

Chronic Obstructive Pulmonary Disease - (COPD)

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What is COPD

- Chronic obstructive pulmonary disease (COPD) is a chronic respiratory condition presenting as slowly progressive breathlessness, often associated with cough and sputum production.
- It includes both chronic bronchitis and emphysema in variable proportions in any one patient.

(Town, Garrett, Taylor & Patterson
2003).

Diana Hart 2013

The burden of COPD

Chronic Obstructive Pulmonary Disease (COPD) is estimated to affect 15% of all New Zealanders aged over 45 years.

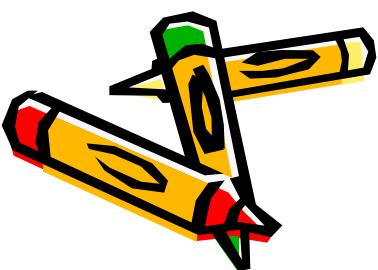
It is the fourth leading cause of death in New Zealand behind cancer, heart disease and stroke.

COPD is permanent, disabling and frequently progressive.

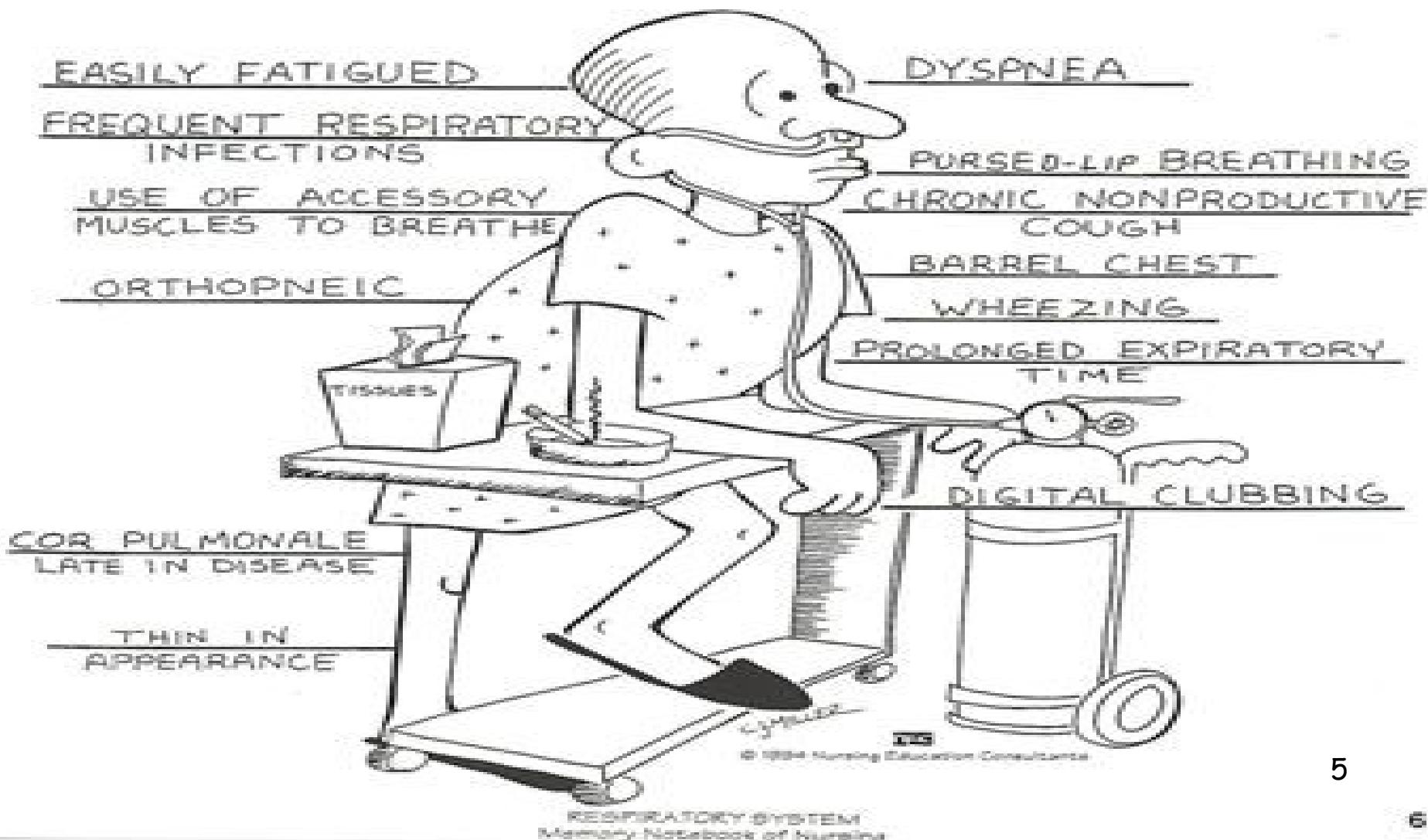
Over 85% of cases of COPD are caused by inhalation of tobacco smoke.

The Asthma Foundation. COPD in New Zealand. 2012. Available from: www.asthmafoundation.org.nz (Accessed Apr, 2012)

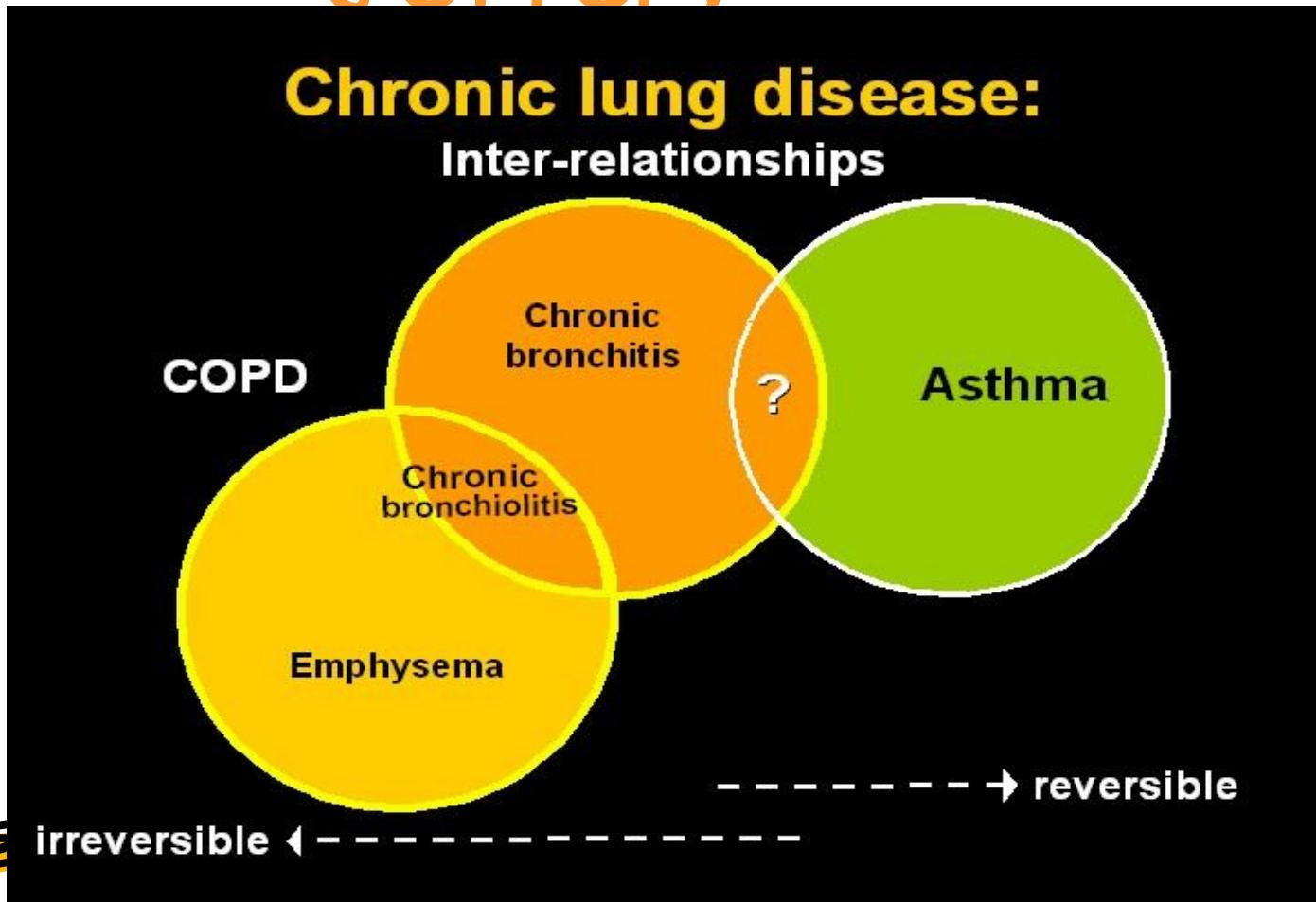
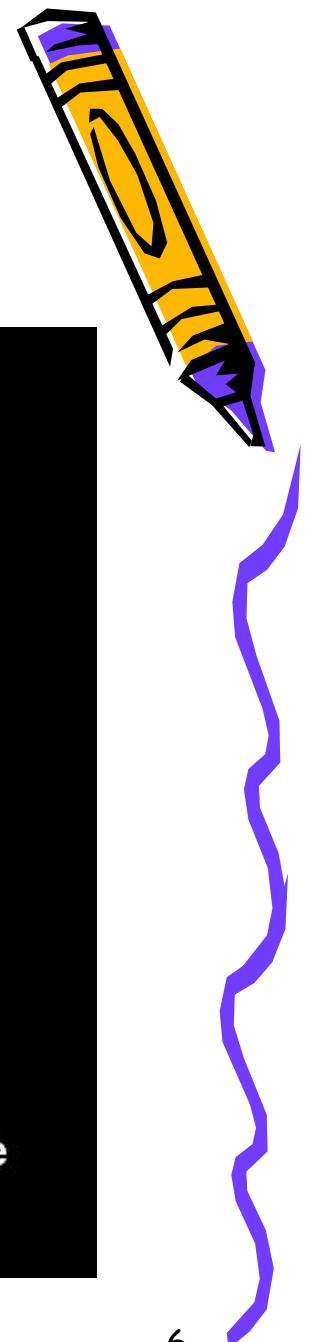
- Management of chronic disease is arguably the most significant challenge for health care systems.
- The financial and social burden from chronic disease has been well documented, discussed and debated.
- The potential for primary care to achieve reductions in avoidable mortality, avoidable hospital admissions and to reduce health inequalities has become the basis for current government policy.



COPD



COPD images by Peter Jeffery



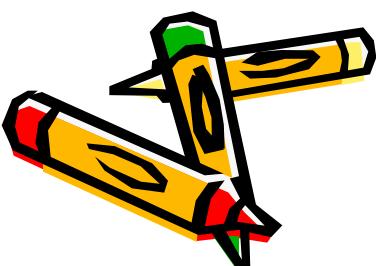
Economic Burden

- The main costs to the health system in New Zealand that are attributable to COPD include medications, hospital care and primary care visits.
- Additional costs accrue from laboratory services, Emergency Department visits, smoking cessation programmes, other laboratory testing, and the provision of rehabilitation services.



Morbidity

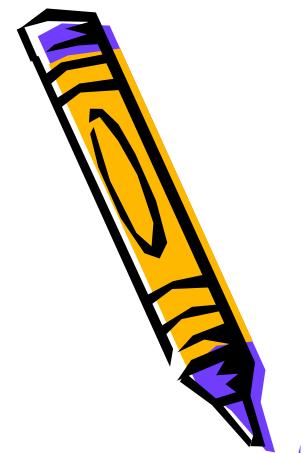
- COPD results in a major deterioration in quality of life, particularly as the disease progresses to the severe stage.
- The most significant symptom is progressive shortness of breath limiting exercise capacity.
- Quality of life is also affected by poor mobility and social isolation.



Mortality

- In 1999, COPD accounted for 5.1% of all deaths in New Zealand.
- Published mortality data in New Zealand are likely to underestimate the true health burden of COPD as the cause of death in patients with severe COPD is often reported as other conditions.
- As a consequence the true mortality may be up to two-and-a-half times the published rates.

(Town et al 2003).

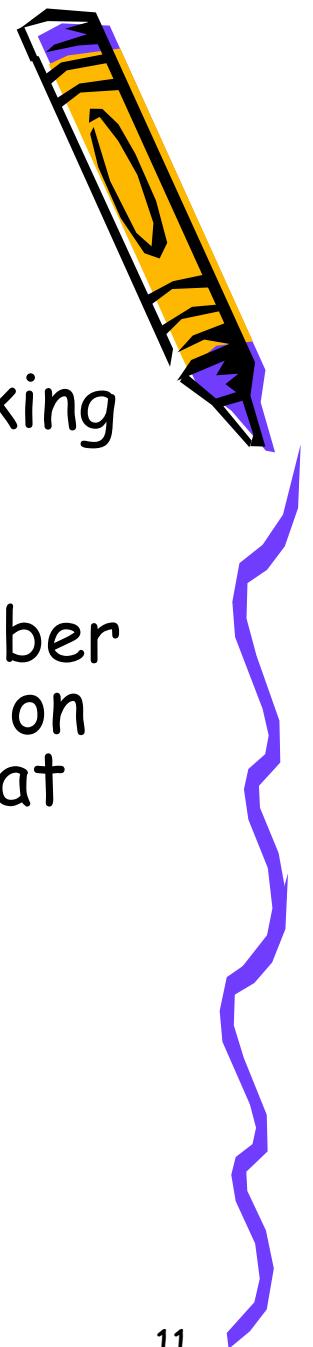
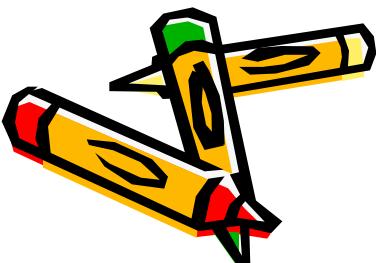


Prevelance

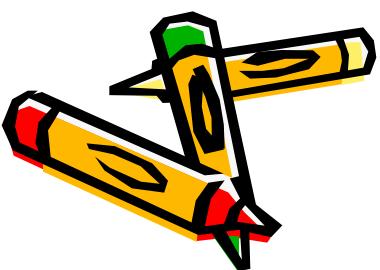
- Although the prevalence of asthma is quite well understood in New Zealand there are no reliable data for COPD from population surveys.
- World Health Organisation (WHO) global estimates from our region suggest that around 15% of adults over the age of 45 years suffer from COPD.
- This means that there are likely to be at least 200,000 cases of COPD amongst adults in New Zealand of whom only 1 in 4 - 5 have had the diagnosis confirmed by a doctor
(Town, Garrett, Taylor & Patterson 2003).

- Throughout western countries COPD is becoming increasingly prevalent as the impact of higher levels of tobacco smoking since the 1930's result in increasing numbers of cases of COPD.
- In 1990 the WHO ranked COPD as number twelve in the list of diseases impacting on health world wide and has predicted that COPD will rank number five by 2020.
- In New Zealand it is already in the top five.

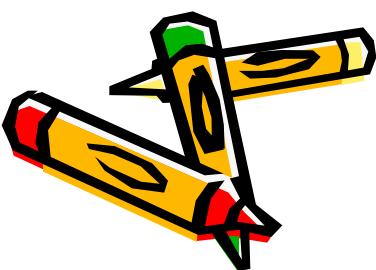
(Town et al 2003)



- In addition to tobacco smoking, the prevalence of COPD is affected by cannabis smoking and certain occupations, including bakers, food processors, spray painters, chemical processors and agricultural workers (jobs which involve exposure to dust and chemicals).
- These causes account for only a small percentage of all cases.

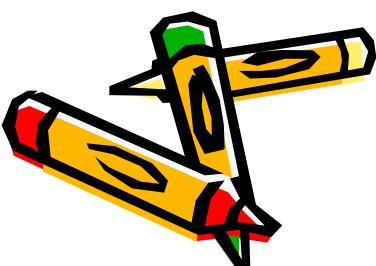


- The prevalence of COPD in any given population is related to the prevalence of smoking and the age of the population.
- Based on hospital admission data, the prevalence for Maori is more than twice that for non-Maori.

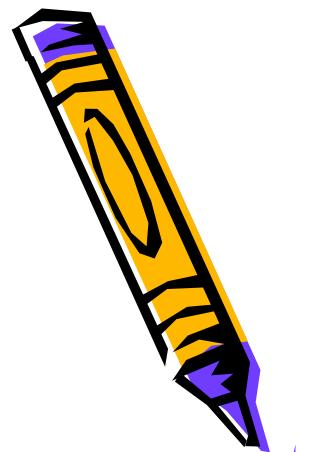


- COPD is often associated with other conditions (co-morbidities) such as heart disease and is associated with an increased risk of myocardial infarction, stroke, lung cancer and pneumonia.
- In many cases there is a significant additional impact of anxiety or depression.

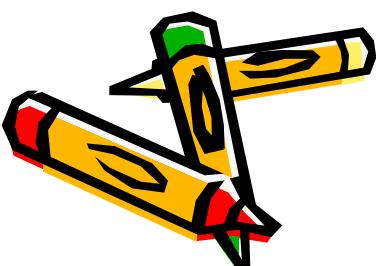
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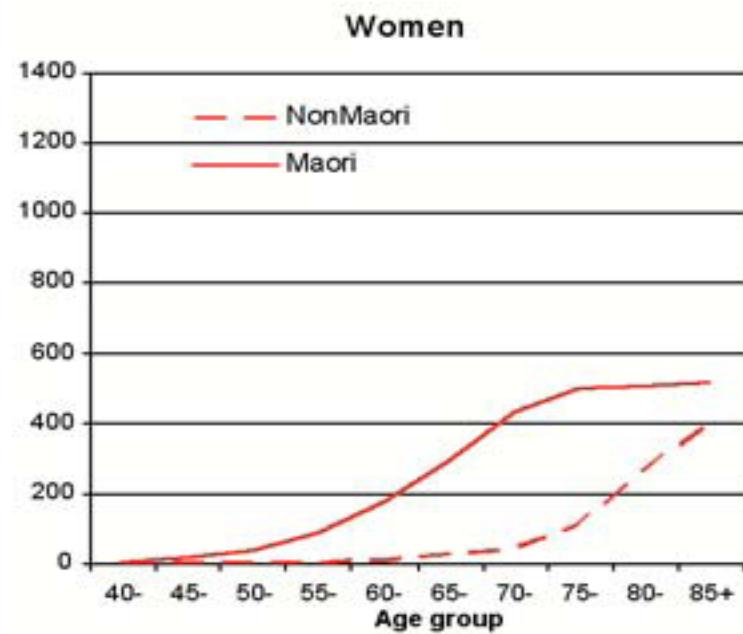
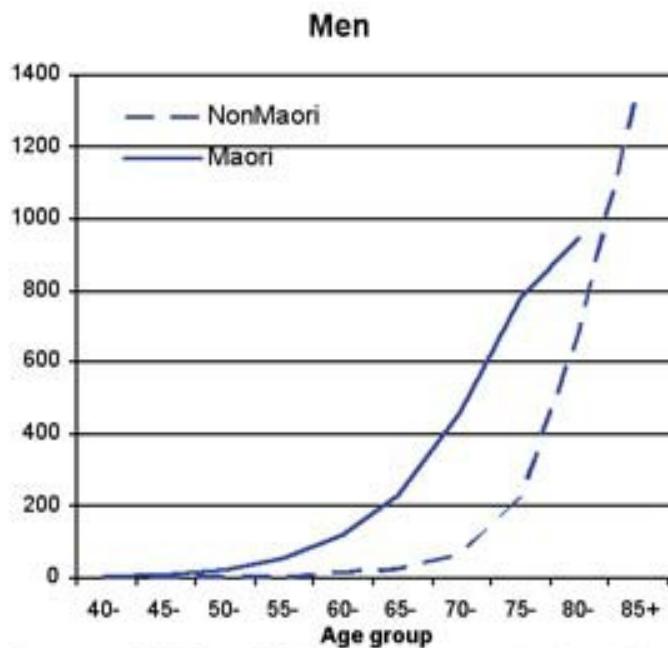
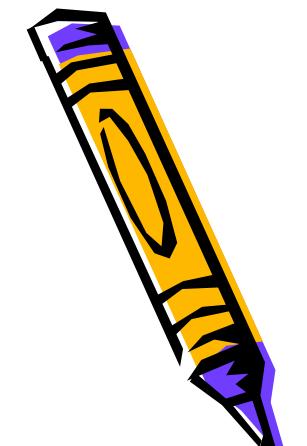
- Diagnosis is confirmed by spirometry demonstrating air flow obstruction.
- As the disease progresses, symptoms become more prominent, lifestyle and quality of life are affected adversely and, ultimately, subjects become short of oxygen leading to significant heart problems.
- In severe cases, oxygen therapy may be provided as part of management.



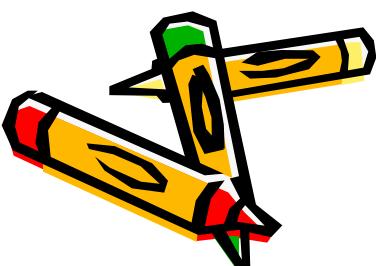
- COPD deaths occur largely in older people and rates for men have been around twice those for women
- The differences between sexes is closing and reflects the proportion of men and women who are currently smoking.



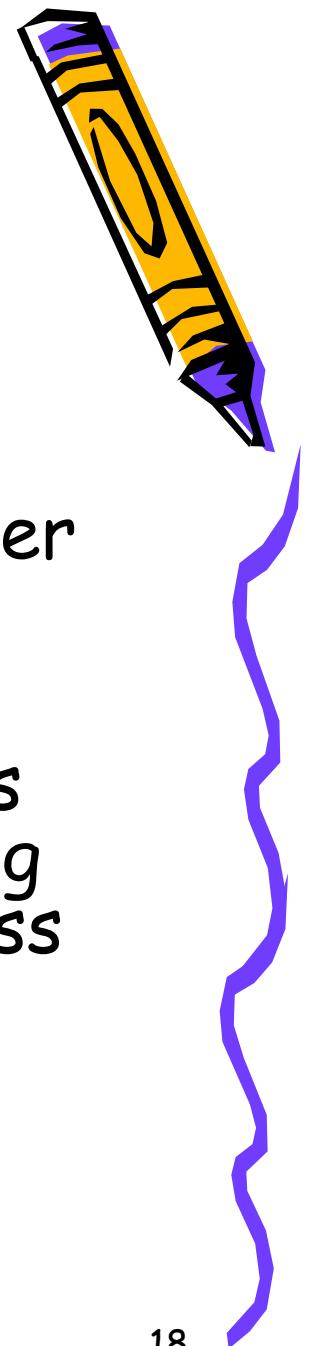
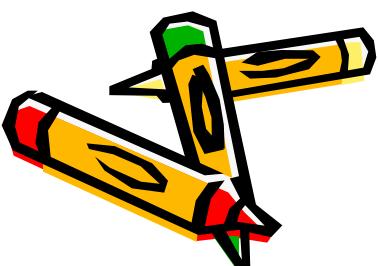
COPD mortality rates (averaged over 3 years) in New Zealand, by sex, age group and ethnicity (per 100,000)



* Data from years 1997/98 to 1999/00. Maori rates smoothed over adjacent age g



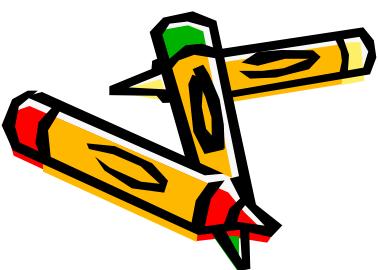
- Depending on the number of prevalent cases, the direct costs have been estimated at between \$102m to \$192m per annum.
- Hospital costs are estimated at \$80m.per annum.
- The average cost per patient per year is estimated at \$2,566 without considering loss of income, the costs to family or loss of quality of life.



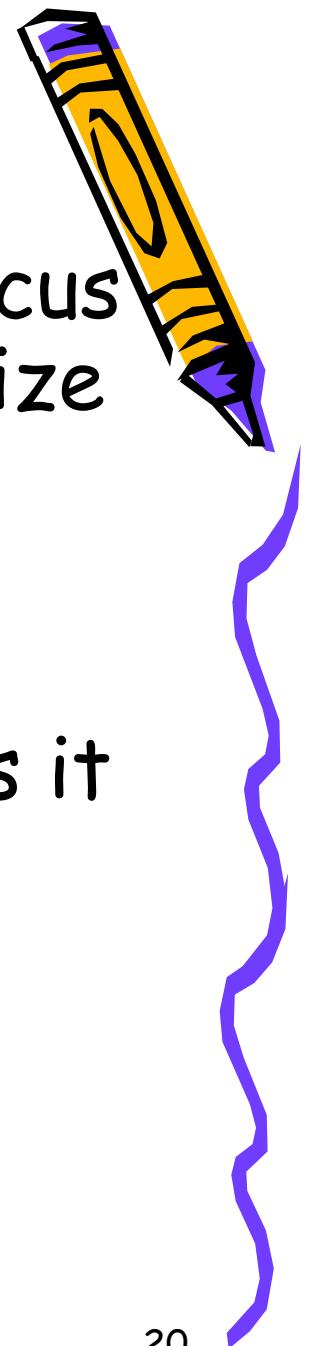
Chronic Bronchitis



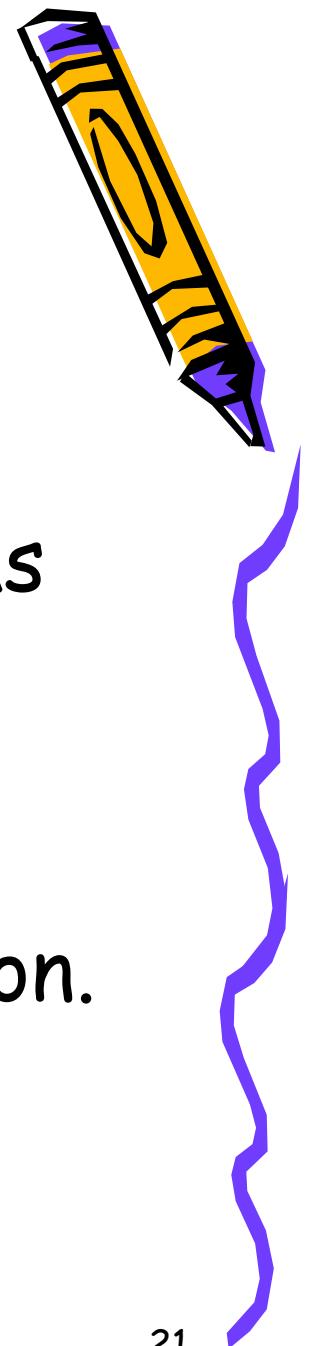
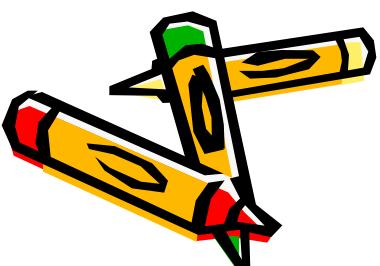
- Chronic Bronchitis is defined as hyper secretion of mucus and chronic productive cough that lasts for at least 3 months of the year for 2 consecutive years.
- The incidence is increased in smokers and also in those workers exposed to air pollution.

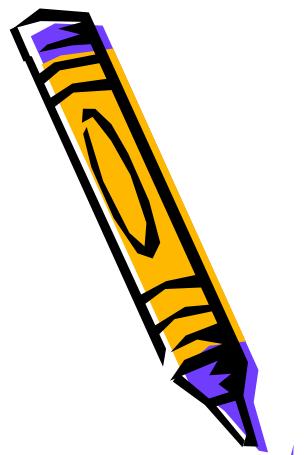


- The inspired irritants increase mucus production and also increase the size and number of mucous glands and goblet cells.
- The mucous is thicker and more tenacious than normal which makes it more likely that bacteria such as *Haemophilus influenza* and *Streptococcus Pneumoniae* will become embedded.



- The best treatment is prevention
- Stop smoking.
- Bronchodilators and expectorants increase airway caliber. improve secretion removal, and maximize gas exchange.
- Physiotherapy- chest clearance techniques.
- Recognition of early sign of infection.
- Steroids for severe exacerbations.

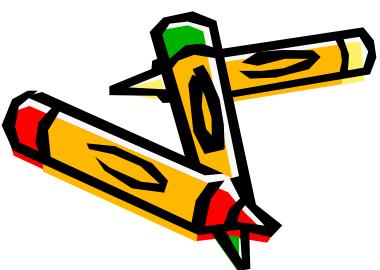




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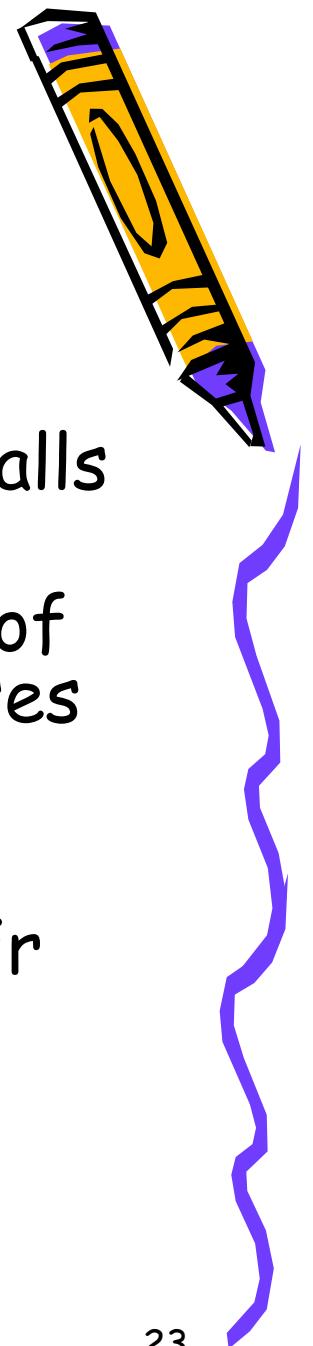
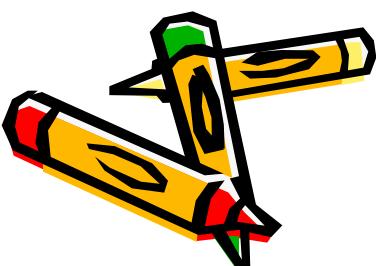
www.allancavanagh.com



"MAN, I COULD KILL A HUMAN RIGHT NOW!"

Emphysema

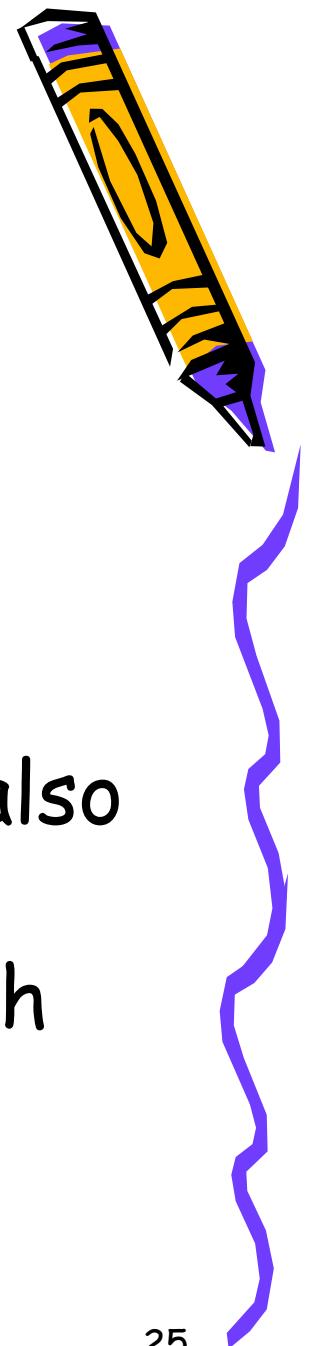
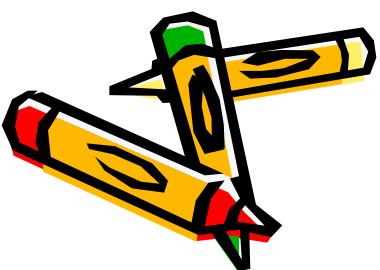
- Emphysema is abnormal permanent enlargement of the acini with accompanying destruction of alveolar walls but without obvious fibrosis.
- Septal destruction eliminates portions of the pulmonary capillary bed and increases air in the acinus.
- Hyperinflation of alveoli causes large air spaces-bullae to develop.



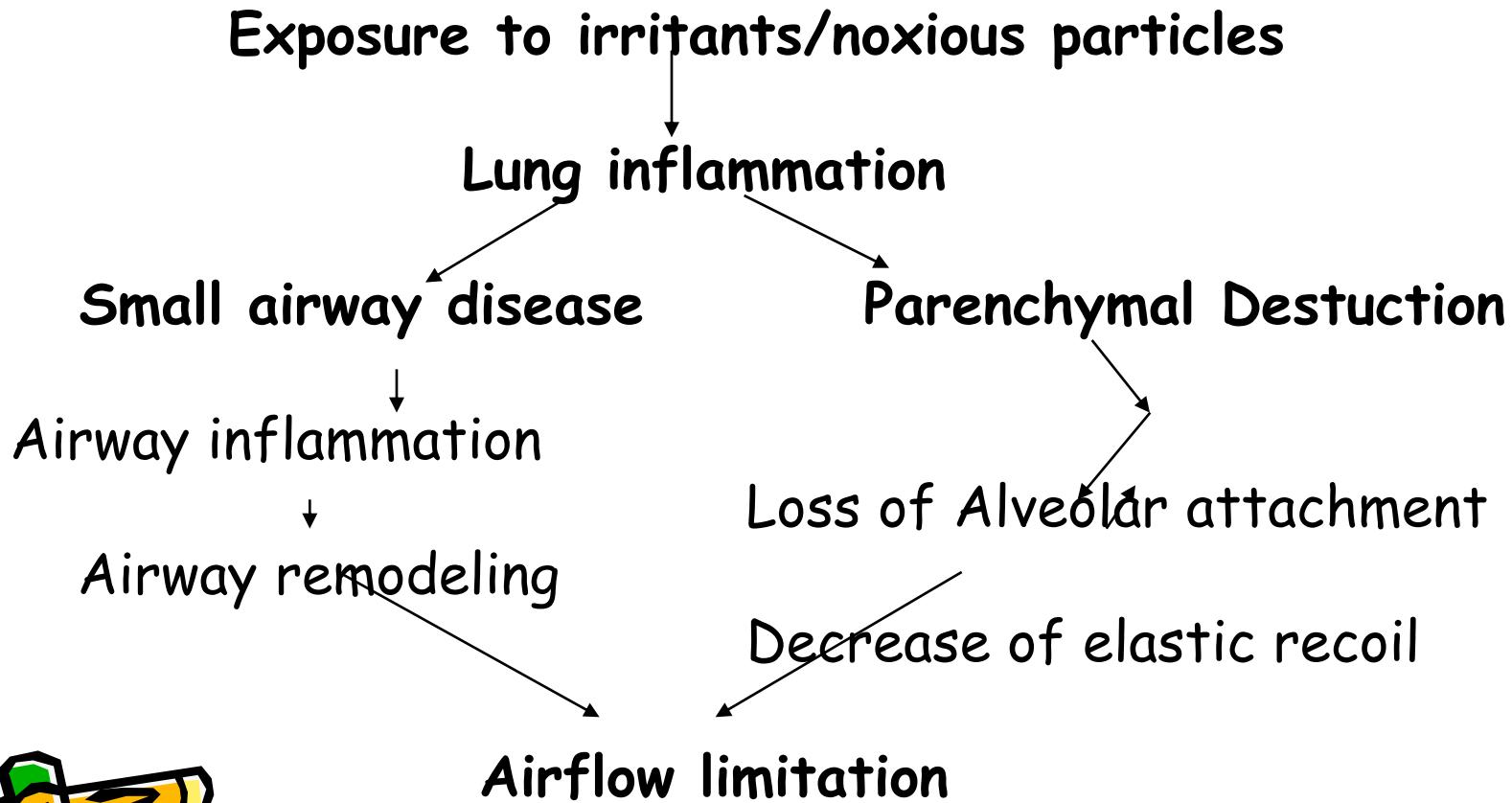
- The main mechanism of airflow limitation is loss of elastic recoil.
- Expiration becomes difficult due to loss of elastic recoil which reduces the volume of air expired passively
- In early life it may be as a result of α_1 -antitrypsin deficiency.

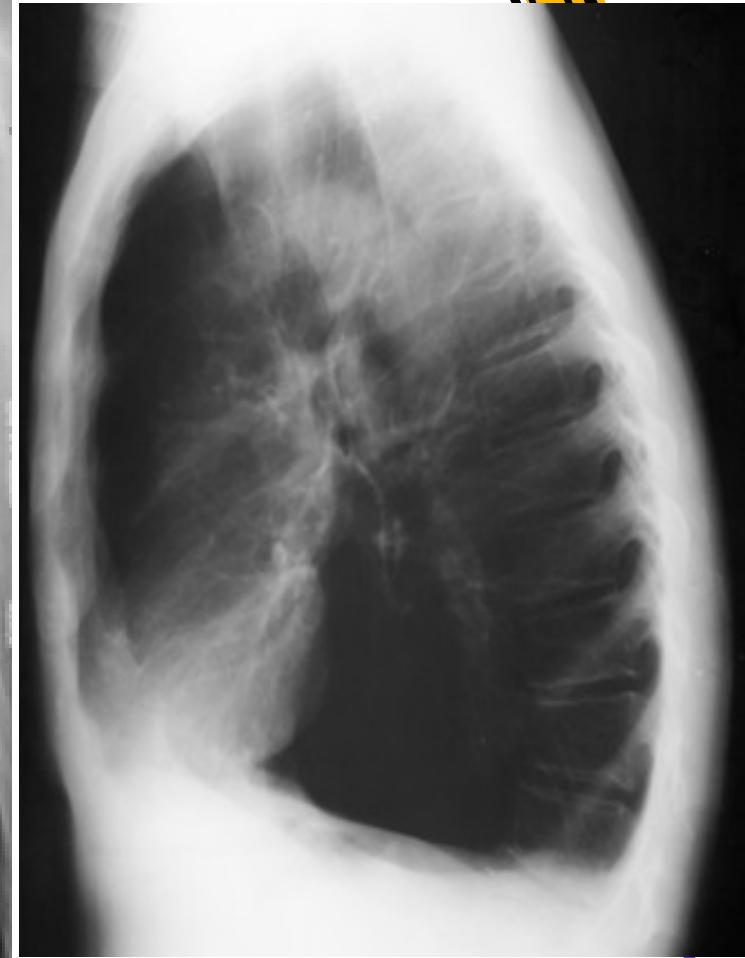


- Septal destruction also affects airway caliber
- Additional airway narrowing can also result from inflammatory hyperreactivity of the bronchi with bronchoconstriction



Pathogenesis of COPD



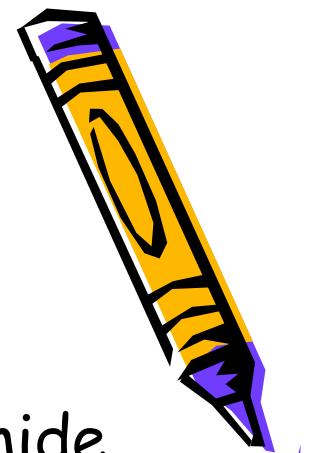


Case Study

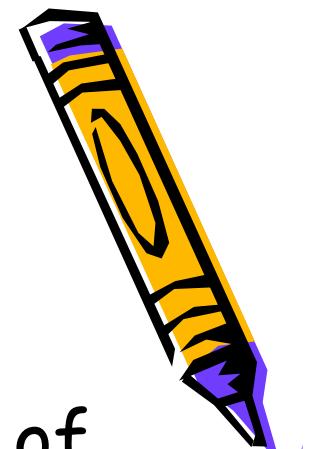
- Mr. T 67 years, married, Retired police detective. Weight 64 kgs Height 1.80 cms.
- Smoker 45 pack year.
- Used to be able to walk 5-6 kms - now about 0.5 km and he starts to become short of breath. Cannot attempt hills now.
- Past medical history hypertension.
- Medications Accupril 5 mgs daily
Lipex 20mgs nocte

Treatment

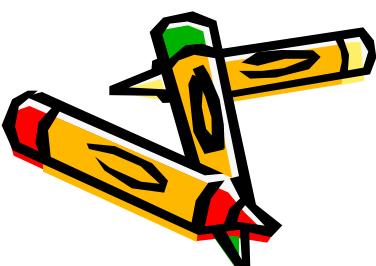
- Stop Smoking
- Bronchodilators:-
 - Anticholinergic agents -Ipratropium Bromide
 - main therapy- check MDI techniques- may need a spacer. May be able to have Spiriva
 - B_2 adrenergic agonist.- eg Salbutamol
 - Glucocorticosteroids -small percentage helpful.
 - Referral to Pulmonary Rehabilitation
 - Lung Volume reduction
 - Oxygen Therapy $PaO_2 >7.3$ kPa or >8 kPa with evidence of Cor Pulmonale
 - Annual flu vaccination and 5 yearly pneumococcal vaccine



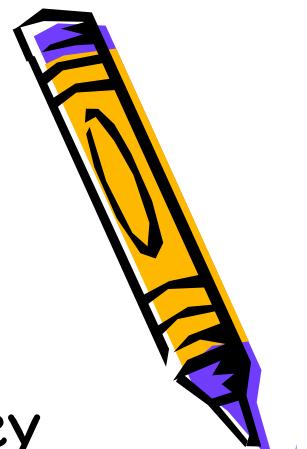
End of life issues



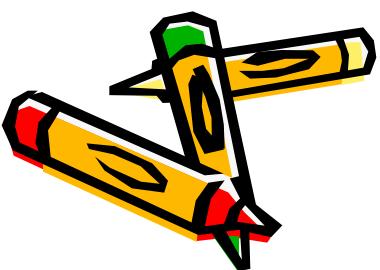
- Severe COPD has a five-year mortality of about 50%.
- For COPD patients who require mechanical ventilation, one-year mortality is 60%.
- Advance directives and end-of-life care be an integral part of the comprehensive management of patients with COPD.



Managing Breathlessness

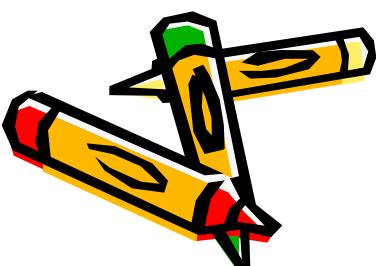


- Progressive breathlessness on exertion is a key feature of COPD.
- Even every day activities such as washing and dressing can cause disabling breathlessness.
- Often the response to such experiences is activity avoidance
- This can lead to a downward deconditioning spiral whereby cardiovascular fitness decreases, skeletal muscle mass is lost and patients consequently become more breathless.



Nutrition

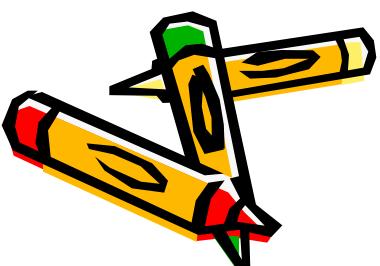
- Normal, healthy eating advice should form part of routine patient education in COPD.
- In severe COPD, however, weight loss is common. The mechanisms behind weight loss are not fully understood but are likely to be a combination of systemic inflammation and a simple energy expenditure/intake imbalance.
- It is associated with a poor prognosis.



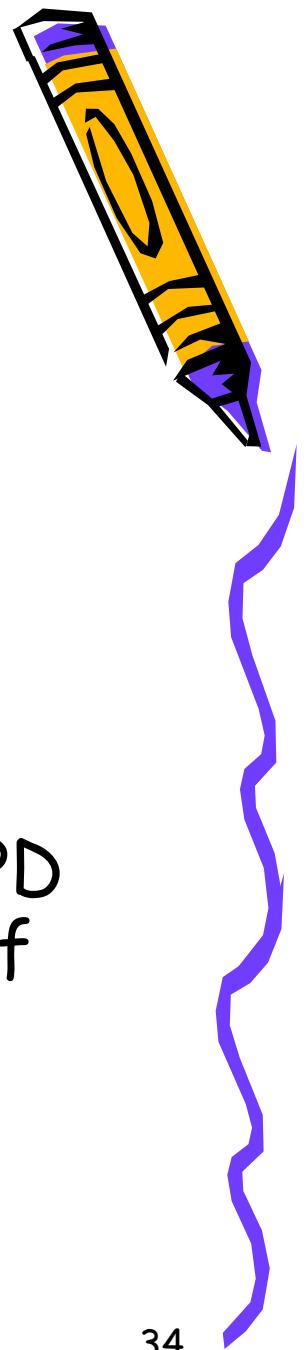
Exacerbations



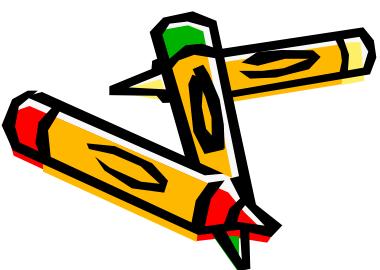
- Exacerbations are distressing, disruptive and disabling; the effects can last up to four months
- Frequent exacerbations increase disease progression and lead to significant loss of quality of life.
- Advice about how to avoid them (if possible), and how to manage them if they occur is therefore important.



Psychological problems and social isolation



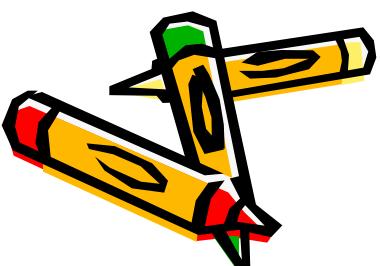
- Breathlessness saps energy and confidence, reduces independence and causes loss of role and self-esteem.
- It is hardly surprising that clinical depression in severe COPD is common
- All health professionals caring for COPD patients need to be alert to the signs of depression.



Family and relationship problems

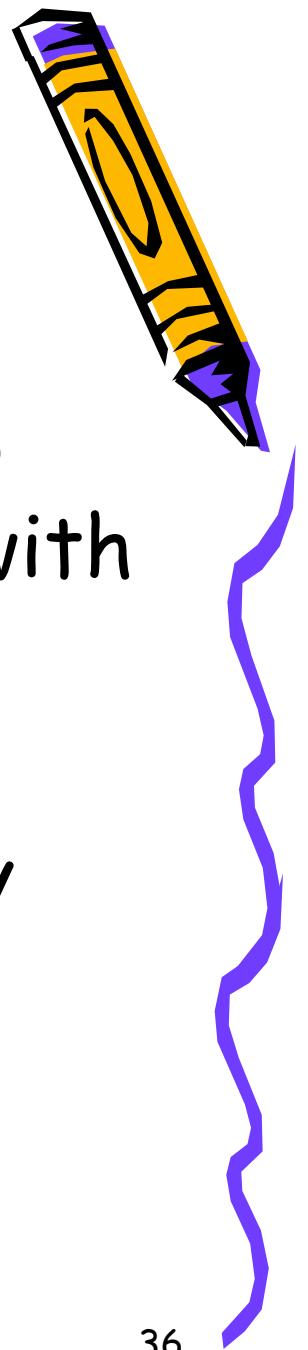
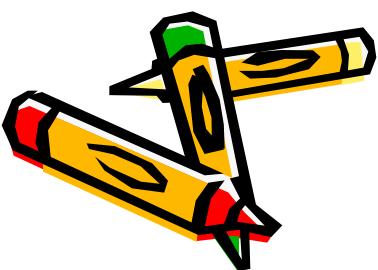


- Long term illness places considerable strains on families and partners.
- Carers often suffer from anxiety and depression. The additional domestic burden they shoulder may produce feelings of resentment on their part and guilt on the part of the patient.
- COPD affects older people and a patient's main carer may also be elderly and ill.
- COPD is a progressive, long-term and eventually terminal illness.



Summary

- The aim of treatment should be to enable patients not simply to live with COPD, but to have a life with it.
- With appropriate treatment and support it is possible to put quality back into their remaining years.



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