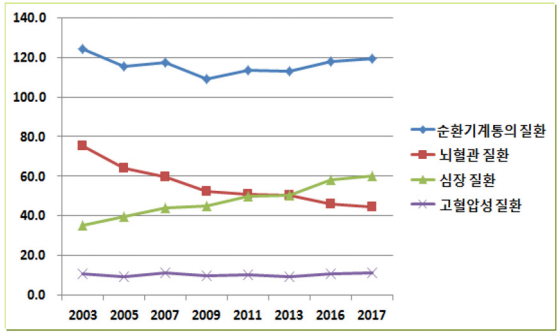
고혈압 병용요법

김 영 식

울산의대

연수강좌

순환기 질환 사망률 추이



만성질환 진료 통계 2010-17

(단위 : 천명, 억원, %)

구 분	진료실인원(천 명)					진료비(억 원)				
	2010년	2016년	2017년	전년 대비	연평균	2010년	2016년	2017년	전년 대비	연평균
계	14,025	16,790	17,297	3.0	3.0	168,106	260,447	282,813	8.6	7.7
고혈압	5,133	5,899	6,054	2.6	2.4	24,904	30,177	31,124	3.1	3.2
당뇨병	2,019	2,704	2,863	5.9	5.1	13,516	20,434	22,239	8.8	7.4
심장질환	1,038							23,396	13.2	8.8
대뇌혈관질환	746							25,915	2.5	7.0
악성신생물	960							56,224	11.8	8.2
간의질환	1,522							9,797	3.6	7.0
정신 및 행동장애	2,167							37,091	8.6	10.2
호흡기결핵	89							1,353	10.1	6.0
신경계질환	2,340							22,796	15.8	12.4
갑상선의 장애	1,024	1,264	1,299	2.8	3.5	2,019	2,921	3,127	7.1	6.4
만성신장병	97	191	206	7.9	11.4	10,731	16,914	18,126	7.2	7.8
관절염	3,907	4,636	4,709	1.6	2.7	14,018	20,279	21,625	6.6	6.4

2017년

진료인원: 600만명,

진료비: 3조 1천억 (1위)

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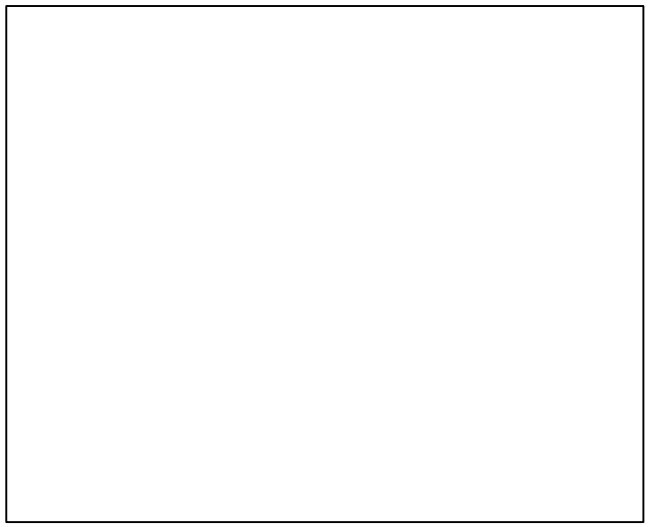
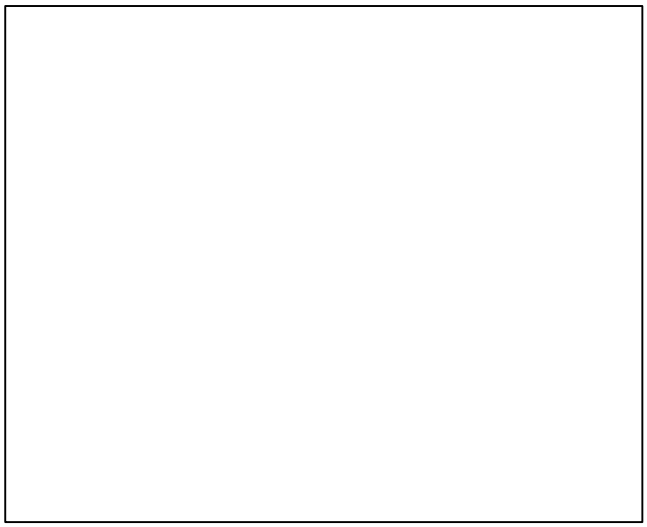
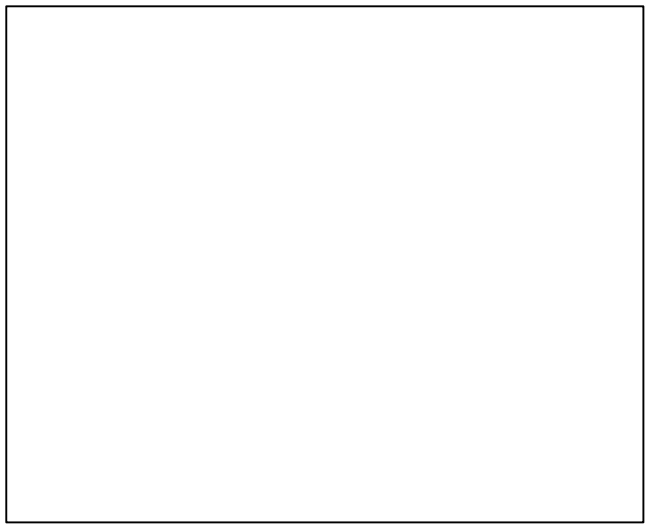
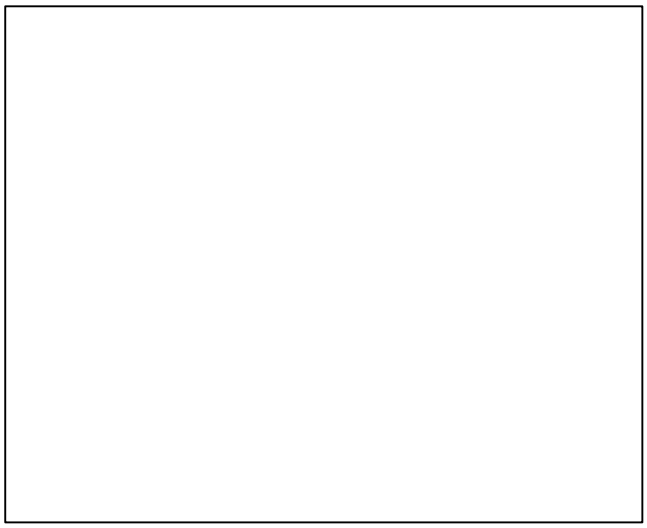








KSH Guideline 2013 vs 2018

2013				2018			
혈압 분류	수축기 혈압 (mmHg)		확장기 혈압 (mmHg)	혈압분류	수축기 혈압 (mmHg)		확장기 혈압 (mmHg)
정상	<120	그리고	<80	정상	<120	그리고	<80
고혈압전단계 1기	120-129	또는	80-84	주의혈압	120-129	그리고	<80
고혈압전단계 2기	130-139	또는	85-89	고혈압 전단계	130-139	또는	80-89
고혈압1기	140-159	또는	90-99	고혈압1기	140-159	또는	90-99
고혈압2기	≥160	또는	≥100	고혈압2기	≥160	또는	≥100

KSH Guideline 2013 vs 2018

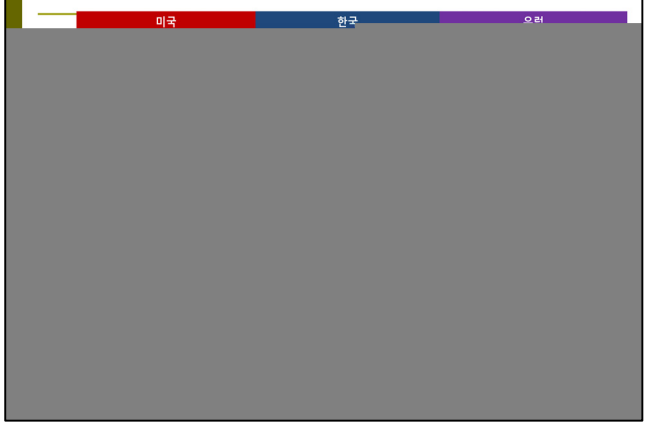
상황	2013 SBP/DBP(mmHg)	2018 SBP/DBP(mmHg)
단순고혈압	140 / 90	140 / 90
고위험군*	-	130 / 80
심혈관질환**	-	130 / 80
노인 고혈압	140~150 / 90	140 / 90
당뇨병	140 / 85	
심혈관질환 없음	-	140 / 85
심혈관질환** 있음	-	130 / 80
만성콩팥병		
알부민뇨 없음	140 / 90	140 / 90
알부민뇨 동반됨	130 / 80	130 / 80
뇌졸중	140 / 90	140 / 90

*10년 심뇌혈관질환 발생률 > 15%, **관상동맥질환, 말초혈관질환, 대동맥질환, 심부전 및 좌심실비대

측정방법에 따른 고혈압 기준 KSH 2013 ESH/ESC 2018

혈압 측정법	수축기혈압 (mmHg)	이완기혈압 (mmHg)
진료실 혈압	≥ 140	≥ 90
24시간 활동혈압		
일일 평균 혈압	≥ 130	≥ 80
주간 평균 혈압	≥ 135	≥ 85
야간 평균 혈압	≥ 120	≥ 70
가정혈압	≥ 135	≥ 85

미국-한국-유럽 고혈압 가이드라인 비교



Requirements for Modern BP Lowering Therapy

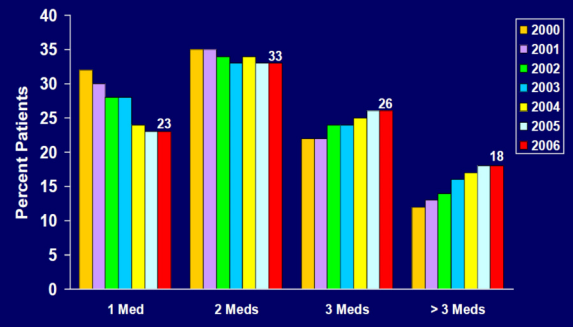
- Effective 24hr BP control
- Cardiovascular disease prevention
- Metabolically “friendly”
- Well tolerated
- Fewer tablets is better
- Simple guidelines

항고혈압제 병합요법

병합요법 근거

Treated Hypertensive Veterans: Number of Antihypertensive Meds

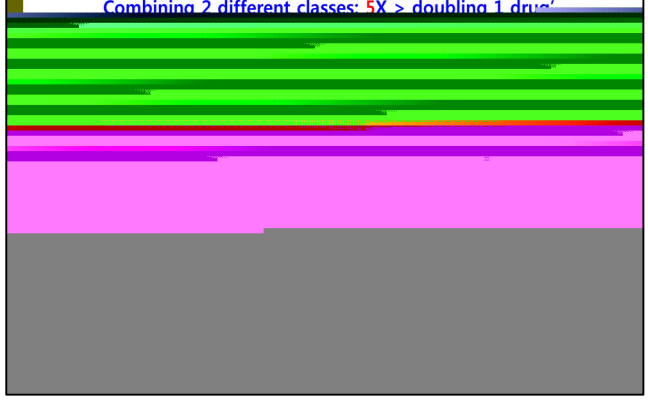
Percent Prescribed



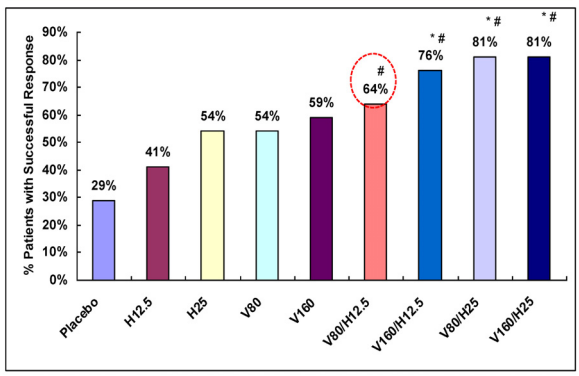
Furmaga, et al. J Clin Hypertens. 2008;10:770–78

Adding is More Effective Than Titrating

Combining 2 different classes: 5X > doubling 1 drug

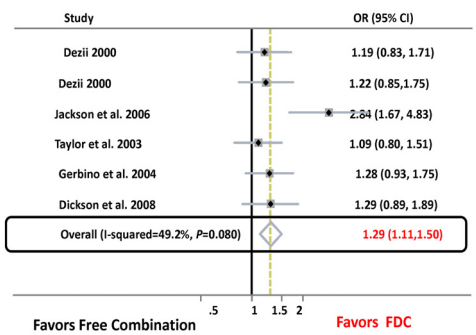


ARB와 thiazide 병합요법간 목표혈압 도달율



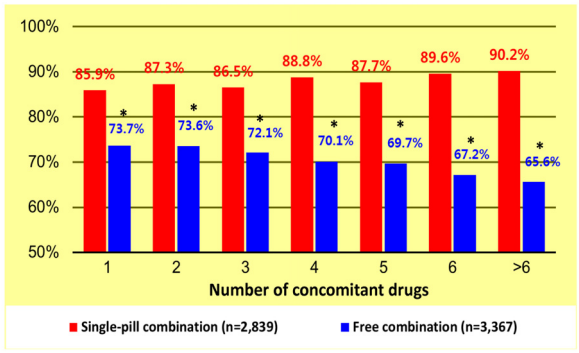
FDC increase persistence and compliance

Meta-analysis of 6 Studies



Gupta AK, et al. *Hypertension*. 2010

순응도: FDC vs Free combination



*p<0.0001

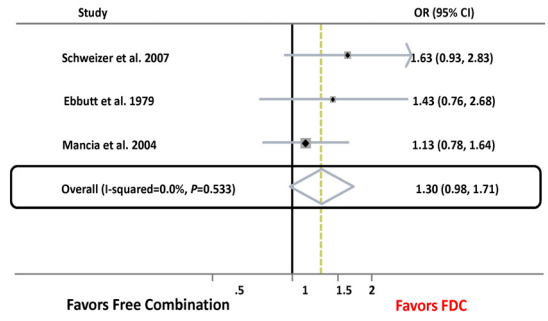
Gerbino & Shoheiber. *Am J Health System Pharm* 2007

Why CCB-ARB Combination?

- CCB/ARB complementary mode of action
- Superior tolerability of ARB
- Wealth of CV outcome data for CCB and ARB

FDC increase normalization of BP

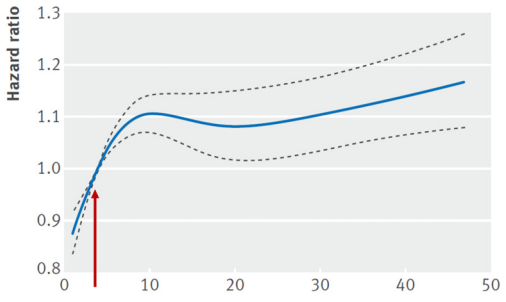
Meta-analysis of 3 Studies



Gupta AK, et al. *Hypertension*. 2010

Less ADR with CCB+ARB vs. CCB

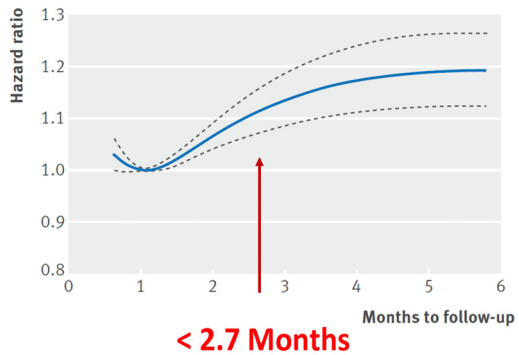
Delay SBP Control: Acute CVDs/ Death ↑



< 1.5 Months

Xu et al. BMJ 2015;350:h158

Delay BP F/U: Acute CVDs/ Death ↑

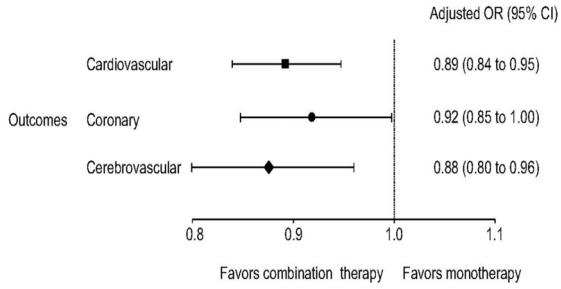


< 2.7 Months

Xu et al. BMJ 2015;350:h158

Initial Combination vs Monotherapy

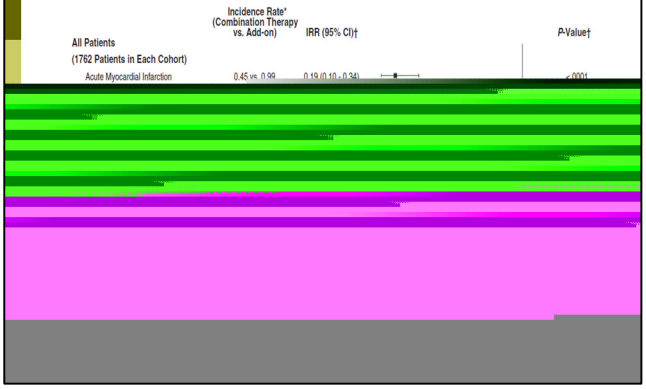
Incidence of CV outcomes (11% ↓)



Corrao, G et al. Hypertension 2011;58:566-572.

Combination Therapy vs Add-On

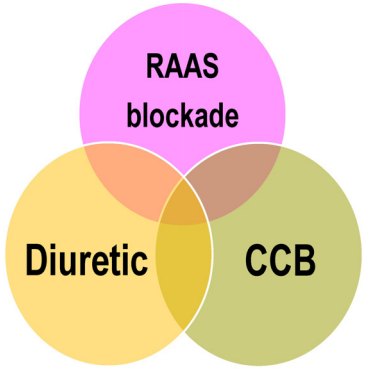
CV events or Death



항고혈압제 병합요법

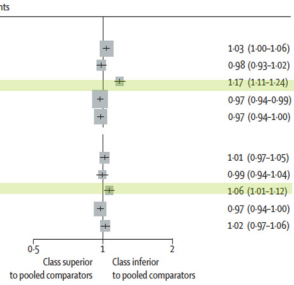
진료지침 활용

Evidence-based combination therapy



Impact of Specific BP-lowering Treatments versus alternative class on CV Outcomes & Mortality

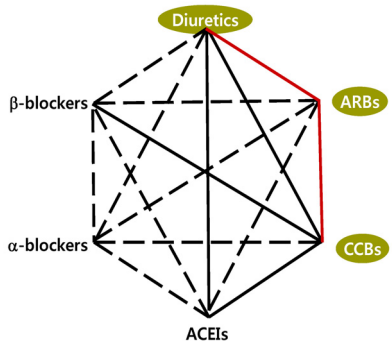
	Studies	Intervention Events	Intervention Participants	Control Events	Control Participants	RR (95% CI)
Major cardiovascular events						
ACE inhibitor	10	5379	31652	9766	50805	1·03 (1·00-1·06)
ARB	8	3647	27140	3779	29331	0·98 (0·93-1·02)
β blocker	9	2863	25989	2520	27231	1·17 (1·11-1·24)
CCB	21	7857	63693	12808	82904	0·97 (0·94-0·99)
Diuretic	11	5830	38353	6782	42410	0·97 (0·94-1·00)
All-cause mortality						
ACE inhibitor	14	3321	33104	5865	52263	1·01 (0·97-1·05)
ARB	11	2546	29282	2638	31404	0·99 (0·94-1·04)
β blocker	12	2805	40953	2688	42170	1·06 (1·01-1·12)
CCB	26	5602	76672	8428	95932	0·97 (0·94-1·00)
Diuretic	12	3425	41625	3806	45707	1·02 (0·97-1·06)



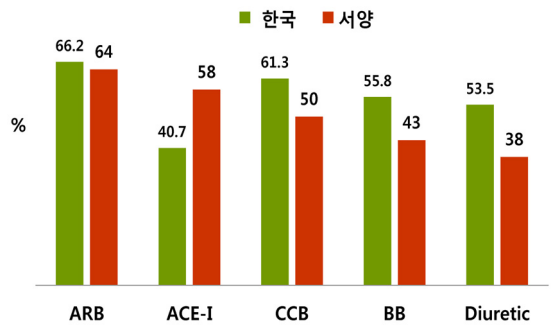
Justifies the focus of treatment on ACE-I or ARB, CCB or Diuretic

Ettehad D, et al. Lancet 2016; 387: 957-967

한국인에서 병합요법 및 FDC



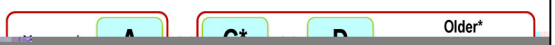
항고혈압제 계열별 투약 지속률



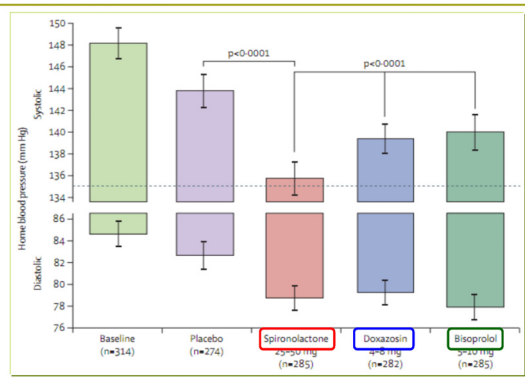
한국: 3개월, 서양: 1년

Hypertension Treatment Strategies

NICE, ASH / ISH, JNC8



3제 요법에 추가한 항고혈압제 효과 비교



Williams B. et al, *Lancet* 2015

2018 ESC/ESH Treatment Target Range

Age group	Office SBP treatment target ranges (mmHg)					Office DBP treatment target range (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke[a]/TIA	
18 - 65 years	Target to 130 *or lower if tolerated* Not <120	Target to 130 *or lower if tolerated* Not <120	Target to <140 to 130 *if tolerated*	Target to 130 *or lower if tolerated* Not <120	Target to 130 *or lower if tolerated* Not <120	70–79
65 - 79 years[b]	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	70–79
≥80 years[b]	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	Target to 130-139 *if tolerated*	70–79
Office DBP treatment target range (mmHg)	70–79	70–79	70–79	70–79	70–79	

항고혈압제의 금기증 2018 ESH/ESC

Drug	Contraindications	
	Compelling	Possible