부록 7: 수용성, 적용성 평가

▣ 권고의 수용성, 적용성 평가

▣ 핵심질문 (KQ1) : 글루코코르티코이드를 사용하는 환자에서 비약물적 치료가 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	All adults taking prednisone at a dose of ≥2.5 mg/day for ≥3 months Optimize calcium intake (800–1,000 mg/day) and vitamin D intake (600–800 IU/day) and lifestyle modifications (balanced diet,	Tobacco use and alcohol abuse should be avoided, and appropriate levels of physical exercise should be encouraged.	Encourage smoking cessation and a decrease of excessive alcohol use to a reasonable level	1. Exercises involving resistance training appropriate for the individual's age and functional capacity and/or weightbearing aerobic exercises are recommended for those with osteoporosis or at risk for osteoporosis	Regular weight-bearing exercise should be advised, tailored according to the needs and abilities of the individual patient.

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	maintaining weight in the recommended range, smoking cessation, regular weight-bearing or resistance training exercise, limiting alcohol intake to 1–2 alcoholic beverages/day) over no treatment or over any of these treatments alone.			[grade B]. 2. Exercises to enhance core stability and thus to compensate for weakness or postural abnormalities are recommended for individuals who have had vertebral fractures [grade B]. 3. Exercises that focus on balance, such as tai chi, or on balance and gait training should be considered for those at risk of	

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
					falls [grade A].	
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	예	예
	가치와 선호도가 유사하다	예	예	예	예	예
	권고로 인한 이득은 유사하다	예	예	예	예	예
	해당 권고는 수용할만하다.	예	예	예	예	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	예	예
	필수적인 전문기술이 이용 가능하다	예	예	예	예	예
	법률적/제도적 장벽이 없다.	예	예	예	예	예
	해당 권고는 적용할만하다.	예	예	예	예	예

▣ 핵심질문 (KQ2) : 40세 미만에서 어떤 약물 치료가 GIOP 예방과 치료에 효과적인가?

▣ 핵심질문 (KQ2-1) : 40세 미만에서 칼슘과 비타민 D 보충은 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	All adults taking prednisone at a dose of ≥2.5 mg/day for ≥3 months Optimize calcium intake (800–1,000 mg/day) and vitamin D intake (600–800 IU/day) and lifestyle modifications (balanced diet, maintaining weight in the recommended range, smoking	1. Advise good nutrition especially with calcium and vitamin D 2. Adequate calcium intake should be achieved through dietary intake if possible, with the use of supplements if necessary. 3. An adequate vitamin D status should be maintained,	1. Ensure adequate intakes of calcium (preferably via a balanced diet) and vitamin D 2. Routine prescription of calcium supplements is not recommended 3. The serum levelof 25-OH vitamin D should be maintained at the optimal value,which has been set at 30	1. For healthy adults at low risk of vitamin D deficiency, routine supplementation with 400–1000 IU (10–25 μg) vitamin D 3 daily is recommended [grade D]. 2. For individuals receiving pharmacologic therapy for osteo-porosis, measurement of serum 25-	General recommendation (GIOP를 포함한) - A daily calcium intake of between 700 and 1200mg should be advised, if possible achieved through dietary intake, with use of supplements if necessary. It is recommended that in postmenopausal

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	cessation, regular weight-bearing or resistance training exercise, limiting alcohol intake to 1–2 alcoholic beverages/day) over no treatment or over any of these treatments alone.	using supplements if required	ng/mL (75 nmoL/L) [52] based on findingsfrom biological and clinical studies that did not focus specificallyon glucocorticoid-induced osteoporosis 4. In patients with vitamin D insufficiency or deficiency, a loading dose of vitamin D should be given to elevate the serum 25-OH vita-min D level above the target of 30 ng/mL	hydroxyvitamin D should follow three to four months of adequate supplementation and should not be repeated if an optimal level (≥ 75 nmol/L) is achieved [grade D].	women and men ≥50 years who are at increased risk of fracture, a daily dose of 800 IU of cholecalciferol should be advised(Grade A recommendation). Intermittent administration of large doses of vitamin D e.g. ≥100,000 IU is not advised, based on recent reports of an associated increased risk of fracture and falls

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
				5. The maintenance dose is 800 to 1200 IU/day (or the equivalent of 100,000 IU every 2–3 months). The currently available data do not support the use of high-dose vitamin D supplementation (500,000 or 600,000 IU once or twice every year)		
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	예	예
	가치와 선호도가 유사하다	예	예	예	예	예
	권고로 인한 이득은 유사하다	예	예	예	예	예

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	해당 권고는 수용할만하다.	예	예	예	예	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	예	예
	필수적인 전문기술이 이용 가능하다	예	예	예	예	예
	법률적/제도적 장벽이 없다.	예	예	예	예	예
	해당 권고는 적용할만하다.	예	예	예	예	예

▣ 핵심질문 (KQ2-2) : 40세 미만에서 비스포스포네이트 사용은 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	1. For adults <40 years of age (women not of childbearing potential and men) with a history of OP fracture, or those continuing GC treatment (≥6 months at a dose of ≥7.5 mg/day) who have either a hip or spine BMD Z score <-3 or bone loss of ≥10%/year at the hip or spine as assessed by dual x-ray	1. Data on the effects of pharmacological interventions in this population are sparse, particularly with regard to fracture risk. 2.Bone-protective therapy may be appropriate in some premenopausal women and younger men, particularly in individuals with a previous history of fracture or receiving high doses of	1. osteoporosis drug therapy should be given to patients with established bone frailty documented by a history of low-energy fracture 2. Osteoporosis drug therapy should not be given routinely to patients without a history of low-energy fracture. Instead, the treatment decision should rely on an evaluation of these	N/A	Bone protective therapy may be appropriate in some premenopausal women and younger men, particularly in individuals with a previous history of fracture or receiving high doses of glucocorticoids

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	absorptiometry (DXA), an oral bisphosphonate should be used rather than the patient receiving no additional treatment beyond calcium and vitamin D. 2. For adults 30 years of age who are receiving very high dose GC treatment (initial prednisone dose of ≥30 mg/day [or equivalent GC exposure] and a cumulative annual	glucocorticoids. 3. Caution is advised in the use of bisphosphonates in women of childbearing age.	verity of the underlying disease, glucocorticoid dose, expected treatment duration, and BMD values 3. When bisphosphonates are used off-label, preference should be given to a bisphosphonate with a limited carry-over effect (risedronate)		

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
		dose of >5 gm) (Table 3), oral bisphosphonate treatment should be initiated.				
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	N/A	예
	가치와 선호도가 유사하다	예	예	예	N/A	예
	권고로 인한 이득은 유사하다	예	예	예	N/A	예
	해당 권고는 수용할만하다.	예	예	예	N/A	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	N/A	예
	필수적인 전문기술이 이용 가능하다	예	예	예	N/A	예
	법률적/제도적 장벽이 없다.	예	예	예	N/A	예
	해당 권고는 적용할만하다.	예	예	예	N/A	예

▣ 핵심질문 (KQ2-3) : 40세 미만에서 부갑상선호르몬 사용은 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	1. For adults <40 years of age (women not of childbearing potential and men) with a history of OP fracture, or those continuing GC treatment (≥6 months at a dose of ≥7.5 mg/day) who have either a hip or spine BMD Z score <-3 or bone loss of ≥10%/year at the hip or spine as assessed by dual x-ray	1. Data on the effects of pharmacological interventions in this population are sparse, particularly with regard to fracture risk. 2.Bone-protective therapy may be appropriate in some premenopausal women and younger men, particularly in individuals with a previous history of fracture or receiving high doses	NA	NA	Bone protective therapy may be appropriate in some premenopausal women and younger men, particularly in individuals with a previous history of fracture or receiving high doses of glucocorticoids

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	absorptiometry (DXA), If treatment with an oral bisphosphonate is not appropriate, the same alternative medications listed for adults <40 years of age are recommended with the exception of raloxifene, which is not used in men and premenopausal women 2. For adults 30 years of age who are receiving very	of glucocorticoids. 3. Caution is advised in the use of bisphosphonates in women of childbearing age.			

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	highdose GC treatment (initial prednisone dose of ≥30 mg/day [or equivalent GC exposure] and a cumulative annual dose of >5 gm) (Table 3), oral bisphosphonate treatment should be initiated. If treatment with an oral bisphosphonate is not appropriate, the age-related recommendations for				

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
		secondline therapy (Table 2) should be followed (with adjustments for women of childbearing potential as outlined in these guidelines).				
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	N/A	N/A	예
	가치와 선호도가 유사하다	예	예	N/A	N/A	예
	권고로 인한 이득은 유사하다	예	예	N/A	N/A	예
	해당 권고는 수용할만하다.	예	예	N/A	N/A	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	N/A	N/A	예
	필수적인 전문기술이 이용 가능하다	예	예	N/A	N/A	예
	법률적/제도적 장벽이 없다.	예	예	N/A	N/A	예
	해당 권고는 적용할만하다.	예	예	N/A	N/A	예

▣ 핵심질문 (KQ2-4) : 40세 미만에서 데노수맙 사용은 GIOP 예방과 치료에 효과적인가?

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고		If treatment with an oral bisphosphonate is not appropriate, the same alternative medications listed for adults≥40 years of age are recommended with the exception of raloxifene, which is not used in men and premenopausal women.	N/A	N/A	N/A	N/A
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	N/A	N/A	N/A	N/A
	가치와 선호도가 유사하다	예	N/A	N/A	N/A	N/A

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	권고로 인한 이득은 유사하다	예	N/A	N/A	N/A	N/A
	해당 권고는 수용할만하다.	예	N/A	N/A	N/A	N/A
적용성	해당 중재/장비는 이용 가능하다.	예	N/A	N/A	N/A	N/A
	필수적인 전문기술이 이용 가능하다	예	N/A	N/A	N/A	N/A
	법률적/제도적 장벽이 없다.	예	N/A	N/A	N/A	N/A
	해당 권고는 적용할만하다.	예	N/A	N/A	N/A	N/A

▣ 핵심질문 (KQ3) : 40세 이상에서 어떤 약물 치료가 GIOP 예방과 치료에 효과적인가?

▣ 핵심질문 (KQ3-1) : 40세 이상에서 칼슘과 비타민 D 보충은 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	All adults taking prednisone at a dose of ≥2.5 mg/day for ≥3 months Optimize calcium intake (800–1,000 mg/day) and vitamin D intake (600–800 IU/day) and lifestyle modifications (balanced diet, maintaining weight in the recommended range, smoking	1. Advise good nutrition especially with calcium and vitamin D 2. Adequate calcium intake should be achieved through dietary intake if possible, with the use of supplements if necessary. 3. An adequate vitamin D status should be maintained,	1. Ensure adequate intakes of calcium (preferably via a balanced diet) and vitamin D 2. Routine prescription of calcium supplements is not recommended 3. The serum levelof 25-OH vitamin D should be maintained at the optimal value,which has been set at 30	NOT GIOP 1. The total daily intake of elemental calcium (through diet and supplements) for individuals over age 50 should be 1200 mg [grade B]. 2. For healthy adults at low risk of vitamin D deficiency, routine supplementation with 400–1000 IU (10–25 μg) vitamin D 3 daily	NOT GIOP, General 1. A daily calcium intake of between 700 and 1200mg should be advised, if possible achieved through dietary intake, with use of supplements if necessary. 2. In postmenopausal women and older men (≥50 ears) at increased risk of

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	cessation, regular weight-bearing or resistance training exercise, limiting alcohol intake to 1–2 alcoholic beverages/day) over no treatment or over any of these treatments alone.	using supplements if required	ng/mL (75 nmoL/L) [52] based on findingsfrom biological and clinical studies that did not focus specificallyon glucocorticoid-induced osteoporosis 4. In patients with vitamin D insufficiency or deficiency, a loading dose of vitamin D should be given to elevate the serum 25-OH vita-min D level above the target of 30 ng/mL	is recommended [grade D]. 3. For adults over age 50 at moderate risk of vitamin D defi-ciency, supplementation with 800–1000 IU (20–25 μg) vitamin D 3 daily is recommended. To achieve optimal vitamin D status, daily supplementation with more than 1000 IU (25 μg) may be required. Daily doses up to 2000 IU (50 μg) are safe and do not	fracture a daily dose of 800IU cholecalciferol should be advised. 3. In postmenopausal women and older men receiving bone protective therapy for osteoporosis, calcium supplementation should be given if the dietary intake is below 700 mg/day, and vitamin D supplementation considered in those at risk of, or with

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
			5. The maintenance dose is 800 to 1200 IU/day (or the equivalent of 100,000 IU every 2–3 months). The currently available data do not support the use of high-dose vitamin D supplementation (500,000 or 600,000 IU once or twice every year)	necessitate monitoring [grade C]. 4. For individuals receiving pharmacologic therapy for osteo-porosis, measurement of serum 25-hydroxyvitamin D should follow three to four months of adequate supplementation and should not be repeated if an optimal level (≥ 75 nmol/L) is achieved [grade D].	evidence of, vitamin D insufficiency.

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	예	예
	가치와 선호도가 유사하다	예	예	예	예	예
	권고로 인한 이득은 유사하다	예	예	예	예	예
	해당 권고는 수용할만하다.	예	예	예	예	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	예	예
	필수적인 전문기술이 이용 가능하다	예	예	예	예	예
	법률적/제도적 장벽이 없다.	예	예	예	예	예
	해당 권고는 적용할만하다.	예	예	예	예	예

▣ 핵심질문 (KQ3-2) : 40세 이상에서 비스포스스포네이트 사용은 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	1) Women ≥40 years of age and not of childbearing potential and men ≥40 years of age (Figure 3) who are at moderate to high risk of fracture should be treated with an oral bisphosphonate. 2) For patients in whom oral bisphosphonates are not appropriate (for example, due to comorbidities, patient preference, or	1) Bone-protective treatment should be started at the onset of glucocorticoid therapy in patients at increased risk of fracture. 2) Alendronate, etidronate, risedronate, zoledronic acid and teriparatide are the front-line therapeutic options for the majority of patients.	1) Postmenopausal women and men older than 50 years of ages hould be considered at high risk for fractures and therefore eligiblefor osteoporosis drug therapy if they meet the following criteria - history of bone frailty fracture after 50 years of age - T-score ≤ − 2.5 at the lumbar spine and/or femur	1) For individuals over age 50 who are on long-term glucocorticoid therapy (≥ three months cumulative therapy during the preceding year at a prednisone equivalent dose ≥ 7.5 mg daily), a bisphosphonate (alendronate,risedronate, zoledronic acid) should be initiated at the outset and should be continued for at	1) Women and men age ≥70 years with a previous fragility fracture, or taking high doses of glucocorticoids (≥7.5 mg/day prednisolone), should be considered for bone protective therapy. 2) Bone-protective treatment should be started at the onset of glucocorticoid therapy in individuals at high

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	concerns about adherence with an oral medication regimen), IV bisphosphonates should be used rather than the patient receiving no additional treatment beyond calcium and vitamin D.		- age ≥ 70 years, since in this age group FRAX® scores evaluating the fracture risk are similar in women starting glucocorticoid therapy and in women with a history of fracture - long-term high dose glucocorticoid therapy (≥7.5mg/d prednisone equivalent for longer than 3	least the duration of the glucocorticoid therapy 2) For long-term glucocorticoid users who are intolerant of first line therapies, calcitonin or etidronate may be considered for preventing loss of bone mineral density	risk of racture. 3) Alendronate and risedronate are first line treatment options. Where these are contraindicated or not tolerated, zoledronic acid or teriparatide are alternative options

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
			months); selection of this dose cutoff is based on its use in most clinical trials as aninclusion criterion and on epidemiological data showing that the relative risk of vertebral fracture increases from 2.6 with dosesof 2.5 to 7.5 mg/d to 5.2 with doses > 7.5 mg/d 2) Among bisphosphonates,		

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
				zoledronic acid or risedronate is always an appropriate choice		
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	예	예
	가치와 선호도가 유사하다	예	예	예	예	예
	권고로 인한 이득은 유사하다	예	예	예	예	예
	해당 권고는 수용할만하다.	예	예	예	예	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	예	예
	필수적인 전문기술이 이용 가능하다	예	예	예	예	예
	법률적/제도적 장벽이 없다.	예	예	예	예	예
	해당 권고는 적용할만하다.	예	예	예	예	예

▣ 핵심질문 (KQ3-3) : 폐경 후 여성에서 선택적 에스트로겐 수용체 조절제 사용은 GIOP 예방과 치료에 효과적인가?

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고		Adults age≥40 years at moderate and high risk of fracture, For postmenopausal women in whom none of these medications is appropriate, raloxifene should be used rather than the patient receiving no additional treatment beyond calcium and vitamin D	NA	NA	NA	NA
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	NA	NA	NA	NA
	가치와 선호도가 유사하다	예	NA	NA	NA	NA

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	권고로 인한 이득은 유사하다	예	NA	NA	NA	NA
	해당 권고는 수용할만하다.	예	NA	NA	NA	NA
적용성	해당 중재/장비는 이용 가능하다.	예	NA	NA	NA	NA
	필수적인 전문기술이 이용 가능하다	예	NA	NA	NA	NA
	법률적/제도적 장벽이 없다.	예	NA	NA	NA	NA
	해당 권고는 적용할만하다.	예	NA	NA	NA	NA

▣ 핵심질문 (KQ3-4) : 40세 이상에서 부갑상선호르몬은 GIOP 예방과 치료에 효과적인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	Adults age≥40 years at moderate and high risk of fracture, If bisphosphonate treatment is not appropriate, teriparatide should be used rather than the patient receiving no additional treatment beyond calcium and vitaminD.	1 Bone-protective treatment should be started at the onset of glucocorticoid therapy in patients at increased risk of fracture. 2. Alendronate, etidronate, risedronate, zoledronic acid and teriparatide are the front-line therapeutic options for the majority of patients.	Teriparatide can be prescribed as the first-line drug in patients at high fracture risk and is reimbursed by the French statutory healthcare system in patients with at least two prevalent vertebral fractures at diagnosis	Teriparatide should be considered for those at high risk for fracture who are taking glucocorticoids (≥ three months cumulative therapy during the preceding year at a prednisone equivalent dose ≥ 7.5 mg daily)	1. Women and men age ≥70 years with a previous fragility fracture, or taking high doses of glucocorticoids (≥7.5 mg/day prednisolone), should be considered for bone protective therapy. 2.Bone-protective treatment should be started at the onset of glucocorticoid therapy in individuals at high

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
						risk of fracture. 3. Alendronate and risedronate are first line treatment options. Where these are contraindicated or not tolerated, zoledronic acid or teriparatide are alternative options
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	예	예
	가치와 선호도가 유사하다	예	예	예	예	예
	권고로 인한 이득은 유사하다	예	예	예	예	예
	해당 권고는 수용할만하다.	예	예	예	예	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	예	예

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	필수적인 전문기술이 이용 가능하다	예	예	예	예	예
	법률적/제도적 장벽이 없다.	예	예	예	예	예
	해당 권고는 적용할만하다.	예	예	예	예	예

▣ 핵심질문 (KQ3-5) : 40세 이상에서 데노수맙 사용은 GIOP 예방과 치료에 효과적인가?

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고		If neither oral nor IV bisphosphonates nor teriparatide treatment is appropriate, denosumab should be used rather than the patient receiving no additional treatment beyond calcium and vitamin D.	NA	NA	NA	NA
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	NA	NA	NA	NA
	가치와 선호도가 유사하다	예	NA	NA	NA	NA
	권고로 인한 이득은 유사하다	예	NA	NA	NA	NA
	해당 권고는 수용할만하다.	예	NA	NA	NA	NA

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
적용성	해당 중재/장비는 이용 가능하다.	예	NA	NA	NA	NA
	필수적인 전문기술이 이용 가능하다	예	NA	NA	NA	NA
	법률적/제도적 장벽이 없다.	예	NA	NA	NA	NA
	해당 권고는 적용할만하다.	예	NA	NA	NA	NA

▣ 핵심질문 (KQ4) : 임신을 계획하고 있는 여성에서 치료 약제 사용은 안전한가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	1. Because of the lack of safety data and the potential fetal harm associated with denosumab and high-dose Ⅳ bisphosphonates should be used only in women who are at high risk of fracture in whom treatment with an oral bisphosphonate and teriparatide is not appropriate. 2. There is a lack of data	Caution is advised in the use of bisphosphonates in women of childbearing age.	Women should be advised against starting a pregnancy during the treatment and within 6 months after its discontinuation.	N/A	Caution is advised in the use of bisphosphonates in women of childbearing age.

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
		on the safety of currently available OP treatments during pregnancy. Therefore, these guidelines do not include recommendations about OP prevention				
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	NA	예
	가치와 선호도가 유사하다	예	예	예	NA	예
	권고로 인한 이득은 유사하다	예	예	예	NA	예
	해당 권고는 수용할만하다.	예	예	예	NA	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	NA	예
	필수적인 전문기술이 이용 가능하다	예	예	예	NA	예

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	법률적/제도적 장벽이 없다.	예	예	예	NA	예
	해당 권고는 적용할만하다.	예	예	예	NA	예

▣ 핵심질문 (KQ5) : GIOP환자에서 신체계측/영상학적/생화학적 방법을 이용하여 얼마간의 간격으로 모니터링 할 것인가?

(GIOP 환자의 치료 반응을 어떻게 모니터링 할 것 인가?)

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	1) In all adults and children who continue GC treatment, a clinical fracture risk reassessment should be performed every 12 months. 2) For adults ≥ 40 years of age who continue GC treatment and are not treated with an OP medication beyond calcium and vitamin D, reassessment with	1) Measurement of BMD at appropriate intervals 2) Annual height measurement 3) Vertebral fracture assessment by X-ray or DXA if fracture is suspected 4) Assessment of adherence to therapy, including calcium and vitamin D, at each visit 5) Measurement of BMD at appropriate	1) Given the rapid onset of bone loss, annual BMD measurement is recommended during the first 2 years of glucocorticoid therapy in the absence of osteoporosis drug therapy or at the end of an osteoporosis drug sequence. Subsequently, the frequency of BMD measurement should	NA	NA

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	FRAX, with BMD testing if available, should be completed every 1–3years. 3) For adults ≥ 40 years old who received an OP treatment in the past but are no longer being treated with an OP medication other than calcium and vitamin D, BMD testing should be done every 2–3 years. 4) For all adults <40 years of age who	intervals 6) Annual height measurement 7) Vertebral fracture assessment by X-ray or DXA if fracture is suspected 8) Measurement of serum PINP after 3 months of teriparatide therapy	be determined based on the BMD values, glucocorticoid dose, and level of control of the underlying disease 2) Clinical follow-up may be sufficient to assess adherence 3) Given the rapid onset of bone loss, annual BMD measurement is recommended during the first 2 years of GC therapy in the absence of osteoporosis drug therapy or at the end		

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	continue GC treatment and are at moderate-to-high fracture risk (history of previous fracture, BMD Z score<-3, received very high-dose prednisone ≥30 mg/day and cumulative dose >5 gm] in the previous year, risks for poor medication adherence or absorption, or multiple OP risk factors), BMD testing should be done every		of an osteoporosis drug sequence. Subsequently, the frequency of BMD measurement should be determined based on the BMD values, glucocorticoid dose, and level of control of the underlying disease 4) Vertebral height measurement once a year: vertebral fractures result in height loss, which is a nonspecific sign of vertebral disease		

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	2–3 years. 5) For adults ≥ 40 years old who continue GC treatment and are currently treated with an OP medication in addition to calcium and vitamin D, BMD testing should be completed every 2–3 years during treatment in high-risk patients such as those receiving very high-dose GCs (initial prednisone dose ≥30 mg/day, cumulative		5) A morphological assessment of the spine is indicated in patients with back pain or height loss ≥ 2 cm during follow-up		

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	dose >5 gm in the previous year), a history of OP fracture occurring after ≥18 months of treatment with antifracture medication (other than calcium and vitamin D), risks for poor medication adherence or absorption, or other significant OP risk factors. 6) For all adults <40 years of age who continue GC treatment				

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	and are at moderate-to-high fracture risk (history of previous fracture, BMD Z score<-3, received very high-dose prednisone ≥30 mg/day and cumulative dose >5 gm] in the previous year, risks for poor medication adherence or absorption, or multiple OP risk factors), BMD testing should be done every 2–3years.				

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	NA	NA
	가치와 선호도가 유사하다	예	예	예	NA	NA
	권고로 인한 이득은 유사하다	예	예	예	NA	NA
	해당 권고는 수용할만하다.	예	예	예	NA	NA
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	NA	NA
	필수적인 전문기술이 이용 가능하다	예	예	예	NA	NA
	법률적/제도적 장벽이 없다.	예	예	예	NA	NA
	해당 권고는 적용할만하다.	예	예	예	NA	NA

▣ 핵심질문 (KQ6) : GIOP 치료 중 골절 위험도를 재평가하여 낮은 골절위험도로 확인되었을 경우 치료 중단을 고려할 수 있는가?

(GIOP 치료 중 어떤 경우에 치료 중단을 고려할 수 있는가?)

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	For adults ≥40 years of age who are treated with OP medication in addition to calcium and vitamin D and are discontinuing GC treatment, discontinuation of the OP medication is recommended if fracture risk at the time of GC discontinuation is assessed to be low.	If glucocorticoid therapy is stopped, withdrawal of bone-protective therapy may be considered, but if glucocorticoids are continued long term, bone protection should be maintained	Osteoporosis drug discontinuation can be considered in patients who meet all the following criteria: no fracture during treatment AND prednisone-equivalent dose≤ 7.5 mg/d AND no new risk factors AND optimal control of under-lying disease activity AND no change in BMD values (with change defined	For patients undergoing long-term glucocorticoid therapy, the appropriate duration of osteoporosis treatment is unknown.	If glucocorticoid therapy is stopped, withdrawal of bone-protective therapy may be considered, but if glucocorticoids are continued long term, bone protection should be maintained in the majority of cases

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
		Otherwise, the OP treatment course should be completed or continued until the fracture risk is assessed to be low		as a decrease ≥ 0.03 g/cm^2 at one or both sites). In every case, the decision to stop osteoporosis drug therapy should rest on a case-by-case evaluation of the risk/benefit ratio.		
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	예	예	예
	가치와 선호도가 유사하다	예	예	예	예	예
	권고로 인한 이득은 유사하다	예	예	예	예	예
	해당 권고는 수용할만하다.	예	예	예	예	예
적용성	해당 중재/장비는 이용 가능하다.	예	예	예	예	예
	필수적인 전문기술이 이용 가능하다	예	예	예	예	예
	법률적/제도적 장벽이 없다.	예	예	예	예	예

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	해당 권고는 적용할만하다.	예	예	예	예	예

▣ 핵심질문 (KQ7) : GIOP치료 실패를 어떻게 정의할 것인가?

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
권고	Follow up treatment recommendation Initial treatment failure: For adults ≥40 years of age who are continuing GC treatment who have had a fracture that occurred ≥18 months after beginning treatment with an oral bisphosphonate or had a significant decline in BMD (≥10%/year) after 1 year of treatment,	No data are available on switching or combining osteoporosis drugs in patients with significant bone loss (BMD decrease≥ 0.03 g/cm^2) or bone frailty fractures during combined long-termglucocorticoid therapy and osteoporosis drug therapy. Advice from a bone disease specialist should ideally be	NA	NA	NA

구분	지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	Treat with another class of OP medication or an IV bisphosphonate is recommended rather than the patient receiving no additional treatment beyong calcium and vitamin D alone or continuing oral bisphosphonate treatment. Treatment if moderate-to-high fracture risk persists after BP therapy: For adults ≥40 years of	obtained			

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
		age who have completed 5 years of bisphosphonate treatement who are continuing GC treatment and are assessed to be at moderate to high risk of fracture, continuation of active OP treatment is recommended rather than the patient receiving no additional treatment beyond calcium and vitamin D.				
수용성	인구 집단(유병률, 발생률 등)이 유사하다	예	예	NA	NA	NA

구분		지침 1 (ACR)	지침 2 (IOF-ESTS)	지침 3 (FRENCH)	지침 4 (CANADA)	지침 5 (NOGG)
	가치와 선호도가 유사하다	예	예	NA	NA	NA
	권고로 인한 이득은 유사하다	예	예	NA	NA	NA
	해당 권고는 수용할만하다.	예	예	NA	NA	NA
적용성	해당 중재/장비는 이용 가능하다.	예	예	NA	NA	NA
	필수적인 전문기술이 이용 가능하다	예	예	NA	NA	NA
	법률적/제도적 장벽이 없다.	예	예	NA	NA	NA
	해당 권고는 적용할만하다.	예	예	NA	NA	NA