Additional file 1: Process flow diagram for in-hospital management of COPD exacerbation

**DIAGNOSTIC ASSESSMENT**

1. History before exacerbation

2. Assessment of symptoms:
   - Physical examination

3. Assessment of differential diagnosis

4. Assessment of comorbidities

5. Daily assessment of vital parameters

6. Diagnostic tests
   - Prior measures of lung function
   - Spirometric classification of severity
   - Documenting frequency and severity of attacks of breathlessness
   - Documenting frequency and severity of attacks of cough
   - History of chronic sputum production
   - Documenting possible limitations of daily activities
   - Prior arterial blood gas measurements in stable condition
   - Number of previous exacerbations in the previous year
   - Number of previous hospitalizations because of COPD in the previous year
   - Number of admissions to ICU in the previous year
   - Cardiovascular status
   - Pre-existing comorbidities
   - Current treatment regimen
   - Smoking status at admission
   - Sleeping and eating difficulties

7. Arterial blood gas measurement

8. Chest X-ray

9. Electrocardiogram

10a. Blood examination

10b. Glucose monitoring

11. Sputum culture and antibiogram

12. Spirometry

13. 1-yearly CT Thorax

14. 1-yearly Echo cardio

15. Admission to ICU if exacerbation is life threatening

- Temperature
- Pulse rate
- Blood pressure
- Pulse oxymetry
- Alertness
- Skin color

- Hemaetology
- Biochemical tests (i.e. blood glucose monitoring)
- Theophylline level in patients on theophylline therapy at admission
PHARMACOLOGICAL MANAGEMENT

Inhaler therapy

16. Short-acting bronchodilators
   Initiation, continuation or increase of doses and frequency

17. Methylxanthines
   Consider if inadequate or insufficient response to short-acting bronchodilators

18. Long-acting bronchodilators
   Initiation, continuation or increase of doses and frequency

19. Inhaled glucocorticoids
   Initiation, continuation or increase of doses and frequency
   Or combination therapy

Corticoids & Antibiotics

20. Oral prednisolone 30-40 mg during 7-14 days

21. Antibiotics if indicated
   Indication:
   - Patients with increased sputum purulence, and also show increased dyspnoea and or increased sputum volume
   - Patients who are critically ill and who need mechanical support
   - Consolidation on a chest radiograph
   - Clinical signs of pneumonia
NON-PHARMACOLOGICAL MANAGEMENT

22. Controlled oxygen therapy in patients hypoxemic during admission

23. Assisted ventilation if indicated

24. Smoking cessation advice in active smokers

25. Patient education: COPD & self management

26. Patient education: Inhaler therapy

27. Patient education: Home oxygen therapy

28. Physiotherapy

29. Pulmonary rehabilitation

30. Screening and updating of vaccinational status: influenza; pneumococcus

31. Nutritional status

32. Deep venous thrombosis prophylaxis

33. Fluid balance

34. Treatment of co-morbid conditions

35. Assessment and management of anxiety and depression

36. Arterial blood gas measurement prior to discharge in patients hypoxemic during exacerbation

37. Prescription of home oxygen therapy in patients who remain hypoxemic at discharge from the ward

38. Discharge management

- Nature of COPD
- Recognition and treatment of exacerbations
- Self management strategies
- Strategies for minimizing dyspnoea

- Training / support in activities of daily life
- Positioning
- Chest Physiotherapy: airway clearance
- Breathing techniques

- Identification for pulmonary rehabilitation
- Referral to pulmonary rehabilitation

- Assessment:
  - BMI
  - Weight loss
- Dietician:
  - Malnutrition: nutritional supplement; advice
  - Overweight: advice

- Monitoring of fluid balance
- Fluid administration in dehydrated patients

- Assessment of medical discharge criteria
- Assessment and management of home situation
- Oral information and discharge letter regarding prescribed home therapy and follow-up appointment
- Arrangement of follow-up appointment 4-6 weeks after discharge
  - The patient's ability to cope at home
  - Measurement of FEV1
  - Re-assessment of inhaler technique and understanding treatment regime
  - In severe COPD: need for LTOT* and/or home nebuliser usage
  - Advice on smoking cessation as necessary
  - Arterial blood gas measurement:
    - In the following three months in patients hypoxemic during a COPD exacerbation
    - After discharge with LTOT
- Information letter for general practitioner
- Discharge checklist

* LTOT= Long Term Oxygen Therapy