

- The patient uses his potential for movement actively after the therapist has supported the initiation of the movement
- To prevent or treat hypo-or hypersensitivity

#### **This level can be used when:**

- The patient has the ability for active movement, but needs the "idea" of how to do it
- The patient has problems to initiate selective movements and instead moves other structures, e.g. the neck or the jaw, especially when just asked verbally to perform a tongue movement
- The patient is hypo- or hypersensitive in the face/mouth

The passage to the next level might be fluent.

### **Active tongue movements**

At this level, the patient is able to perform active facial movements, but the quality is decreased.

#### **Objective**

- The patient can perform and repeat selective facial movement with a clear start and stop of the movement
- To prevent or treat hypo-or hypersensitivity

**This level can be used, when:**

- The quality of the tongue movement is still decreased or gets worse during repetition
- There are problems to clearly start and stop a movement
- The patient shows hypo- or hypersensitivity in the face/ mouth

The passage to the next level might be fluent.

**Active tongue movement in a sequence or activity that is related to everyday life**

On this level, active facial movements are embedded into a sequence of an activity or an activity.

**Objective**

- To transfer the ability to perform selective tongue movements into a meaningful context/activity
- To treat or prevent hypo- or hypersensitivity

**This level can be used when:**

- The patient is already able to perform facial movements, but still has problems utilising them in everyday life activities
- The patient needs the context of an activity to be able to perform tongue movements, since he might not be able to perform tongue movements in 'abstract' contexts, e.g. on verbal request

**Evaluation of the chosen level to work with tongue movements, regarding the parameters for quality of movements:**

- Selectivity
- Range of movement
- Repetitions are possible with the same quality
- There is a clear start and stop of the movement.

A position with more base of support might improve the patient's ability to perform selective movements!

**Box: "Techniques to inhibit overactivity"**

Overactivity in the less affected side of the face might inhibit/ impede selective symmetrical movements in the face.

**Objective**

- To facilitate selective movements of the face
- To prevent asymmetry at rest and during activity
- Regulate tonus in the facial muscles

To be able to inhibit overactivity, often several interventions must be combined. A helpful order could be:

1. Choose a position with a rather big base of support, e.g. in side lying or half sitting. If the patient is lying on the side, it is helpful to position him on the overactive side, with good support for the neck. The contact by the pillow might already help to release the hyperactivity.
2. Bring the patient's hands into his face / or contact by the hands of the therapist in the patient's face: The therapist brings his own hand or the hands of the patient to those areas in the face, where the muscles are overactive. The head and the jaw should be stable. The hand(s) give a clear, firm contact, without moving too much.
3. Use active movements in the opposite way of the overactive pattern: When the face is symmetrical at rest, and the overactivity is inhibited, there is an optimal starting point for facilitation of selective movements (in the opposite direction of the hyperactivity)

*Example: A patient has much overactivity in both mm occipitofrontalis, seen as the eyebrows are raised constantly. The therapist inhibits the overactivity by facilitating a rather long neck, and giving contact to the patient's forehead with her hands, until the Mm occipitofrontalis relaxes. Afterwards, the therapist facilitates the patient to frown.*

#### **Techniques to inhibit overactivity can be used when:**

- The patient at rest or during movement shows abnormal activity in other parts of the face, avoiding selective movement/ function/ activity

#### **Evaluation**

##### **Signs that techniques to inhibit overactivity are appropriate/helpful:**

- The patient's face looks more symmetrical (at rest)
- The patient is able to move selectively, both in the more and the less affected side of the face

##### **Signs that techniques to inhibit overactivity are not appropriate / helpful:**

- The patient's face looks more asymmetrical (at rest)
- The patient's motor behaviour does not change / the overactivity increases

### **Box: "Methods / Techniques"**

#### **Positioning**

Means, that all body segments (pelvis, thorax, shoulder girdle, head and extremities) are being brought in an appropriate position to each other, to the base of support, the gravity and the activity. Each position chosen must be safe (without risk for falling or aspirate saliva). A position should never be uncomfortable or painful. Before positioning, the patient should be mobilised and postural control should be facilitated, to create optimal alignment. For patients with rather severe problems of perception, guiding (Affolter Model®) might be useful, to achieve the new position (e.g. from sitting to side lying).

#### **Objective**

- To create a dynamic- stable position in an appropriate alignment to encourage postural control and selective movements of the extremities and in the facial oral tract.

**Positioning can be used when the patient shows:**

- Mal-alignment because of altered tonus / lack of postural control
- Problems with perception
- Lack of endurance
- Low arousal
- Lack of selective movements in the trunk, the extremities and /or the facial oral tract
- Insufficient respiration

**Evaluation****Signs that a position is appropriate / helpful:**

- Change of the patient's motor behaviour towards the normal (movement become easier and more selective)
- The patient's tone and alignment are optimal
- The patient is more awake and alert, more calm and concentrated
- The patient's respiration is more normal

**Signs that a position is not appropriate / helpful:**

- The patient's tone increases in an unhelpful way in one or more muscles
- The patient shows associated reactions when he is trying to move
- The patient remains passive, arousal decreases
- Vegetative reactions: Sweating, increasing or decreasing blood pressure, saturation decreases, respiratory frequency increases or decreases
- The patient loses concentration, becomes restless and / or the facial expression gets tensed
- The patient has problems to perform selective movements, which otherwise are possible in a lower position

*Example: The patient is in half sitting position not able to raise his eyebrows without extending his neck, too. However, in side lying position, he is able to raise his eyebrows selectively, which means without other structures moving.*

- The patient shows signs of penetration/aspiration
- The patient's respiration becomes insufficient

When one or more signs appear, the therapist has to consider, if the position itself is inappropriate, or if he has been too long in the same position. Is there a need to find a new position for the patient, or would small changes in the actual position be adequate?

**Mobilisation**

Means, to move the whole body (e.g. for coming from one position into another), parts of the body, extremities or specific structures, as muscles, joints or connective tissue.

**Objective**

- To achieve more postural control, facilitate selective movements, higher range of movement (ROM),
- Normalize tone, optimize alignment
- Increase arousal

**Mobilisation can be used when the patient has:**

- Sensory-motor problems (lack of postural control or problems with selective movements of extremities or in the facial oral tract)
- Increased mobility, that influences selective movement
- Cognitive and / or perceptive problems, e.g. decreased arousal, neglect, lack of attention

**Evaluation****Signs that mobilisation has the required impact/ is appropriate / helpful**

- Movement gets possible, easier, more selective
- Range of Movement (ROM) increases
- More optimal alignment
- The patient does feel the mobilised parts of the body better and / or uses them
- The patient is more awake / attentive, alert or concentrated

**Signs that the mobilisation does not have the intended impact:**

- The patient has pain or feels uncomfortable
- ROM become smaller or there is no change at all
- Alignment or tone does not change or become unhelpful, no chance for movement
- No change in sensibility or proprioception
- The patient stays or become restless, loses concentration
- No change in arousal

**Guiding**

The term "guiding" refers to the Affolter Model® ([www.apwschweiz.ch](http://www.apwschweiz.ch)). Here, the therapist physically guides the patient's body and hands in problem solving everyday life activities. The goal is to provide tactual information to the patient, about the position of his body in the environment and the activity. There are two methods for guiding, nursing and elementary guiding, described in Affolter 1991 and 2000.

**Objective**

- To provide relevant tactile information in a structured way to the patient about his body in the environment and the ongoing activity.
- To encourage problem solving processes and formation of hypotheses in everyday life activities

**Guiding can be used, when:**

- The patient has perceptive / cognitive problems
- The searching, acquiring, and treating of information from the environment is disturbed. This leads to decreased ability to problem solving in everyday life activities.

**Evaluation****Signs that guiding is appropriate / helpful:**

- The patient pays attention to the ongoing activity

- The patient seems to understand the activity (comprehension)
- The patient adapts his tone in the activity or pursues movements by himself
- The patient executes the next step in the activity
- The patient's behaviour changes towards normal behaviour, required for the context

#### **Signs that guiding is not appropriate / helpful**

- The patient becomes (more) restless
- His tension / tone increases
- No changes in the patient's behaviour

Here, the therapist should consider, if the level or the way of guiding should be modified or if guiding is an adequate intervention in that context.

#### **Facilitation**

Facilitation is a technique, where- most of the time via manual contact- the sensory and proprioceptive systems is activated. Facilitation is an active learning process, helping a person to overcome inertia, continue or terminate functional tasks (Vaughan Graham 2009, 2016, Gjelsvik 2016). Facilitation is never passive. The therapist uses facilitation, when she wants to work on the patient's postural control or selective, functional movements in the facial oral tract. The place, direction and duration of facilitation might vary.

#### **Objective**

- To allow / facilitate movement and change motor behaviour

#### **Facilitation can be used, when the patient has:**

- Inadequate motor behaviour
- Decreased / lack of postural control
- Problems to perform selective movement

#### **The various intensity of facilitation**

##### **Continuous facilitation**

The therapist chooses to facilitate continuously, when the patient:

- Loses postural control when the therapist stops to facilitate ("hands off")
- Does not have the idea to or the possibility to initiate, accomplish or complete a movement / function / activity
- When the therapist stops to facilitate, selective movements are not possible AND / OR mass movements or associated reactions appear
- In general, the quality of movement decreases without facilitation

##### **Facilitation in between, over short sequences**

The therapist chooses to facilitate in between, if:

- The patient can keep up postural control over a short while
- The patient takes over, initiates or completes a movement / function or activity in an adequate quality / quantity spontaneously

**Facilitation to initiate movement or patterns of movement**

The therapist facilitates to initiate movement / function / activity, if:

- The patient has sufficient postural control and is able to keep it to take over, continue and to finish/ complete a movement, function/ activity / task
- The patient is able to perform spontaneous, selective movement in the facial oral tract

**Evaluation****Signs that facilitation is appropriate / helpful:**

- Motor behaviour changes towards the normal
- The patient become (more) active
- Movement become easier, more selective

**Signs that facilitation is not appropriate / helpful:**

- The patient's tone increases in an unhelpful way
- Associated reactions occur when the patient tries to move
- Motor behaviour does not change
- The patient remains passive

**Box: "Guiding / instruction / supervision of patients and / or relatives / helpers / nursing staff"**

Guidance can be offered to certain problems in activities. For example, if the patient has facial palsy, he might be instructed to self training or specific interventions, (e.g. how to inhibit overactivity). Or, the patient is supervised if he performs the self training in a proper manner. It might also be, that relevant staff or relatives are supervised, if they perform the learned interventions in a correct manner.

Guidance / instruction / supervision of the patient / nursing staff / helpers / and / or relatives includes both, verbal and written explanations, supplied by practical exercises of the interventions chosen. When relevant, the use of pictures or photographs might be beneficial, too. It is the therapist's responsibility to perpetual make sure, that the interventions are performed in a correct manner and to adopt the interventions towards the patient's current need. The patient / relatives / helpers or nursing staff should have the possibility to contact the therapist in case of questions or if there are problems, when running the interventions.

**Objective**

- To involve the patient / relatives /nursing staff / helpers as far as adequate and possible, to prevent complications, e.g.. loss of mobility in the more affected side or overactivity in the less affected side of the face
- To enable optimal activity and participation in a quality as good as possible (e.g. to be able to drink from a glass without drooling)
- To promote learning / establishing of functional movement / patterns of movement (e.g. to clean the mouth for remains/ residues during eating)

- To ensure helpful and structured input to the facial-oral tract (e.g. by passively mobilise parts of the face, when active movement is not possible yet)
- To inaugurate relevant interventions into the patient's everyday life, aiming towards optimal function, and activity

**Guidance/instruction /supervision can be used, when the patient:**

- Has the prerequisites (perceptive, cognitive and senso-motory) to be responsible for own training / treatment
- Is not able to independently perform training / treatment by himself, but the relatives / nursing staff / helpers are resources that could be involved

**Evaluation**

**Signs that guidance / instruction / supervision of the patient and / or relatives / helpers / nursing staff is appropriate:**

- The patient's level of function increases
- No or less complications occur
- Unwanted / unhelpful symptoms (e.g. hyperactivity) are reduced or disappear

**Signs that guidance / instruction / supervision of the patient and / or the relatives / nursing staff / helpers does not have the required effect or should be modified:**

- Complications or unwanted symptoms do appear, e.g.. pain or hyperactivity
- The self training is not at all carried out or only infrequently, because the patient or the relatives / nursing staff / helpers are wary about how to do it or they do not have the resources to do it

**Box: "Therapeutic eating and drinking with focus on facilitation of facial movements"**

In general, therapeutic eating means that the therapist uses different consistencies in a very controlled situation, to work on the problems in the swallowing sequence (see also Chart and manual: Swallowing, eating and drinking"). Chewing firm food wrapped in gauze might be used or "pureed consistencies" or more or less thickened liquids. The therapist must carefully reflect, if the patient has the prerequisites for therapeutic eating (taught on the F.O.T.T.® basic course). Therapeutic eating can be used with the focus on facial movements, too.

**Objective**

- To facilitate selective, functional movements in the face in an everyday life context

**Therapeutic eating and drinking with focus on facilitation of facial movements can be used when the patient has:**

- Problems to perform movement in an abstract context
- Potential and need to transfer selective active movements into a sequence of movement in an everyday life context.
- Needs repetition in different situations to encourage learning of functional sequences of movement

*Example: The patient has difficulties to purse the lips on verbal request. The therapist guides the patient to pour a glass of juice. She stabilizes the patient's head and jaw and places the straw between the patient's lips. Now, the patient adequately sucks the juice from the straw, pursing the lips.*

## Evaluation

### Signs that therapeutic eating with focus on facial movements is appropriate/ helpful:

- The patient is able to perform selective, functional movement / sequences of movement
- The patient is active
- The patient is able to keep upright postural control, at least for a short time

### Signs that therapeutic eating with focus on facial movements is not appropriate/ helpful:

- The patient loses postural control
- The patient remains passive
- The patient shows associated reactions / mass movements

## Box "Facilitation to swallowing"

Facilitation to swallowing is an important method and technique that might prevent penetration and / or aspiration. Here, the therapist stabilises structures, relevant for swallowing (e.g. head and jaw) or moves structures relevant for swallowing (e.g. the tongue) with specific handling. These handling is taught at the F.O.T.T. basic courses. Facilitation to swallowing might be individual different, depending on the patient and his problems.

The technique should be used, as soon as the patient tries to initiate swallowing (often seen in pumping jaw movements), or if the patient should swallow, but does not initiate it.

## Objective

- To increase the rate and quality of swallowing
- The patient learns to swallow spontaneous and sufficient again
- To prevent penetration / aspiration

## Techniques to facilitate swallowing

- The therapist stabilises the patient's head and the lower jaw in an optimal alignment
- The therapist facilitates the first third of the tongue upwards, towards the hard palate, from the outside of the floor of the mouth
- The therapist facilitates the second third of the tongue upwards towards the soft palate, from the outside of the floor of the mouth
- The therapist gives an input from the floor of the mouth towards the region of the vallecular space, so the patient is able to feel remains of saliva
- The therapist mobilizes the patient's tongue within or outside of the mouth, to prepare the pharyngeal stage of the swallowing sequence

- The therapist facilitates active tongue movements within or outside the mouth, as a preparation for the pharyngeal stage of swallowing
- The patient gets input to feel saliva, that might sit in the pharynx, e.g. by working in the expiration phase of the respiration cycle. If possible, the patient's voice might get used for that input, too.
- The therapist mobilises the patient or parts of his body, e.g. the upper trunk or the head, to "disturb" remains of saliva that might sit in the mouth or pharynx, to elicit a swallowing response

#### **Facilitation to swallowing can be used when the patient:**

- Does not swallow spontaneously (e.g. he initiates swallowing with pumping jaw movements or does not swallow at all)
- Does not swallow sufficiently, e.g. the patient's tongue pushes forward when swallowing, and saliva is not transported towards the pharynx, but rather out of the mouth. Other signs of insufficient swallowing: a wet voice, coughing after swallowing or saliva running out of the mouth after swallowing

#### **Evaluation:**

##### **Signs that facilitation of swallowing is appropriate / helpful:**

- The patient swallows
- The patient does show less or no pumping jaw movements before swallowing
- The patient's voice is not wet / he does not cough after swallowing
- Saliva is getting transported more sufficient/ there are less remains of saliva in the cheek (s) or on the tongue

##### **Signs that facilitation of swallowing does not have the required effect / is not appropriate:**

- The patient does not swallow
- The patient shows (many) jaw pumping movements, that might not be followed by a swallow
- There are signs of penetration / aspiration (wet voice / coughing)
- The patient has many remains of saliva in the mouth or saliva runs out of the mouth
- The patient removes the therapist's hands from the floor of the mouth / jaw or turns his head away

Here, the therapist should consider, if she should modify the technique of facilitation, or if the patient does need a different support to swallow. See "**Techniques to facilitate swallowing**".

#### **Box: "Interventions for protection of the airways"**

Protection of the airway is an important method and technique to encourage and facilitate sufficient reactions, when there are clinical signs of penetration and / or aspiration of saliva / food / liquid.

Patients, who do not perceive that they need to clear / protect the airway, do not benefit from verbal requests to cough or clear their throat. With the here described techniques, the therapist always should facilitate patients, when they: initiate cough, have ratteling breathing sounds (clinical sign of aspiration), have wet voice or try to clear their throat (clinical sign of penetration). Often, several techniques might be used as a combination.

#### **Objective**

- Sufficient protection of the airways

- Prevention of complications, as aspiration pneumonia
- Learning of functional, effective movements / patterns of movement to react on penetration/ aspiration

#### **Techniques to encourage protection of the airway:**

- **Facilitation to sufficient clearing of the throat / cough:**  
Facilitation of the abdominal and intercostal muscles for a sufficient cough. This includes support of the thorax / trunk to come forward and support to swallow after coughing or clearing the throat. If necessary, the patient should be facilitated either to spit out or to swallow (see also box: "Facilitation to swallow").
  - **Facilitation to clear throat, spit out, blow one's nose:** If there are remains of saliva / food / liquid in the pharynx, around the pharyngeal wall, the most effective way to get rid of it, would be to clear the pharynx and spit out. Secretions in the nose should be removed, either by the therapist with cotton buds, or the patient is facilitated to blow his nose. If necessary, the patient should be facilitated either to spit out or to swallow (see also box: "Facilitation to swallow").
  - **Cleaning the mouth with gauze / oral hygiene:** Secretions / remains of saliva / food / liquid that has been collected in the cheeks, on the tongue or on the soft palate, should be removed with gauze. For doing so, the therapist wraps gauze around her finger and removes the material in a structured way from the oral cavity.
  - **Cleaning of the mouth in patients with more abilities to be active:** The patient's finger can be guided towards his mouth, so he can feel the rests by himself. Then, he might be facilitated to remove them, swallowing or spitting out. Another way could be, to support the patient to find remains with the tongue, swallowing them or spit them out.

#### **Interventions to protect the airway can be used when the patient:**

- Shows signs of penetration / aspiration without spontaneous reactions for protection of the airway
- Has insufficient (e.g.. weak cough, lack of clearing swallow, remains of material in the oral cavity or unhelpful reactions on penetration / aspiration (e.g. wants to drink something, despite the airway still is not free, and the patient still is coughing)

#### **Signs that facilitation of protection of the airway is appropriate / helpful**

- The patient's voice does sound clear
- The upper and lower airway is free from secretions
- The patient coughs rather loud and powerful and can be facilitated to swallow or spit out afterwards (or does it spontaneously)
- There are no remains of food, secretions, liquid in the oral cavity

#### **Signs that facilitation of protection of the airway does not have the required effect / is not appropriate:**

- The patient's voice sounds wet
- Secretions in the upper and lower airway are to be heard during respiration
- There is no spontaneous clearing swallow / spitting out after coughing / the patient cannot be facilitated to do so
- There are remains of secretions / food / liquid in the oral cavity

- Coughing sounds rather weak / the patient continues to cough or clear the throat

#### 7.4. Evaluation: Does the patient react/respond appropriate/as expected on the chosen interventions – related towards the goal?

Here, the therapist collects her observations made since the beginning of the treatment:

- Does the treatment still seem appropriate?
- Does the goal for today's treatment still seem realistic to achieve? Or is the goal already achieved?
- Should the therapist adhere to her original plan / the interventions started up or does the patient's response require to set in with different therapeutic interventions?

Here, the therapist should answer YES or NO.

#### 7.5. Continuing the treatment in view of the evaluation

**If the answer is YES**, the therapist either should work towards the goal or, if it already is achieved, work with **repetition** and / or **shaping**. Shaping means to work on the patient's individual "limit", neither on a too high nor on a too low level. This is done by increasing requirements or offer the patient less support, (e.g. less facilitation (Gjelsvik 2016), or a position with less base of support. Shaping is an important method to encourage motor learning (Vögele 2015).

Repetition might contain different aspects: To let the patient repeat the same movement / sequence movement / activity under the same conditions gives the therapist information if the patient can keep up the quality of the movement and encourages learning. Repetition also might be used under different conditions (e.g. changed context, speed, position, range of movement, etc. (Vögele 2015). Motor learning is assumed to be most effective, when repetition is done in varied context.

*Example: A patient with a left central facial palsy has a severe overactivity on the less affected side of his face and tends to extend his neck when performing facial movements. The goal for the treatment of the day was, that he in, side lying position, with facilitation, is able to close the lips symmetrical, without extending the neck. This succeeded, and the patient is even able to do this without facilitation of the lips. Now, the therapist is using "shaping" by position the patient in a half sitting position, and facilitate symmetrical closure of the lips here, too. This also succeeds, and the therapist works on the patient's limit by integrating this movement into a functional context. She guides the patient to open his lip balm and apply it and spread it between the lips. No overactivity is to be seen.*

**If the answer is NO**, the therapist should consider, how to increase support for the patient, e.g. by offering him a position with more base of support, more facilitation, or set the goal lower for the patient. If it seems unrealistic to achieve the goal at all, the therapist should set a goal that is realistic and achievable in relation to the patient's current condition and difficulties.

*Example: A patient with a left side central facial palsy has a slight overactivity in the less affected side of the face, and always extend his neck when moving the face. The goal for the treatment of the day was, in sitting position, after some lip balm was applied on his lips, to spread it between the lips without overactivity in the*

*less affected side. The goal was not reached; the patient loses postural control and tends to fall towards his left side, while trying to move his lips. The therapist reacts and modifies her intervention: she positions the patient in a half sitting position and uses more facilitation for the head and the jaw, and the patient succeeds.*

## **7.6. Re-Evaluation: Does the patient react/respond appropriately/as expected on the chosen interventions? Is the goal for today's treatment reached? Is the long-term goal still realistic? Finish today's treatment. Clinical reasoning about the next treatment.**

Towards the end of today's treatment, the therapist does "re"-evaluate, how the modification of the chosen interventions or the onset of new interventions succeeded. For evaluation, the therapist analyses the patient's response. The following reflections might become relevant:

- Were the therapeutic interventions appropriate related to the patient's problems and the underlying causes?
- Were the interventions carried out on the right level / in the right intensity?
- What kind of interventions are most helpful for the patient, to bring out the best / most optimal selective / functional movement?
- If the goal for today's treatment was not achieved – is it still realistic / relevant for the next treatment?
- Is the long-term goal still relevant / realistic?
- Which considerations and experiences from today's treatment are relevant for the next treatment, when the process of assessment, analysis, treatment and evaluation starts again?

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