




Fundamentals of Edema

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Lesson Objectives



1. Define edema
2. Describe two strategies for edema resolution

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Edema

- Swelling caused by excess fluid trapped in body tissues; the fluid is called "lymph."
- Most frequently occurs in the hands, arms, feet, ankles and legs.
- Normally mobilized through movement to assist lymph nodes eliminate toxins
- Disuse/Nonuse → peripheral edema

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Prevalence & Causes

Prevalence

- 33% of chronic stroke survivors (Boomkamp-Koppen, et al.; 2005)
- 37% of chronic stroke survivors (> 3 mos post ictus)
- 18.5% in acute stroke (Gerbruers et al., 2011)

Possible causes

- Dysregulation of autonomic nervous system? (Artzburger & White, 2011)
- Venous congestion d/t immobility? (Artzburger & White, 2011; Guerts, 2000)
- Vascular changes → alteration of filtration and reabsorption of fluids (Wang, et al., 2004)

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Other causes of edema

- NSAIDS
- High salt intake
- Corticosteroids (predisone)
- Some DM2 medications
- Stroke severity not related to edema severity (Gerbruers et al., *J Rehabil Med*; 2011)

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How is it measured?

Volumetry:

Measure amount of displaced water after limb is placed in container

Pictures from Performance Health Website



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Circumferential measurement

Ankle:

https://www.physio-pedia.com/Figure_of_Eight_Method_of_Measuring_Ankle_Joint_Swelling

Hand:

https://www.physio-pedia.com/Figure_of_Eight_Measurement_of_the_Hand



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How is it measured (cont'd), if pitting?

1+	Barely detectable impression when finger is pressed into skin
2+	Slight indentation. 15 seconds to rebound
3+	Deeper indentation. 30 seconds to rebound.
4+	> 30 seconds to rebound.

O'Sullivan, Schmitz, & Fulk, Physical Rehabilitation (7th ed)

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Only moderate agreement between visual and volumetric assessment

- Visual assessment and volumetric assessment administered to 125 patients w stroke
- Agreement between the two measurements is only $k = 0.23-0.38$ (moderate)
- Stick with volumetrics!

Gerbruers N, et al., *Disabil Rehabil* 2011

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Treatments

Giang et al., 2016

- 189 articles met initial search criteria
- Keywords: stroke, hand oedema, hand swelling
- 9 articles ultimately included

The Winners:

Lycra pressure garments with glove splints,
 bilateral passive motion upper-limb exercises,
 laser therapy, acupuncture



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Thank you!

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