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# Self monitoring in Chronic Obstructive Pulmonary Disease (COPD)

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# Why are we doing this and why may respiratory rate monitoring help?

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- Long term illness
- COPD
- Home monitoring service
- Home monitoring of COPD
- Respiratory rate?

# Long Term Conditions

The care of people with chronic conditions consumes a large proportion of health and social care resources

- **17.5 million** adults may be living with a chronic disease
- **75%** of people over 75yrs have a chronic disease
- **45%** will suffer from more than one condition
- **By 2030** the incidence of chronic disease will double

Will telemetry supported self monitoring improve the management of these conditions?

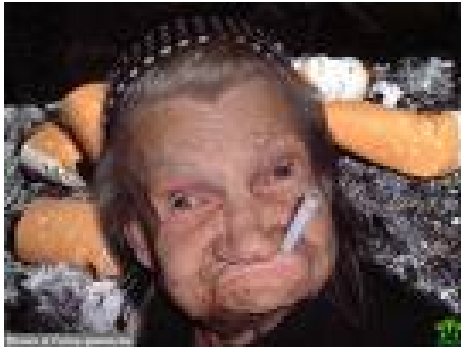
# COPD

- Chronic obstructive pulmonary disease (COPD) is characterised by airflow obstruction. The airflow obstruction is
  - usually progressive
  - not fully reversible
  - does not change markedly over several months.

*The disease is predominantly caused by smoking.*

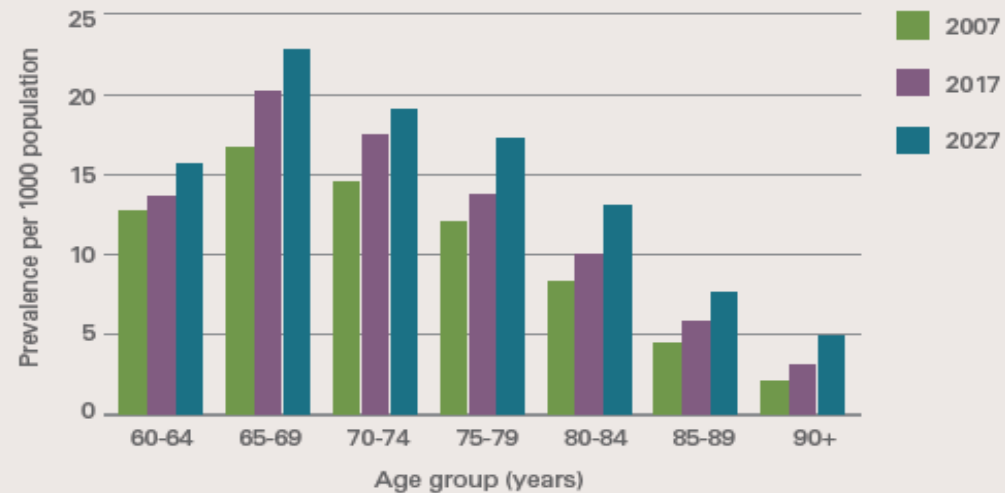
- Symptoms include
  - exertional breathlessness
  - chronic cough
  - regular sputum production
  - frequent winter “bronchitis”
  - wheeze.

# Expected Increase in COPD



## Exhibit 2

Projected prevalence of COPD in people aged 60 and above over the next 20 years



Source: ISD Scotland, 2004/05; GAD population projections, 2005

Audit Scotland. Managing long-term conditions. 2007

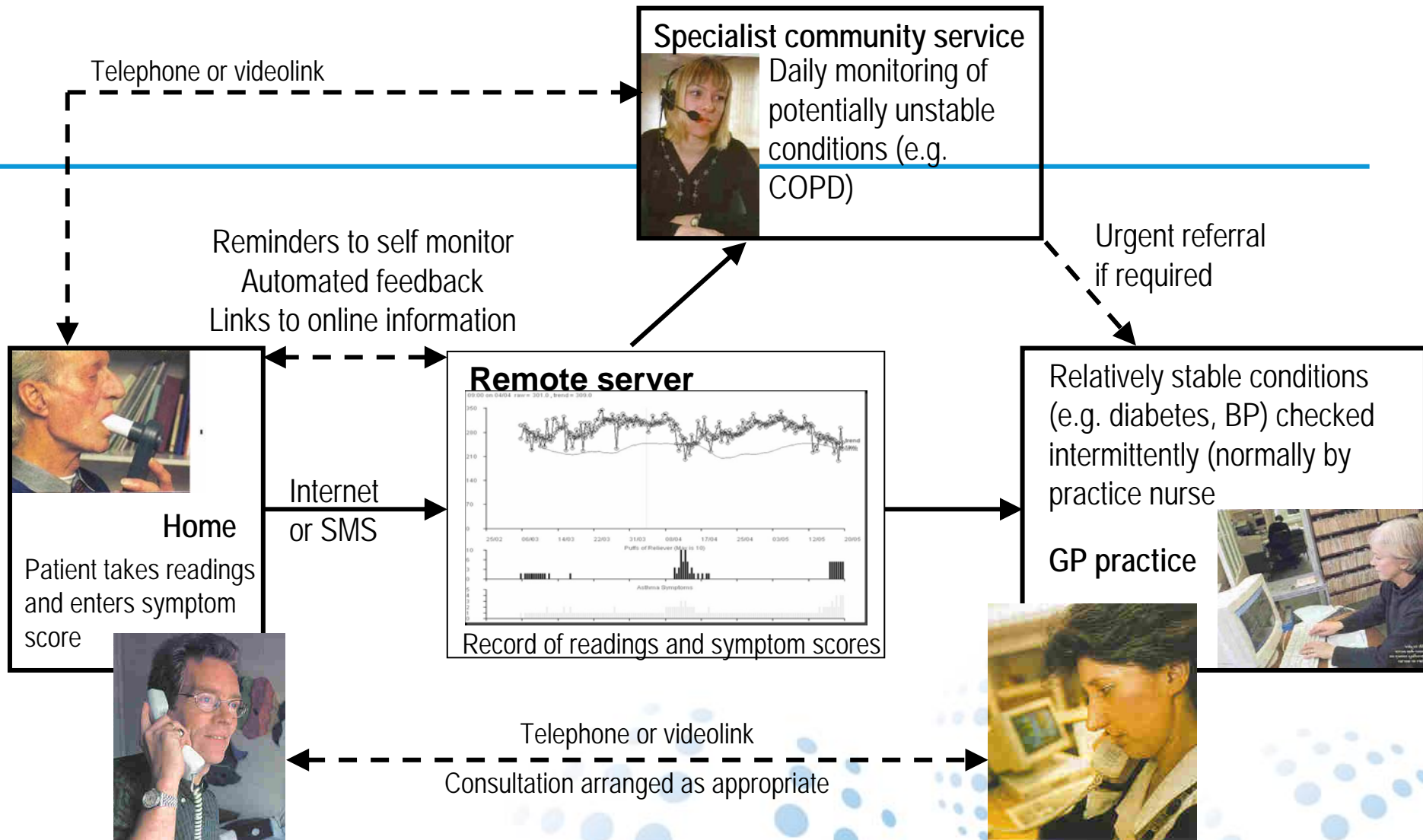
# Exacerbations

- An exacerbation is a sustained worsening of symptoms from the usual stable state that is beyond normal day-to-day variations, and is acute in onset.
- retrospective audit of patients admitted to hospital with exacerbation of COPD has shown that 34% were **re-admitted** and 14% had **died** within 3 months
- patients experiencing frequent exacerbations (more than 2.92 per year) have more rapid **lung function decline**

# Why self-monitoring in COPD?

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- Evidence suggest that there is an increase in symptoms about 24 hours before the onset of a full exacerbation
- Starting antibiotics and/ or steroids during this time could prevent hospital admissions



## Models of telemetric supported self monitoring

# What to monitor?

- Symptom score – comparing today with ‘usual’

- Peak flow/ FEV<sub>1</sub>
- Pulse oximetry



- Scepticism that these measures would be accurately taken
- Basis for treatment initially symptom scores

# How to monitor

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# Findings from COPD pilot

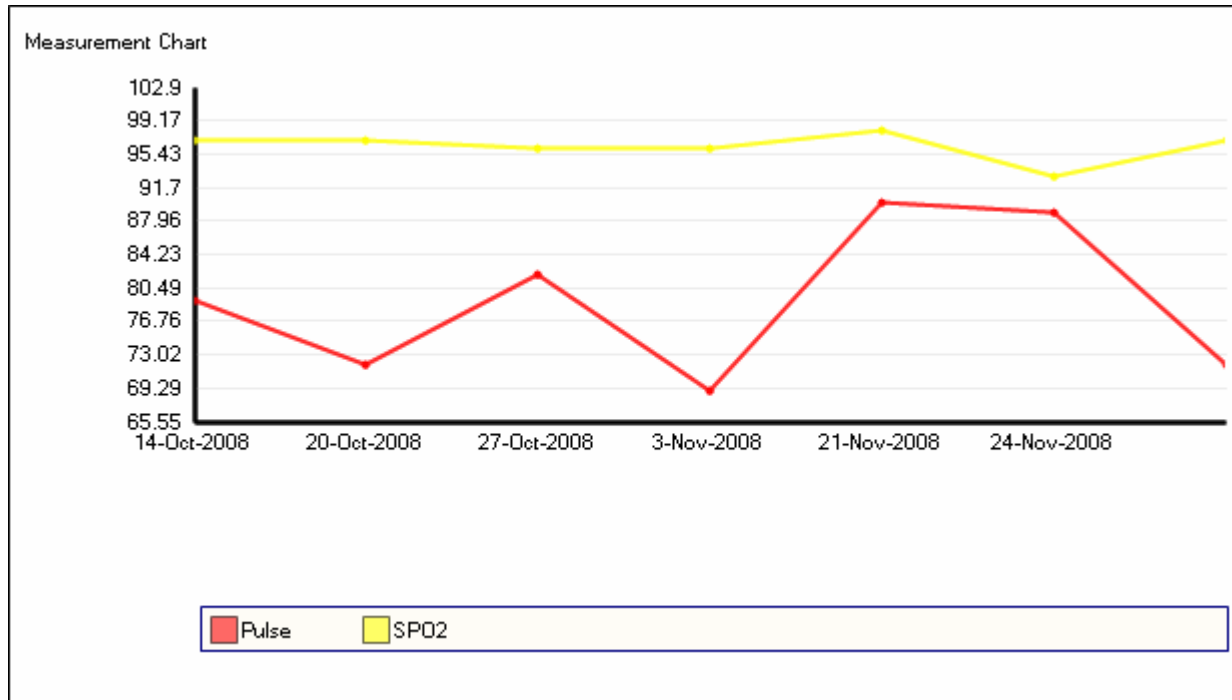
(qualitative work plus service records)

- 30 patients – ongoing
- Based on symptom scores the amount of treatment doubled
- Some people always scored high
- Some people could differentiate a genuine increase in symptoms from just feeling bad – others could not

## Interim analysis of other parameters

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- Peak flow / FEV<sub>1</sub> did not appear to identify exacerbations
- SPO<sub>2</sub> dropped in some cases, but was fairly late sign
- Pulse rate rose



# Respiratory rate: the missing compensatory factor

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- Resting respiratory rate rises to maintain oxygen saturation
- Ancillary muscles of respiration may be used
- Easy pattern to recognise face to face - difficult to monitor remotely
- Measured surreptitiously
- Video not good or popular

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- Can we measure respiratory rate using speckled computing?
  - Will this improve our ability to identify COPD exacerbations early?