


# Translation and adaption of the Yale Swallow Protocol for a Danish intensive care setting

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### Abstract

**Background:** Dysphagia related to intubation affects almost one in five patients in the intensive care unit; it may vary due to fluctuations in cerebral status and fatigue and lead to pneumonia, re-intubation and increased mortality. Taking care of patients' nutritional needs is an integral part of nursing and nurses must therefore be able to assess risk of dysphagia at all hours. However, Danish validated methods for use in the critically ill patient population are lacking.

**Aim:** To translate and adapt the Yale Swallow Protocol method for implementation in a Danish intensive care unit setting.

**Methods:** Translation and adaption followed WHO's recommendations for translation and adaption of instruments. Face validity of the Danish version was evaluated in four group interviews. These were digitally recorded,

transcribed and analysed using deductive content analysis. All interviewees gave informed consent.

**Findings:** The translated version of the Yale Swallow Protocol was easy to understand, although nurses needed to have the method explained and needed training in using the method. In addition, the Yale Swallow Protocol must be adapted to local practice in terms of identifying patients at risk of dysphagia and deciding where to document results of the screening.

**Conclusion:** The translated version of the Yale Swallow Protocol proved conceptually and culturally sound and acceptable to intensive care unit nurses. Implementation should be followed by theoretical and practical training to build a nursing vocabulary relating to dysphagia and strengthen nurses' sensitivity to clinical manifestations consistent with dysphagia.

**Keywords:** critical care, critical care nursing, deglutition disorders, dysphagia, health screening, post-extubation dysphagia.

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## Introduction

Dysphagia caused by intubation and mechanical ventilation affects between 3 and 62% of patients admitted to the intensive care units (ICU) (1). A recent, prospective study showed rates of dysphagia following intubation to be 18.3% in emergency admissions (2). Dysphagia increases the risk of aspiration, pneumonia, repeated mechanical ventilation and mortality (3, 4). Despite this, international guidelines for handling dysphagia in the ICU are lacking.

In ICU patients, dysphagia may vary around the clock as fatigue and cerebral status play an important role for

the patients' ability to swallow effectively without aspiration (4, 5). For this reason, ICU nurses must be able to assess dysphagia in the ICU patient at all hours. This will be an important addition to assessments made by speech language pathologists (SLPs) often only available during daytime. However, for nurses to be able to assess dysphagia in ICU patients, development and validation of screening procedures are highly needed.

## Background

The swallow function depends on a complicated interplay between more than 30 muscle pairs, cranial nerves, and areas in the cortex and the medulla oblongata (4, 5). We only partially understand causes for dysphagia in the ICU patients, but the following factors have been suggested as significant: Trauma to the pharynx caused by intubation, that is placing a tube for mechanical ventilation in the

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airway, critical illness neuromyopathy resulting in muscular weakness, and decreased or fluctuating level of consciousness caused by medication, delirium or critical illness (4, 5).

Dysphagia is a serious complication to critical illness, potentially increasing mortality (2). Despite this, research shows that nursing practice significantly varies (6, 7). Nurses have very different views on what constitutes safe swallowing (7). Nonetheless, it often falls upon nurses to assess patients' swallowing function and determine whether to offer the patient something to eat and drink (7). Thus, by developing valid screening methods ICU nurses may improve patient safety and reduce complications due to dysphagia caused by intubation, mechanical ventilation and critical illness.

Fiberoptic endoscopic evaluation of swallowing (FEES) is a gold standard for diagnosing dysphagia (8). FEES may be performed bedside by physicians or SLPs by testing different foods and consistencies, but some patients find the endoscopic examination of their upper airways disagreeable (9). A clinical examination by SLPs is another way to diagnose dysphagia. However, silent aspiration without choking or coughing may be difficult to detect in a clinical examination.

Screening for dysphagia in *general hospital populations* is possible by using different screening methods (1). One of the simplest and most rigorously validated tests is the Yale Swallow Protocol (YSP) (10–13). The YSP is a three-step method that consists of a short cognitive test (14), assessment of oral mechanisms (ability to protrude the tongue, smile and pucker lips) (15), and the patient's ability to drink 90 mL water from a cup or by straw without stopping, choking or coughing (10). The YSP has high sensitivity of 0.96, thus effectively identifying patients who may safely begin oral feeding and drinking (10). The low specificity of 0.5 indicates that patients who fail the YSP will need a specialised assessment by the SLP before eating and drinking are commenced (10). The clinical importance of the high sensitivity is that nurses may employ the YSP at all hours to identify patients at risk and thereby be able to prevent aspiration detrimental to patient recovery. Moreover, patients not at risk can begin oral feeding earlier, which may improve their nutritional status and well-being. However, dysphagia in ICU patients varies from other hospitalised patients because of intubation, muscle weakness and alternating level of consciousness. Translation and adaption of the YSP for an ICU setting is therefore necessary before test of validity and effectiveness in a larger validation study.

## Aim

The aim of this study was to translate and adapt the YSP method for application in a Danish ICU setting.

## Methods

Translation and adaption of the YSP method was guided by the WHO recommendations for translating and adapting instruments (16) and Cha, Kim and Erlen (17). This included forward- and back-translation of the YSP and pre-testing on the target population to assess face validity and acceptability. In addition, we pre-tested two graphic presentations of the YSP on the target population before the final layout was approved. As all authors are highly experienced and certified ICU nurses, the expert committee suggested by the WHO recommendations (16) was not employed.

AHN and HS made the forward translation of the YSP from English to Danish, compared translations and discussed and resolved differences. In Denmark, occupational therapists are the professional group responsible for clinical examination of patients in risk of dysphagia. Therefore, to ensure a correct and conceptually sound translation (17), we consulted occupational therapists on specific phrases and choice of wording. NDG, a native English speaking ICU nurse with a good command of Danish, did the back-translation from Danish to English. We repeated this process to resolve minor issues. At all stages of the translation process, NDG was blinded to the original English version. One of the original authors of the YSP (Debra Suiter) reviewed and approved of the final back-translation.

Nurses from two regional hospital ICUs participated in four group interviews to evaluate face validity of the Danish version of the YSP including two different graphic presentations.

Each group consisted of 2–3 experienced ICU nurses; AHN led the interviews that lasted 35–40 minutes each. The questioning route consisted of a short opening question and key questions relating to the clarity, layout and applicability of the Danish version of the YSP (18). The graphic presentation of the YSP was finalised and presented at the fourth group interview. The group interviews were digitally recorded, transcribed verbatim and analysed using deductive content analysis (19). We used a structured analysis matrix to categorise content relating to clarity of each step and the layout of the YSP and issues pertinent to implementation of the YSP.

All nurses participating in the group interviews gave informed consent. The study was registered with the Danish Data Protection Agency (ID 1-16-02-312-19) by the Central Denmark Region and approved by the Health Research Ethics Committee of Central Denmark Region (ID 1-10-72-181-19).

## Findings

### *Translation of the YSP*

In the translation process, we strove to produce a culturally sensitive, easy understandable yet professionally

acceptable method for dysphagia screening in the intensive care unit. A challenge was the lack of equivalent terms, terms with secondary meanings and different professional groups involved in the care for the patient with dysphagia, all of which had to be dealt with in the translation. The full Danish version and the re-translation are available in Table 1.

The title acronym YSP was not easy to say in Danish. Therefore, we rearranged the letters to "SPY", which conveyed the same meaning in Danish while being much easier to pronounce.

In step 1 of the YSP, the terms "existing" and "pre-existing" referred to patients having dysphagia and/or receiving enteral tube feeding prior to their present hospitalisation. As we were translating the YSP primarily for use in the intensive care unit, the translation had to differentiate between having a tube as part of the critical care treatment and having it due to pre-existing dysphagia. To reflect this, we chose to translate these terms into "known with", which is a generally accepted term for a pre-existing condition in Danish.

**Table 1** Original version compared to the Danish version and the retranslated version of the Yale Swallow Protocol

Original version of Yale Swallow Protocol:	Danish version, translated by HS and AHN	Re-translation by NDG
<i>Validation of the Yale Swallow Protocol: A Prospective Double-Blinded Videofluoroscopic study. Suiter, Sloggy, Leder (2014)</i>		
Yale Swallow Protocol	Synkeprotokol Yale (SPY)	Swallowing Protocol Yale (SPY)
Step 1: Exclusion Criteria	Patienter uden mistanke om aspirationsrisiko skal ikke synkefunktionsscreenes.	Patients with no perceived risk of aspiration need not be screened.
___ Yale synkefunktions screening Deferred due to NO concern for aspiration risk.	Hvis patientens kliniske tilstand forandres, så det medfører risiko for aspiration, skal patienten screenes igen før ordination af oral ernæring eller oral medicin.	If the patient's condition worsens and there is a risk of aspiration then the patient must undergo a new screening before the prescription of food or oral medication.
Any YES answer to the following risk factors will also defer administration of protocol:	Trin 1: Eksklusionskriterier	Stage 1: Exception criteria
Yes-No	Synkefunktionsscreeningen udsættes ved JA til en eller flere risikofaktorer:	The swallowing screening can be postponed if one or more of the following risk factors are positive:
___ ___ Unable to remain alert for testing	Ja Nej	yes-no
___ ___ Eating a modified diet (thickened liquids) due to pre-existing dysphagia	___ ___ Har svært ved at fastholde opmærksomheden under testen	___ ___ Has difficulty in concentrating during the test
___ ___ Existing enteral tube feeding via stomach or nose	___ ___ Spiser modificeret kost (med fortykkede væsker) på grund af kendt dysfagi	___ ___ Receives a special diet (consisting of thickened drinks) because of a pre-existing dysphagia
___ ___ Head-of-bed restrictions < 30	___ ___ Kendt med enteral ernæring via nasogastrisk- eller PEG sonde	___ ___ Is known to receive nutrition through a nasogastric or PEG feeding tube
___ ___ Tracheotomy tube present	___ ___ Hovedgærdet må højst være eleveret 30°	___ ___ The headboard of the bed can only be raised by a maximal 30°
___ ___ Nil per os by physician order	___ ___ Har trakeotomitube	___ ___ Has a tracheostomy tube
If the patient's clinical status changes resulting in a new risk for aspiration, the protocol must be readministered before oral alimentation or medications are ordered.	___ ___ Intet pr. os. ordineret af læge	___ ___ "Nil by mouth" is requested by the medical staff.
		If the patient's condition worsens and there is a risk of aspiration then the patient must undergo a new screening before the prescription of food or oral medication.
Step 2: Administration Instructions	Trin 2: Test	Stage 2 Testing
If patient is deemed an aspiration risk and all exclusion criteria in Step 1 are checked "NO," proceed with protocol:	Hvis patienten anses for at have aspirationsrisiko og alle eksklusionskriterier i trin 1 er besvaret med "NEJ" fortsættes med screening.	If the patient is considered to have a risk of aspirating and all of the exception criteria in stage 1 have been answered no then the screening can continue.

- Brief Cognitive Screen:

What is your name?  
Where are you right now?  
What year is it?

- Oral Mechanism Examination:

Labial closure  
Lingual range of motion  
Facial symmetry (smile/pucker)

"Labial closure was the ability to close the lips completely with no observable gaps. Lingual range of motion was the ability to protrude the tongue anteriorly beyond the lips and lateralise to the right and left labial commissures. Facial symmetry was the ability to smile and pucker symmetrically. Instructions were given verbally with visual demonstrations as necessary."

(Leder, Suiter, Murray, Rademaker, 2013)

Perform the 3-ounce water swallow challenge:

Sit patient upright at 80–90° (or as high as tolerated [30°]).

Ask patient to drink the entire 3 ounces (90 cc) of water from a cup or with a straw, in sequential swallows, and slow and steady but without stopping. (Note: Cup or straw can be held by clinician or patient.) Assess patient for interrupted drinking and coughing or choking during or immediately after completion of drinking.

Note: Information from the brief cognitive screen and oral mechanism examination provide information on odds of aspiration risk with the 3-ounce water swallow challenge and should not be used as exclusionary criteria for screening.

### Step 3: Pass/Fail Criteria

#### Results and Recommendations

\_\_\_ PASS: Complete and uninterrupted drinking of all 3 ounces of water without overt signs of aspiration, i.e., coughing or choking, either during or immediately after completion.

- If patient passes, collaborate with MD/PA/LIP to order appropriate oral diet. If dentate, order a soft solid consistency or regular consistency diet. If edentulous, order a liquid and puree diet.

- Kort kognitiv test:

Hvad hedder du?  
Hvor er du lige nu?  
Hvilket år er det?

- Oral-mekanisk undersøgelse:

Evne til at lukke læberne helt sammen  
Bevægelighed af tungen (Kan patienten række tunge ud over tandrækken og læberne? Kan patienten bevæge tungen ud i højre og venstre mundvig?)  
Ansigtssymmetri (smile /spidse læber)

Instruktioner gives mundligt og demonstreres visuelt om nødvendigt.

- Gennemfør synketesten med 90 mL vand:

1. Sæt patienten op (80–90°) eller så højt som muligt (> 30°).
2. Bed patienten om at drikke 90 mL vand af en kop eller med et sugerør, langsomt og roligt, uden at stoppe. (Bemærk: Kop eller sugerør kan holdes af personale eller patient).
3. Observer om patienten afbryder indtagelsen undervejs. Observer om patienten hoster eller viser symptomer på at få vandet galt i halsen undervejs eller umiddelbart efter at patienten har drukket vandet.

Bemærk: Oplysninger fra den korte kognitive test og oral-mekanisk undersøgelse giver udelukkende information om risikoen for aspiration ved synketesten, og bør ikke bruges som eksklusionskriterier for screening.

### Trin 3: Bestået / ikke bestået kriterier

#### Resultater og anbefalinger

\_\_\_ BESTÅET: Patienten drikker 90 mL vand uden afbrydelser og uden åbenlyse tegn på aspiration, dvs. hoste eller tegn på at få vandet galt i halsen, enten undervejs eller umiddelbart efter patienten er færdig.

- Hvis patienten består synketesten, ordineres en passende kostform i samarbejde med læge.

Hvis patienten har tænder, ordineres blødt eller almindelig kost. Hvis patienten ikke har tænder, ordineres flydende eller pureekost.

- Short cognitive test.

What is your name?  
Where are you right now?  
What year are we in?

- Oral motor skills examination

The ability to close the lips together.  
Movement of the tongue (is the patient able to stick his/her tongue out past teeth and lips? Can the patient move the tongue back and forth from each corner of the mouth?)  
Facial symmetry (smiling/ pouting of the lips)

Instructions can be given orally and repeated visually by miming if necessary

- Undertake a swallowing test with 90 mL of water.

1. Sit the patient up (80–90°) or as high as possible.
2. Ask the patient to drink the 90 mL of water out of a cup or by using a straw, slowly without stopping. (note: the nursing staff can assist by holding the cup or straw)
3. Observe if the patient stops drinking before he/she is finished the water. Observe if the patient begins to cough or show signs that the water is going down "the wrong way" either during drinking or immediately after the patient has finished drinking.

Note that information from the short cognitive test and the oral motor skills examination can only give an indication about the risk of aspirating in the swallowing test. It should not be used to exclude a patient from the test.

### Stage 3 Passed/not passed criteria.

#### Results and recommendations

\_\_\_ PASSED: The patient is able to drink 90 mL of water without a break and without a clear sign of aspiration. In other words coughing or other signs that water has gone down the wrong way either during, or just after the patient is finished.

If the patient passes the swallowing test then an appropriate type of food is planned in collaboration with medical staff. If the patient has teeth then a soft or ordinary diet is prescribed. If the patient has no teeth or dentures then a pureed or liquid diet is prescribed.

\_\_\_ FAIL: Inability to drink the entire 3 ounces in sequential swallows due to stopping/starting or patient exhibits overt signs of aspiration, i.e., coughing or choking, either during or immediately after completion.

- If patient fails, keep nil per os (including medications) and discuss with the MD/PA/LIP the need for an objective swallowing evaluation by speech language pathologist.
- Readminister the protocol in 24 hours if patient shows clinical improvement.

\_\_\_ IKKE BESTÅET: Patienten kan ikke drikke 90 mL vand uden afbrydelse eller patienten viser åbenlyse tegn på aspiration, dvs. hoste eller tegn på at få vandet galt i halsen; enten undervejs eller umiddelbart efter at patienten er færdig.

- Hvis patienten ikke består testen, må der ikke gives noget per os (inklusive medicin). Behovet for en objektiv undersøgelse ved ergoterapeut drøftes med lægen.
- Gentag screeningen, hvis patienten viser kliniske tegn på bedring eller efter 24 timer.

\_\_\_ NOT PASSED: The patient is unable to drink 90 mL of water without breaks or if the patient shows visible signs of aspirating, for example coughing or choking

If the patient does not pass the test then he/she is not permitted to eat or drink (also oral medication)

The need for an occupational therapist to undertake an objective test is discussed with the doctor.

Repeat the screening if the patient shows signs of clinical improvement or after 24 hours.

Step 1 of the YSP contain a series of yes-no questions, which must be checked "NO" in order to proceed with the protocol. The Danish translation had to honour this format in all questions. The phrase "unable to remain alert" was at first translated using a negation although we did recognise that ticking "NO" to a sentence containing a negation could potentially be difficult. However, based on feedback from ICU nurses, we rephrased this sentence and furthermore, rearranged the order of the sentences in step 1 to make it easier to follow (see Fig. 1).

The concept "oral mechanism" did not have an equivalent in Danish and proved difficult to translate. We consulted occupational therapists responsible for assessing dysphagia on how to translate this into a conceptually and professionally acceptable phrase that adequately would cover the assessment. Based on the suggestions made by the occupational therapists, we settled on a translation (*oral mekanisk undersøgelse*, see Table 1), which at the same time constituted a new term in Danish.

The target group for our translation was primarily nurses working in intensive care units, and secondarily, nurses working in general, non-neurological hospital settings. Neither group has a detailed understanding of dysphagia nor do they have any advanced vocabulary to describe swallowing function and dysphagia. After consulting with one of the original authors, we therefore decided to support the translation of "oral mechanism" by including a detailed description of how to assess the oral mechanism, which had been published by the same group of authors who had developed the YSP (15).

Translating the term "choking" into Danish is possible; however, the Danish equivalent term has a connotation of strangulation, which would be unacceptable to a Danish audience. To achieve a conceptual rather than a literal translation, a common Danish turn of phrase describing "getting something in the wrong throat" was chosen.

To make a culturally sensitive translation, we also had to think about professional groups involved in handling

patients with dysphagia. The original version referred to SLP's (speech language pathologists), LIP's (licensed independent practitioners) and PA's (physician's assistants). For the Danish version, this was translated into occupational therapists and physicians who are the appropriate professionals handling dysphagia in Denmark.

#### *Face validity of the Danish version of YSP*

Eleven experienced and certified ICU nurses participated in one of four group interviews (see Table 2) evaluating the face validity of the Danish version of YSP and two preliminary and one final graphic presentation of it. The first graphic presentation was in a horizontal table format, the second was in a vertical flow diagram format with arrows connecting each box (see Figs 2 and 3).


#### *Clarity of wording*

To assess clarity of wording of the Danish version of the YSP, nurses were asked to rephrase the content of each sentence and each step in their own words. Only a few problems of understanding the translated version were encountered, nevertheless, several nurses found discussing the content of the YSP beneficial and a way to make sure that they understood it.

The ICU nurses were satisfied that only patients at risk of dysphagia should undergo screening. Nurses found it easy to picture patients not at risk, and they suggested reviewing the patient's history to assess if the patient was at risk of dysphagia.

As we expected, the ICU nurses initially found answering "no" to a sentence containing a negation difficult, but, in the interviews all nurses accepted this wording after explanation and discussion. However, subsequent feedback from a broader group of nurses showed that this continued to cause problems and it had to be rephrased.

In all group interviews, nurses vented their frustration that the YSP was not developed for patients with a

SPY-ICU (Nielsen, Gow, Svenningsen, 2020)
 

Patienter uden mistanke om aspirationsrisiko skal ikke synkefunktionsscreenes. Hvis patientens kliniske tilstand forandres, så det medfører risiko for aspiration, skal patienten screenes igen før ordination af oral ernæring eller oral medicin.

**Trin 1: Eksklusionskriterier**  
Synkefunktionsscreeningen udsættes ved **JA** til en eller flere risikofaktorer:

**Ja Nej**

Har svært ved at fastholde opmærksomheden under testen

Spiser modificeret kost (med fortykkede væsker) på grund af kendt dysfagi

Kendt med enteral ernæring via nasogastrisk- eller PEG sonde

Hovedgærdet må højst være eleveret 30°

Har trakeostomitube

Intet pr. os. ordineret af læge

**Trin 2: Test**  
Hvis patienten anses for at have aspirationsrisiko og alle eksklusionskriterier i trin 1 er besvaret med " NEJ " fortsættes med screening.

<p><b>A. Kort kognitiv test:</b></p> <ul style="list-style-type: none"> <li>• Hvad hedder du?</li> <li>• Hvor er du lige nu?</li> <li>• Hvilket år er det?</li> </ul> <p><b>B. Oral-mekanisk undersøgelse:</b></p> <ul style="list-style-type: none"> <li>• Evne til at lukke læberne helt sammen</li> <li>• Bevægelighed af tungen (Kan patienten række tunge ud over tandrækken og læberne? Kan patienten bevæge tungen ud i højre og venstre mundvig?)</li> <li>• Ansigtssymmetri (smile/spidse læber)</li> </ul> <p>Instruktioner gives mundligt og demonstreres visuelt om nødvendigt.</p> <p><b>C. Gennemfør synketesten med 90 ml vand:</b></p> <ol style="list-style-type: none"> <li>1. Sæt patienten op (80–90°) eller så højt som muligt (&gt; 30°).</li> <li>2. Bed patienten om at drikke 90 ml vand af en kop eller med et sugerør, langsomt og roligt, uden at stoppe. (Bemærk: Kop eller sugerør kan holdes af personale eller patient).</li> <li>3. Observer om patienten afbryder indtagelsen undervejs. Observer om patienten hoster eller viser symptomer på at få vandet galt i halsen undervejs eller umiddelbart efter at patienten har drukket vandet.</li> </ol>	<p><b>Bemærk:</b> Oplysninger fra den korte kognitive test og oral-mekanisk undersøgelse giver udelukkende information om risikoen for aspiration ved synketesten, og bør ikke bruges som eksklusionskriterier for screening.</p>
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**Trin 3: Bestået / ikke bestået kriterier**  
Resultater og anbefalinger

<p><b>__ BESTÅET:</b> Patienten drikker 90 ml vand uden afbrydelser OG uden åbenlyse tegn på aspiration, dvs. hoste eller tegn på at få vandet galt i halsen, enten undervejs eller umiddelbart efter patienten er færdig.</p> <ul style="list-style-type: none"> <li>• Hvis patienten består synketesten, ordineres en passende kostform i samarbejde med læge. Hvis patienten har tænder, ordineres blød eller almindelig kost. Hvis patienten ikke har tænder, ordineres flydende eller purékost.</li> </ul>	<p><b>__ IKKE BESTÅET:</b> Patienten kan ikke drikke 90 ml. vand uden afbrydelse ELLER patienten viser åbenlyse tegn på aspiration, dvs. hoste eller tegn på at få vandet galt i halsen; enten undervejs eller umiddelbart efter at patienten er færdig.</p> <ul style="list-style-type: none"> <li>• Hvis patienten ikke består testen, må der ikke gives noget per os (inklusive medicin). Behovet for en objektiv undersøgelse ved ergoterapeut drøftes med lægen.</li> <li>• Gentag screeningen, hvis patienten viser kliniske tegn på bedring eller efter 24 timer.</li> </ul>
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Suiter, Sloggy, Leder (2014): Validation of the Yale Swallow Protocol: A prospective Double-Blinded Videofluoroscopic study.  
Leder, Suiter, Rademaker (2013): Can an Oral Mechanism Examination Contribute to the Assessment of Odds of Aspiration?

Figure 1 Final version of the SPY-ICU.

**Table 2** Participant characteristics

Group interviews	Participant age	Experience as ICU nurse (years)
1	65	41
	46	20
	60	31
2	26	2
	67	44
	67	44
3	42	5
	40	10
4	63	30
	56	28
	34	9

tracheostomy. This indicates that the YSP does not cover all patients in need of dysphagia assessment in the intensive care unit.

Step 2 of the YSP describes the test procedure starting with the brief cognitive test. This was very straightforward. Observation of the patients' cognitive functions is already an integrated part of critical care (20). The oral mechanism examination, which had been supplemented by a description, was easy to understand, despite using a new term. In all interviews, nurses gave examples of

how to explain this to the patient in everyday words. However, it was necessary to explain that the brief cognitive test and the oral mechanism examination were not stopping criteria, but reminders for the nurses to proceed to the swallow challenge with care. While not difficult to understand, the actual swallowing challenge did prompt a number of questions. Nurses needed to understand how to assess if the patient stopped during the swallowing challenge. Moreover, it was necessary to explain that a large volume (90 mL) of water was essential to effectively reveal silent aspiration, which is volume dependent. This illustrates that it is necessary to explain the YSP in details but also to train nurses in performing the YSP in clinical practice.

### Preferences for layout

Two different graphical presentations of the YSP were evaluated in the group interviews; a horizontal table layout and a vertical flow diagram layout, see Figs 2 and 3. Both graphic presentations used different colours for each step; in step 3, the pass option was green, and the fail option was yellow. This choice referred to traffic lights where green means go and yellow means wait. Nurses had divided preferences. Some found the flow diagram

**SPY-ICU** (Nielsen, Gow, Svenningsen, 2020)

**Trin 1: Eksklusionskriterier**  
 \_\_\_ Der er IKKE mistanke om aspirationsrisiko og der foretages ikke synkefunktionsscreening.

Synkefunktionsscreeningen udsættes ved JA til en eller flere risikofaktorer:

**Ja Nej**

\_\_\_ Kan ikke fastholde opmærksomheden under testen  
 \_\_\_ Spiser modificeret kost (med fortykkede væsker) på grund af kendt dysfagi  
 \_\_\_ Kendt med enteral ernæring via nasogastrisk- eller PEG sonde  
 \_\_\_ Hovedgærdet må højst være eleveret 30°  
 \_\_\_ Har trakeotomitube  
 \_\_\_ Intet pr. os. ordineret af læge

Hvis patientens kliniske tilstand forandres, så det medfører ny risiko for aspiration, skal patienten screenes igen før ordination af oral ernæring eller oral medicin.

**Trin 2: Test**  
 Hvis patienten anses for at have aspirationsrisiko og alle eksklusionskriterier i trin 1 er besvaret med "NEJ" fortsættes med screening.

**A. Kort kognitiv test:**  
 • Hvad hedder du?  
 • Hvor er du lige nu?  
 • Hvilket år er det?

**B. Oral-mekanisk undersøgelse:**  
 • Evne til at lukke læberne helt sammen  
 • Bevægelighed af tungen (Kan patienten række tunge ud over tandrækken og læberne? Kan patienten bevæge tungen ud i højre og venstre mundvig?)  
 • Ansigtssymmetri (smile/spidse læber)

Instruktioner gives mundligt og demonstreres visuelt om nødvendigt.

**C. Gennemfør synketesten med 90 ml vand:**  
 1. Sæt patienten op (80–90°) eller så højt som muligt (> 30°).  
 2. Bed patienten om at drikke 90 ml vand af en kop eller med et sugerør, langsomt og roligt, uden at stoppe. (Bemærk: Kop eller sugerør kan holdes af personale eller patient).  
 3. Observer om patienten afbryder indtagelsen undervejs. Observer om patienten hoster eller viser symptomer på at få vandet galt i halsen undervejs eller umiddelbart efter at patienten har drukket vandet.

Bemærk: Oplysninger fra den korte kognitive test og oral-mekanisk undersøgelse giver udelukkende information om risikoen for aspiration ved synketesten, og bør ikke bruges som eksklusionskriterier for screening.

**Trin 3: Bestået / ikke bestået kriterier**  
 Resultater og anbefalinger

\_\_\_ **BESTÅET:** Patienten drikker 90 ml vand uden afbrydelser OG uden åbenlyse tegn på aspiration, dvs. hoste eller tegn på at få vandet galt i halsen, enten undervejs eller umiddelbart efter patienten er færdig.

• Hvis patienten består synketesten, ordineres en passende kostform i samarbejde med læge. Hvis patienten har tænder, ordineres blød eller almindelig kost. Hvis patienten ikke har tænder, ordineres flydende eller purekost.

\_\_\_ **IKKE BESTÅET:** Patienten kan ikke drikke 90 ml. vand uden afbrydelse ELLER patienten viser åbenlyse tegn på aspiration, dvs. hoste eller tegn på at få vandet galt i halsen; enten undervejs eller umiddelbart efter at patienten er færdig.

• Hvis patienten ikke består testen, må der ikke gives noget per os (inklusive medicin). Behovet for en objektiv undersøgelse ved ergoterapeut drøftes med lægen.  
 • Gentag screeningen, hvis patienten viser kliniske tegn på bedring eller efter 24 timer.

**Figure 2** Horizontal table layout of the SPY.

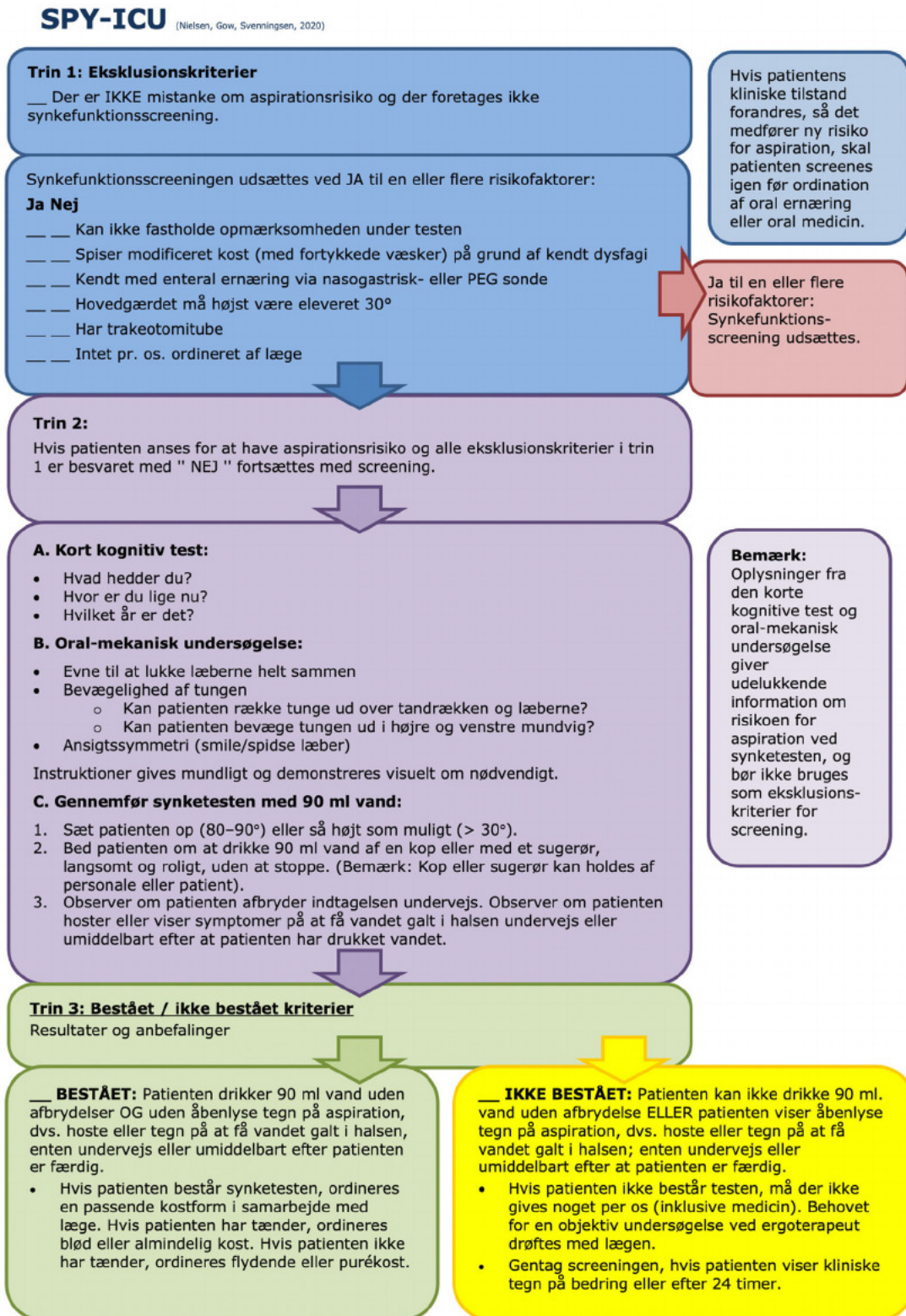


Figure 3 Vertical flow diagram layout of the SPY.

layout familiar as it resembled other algorithms used in their clinical practice. Others found the arrows confusing and they felt they had to read everything anyway. Some preferred the table style, but the horizontal layout made it difficult to read long sentences across the table. We therefore settled on a vertical table layout without arrows, but with the use of different bright colours to indicate each step. Finally, all agreed that the use of yellow colour to indicate "fail" and green colour to indicate "pass" was logic and easy to understand, see Fig. 1. The final layout was presented and approved in the final group interview with no further adjustments.

### Implementation issues

In the group interviews, we also identified several issues pertinent to implementation in clinical practice. In all group interviews, nurses raised the question of where to document the result of the YSP or whether the YSP had been deferred due to one or more exclusion criteria. As a consequence, results from previous screens should be easy to locate in the patient's charts. We therefore recommend that before implementing the YSP, guidelines for documentation should be decided locally.

Only patients at risk should be screened for dysphagia. However, some nurses noted that patients not considered being at risk of dysphagia would have difficulties passing the water challenge. This led to the realisation that more ICU patients than anticipated by the nurses probably would be at risk of dysphagia. Moreover, it illustrates that when asking health professional with little or no prior knowledge of dysphagia to undertake dysphagia screening they must receive sufficient information about the tool and when to use it.

In the group interviews, nurses asked a number of questions on how to perform the actual test. Especially, they questioned the water test and how to observe if the patient would stop drinking. This shows that training is necessary for nurses to reliably be able to screen patients.

### Discussion

Group interviews showed that although the YSP was easy to understand, nurses needed to have the YSP method explained and to be trained in using it. In addition, the YSP must be adapted to local practice in terms of defining which patients might be at risk of dysphagia and where to document results of YSP screening.

For the translation, we needed to find new terms to cover all elements of the YSP to achieve conceptual equivalence where vocabulary equivalence could not be achieved (17). However, the lack of appropriate nursing terms for dysphagia screening illustrated that this is not a core nursing activity. Christensen and Trapl (7) audited current practice of detecting dysphagia in a 9 bedded

Australian ICU and found that nurses had diverging views on what constituted safe swallowing. Moreover, nurses used everyday words, for example being able to swallow one's own saliva or cough or speak to describe patients with adequate swallowing function (7). This may indicate that nurses may need more technical terms in order to describe patients' ability to swallow. We acknowledge that saliva swallowing, coughing or speaking (7) is clearly related to the ability to swallow safely, but in the critically ill patient in the intensive care unit, these signs may have many meanings and not only be related to swallowing dysfunction.

In a review, Tanner describes that clinical judgement requires scientific and theoretical knowledge that can be applied across different situations but also a knowledge stemming from experience and from knowing the patient (21). Furthermore, Tanner argues that nurses' clinical judgment is governed by the nurse's tacit understanding of what is good and right rather than objective data about the patient's situation (21). Since dysphagia may be difficult to detect in the critically ill patients and consequences of aspirations are grave, we argue that ICU nurses may need more knowledge about dysphagia in the critically ill patient and more training in how to assess patients' swallowing function to strengthen their clinical judgement. An integral part of this will be the development of a nursing vocabulary relating to dysphagia in the critically ill patient, which may help nurses express their tacit knowledge about swallowing difficulties in the critically ill patient in the ICU.

According to the YSP, screening should be deferred if there is no concern for aspiration risk. In the group interviews, nurses found this meaningful and suggested reviewing the patients' history to assess potential risk of dysphagia. However, in the group interviews nurses did not mention risk factors described in the literature such as trauma to the airway due to intubation, reduced sensitivity of the larynx, critical illness polyneuropathy, delirium and reduced level of consciousness (4, 5). This indicates that ICU nurses may need a deeper understanding of risk factors of dysphagia in order to execute the first step of the YSP. Furthermore, several nurses expressed in the group interviews that 90 mL of water would be an unsurmountable challenge for some patients. However, prior to the interview they would not have thought of these patients as having dysphagia. This illustrates that ICU nurses need to be able to recognise and interpret subtle clinical manifestations in context of risk factors as potential signs of dysphagia.

Describing different types of learning, Illeris points out the difference between assimilative learning, where new knowledge is linked to existing patterns of understanding and accommodative learning, where existing patterns of understanding is rearranged or transformed in order for the new knowledge to fit in (22). The latter form can be

demanding and require much mental energy (22). Pointing out ICU patients with compromised awareness as potentially having dysphagia was compatible with ICU nurses' mental schemes of aspiration risk. However, the extent of the problem surprised the ICU nurses in the group interviews. Therefore, achieving a more comprehensive understanding of dysphagia in the ICU patients may also demand nurses to change their mental schemes of which patients may be at risk of dysphagia.

We therefore suggest that groups at risk of dysphagia are defined locally according to case mix. In combination with education and training, this may be a way to build experience and attention towards the patient with dysphagia in the ICU.

### Limitations

This study focused on the clarity of wording, layout and implementation issues. We collected data in group interviews. Observations of nurses performing the YSP on patients in the intensive care unit might have provided more information on how they perceived the YSP in practice. However, this was beyond the scope of this paper. Finally, nurses in all group interviews complained that the YSP excluded patients with tracheotomies as this particular patient group often has manifest swallowing difficulties. Patients may have their tracheotomy for a prolonged period, and therefore, nurses will often allow patients to try to eat and drink. This indicates that nurse initiated screening of this group is also needed although

not covered by the YSP. Other measures should address problems of this group.

### Conclusion

The translated version of the YSP conceptually and culturally sound and acceptable to ICU nurses when all elements were reviewed and explained. Before implementation, risk patients and documentation practice should be defined according to local practice. Moreover, implementation should be followed by theoretical and practical training to build a nursing vocabulary relating to dysphagia and strengthen nurses' sensitivity to clinical manifestations consistent with dysphagia.

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