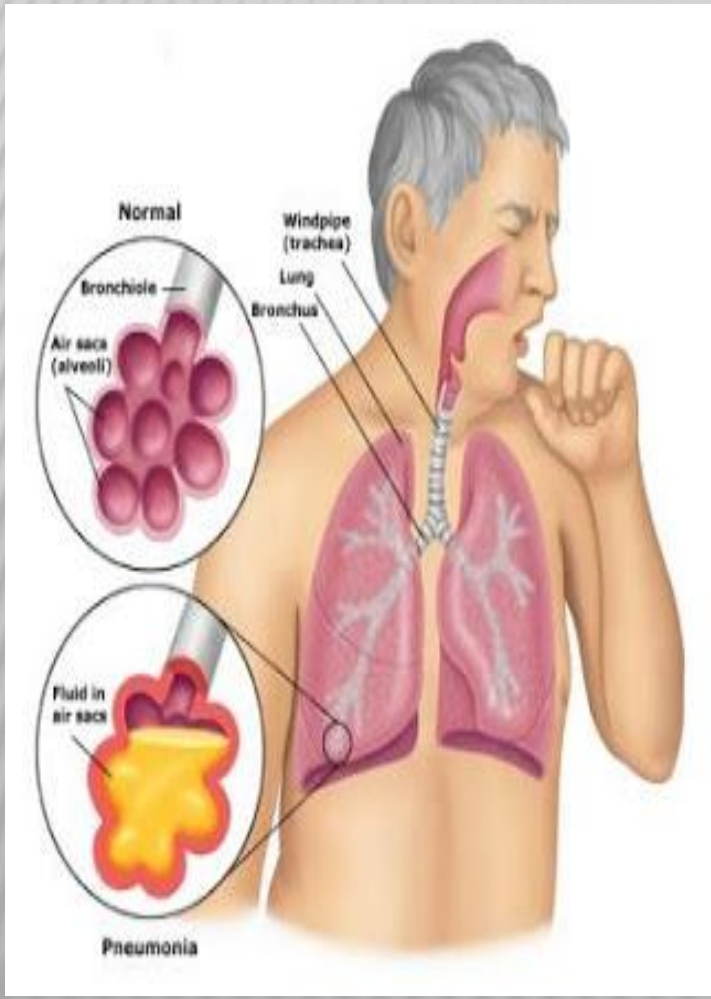
PPOK



Willi wahyu timur Apt.

For pharmacy student of Unissula

DEFINISI

PPOK / COPD (Chronic Obstructive Pulmonary Disease)

Penyakit Paru Obstruktif Kronik (PPOK) adalah penyakit yang ditandai dengan hambatan aliran udara di saluran nafas yang tidak reversibel dan bersifat progresif (Depkes, 2008)

GOLD 2013

- PPOK, penyakit umum yang dapat dicegah dan diobati, ditandai oleh keterbatasan aliran udara yang menetap yang biasanya progresif dan berkaitan dengan respons peradangan yang meningkat di jalan napas dan paru-paru terhadap partikel atau gas-gas berbahaya.
- **Eksaserbasi dan komorbiditas** berperan dalam derajat keparahan seorang pasien secara keseluruhan

GOLD 2021

OVERALL KEY POINTS:

- *Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.*

- *The most common respiratory symptoms include dyspnea, cough and/or sputum production. These symptoms may be under-reported by patients.*

- *The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute. Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and accelerated aging.*

- *COPD may be punctuated by periods of acute worsening of respiratory symptoms, called exacerbations.*

- *In most patients, COPD is associated with significant concomitant chronic diseases, which increase its morbidity and mortality.*

DIFFERENTIAL DIAGNOSIS OF COPD

DIAGNOSIS	SUGGESTIVE FEATURES
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/early morning. Allergy, rhinitis, and/or eczema also present. Family history of asthma. Obesity coexistence.
Congestive Heart Failure	Chest X-ray shows dilated heart, pulmonary edema. Pulmonary function tests indicate volume restriction, not airflow limitation.
Bronchiectasis	Large volumes of purulent sputum. Commonly associated with bacterial infection. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.
Tuberculosis	Onset all ages. Chest X-ray shows lung infiltrate. Microbiological confirmation. High local prevalence of tuberculosis.
Obliterative Bronchiolitis	Onset at younger age, nonsmokers. May have history of rheumatoid arthritis or acute fume exposure. Seen after lung or bone marrow transplantation. CT on expiration shows hypodense areas.
Diffuse Panbronchiolitis	Predominantly seen in patients of Asian descent. Most patients are male and nonsmokers. Almost all have chronic sinusitis. Chest X-ray & HRCT show diffuse small centrilobular nodular opacities & hyperinflation.

These features tend to be characteristic of the respective diseases, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in the developing world where other risk factors may be more important than cigarette smoking); asthma may develop in adult and even in elderly patients.

COPD

Disebabkan Bronkitis kronik atau Emfisema, maupun keduanya

Bronkitis kronik

adalah Kelainan saluran napas yang ditandai oleh batuk kronik berdahak minimal 3 bulan dalam setahun sekurang-kurangnya dua tahun berturut - turut, tidak disebabkan penyakit lainnya.

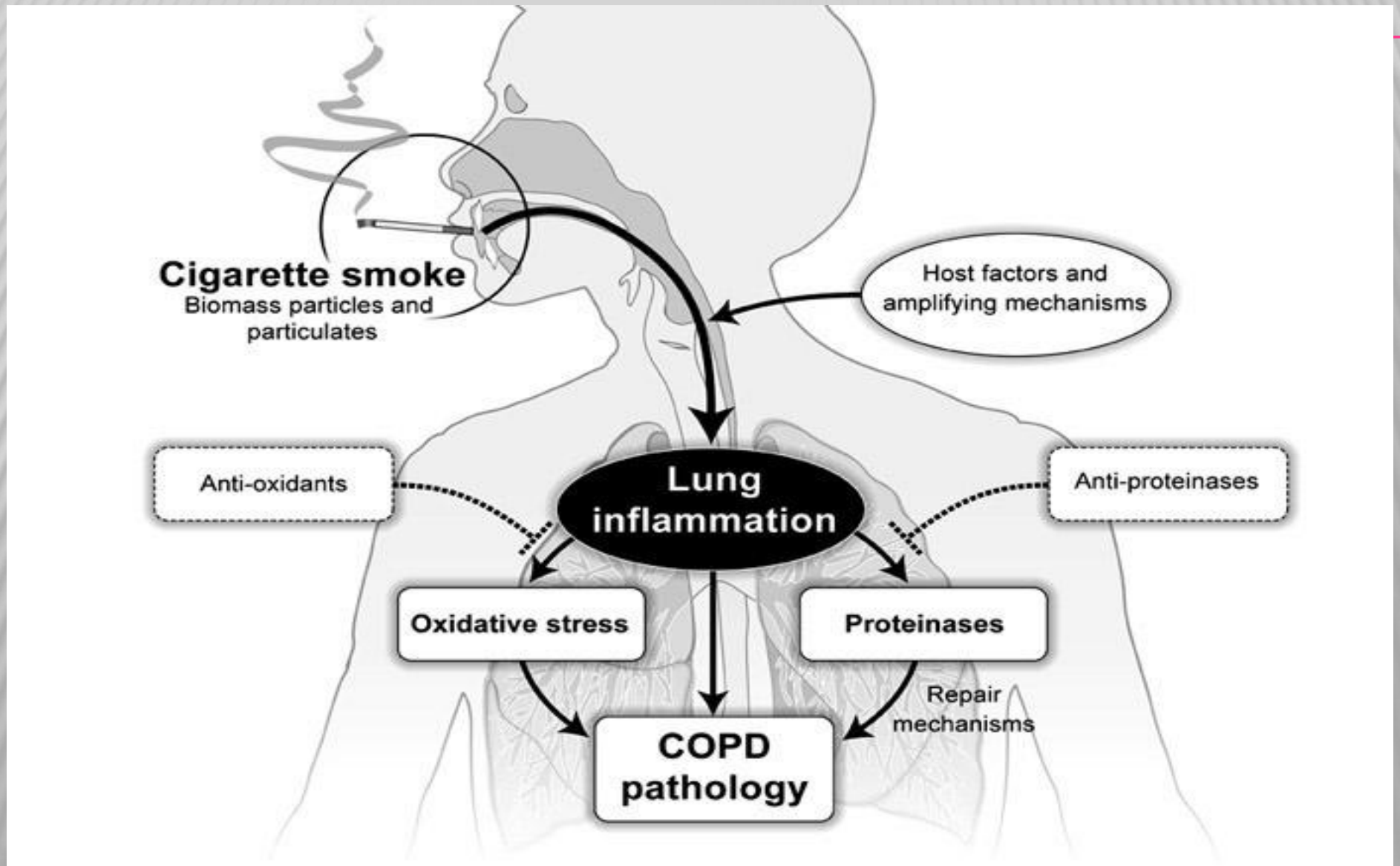
Emfisema

Suatu kelainan anatomis paru yang ditandai oleh pelebaran rongga udara distal bronkiolus terminal, disertai kerusakan dinding alveoli.

ETIOLOGI & FAKTOR RESIKO PPOK

- Kebiasaan merokok
- Polusi udara
- Hipereaktivitas bronkus
- Riwayat infeksi
- Pekerjaan
- Usia
- Jenis Kelamin
- Adanya gangguan fungsi paru yang sudah terjadi
- Defisiensi antitripsin alfa - 1, umumnya jarang terdapat di Indonesia (khusus untuk kasus Emfisema)

PATOGENESIS COPD



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PATOFISIOLOGI BRONKITIS KRONIS

Iritasi yang terus-menerus (Akibat asap rokok & polutan)

↓

Proliferasi sel goblet & pergantian epitel menjadi tidak bersilia

↓

Menghambat pembersihan mukosiliar

↓

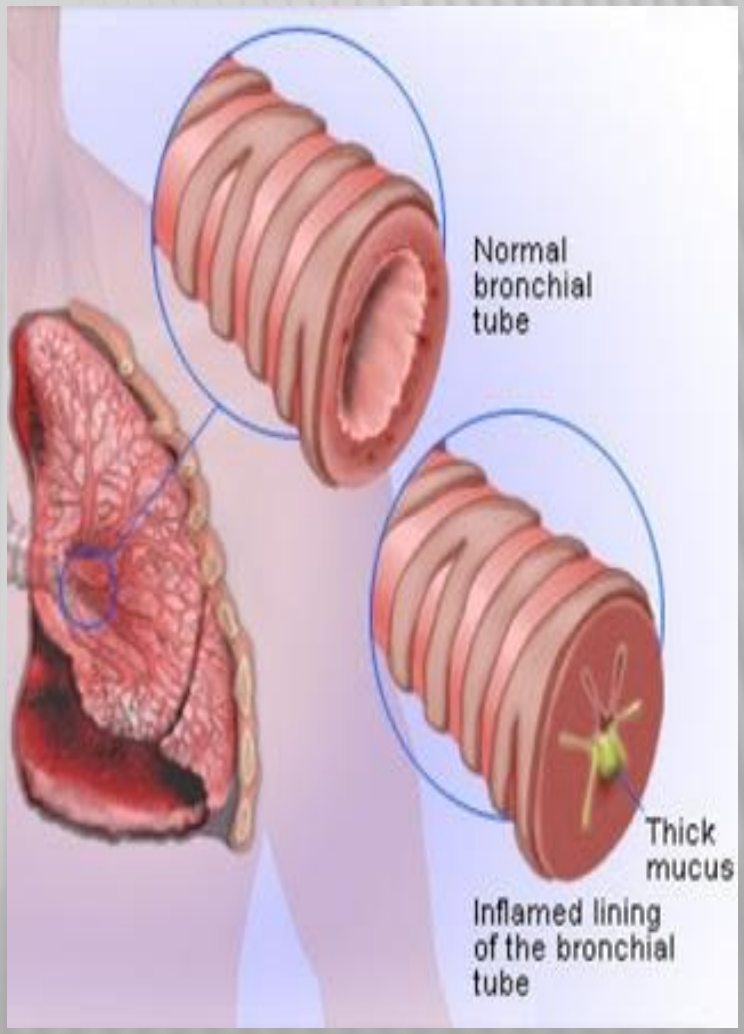
Hiperplasia, hipertrofi kelenjar penghasil mucus

↓

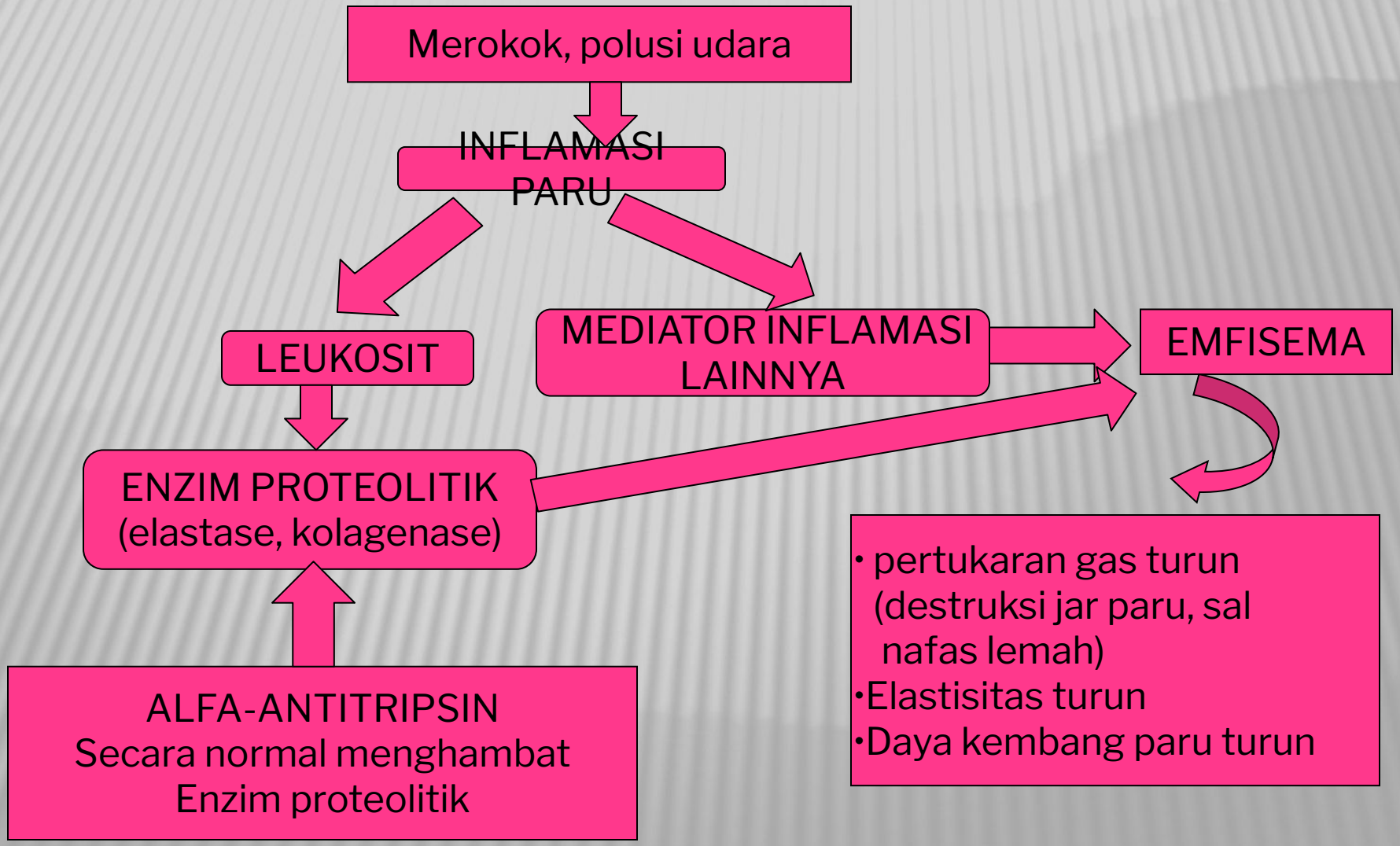
Hipersekresi mucus

↓

Obstruksi



PATOFISIOLOGI EMFISEMA



GEJALA & TANDA COPD

Batuk kronis	• Terjadi berselang atau setiap hari • Terjadi sepanjang hari (tidak seperti asma)
Produksi sputum (kronis)	• Produksi sputum □ indikasi PPOK
Bronkitis akut	• Terjadi berulang
Sesak napas	• Progresif sepanjang waktu & setiiap hari • memburuk jika berolahraga & jika terkena infeksi pernapasan
Riwayat paparan terhadap resiko COPD	• merokok, partikel senyawa kimia, polusi

KLASIFIKASI COPD (BERDASARKAN KEPARAHAN) #DULU

Mild COPD	Moderate COPD	Severe COPD	Very Severe COPD
• FEV1/FVC < 70%, FEV1 ≥ 80% pada umumnya • Ada gejala batuk kronis • Produksi sputum	• FEV1/FVC < 70%, 50% < FEV1 > 80% • Nafas pendek • Kadang muncul batuk & asma	• FEV1/FVC < 70%, 30% < FEV1 > 50% • nafas pendek • penurunan kualitas hidup • kelelahan • eksaserbasi berulang	• FEV1/FVC < 70%, FEV1 < 30% atau <50% • Kegagalan respirasi kronis • Munculnya komplikasi • Mengancam jiwa • Kualitas hidup sangat terganggu

KLASIFIKASI DERAJAT KEPARAHAN KETERBATASAN ALIRAN UDARA

- Pada pasien dengan *FEV_1/FVC* < 0,70:
- GOLD 1: Ringan $FEV_1 \geq 80\%$ prediksi
- GOLD 2: Sedang $50\% \leq FEV_1 < 80\%$ prediksi
- GOLD 3: Berat $30\% \leq FEV_1 < 50\%$ prediksi
- GOLD 4: Sangat Berat $FEV_1 < 30\%$ prediksi
- **Berdasarkan FEV_1 pasca bronkodilator*

THE REFINED ABCD ASSESSMENT TOOL

Spirometrically Confirmed Diagnosis › Assessment of airflow limitation › Assessment of symptoms/risk of exacerbations

Post-bronchodilator $FEV_1/FVC < 0.7$

Grade	FEV_1 (% predicted)
GOLD 1	≥ 80
GOLD 2	50-79
GOLD 3	30-49
GOLD 4	< 30

Moderate or Severe Exacerbation History

- ≥2 or ≥ 1 leading to hospital admission
- 0 or 1 (not leading to hospital admission)

C	D
A	B

mMRC 0-1 CAT < 10	mMRC ≥ 2 CAT ≥ 10

Symptoms

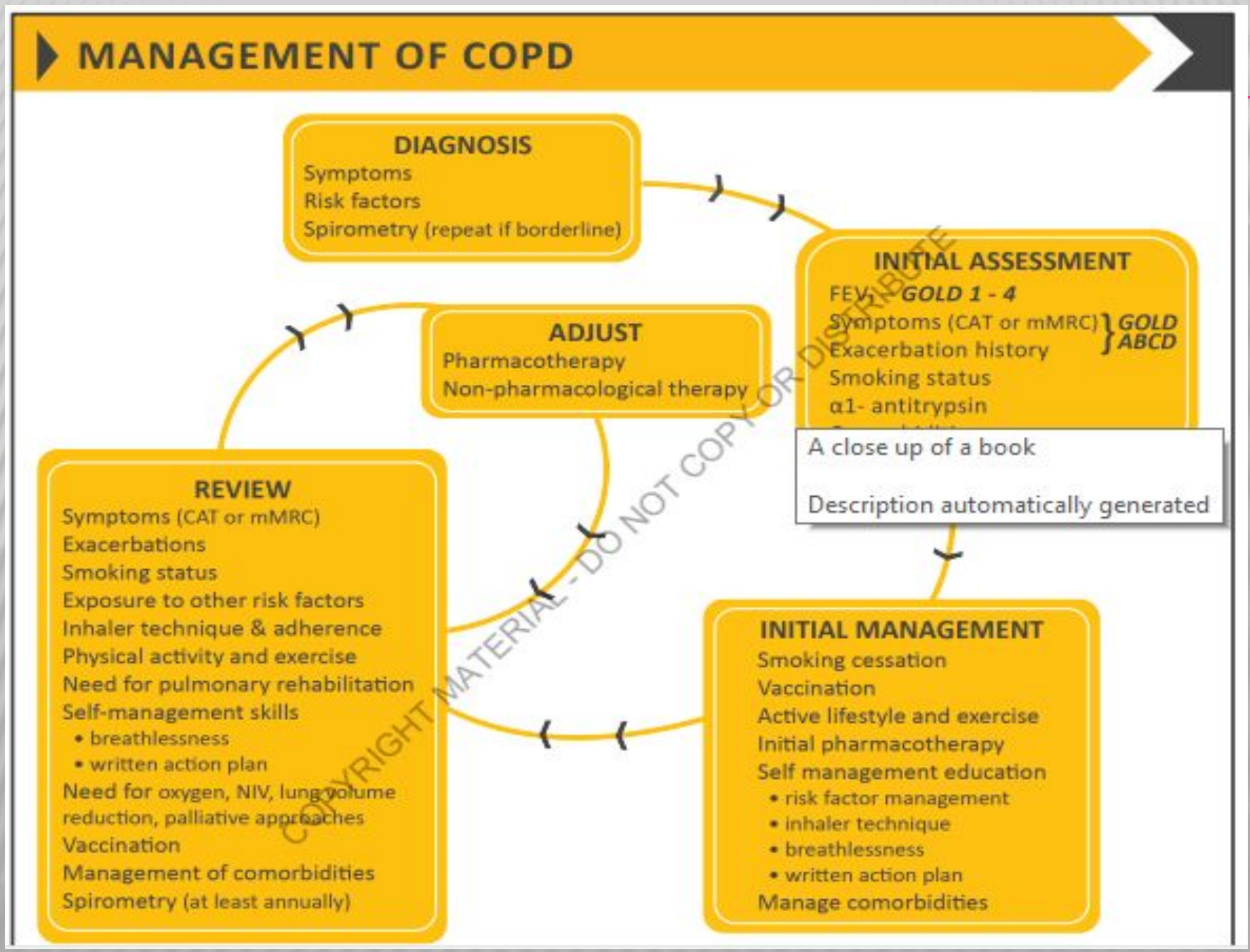
FIGURE 2.4

PENILAIAN PPOK (GOLD 2013)

1. Nilai gejala
2. Nilai derajat keterbatasan aliran udara dengan menggunakan spirometri
3. Nilai risiko eksaserbasi
4. Nilai komorbiditas

TUJUAN TERAPI PADA COPD

- Menghilangkan gejala
- Mencegah progresifitas penyakit
- Meningkatkan kualitas hidup pasien
- Mencegah & mengobati eksaserbasi serta komplikasi
- Menurunkan angka kematian
- Mencegah atau mengurangi efek samping pengobatan


MANAGEMENT OF COPD
DIAGNOSIS
Symptoms
Risk factors
Spirometry (repeat if borderline)
INITIAL ASSESSMENT
FEV1 - GOLD 1 - 4
Symptoms (CAT or mMRC) } GOLD ABCD
Exacerbation history
Smoking status
α1- antitrypsin
A close up of a book
Description automatically generated
INITIAL MANAGEMENT
Smoking cessation
Vaccination
Active lifestyle and exercise
Initial pharmacotherapy
Self management education
• risk factor management
• inhaler technique
• breathlessness
• written action plan
Manage comorbidities
REVIEW
Symptoms (CAT or mMRC)
Exacerbations
Smoking status
Exposure to other risk factors
Inhaler technique & adherence
Physical activity and exercise
Need for pulmonary rehabilitation
Self-management skills
• breathlessness
• written action plan
Need for oxygen, NIV, lung volume reduction, palliative approaches
Vaccination
Management of comorbidities
Spirometry (at least annually)
ADJUST
Pharmacotherapy
Non-pharmacological therapy
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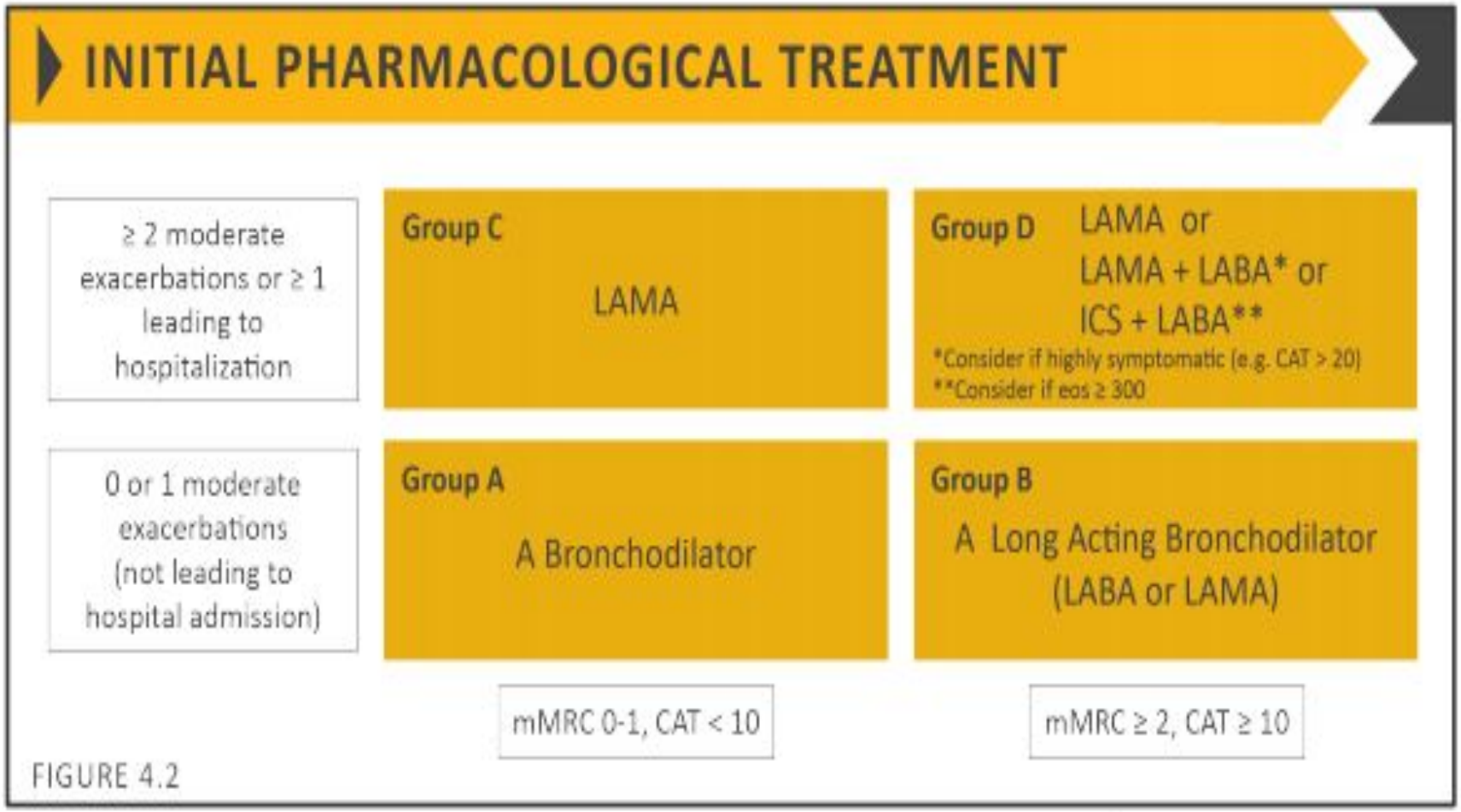

FIGURE 4.2

Definition of abbreviations: eos: blood eosinophil count in cells per microliter; mMRC: modified Medical Research Council dyspnea questionnaire; CAT™: COPD Assessment Test™.

TERAPI FARMAKOLOGI COPD

Table 10 - Commonly Used Formulations of Drugs for COPD					
Drug	**Inhaler (μg)**	**Solution for Nebulizer (mg/ml)**	**Oral**	**Vials for injection (mg)**	**Duration of Action (hours)**
β_2-agonists					
Short-acting					
Fenoterol	100-200 (MDI)	1	0.05% (Syrup)		4-6
Salbutamol (albuterol)	100, 200 (MDI & DPI)	5	5mg (Pill) Syrup 0.024%	0.1, 0.5	4-6
Terbutaline	400, 500 (DPI)	–	2.5, 5 (Pill)	0.2, 0.25	4-6
Long-acting					
Formoterol	4.5–12 (MDI & DPI)				12+
Salmeterol	25-50 (MDI & DPI)				12+
Anticholinergics					
Short-acting					
Ipratropium bromide	20, 40 (MDI)	0.25-0.5			6-8
Oxitropium bromide	100 (MDI)	1.5			7-9
Long-acting					
Tiotropium	18 (DPI)				+24

Combination short-acting β_2-agonists plus anticholinergic in one inhaler					
Fenoterol/Ipratropium	200/80 (MDI)	1.25/0.5			6-8
Salbutamol/Ipratropium	75/15 (MDI)	0.75/4.5			6-8
Methylxanthines					
Aminophylline			200-600 mg (Pill)	240 mg	Variable, up to 24
Theophylline (SR)			100-600 mg (Pill)		Variable, up to 24
Inhaled glucocorticosteroids					
Beclomethasone	50-400 (MDI & DPI)	0.2-0.4			
Budesonide	100, 200, 400 (DPI)	0.20, 0.25, 0.5			
Fluticasone	50-500 (MDI & DPI)				
Triamcinolone	100 (MDI)	40		40	
Combination long-acting β_2-agonists plus glucocorticosteroids in one inhaler					
Formoterol/Budesonide	4.5/80, 160 (DPI) (9/320) (DPI)				
Salmeterol/Fluticasone	50/100, 250, 500 (DPI) 25/50, 125, 250 (MDI)				
Systemic glucocorticosteroids					
Prednisone			5-60 mg (Pill)		
Methyl-prednisolone	10-2000 mg		4, 8, 16 mg (Pill)		

Recommended Progression of COPD Pharmacotherapy

0: At Risk	I: Mild	II: Moderate	III: Severe	IV: Very Severe
• Chronic symptoms • Exposure to risk factors • Normal spirometry	• $FEV_1 \geq 80\%$ • With or without symptoms	• FEV_1 50% to 79% • With or without symptoms	• FEV_1 30% to 49% • With or without symptoms	• $FEV_1 < 30\%$ • Or presence of chronic respiratory failure or right heart failure
Avoidance of risk factor(s); vaccinations				
	Add short-acting bronchodilator when needed			
		Add regular treatment with one or more long-acting bronchodilators; Add rehabilitation		
			Add ICS if repeated exacerbations	
				Add long-term oxygen if indicated Consider surgical treatments

TATATLAKSANA PPOK STABIL : TERAPI FARMAKOLOGIK #GOLD2013

((OBAT PADA SETIAP KOTAK DISEBUTKAN BERDASARKAN URUTAN ABJAD, DAN TIDAK BERARTI BERDASARKAN URUTAN KEPENTINGANNYA)

Pasien	Piliahn Pertama	Pilihan Kedua	Pilihan alternatif
A	SAMA prn atau SABA prn	LAMA *atau* LABA *atau* SABA dan SAMA	Teofilin
B	LAMA *atau* LABA	LAMA dan LABA	SABA d*an/atau* SAMA Teofilin
C	ICS + LABA *atau* LAMA	LAMA dan LABA	PDE4-inh. SABA dan/atau SAMA Teofilin
D	ICS + LABA *atau* LAMA	ICS dan LAMA atau ICS + LABA dan LAMA *atau* ICS+LABA dan PDE4-inh. *atau* LAMA dan LABA *atau* LAMA dan PDE4-inh.	Karbosistein SABA dan/atau SAMA Teofilin

OBAT-OBATAN LAIN

- Anti oksidan

  -Digunakan untuk mengurangi eksaserbasi & memperbaiki kualitas hidup

- ex. N-asetilsistein
- Mukolitik

  - Diberikan pada eksaserbasi akut dengan sputum yang kental
- Alpha-1 antitrypsin

  hanya untuk pasien yang kekurangan enzim Alpha-1 antitrypsin

Appendix E: Antibiotic Treatment Recommendations for Acute Exacerbations of COPD (AECOPD)

Antibiotic Treatment Recommendations for Acute COPD Exacerbations		
Category	**Symptoms & Risk Factors**	**Antimicrobial treatment**
Simple COPD No risk factors	Increased dyspnea, increased cough and sputum, sputum purulence • $FEV_1 \geq 50\%$ of predicted • < 4 exacerbations/year	<u>First Choice (alphabetical)</u> • amoxicillin • doxycycline • trimethoprim/sulfamethoxazole <u>Alternate Antibiotics:</u> • beta-lactam/beta-lactamase inhibitor • extended spectrum macrolides • 2nd or 3rd generation cephalosporins
Complicated COPD Have 1 or more risk factors for treatment failure and/or more virulent or resistant pathogens	Increased dyspnea, increased cough and sputum, sputum purulence **plus at least 1 of the following:** • $FEV_1 < 50\%$ of predicted • ≥ 4 exacerbations/year • ischemic heart disease • use of home oxygen • chronic oral steroid use • antibiotic use in the past 3 months	<u>First Choice</u> • antibiotics for uncomplicated patients when combined with oral steroids may suffice • beta-lactam/beta-lactamase inhibitor • fluoroquinolones (newer) <u>Alternate Antibiotics</u> May require parental therapy. Consider referral to specialist or hospitalization.
References: CTS COPD Recommendations - highlights for primary care. Can Respir J 2008;15(Suppl A):1A-8A.		

Fluoroquinolone resistance increases with frequent prescriptions. Avoid these medications if prescribed in the previous 3 months (for any indication), and consider an antibiotic from a different class.

TABLE 29-14 Recommended Antimicrobial Therapy in Acute Exacerbations of Chronic Obstructive Pulmonary Disease

Patient Characteristics	Likely Pathogens	Recommended Therapy
Uncomplicated exacerbations <4 exacerbations per year No comorbid illness FEV_1 >50% of predicted	*Streptococcus pneumoniae* *Haemophilus influenzae* *Moraxella catarrhalis* *Haemophilus parainfluenzae* Resistance uncommon	Macrolide (azithromycin, clarithromycin) Second- or third-generation cephalosporin Doxycycline Therapies not recommended[a]: TMP-SMX, amoxicillin, first-generation cephalosporins, and erythromycin
Complicated exacerbations Age ≥65 years >4 exacerbations per year FEV_1 <50% but >35% of predicted	As above plus drug-resistant pneumococci, β-lactamase–producing *H. influenzae* and *M. catarrhalis*	Amoxicillin/clavulanate Fluoroquinolone with enhanced pneumococcal activity (levofloxacin, gemifloxacin, moxifloxacin)
Complicated exacerbations with risk of *Pseudomonas aeruginosa* Chronic bronchial sepsis[b] Need for chronic corticosteroid therapy Resident of nursing home >4 exacerbations per year FEV_1 >35% of predicted	Some enteric gram-negatives As above plus *P. aeruginosa*	Fluoroquinolone with enhanced pneumococcal and *P. aeruginosa* activity (levofloxacin) IV therapy if required: β-lactamase–resistant penicillin with antipseudomonal activity Third- or fourth-generation cephalosporin with antipseudomonal activity

TERAPI NON FARMAKOLOGI

- Menghentikan kebiasaan merokok
- Mengurangi paparan asap rokok,debu,polusi udara
- Rehabilitasi paru-paru secara komprehensif dengan OR dan latihan pernafasan
- Perbaikan nutrisi
- Tidak ada obat yang dapat menunda memburuknya fungsi paru jika pasien tetap merokok

JGN TIRU ORANG INI....

Thanks …