

2026 Akita University Faculty of Medicine Syllabus

Category	: 臨床医学アドバンスコース
Course Title	: Orthopedics
Eligible Students	: grade 4 Elective Course
Code	: 71604002
Schedule	: week 13 ~ week 13
Credits	: 0.5

1. Lead Instructor

Naohisa Miyakoshi (Professor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)

2. Instructors

Naohisa Miyakoshi (Professor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Michio Hongo (Professor, School of Health Science, Physical therapy, 6532)
Yuji Kasukawa (Associate Professor, Rehabilitation Medicine, 6148, Office Hour: 9:00-17:00)
Koji Nozaka (Associate Professor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Hiroyuki Tsuchie (Lecturer, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Hiroyuki Nagasawa (Lecturer, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Hiroaki Kijima (Lecturer, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Tsuyoshi Shirahata (Assistant Professor, Advanced Emergency and Critical Care Center, 6148, Office Hour: 9:00-17:00)
Daisuke Kudo (Assistant Professor, Rehabilitation Medicine, 6148, Office Hour: 9:00-17:00)
Ryota Kimura (Assistant Professor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Yuichi Ono (Assistant Professor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Manabu Akagawa (Medical Doctor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)
Yusuke Yuasa (Medical Doctor, Advanced Emergency and Critical Care Center, 6148, Office Hour: 9:00-17:00)
Shohei Murata (Medical Doctor, Rehabilitation Medicine, 6148, Office Hour: 9:00-17:00)
Syuntaro Harata (Medical Doctor, Department of Orthopedic Surgery, 6148, Office Hour: 9:00-17:00)

3. Course Description Outline(Course Objectives)

Aim of class

Review the important items learned in lectures in the 3rd year musculoskeletal core curriculum, learn the latest knowledge, and deepen your understanding of orthopedic surgery. Understand and practice the basic techniques of orthopedic surgery through Musculoskeletal echo training and cast-wrapping practice. Also, learn about related professionalism, ethics, medical behavioral science, medical safety, medical law (system), and EBM.

【Overview】

A-1-1 Medical ethics and bioethics

- Explain the historical flow and meaning of medicine and medical care. (5-1 to 5-5)

A-2-2 How to study

- Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. (5-1 to 5-5)

A-6-1 Ensuring safety

- Share information on medical safety and explain the importance of analysis for post-mortem use. (3-5,3-6,4-3,4-6)

A-8-1 Cultivate a desire for medical research

- Based on the analysis of patients and diseases, it is possible to search and organize the latest information from textbooks, papers, etc., and to deepen understanding, diagnosis, and treatment of diseases. (5-1 to 5-5)

B-1-8 Systems of health, medical care, welfare and nursing care

- Explain the current situation and system of welfare for persons with disabilities. (3-6,3-7,4-8)

D-4-1 Structure and function

- Explain the structure and function of bones, cartilage, joints, and ligaments. (3-1)
- Explain the structure and function of the spinal column. (3-1)
- Explain the limb skeleton, movement and innervation of major muscle groups. (3-1)
- Explain the structure of the pelvis and gender differences. (3-1)
- Explain the mechanism of bone growth and bone formation/resorption. (3-1,3-2)
- Students can outline the muscle groups involved in posture and movement of the trunk. (3-1)
- Explain anti-gravity muscles. (3-1)

D-4-2 Basics of diagnosis and examination

- Outline the indications for musculoskeletal imaging (X-ray imaging, computed tomography (CT), magnetic resonance imaging (MRI), ultrasonography, and bone mineral determination). (3-3,5-3)

D-4-3 Symptoms

- Motor paralysis/muscle weakness (3-2,4-2)
- Joint pain/swelling (3-2,4-2)
- Low back pain (3-2,4-2)

D-4-4(1) Common diseases of the motor system

- Explain the diagnosis and initial treatment of limb/spinal trauma. (3-3,4-2,4-3,4-6)
- Explain the definition, severity classification, diagnosis and treatment of joint dislocation and ligament injury. (3-2,3-3,4-2,4-3,4-6)
- Explain the pathophysiology, symptoms, diagnosis and treatment of compartment syndrome. (3-2,3-3,3-5,4-2,4-3,4-6)
- Explain the etiology and pathophysiology of osteoporosis and list the most common fracture sites. (3-2 ~ 3-4,3-7,4-2 ~ 4-4,4-8)
- Explain the pathology, diagnosis and treatment of arthritis and tenosynovitis. (3-2,3-3,4-1 ~ 4-3,4-6)
- Explain the symptoms, diagnosis and treatment of osteoarthritis. (3-2,3-3,4-2,4-3,4-6)
- Listen entrapment peripheral neuropathy (carpal tunnel syndrome, cubital tunnel syndrome, etc.) and explain its symptoms. (3-2,3-3,4-2,4-3)
- Explain the neurological symptoms of cervical spondylotic myelopathy (including spinal ligament ossification) and cervical spondylotic radiculopathy. (3-1 ~ 3-3,4-1 ~ 4-3)
- Explain the diagnosis and treatment of spinal cord injury. (3-1 ~ 3-7,4-1 ~ 4-4)
- Explain the symptoms, diagnosis, and treatment of lumbar disc herniation. (3-2 ~ 3-4,4-1 ~ 4-3)
- Explain the pathophysiology, symptoms, diagnosis and treatment of lumbar spinal canal stenosis. (3-2 ~ 3-4,4-1 ~ 4-3)
- Explain the symptoms, diagnosis and treatment of lumbar separation/spondylolisthesis. (3-2 ~ 3-4,4-1 ~ 4-3)
- Explain the pathology, diagnosis, and treatment of chronic locomotory pain (back pain, neck pain, stiff neck). (3-2 ~ 3-4,4-1 ~ 4-4)
- Outline the rehabilitation of musculoskeletal diseases. (3-3,3-4,4-3,4-4)

D-4-4(2) Infectious disease

- Explain the symptoms, diagnosis, and treatment of septic arthritis. (3-2,3-3,4-1 ~ 4-3,4-6)
- Explain the symptoms, diagnosis, and treatment of intervertebral discitis, suppurative spondylitis, and spinal caries. (3-2,3-3,4-1 ~ 4-3,4-6)

D-4-4-(3) Neoplastic disease

- Explain clinical findings, imaging findings, pathological findings, and initial treatment of primary bone tumors (osteosarcoma, Ewing's sarcoma). (3-2 ~ 3-4, 3-7, 4-2 ~ 4-4, 4-7)
- Explain the clinical findings, imaging findings, and laboratory findings of metastatic bone tumors. (3-2 ~ 3-4,4-1 ~ 4-4)
- Outline the diagnosis, pathological findings, and treatment of malignant soft tissue tumor (liposarcoma). (3-3, 3-4, 4-1 to 4-4)

F-2-7 Diagnosis and treatment using ultrasound

- Outline the treatment using ultrasound. (3-1 ~ 3-3,4-3,4-6)

F-2-14 Rehabilitation

- Explain the concept and adaptation of rehabilitation. (3-3,3-7)
- Understand the composition of the rehabilitation team and explain the role of the doctor. (4-7,4-8)
- Explain outline physical therapy and occupational therapy. (3-3,3-7)

Explain related professionalism, ethics, medical behavioral science, medical safety, medical law (system), and EBM. (1-1,1-2,2-1 ~ 2-8,3-6,4-8,5-1 ~ 5.5,6-1,6-2)

4. Textbook/Reference Books

Although not specified, refer to the same as the 3rd year musculoskeletal core curriculum.

5. Assessment

An oral examination will be conducted, and a score of 60 points or higher will be considered a pass.

6. Out of Class Study/Message

Gather by 8:50. The location will be announced separately.

Accepted number of people: about 10 people

Read the assigned textbooks and reference books before class.

Review the handouts after the class is over.

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
1	6 / 29 (Mon)	1-2	Lecture	<p>Theme: Key points and topics in joint diseases Deepen understanding of treatment methods for joint diseases, especially recent surgical treatments.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care. A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. D-4-4-(1) Explain the diagnosis and initial treatment of limb injuries. D-4-4-(1) Explain the pathology, diagnosis, and treatment of arthritis and tenosynovitis. D-4-4-(1) Explain signs and symptoms, diagnosis, and treatment of osteoarthritis. D-4-4-(2) Explain symptoms, diagnosis and treatment of septic arthritis</p>	Koji Nozaka	遠隔講義室
2	6 / 29 (Mon)	3-4	Lecture	<p>Theme: External fixation Deepen understanding of the progress of external fixation methods and surgical therapy using external fixation for limb deformity correction.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care. A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. D-4-4-(1) Explain the diagnosis and initial treatment of limb injuries. D-4-4-(2) Explain symptoms, diagnosis, and treatment of pyogenic arthritis.</p>	Koji Nozaka	遠隔講義室

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
3	6 / 29 (Mon)	5-6	Lecture	<p>Theme: Forefront of bone and soft tissue tumor surgery We explain the surgical therapy for bone and soft tissue tumors, especially the new surgical therapy and adjuvant therapy that have been developed in recent years.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care. A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. C-4-6 Outline tumor classification, degree of differentiation, grade, and stage. D-4-2 Outline indications for musculoskeletal imaging. D-4-4-(3) Explain clinical findings, imaging findings, pathological findings, and initial treatment of primary bone tumors.</p>	Hiroyuki Tsuchie	遠隔講義室
4	6 / 29 (Mon)	7-8	Practice	<p>Theme: Orthopedic ultrasound To deepen our understanding of ultrasound diagnosis of locomotory diseases and ultrasound-guided treatment.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care. A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. D-4-1 Explain the structure and function of bones, cartilage, joints, and ligaments. D-4-2 Outline indications for musculoskeletal imaging. F-2-7 Outline treatment using ultrasound. F-2-14 Outline physical therapy and occupational therapy.</p>	Ryota Kimura	附属病院整形外科外来

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
5	6 / 29 (Mon)	9-10	Lecture	<p>Theme: Fracture essentials Classification of limb fractures, treatment methods, indications for surgery, surgical therapy, and important matters related to internal fixation metals will be reviewed to deepen understanding.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care. A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. D-4-4-(1) Explain the definition, severity classification, diagnosis and treatment of joint dislocation and ligament injury. F-2-14 Outline physical therapy and occupational therapy.</p>	Manabu Akagawa	遠隔講義室
6	6 / 30 (Tue)	1-2	Lecture	Theme: independent learning		
7	6 / 30 (Tue)	3-4	Lecture	<p>Theme: Gypsum training Learn about the adaptation of external fixation with a cast and the actual cast fixation method (procedure, points to be noted).</p> <p>A-6-1 Share information on medical safety and explain the importance of analysis for post-mortem use. D-4-4-(1) Explain the diagnosis and initial treatment of limb injuries. D-4-4-(1) Explain pathophysiology, signs and symptoms, diagnosis, and treatment of compartment syndrome. D-4-4-(1) Outline rehabilitation for musculoskeletal diseases. F-2-14 Explain the concept and adaptation of rehabilitation.</p>	Yusuke Yuasa	附属病院整形外科外来
8	6 / 30 (Tue)	5-6	Self learning	<p>Theme: Pathology of osteoporosis, differential diagnosis of vertebral fractures, and fracture treatment A-4-4-(1) Be able to explain the diagnosis and initial treatment of spinal trauma. A-4-4-(1) Explain the etiology and pathophysiology of osteoporosis and list the most common fracture sites. D-12-1 Explain the action and secretion regulation mechanism of hormones secreted by the parathyroid glands (parathyroid glands). D-12-4-(3) Abnormalities in calcium metabolism can be explained by relating them to diseases. D-12-4-(3) Explain the etiology, pathology, symptoms, and diagnosis of hyperparathyroidism and hypoparathyroidism.</p>	Naohisa Miyakoshi	遠隔講義室

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	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
9	6 / 30 (Tue)	7-8	Practice	<p>Theme: Traumatic spinal cord injury nationwide and in Akita</p> <p>A-1-1 Explain the historical flow and meaning of medicine and medical care.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, it is possible to search and organize the latest information from textbooks, papers, etc., and to deepen understanding, diagnosis, and treatment of diseases.</p> <p>D-4-1 Explain the structure and function of the spinal column.</p> <p>D-4-4-(1) Be able to explain the diagnosis and initial treatment of spinal trauma.</p>	Naohisa Miyakoshi	遠隔講義室
10	6 / 30 (Tue)	9-10	Lecture	<p>Theme: Pediatric spinal deformity</p> <p>Based on the historical background, recent topics will be studied regarding the diagnosis, brace therapy, and surgical therapy of pediatric spinal deformity.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases.</p> <p>D-4-1 Explain the structure and function of the spinal column.</p> <p>D-4-1 Outline the muscle groups involved in posture and trunk movement.</p> <p>D-4-2 Outline indications for musculoskeletal imaging.</p>	Michio Hongo	遠隔講義室

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	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
11	7 / 1 (Wed)	1-2	Lecture	<p>Theme: Sports doctor actual</p> <p>Learn the biomechanics of the knee joint, which consists of bone, cartilage, ligament, meniscus, etc., and understand the treatment policy according to the mechanical characteristics.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases.</p> <p>D-4-1 Explain the structure and function of bones, cartilage, joints, and ligaments.</p> <p>D-4-2 Outline indications for musculoskeletal imaging.</p> <p>D-4-4-(1) Explain the definition, severity classification, diagnosis and treatment of joint dislocation and ligament injury.</p> <p>D-4-4-(1) Explain signs and symptoms, diagnosis, and treatment of osteoarthritis.</p> <p>D-4-4-(1) Outline rehabilitation for musculoskeletal diseases.</p> <p>F-2-14 Explain the concept and adaptation of rehabilitation</p>	Yuichi Ono	遠隔講義室
12	7 / 1 (Wed)	3-4	Lecture	<p>Theme: First initial trauma response</p> <p>A-2-2 Be able to extract important points and issues from the contents of lectures, domestic and international textbooks and papers, search information, etc.</p> <p>A-8-1 Be able to search, organize, and integrate the latest information from textbooks and papers based on patient and disease analysis, leading to a deeper understanding, diagnosis, and treatment of diseases.</p> <p>D-4-2 Be able to outline the indications for musculoskeletal imaging diagnosis. D-4-4-(1) Be able to explain the definition, severity classification, diagnosis, and treatment of joint dislocations and ligament injuries.</p> <p>F-2-14 Be able to outline physical therapy and occupational therapy.</p>	Syuntaro Harata	遠隔講義室

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
13	7 / 1 (Wed)	5-6	Lecture	<p>Theme: Actual spine endoscopic surgery Learn about types of minimally invasive spinal surgery and advances and indications for endoscopic surgery.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care. A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. D-4-1 Explain the structure and function of the spinal column. D-4-1 Outline the muscle groups involved in posture and trunk movement. D-4-2 Outline indications for musculoskeletal imaging. D-4-4-(1) Explain signs and symptoms, diagnosis, and treatment of lumbar disc herniation.</p>	Daisuke Kudo	北臨床棟 2階カンファランスルーム
14	7 / 1 (Wed)	7-8	Lecture	<p>Theme: Adult spinal deformity Learn about surgical indications considering spinal alignment for surgical therapy of adult spinal deformity.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc. A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases. D-4-1 Explain the structure and function of the spinal column. D-4-1 Outline the muscle groups involved in posture and trunk movement. D-4-2 Outline indications for musculoskeletal imaging. D-4-4-(1) Explain pathophysiology, signs and symptoms, diagnosis, and treatment of lumbar spinal canal stenosis. D-4-4-(1) Explain the symptoms, diagnosis, and treatment of lumbar separation/spondylolisthesis.</p>	Daisuke Kudo	北臨床棟 2階カンファランスルーム

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	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
15	7/1 (Wed)	9-10	Lecture	<p>Theme: Spine essentials and topics Learn the core curriculum and study recent topics on items covering spinal column diseases in general.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases.</p> <p>D-4-1 Explain the structure and function of the spinal column.</p> <p>D-4-1 Outline the muscle groups involved in posture and trunk movement.</p> <p>D-4-2 Outline indications for musculoskeletal imaging.</p>	Yuji Kasukawa	北臨床棟 2 階カンファ ランス ルーム
16	7/2 (Thu)	1-2	Lecture	<p>Theme: Important information about knee joint diseases A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, it is possible to search and organize the latest information from textbooks, papers, etc., and to deepen understanding, diagnosis, and treatment of diseases.</p> <p>D-4-2 Outline indications for musculoskeletal imaging.</p> <p>D-4-4-(1) Explain the definition, severity classification, diagnosis and treatment of joint dislocation and ligament injury.</p> <p>F-2-14 Explain outline physical therapy and occupational therapy.</p>	Manabu Akagawa	北臨床棟 2 階カンファ ランス ルーム
17	7/2 (Thu)	3-4	Lecture	<p>Theme: Important points for bone and soft tissue tumors Learn about the important points of bone and soft tissue tumors, basic surgical therapy, and new surgical techniques.</p> <p>A-1-1 Outline the historical flow and meaning of medicine and medical care.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from textbooks, papers, etc. to deepen understanding, diagnosis and treatment of diseases.</p> <p>C-4-6 Outline tumor classification, degree of differentiation, grade, and stage.</p> <p>D-4-2 Outline indications for musculoskeletal imaging.</p> <p>D-4-4-(3) Explain clinical findings, imaging findings, pathological findings, and initial treatment of primary bone tumors.</p> <p>D-4-4-(3) Explain clinical, imaging, and laboratory findings of metastatic bone tumors.</p> <p>D-4-4-(3) Outline the diagnosis, pathological findings, and treatment of malignant soft tissue tumors.</p>	Hiroyuki Nagasawa	北臨床棟 2 階カンファ ランス ルーム

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
18	7/2 (Thu)	5-6	Self learning	Theme: Independent learning		
19	7/2 (Thu)	7-8	Lecture	<p>Theme: Musculoskeletal rehabilitation</p> <p>Theme: Musculoskeletal rehabilitation Learn about rehabilitation for locomotorium diseases, brace therapy, and the welfare system for the disabled.</p> <p>A-2-2 Extract important matters and problems from the content of lectures, domestic and foreign textbooks and papers, search information, etc.</p> <p>A-8-1 Based on the analysis of patients and diseases, search and organize the latest information from text books, papers, etc. to deepen understanding, diagnosis and treatment of diseases.</p> <p>B-1-8 Explain the current situation and system of welfare for persons with disabilities.</p> <p>D-4-1 Explain the structure and function of bones, cartilage, joints, and ligaments.</p> <p>D-4-1 Outline the muscle groups involved in posture and trunk movement.</p> <p>D-4-1 Explain antigravity muscles.</p> <p>D-4-4-(1) Outline rehabilitation for musculoskeletal diseases.</p> <p>F-2-14 Explain the concept and adaptation of rehabilitation.</p> <p>F-2-14 Understand the composition of a rehabilitation team and explain the role of a doctor.</p> <p>F-2-14 Outline physical therapy and occupational therapy.</p>	Shohei Murata	北臨床棟 2階カンファランスルーム
20	7/2 (Thu)	9-10	Examination	Theme: Oral examination for orthopedic surgery	Hiroaki Kijima	北臨床棟 2階カンファランスルーム