COPD
Guideline to clinical practice

동아의대 호흡기 내과
엄수정

Global Initiative for Chronic Obstructive Lung Disease

GLOBAL STRATEGY FOR THE DIAGNOSIS, MANAGEMENT, AND PREVENTION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

2019 REPORT

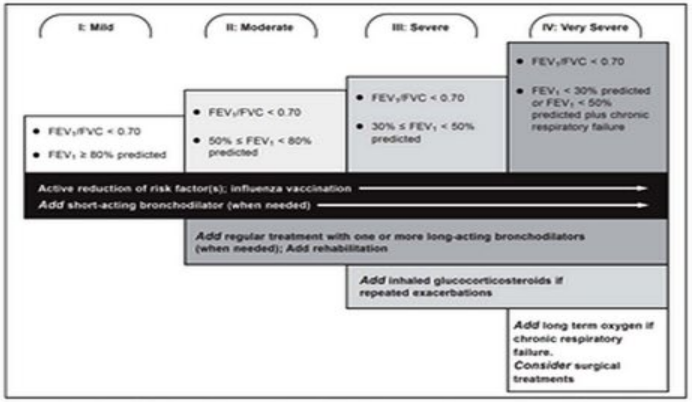
Global Initiative for Chronic Obstructive Lung Disease

GLOBAL STRATEGY FOR THE DIAGNOSIS, MANAGEMENT, AND PREVENTION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

2017 REPORT

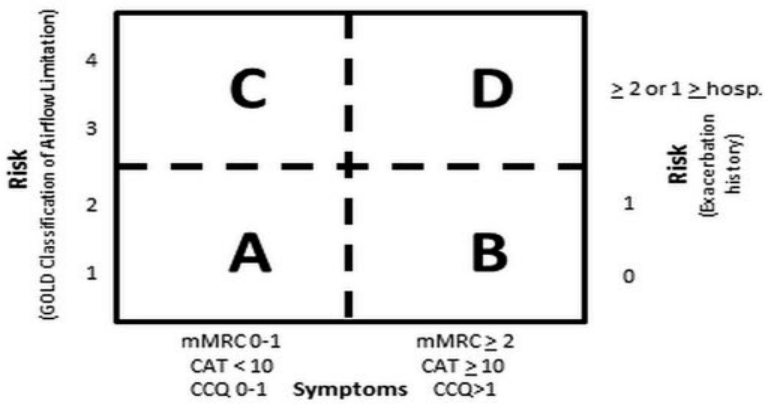
Progression of Guideline Assessment

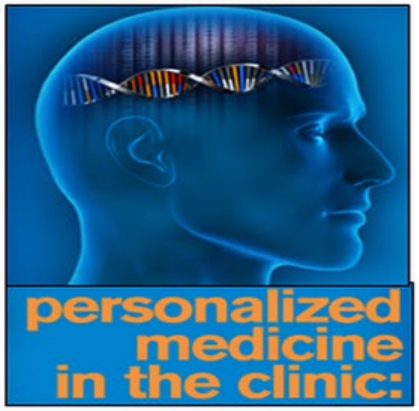
2006



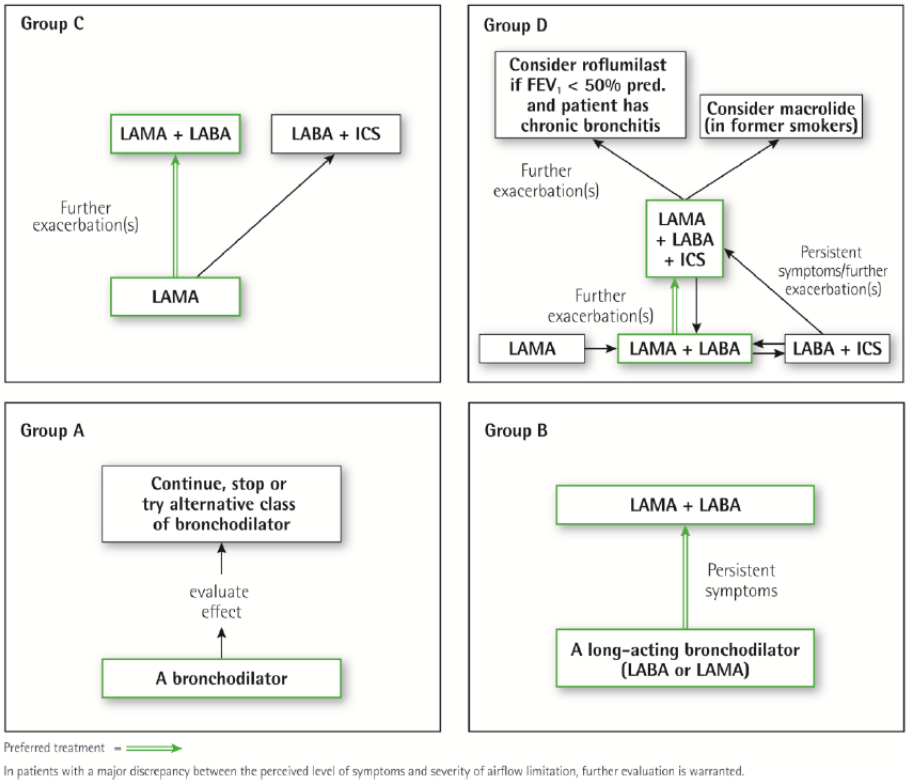
*Postbronchodilator FEV_1 is recommended for the diagnosis and assessment of severity of COPD.

2011





2017 GOLD



Preferred treatment →

In patients with a major discrepancy between the perceived level of symptoms and severity of airflow limitation, further evaluation is warranted.

2019 GOLD

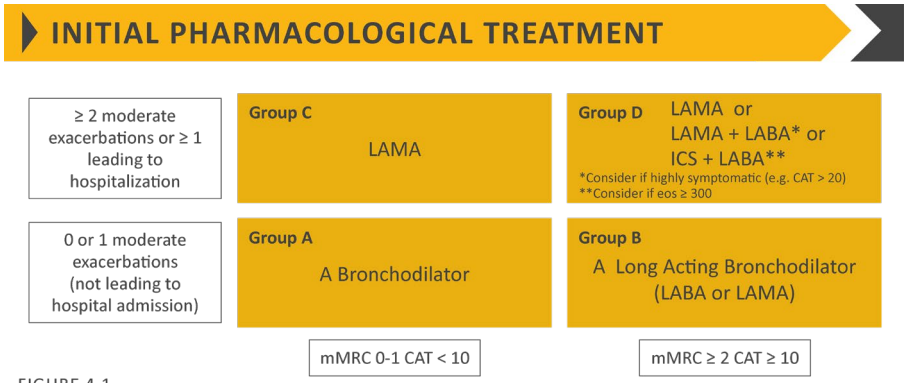


FIGURE 4.1

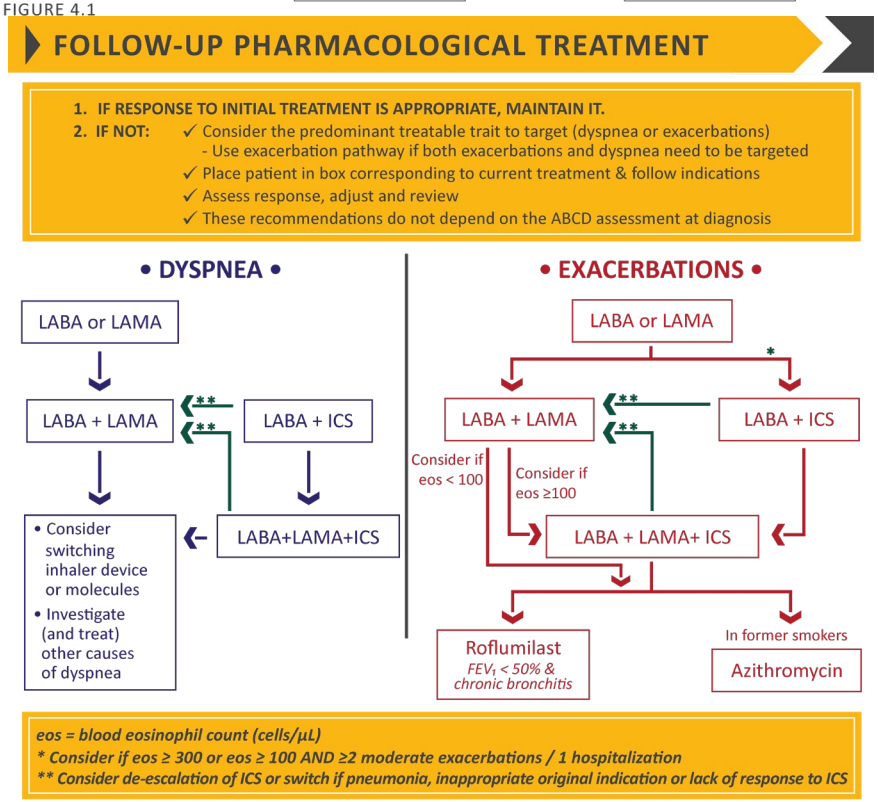
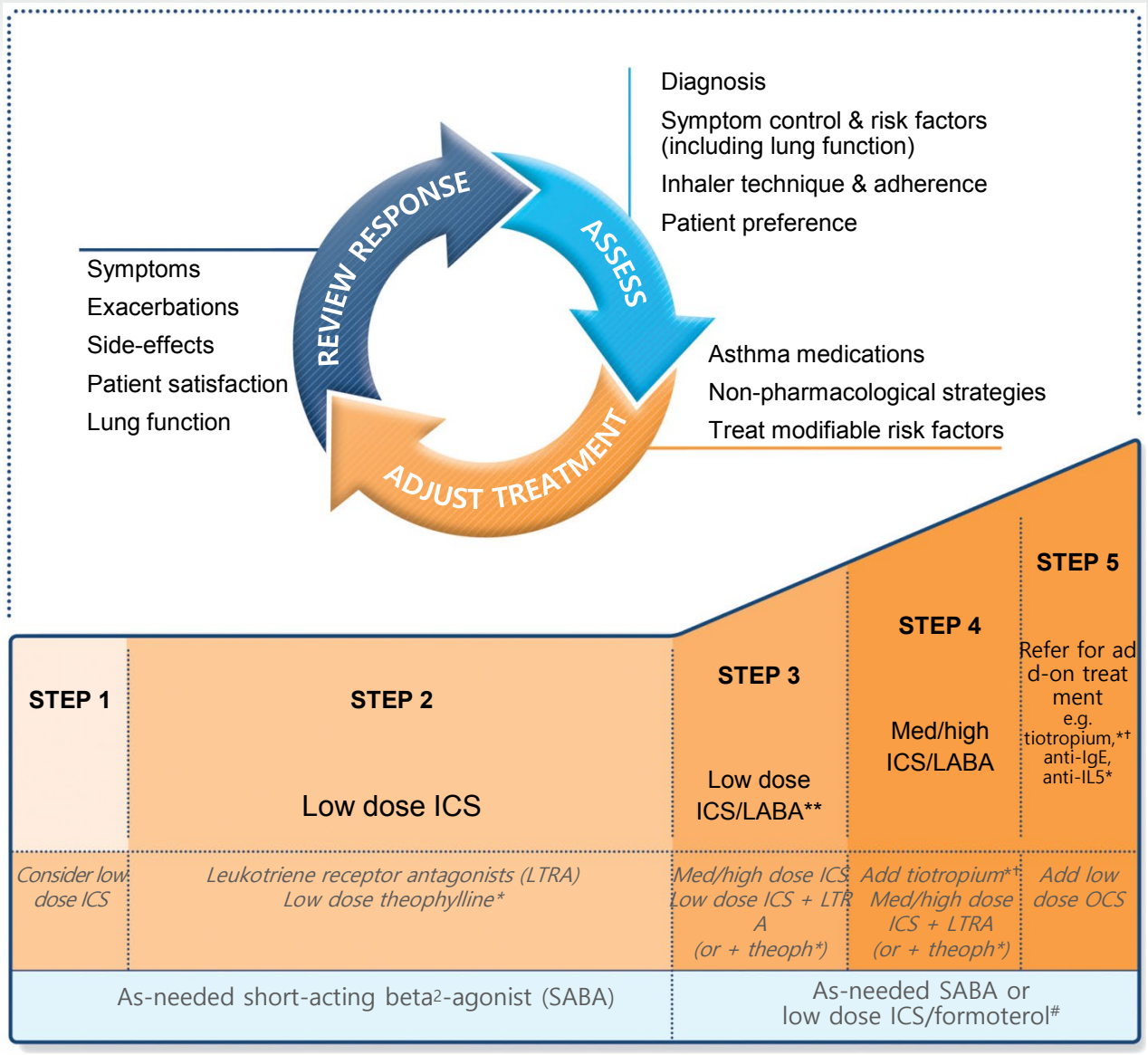


FIGURE 4.3

Stepwise management - pharmacotherapy



*Not for children <12 years

**For children 6-11 years, the preferred Step 3 treatment is medium dose ICS

#For patients prescribed BDP/formoterol or BUD/ formoterol maintenance and reliever therapy

† Tiotropium by mist inhaler is an add-on treatment for patients ≥12 years with a history of exacerbations

Treatment of stable COPD

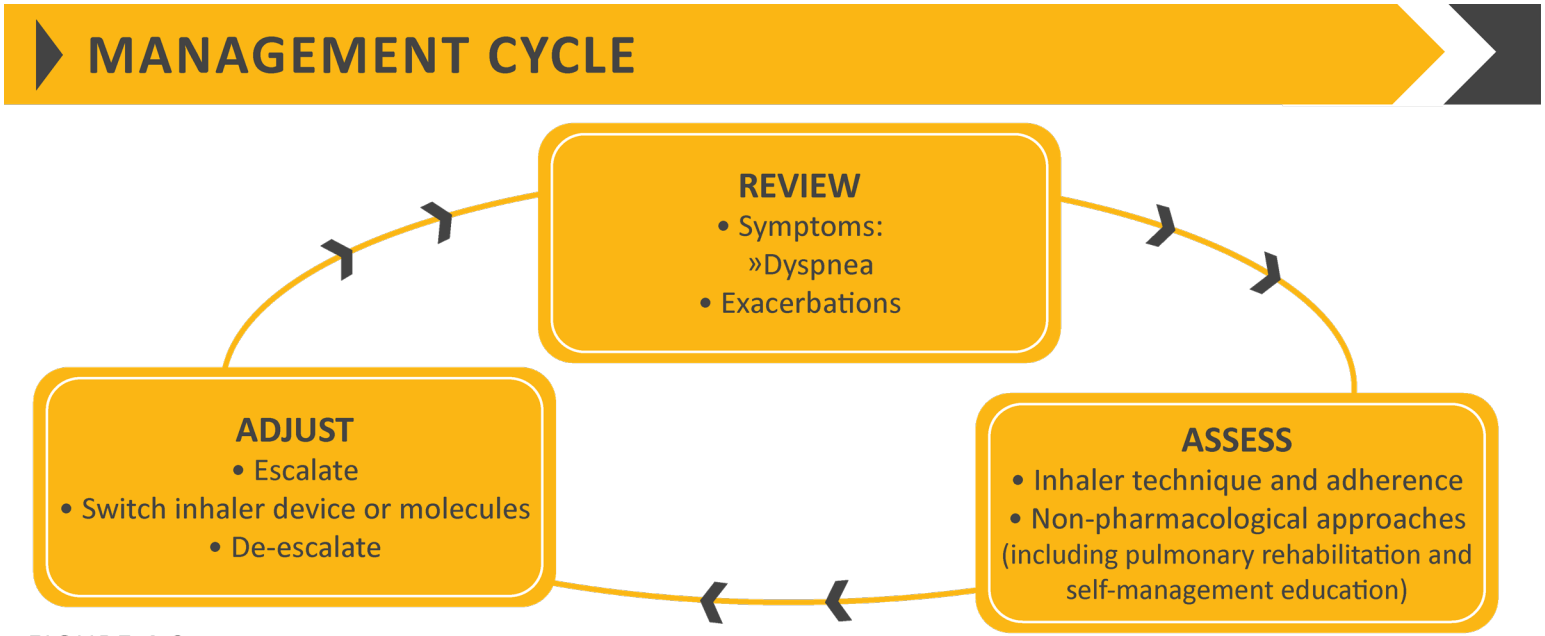


FIGURE 4.2

내용

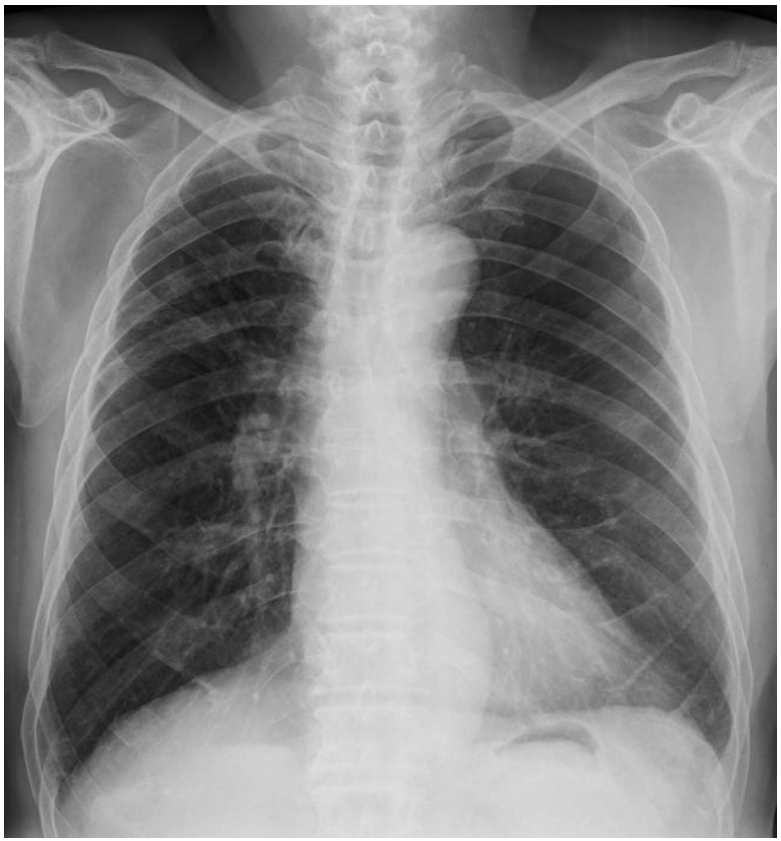
1) **Initial treatment**
2) **ICS, When ?**
3) **Non-pharmacologic treatment**

내용

1) **Initial treatment**
2) **ICS, When ?**
3) **Non-pharmacologic treatment**

68/Male

- Progressive dyspnea for 3 months
- Current smoker, 50 PY
- mMRC 3
- Previous Exacerbation 1/yr



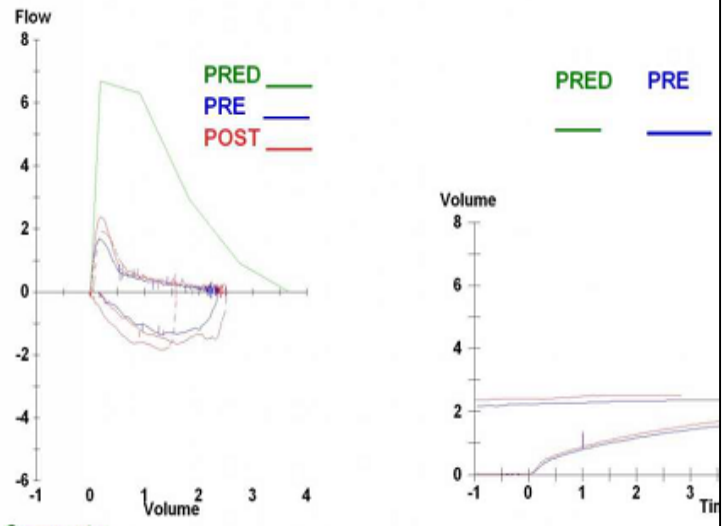
68/Male

Age: 68 Race: Asian
Height(cm): 160 Weight(kg): 41.0
Room: PI OPD

Temp: 26
Physician:
Technician:

Spirometry (BTPS)

		PRED	PRE-RX BEST	%PRED	POST BEST
FVC	Liters	3.67	2.36	64	2.52
FEV1	Liters	2.76	0.82	30	0.90
FEF50%	L/sec	2.91	0.32	11	0.34
FEF25-75%	L/sec	2.41	0.29	12	0.32
FEV1/FVC	%	73	35		36
PEF	L/sec	6.67	1.86	28	2.38
VC	Liters	3.38	2.36	70	2.52
IC	Liters	2.31	0.84	36	0.98
ERV	Liters	1.15	0.50	43	0.64



Comments:

■ 만성폐쇄성폐질환 검사(CAT: COPD Assessment Test) 검사일자 2017-12-26

다음은 만성폐쇄성질환이 당신의 육체적, 정신적 건강과 일상생활에 미치는 영향을 평가하기 위한 것입니다. 각 질문에 해당하는 자신의 점수를 확인하고, 점수에 표시하세요.

1	나는 전혀 기침을 하지 않는다.	○0	○1	●2	○3	○4	○5	나는 항상 기침을 한다.
2	나는 가슴에 전혀 가래가 없다.	○0	○1	●2	○3	○4	○5	나는 가슴에 가래가 가득 차 있다.
3	나는 전혀 가슴 답답함을 느끼지 않는다.	○0	○1	●2	○3	○4	○5	나는 가슴이 아주 답답함을 느낀다.
4	나는 언덕이나 계단을 오를 때 전혀 숨이 차지 않는다.	○0	○1	○2	○3	●4	○5	나는 언덕이나 계단을 오를 때 아주 숨이 차다.
5	나는 집에서 활동하는데 전혀 제약을 받지 않는다.	○0	○1	○2	○3	●4	○5	나는 집에서 활동하는데 많은 제약을 받는다.
6	폐질환에도 불구하고 나는 외출하는데 자신이 있다.	○0	○1	○2	○3	●4	○5	폐질환 때문에 나는 외출하는데 전혀 자신이 없다.
7	나는 잠을 깊이 잔다.	○0	●1	○2	○3	○4	○5	폐질환 때문에 나는 잠을 깊이 자지 못한다.
8	나는 기운이 왕성하다.	○0	○1	○2	○3	●4	○5	나는 전혀 기운이 없다.

총점 : 23

FEV1 33%, CAT 23

Treatment of stable COPD

FEV1 33%, CAT 23
전년도 악화 1회

INITIAL PHARMACOLOGICAL TREATMENT

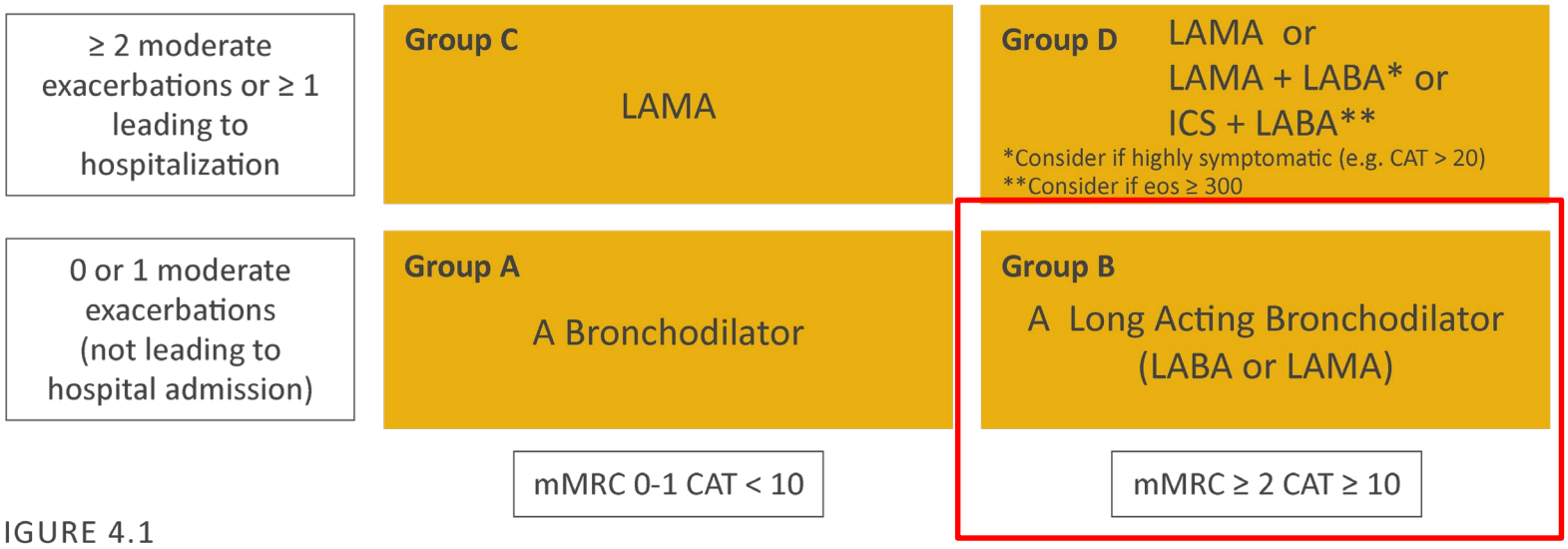


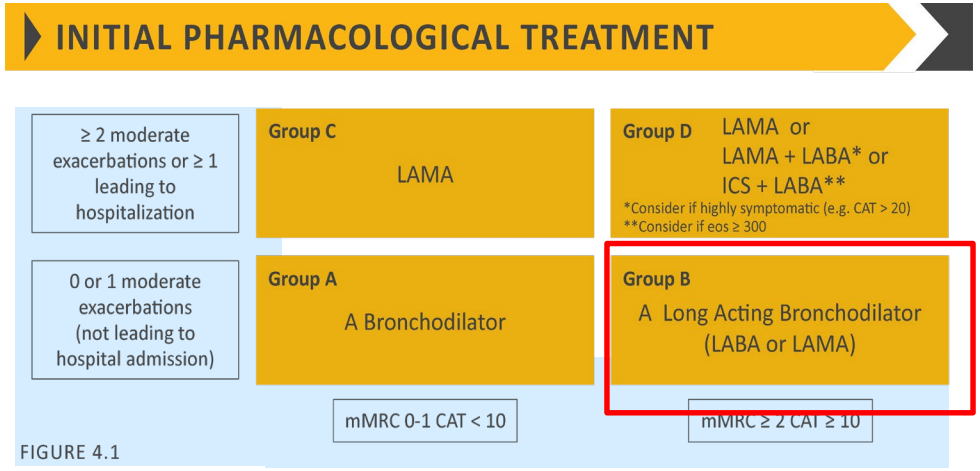
FIGURE 4.1

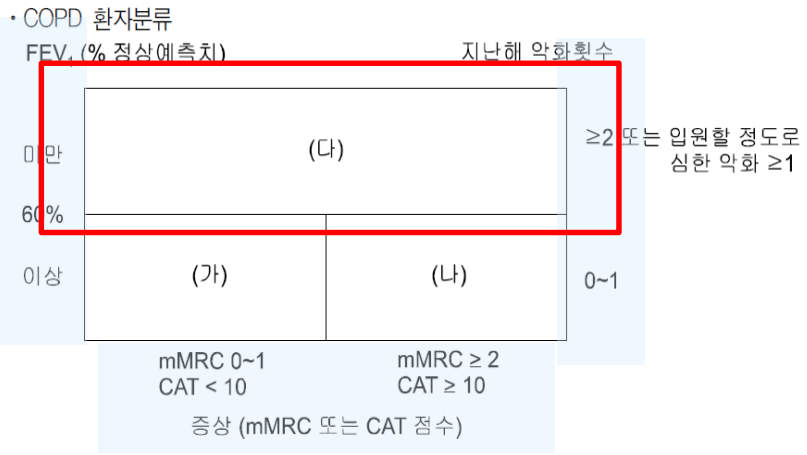
Definition of abbreviations: eos: blood eosinophil count in cells per microliter; mMRC: modified Medical Research C ouncil dyspnea questionnaire; CAT™: COPD Assessment Test™.

Clinical Consideration

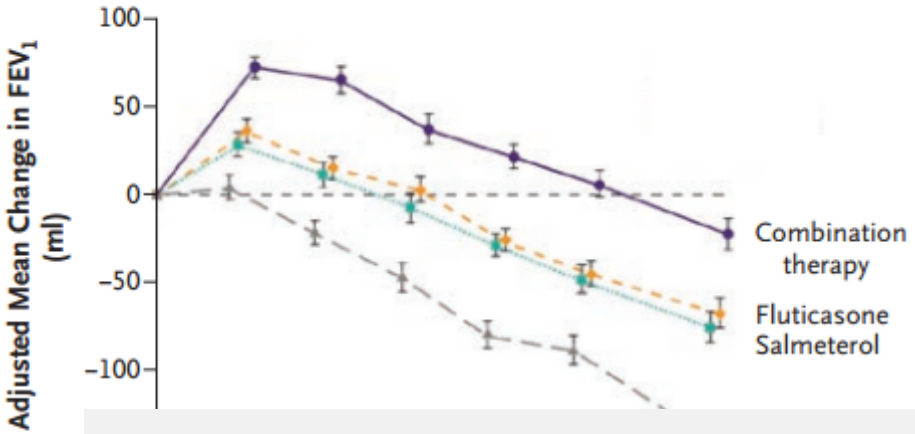
1) 폐기능이 나빠서 국내 지침으로 하면 " 다 " 그룹

-- LABA/LAMA로 할까? LABA or LAMA 로 할까?

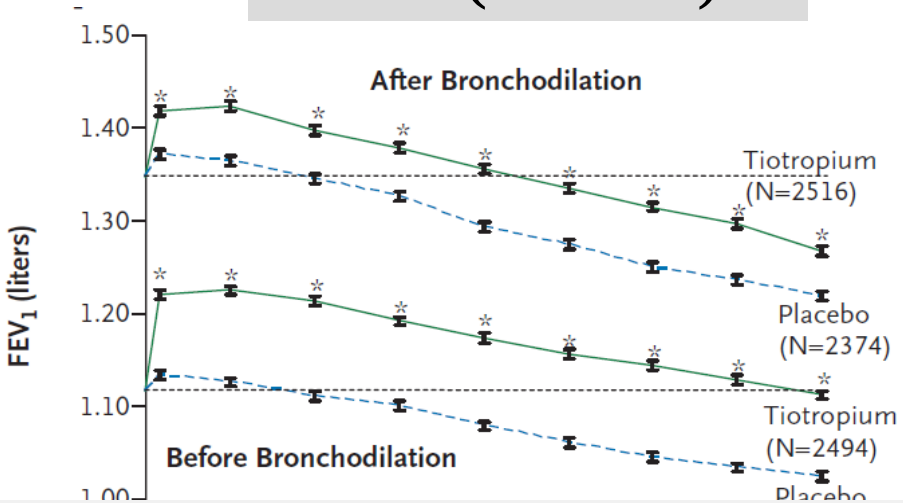




ICS/LABA (TORCH)



LAMA (UPLIFT)



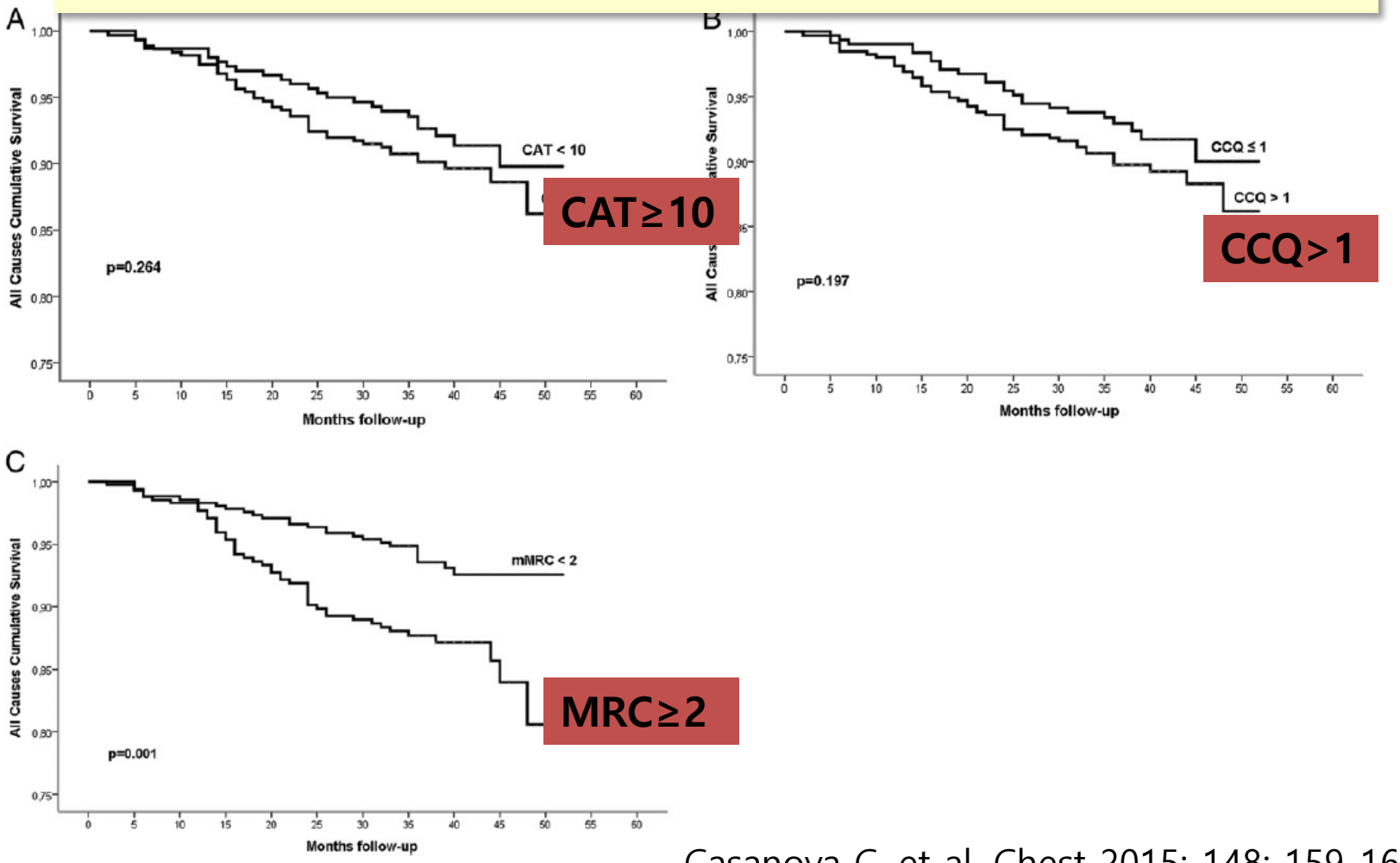
No Proved Pharmacologic Option to Alter Disease Progression

1) FEV_1은 가장 강력한 예후 예측 인자이지만 개인의 예후와는 연관성이 떨어진다.
2) 약물 치료로 폐기능을 호전 시킬 수 없다. (장기적 질환 경과 변화를 기대할 수 없다)
3) GOLD 는 initial pharmacologic treatment option을 정하는 도구로서의 FEV_1의 기능을 삭제한 것이다.

Calverley et al. N Engl J Med 2007;356:775-89.
Tashkin DP et al. N Engl J Med 2008;359:1543-54.

Survival Prediction

호흡곤란은 중요한 예후 예측인자이다



Casanova C, et al. Chest 2015; 148: 159-168.

Manage Stable COPD: Goals of Therapy

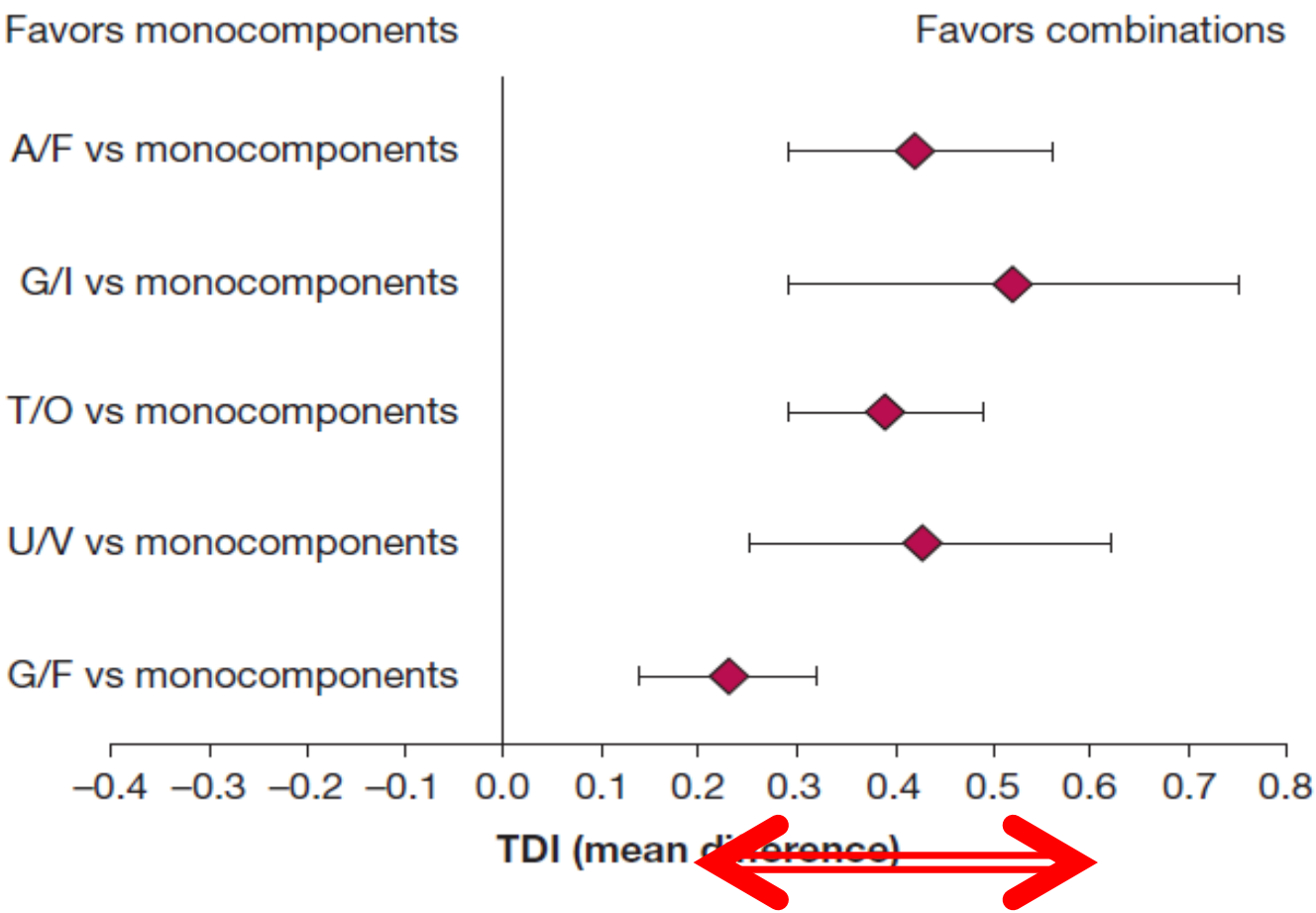
- Relieve symptoms
- Improve exercise tolerance
- Improve health status

Reduce symptoms

- Prevent disease progression
- Prevent and treat exacerbations
- Reduce mortality

Reduce risk

Impact on Dyspnea(TDI)



Calzetta L, et al. Chest. 2016 May;149(5):1181-96

68/Male

- Progressive dyspnea for 3 months
- Current smoke
- CAT 23, mMR(
- SPIRIVA respimat
- 2개월 후 mMRC 3
- CAT 22
- 숨이 차요, 호전되지 않습니다.

외래진료일 : 2018/01/29 진료과 : 호흡기내과 진료의 : 엄수정

■ 만성폐쇄성폐질환 검사(CAT: COPD Assessment Test) 검사일자 2018-01-29

다음은 만성폐쇄성질환이 당신의 육체적, 정신적 건강과 일상생활에 미치는 영향을 평가하기 위한 것입니다. 각 질문에 해당하는 자신의 점수를 확인하고, 점수에 표시하세요.

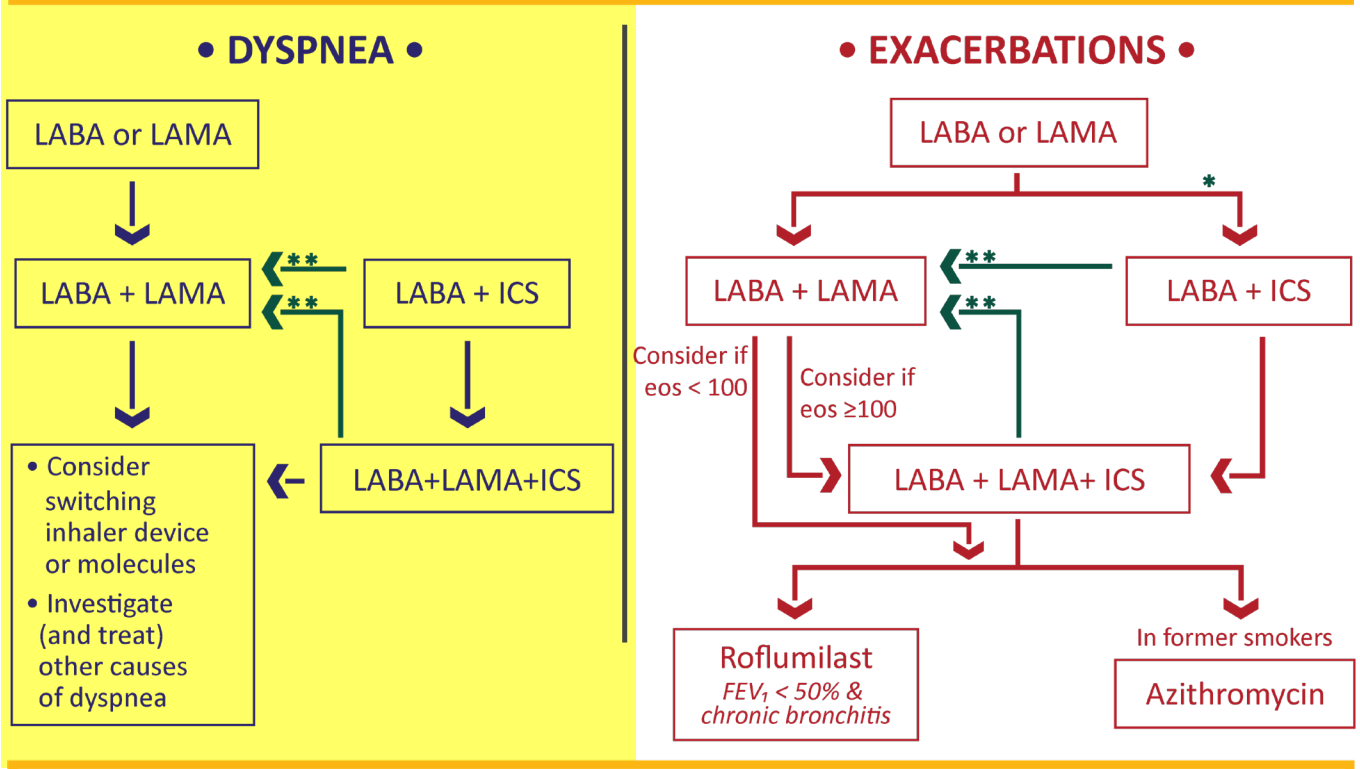
1	나는 전혀 기침을 하지 않는다.	○0	○1	◉2	○3	○4	○5	나는 항상 기침을 한다.
2	혀 가래가 없다.	○0	○1	◉2	○3	○4	○5	나는 가슴에 가래가 가득 차 있다.
3	느끼지 않는다.	○0	○1	◉2	○3	○4	○5	나는 가슴이 아주 답답함을 느낀다.
			○1	○2	○3	◉4	○5	나는 언덕이나 계단을 오를 때 아주 숨이 차다.
			○1	○2	◉3	○4	○5	나는 집에서 활동하는데 많은 제약을 받는다.
			○1	○2	◉3	○4	○5	폐질환 때문에 나는 외출하는데 전혀 자신이 없다.
7	나는 잠을 깊이 잔다.	○0	○1	○2	○3	◉4	○5	폐질환 때문에 나는 잠을 깊이 자지 못한다.
8	나는 기운이 왕성하다.	○0	○1	◉2	○3	○4	○5	나는 전혀 기운이 없다.

총점 : 22

일자 2018-01-29 By 엄수정

FOLLOW-UP PHARMACOLOGICAL TREATMENT

1. **IF RESPONSE TO INITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.**
2. **IF NOT:**
   - ✓ Consider the predominant treatable trait to target (dyspnea or exacerbations)
     - Use exacerbation pathway if both exacerbations and dyspnea need to be targeted
   - ✓ Place patient in box corresponding to current treatment & follow indications
   - ✓ Assess response, adjust and review
   - ✓ These recommendations do not depend on the ABCD assessment at diagnosis



eos = blood eosinophil count (cells/µL)
** Consider if eos ≥ 300 or eos ≥ 100 AND ≥2 moderate exacerbations / 1 hospitalization*
*** Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication or lack of response to ICS*

FIGURE 4.3

■ 만성폐쇄성폐질환 검사(CAT: COPD Assessment Test)　　검사일자 2017-12-26

다음은 만성폐쇄성질환이 당신의 육체적, 정신적 건강과 일상생활에 미치는 영향을 평가하기 위한 것입니다. 각 질문에 해당하는 자신의 점수를 확인하고, 점수에 표시하세요.

1	나는 전혀 기침을 하지 않는다.	○0	○1	●2	○3	○4	○5	나는 항상 기침을 한다.
2	나는 가슴에 전혀 가래가 없다.	○0	○1	●2	○3	○4	○5	나는 가슴에 가래가 가득 차 있다.
3	나는 전혀 가슴 답답함을 느끼지 않는다.	○0	○1	●2	○3	○4	○5	나는 가슴이 아주 답답함을 느낀다.
4	나는 언덕이나 계단을 오를 때 전혀 숨이 차지 않는다.	○0	○1	○2	○3	●4	○5	나는 언덕이나 계단을 오를 때 아주 숨이 차다.
5	나는 집에서 활동하는데 전혀 제약을 받지 않는다.	○0	○1	○2	○3	●4	○5	나는 집에서 활동하는데 많은 제약을 받는다.
6	폐질환에도 불구하고 나는 외출하는데 자신이 있다.	○0	○1	○2	○3	●4	○5	폐질환 때문에 나는 외출하는데 전혀 자신이 없다.
7	나는 잠을 깊이 잔다.	○0	●1	○2	○3	○4	○5	폐질환 때문에 나는 잠을 깊이 자지 못한다.
8	나는 기운이 왕성하다.	○0	○1	○2	○3	●4	○5	나는 전혀 기운이 없다.

총점 : 23

S

PD Assessment Test)　　검사일자 2018-09-10

, 정신적 건강과 일상생활에 미치는 영향을 평가하기 위한 것입
를 확인하고, 점수에 표시하세요.

			●1	○2	○3	○4	○5	나는 항상 기침을 한다.
			●1	○2	○3	○4	○5	나는 가슴에 가래가 가득 차 있다.
3	나는 전혀 가슴 답답함을 느끼지 않는다.	○0	●1	○2	○3	○4	○5	나는 가슴이 아주 답답함을 느낀다.
4	나는 언덕이나 계단을 오를 때 전혀 숨이 차지 않는다.	○0	○1	○2	○3	●4	○5	나는 언덕이나 계단을 오를 때 아주 숨이 차다.
5	나는 집에서 활동하는데 전혀 제약을 받지 않는다.	○0	●1	○2	○3	○4	○5	나는 집에서 활동하는데 많은 제약을 받는다.
6	폐질환에도 불구하고 나는 외출하는데 자신이 있다.	○0	○1	●2	○3	○4	○5	폐질환 때문에 나는 외출하는데 전혀 자신이 없다.
7	나는 잠을 깊이 잔다.	●0	○1	○2	○3	○4	○5	폐질환 때문에 나는 잠을 깊이 자지 못한다.
8	나는 기운이 왕성하다.	○0	○1	○2	○3	●4	○5	나는 전혀 기운이 없다.

총점 : 14

결과일자 2018-09-10　　By 엄수정

- **LABA/LAMA**
- **Pul Rehab**

68/Male

2017.12

Age: 68 Race: Asian
Height(cm): 160 Weight(kg): 41.0
Room: PI OPD

Temp: 26 PBar: 747
Physician: 엄수정
Technician:

Spirometry (BTPS)

		PRED	PRE-RX BEST	PRE-RX %PRED	POST-RX BEST	POST-RX %PRED	% CHG
FVC	Liters	3.67	2.36	64	2.52	69	7
FEV1	Liters	2.76	0.82	30	0.90	33	10
FEF50%	L/sec	2.91	0.32	11	0.34	12	6
FEF25-75%	L/sec	2.41	0.29	12	0.32	13	11
FEV1/FVC	%	73	35		36		
PEF	L/sec	6.67	1.86	28	2.38	36	28
VC	Liters	3.38	2.36	70	2.52	75	7
IC	Liters	2.31	0.84	36	0.98	42	17
ERV	Liters	1.15	0.50	43	0.64	56	29

Flow

2018. 9

Age: 70 Race: Asian
Height(cm): 160 Weight(kg): 45.0
Room: PI OPD

Temp: 25 PBar: 752
Physician: 엄수정
Technician:

Spirometry (BTPS)

		PRED	PRE-RX BEST	PRE-RX %PRED	POST-RX BEST	POST-RX %PRED	% CHG
FVC	Liters	3.69	2.60	70	2.91	79	12
FEV1	Liters	2.69	0.88	33	1.08	40	23
FEF50%	L/sec	2.84	0.24	8	0.43	15	79
FEF25-75%	L/sec	2.32	0.24	10	0.35	15	45
FEV1/FVC	%	72	34		37		
PEF	L/sec	6.60	2.21	33	2.56	39	16
VC	Liters	3.33	2.60	78	2.91	87	12
IC	Liters	2.28	0.93	41	1.09	48	17
ERV	Liters	1.14	0.74	65	1.02	90	38

Flow

호흡재활이란?

환자 평가, 약물 치료, 금연 교육, 이완 요법, 호흡 운동, 호흡근 강화, 객담 제거, 자가 관리 등의 방법으로 호흡질환의 증상을 감소시켜 일상생활 최적의 기능 수행을 목적으로 하는 포괄적 치료입니다.

호흡재활 대상 질환

호흡재활 대상자

- 만성 폐쇄성 폐질환
- 만성 기관지염
- 폐기종
- 척수 손상 환자
- 폐 절제 수술 전후
- 폐용적축소수술 전
- 간질성 폐질환
- 신경 근육 질환
- 천식
- 폐동맥고혈압 환자
- 폐이식 수술 전후

호흡재활의 필요성

- 운동능력이 향상됩니다.
- 호흡곤란이 감소합니다.
- 삶의 질이 향상됩니다.
- 불안과 우울감이 감소합니다.
- 입원율이 감소합니다.
- 사망률이 감소합니다.
- 호흡재활의 효과는 치료가 끝나도 지속됩니다.

동아대학교병원 호흡기내과, 재활의학과에서는 다음과 같은 호흡재활을 시행하고 있습니다.

호흡 운동

호흡곤란 증상을 완화하기 위해선 호흡의 효율성을 높이는 자세 및 운동방법을 교육받아야 합니다.

유산소 운동

유산소 운동은 평가를 통해 환자 개개인에 맞춤 운동을 처방하고, 심폐지구력을 향상시킴으로써 활동량 증가, 근지구력 향상, 자신감 회복, 일상생활 기능 회복을 촉진시킬 수 있습니다.

호흡근 강화 훈련

간단히 휴대할 수 있는 기구를 이용하여 호흡근을 강화함으로써 호흡곤란의 빈도를 줄이고 호흡기능을 증가시킬 수 있습니다.

기도분비물 관리

호흡재활을 통해 기도분비물을 제거하는 자세 및 방법을 배우고 실제 여러 기구를 이용하여 분비물을 제거하여 호흡기능에 도움을 받을 수 있습니다.

Pul Rehab

PULMONARY REHABILITATION, SELF-MANAGEMENT AND INTEGRATIVE CARE IN COPD

PULMONARY REHABILITATION

- Pulmonary rehabilitation improves dyspnea, health status and exercise tolerance in stable patients **(Evidence A)**.
- Pulmonary rehabilitation reduces hospitalization among patients who have had a recent exacerbation (≤4 weeks from prior hospitalization) **(Evidence B)**.

동영상 자료실


대한결핵 및 호흡기학회
The Korea Academy of Tuberculosis and Respiratory diseases
HOME | LOGIN | JOIN
Contact Us English
학회소개
지회 및 연구회
학술행사
논문 및 간행물
회원공간
자료실
열린마당
Home 자료실 동영상자료실
대한결핵 및 호흡기학회
WebCast 영상
대한결핵 및 호흡기학회
호흡재활치료법
호흡재활치료_Full version
호흡재활치료_의료진용
호흡재활치료_환자용
대한결핵 및 호흡기학회에서 알려주는
호흡재활 치료법
제작: 대한결핵 및 호흡기학회 호흡재활연구회
동영상 Download
KATRD
(우 08652) 서울특별시 서초구 반포대로 58 101동 605호 (서초동, 서초아트자이)
Tel. 02)575-3825, 576-5347 Fax. 02)572-6683 E-mail. katrd@lungkorea.org , katrd@hanmail.net
Copyright © The Korean Academy of Tuberculosis and Respiratory Diseases. All rights reserved.
질병관리본부 결핵연구원
결핵진료의사 대상 동영상교육자료
바로가기
대한결핵 및 호흡기학회
COPD 교육동영상
바로가기

내용

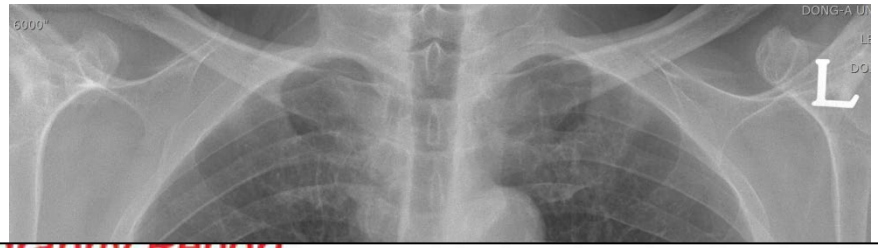
1) Initial treatment

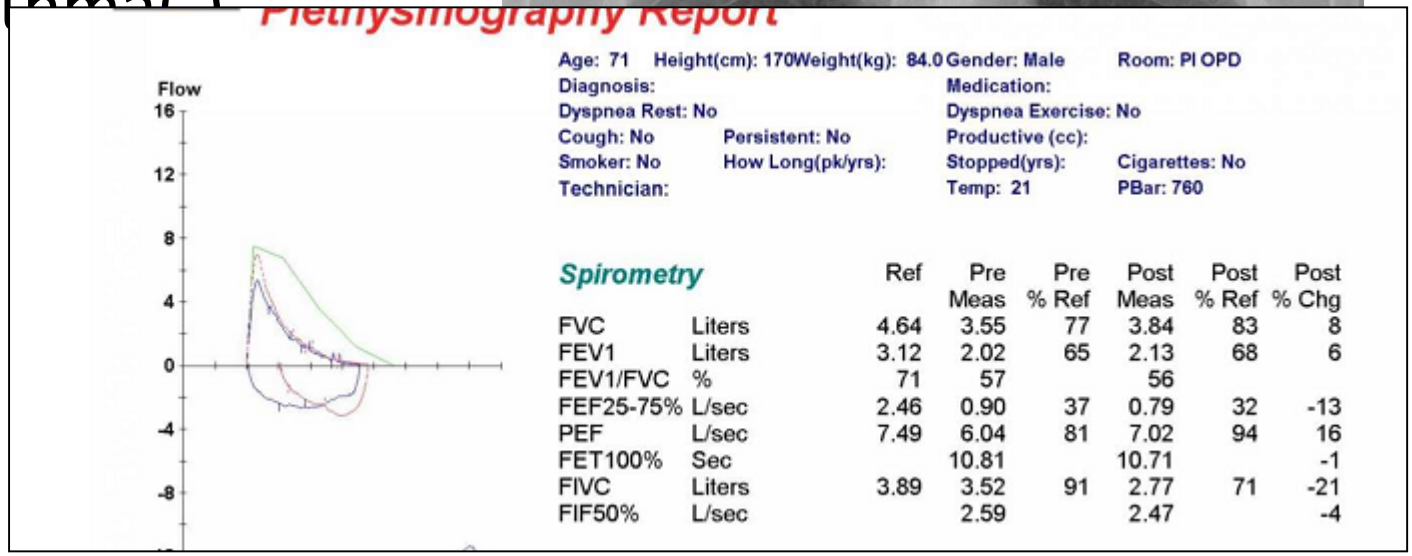
2) ICS, When ?

3) Non-pharmacologic treatment

72/Male

- Progressive dyspnea and cough for 2 months
- Ex-smoker, 20 PY (20년전 중단)
- mMRC 2, CAT 14
- 악화 ; 2 회
- Asthma( )





Treatment of stable COPD

FEV1 68%, CAT 14
전년도 악화 2회

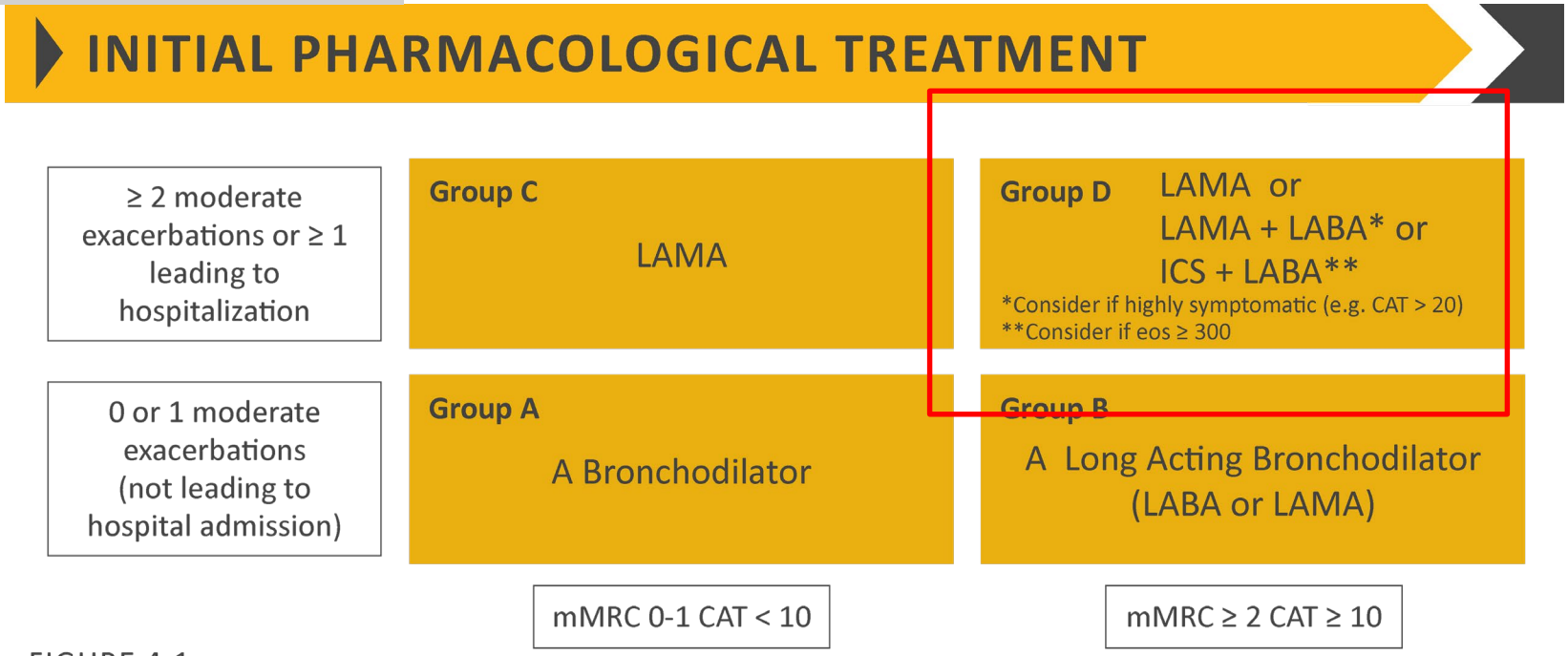


FIGURE 4.1

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

72/Male

- mMRC 2, CAT 14
- FEV_1 68%
- Asthma(-)
- GOLD Grade 2 Group D

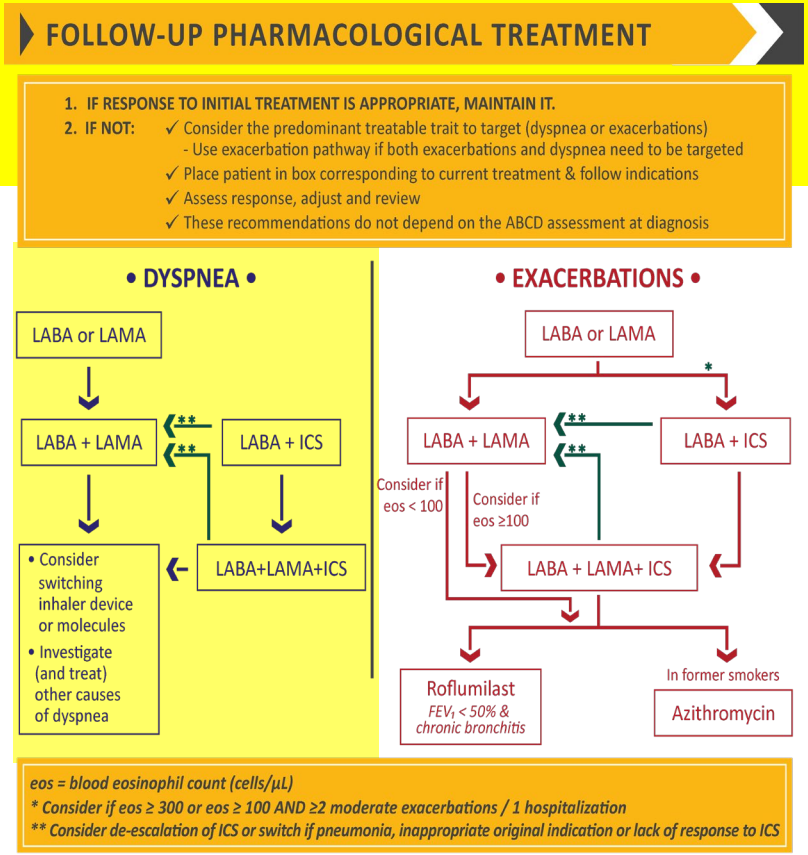


FIGURE 4.3

- Spiriva Respimat
- 3개월 후) 기침 객담은 좋아졌는데 숨은 계속 차요

  Wheeze(+), CAT 9
- Vahelva respimat
- 3개월 후) 증상이 별로 호전된 것 같지 않아요, 숨이 차요

  Ronchi (+) CAT 9

■ 검사종류 : 일반혈액검사(2

■ 검체종류 : WB

■ 검사실소견 :

■ (?)는 검사결과가 확정이 5

■ 검사종류 : 일반혈액검사(2018-09-10)

■ 검체종류 : WB

■ 검사실소견 :

■ (?)는 검사결과가 확정이 되지 않은 상태입니다.

■ 보고일자 : 2018-11-05 09:25 / 김태훈

■ 검체일자 : 2018-11-05 08:56 (1811050322)

엑셀저장 인쇄

	검사명
1	Routine CBC (LM0131~38)
2	WBC
3	RBC
4	Hemoglobin
5	Hematocrit
6	MCV
7	MCH
8	MCHC
9	Platelet
10	Diff. Count (LM0141~54)
11	Band Neutrophil
12	Seg. Neutrophil
13	Lymphocyte
14	Monocyte
15	Eosinophil
16	Basophil
17	At.Lymphocyte
18	Metamyelocyte
19	Myelocyte
20	Promyelocyte
21	Blast
22	Plasmocyte
23	N.RBC
24	Other

	검사명	KV	검사결과	S	단위	참고치	검체명	의사전달사항
1	Routine CBC (LM0131~38)						WB	
2	WBC		7.55		10*3/ul	3.5-10	WB	
3	RBC		4.70		10*6/ul	3.9-5.5	WB	
4	Hemoglobin		14.8		g/dl	13-17	WB	
5	Hematocrit		42.5		%	38-50	WB	
6	MCV		90.4		fl	80-98	WB	
7	MCH		31.5		pg	27-34	WB	
8	MCHC		34.8		g/dl	32-36	WB	
9	Platelet		264		10*3/ul	140-360	WB	
10	Diff. Count (LM0141~54)				%		WB	
11	Band Neutrophil				%	0-2	WB	
12	Seg. Neutrophil		41.6		%	40-70	WB	
13	Lymphocyte		38.1		%	20-47	WB	
14	Monocyte		8.5		%	3-10	WB	
15	Eosinophil	▲	10.7		%	0-7	WB	
16	Basophil		1.1		%	0-2	WB	
17	At.Lymphocyte				%	0.0	WB	
18	Metamyelocyte				%	0.0	WB	
19	Myelocyte				%	0.0	WB	
20	Promyelocyte				%	0.0	WB	
21	Blast				%	0.0	WB	
22	Plasmocyte				%	0.0	WB	
23	N.RBC		0.0		/100WBC		WB	
24	Other				%	0-4%	WB	

외래진료일 : 2018/09/10 진료과 : 호흡기내과 진료의 : 엄수정

ACO ? (Initial COPD 진단)

40대경부터 겨울마다 감기가 오래간다
호흡곤란 (+)
wheeze(+) -- No response to Bronchodilator
cough (+) sputum (+) --whitish

smoking quit 2010'

HTN(+) 3 년전부터

ALCOHOL (+) 매일, 소주 4병
--1개월 전부터 술 안드심

Blood Eosin 10% (7160), Sputum Eosin 2.0%, total Ig E : 91.1
PFT (2018.3.26) FEV1/FVC 56% FVC 83% FEV1 63% BDR 6% 110mL
(2018.09.10) FEV1/FVC 56% FVC 99% FEV1 82% BDR(-)

외래진료일 : 2018/09/10 진료과 : 호흡기내과 진료의 : 엄수정

Symbicort 처방

■ **호기산화질소(FeNO)**

보고일 2018-11-05

Result : 31 **ppb**

2018.12) ICS 추가 후 MUCH IMPROVE

ICS Add On?

Initial Treatment 에서 ICS 고려 하는 경우

증상이 심하고, 잦은 악화 혹은 심한 악화를 경험하였으며
Blood Eos ≥300

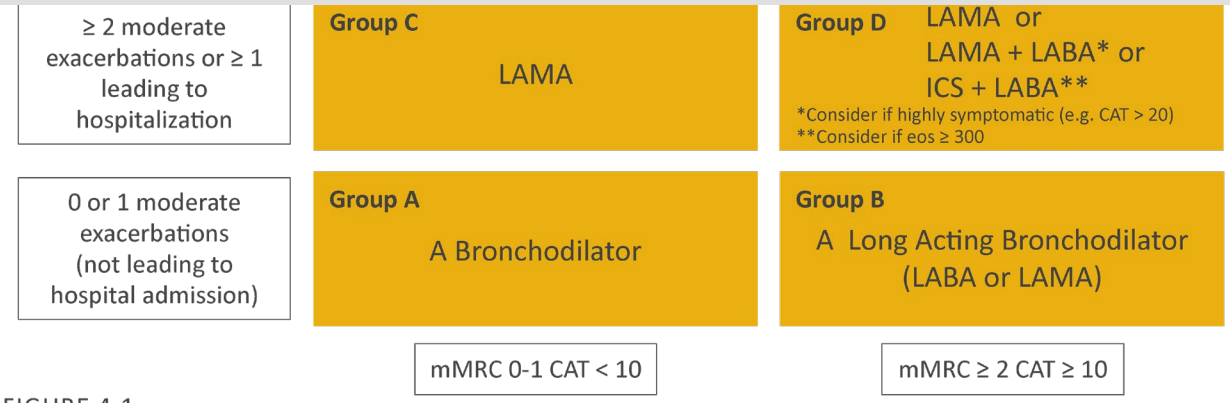


FIGURE 4.1

ICS Add On?

Follow Up 에서 ICS 고려 하는 경우

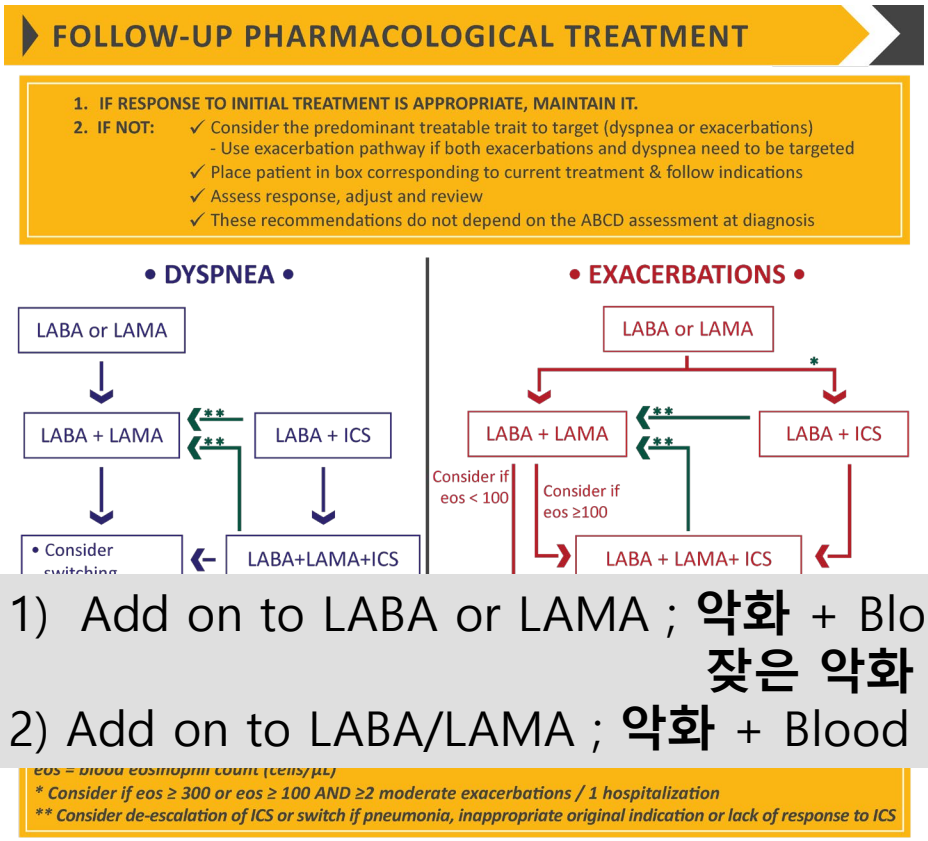


FIGURE 4.3

1) Add on to LABA or LAMA ; **악화** + Blood Eos ≥ 300
잦은 악화 혹은 **심한 악화** + Blood Eos ≥ 100
2) Add on to LABA/LAMA ; **악화** + Blood Eos ≥ 100

ICS Withdrawal?

Follow Up 에서 ICS Withdrawal 고려 하는 경우

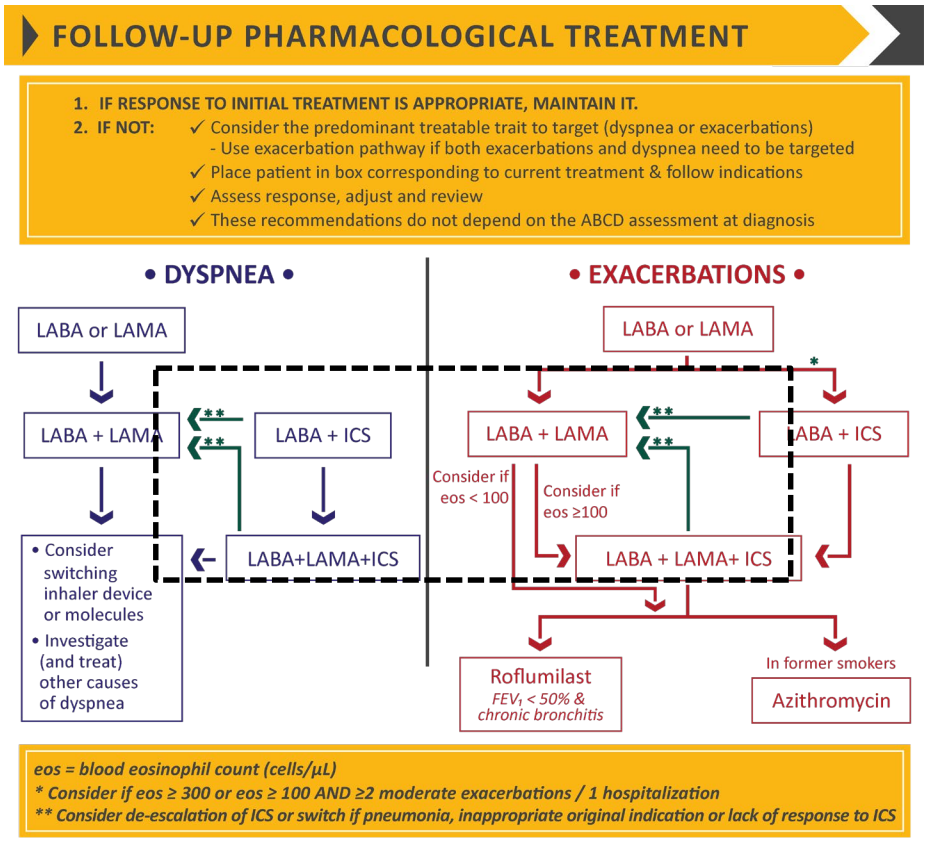


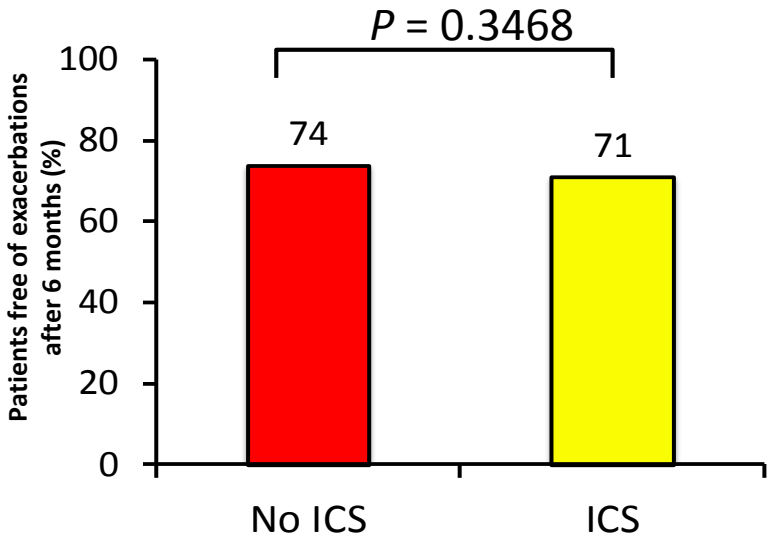
FIGURE 4.3

1) Pneumonia
2) Inappropriate original indication
3) Lack of response to ICS

ICS step-down

- WISDOM
- SUNSET
- INSTEAD
- OPTIMO
- DACCORD

Low risk of exacerbation
(1회 이하 악화 병력)
GOLD ≤ 2



Rossi A, et al. Respir Res. 2014;15:77.

Magnussen H et al N Engl J Med 2014;371:1285-94.

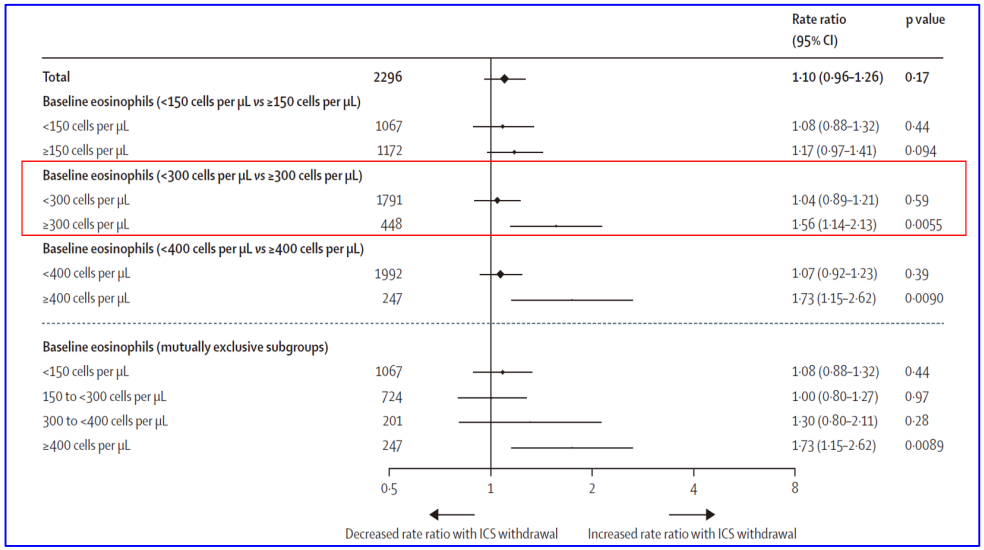
International Journal of COPD 2017:12 487–494

Chapman KR, et al. Am J Respir Crit Care Med 2018.

ICS step-down

- WISDOM
- SUNSET
- INSTEAD
- OPTIMO
- DACCORD

Low and High risk of exacerbation
GOLD 3이상



Rossi A, et al. Respir Res. 2014;15:77.

Magnussen H et al N Engl J Med 2014;371:1285-94.

International Journal of COPD 2017:12 487–494

Chapman KR, et al. Am J Respir Crit Care Med 2018.

EUROPEAN RESPIRATORY *journal*

FLAGSHIP SCIENTIFIC JOURNAL OF ERS

Early View

Review

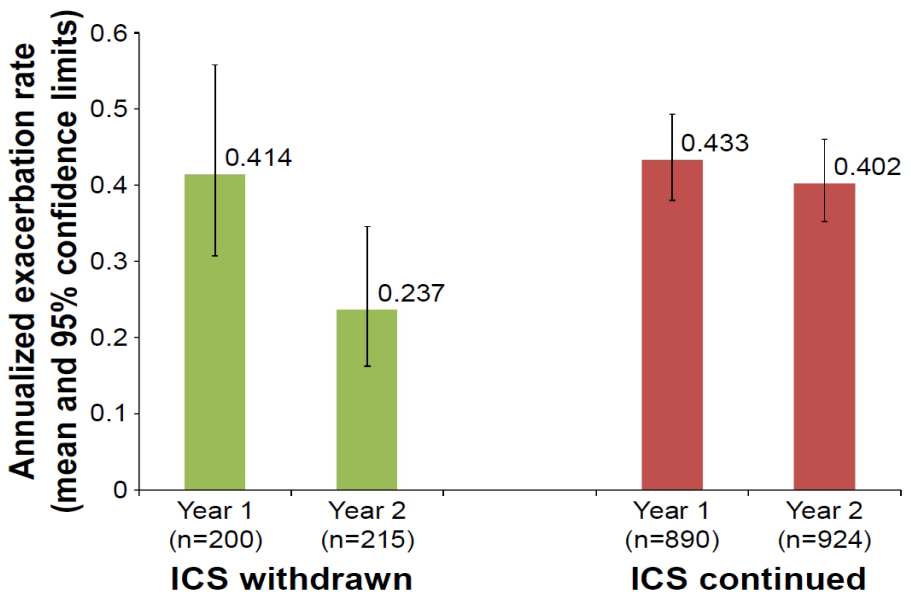
Inhaled corticosteroids in COPD: Friend or foe?

Alvar Agusti, Leonardo M Fabbri, Dave Singh, Jørgen Vestbo, Bartolome Celli, Frits ME Franssen, Klaus F. Rabe, Alberto Papi

STRONG SUPPORT	CONSIDER USE	AVOID USE
History of hospitalisation(s) for ECOPD*		Repeated pneumonia events
≥2 moderate ECOPD/year*	1 moderate ECOPD/year*	
Blood eosinophils >300 cells/μL	Blood eosinophils 100–300 cells/μL	Blood eosinophils <100 cells/μL
History of, or concomitant, asthma		History of mycobacterial infection

ICS step-down

- WISDOM
- SUNSET
- INSTEAD
- OPTIMO
- DACCORD



Physician guided ICS withdrawl

Rossi A, et al. Respir Res. 2014;15:77.

Magnussen H et al N Engl J Med 2014;371:1285-94.

International Journal of COPD 2017:12 487–494

Chapman KR, et al. Am J Respir Crit Care Med 2018.

Pharmacologic Treatment 요약

Dyspnea 심한 경우

LAMA / LABA

악화와 호산구

LAMA or LABA

악화와 호산구

Triple

악화 혹은
호흡곤란

ICS/LABA

Blood Eosin 300
이상인 경우

내용

1) Initial treatment

2) ICS, When ?

3) Non-pharmacologic treatment

Home NIV

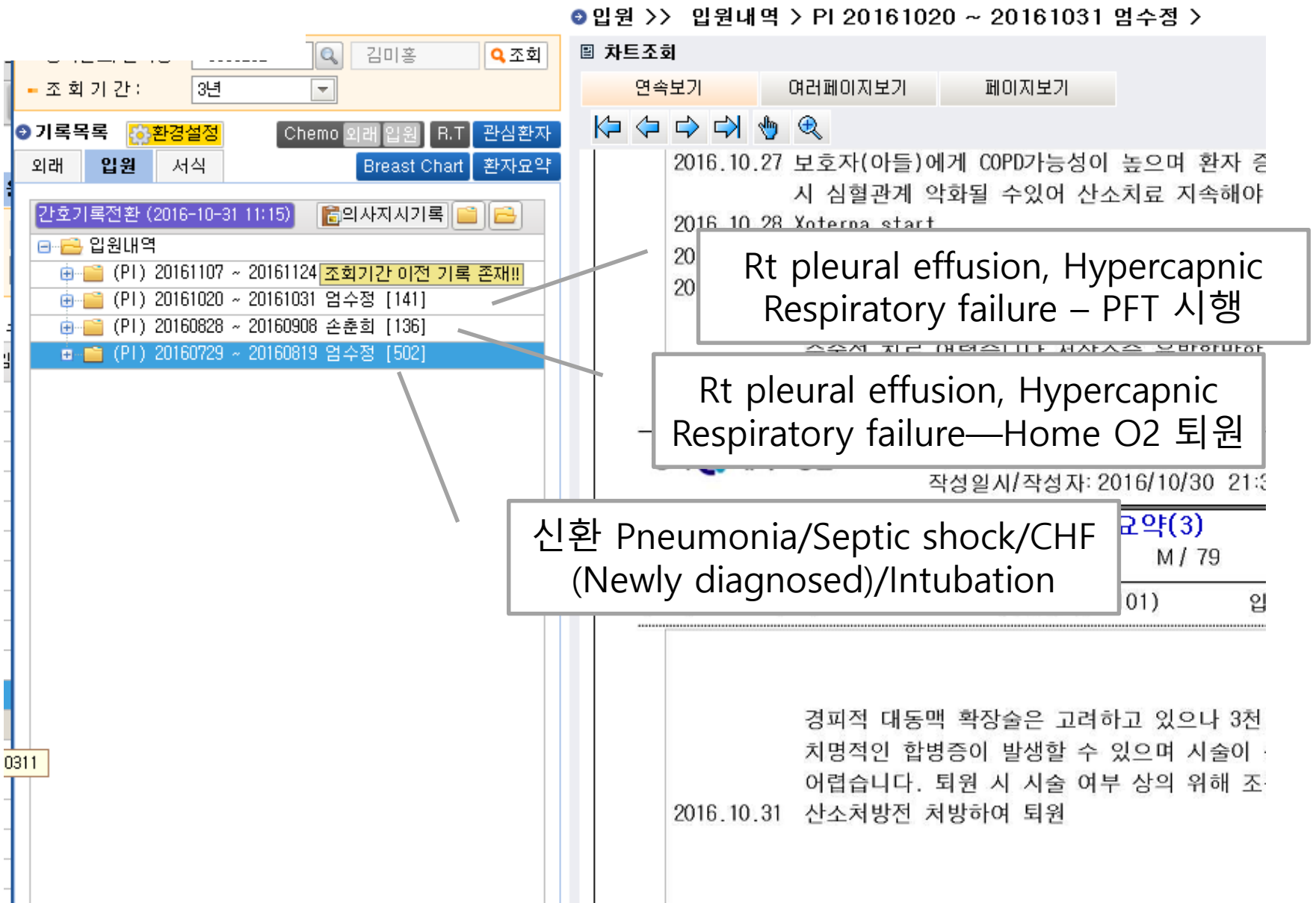
- Clear Indication ; COPD and Obstructive sleep apnea

- after AE and hospitalization ?

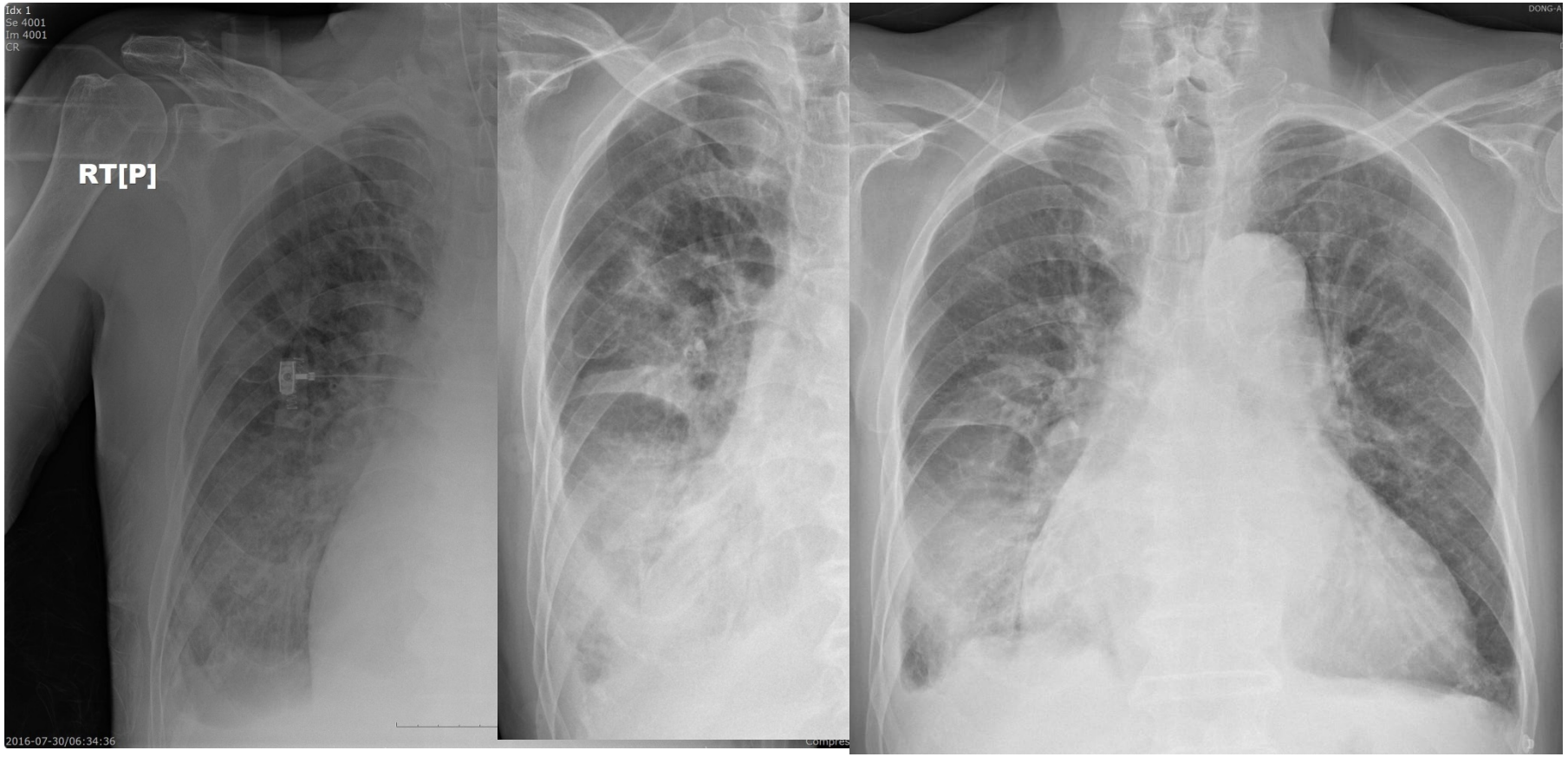
80세 남자

- COPD
- Cor pulmonale
- Severe AS
- AF
- CHF

80세 남자


입원 >> 입원내역 > PI 20161020 ~ 20161031 엄수정 >
차트조회
연속보기
여러페이지보기
페이지보기
김미홍
조회
조 회 기 간 :
3년
기록목록
환경설정
Chemo 외래 입원
R.T
관심환자
외래
입원
서식
Breast Chart
환자요약
간호기록전환 (2016-10-31 11:15)
의사지시기록
입원내역
(PI) 20161107 ~ 20161124 조회기간 이전 기록 존재!!
(PI) 20161020 ~ 20161031 엄수정 [141]
(PI) 20160828 ~ 20160908 손춘희 [136]
(PI) 20160729 ~ 20160819 엄수정 [502]
2016.10.27 보호자(아들)에게 COPD가능성이 높으며 환자 증
시 심혈관계 악화될 수있어 산소치료 지속해야
2016.10.28 Xoterna start
Rt pleural effusion, Hypercapnic Respiratory failure – PFT 시행
Rt pleural effusion, Hypercapnic Respiratory failure—Home O2 퇴원
작성일시/작성자: 2016/10/30 21:3
신환 Pneumonia/Septic shock/CHF (Newly diagnosed)/Intubation
요약(3)
M / 79
01)
경피적 대동맥 확장술은 고려하고 있으나 3천
치명적인 합병증이 발생할 수 있으며 시술이
어렵습니다. 퇴원 시 시술 여부 상의 위해 조
2016.10.31 산소처방전 처방하여 퇴원
0311

80세 남자



160730 160910 161025

80세 남자

	검사명	H V	검사결과	S	단위	참고치	검체명	의사전달사항
1	pH		7.395			7.35-7.45	ART-B	
2	pCO2		39.9		mmHg	35-45	ART-B	
3	pO2	▼	74.2		mmHg	75-100	ART-B	
4	Base Exess		-0.9		mEq/L	-2-2	ART-B	
5	Base Exess ecf		-1		mEq/L		ART-B	NP 1L
6	Bicarbonate		23.9		mEq/L	21-28	ART-B	
7	Bicarbonate st		23.7		mEq/L		ART-B	
8	TCO2		25.1		mEq/L	22-29	ART-B	
9	O2 Saturation		95		%	94-100	ART-B	

160819
퇴원일

	검사명	H V	검사결과	S	단위	참고치	검체명
1	pH	▼	7.327			7.35-7.45	ART-B
2	pCO2	▲	74.5		mmHg	35-45	ART-B
3	pO2	▼	70.3		mmHg	75-100	ART-B
4	Base Exess	▲	8.9		mEq/L	-2-2	ART-B
5	Base Exess ecf		12.1		mEq/L		ART-B
6	Bicarbonate	▲	38.1		mEq/L	21-28	ART-B
7	Bicarbonate st		32.5		mEq/L		ART-B
8	TCO2	▲	40.4		mEq/L	22-29	ART-B
9	O2 Saturation	▼	92.2		%	94-100	ART-B

1601107
재입원

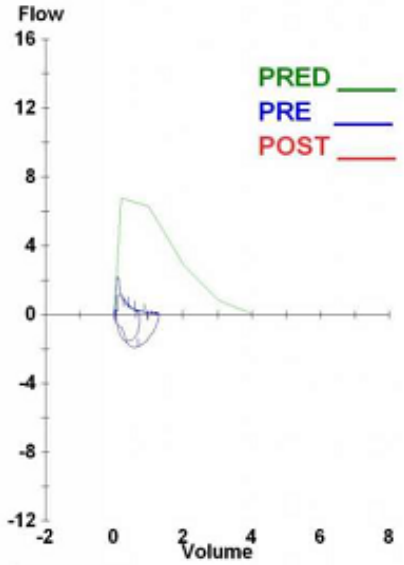
80세 남자

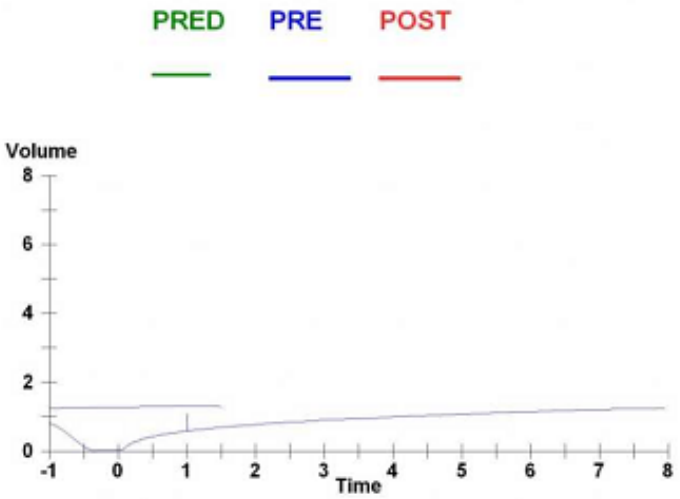
Name: 김미종,
Gender: Male
Age: 79 Race: Asian
Height(cm): 165 Weight(kg): 64.0
Room: CI / 55W

Id: 6968292
Date: 10/24/16
Temp: 23 PBar: 753
Physician: 손춘희
Technician:

Spirometry

	(BTPS)	PRED	PRE-RX BEST	PRE-RX %PRED	POST-RX BEST	POST-RX %PRED	% CHG
FVC	Liters	4.05	1.31	32			
FEV1	Liters	2.59	0.59	23			
FEF50%	L/sec	2.85	0.26	9			
FEF25-75%	L/sec	2.01	0.18	9			
FEV1/FVC	%	68	45				
PEF	L/sec	6.76	2.44	36			
VC	Liters	3.40	1.31	39			
IC	Liters	2.35	0.65	28			
ERV	Liters	1.17	0.27	23			

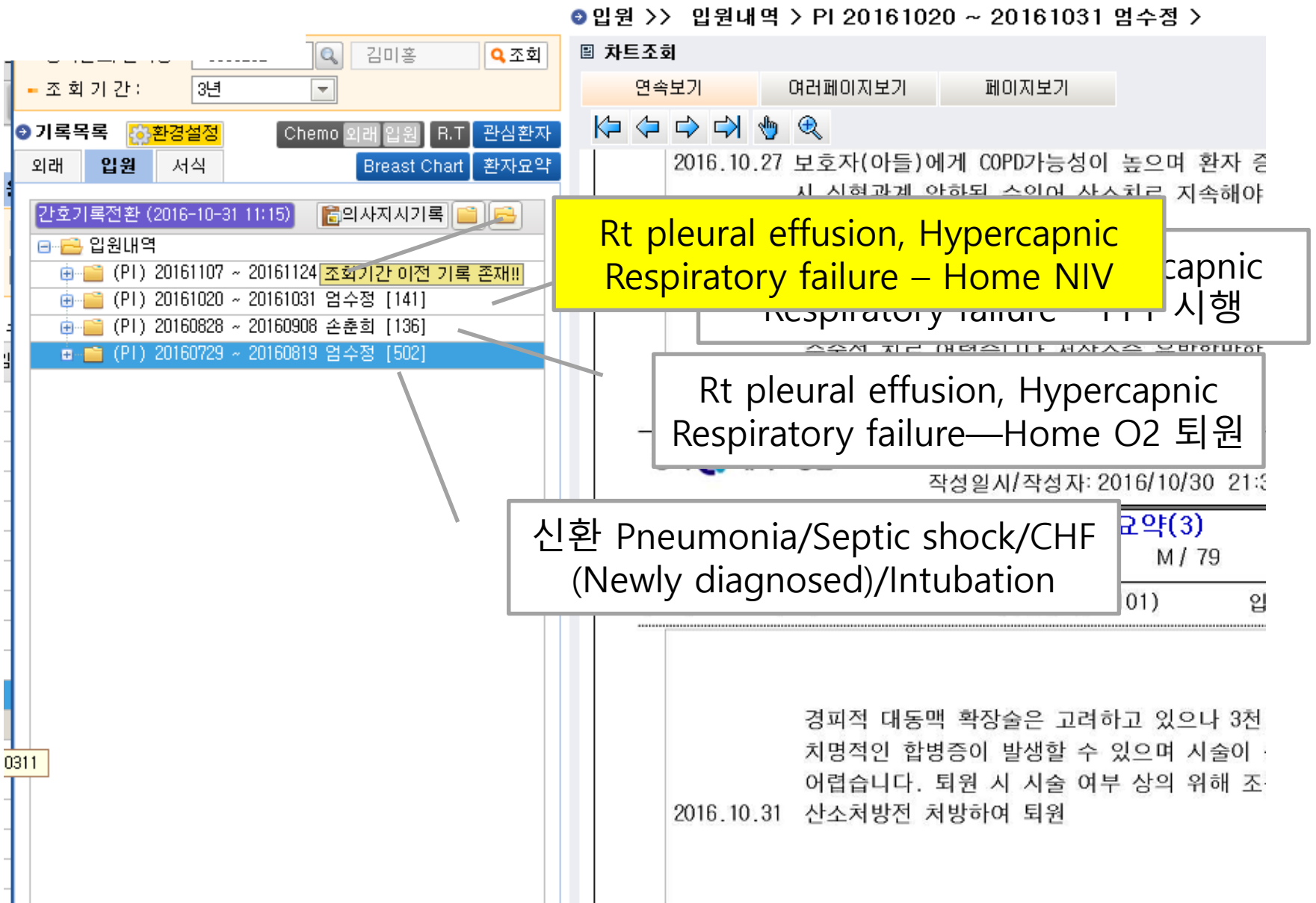




Comments:

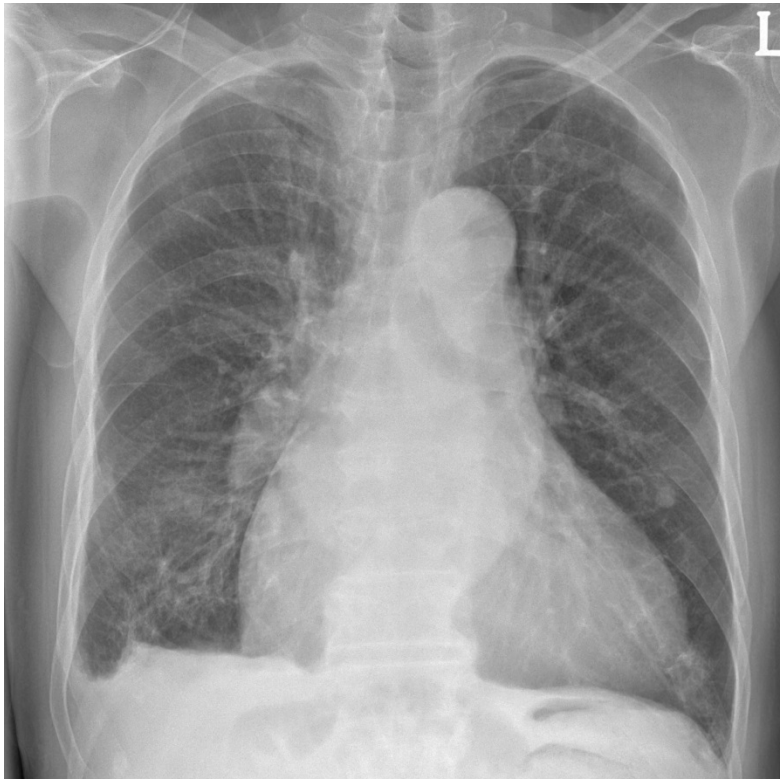
Interpretation:

80세 남자


입원 >> 입원내역 > PI 20161020 ~ 20161031 엄수정 >
차트조회
연속보기
여러페이지보기
페이지보기
2016.10.27 보호자(아들)에게 COPD가능성이 높으며 환자 증
조회 기 간 :
3년
김미홍
조회
기록목록
환경설정
Chemo 외래 입원
R.T
관심환자
외래
입원
서식
Breast Chart
환자요약
간호기록전환 (2016-10-31 11:15)
의사지시기록
입원내역
(PI) 20161107 ~ 20161124 조회기간 이전 기록 존재!!
(PI) 20161020 ~ 20161031 엄수정 [141]
(PI) 20160828 ~ 20160908 손춘희 [136]
(PI) 20160729 ~ 20160819 엄수정 [502]
Rt pleural effusion, Hypercapnic Respiratory failure – Home NIV
capnic
시행
Rt pleural effusion, Hypercapnic Respiratory failure—Home O2 퇴원
작성일시/작성자: 2016/10/30 21:3
요약(3)
M / 79
01)
신환 Pneumonia/Septic shock/CHF (Newly diagnosed)/Intubation
경피적 대동맥 확장술은 고려하고 있으나 3천
치명적인 합병증이 발생할 수 있으며 시술이
어렵습니다. 퇴원 시 시술 여부 상의 위해 조
2016.10.31 산소처방전 처방하여 퇴원
0311

80세 남자 Home NIV 1개월 후

걸어서 외래에 방문



80세

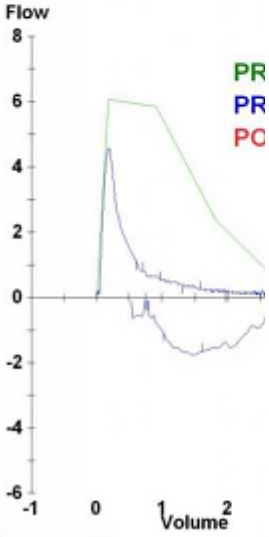
- 검사
- 검체
- 검사
- (?)는

1	pH
2	pCO
3	p02
4	Bas
5	Bas
6	Bic
7	Bic
8	TCO
9	02

Name: 김미홍,
Gender: Male
Age: 80 Race: As
Height(cm): 158 W
Room: PI OPD

Spirometry (BT

FVC	Liters
FEV1	Liters
FEF50%	L/sec
FEF25-75%	L/sec
FEV1/FVC	%
PEF	L/sec
VC	Liters
IC	Liters
ERV	Liters



Comments:

Interpretation:
There is a severe obstructive l

LVOTd(cm)		2.2	RVIDd(mm)		38

LV Size is	Mildly enlarged	RV Size is	Upper limit normal
LV Function is	Mildly depressed	RV Function is	Normal
EF is	45-49%	RV Wall Motion is	Normal
Wall Motion shows	Mild global hypokinesia		

Left Atirum	Severely enlarged	Right Atrium	Severely enlarged
Aortic root	Upper limit normal	Pericardium	Trace

◆ CARDIAC VALVES

Aortic valve	Severe calcification/thickening, motion diagnostic of AS, root calcification
Mitral valve	Mild thickening and preserved motion
Pulmonic valve	Normal structure and motion
Tricuspid valve	Mild calcification and normal motion

◆ DOPPLER FINDINGS

	AV	LVOT	MV	TV	PV
Peak Velocity(m/s)	3.9				
Peak Gradient(mmHg)					
Mean Gradient(mmHg)	34				
TVI(cm)	80	17			
PHT(ms)	AVA:0.8cm2				

MR	Mild	MS	None	AR	Mild	AS	Severe	TR	Mod	PR	Trace

◆ DIASTOLIC FUNCTION

Mitral:E: 111 cm/s A: cm/s, E/A : DT : m/s

Tissue Doppler: Septal annulus: Sa: 4.0 cm/s, Ea: 5.8 cm/s, Aa: cm/s

Lateral annulus: Sa: 7.2 cm/s, Ea: 8.9 cm/s, Aa: cm/s

E/Ea (septal): 19.1 , E/Ea (lateral) : 12.5

LV Relaxation	Abnormal LV relaxation	LV Filling pressure	Elevated

TR velocity : 3.5 m/s, RA pressure : 10-15 mmHg, Pa systolic pressure : 58-63 mmHg

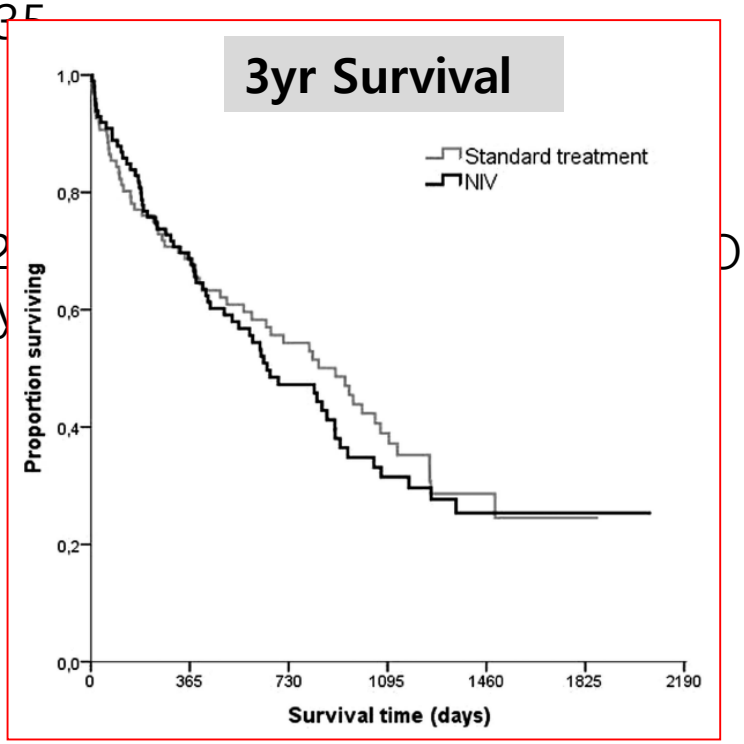
Stroke Volumn : 64.6 ml, HR : 75 bpm, Cardiac output : L/min

80세 남자 Home NIV 1년 후

- 악화 없이 외래 경과 관찰 중
- 현재 부인을 간병하다가 병원에서 마주침 (2017.11.13)

REspiratory Support in COPD after acUte Exacerbation (RESCUE) trial

- Netherlands
- COPD patients admitted to hospital with ARF and prolonged hypercapnia >48 h after termination of ventilatory support
- PaCO2 of ≥ 6 kPa(45mmHg), pH >7.3
- 1º outcome : readmission or death
- Procedure : IPAP of 19.2 ± 3.4 cm H2O with an adherence of 6.3 ± 2.4 h/day
- N=201



Struik FM et al. Thorax 2014;69:826–834..

Non-invasive positive pressure ventilation for the treatment of severe stable chronic obstructive pulmonary disease: a prospective, multicentre, randomised, controlled clinical trial

Thomas Köhnlein, Wolfram Windisch, Dieter Köhler, Anna Drabik, Jens Geiseler, Sylvia Hartl, Ortrud Karg, Gerhard Laier-Groeneveld, Stefano Nava, Bernd Schönhofer, Bernd Schucher, Karl Wegscheider, Carl P Criée, Tobias Welte

Lancet Respir Med 2014; 2: 698–705
Published Online July 25, 2014
http://dx.doi.org/10.1016/S2213-2600(14)70153-5
See Comment page 672

From the Department of Respiratory Medicine, Hannover Medical School, Hannover, Germany (T Köhnlein MD); Centre for Respiratory Medicine, Hospital Köln-Merheim, University of Witten/Herdecke, Cologne, Germany (W Windisch MD); Department of Pneumology I, Fachkrankenhaus Kloster Grafschaft, Schmallenberg, Germany (D Köhler MD); Department of Medical Biometry and Epidemiology, University Medical Centre Hamburg-Eppendorf, Hamburg, Germany (A Drabik PhD, K Wegscheider PhD); Centre of

Summary

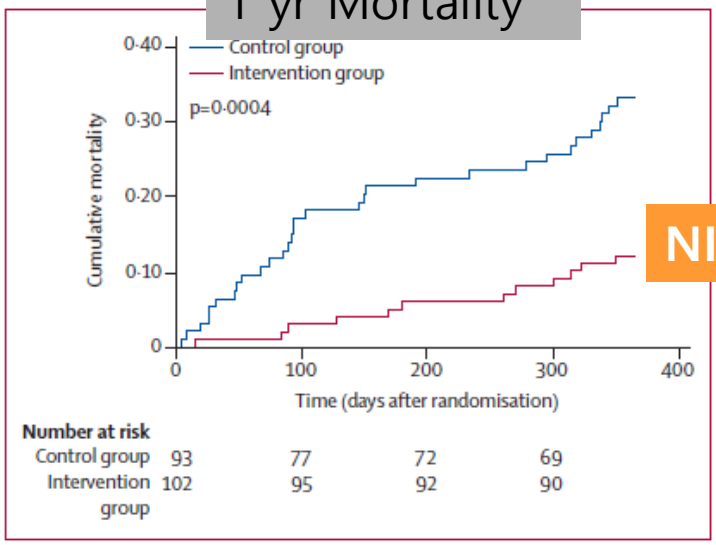
Background Evidence is weak for the ability of long-term non-invasive positive pressure ventilation (NPPV) to improve survival in patients with stable hypercapnic chronic obstructive pulmonary disease (COPD). Previous prospective studies did not target a reduction in hypercapnia when adjusting ventilator settings. This study investigated the effect of long-term NPPV, targeted to markedly reduce hypercapnia, on survival in patients with advanced, stable hypercapnic COPD.

Methods This investigator-initiated, prospective, multicentre, randomised, controlled clinical trial enrolled patients with stable GOLD stage IV COPD and a partial carbon dioxide pressure ($PaCO_2$) of 7 kPa (51·9 mm Hg) or higher and pH higher than 7·35. NPPV was targeted to reduce baseline $PaCO_2$ by at least 20% or to achieve $PaCO_2$ values lower than 6·5 kPa (48·1 mm Hg). Patients were randomly assigned (in a 1:1 ratio) via a computer-generated randomisation sequence with a block size of four, to continue optimised standard treatment (control group) or to receive additional NPPV for at least 12 months (intervention group). The primary outcome was 1-year all-cause mortality. Analysis was by intention to treat. The intervention was unblinded, but outcome assessment was blinded to treatment assignment. This study is registered with ClinicalTrials.gov, number NCT00710541.

Findings Patients were recruited from 36 respiratory units in Germany and Austria, starting on Oct 29, 2004, and terminated with a record of the vital status on July 31, 2011. 195 patients were randomly assigned to the NPPV group (n=102) or to the control group (n=93). All patients from the control group and the NPPV group were included in the primary analysis. 1-year mortality was 12% (12 of 102 patients) in the intervention group and 33% (31 of 93 patients) in the control group; hazard ratio 0·24 (95% CI 0·11–0·49; p=0·0004). 14 (14%) patients reported facial skin rash, which could be managed by changing the type of the mask. No other intervention-related adverse events were reported.

Interpretation The addition of long-term NPPV to standard treatment improves survival of patients with hypercapnic, stable COPD when NPPV is targeted to greatly reduce hypercapnia.

1 yr Mortality



NIV

Research

JAMA | Original Investigation

Effect of Home Noninvasive Ventilation With Oxygen Therapy vs Oxygen Therapy Alone on Hospital Readmission or Death After an Acute COPD Exacerbation

A Randomized Clinical Trial

Patrick B. Murphy, PhD; Sunita Rehal, MSc; Gill Arbane, BSc (Hons); Stephen Bourke, PhD; Peter M. A. Calverley, PhD; Angela M. Crook, PhD; Lee Dowson, MD; Nicholas Duffy, MD; G. John Gibson, MD; Philip D. Hughes, MD; John R. Hurst, PhD; Keir E. Lewis, MD; Rahul Mukherjee, MD; Annabel Nickol, PhD; Nicholas Oscroft, MD; Maxime Patout, MD; Justin Pepperell, MD; Ian Smith, MD; John R. Stradling, PhD; Jadwiga A. Wedzicha, PhD; Michael I. Polkey, PhD; Mark W. Elliott, MD; Nicholas Hart, PhD

Editorial page 2167
Supplemental content
CME Quiz at jamanetwork.com/learning

IMPORTANCE Outcomes after exacerbations of chronic obstructive pulmonary disease (COPD) requiring acute noninvasive ventilation (NIV) are poor and there are few treatments to prevent hospital readmission and death.

OBJECTIVE To investigate the effect of home NIV plus oxygen on time to readmission or death in patients with persistent hypercapnia after an acute COPD exacerbation.

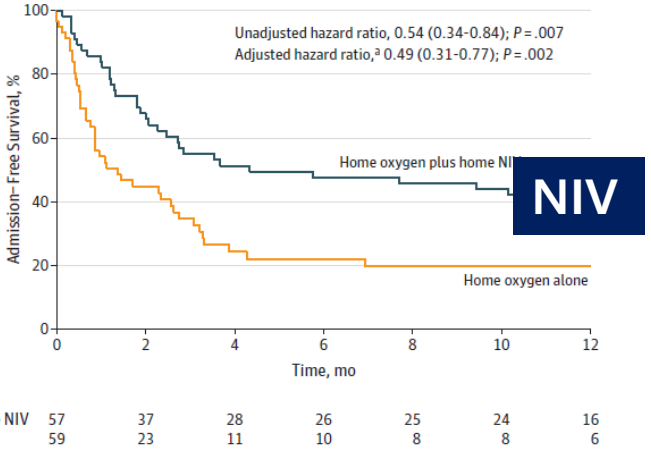
DESIGN, SETTING, AND PARTICIPANTS A randomized clinical trial of patients with persistent hypercapnia ($PaCO_2$ >53 mm Hg) 2 weeks to 4 weeks after resolution of respiratory acidemia, who were recruited from 13 UK centers between 2010 and 2015. Exclusion criteria included obesity (body mass index [BMI] >35), obstructive sleep apnea syndrome, or other causes of respiratory failure. Of 2021 patients screened, 124 were eligible.

INTERVENTIONS There were 59 patients randomized to home oxygen alone (median oxygen flow rate, 1.0 L/min [interquartile range {IQR}, 0.5-2.0 L/min]) and 57 patients to home oxygen plus home NIV (median oxygen flow rate, 1.0 L/min [IQR, 0.5-1.5 L/min]). The median home ventilator settings were an inspiratory positive airway pressure of 24 (IQR, 22-26) cm H_2O, an expiratory positive airway pressure of 4 (IQR, 4-5) cm H_2O, and a backup rate of 14 (IQR, 14-16) breaths/minute.

MAIN OUTCOMES AND MEASURES Time to readmission or death within 12 months adjusted for

1 yr adm free survival

Figure 2. Kaplan-Meier Su… …to the End of Trial Follow-up at 1 Year



NIV

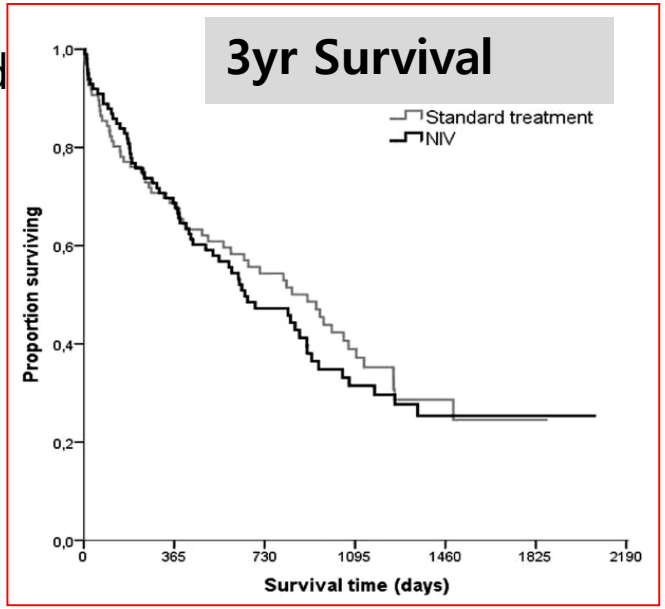
REspiratory Support in COPD after acUte Exacerbation (RESCUE) trial

- Netherlands
- COPD patients admitted to hospital with ARF and **prolonged hypercapnia >48 h after termination of ventilatory support**
- PaCO2 of ≥ 6 kPa(45mmHg), pH >7.35

- 1º outcome : readmission or death

- Procedure : IPAP of 19.2 ± 3.4 cm H2O and with an adherence of 6.3 ± 2.4 h/day.

- N=201



Struik FM et al. Thorax 2014;69:826–834..

Non-invasive positive pressure ventilation for the treatment of severe stable chronic obstructive pulmonary disease: a prospective, multicentre, randomised, controlled clinical trial

Thomas Köhnlein, Wolfram Windisch, Dieter Köhler, Anna Drabik, Jens Geiseler, Sylvia Hartl, Ortrud
Bernd Schönhofer, Bernd Schucher, Karl Wegscheider, Carl P Criée, Tobias Welte

Lancet Respir Med 2014;
2: 698–705
Published Online
July 25, 2014
http://dx.doi.org/10.1016/
S2213-2600(14)70153-5
See Comment page 672

From the Department of Respiratory Medicine, Hannover Medical School, Hannover, Germany (T Köhnlein MD); Centre for Respiratory Medicine, Hospital Köln-Merheim, University of Witten/Herdecke, Cologne, Germany (W Windisch MD); Department of Pneumology I, Fachkrankenhaus Kloster Grafschaft, Schmallenberg, Germany (D Köhler MD); Department of Medical Biometry and Epidemiology, University Medical Centre Hamburg-Eppendorf, Hamburg, Germany (A Drabik PhD, K Wegscheider PhD); Centre of

Summary

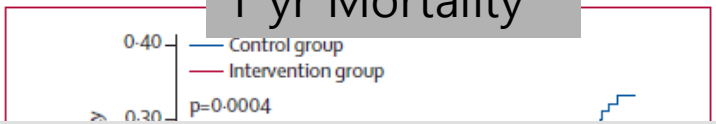
Background Evidence is weak for the ability of long-term non-invasive positive p
survival in patients with stable hypercapnic chronic obstructive pulmonary disease
did not target a reduction in hypercapnia when adjusting ventilator settings. Thi
term NPPV, targeted to markedly reduce hypercapnia, on survival in patients with

Methods This investigator-initiated, prospective, multicentre, randomised, co
with stable GOLD stage IV COPD and a partial carbon dioxide pressure ($PaCO_2$)
pH higher than 7·35. NPPV was targeted to reduce baseline $PaCO_2$ by at least
than 6·5 kPa (48·1 mm Hg). Patients were randomly assigned (in a 1:1 ratio) via
sequence with a block size of four, to continue optimised standard treatment (
NPPV for at least 12 months (intervention group). The primary outcome was 1-
by intention to treat. The intervention was unblinded, but outcome assessment
This study is registered with ClinicalTrials.gov, number NCT00710541.

Findings Patients were recruited from 36 respiratory units in Germany and A
terminated with a record of the vital status on July 31, 2011. 195 patients w
group (n=102) or to the control group (n=93). All patients from the contro
included in the primary analysis. 1-year mortality was 12% (12 of 102 patients
(31 of 93 patients) in the control group; hazard ratio 0·24 (95% CI 0·11–
reported facial skin rash, which could be managed by changing the type of the
adverse events were reported.

Interpretation The addition of long-term NPPV to standard treatment improves survival of patients with hypercapnic, stable COPD when NPPV is targeted to greatly reduce hypercapnia.

1 yr Mortality



- Germany
- Well designed Large scale RCT
- GOLD stage 4, pH >7.35 & Pco2≥ 52 mmHg
- Stable at least 1 mo
- 6hr/day NPPV
- Primary outcome ;1yr survival
- NIV 12% vs CONTROL 33%

Research

JAMA | Original Investigation

Effect of Home Noninvasive Ventilation With Oxy vs Oxygen Therapy Alone on Hospital Readmissio After an Acute COPD Exacerbation

A Randomized Clinical Trial

Patrick B. Murphy, PhD; Sunita Rehal, MSc; Gill Arbane, BSc (Hons); Stephen Bourke, PhD; Peter M. A. Calverley, PhD; Ang
Lee Dowson, MD; Nicholas Duffy, MD; G. John Gibson, MD; Philip D. Hughes, MD; John R. Hurst, PhD; Keir E. Lewis, MD; R
Annabel Nickol, PhD; Nicholas Oscroft, MD; Maxime Patout, MD; Justin Pepperell, MD; Ian Smith, MD; John R. Stradling, F
Jadwiga A. Wedzicha, PhD; Michael I. Polkey, PhD; Mark W. Elliott, MD; Nicholas Hart, PhD

IMPORTANCE Outcomes after exacerbations of chronic obstructive pulmonary disease (COPD) requiring acute noninvasive ventilation (NIV) are poor and there are few treatments to prevent hospital readmission and death.

OBJECTIVE To investigate the effect of home NIV plus oxygen on time to readmission or death in patients with persistent hypercapnia after an acute COPD exacerbation.

DESIGN, SETTING, AND PARTICIPANTS A randomized clinical trial of patients with persistent hypercapnia ($PaCO_2$ >53 mm Hg) 2 weeks to 4 weeks after resolution of respiratory acidemia, who were recruited from 13 UK centers between 2010 and 2015. Exclusion criteria included obesity (body mass index [BMI] >35), obstructive sleep apnea syndrome, or other causes of respiratory failure. Of 2021 patients screened, 124 were eligible.

INTERVENTIONS There were 59 patients randomized to home oxygen alone (median oxygen flow rate, 1.0 L/min [interquartile range {IQR}, 0.5-2.0 L/min]) and 57 patients to home oxygen plus home NIV (median oxygen flow rate, 1.0 L/min [IQR, 0.5-1.5 L/min]). The median home ventilator settings were an inspiratory positive airway pressure of 24 (IQR, 22-26) cm H_2O, an expiratory positive airway pressure of 4 (IQR, 4-5) cm H_2O, and a backup rate of 14 (IQR, 14-16) breaths/minute.

MAIN OUTCOMES AND MEASURES Time to readmission or death within 12 months adjusted for

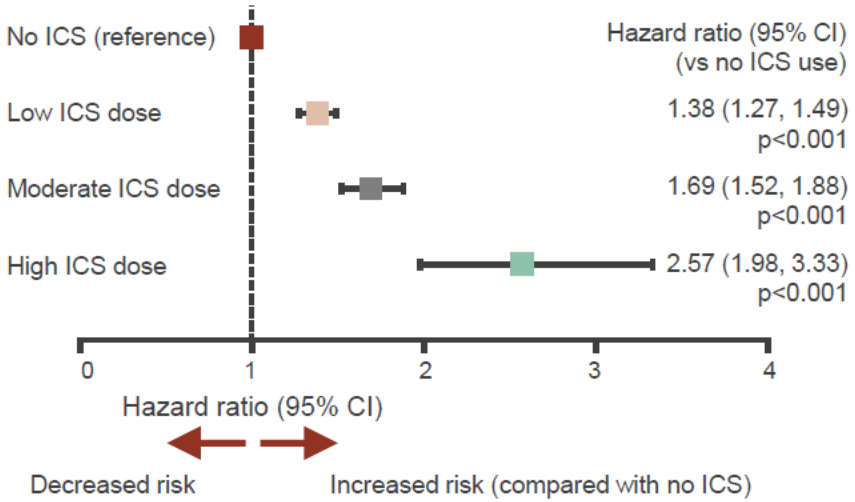
- UK
- persistent hypercapnia (PaCO2 >53 mm Hg) and hypoxemia (PaO2 <55mmHg or <60mmHg; ≥1 of polycythemia, pulmonary hypertension, or cor pulmonale; >30% of sleep time with oxygen saturation<90%)
- At least 2 weeks after Acute respiratory acidosis resolution
- 6hr/day NPPV
- Primary outcome ; readmission or death
- NIV 50% Risk Reduction

Summary

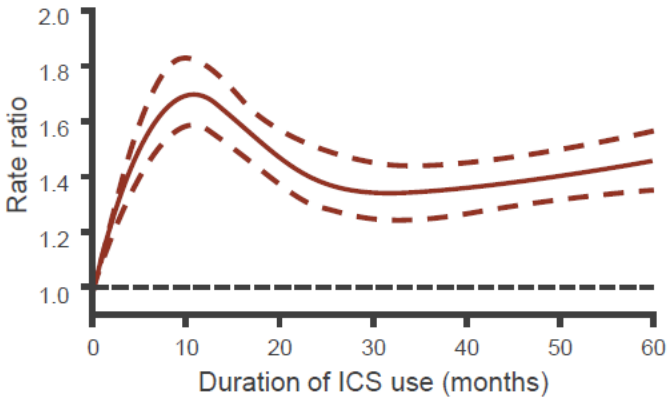
- COPD약물치료의 핵심은 기관지 확장제이다
- ICS는 혈중 호산구, 악화의 위험도에 따라 추가할 수 있다
- 금연, 호흡재활 등 비 약물 치료는 매우 중요하다.

TORCH study (*post-hoc* analysis): greater rate of pneumonia reported in the fluticasone and salmeterol/fluticasone combination group (84 and 88 per 1,000 treatment-years, respectively) vs salmeterol and placebo (52 and 52 per 1,000 treatment years, respectively)[1]

Evidence for a dose-response relationship[2]



Evidence for sustained elevated risk with long-term use[3]

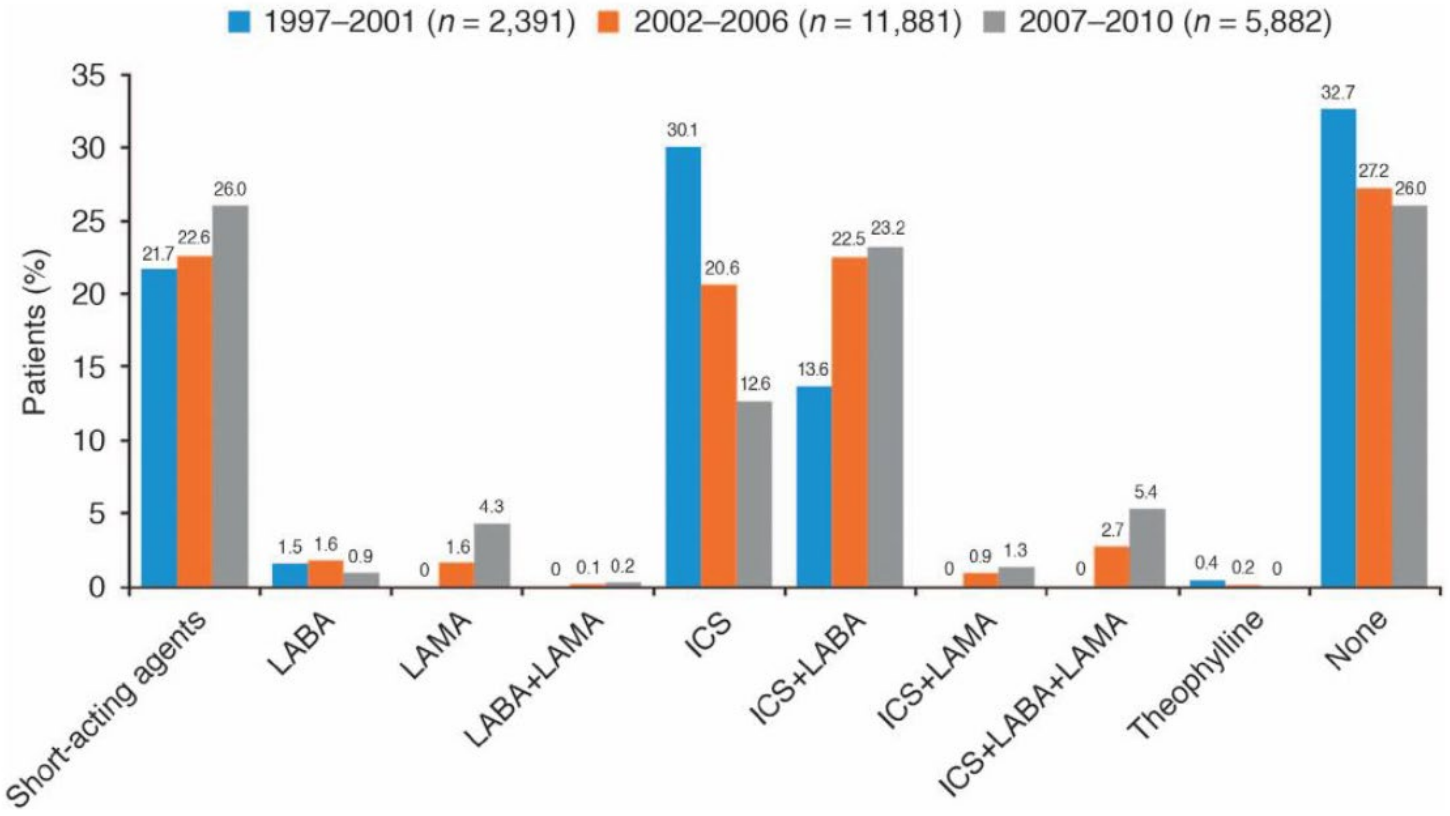


Rate ratio for ICS use vs non-ICS use represented by solid line; dashed lines represent 95% CI

CI = confidence interval; ICS = inhaled corticosteroid; TORCH = TOwards a Revolution in COPD Health

1. Crim C, et al. Eur Respir J 2009
2. Yawn BP, et al. Int J Chron Obstruct Pulmon Dis 2013
3. Suissa S, et al. Thorax 2013

ICS prescription in COPD patients: Initial prescription



npj Primary Care Respiratory Medicine (2016) 16002