



Starzenie

Zespół frailty- fizjologia czy patologia?

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Umowne Okresy Życia Człowieka

1. Rozwojowy do 29 r.ż.

dzieciństwo (0-14)

młodość (15-29)

2. Twórczy 30-59 r.ż.

średni (30-44)

dojrzałości (45-59)

3. Starość 60-89 r.ż.

wczesna (60-74)

późna (75-89)

4. Długowieczność >89 r.ż.

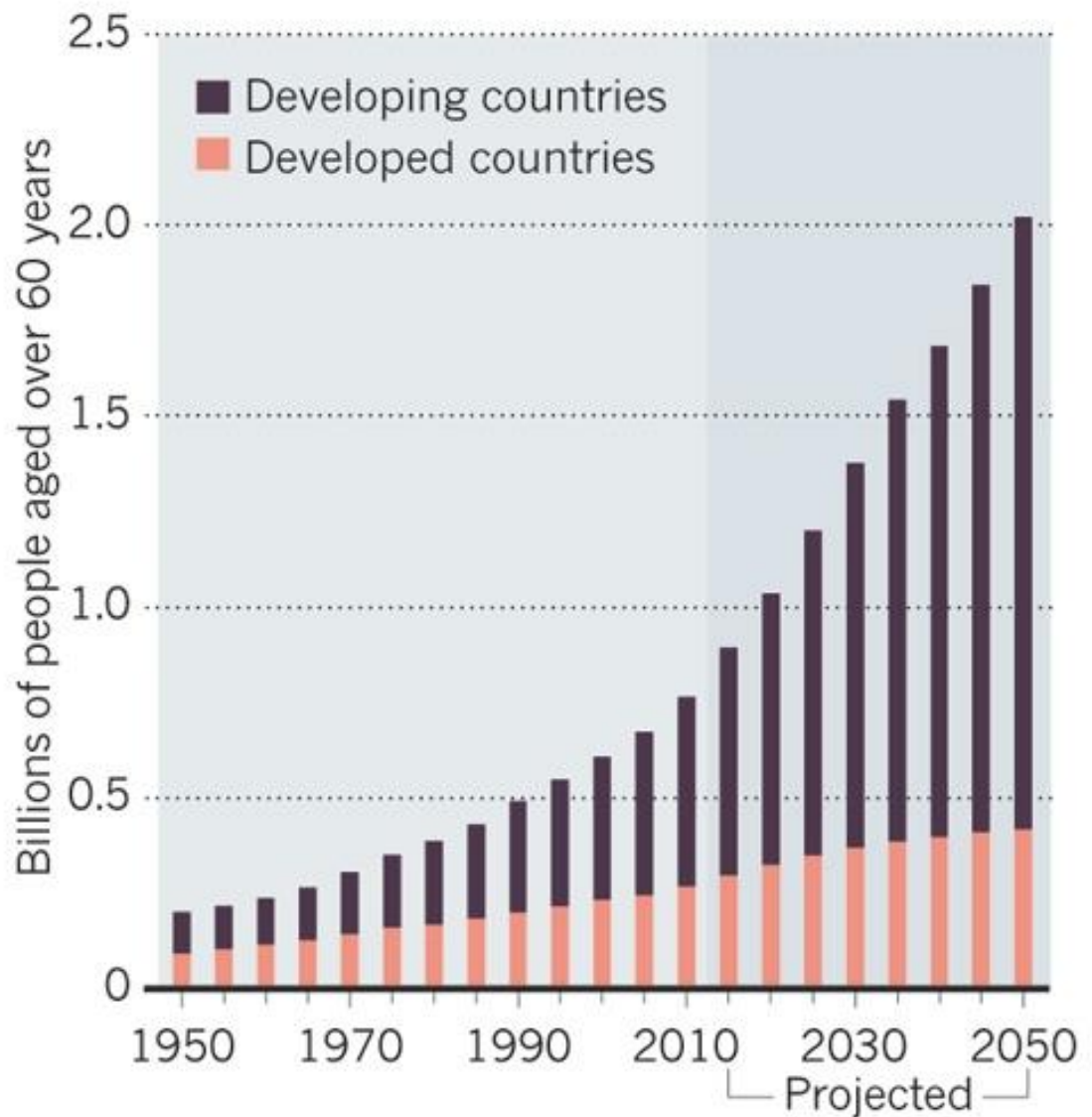
Medical research: Treat ageing

Luigi Fontana, Brian K. Kennedy, Valter D. Longo, Douglas Seals & Simo

23 July 2014

AGE OF THE OLD

By 2050, the number of people aged over 60 years is projected to be five times that in 1950.





Prognozy GUS dla ludności Polski

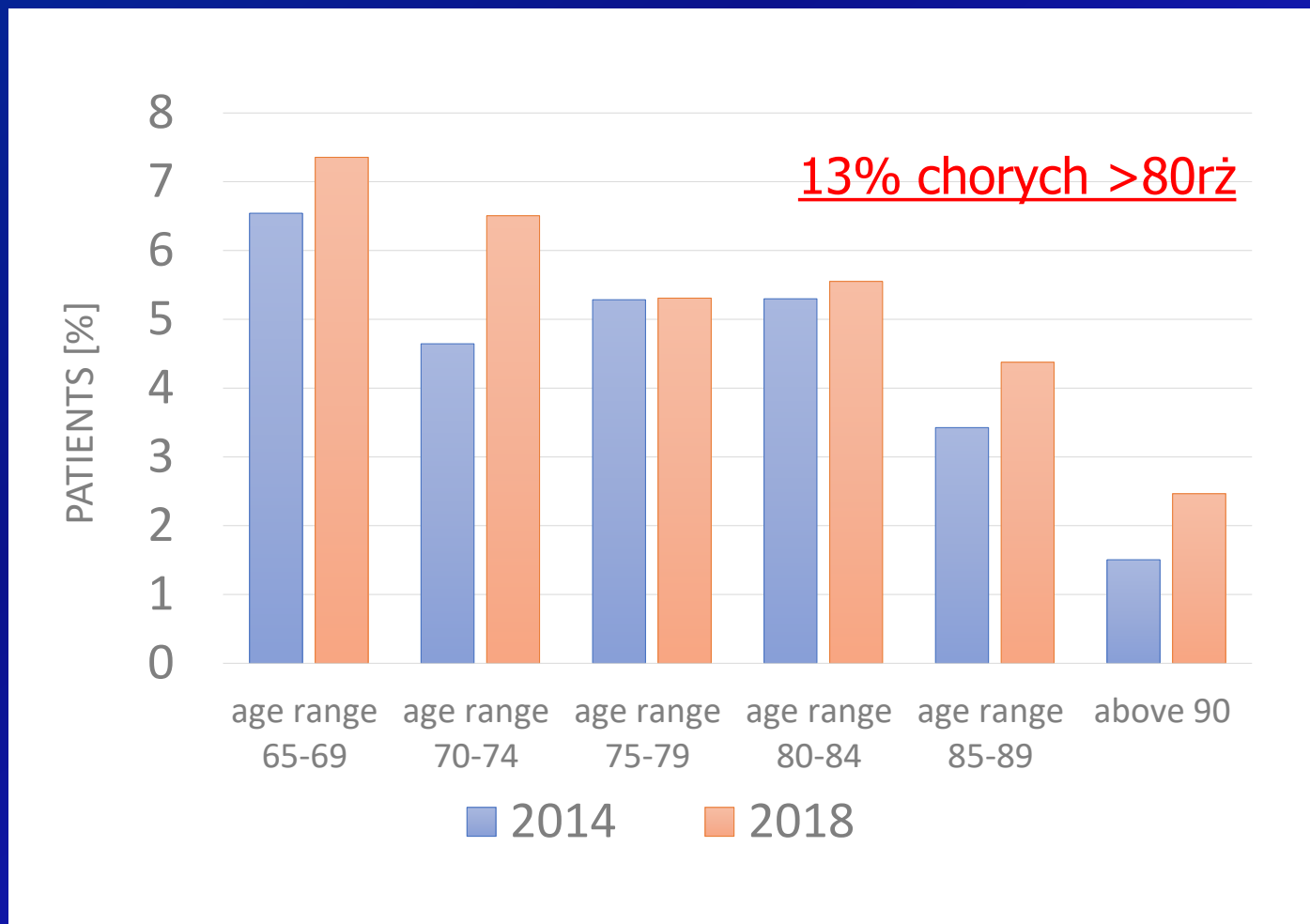
	2016	2026	2036
80-84	866 340	863 629	1 611 831
85-89	524 130	556 833	942 588
90-94	194 572	286 352	320 487
95-99	32 937	93 916	117 671
100+	4 325	14 847	31 276
	1 622 304	1 815 577	3 023 853

Przeciętne dalsze trwanie życia w Polsce

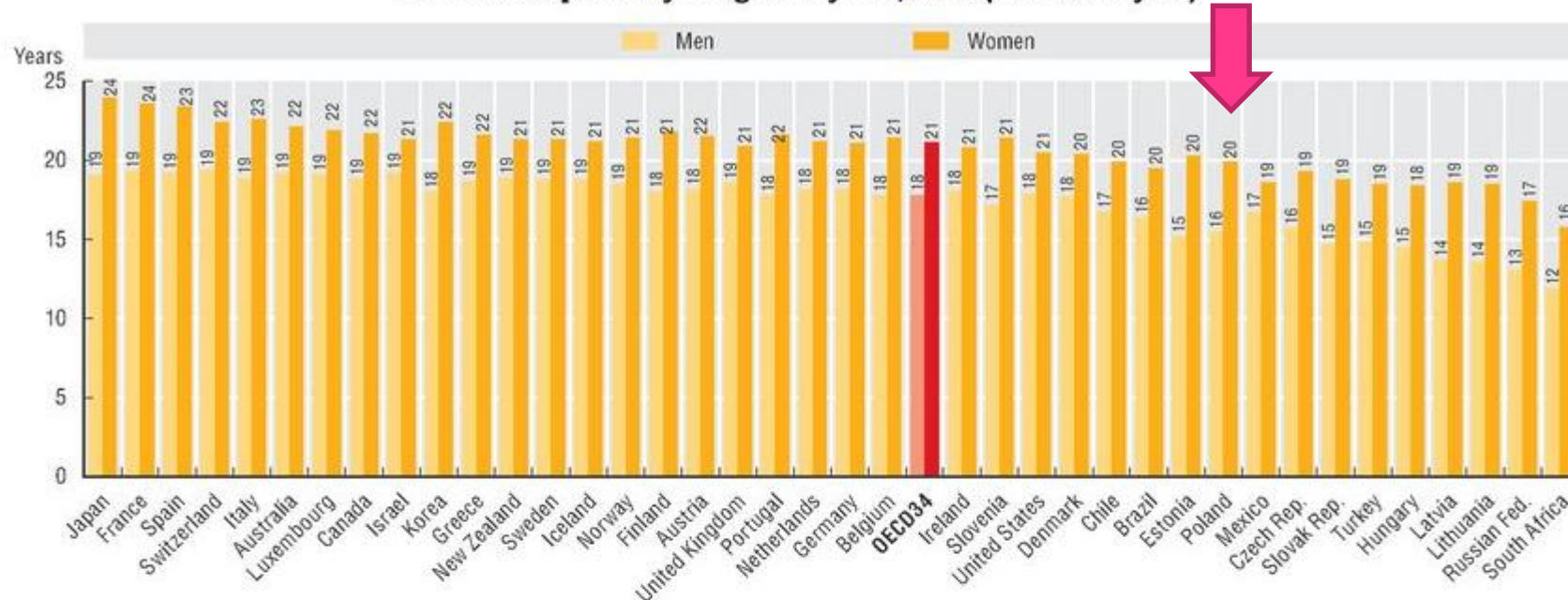
Wiek (lata)	Mężczyźni	Kobiety
60	18,52	23,76
65	15,32	19,68
70	12,38	15,79
75	9,69	12,13
80	7,37	8,95
85	5,49	6,43
90	4,03	4,54
95	2,93	3,17
100	2,14	2,23

Zgłoszenia do SOR Szpitala Uniwersyteckiego w Krakowie w latach 2014-2018

procent pacjentów >65 rż wzrósł z 26,7% w 2014 do 31.56% w 2018



11.4. Life expectancy at age 65 by sex, 2013 (or nearest year)

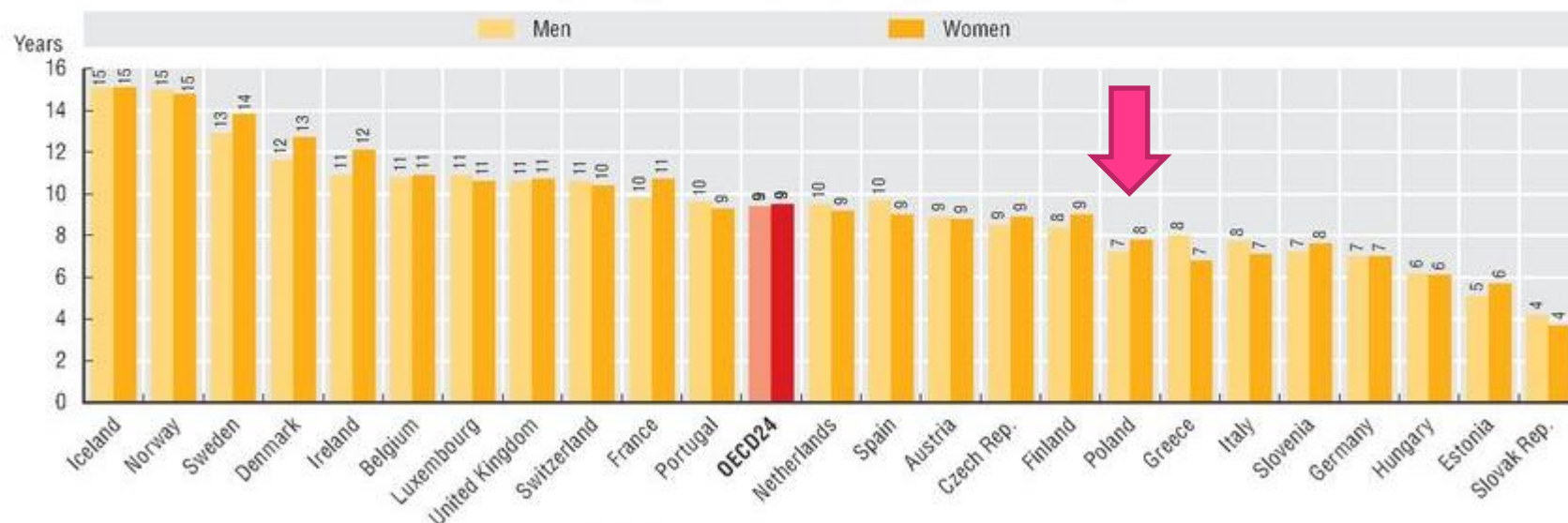


Note: Countries are ranked in descending order of life expectancy for the whole population.

Source: OECD Health Statistics 2015, <http://dx.doi.org/10.1787/health-data-en>.

StatLink <http://dx.doi.org/10.1787/888933281383>

11.5. Healthy life years at age 65, European countries, 2013



Note: Countries are ranked in descending order of healthy life expectancy for the whole population.

Is late-life dependency increasing or not? A comparison of the Cognitive Function and Ageing Studies (CFAS)

	1991	2011	Difference
Men			
Life expectancy	12.9	17.6	4.7
Independent	9.5 (9.3 to 9.7)	11.2 (10.8–11.5)	1.7 (1.2 to 2.1)
Low dependency	2.3 (1.9 to 2.7)	4.0 (3.5–4.5)	1.7 (1.0 to 2.4)
Medium dependency	0.7 (0.3 to 1.2)	1.1 (0.5–1.7)	0.3 (–0.4 to 1.1)
Women			
Life expectancy	16.5	20.6	4.1
Independent	9.5 (9.2 to 9.8)	9.7 (9.3–10.2)	0.2 (–0.4 to 0.7)
Low dependency	5.3 (4.9 to 5.7)	7.8 (7.3–8.3)	2.4 (1.8 to 3.1)
Medium dependency	1.0 (0.5 to 1.5)	1.1 (0.5–1.8)	0.2 (–0.6 to 1.0)
High dependency	0.6 (0.1 to 1.1)	1.9 (1.3–2.6)	1.3 (0.5 to 2.1)

dłuższe życie = życie w niesprawności

Kluczowe pytanie dla geriatrici – **jak zachować samodzielność/sprawność w późnym okresie życia?**



Ageing

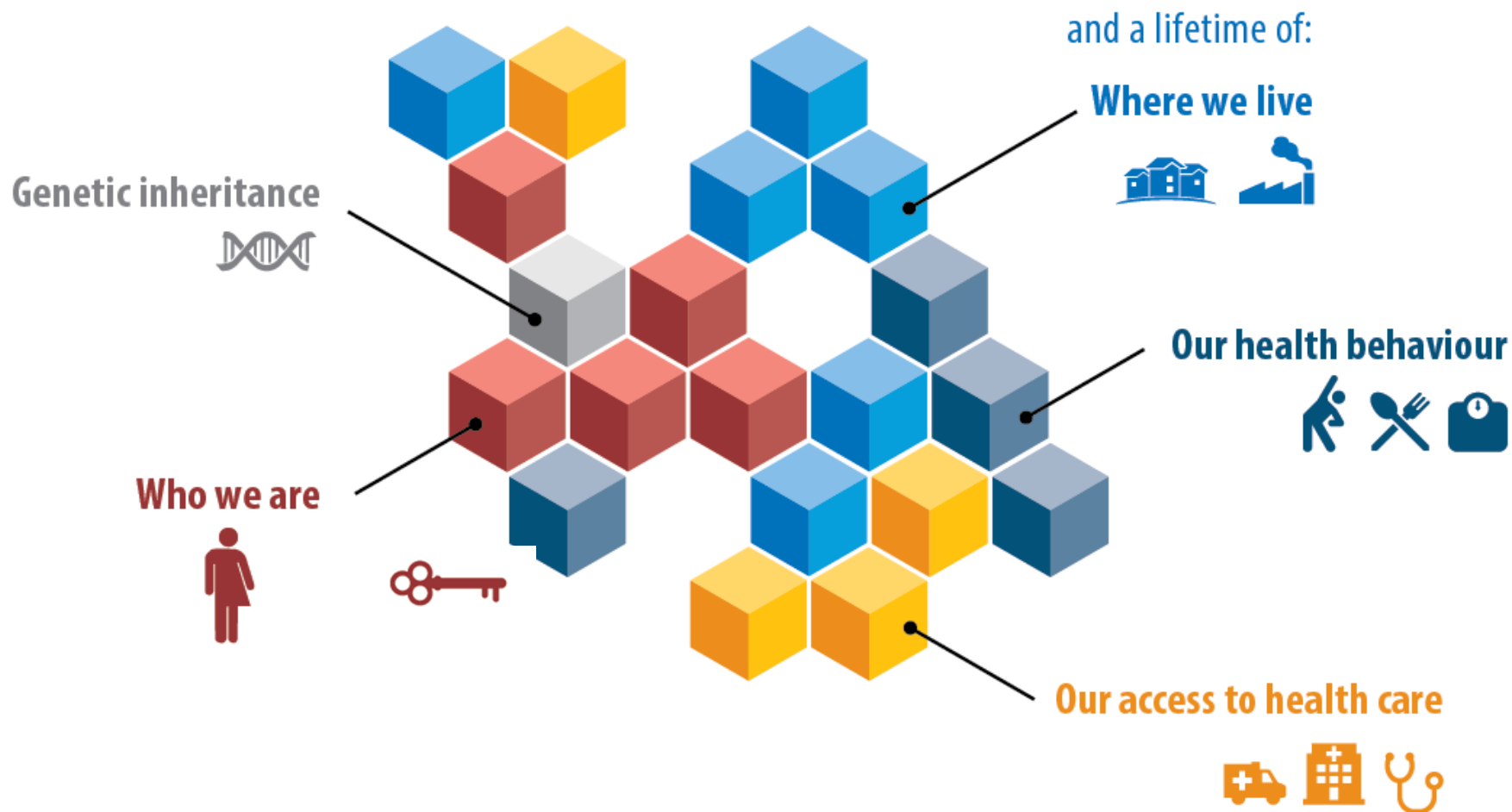


Ageing is the process during which structural and functional changes accumulate in an organism as a result of the passage of time.

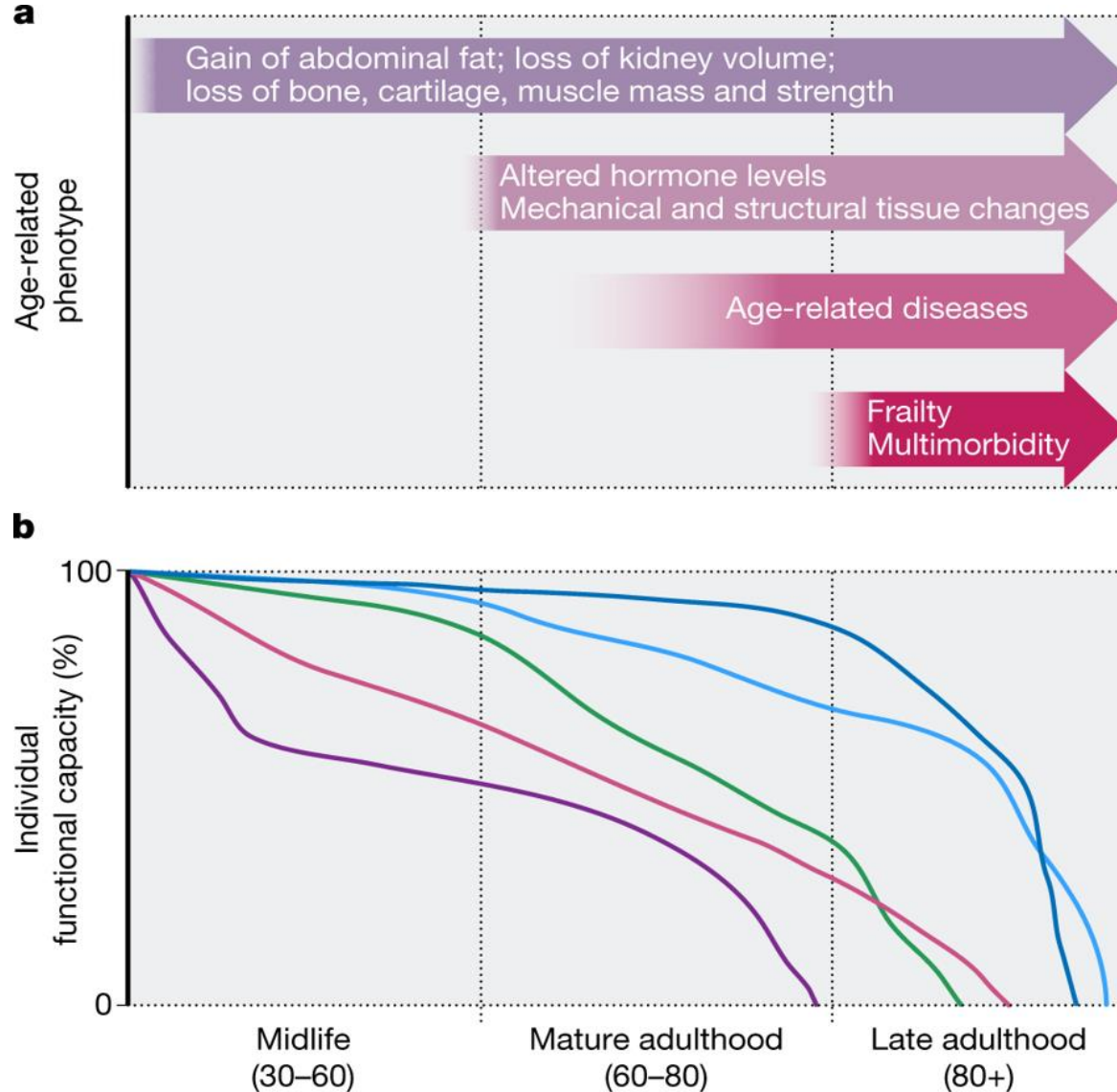
The changes manifest as a decline from the organism's peak fertility and physiological functions until death
(Nature 2017)

Determinanty starzenia

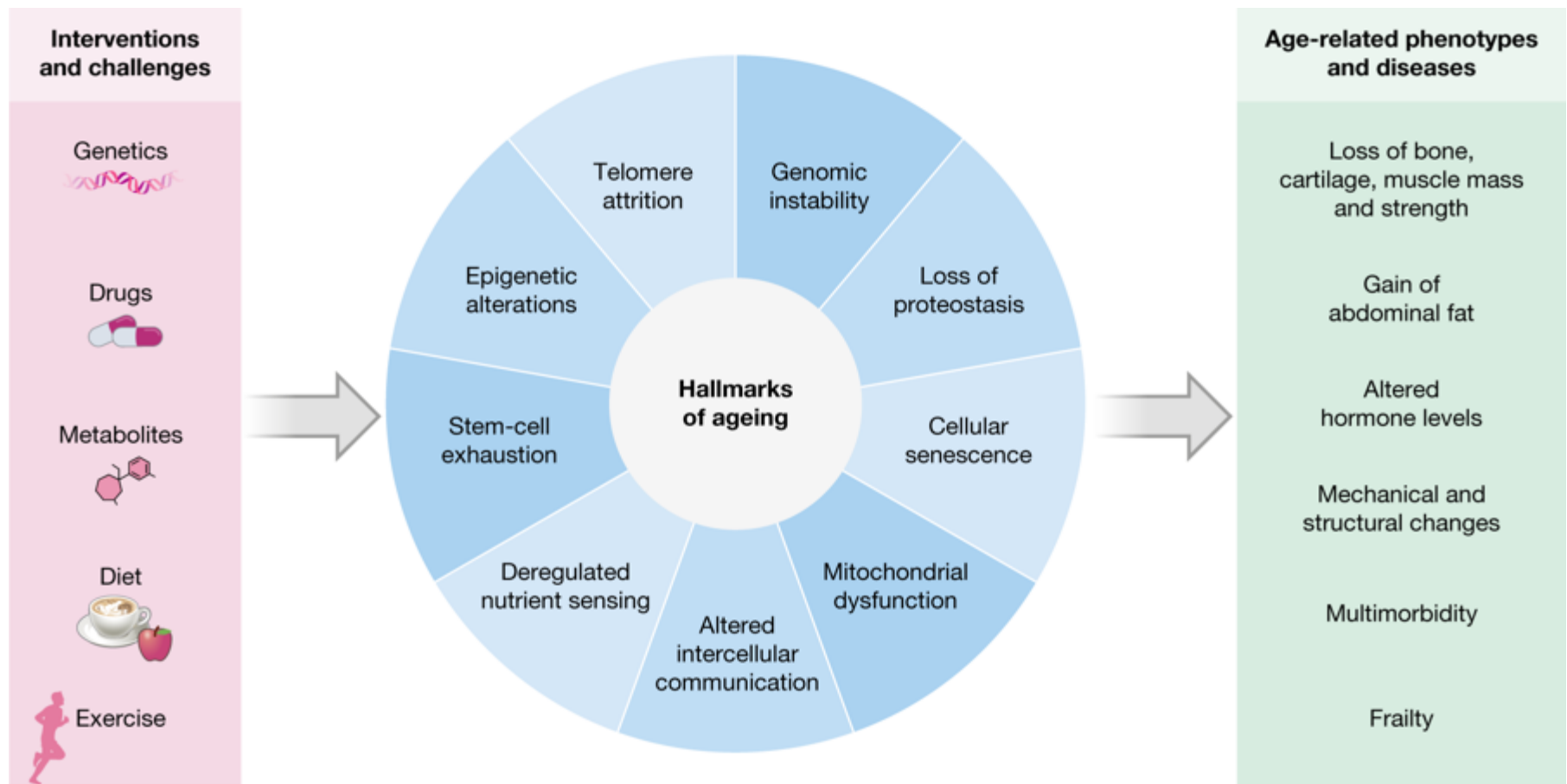
What makes us age differently?



Schematic representation of the timing and progression of age-related phenotypes in adult humans



Ageing is characterized by mechanistic hallmarks that contribute to ageing to different extents in different organisms, and in different cell types within an organism.



The Frailty Syndrome

(zespół słabości, wyniszczenie starcze?)



“Syndrom fizjologiczny, charakteryzujący się zmniejszeniem rezerw i odporności na czynniki stresogenne, wynikający ze skumulowania się obniżonej wydolności różnych systemów/układów fizjologicznych, co w konsekwencji prowadzi do podatności na wystąpienie niekorzystnych następstw”

(Fried et al. 2003)

“Zespół słabości” - zespół kliniczny charakteryzujący się co najmniej trzema kryteriami spośród niżej wymienionych:

- Spadek wagi (>5 kg w ciągu 12 m-cy)
- Osłabienie
- Wyczerpanie
- Spowolnienie chodu
- Obniżona aktywność fizyczna

Fried LP et al, J Ger Med Sci, 2001



“Osoby z wysokim prawdopodobieństwem uzależnienia się od pomocy osób innych w zakresie codziennej opieki w ciągu nadchodzących 12 miesięcy.”



EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

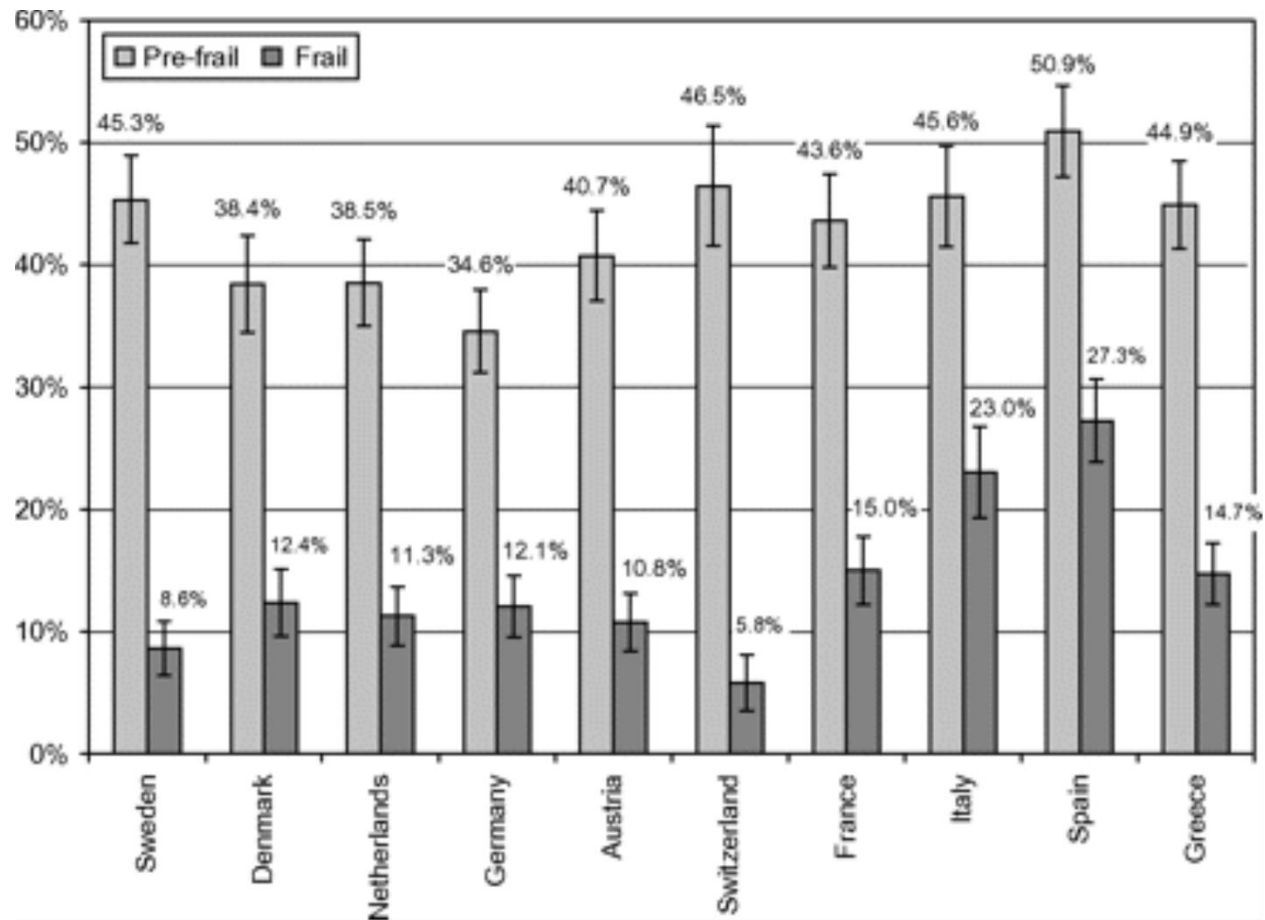
Reflection paper on physical frailty: instruments for baseline characterisation of older populations in clinical trials

Gait speed is measured over short distances, usually using a 2.43-meter (8 feet) to 6-meter walking course with a simple protocol.^{40,41} Most evidence for use comes from large epidemiological studies using 4- or 6-meter walking distances⁴² with standardisation to 4 meters⁴³, thus the 4 meters distance is recommended as the standard assessment. In addition, it is more practical for use both in the home context and at the clinic.³⁴ As mentioned for the SPPB, it requires modest instrumentation (a chronometer and a floor mark).

Gait speed cut-offs have been defined based on their relation with a risk of negative health outcomes (persistent lower extremity limitation, hospitalization and death):^{30,40,41}

<0.4 m/s	very high risk of negative health outcomes
0.4 – 0.99 m/s	high risk of negative health outcomes
≥ 1 m/s	low risk of negative health outcomes

Percentage of the 65 years and older community-dwelling population classified as prefrail and frail by country



From: Prevalence of Frailty in Middle-Aged and Older Community-Dwelling Europeans Living in 10 Countries

J Gerontol A Biol Sci Med Sci. 2009;64A(6):675-681. doi:10.1093/gerona/glp012

J Gerontol A Biol Sci Med Sci | © The Author 2009. Published by Oxford University Press on behalf of The Gerontological Society of America. All rights reserved. For permissions, please e-mail: journals.permissions@oxfordjournals.org.

Frailty in elderly people

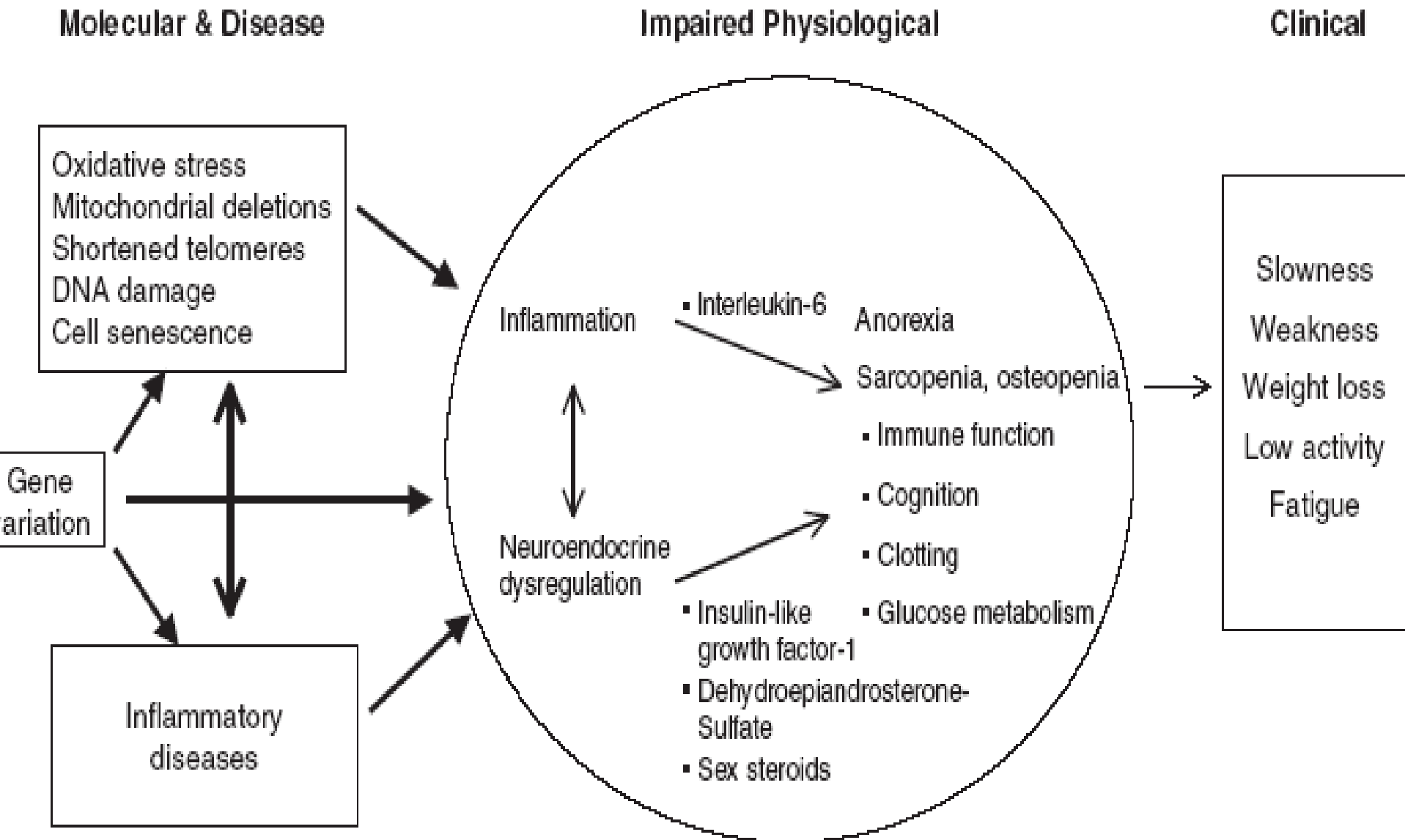
Andrew Clegg, John Young, Steve Iliffe, Marcel Olde Rikkert, Kenneth Rockwood

	Year	Country	Participants (n)	Length of follow-up (years)	Falls (HR*/OR† [95% CI])		Worsening disability (HR*/OR† [95% CI])		Hospitalisation (HR*/OR† [95% CI])		Care home admission (HR*/OR† [95% CI])		Mortality (HR*/OR† [95% CI])	
					Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty
Cardiovascular Health Study (CHS) ³¹	2001	USA	5317	7	1.12* (1.00–1.26)	1.23* (0.99–1.54)	1.55* (1.38–1.75)	1.79* (1.47–2.17)	1.11* (1.03–1.19)	1.27* (1.11–1.46)	NA	NA	1.32* (1.13–1.55)	1.63* (1.27–2.08)
Canadian Study of Health and Aging (CSHA) ³²	2004	Canada	9008	5	NA	NA	NA	NA	NA	NA	2.54† (1.67–3.86)	2.60† (1.36–4.96)	2.54† (1.92–3.37)	3.69† (2.26–6.02)
Women's Health and Aging Study (WHAS) ³³	2006	USA	1438	3	0.92* (0.63–1.64)	1.18* (0.63–2.19)	NA	NA	0.99* (0.67–1.47)	0.67* (0.33–1.35)	5.16* (0.81–32.79)	23.98* (4.45–129.2)	3.50* (1.91–6.39)	6.03* (3.00–12.08)
Study of Osteoporotic Fractures (SOF) ³⁴	2008	USA	6701	4.5	1.23† (1.02–1.48)	2.44† (1.95–3.04)	1.89† (1.66–2.14)	2.79† (2.31–3.37)	NA	NA	NA	NA	1.54† (1.40–1.69)	2.75* (2.46–3.07)

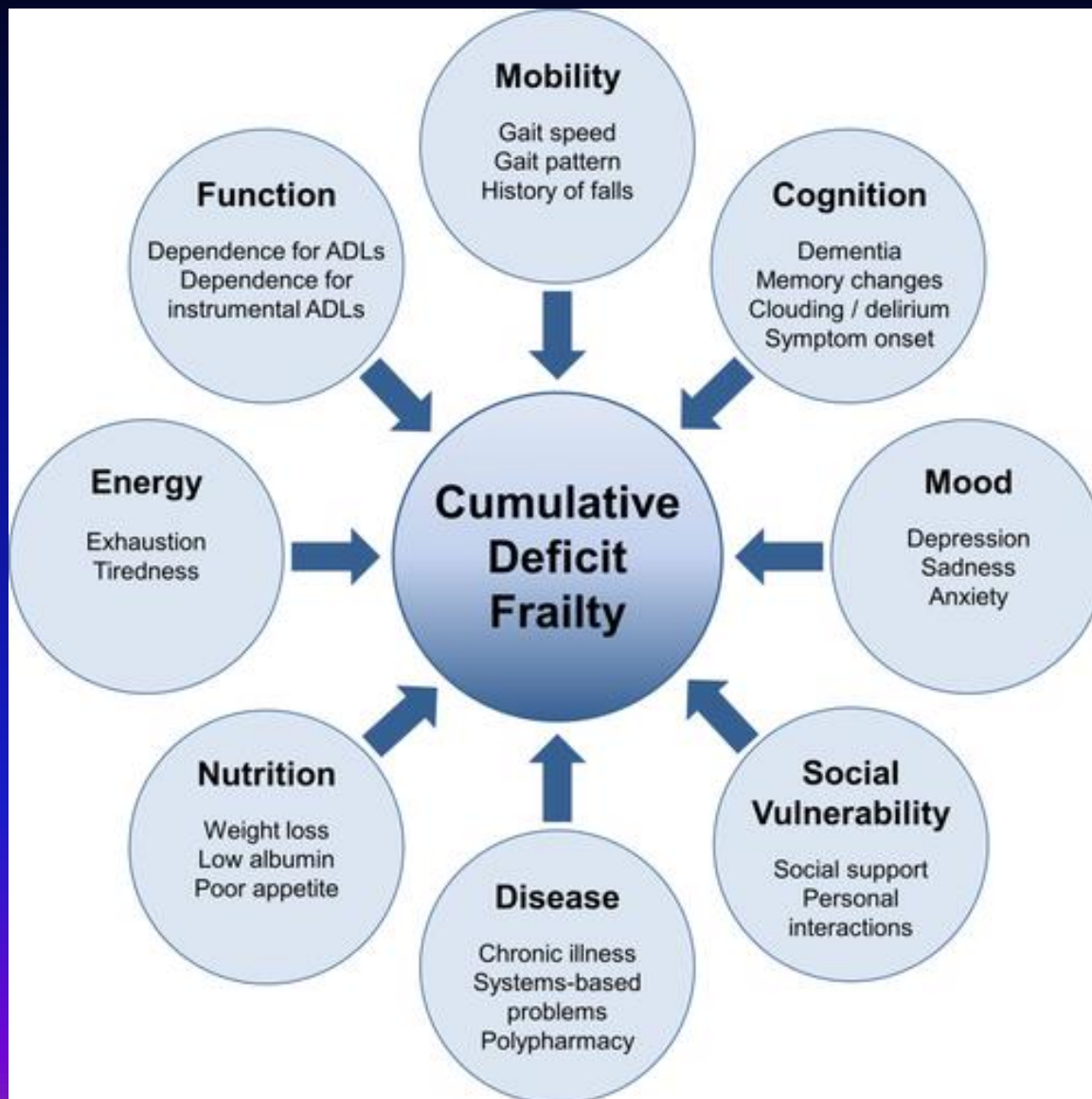
HR=hazard ratio. NA=not available. OR=odds ratio. *Hazard ratio. †Odds ratio. The comparator for hazard ratios and odds ratios is people who are not frail.

Table: Covariate-adjusted associations between frailty and adverse outcomes (falls, disability, hospitalisation, care home admission, and mortality) from four large prospective cohort studies

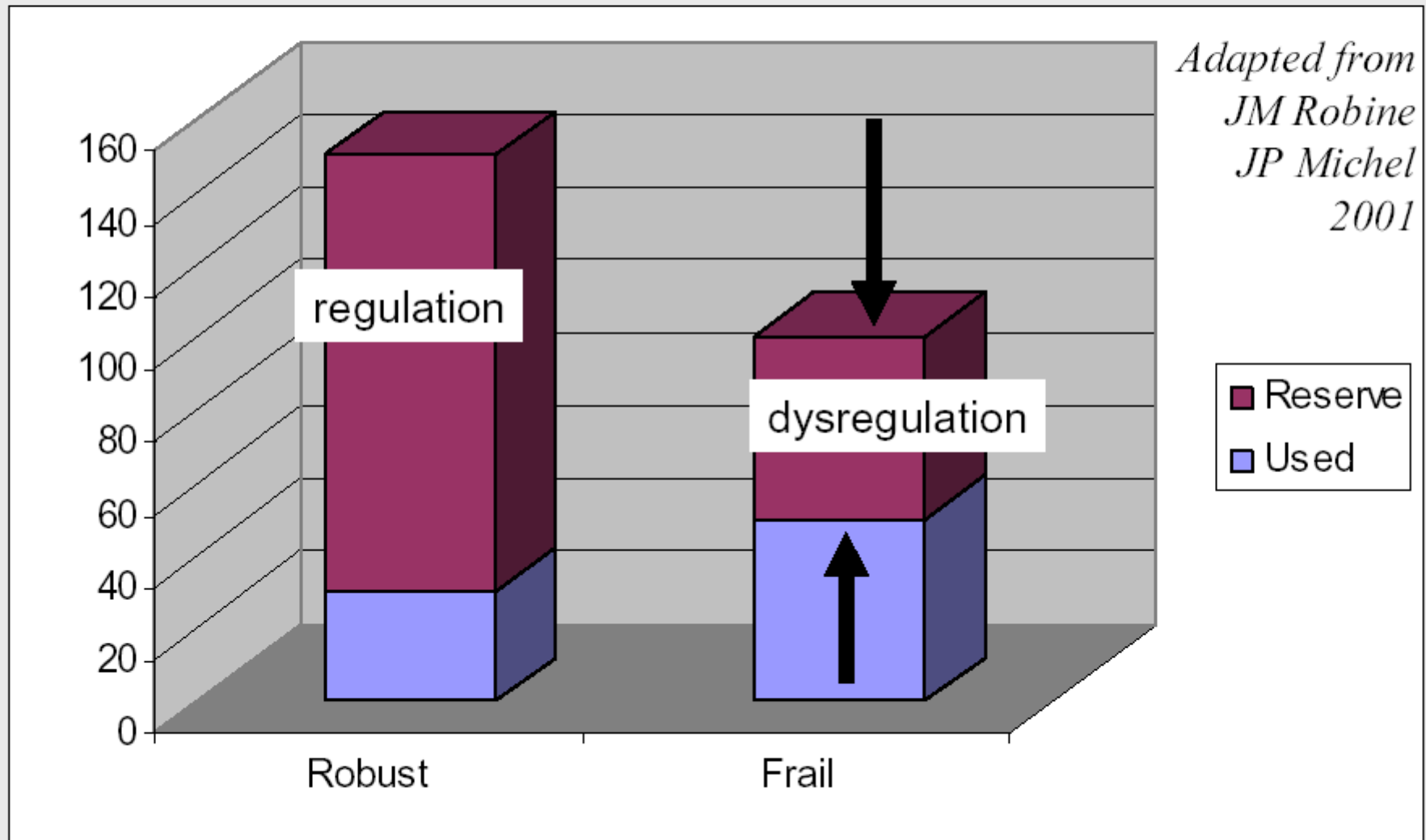
Frailty - pathophysiology



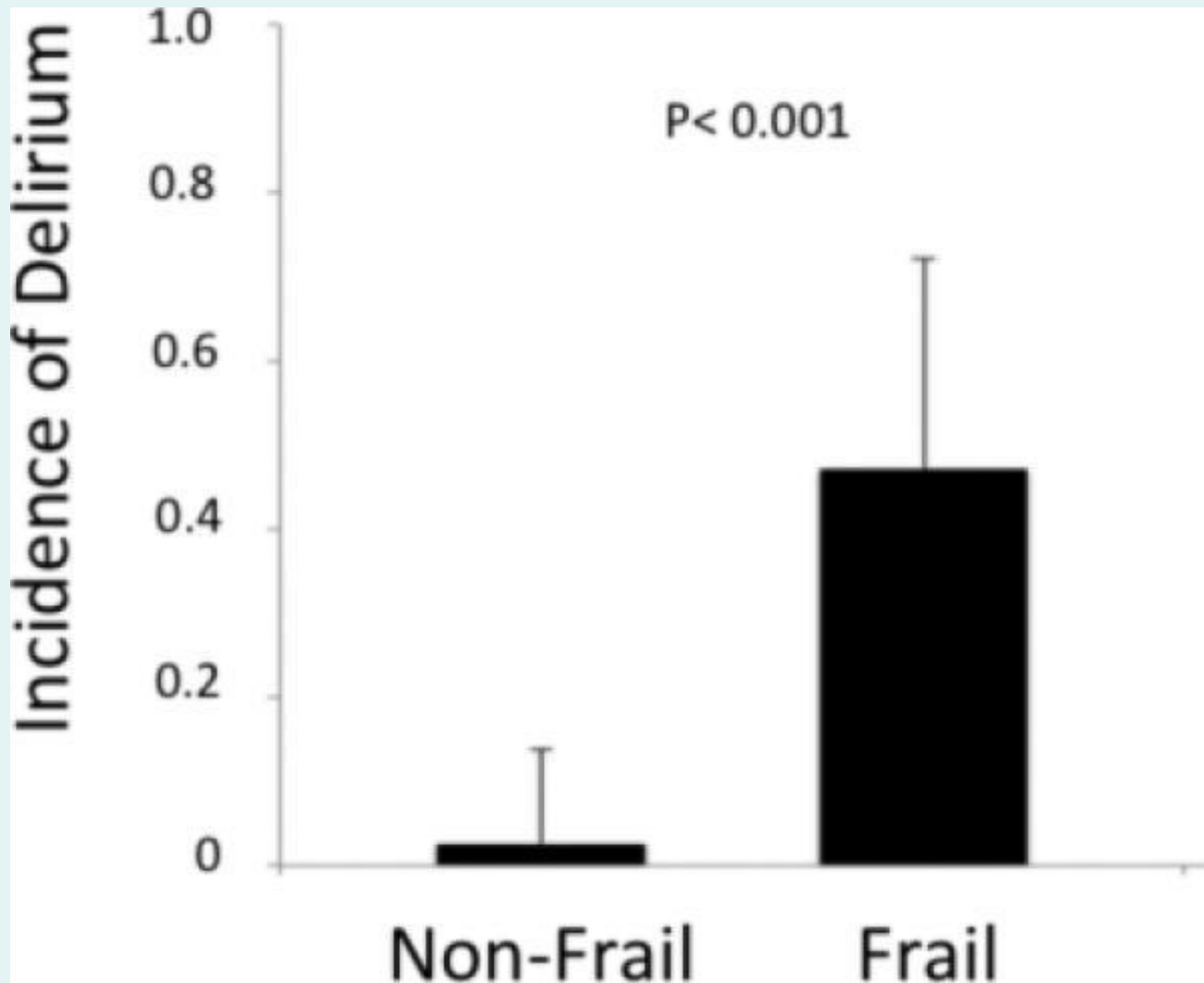
Zespół frailty ma wiele twarzy!



Frailty = zmniejszona rezerwa
(sprawność, wydolność, pamięć, odporność,
psychologia, ekonomiczna)

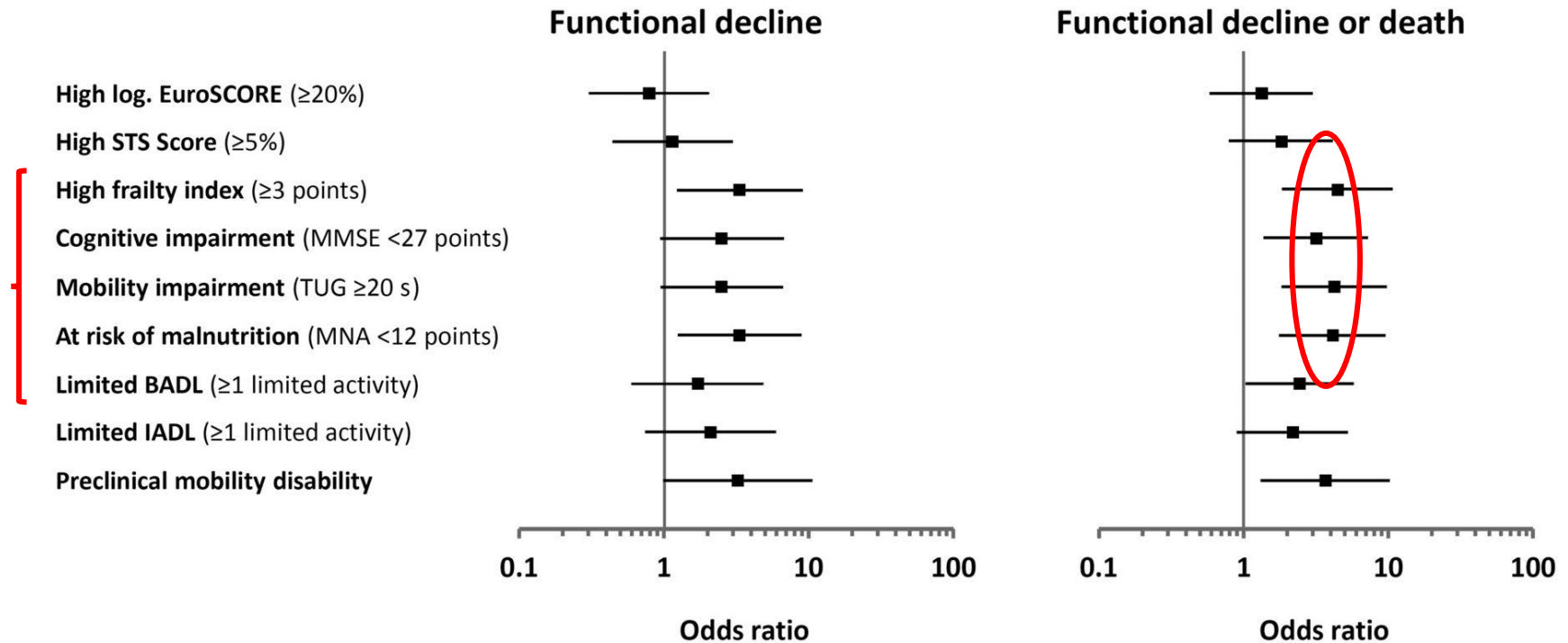


The incidence of delirium after cardiac surgery among frail compared with non-frail patients



Predictors of functional decline in elderly patients undergoing transcatheter aortic valve implantation (TAVI)

Odds ratios and 95% confidence intervals of univariable associations of dichotomized risk predictors with functional decline (defined as deterioration of the ability to perform basic activities of daily living) and functional decline or death.



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TABLE 8. Summary of Studies Examining the Association of Frailty With Chemotherapy-Related Outcomes

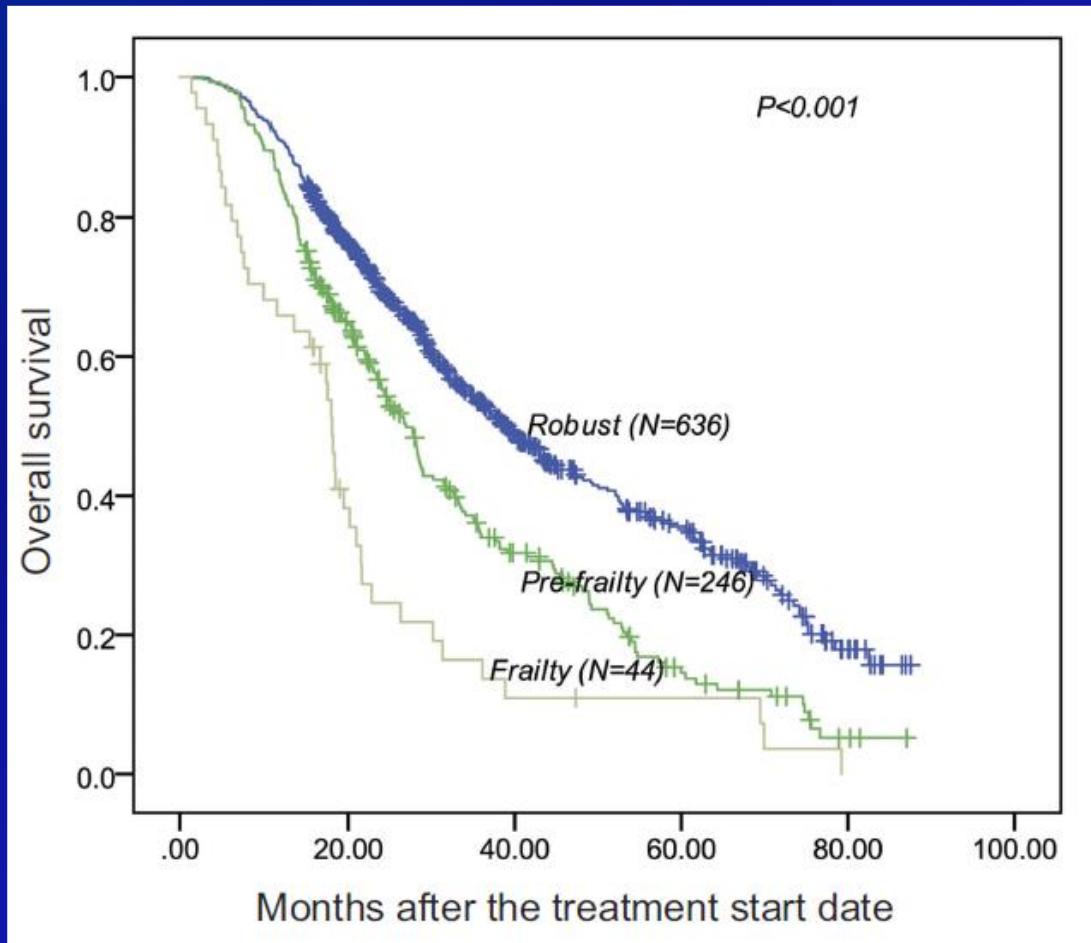
STUDY	CANCER TYPE	NO. OF PATIENTS	FRAILTY TOOL	OUTCOME DATA	SUMMARY OF RESULTS
Clough-Gorr 2010 ⁸	Breast	660	CGA	Treatment tolerance and all-cause mortality	GA domains were independently associated with poor treatment tolerance (clinical, psychosocial) and predicted mortality (sociodemographic, clinical, functional status, psychosocial), independent of age and stage of disease
Hurria 2011 ¹¹⁴	Multiple	500	CGA	Chemotherapy-related toxicity	GA variables were associated with grade 3-5 toxicity
Cailliet 2011 ¹¹⁵	Multiple	375	CGA	Cancer treatment outcome	Functional status assessed by ADL score and malnutrition were independently associated with changes in cancer treatment
Puts 2011 ¹¹⁶	Multiple solid tumors	112	CIFA frailty markers/functional status	Treatment toxicity and 6-mo mortality	Toxicity predicted by low grip strength, but none of the functional measures
Biesma 2011 ¹¹⁷	Lung	181	CGA	QOL	- ECOG performance status and ADL disability, but none of the CIFA frailty markers, predicted time to death - CGA items were only associated with neuropsychiatric toxicity - CGA and QOL items measure one underlying dimension, which is highly prognostic
Clough-Gorr 2012 ⁷	Breast	660	C-SGA	All-cause and breast-cancer-specific mortality	- Lower survival among patients with C-SGA ≥ 3 and decreased survival as the number of deficits increased - After adjusting for confounding factors, 2-fold higher death rate in women with ≥ 3 C-SGA deficits
Shin 2012 ¹¹⁸	Multiple	64	CGA	Chemotherapy-related outcome	Baseline ECOG PS was an independent predictive factor of significant chemotherapy-related toxicity
Extermann 2012 ¹¹⁹	Multiple	518	CGA/CRASH score	Chemotherapy-related toxicity	GA variables comprising the CRASH score were associated with hematologic and nonhematologic toxicities
Aparicio 2013 ¹²⁰	Colon	123	CGA	Chemotherapy-related outcome	- GA factors were predictive for: - Grade 3-4 toxicity: MMSE $\leq 27/30$, and impaired IADL - Dose-intensity reduction: alkaline phosphates $> 2 \times$ ULN - Unexpected hospitalization: MMSE $\leq 27/30$ and GDS ≤ 2
Falandryr 2013 ¹²¹	Breast	60	CGA	Chemotherapy-related outcome	- Age ≥ 80 y and living in residential homes were associated with nonhematologic toxicities - Age, deficiency in IADL, cardiac dysfunction, and living in residential homes were associated with decreased PFS - Living in residential homes was associated with decreased OS
Hamaker 2014 ¹²²	Breast	78	CGA	Chemotherapy-related toxicity	Grade 3-4 chemotherapy-related toxicity observed in 19% of patients without deficits, 56% of those with 2 deficits, and 80% of those with ≥ 3 deficits
Sastrer 2015 ¹²³	Colorectal	33	CGA	Chemotherapy-related outcomes	No deaths or grade 4-5 adverse events were related to panitumumab in frail patients
Correr 2016 ¹²⁴	Lung	494	CGA	Treatment failure, OS, PFS, toxicity	- No association between CGA arm and TFFS or OS - Fewer treatment failures and toxicities observed in CGA arm
Meresse 2017 ¹²⁵	Breast	223	Age	Chemotherapy-related toxicity	- Patients ages 75-80 y received chemotherapy treatment less often than younger patients - No differences in toxicity

Obecność
frailty
zwiększa
ryzyko
powikłań
chemioterapii

A Cancer Journal for
Clinicians, Volume: 67,
Issue: 5, Pages: 362-377,

Prediction of chemotherapy adverse reactions and mortality in older patients with primary lung cancer through frailty index based on routine laboratory data

Survival curves 926 patients with primary lung cancer receiving chemotherapy according to baseline frailty status



Incidence and predictors of postoperative delirium in the older acute care surgery population: a prospective study

Can J Surg, Vol. 62, No. 1, February 2019

Table 2: Multivariable logistic regression analysis for overall delirium and longer delirium episodes

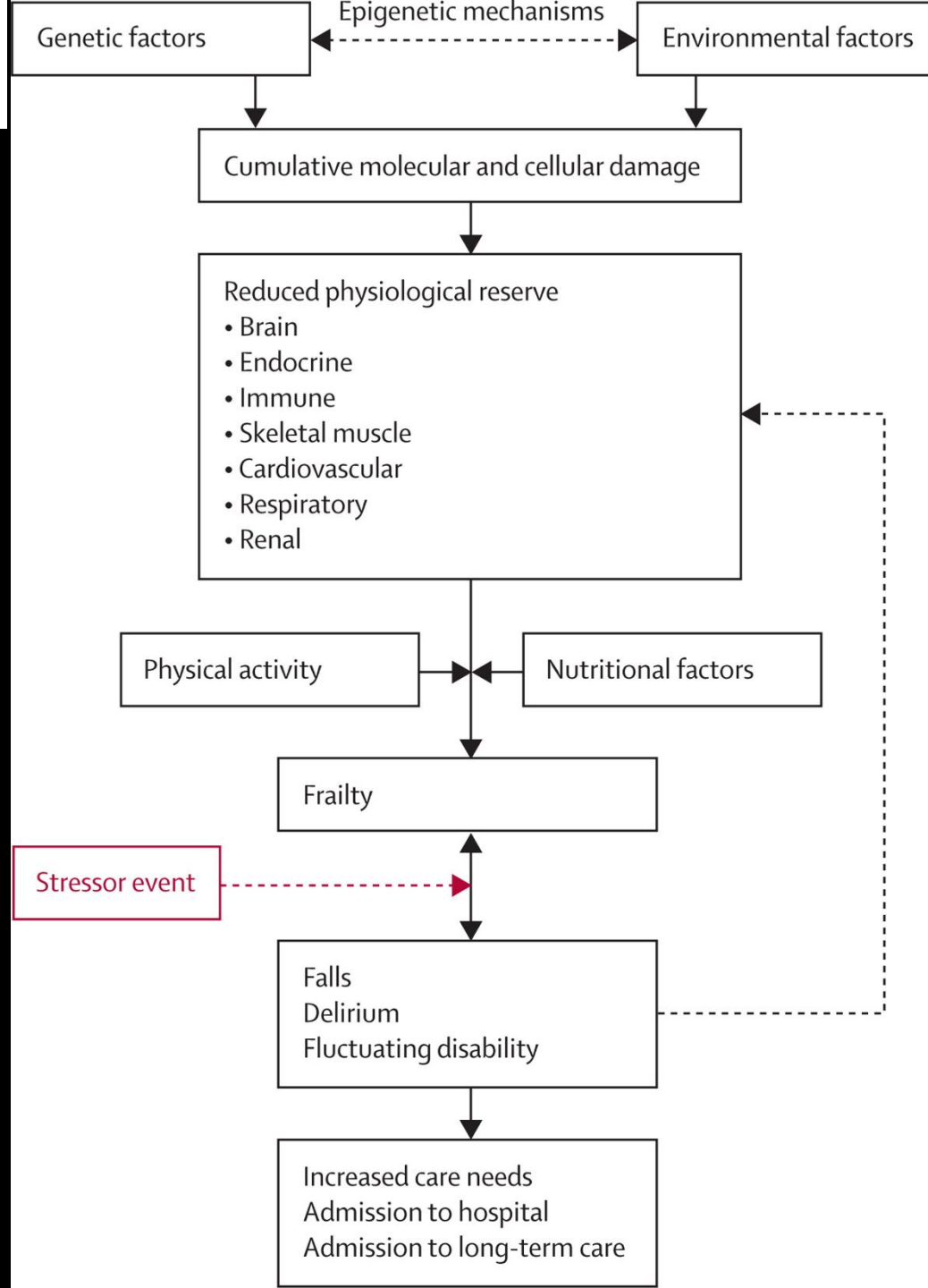
Variable	OR (95% CI)	
	Overall delirium	Longer delirium episodes
Appendix surgery	5.26 (1.40–19.75)	—
Intestinal surgery	4.74 (1.86–12.08)	—
Mild to moderate frailty	4.50 (1.76–11.50)	7.77 (2.18–27.65)
Gallbladder surgery	4.48 (1.41–14.17)	—
Foley catheter use	3.37 (1.36–8.35)	4.48 (1.76–11.50)
Intensive care unit admission	1.37 (1.06–1.78)	—

CI = confidence interval; OR = odds ratio.

Frailty in elderly people

Andrew Clegg, John Young, Steve Iliffe, Marcel Olde Rikkert, Kenneth Rockwood

Patofizjologia i następstwa zespołu słabości



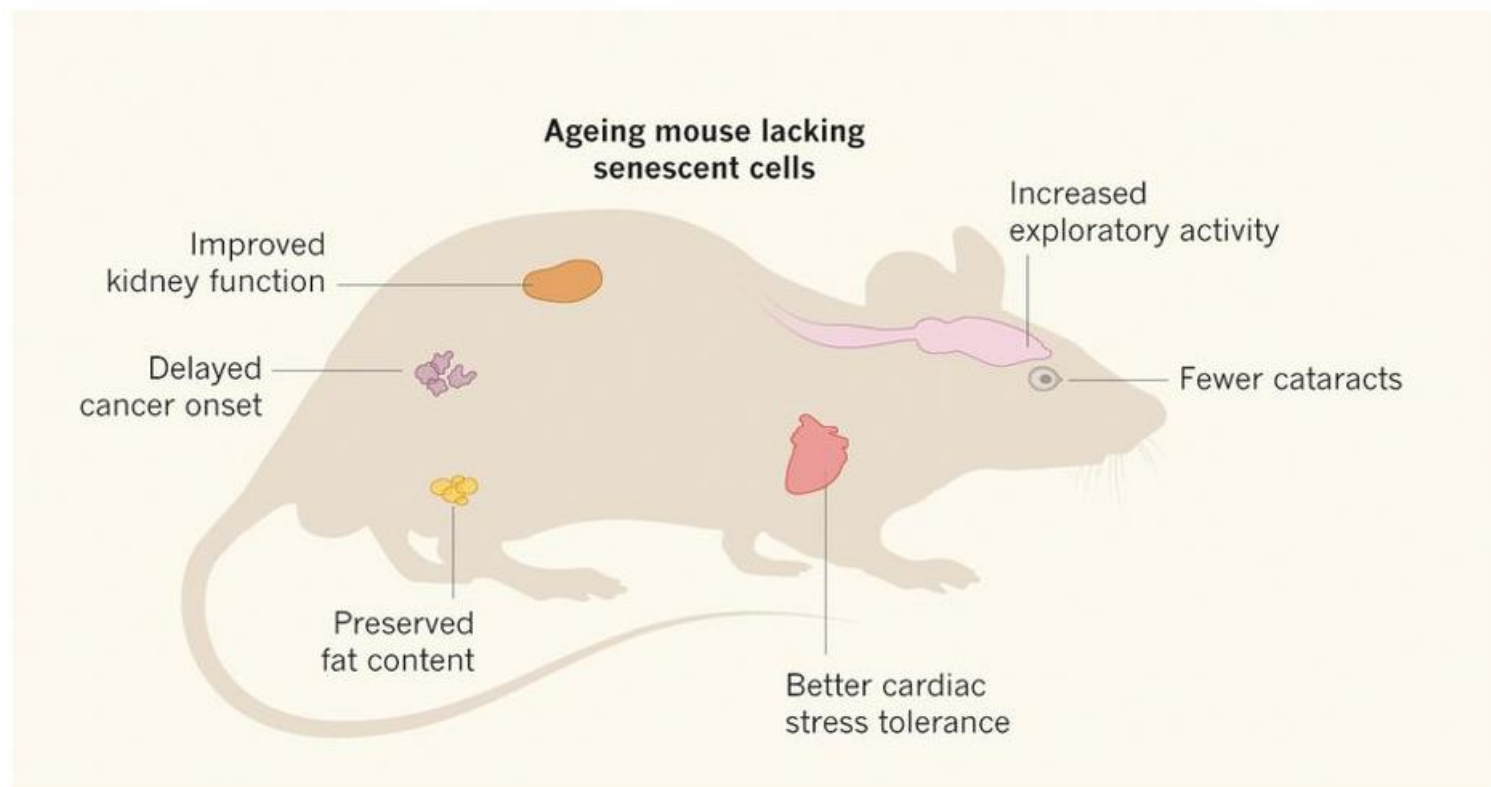
Podsumowanie – take home message

1. w najbliższym czasie liczba osób 80+ w Polsce zbliży się do 10% populacji
2. zespół słabości (frailty) dotyczy ok 30-40% osób po 80 r.ż.
3. cechy z.słabości : utrata masy mięśniowej, wolny chód, uczucie wyczerpania (osłabienie), pogorszenie sprawności
4. może dotyczyć również funkcji poznawczych, sytuacji socjoekonomicznej
5. konsekwencja- znaczne zmniejszenie rezerw – trudniejsze radzenie sobie ze stresem (chorobą, upadkiem, zabiegiem, sytuacją stresową)
6. ważne wczesne rozpoznanie oraz wdrożenie działań przerwencyjnych

News & Views | Published: 03 February 2016

Ageing

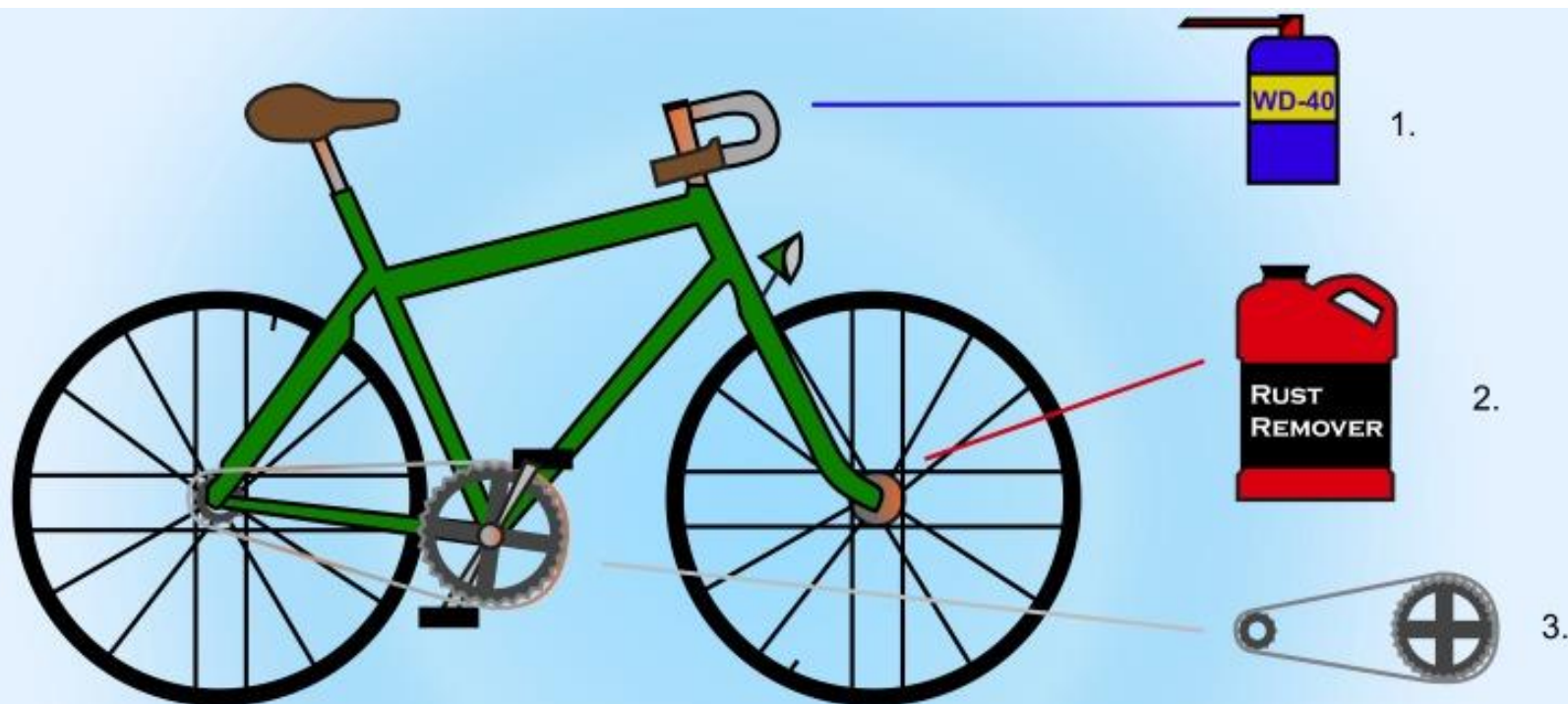
Out with the old

Jesús Gil & Dominic J. Withers Nature 530, 164–165 (11 February 2016) | [Download Citation](#) 

Senescent cells, which are in a state of irreversible growth arrest, accumulate in various organs during ageing and are associated with age-related diseases in many tissues. Baker *et al.*² selectively eliminated senescent cells in ageing mice. This increased healthy lifespan, reducing many age-related, disease-associated abnormalities.

Maintenance and repair of an aging life cycle

Marjolein P. Baar, Hester Van Willigenburg and Peter L.J. de Keizer



	Bicycle care and repair:	Resemblance in aging care:	
1.	WD-40 prevents rust	Dietary restriction & exercise to prevent aging	
2.	Rust remover	FOXO4-DRI removes senescent cells	
3.	Replacement of parts	Tissue rejuvenation to replace aged tissue	

**„Life is like riding a bicycle. To keep
your balance you must keep moving.“**

Albert Einstein

