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Campus

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# Nutrition Essentials: Stroke

Dysphagia and  
Malnutrition



# Stroke is the second leading cause of death and a leading cause of adult disability worldwide<sup>1</sup>

**>12 million people**  
suffer from stroke  
globally each year<sup>1</sup>



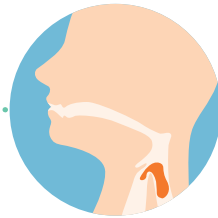
- Stroke is a complex disease, with many factors affecting a patient's health outcome.
- Early and intense rehabilitation is key to restoring patient independence by improving physical, mental and emotional functions.<sup>2</sup>



# Clinical challenges of stroke-related complications

Post-stroke complications may slow down recovery, increase hospitalization duration, healthcare costs, disability and mortality.<sup>3-5</sup>

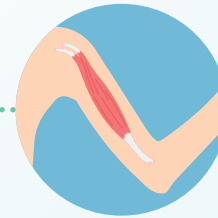
Common  
post-stroke  
complications  
are:<sup>6-8</sup>



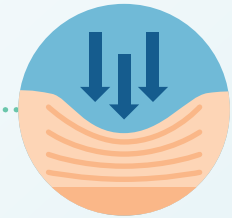
Swallowing  
problems  
(dysphagia)



Malnutrition

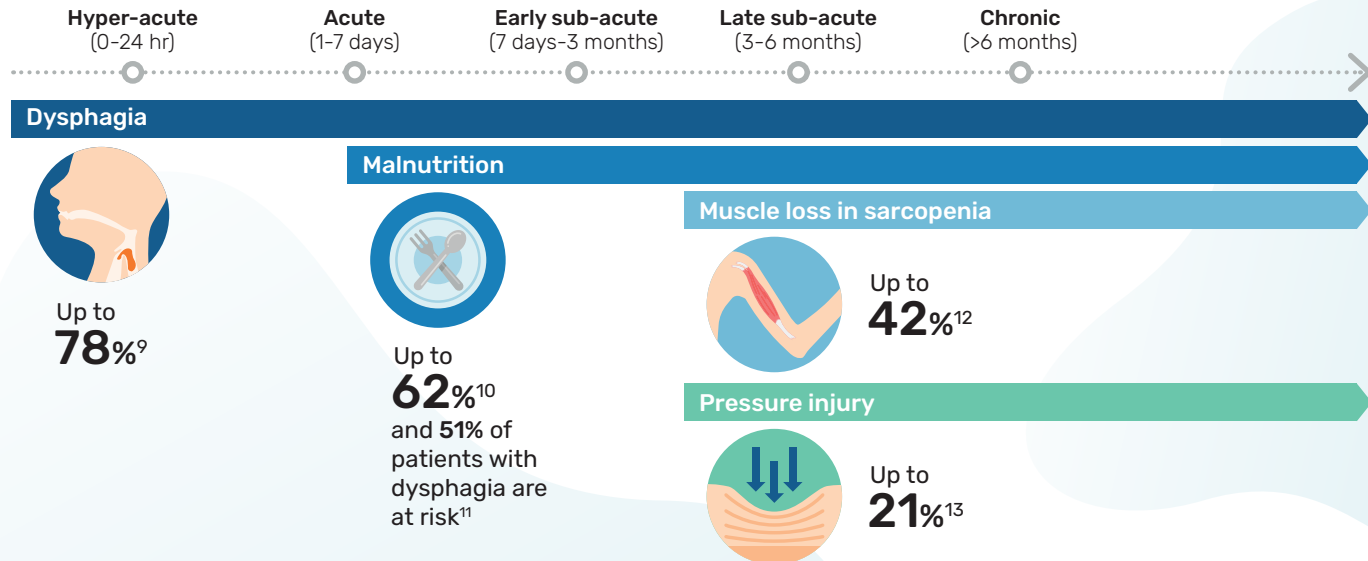


Reduced  
muscle mass



Pressure  
injuries

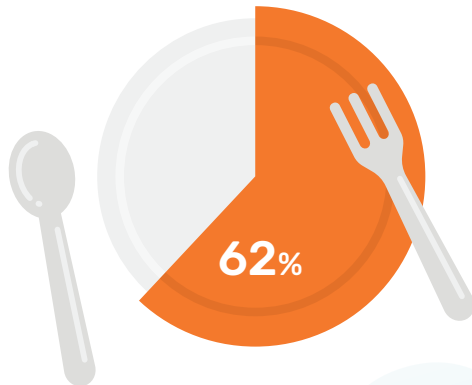
# Most stroke patients experience dysphagia, malnutrition, sarcopenia or pressure injuries throughout their disease journey



Post-stroke complications may be managed by specific nutritional intervention

# Post-stroke malnutrition is common and impacts recovery

**Malnutrition** is estimated to affect up to **62% of stroke patients**.<sup>10,14,15</sup>

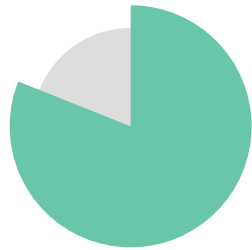


## Malnutrition in stroke patients increases the:

- Risk of mortality<sup>4,29</sup>
- Risk of poor functional prognosis<sup>5</sup>
- Length of hospital stay and readmissions<sup>4,29</sup>
- Rates of pressure injuries, uterine tract infections, chest infections and gastrointestinal bleeds<sup>5,30</sup>
- Hospital costs<sup>4,29</sup>

# Prevalence of post-stroke dysphagia

Dysphagia after a stroke occurs in:<sup>16</sup>



**29% - 81%**  
in acute stroke



**11% - 50%**  
in stroke after  
6 months



Up to **78%**  
of stroke survivors  
are affected  
by dysphagia  
(difficulty  
swallowing)<sup>9,10</sup>



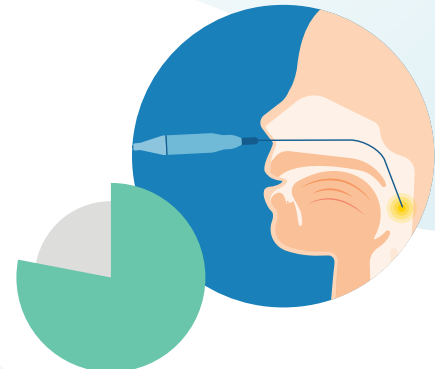
## Dysphagia prevalence after stroke varies depending on the assessment method<sup>9</sup>



**37% - 45%**  
with bedside  
screening



**51% - 55%**  
with clinical  
testing



**64% - 78%**  
with instrumental  
testing

# Dysphagia may impact the safety, efficacy and physiology of swallowing

Safe swallowing requires well-coordinated timing to move chewed food and liquids through the mouth, throat, and into the esophagus.<sup>17</sup>

Dysphagia can have many consequences and can, amongst others, affect the safety, efficacy and physiology of swallowing:



## **Safety of swallowing**

by a bolus entering the airways



## **Efficacy of swallowing**

by a bolus that remains in the mouth or throat

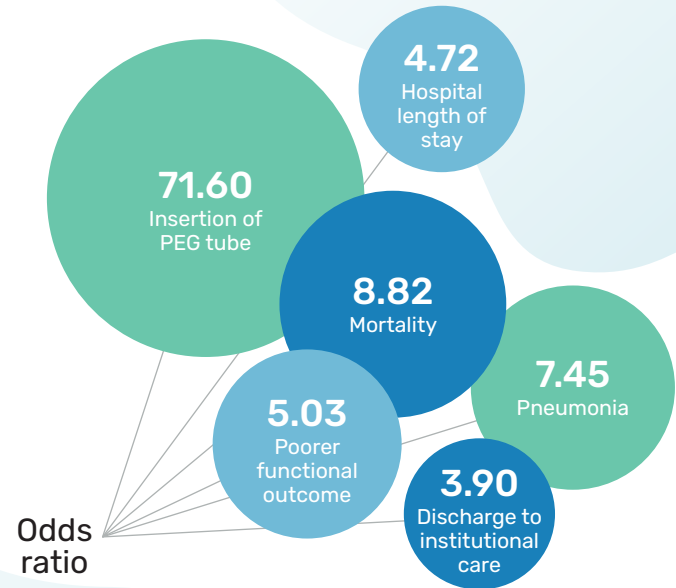
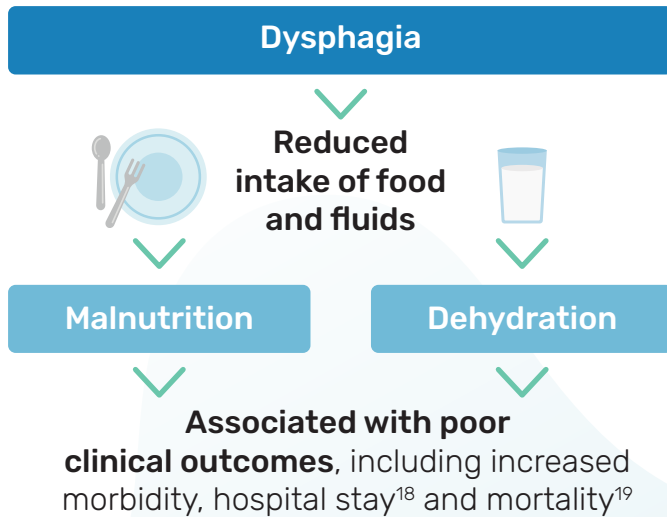


## **Physiology of swallowing**

by increasing the time to closure of the airway



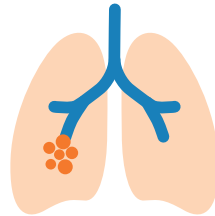
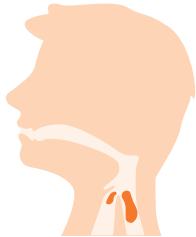
# Post-stroke dysphagia negatively impacts clinical outcomes



Post-stroke dysphagia also affects psychological well-being and level of independence and is linked to low mood and depression

# Dysphagia increases the risk of aspiration and pneumonia

Unsafe swallowing, such as in patients with post-stroke dysphagia can cause foods or liquids to enter the airways.



**52%** of patients with dysphagia suffer from **aspiration**<sup>20</sup>

In stroke patients, the risk of **pneumonia** is **3 times higher** if they have **dysphagia** and is **11 times higher** if the patient has **aspiration**<sup>9</sup>

The risk of **death** is **3 times higher** in patients with **aspiration pneumonia** compared to patients without pneumonia<sup>21</sup>

# Malnutrition associated with post-stroke dysphagia has been observed in sub-acute stroke patients<sup>22</sup>

## Study population



n= 36  
Sub-acute  
stroke with  
dysphagia



n= 49  
Sub-acute  
stroke without  
dysphagia

## Assessment

- Malnutrition (MNA-SF test)
- Blood concentration of metabolites
- Quality of life
- Daily activities

## More findings (according to MNA-SF test):



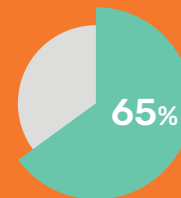
All sub-acute stroke patients showed lower nutrient levels (e.g.: Vitamins, minerals and fatty acids)

MNA-SF, Mini Nutritional Assessment – Short Form.

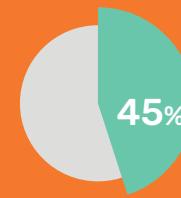


## Outcomes

% of risk of malnutrition and malnutrition according MNA-SF test



Stroke with  
dysphagia

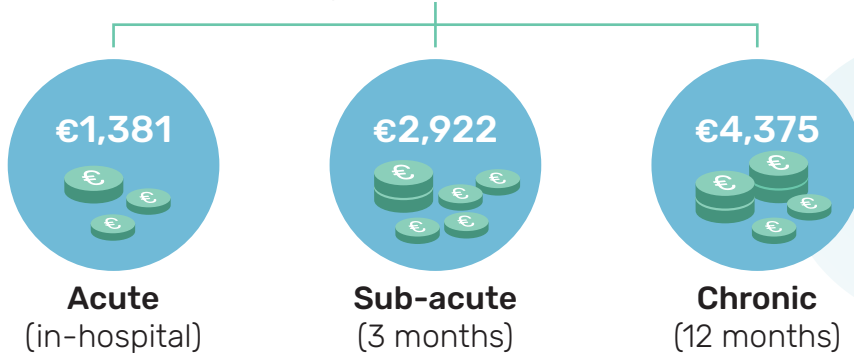


Stroke without  
dysphagia

# Economic burden of post-stroke dysphagia

Dysphagia complications dramatically increase healthcare costs for stroke patients, mainly due to longer hospital stays.<sup>14</sup>

Post-stroke dysphagia increased major total costs by:



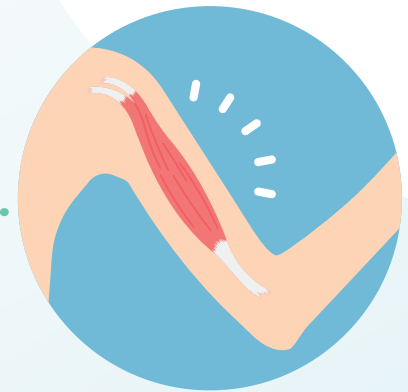
Respiratory infection and malnutrition, or its risk, increased major mean costs by over €12,000 per patient, per year.

# Malnutrition and dysphagia can also lead to sarcopenia

Sarcopenia is characterized by progressive and generalized loss of skeletal muscle mass and function, resulting in reduced physical performance.<sup>23-25</sup>



Patients with **malnutrition** had approximately **three to four times the risk** of developing **sarcopenia** than those without malnutrition.<sup>26,27</sup>









# Nutritional risk screening recommendations

- Experts recommend screening of patients with acute stroke for nutritional risk within the first days after hospital admission using validated screening tools such as the BAPEN 'Malnutrition Universal Screening Tool' (MUST).<sup>28</sup>
- Formal dysphagia screening test should be performed as soon as possible to prevent post-stroke pneumonia and decrease risk of early mortality.<sup>16</sup>
- No food or liquid including oral medication should be administered, until dysphagia screening has been done and swallowing adjudged to be safe.<sup>16</sup>



# Screening tools for post-stroke dysphagia

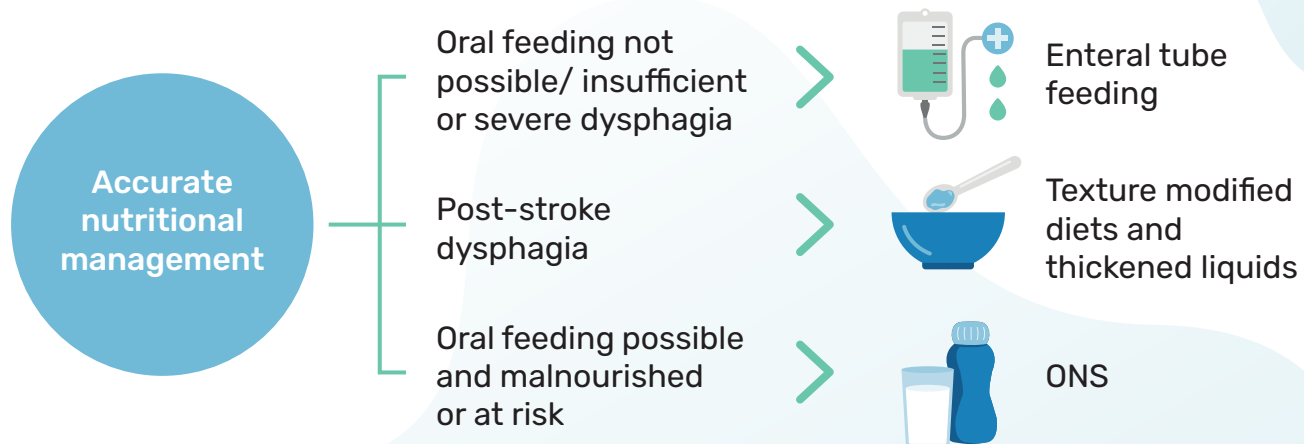
Examples of practical screening and assessment tools for post-stroke dysphagia.

	 <b>Water swallow test</b>	 <b>Multiple consistency test</b>	 <b>Fiberoptic endoscopy</b>
Suitable HCP	Nurses in stroke units with limited time/resources to assess acute stroke patients	Nurses and/or swallow specialists in stroke units with moderate time/resources to assess acute stroke patients	SLTs and/or specialist clinicians in stroke units with access to FEES medical imaging equipment and trained in its use
Description	Simple bedside screening tools that involve a functional assessment of the patient, including a water swallow challenge	Bedside screening tool that uses foods/liquids of varying consistency to help determine the severity of swallowing impairment	Specialized method for swallowing assessment after acute stroke that grades severity by visualizing the swallowing process directly in response to foods/liquids of varying consistency
Aim	Identify aspiration risk, the most appropriate feeding route, and possible need for additional specialist assessment	Identify aspiration risk, the most appropriate feeding route/consistency, and the possible need for additional specialist assessment	Provide direct visualization of the oropharynx and advise the most appropriate feeding route/consistency to be used
			

# Managing malnutrition, dysphagia and sarcopenia in patients

In addition to physical exercise for patients with sarcopenia, dietary and nutritional interventions can benefit stroke patients.

**ESPEN and ESO-ESSD recommend:<sup>8,16</sup>**

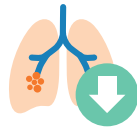


ESO-ESSD, European Stroke Organization and European Society for Swallowing Disorders; ESPEN, European Society for Clinical Nutrition and Metabolism; ONS, oral nutritional supplements.



# Dietary interventions recommended for treating post-stroke dysphagia<sup>16</sup>

## Dietary interventions



Texture-modified diets and/or thickened liquids are suggested to be used to reduce the risk of pneumonia.



Texture-modified diets and/or thickened liquids should be prescribed only based on appropriate assessment of swallowing.



Monitor fluid balance and nutritional intake in stroke patients put on texture-modified diets and/or thickened liquids.

# Nutritional interventions in treating post-stroke dysphagia<sup>16</sup>

## Nutritional interventions



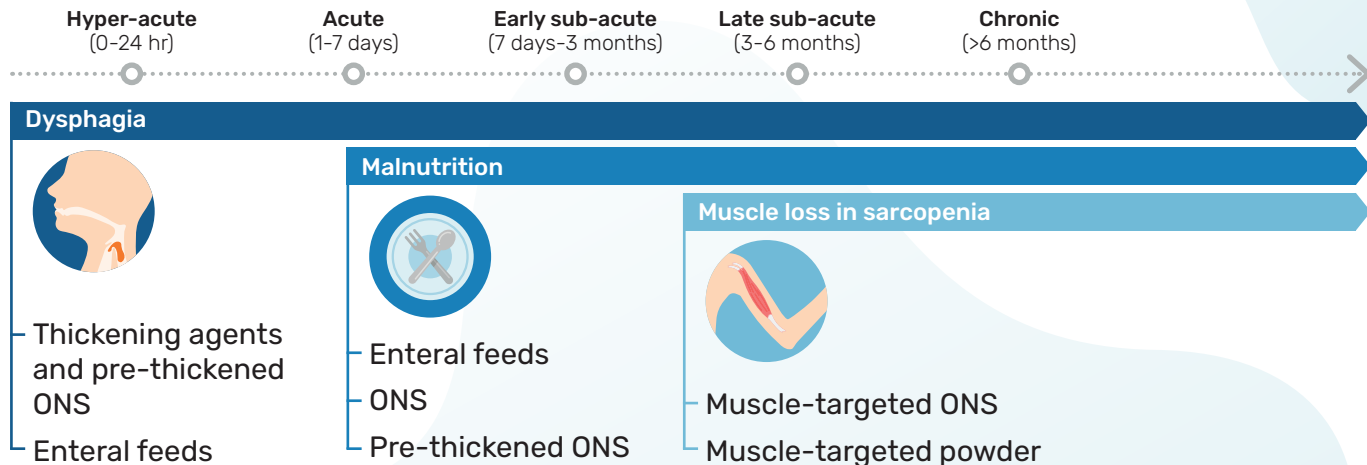
In stroke patients who present with a risk of malnutrition or with manifest malnutrition and can tolerate an oral diet, it is suggested to consider the use of oral nutritional supplementation.



In patients with post-stroke dysphagia and insufficient oral intake, it is suggested to use early enteral nutrition via a nasogastric tube.

# Nutritional intervention is essential in supporting recovery of stroke patients

- Specialized nutrition solutions can address key nutritional challenges to support stroke patients along the stroke care continuum.



ONS, oral nutritional supplements.

## References

1. Feigin VL, et al. *Int J Stroke* 2022;17:18–29.
2. Shimazu S et al. *Nutrition* 2021;83:111091.
3. Qin H, et al. *Curr Neurovasc Res.* 2021;18(5):489–96.
4. Lim SL, et al. *Clin Nutr.* 2012 Jun;31(3):345–50.
5. FOOD Trial Collaboration. *Stroke.* 2003;34(6):1450–6.
6. Yoshimura Y, *Nutrients* 2022;14:1130.
7. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide.* Emily Haesler (Ed.). Cambridge Media: Osborne Park, Australia; 2014.
8. Burgos R, et al. *Clin Nutr.* 2018;37:354–96.
9. Martino R, et al. *Stroke* 2005;36:2756–63.
10. Foley NC, et al. *Stroke.* 2009;40(3):e66–74.
11. Carrión S et al. *Clin Nutr.* 2017;36(4):1110–6.
12. Su Y et al. *Stroke Cerebrovasc Dis.* 2020;29(9):105092.
13. Langhorne P, et al. *Stroke* 2000;31:1223.
14. Marin S, et al. *Eur J Neurol.* 2021;28(11):3670–81.
15. Mosselman MJ, et al *J Neurosci Nurs.* 2013;45(4):194–204.
16. Dziewas R, et al. *Eur Stroke J.* 2021;6(3):LXXXIX–CXV.
17. Garcia JM, Chambers E 4th. *Am J Nurs.* 2010;110(11):26–33.
18. Altman KW, et al. *Arch Otolaryngol Head Neck Surg.* 2010;136(8):784–9.
19. Rommel N, et al. *Nat Rev Gastroenterol Hepatol.* 2016;13(1):49–59.
20. Teasel R, et al. *Dysphagia and Aspiration following stroke. Evidence-Based Review of Stroke Rehabilitation.* March 2018. Available at: <http://www.ebrsr.com/sites/default/files/v18-SREBR-CH15-NET.pdf>. Accessed 2 August 2023.
21. Katzan IL, et al. *Neurology* 2003;60:620–5.
22. van Wijk N. et al. *Front Neurol.* 2023;13:1028991.
23. Cruz-Jentoft A, et al. *Age Ageing.* 2019;48(1):16–31.
24. Anker SD, et al. *J Cachexia Sarcopenia Muscle.* 2016;7(5):512–14.
25. Cruz-Jentoft A and Sayer A. *Lancet.* 2019;393(10191):2636–46.
26. Beaudart C, et al. *Nutrients.* 2019;11(12):2883.
27. Batsis JA, et al. *J Am Geriatr Soc.* 2013;61.6:974–80.
28. The 'MUST' report. *Nutritional screening for adults: a multidisciplinary responsibility.* Elia M, editor. 2003. Redditch, UK, BAPEN.
29. Gomes F, et al. *J Stroke Cerebrovasc Dis.* 2016;25(4):799–806.
30. Sabbouh T, and Torbey MT. *Neurocrit Care.* 2018;29(3):374–384.

