

Using protocols: pros and cons

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Courtesy of the Asklepios Stadtklinik Bad Tölz

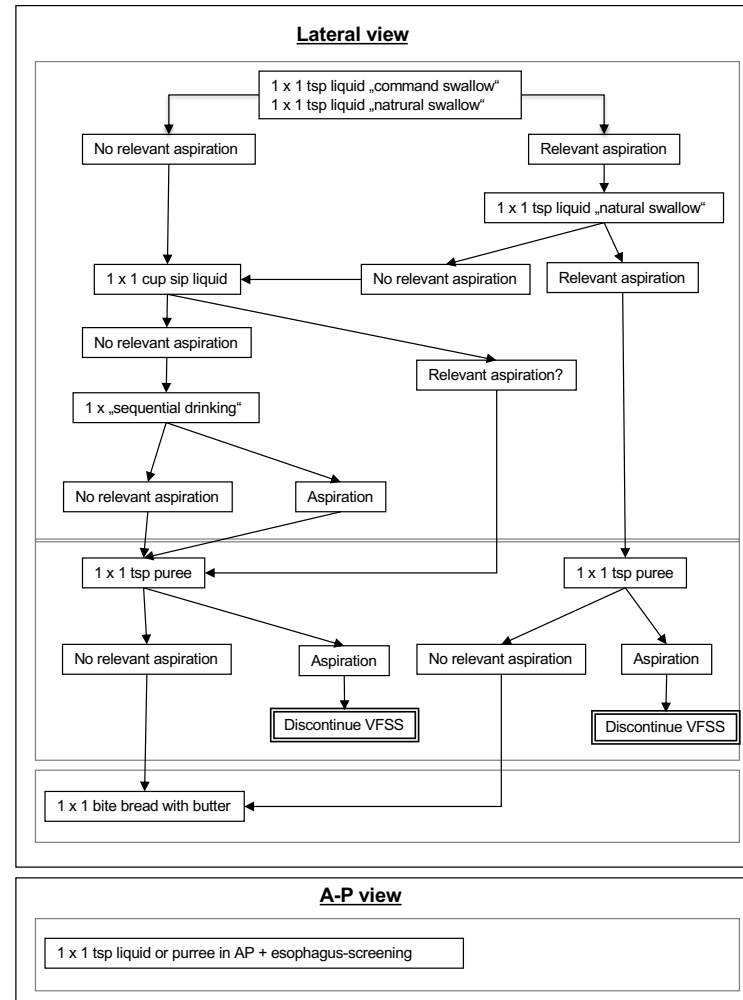
Protocols

Protocols for VFSS execution vs protocols for VFSS analysis

- VFSS **execution** can be proceeded according to a standardized protocol or purely according to the needs of the patient
- Validated protocols allow for transparency, reproducibility, accurate and reliable measurement
 - One example of a standardized protocol is the MBSImP
 - often still each hospital creates its own protocol
- But there should be flexibility for reasonable modification based on patient needs => mixture of protocol and patient-centered approach

[Daniels et al. 2019, Martin-Harris et al. 2020]

Protocol VFSS



Protocols

During the VFSS:

At the beginning, the patient is positioned in the lateral view

- Together with the radiologist, it is important to adapt the image section to the patient
 - Some pats move a lot, then the radiologic view can be chosen a little larger
 - The recommendation that the radiologist "moves/adjusts" the radiologic device when the patient moves can (from personal experience) lead to irritation of the patient

Contrast agent

- The contrast used depends on local regulations and availability
 - In the US Varibar has standardized barium products for VFSS use
 - In Germany non-ionic low osmolar water-soluble contrast medium must be used at the beginning (can be reabsorb in case of aspiration)
 - <https://steeleswallowinglab.ca/srrl/best-practice/barium-recipes/iddsi-barium-calculator/>

SLP part

During the VFSS:

- Application of bolus with contrast medium [Logemann 1998, ASHA 2004, Daniels et al., 2019]
 - At the beginning, small amounts of liquid (tsp) – at least 2 x
 - Gradually increase the amount (sip -> consecutive drinking)
 - As far as possible, allow the patient to selffeed
 - Purree – if possible, several spoonfuls, ideally selffed by pat
 - Solid food (e.g. bread spread with barium butter)
- Focus of the SLP on observable symptoms:
 - anterior leaking (leaking of bolus from the oral cavity)
 - pre-swallow pooling (the entry of bolus into the pharynx before swallow initiation)
 - Post-swallow residue (residue in oral cavity, valleculae, pyriform sinus, or diffuse)
 - Penetration (also nasal), aspiration

SLP part

During the VFSS:

- Increasing bolus size (e.g. from 1/2 tsp to sip) can prevent aspiration
 - in the case of abnormalities with small bolus sizes before implementing compensatory techniques, where justifiable, vary the bolus size first [Robbins et al. 1987]
- Use natural sips (not command sips)
 - Command swallows and natural swallows differ in terms of temporal and spatial aspects [Daniels et al. 2007]
 - They can have both positive and negative effects on swallowing
 - Command swallows can therefore be tried as a compensatory technique if applicable [Daniels et al. 2019]

SLP part

During the VFSS:

- In case of pharyngeal residues, anterior-posterior view is recommended to assess symmetry
- Following the examination, an esophageal "screening" should be carried out
 - This is not a full assessment of the esophageal phase, at most it serves to determine gross abnormalities
- Basically, the principle of "as much as necessary, as little as possible" applies
 - The aim is a meaningful examination with the lowest possible radiation exposure
- Checking different consistencies, quantities, and application types increases the likelihood of finding something that the patient can safely and efficiently take orally [Kuhlemeier et al. 2001]

Protocols for analysis

- Identification of the underlying pathomechanism that causes the observed symptoms
- There are no universal standards for the process of VFSS analysis
- Frame-by-frame and slow motion analysis are recommended
- A combination of temporal measurements and descriptive analyses is often used

[Martin-Harris et al. 2020]

Protocols for analysis

- Modified Barium Swallow Impairment Profile (MBSImP) developed 2008 by Martin-Harris and colleagues
- Until now only available in English
- The only measurement tool that has undergone rigorous testing
- In order to use the MBSImP, participants attend a training until they have reached a minimum of 80% correct interpretations in the evaluation of VFSS studies
- Three domains (oral, pharyngeal, esophageal) with corresponding parameters that are evaluated using 3- to 5-point scales

Protocols for analysis

4 Components of VFSS analysis:

- Anatomic abnormalities
 - Judgement of structures in collaboration with radiology
 - Effects on swallowing
- Bolus flow
 - Timing measures (eg. oral transit time, total swallowing duration)
 - Directional description (penetration/ aspiration, pre-/ intra-/ post-swallow)
 - Bolus clearance (post swallow residue)

[Daniels et al. 2019]

Protocols for analysis

4 Components of VFSS analysis:

- Temporal coordination and extent of structural movement
 - Velar movement, base of tongue retraction, hyolaryngeal excursion, laryngeal vestibule closure, PES opening
 - Judged: movement relative to bolus flow and extent of movement
- Response to compensatory techniques
 - Comment on effectiveness regarding safety and efficiency

These components can be measured „subjectively“ (descriptive) or „objectively“ (measures of time or distance).

[Daniels et al. 2019]

Protocols for analysis

- Examples of „objective“ time and distance measurements:
 - Swallow reaction time – time between the passing of bolus at the ramus of the mandibula and the first superior/ anterior sudden hyoid displacement
 - Pharyngeal Transit time – Time between bolus tip reaches pharynx and the first frame when the bolus end leaves the pharynx
- For the comparison with some existing standard values, precise knowledge and, if necessary, conversion of the frame rate is required
- These measurements are time-consuming and are used primarily in the context of research

[Duchac et al. 2020]

Protocols

„Because the MBSS provides a short sampling of swallowing function and patients' physical and cognitive status may vary throughout the day, findings should be validated, whenever possible, via direct or consultative observation of patient performance at the bedside or at mealtime.

Diagnostic information attained from the MBSS, when paired with clinical observations, underlying diagnoses, and clinician judgment, provides the basis for determining and targeting patients' swallowing impairments.“

[Martin-Harris et al 2020]