

Shortness of breath and older adults

Mark Weatherall

University of Otago Wellington



Ageing of the population

	N > 65	% total population
1976	275,000	9
2001	450,400	12.1
2006	512,000	12.2
2031	1,091,000	21.4
2051	1,353,000	24.7

Ageing of the population

Age	1975-7		2005-7	
	Male	Female	Male	Female
	Mean life expectancy		Mean life expectancy	
60	16.1	20.4	22.0	24.9
70	10	13	14.2	16.6
80	5.7	7.3	8.0	9.5
90	2.8	3.4	3.9	4.4

Diseases, impairments, and activity limitations

Health related issue	Prevalence: 45-54	Prevalence: 75+
Any chronic condition	69.4	91.2
General health related as Fair or Poor	9.9	19.6
Chronic painful condition	19.2	28.1
Use of GP in last 12 months	80.6	96.1
Inpatient hospital care in last 12 months	5.3	17.5

Diseases, impairments, and activity limitations

Disease	Prevalence: 45-54	Prevalence: 75+
Hypertension medication use	12.6	47.6
Increased cholesterol	21.7	32.9
Ischemic heart disease	3.0	26.0
Congestive heart failure	1.1	10.1
Stroke	1.0	11.2
Arthritis	15.7	46.8
Osteoporosis	2.2	14.0
Diabetes	5.2	13.8
Mood problems	11.9	8.7
Anxiety problems	4.0	3.3

Diseases, impairments, and activity limitations

Activity limitation	Age 70-74	Age 85+
	% with limitation	
Housekeeping	9	59
Shopping	6	57
Bathing	2	43
Mobility	3	30

Diseases, impairments, and activity limitations

Disorder	Percentage of subjects
Heart failure	31
Osteoarthritis	26
Stroke	22
Dementia	22
Deafness	14
Psychiatric illness	14
Fracture of the proximal femur	12
Cataract	12
Ischemic heart disease	11
Chronic obstructive lung disease	10

Changes to respiratory system

- Reduced elasticity and increased chest wall stiffness
- Collapse of smaller airways
- Reduced PaO₂, FEV₁, diffusing capacity, mucociliary transport, swallowing, immune system changes
- Little effect in healthy but with other toxins such as tobacco or environmental challenge, such as infection, worse respiratory performance

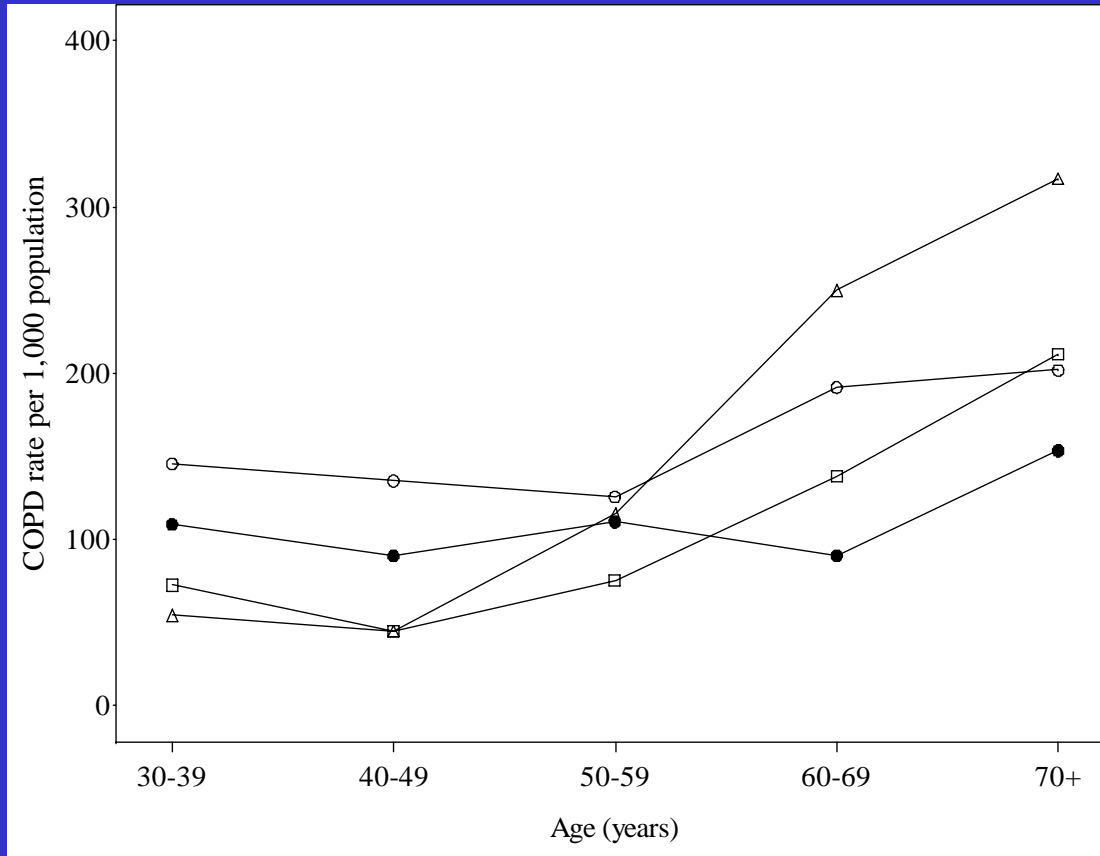
Changes to cardiac system

- Increased stiffness of myocardium, both structural from increased connective tissue and due to failure to remove calcium from contractile proteins
- Reduced early diastolic filling
- Increased peripheral resistance and aortic impedance
- Decreased pulse on exertion and maximum cardiac output
- Reduced beta receptor activity, heart and lungs

COPD and older age

- A problem of definition as very few very old in studies and difficult to distinguish age related change from disease
- Likely to be prevalent and under-diagnosed
- In Wellington Respiratory Survey by GOLD definition (post-BD FEV1/FVC < 70%) prevalence was around 30% in 70+ and 14% in younger
- Compare GP diagnosis rate of 14% (although very poor agreement with spirometry)

COPD and older age



- △: GOLD
- : LLN post-BD
- : LLN pre-BD
- : Doctor's diagnosis

COPD and older age

- Reasons for increased prevalence uncertain
- Likely a cohort effect of prevalence of smoking
- Perhaps environmental exposure to air-borne toxins
- Some represents chronic asthma

CHF and older age

- No NZ studies of prevalence
- Based on Framingham data:

Age	Prevalence
45-64	3%
65-74	6%
75+	10%

CHF and older age

- A UK echo-cardiogram study found 7.5% of adults aged over 70 years had systolic dysfunction and half of these did not have a diagnosis of CHF
- A lethal condition: US data one year mortality after symptoms of 28% and 5 year mortality in men 60%, less in women, no change over 20 years
- Ischemic heart disease, hypertensive heart disease, contributions from degenerative aortic stenosis and Atrial Fibrillation (5% 70+)

General Principles

- The cohort effect
- Diversity
- Multiple pathology, problems, and dimensions
- Failure to present
- Atypical presentation
- The threshold effect
- Disordered homeostasis and the cascade effect
- The importance of the social context

Assessment: History

- Care with sensory impairments
- High prevalence of cognitive impairment especially in 85+
- Around 30% of 85+ have moderate dementia, only half known
- In health care settings delirium very prevalent
- An supplementary history is usually useful

Assessment: History

- If have mobility limitation may not notice shortness of breath but other symptoms such as fatigue and loss of energy
- If mobility limitation consider VTE
- Drugs: check actual use
- Watch out for beta-blockers (glaucoma drops, ischemic heart disease)
- Can inhalers be used: watch

Assessment: History

- Past medical history: TB and odd treatments, vaccination, co-morbidities especially cardiac
- Functional history is very important for activities, should you care about urinary incontinence?
- Still need to know about tobacco and alcohol
- Will there be a cohort effect for cannabis?

Physical examination: General Principles

- Look beyond the cardio-respiratory system
- Especially hearing, eyesight, cognitive function
- Musculo-skeletal and nervous system
- Consider using screening instrument for cognitive function
- The value of just about every cardiac and respiratory sign is reduced or confusing

Physical examination: Cardiac system

- Anticipate a higher prevalence of hypertension and orthostatic hypotension. Calcified arterial system can lead to spuriously high BP
- JVP may be more difficult to see with kyphosis but the most reliable sign of CHF
- S4 heart sound can be normal
- Leg oedema has many causes

Physical examination: Respiratory

- Respiratory rate valuable but beware periodic breathing
- Tongue varicosities may look like central cyanosis
- Crackles are non-specific
- Watch out for old TB treatments

Investigations

- CXR may be difficult to interpret with kyphoscoliosis and previous scarring
- ECG: a completely normal ECG is specific, unlikely to have systolic heart failure
- Abnormal ECG is very common
- Routine bloods: Creatinine can be in the ‘normal’ range even in moderate to severe renal failure because of loss of muscle

Investigations

- Arterial blood gas: The PaO₂ will be lower than in younger adults
- Spirometry: Caution in accepting the reference range in the very elderly as almost always this is extrapolation from younger adult equations

Treatment

- General issues
- Balance therapeutic nihilism with hopeless optimism
- Very few very elderly in RCT's of treatment so extrapolating results in younger healthier adults
- Altered pharmacokinetics (what the body does to the drug) such as reduced renal clearance, altered body fat/lean body mass
- Useful aphorism start low and go slow

Treatment

- Altered pharmacodynamics (what the drug does to the body)
- Particular example is reduced beta 2 agonist sensitivity
- More likely to be on more drugs, may affect adherence, greater likelihood of drug interactions, especially for warfarin and theophylline
- Breathing problems may be part of the clinical picture: MDT assessment, remediation and work-arounds

Treatment

- CHF: should still have a low threshold for ACE inhibitors
- Frusemide more likely to give continence problems because of rapid bladder filling and detrusor overactivity
- Digoxin: use a low dose
- Beta blockers: use cautiously

Treatment

- COPD: can the inhalers be manipulated and used?
- Low threshold for anti-cholinergic inhalers
- Older people get asthma too, don't forget ICS
- Tremor may be an issue for beta agonist use
- Physical inactivity may benefit from formal pulmonary rehabilitation within limits of co-morbidities

Conclusion

- Older adults can be challenging, frustrating, difficult and satisfying to diagnose and treat
- May have multiple problems and diagnoses
- Good luck!