




# European Diploma in Musculoskeletal Radiology: Written Part of the Exam

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## Abstract

### Keywords

- ▶ European Society of Musculoskeletal Radiology
- ▶ diploma
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- ▶ exam
- ▶ multiple-choice questions

The European Diploma in Musculoskeletal Radiology (EDiMSK) is a recognized European qualification of excellence for musculoskeletal (MSK) radiologists. The EDiMSK confirms proof of knowledge of MSK radiology, in addition to any national qualifications certifying competency. The examination is conducted in English and consists of both a written and an oral part. This article guides candidates taking the EDiMSK examination on how to prepare for the written exam that consists of 40 multiple-choice questions (MCQs). Information is provided on how the questions are structured and the candidate is scored. Ten MCQs representative of the written section of the EDiMSK are also presented.

The European Training Curriculum for Subspecialization in Radiology (ETCSR) provides curricular contents for a full subspecialization in a field of radiology beyond year 5.<sup>1</sup> As recommended by the European Society of Radiology (ESR) and the European Union of Medical Specialists, at the end of level III training, objective measurement of the achieved standard should be made in

line with national customs and practices, and a subspecialty exam should ideally be part of the completion of training.<sup>1-3</sup> ETCSR cites 13 fields of subspecialization in radiology (▶ **Table 1**).<sup>1,2,4</sup> To our knowledge, there are not many subspecialty exams and formal qualifications at the national level in musculoskeletal (MSK) radiology in Europe.<sup>5</sup>

The European Diploma in Musculoskeletal Radiology (EDiMSK) is a recognized European qualification of excellence for MSK radiologists. It serves as a tool for the standardization and accreditation of radiologists across and beyond European borders and will help regulate training across Europe.<sup>6</sup> In addition, it will assist its holders to promote their skills and experience

**Table 1** Fields of subspecialization in radiology in Europe<sup>a</sup>

Subspecialty (level III) types of radiology	European subspecialty society	European subspecialty exam and diploma	ESR endorsement	UEMS-CESMA appraisal
Breast	EUSOBI	Yes	Yes	No
Cardiac and vascular	ESCR	Yes	Yes	No
Chest/Thoracic	ESTI	Yes	Yes	No
Emergency	ESER	Yes	Yes	No
Gastrointestinal and abdominal	ESGAR	Yes	Yes	No
Head and neck	ESHNR	Yes	Yes	No
Interventional	CIRSE	Yes	Yes	Yes
Musculoskeletal	ESSR	Yes	Yes	no
Neuroradiology	ESNR	Yes (multiple)	No	Yes
Oncologic	ESOI	No	No	No
Pediatric	ESPR	Yes	No	No
Urogenital	ESUR	Yes	Yes	No
Medical imaging informatics	EuSoMII	No	No	No

Abbreviations: CESMA, Council of European Specialist Medical Assessment; CIRSE, Cardiovascular and Interventional Radiological Society of Europe; ESER, European Society of Emergency Radiology; ESGAR, European Society of Gastrointestinal and Abdominal Radiology; ESHNR, European Society of Head and Neck Radiology; ESNR, European Society of Neuroradiology; ESPR, European Society of Pediatric Radiology; ESR, European Society of Radiology; ESSR, European Society of Musculoskeletal Radiology; ESTI, European Society of Thoracic Imaging; ESUR, European Society of Urogenital Radiology; EuSoMII, European Society of Medical Imaging Informatics; UEMS, European Union of Medical Specialists.

<sup>a</sup>Adapted from references 1, 2, and 4.

Note: Overview of existing European subspecialty exams and diplomas in radiology and their endorsement. List of subspecialties in radiology (according to the European Training Curriculum for Subspecialization in Radiology),<sup>1</sup> their corresponding European subspecialty society, existence of European subspecialty exam and diploma, endorsement by the European Society of Radiology and/or the Council of European Specialist Medical Assessment.

when dealing with other clinical colleagues, the general public, and their patients. The ESR endorses the EDiMSK for all these reasons.<sup>6</sup>

The EDiMSK provides an international benchmark for MSK radiology above general radiology. It certifies that the holder has a high level of knowledge of MSK radiology in line with the requirements of the ETCSR<sup>1</sup> by first successfully passing a written test of knowledge consisting of 40 multiple-choice questions (MCQs) covering all level III topics in MSK radiology of the ETCSR, as well as the European Society of Musculoskeletal Radiology (ESSR) subcommittees area of expertise, and then taking an oral test discussing cases within the level III curriculum of the ETCSR that practicing MSK radiologists can be expected to encounter in their practice.<sup>7</sup> The EDiMSK confirms proof of knowledge of MSK radiology in addition to any national qualifications certifying competency. Thus it may contribute to reinforce the candidate's curriculum vitae,

thus helping build up their career profile.<sup>8</sup>

Of note, the level of knowledge requested from candidates must correspond to the curricular contents for full subspecialization in the field of radiology provided by the ETCSR.<sup>1</sup> Thus all exam questions and cases primarily reflect knowledge in MSK radiology at a standard expected at the end of training at level III as outlined in the ETCSR.

Because the level III training program in MSK radiology of the ETCSR actually comprises knowledge of different fields within MSK radiology, each one may be represented by a separate question and/or clinical case in the EDiMSK exam. ►Table 2 lists the 27 fields and topics of the ETCSR within the MSK field, as well as knowledge of principles of treatment.

Given this large field, the EDiMSK examination is only open to fully trained licensed and practicing radiologists with at least 2 years of subspecialization training in MSK radiology.<sup>6</sup> A

candidate who has passed the EDiMSK should be able to work as a consultant radiologist in a hospital or private practice with a focus on MSK diseases in close collaboration with clinical colleagues.

The examination is held in English and consists of both a written and an oral part. The candidate needs a level of competence in the English language that enables a correct understanding of the MCQs that use medical vocabulary. Both sections of the examination (oral and written) must be passed.<sup>6</sup> The written part is held first. Hence only candidates who have successfully passed it can proceed to the oral section of the EDiMSK exam.<sup>9</sup>

The ESSR Educational Committee frequently receives questions about how best to prepare for the EDiMSK exam. We present some tips and tricks for the written part of the exam here; a separate article in this issue offers help for how to prepare for the oral part.<sup>9</sup> More general recommendations and the results of a

**Table 2** Musculoskeletal fields<sup>a</sup>

Knowledge of anatomy and physiology	Modality-driven skills and knowledge	Knowledge of pathology	
Detailed MSK anatomy	Radiography	Developmental anomalies	
Skeletal maturation	Fluoroscopy	Congenital diseases	
Anatomical variants	DXA	Acute trauma	
	US	Chronic trauma and overuse	
	CT	Soft tissue injuries	
	MRI	Arthritis	
	Hybrid imaging		Neurologic disorders affecting the MSK system
			Muscular disorders
			Connective tissue disease
			Infectious disorders
			Metabolic and endocrine diseases
			Bone tumors
			Soft tissue tumors
			Tumor-like conditions
			Posttreatment MSK evaluation
			Complications of orthopaedic hardware and joint prostheses
	Knowledge of principles of treatment		
	MSK interventions		

Abbreviations: CT, computed tomography; DXA, dual-energy X-ray absorptiometry; MRI, magnetic resonance imaging; MSK, musculoskeletal; US, ultrasound.

<sup>a</sup>Adapted from the European Training Curriculum for Subspecialization in Radiology, MSK section.<sup>1</sup>

Note: The fields and topics of the ETCRS in MSK radiology are illustrated. They emphasize the distinction between anatomical and physiologic, modality-driven, and pathologic skills and knowledge.

survey of candidates who had successfully passed the examination were published in an earlier issue of *Seminars*.<sup>6</sup>

## Written Part of the Examination

Beginning in May 2024, the written exam is conducted online ~ 3 weeks before the ECR or ESSR annual meeting. It consists of 40 MCQs that cover all aspects relevant to MSK radiology as mentioned in the ETCRS<sup>1</sup> and listed in ► **Table 2**. All MCQs are first validated and approved by an external committee of senior radiologists with a background in MSK radiology, with international higher and postgraduate education, and have passed specialist medical examinations. Total examination time is 60 minutes. Software is provided by the European Board of Radiology of the ESR.

The candidates are informed after the written exam whether they have

passed and will be invited to sit the oral exam. A typical EDiMSK MCQ consists of a question, clinical information if needed, and four answers. Only one answer is correct. The MCQs use a common and precise language, and the correct answer stem should generally be clearly correct and not controversial or ambiguous. If there is a question related to the frequency of imaging findings, the percentages have a clear discrimination and ask for data published in the literature. The order of the questions is shuffled by the software so each individual candidate is presented with the questions in a different order.

The MCQs have different levels of complexity: easy, moderate, or difficult in relation to the ETCRS MSK level III curriculum. The Angoff value<sup>10</sup> is used to identify the difficulty of a question and helps predict what proportion of candidates would answer the item correctly (0–100%) based on

their level of experience and knowledge: 0% if there are no candidates who would answer the item correctly or 100% if all candidates would answer it correctly.

The level of difficulty is set as follows: a value < 40% means the MCQ is considered difficult, a value between 41% and 75% means it is considered moderate, and a value > 76% means it is considered easy. This label is assigned by the ESSR Educational Committee and by the external validation committee in consensus. In addition, these labels are regularly checked and may be reassigned after an analysis of the results of the written part of the EDiMSK.

The MCQs are not distributed after the exam to the candidates, and they only receive the information whether they have passed or failed. To pass the written part of the exam, each candidate has to answer at least 70% (28 of 40 questions) correctly. Of note, all

candidates have consented in their application form that they understand that no appeal may be made about the content of the examination.<sup>7</sup>

### Sample Questions for the Written Part of the Examination

We present 10 representative questions for the written part of the EDiMSK. Of note, these questions will not be used in future EDiMSK examinations. The correct answer is given in the notes following the MCQ.

#### MCQ 1: On magnetic resonance imaging, the structures of the rotator cuff interval can be best evaluated on

- Oblique sagittal and oblique coronal images
- Axial and oblique coronal images
- Oblique sagittal and axial images
- ABER position

The rotator interval can be difficult to evaluate with imaging. Rotator interval pathology is implicated in glenohumeral instability, biceps instability, and adhesive capsulitis entities. To review this topic further, see Petchprapa et al.<sup>11</sup> The correct answer is c.

#### MCQ 2: Which of the following tendons does *not* take part in the common extensor tendon origin?

- Extensor carpi radialis brevis
- Extensor carpi radialis longus
- Extensor digitorum communis
- Extensor carpi ulnaris

Lateral epicondylalgia is the most common cause of lateral elbow pain and generally attributed to osteotendinous irritation of the common extensor origin in which pathologic changes in the tendinous origins of extensor carpi radialis brevis and extensor digitorum communis muscles are commonly implicated. To review this topic further, see Dones et al.<sup>12</sup> The correct answer is b.

#### MCQ 3: Which tendon is most commonly affected in patients with rheumatoid arthritis?

- Patellar tendon
- Tibialis posterior tendon
- Peroneus longus tendon
- Biceps tendon

The posterior tibial tendon is commonly affected in chronic rheumatoid arthritis, and chronic inflammation causes tenosynovitis, chronic tendinosis, and partial or complete rupture that can lead to flatfoot. To review this topic further, see Hasler et al.<sup>13</sup> The correct answer is b.

#### MCQ 4: Osteosclerosis is *not* a typical feature of

- Osteopetrosis
- Camurati-Engelmann disease
- Dyschondrosteosis
- Melorheostosis

Heterozygous mutations of *SHOX* (short stature homeobox containing gene) have been implicated in patients with Madelung's deformity, Leri-Weill dyschondrosteosis (77%), Turner's syndrome (66%), and idiopathic short stature (3%). Homozygous mutations of the *SHOX* gene have been identified in patients with Langer's mesomelic dysplasia (100%). Recognition of the early radiographic features encountered in *SHOX* haploinsufficiency may be pivotal for the diagnosis. To review this topic further, see Gahunia et al.<sup>14</sup> The correct answer is c.

#### MCQ 5: Which hip impingement syndrome is most frequent in young athletes?

- Cam femoroacetabular impingement
- Pincer femoroacetabular impingement
- Ischiofemoral impingement
- Mixed impingement

Femoroacetabular impingement (FAI) is a chronic hip condition caused by femoral head and acetabular malformations, resulting in abnormal

contact across the joint. FAI often leads to labral, cartilaginous, and tissue damage that predisposes this patient population to early osteoarthritis. To review this topic further, see Fortier et al.<sup>15</sup> The correct answer is a.

#### MCQ 6: Regarding Morton's neuroma, which of the following statements is correct?

- It is invariably located anterior to the deep intermetatarsal ligament.
- It most frequently affects the third intermetatarsal space.
- It is often associated with a distended intermetatarsal bursa.
- The term "neuroma" is a misnomer because the abnormality is non-neoplastic and does not represent a true neuroma.

Morton's neuromas are focal areas of symptomatic perineural fibrosis around a plantar digital nerve of the foot. They are also known as interdigital or intermetatarsal neuromas or as Morton's metatarsalgia and thought to be due to chronic entrapment of the nerve by the intermetatarsal ligament. Magnetic resonance imaging is accurate in diagnosing Morton's neuroma and may be important for correct localization.<sup>16</sup> The correct answer is d.

#### MCQ 7: In the POEMS syndrome, which of the following statements is false?

- Affected patients are older than patients with standard multiple myeloma.
- Sclerotic bone lesions are found in most patients.
- Sclerotic bone lesions can be mistaken for bone islands.
- As a consequence of treatment response, sclerotic bone lesions may decrease in size.

POEMS syndrome is the acronym for a rare multisystem paraneoplastic disorder with these features: polyneuropathy

(P), organomegaly (O), endocrinopathy (E), monoclonal gammopathy (M), and skin changes (S). The peak incidence of this syndrome is in the fifth to sixth decades as opposed to standard multiple myeloma where the peak incidence is in the seventh and eighth decades.<sup>17</sup> The correct answer is a.

### MCQ 8: Which statement is most probably true? Corticosteroid injection for rotator cuff tendinopathy

- Strengthens the tendon and avoids rupture
- Is good for healing of tendinopathy
- Is effective for temporary pain relief
- Increases collagen fascicle strength

Most insertional and noninsertional tendinopathy cases are associated with repetitive or overuse injuries. Eccentric exercise shows the strongest evidence of therapeutic efficacy. Corticosteroid and nonsteroidal anti-inflammatory medications have not been shown to be effective except for temporary pain relief for rotator cuff tendinopathy.<sup>18</sup> The correct answer is c.

### MCQ 9: Which of the following joints is most often involved in hemophilic arthropathy?

- Toes
- Wrist
- Knee
- Shoulder

Hemophilic arthropathy refers to permanent joint disease occurring in patients with hemophilia as a long-term consequence of repeated hemarthrosis. Hemophilic arthropathy is often monoarticular or oligoarticular, and large joints are most commonly involved in this order of frequency: knee, elbow, ankle, hip, and shoulder. To review this topic further, see Ray et al.<sup>19</sup> The correct answer is c.

### MCQ 10: Which feature does not fit with anterior cruciate ligament (ACL) reconstruction?

- An anteriorly located femoral bone tunnel causes elongation of the graft and results in knee instability.
- Localized anterior arthrofibrosis is an important cause of extension loss.
- Graft impingement most commonly occurs when the tibial bone tunnel is anterior to Blumensaat's line.
- The most common method of reconstructing the ACL is to use a bone-quadriceps tendon-bone autograft.

ACL reconstruction is a common procedure after an ACL tear and aims to reduce knee joint instability and thus prevent any further meniscal and/or cartilage damage. The bone-patellar tendon-bone autograft and four-strand hamstring autograft are the two most commonly used techniques.<sup>20</sup> The correct answer is d.

### Conclusion

This article presented typical sample questions of the written part of the EDiMSK exam. Of course, these sample questions will not be used in future EDiMSK examinations. We described how the questions are structured and how the candidate will be scored. We hope this article will help those who are preparing for the written EDiMSK exam. We wish all candidates the best of luck!

#### Conflict of Interest

None declared.

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