Implementation of a Computer Guided Consultation (intelligent clinical decision support system software) for COPD patients in NHS Bedfordshire: evaluation of clinical and health economic benefits

Biswajit Chakrabarti1&2, Mike Pearson1&2, Eddie McKnight2, Lisa Davies1&2, Phil England2, Louise Reed2, Kim Sergeant2, Robert Angus1&2

1.University Hospital Aintree, Liverpool University Hospitals NHS Foundation Trust. 2.Lunghealth Ltd
Correspondence: biz@doctors.org.uk

Background

COPD is a common source of morbidity, mortality and healthcare utilization within primary care.

We have previously reported that the approach of a computer guided consultation in COPD allows consistent delivery of specialist, guideline quality care.

This is even in hands of clinicians with basic disease specific training.

(Angus RM et al. Feasibility and impact of a computer guided consultation on guideline based management of COPD in general practice. Prim Care Respir J. 2012 Dec; 21(4): 425-30)

Methodology

The Lunghealth guided consultation diagnoses COPD, grades the disease according to severity which then leads to correct treatment pathways

- 4,500 interconnected algorithms
- Products CE marked and ORCHA/NHS DTAC accredited

Algorithms for:
- Treatment interventions
- Spirometry interpretation
- Inhaler technique
- Emergency review
- Pulmonary Rehab
- Oxygen Assessment
- Flu/COVID Vaccinations
- Smoking Cessation
- Diagnosis, challenge and confirmation

Provides real time patient reporting and practice dashboards
- Sign posts referrals in line with locality resources
- Sign-posts patients who do not have COPD/ASTHMA for further investigation
- Read/Write back integration with EMIS/ SystemOne
- Drive prescribing policy and ensures patient follow-up

Results

- 847 patients on the COPD register in NHS Bedfordshire CCG were reviewed using the COPD computer guided consultation across 17 practices from March 2019-March 2020 comprising 19% of the COPD population in NHS Bedfordshire.
-

Clinical benefits following implementation of the Computer Guided Consultation

- Following review with the Clinical Guided Consultation, 18% (146/847) were found not to have the diagnosis of COPD (McNemar's test; $p<0.001$).
- In those who were diagnosed with COPD, those found to have adequate inhaler technique and a written COPD management plan increased from 68% to 94.8% and 44.4% to 92.1% respectively from pre to post CGC review (McNemar's test; $p<0.001$).
- 12% of the cohort were referred for Smoking Cessation and an additional 8.1% of subjects diagnosed with COPD were referred for pulmonary rehabilitation.
- One or more COPD medication was discontinued in 43% (382/847) whilst new COPD medication was commenced in 29% (244/847).

Health economic benefits following implementation of the Computer Guided Consultation

- Patients on the COPD register shown not to have COPD and thus have no need for continued inhaler therapy
- Patients on the COPD register shown not to have COPD and thus no need for follow up visits
- In those patients who have a confirmed diagnosis of COPD, optimization of drug therapy results in reduction in readmission rates and healthcare utilization
- In those patients who have a confirmed diagnosis of COPD, optimizing drug therapy to use the NICE recommended formulations
- Implementation of the CGC within the cohort studied is believed to have delivered a net potential saving of around £200,000
- If we extended the results from our latest trial site in Bedfordshire to the whole CCG, we estimated this could bring saving of £587,000 in the first year, largely as a result of correct diagnosis and optimizing therapy in line with NICE guidelines.

The clinical guided consultation is owned by Lunghealth Ltd; the project to implement the clinical guided consultation was funded by Chiesi

Key points of the Lunghealth Guided Consultation

- Designed to guide staff to work to consistent guideline level standards in COPD diagnosis and management
- The software prompts...
  - A purposeful history to support a diagnosis of COPD integrating symptoms, history and examination findings
  - Interpretation of spirometry in an intelligent manner
  - Consideration of appropriate investigations
  - Integrates findings and suggests evidence based interventions and therapies based on the staging of COPD and the presence of other appropriate clinical markers
  - Use of the guided consultation provides an effective safety net against misdiagnosis whilst prompting the user to consider other potential comorbidities.
  - Patients with a confirmed diagnosis receive appropriate management - both pharmacological and non-pharmacological - to achieve optimum disease control and health related quality of life.
  - Patients receive tailored treatments depending upon the severity of their disease, taking into account spirometry, symptoms and exacerbation frequency.
- The software does not make decisions – it suggests therapeutic interventions or further medical referral while leaving it open for the clinician to make the final choice as appropriate
- All patients have a standardised electronic record of their condition, which can be used for future care both elective and acute. Available inside NHS N3 network, can be operated by nurse, doctor or technician and in primary, intermediate or secondary care

Conclusion

The use of a computer guided consultation (intelligent clinical decision support system) in the review of patients on the COPD register conveys significant clinical benefit over and beyond usual care particularly in reducing misdiagnosis and optimization of medicines

The use of a computer guided consultation conveys significant health economic benefit estimated to bring a saving of £587,000 across a whole CCG during the first year following implementation