Supplementary Appendix 1: EHR Trigger Logic, Bedside Prompt, and Orderset (Implementation Tools — full text for local adaptation)

A. Trigger logic (machine-readable description)

1. Trigger event: ED or ward encounter where clinician records primary problem = "COPD exacerbation" OR ICD-10 code J44.1 entered within initial documentation OR clinician selects "AECOPD pathway" during ED triage.
2. Timing: Trigger evaluated at ED disposition and on ward admission (first 6 hours).
3. Action: If the trigger is positive, display bedside prompt and a link to the AECOPD orderset in the active orders pane.

B. Bedside prompt (short text for pop-up display)
Prompt title: "AECOPD — care checklist"
Prompt body:
"This patient has been identified with an acute COPD exacerbation. Please consider the following at admission:

1. Bronchodilator: MDI + spacer preferred (neb. if MDI not feasible).
2. Systemic corticosteroid: Prednisolone 40 mg PO daily × 5 days (or IV equivalent if required). Check recent steroid exposure before prescribing.
3. Oxygen: Target SpO_2 88–92% — document FiO_2 and target range.
4. Antibiotics: Consider only if increased sputum purulence/volume, fever, or CXR consolidation. See the antibiotic checklist in orderset.
5. Request ABG within 1 hour if clinically indicated.
6. Consider NIV for persistent hypercapnia/hypoxaemia or increased work of breathing.
7. At discharge: automatic pulmonary rehabilitation referral (if eligible) and smoking cessation advice/referral.
   Click 'Open AECOPD orderset' to pre-populate recommended orders."

C. AECOPD Orderset (core items; checkboxes & defaults)
Oxygen therapy

- Titrate oxygen to *Target SpO_2 88–92%* (checkbox = default). Document FiO_2. Pre-filled text: "Target SpO_2 88–92%, titrate O_2 to target; monitor SpO_2 and record FiO_2."
  Bronchodilator therapy
- Preferred: Salbutamol (albuterol) MDI 100 mcg — 2 puffs via spacer PRN q4h (pre-filled). Ipratropium MDI — 2 puffs PRN (checkbox).

- Nebulizer option: Salbutamol + ipratropium nebuliser PRN (allowed if MDI not feasible).
  Systemic corticosteroid
- Prednisolone 40 mg PO daily × 5 days (pre-filled). Alternative: Hydrocortisone IV 100 mg IV bolus if NPO (pre-filled alternative).
  Antibiotics
- Antibiotic order optional: include checkboxes for indication (sputum purulence, increased sputum volume, fever >38°C, or consolidation on CXR). If none are checked, the default state is "no antibiotic recommended." Common first-line antibiotic suggested text (local formulary) may be prefilled but requires active clinician confirmation.
  ABG
- ABG order prefilled with option: "ABG within 1 hour if clinically indicated" (checkbox).
  NIV
- NIV order with pre-populated indication checklist (persistent hypercapnia, pH < 7.35 on ABG with hypercapnia, persistent hypoxaemia despite O_2, or increased work of breathing). If NIV is ordered, a pre-populated monitoring and escalation plan will be included.
  Discharge bundle
- Pulmonary rehabilitation referral (automatic for eligible patients — checkbox to defer).
- Smoking cessation counselling documented (checkbox) with option to auto-generate referral and leaflets.
- Vaccination check (influenza, pneumococcal): checkbox to order vaccination or send reminder.
- Arrange respiratory clinic follow-up within 2–6 weeks (checkbox).
  Clinical notes/information
- Short instruction field: "Document prior steroid exposure in last 3 months: [link to medication history]."
- Link to inhaler technique leaflet and nursing demonstration checklist (PDF link).

D. Implementation notes for local adaptation

- All default orders are editable and require active confirmation. The system does not auto-prescribe antibiotics without confirmation from a clinician.
- The orderset contains short free-text rationale lines to give clinicians evidence context (one-line guideline citations).

- Consider aligning antibiotic defaults with local antimicrobial stewardship guidance and local formulary.

Table S1. Process measures for implementation fidelity

Process Measure	Baseline	Post-intervention	Notes
Staff training attendance (%)	N/A	100%	All targeted nursing and medical staff attended at least one session
Bedside prompt display rate (%)	N/A	98%	Based on the EHR log for all AECOPD admissions
Orderset opened (%)	N/A	88%	Percentage of triggered admissions where the orderset was opened
Orderset fully completed (%)	N/A	82%	All relevant fields completed; remainder partially used
Average time from admission to orderset opening (hours)	N/A	0.8 ± 0.3	Mean ± SD
Prompt override rate (%)	N/A	5%	Proportion of cases where staff dismissed promptly without opening the orderset

Table S2. Baseline Demographic and Clinical Characteristics of AECOPD Patients at Baseline and Re-audit

Variable	Baseline (n=50)	Re-audit (n=50)	p-value*
Age, mean (SD)	69.4 (9.1)	70.1 (8.7)	0.68
Male sex, n (%)	31 (62.0%)	30 (60.0%)	0.84
Current smoker, n (%)	29 (58.0%)	27 (54.0%)	0.69
Prior home oxygen, n (%)	15 (30.0%)	17 (34.0%)	0.66
Prior hospitalization in the last 12 mo, n (%)	22 (44.0%)	20 (40.0%)	0.68
COPD severity (GOLD 3–4), n (%)	36 (72.0%)	35 (70.0%)	0.83
Charlson comorbidity index, median (IQR)	4 (3–5)	4 (3–5)	0.92

* p-values: Fisher's exact test for categorical variables; independent t-test for normally distributed continuous variables; Mann–Whitney U test for non-normally distributed continuous variables.

Supplementary Table S3. Resource and approximate cost template:

- Informatics configuration hours: [60 hrs]
- Clinical staff (co-design / meetings) hours: [100 hrs]
- Education delivery hours: [20 hrs]
- Any software/licensing costs: [15000 USD]
- Estimated total implementation cost: [35000 USD]
  (We summarized that no new hardware was required and that costs were primarily staff time and informatics configuration.)