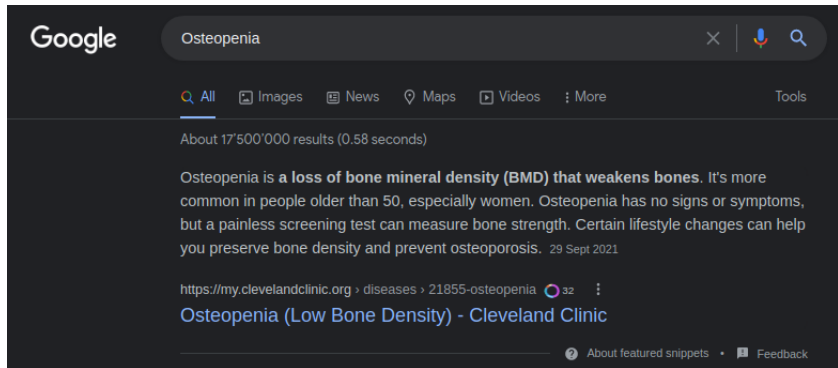




# The tree projects.







# Osteopenia from MRI images



Google



Osteopenia

× |  



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About 17'500'000 results (0.58 seconds)

Osteopenia is a **loss of bone mineral density (BMD) that weakens bones**. It's more common in people older than 50, especially women. Osteopenia has no signs or symptoms, but a painless screening test can measure bone strength. Certain lifestyle changes can help you preserve bone density and prevent osteoporosis. 29 Sept 2021

<https://my.clevelandclinic.org/diseases/21855-osteopenia>  

**Osteopenia (Low Bone Density) - Cleveland Clinic**

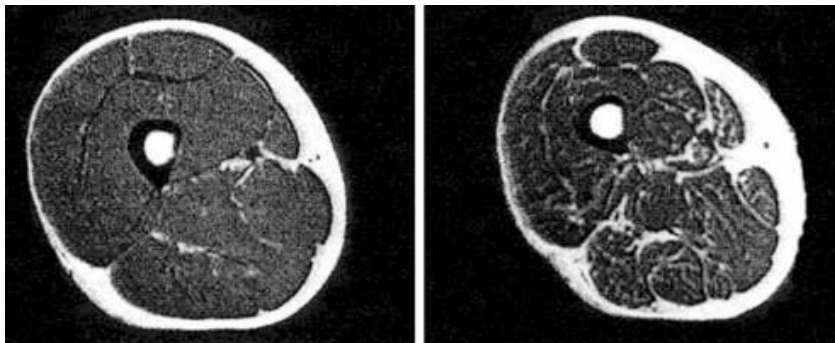
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Only density?

# Osteoporosis and bone structure

1. Research on limited micro-CT scans of vertebrae bones from Richard Abel (Imperial),
2. Structure of trabeculae determines bone resistivity,
3. Structure of trabeculae determines if patient has, or has not osteoporosis.
4. Not published due to the sample size!
5. **Can we work together on your data to check if we get similar results from osteopenia?**

## Sacrospenia detection from MRI images



# Sacrospenia, possible measurements

1.  $v_m$ , percentage of muscle volume,
2.  $v_f$ , percentage of fat volume,
3.  $v_b$ , percentage of bone volume,
4.  $p_f$ , penetration of muscle by fat (measured by how much we need to extend muscle to get rid of the fat inside),
5. Score:  $S = \alpha_1 v_m + \alpha_2 v_f + \alpha_3 v_b + \alpha_4 p_f$ ,
6. How to select  $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ ?
7. Correlation with PASE?

# Physical Activity Scale for the Elderly (PASE) Score

PASE SCORING FORM

PASE Item	Type of Activity	Activity Weight	Activity Frequency	Weight times Frequency
2.	Walk outside home	20	a.	
3.	Light sport / recreational activities	21	a.	
4.	Moderate sport / recreational activities	23	a.	
5.	Strenuous sport / recreational activities	23	a.	
6.	Muscle strength / endurance exercises	30	a.	
7.	Light housework	25	b.	
8.	Heavy housework or chores	25	b.	
9a.	Home repairs	30	b.	
9b.	Lawn work or yard care	36	b.	
9c.	Outdoor gardening	20	b.	
9d.	Caring for another person	35	b.	
10.	Work for pay or as volunteer	21	c.	
PASE SCORE:				

## Activity Frequency Values:

- Use hours per day conversion table below
- 1 = activity reported in past week, 0 = activity not reported
- Divide work hours reported in Item 10.1 by seven; if no work hours or if job involves mainly sitting with slight arm movements (Item 10.2 = 1), then activity frequency = 0.

ACTIVITY TIME TO HOURS PER DAY CONVERSION TABLE

Days of Activity	Hours Per Day of Activity	Hours Per Day
0. Never		0
1. Seldom	1. Less than 1 hour	.11
	2. 1-2 hours	.32
	3. 2-4 hours	.64
	4. More than 4 hours	1.07
2. Sometimes	1. Less than 1 hour	.25
	2. 1-2 hours	.75
	3. 2-4 hours	1.50
	4. More than 4 hours	2.50
3. Often	1. Less than 1 hour	.43
	2. 1-2 hours	1.29
	3. 2-4 hours	2.57
	4. More than 4 hours	4.29

<https://meetinstrumentenzorg.nl/wp-content/uploads/instrumenten/PASE-handl.pdf>

# Man in motion

1. Standard modality (including biplane images) with time,
2. Detect deviations from periodic behavior,
3. See separated slides.