Role of nutritional care in Falls & Hip Fracture in Nursing Home Residents

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Falls in Ireland

- 30% of community dwelling adults aged 65 yrs+ will experience at least one fall per year¹
- This figures rises to 50% for those in nursing homes¹
- UK data suggests care home residents are 3 times more likely to fall than community dwelling peers and 10 times more likely to sustain a significant injury as a result²
- Falls are a contributory factor in 40 per cent of admissions to care homes²

^{1. &}lt;u>https://www.hse.ie/eng/health/az/f/falls/</u>

^{2.} https://bmjopenquality.bmj.com/content/bmjqir/6/1/u214186.w5626.full.pdf



Consequences of falls

Serious, debilitating, life threatening¹

- In Ireland, an estimated 60,000 people aged 65+ require medical attention for a fall each year²
- Predicted to cost €1bn by 2020²
- Fracture is one of the most serious injuries to result from a fall¹

1. NICE, 2017. www.nice.org.uk/guidance/cg124 [09.08.18]. 2. <u>https://www.hse.ie/eng/services/news/media/pressrel/international-and-irish-experts-tackle-falls-prevention-and-bone-health-at-dublin-conference.htmlIHFD</u>. 3.



Hip fractures: Incidence and cost of care in Ireland



- Number of hip fracture admissions increased 16% since 2000
- **Expect 3 fold increase** in hospitalisations for hip fractures by 2046, in line with anticipated large increases in the elderly population.
- Hip fracture costs are projected to increase from €54.9M in 2014 to €162M in 2046



How are we improving patient care around hip fractures in Ireland?

Irish Hip Fracture NOCA National Office of Clinical Audit Database IHFD IRISH HIP FRACTURE DATABASE NATIONAL REPORT 2017 Better, safer care FROM BROKEN BONE TO WALKING HOME

IHFD is a clinically led, quality improvement initiative which has been recording data on hip fractures in Irish hospitals since 2012

In 2017, **3,608** patients aged 60 + were hospitalised following a hip fracture

10% were admitted from a nursing home, this increases with age to 20% over the age of 90 years³



What is the role of good nutritional care in falls and hip fractures?

How many hip fracture patients are malnourished on hospital admission?





Malnutrition is common in hip fracture patients¹

2 in 3 (63%) of hip fracture patients may be malnourished or nutritionally at risk on admission to hospital¹

Why is malnutrition so common in hip fracture?

1. Murphy, et al. Eur J Clin Nutr. 2000;54:556-562.



Malnutrition & hip fracture: inextricably linked





Malnutrition increases the risk of falls & hip fracture¹⁻⁴

1) Malnutrition reduces muscle mass & strength¹

Reduced muscle mass & strength may impair postural reflexes meaning risk of falls is increased by 3 fold²

2) Malnutrition reduces fat mass which **diminishes the protective** layer around the hip^{3,4}

3) Malnutrition **accelerates the loss of bone mineral density** at the proximal femur^{3,4}

risk of hip _fracture is increased, upon falling

Call to action: Prevent, anticipate and treat malnutrition in nursing homes to help prevent falls & fracture in the first instance

1. Neyens, et al. Arch Geront Geriatr. 2013;56:265-269. 2. Landi, et al. Clin Nutr. 2012;31:652-658. 3. Bonjour, et al. Bone. 1996;18:139S-144S. 4. Paillaud, et al. Br J Nutr 2000;83(2):97e103.

The pathophysiolology of malnutrition after hip fracture

Likely pre-existing malnutrition¹



1. Murphy, et al. Eur J Clin Nutr. 2000;54:556-562. 2. Hedström, et al. Acta Orthopaedica, 2006;77(5);741-747. 3. Avenell, et al. Cochrane Database Syst Rev. 2016;11. 4. Schurch, et al. Ann Intern Med. 1998;128:801-809. 5. Calori, et al. Injury, Int. J. Care Injured. 2007;38:11-18. 6. Li, et al. Br J Nutr. 2007;98(2):237-252. 7. Wintergerst, et al. Ann Nutr Metab. 2007;51(4):301-323. 8. Dorner, et al. Adv Skin Wound Care. 2009;22(5):212-21. 9. Bauer, et al. J Am Med Dir Assoc. 2013;14(8):542-59.

Negative nutrient balance after hip fracture: reduced intake when requirements are high

Anorexia - physical

 Caused by Inflammation
Nausea and vomiting related to disease, drugs or treatment (e.g. opioids, ohemoor radiotherapy)

Reduced food intake due to disease and disability

Eating problems

- Difficuities getting food to the mouth, ohewing, tasting and swallowing
 - Taste and smell ohanges
 - Dry or painful mouth
 - Breathlessness

Anorexia - psychological • Depression • Anxiety

Food aversion

Contraindioations to eating

- GI obstruction or lieus
 - Post surgery
- Symptoms after eating in peptio uloer disease or short bowel syndrome

So what?



1. Lumbers, et al. Clin Nutr. 1996;15;101-107. 2. Li, et al. Br J Nutr. 2007;98(2):237-252. 3. Patterson, et al. J Bone Joint Surg AM. 1992;74(2)251-260.4. Dorner, et al. Adv Skin Wound Care. 2009;22(5):212-21. Skin Wound Care. 2009;22(5):212-21. 5. Baumgarten, et al. JAGS, 2009;57:863-870. 6. Lumbers, et al. Clin Nutr. 1996;15;101-107. 7. Koren-Hakim, et al. Clin Nutr. 2012;31(6);917-921.



How do we embed good nutritional care as an integral part of hip fracture rehabilitation?

What percentage of hip fracture patients in Ireland are discharged home from hospital?





What percentage of hip fracture patients in Ireland are discharged home from hospital?

Only 22% of hip fracture patients in Ireland go home upon discharge from hospital¹

Many patients who survive hip fracture will be discharged to your care & their nutritional state may be even worse than when they went in^{2,3}



The pathology of malnutrition after hip fracture

How long does the residual inflammatory syndrome last?

Up to 10 days



Up to 1 month

Up to 3 months



The pathology of malnutrition after hip fracture

The residual inflammatory syndrome lasts for up to **3 months**¹

Call to action: Manage malnutrition in nursing homes to promote positive clinical outcomes after hip fracture and help break the falls & fracture cycle



Malnutrition increases the risk of recurrent falls & hip fractures¹

5 year observational cohort study of **24,500** hip fracture patients found <u>malnutrition was the strongest independent risk factor</u> for a second hip fracture

Hazard ratio: 2.47 (99.9% confidence interval: 1.87-3.26)





Dietary intake after hip fracture is often inadequate

Typical daily nutritional deficit of a 58kg hip fracture patient

	Estimated requirement	Average intake	Deficit
Protein	70-87 g/d ¹	42 g/d*	28-45 g/d
Energy	1680 kcal/d ^{2,3}	1150 kcal/d*	530 kcal/d
Micronutrients	RNI	Below RNI ⁴	Vitamins & minerals required for recovery processes [§]

ONS are indicated to help manage nutritional deficit

ONS: oral nutritional supplement

*Mean intake of 125 hip fracture patients from 5 randomised controlled trials⁵⁻⁹ [§]E.g. fracture repair¹⁰, immunological response¹¹ & wound healing¹². RNI: reference nutrient intakes.

1. Deutz, et al. Clin Nutr. 2014;33(6):929-36. 2. Henry. Public Health Nutr. 2005;8(7a):1133-1152. 3. Gandy, et al. Manual of Dietetic Practice. Blackwell Publishing, 2014. 4. Murphy, et al. Eur J Clin Nutr. 2000;54:556-562. 5. Botella-Carretero, et al. J Parenter Enteral Nutr. 2008; 32(2):120-128. 6. Botella-Carretero, et al. Clin Nutr. 2010;29(5):574-579. 7. Delmi, et al. Lancet. 1990;335:1013-1016. 8. Fabian, et al. Wien Klin Wochenschr. 2011;123(3-4):88-93. 9. Stableforth, et al. Br J Surg. 1986;123:88-93.10. Calori, et al. Injury, Int. J. Care Injured. 2007;38:11-18. 11. Wintergerst, et al. Ann Nutr Metab. 2007;51(4):301-323. 12. Dorner, et al. Adv Skin Wound Care. 2009;22(5):212-21.



High protein* ONS is associated with positive clinical outcomes after hip fracture

- ✓ Reduction in:
 - Hospital readmissions^{1,2}
 - Length of hospital stay¹⁻³
 - Complications¹⁻³
 - Mortality^{2,3}
 - Bone mineral density loss⁴

✓ Increases in:

- Functional status⁵
- Quality of life⁶
- Handgrip strength¹
- Muscle mass⁷
- Body weight^{1,7}
- Protein intake¹
- Energy intake¹

versus control (e.g. diet advice)

Mean prescription 2 ONS per day for 3-4 months

Compliance is better with high energy, low volume ONS^{9,10}

*At least 20% of total energy from protein⁸

1. Cawood, et al. Ageing Res Rev. 2012;11:278-79. 2. Delmi, et al. Lancet. 1990;335:1013-1016. 3. Tkatch, et al. JACN. 1992;11(5):519-525. 4. Schurch, et al. Ann Intern Med. 1998;128:801-809. 5. Tidermark, et al. Clin Nutr. 2004;23:587-596. 6. Flodin, et al. BMC Geriatrics. 2015;15:149. 7. Malafarina, et al. Maturitas. 2017;101:42-50. 8. Regulations (EC) No. 1924/2006, 2006. OJEU. L12:3-18. 9. Hubbard, et al. Clin Nutr. 2012;31:293-312. 10. Hubbard, et al. Proc Nutr Soc. 2010;69(OCE2):E164.



Malnutrition & hip fracture: A call to action in nursing homes

Call to action: manage malnutrition in nursing homes in order to

- 1. help prevent falls & fracture in the first instance
- 2. promote positive clinical outcomes after hip fracture and help break the falls & fracture cycle



