2024 Akita University Faculty of Medicine Syllabus

Category ： 臨床医学 III
Course Title ： ophthalmology
Eligible Students ： grade 4 Related Course
Code ： 71633022
Schedule ： week 7 〜 week 10
Credits ： 1

1. **Lead Instructor**

Takeshi	Iwase	(Professor, Department of Ophthalmology Akita University Hospital, 6164)

2. **Instructors**

Takeshi	Iwase	(Professor, Department of Ophthalmology Akita University Hospital, 6164)
Jiro	Kogo	(Associate Professor, Department of Ophthalmology Akita University Hospital, 6167)
Shungo	Nishiyama	(Medical Doctor, Department of Ophthalmology Akita University Hospital, 6167)
Sanae	Abe	(Part-time Lecturer, Shiritsu Akita Hospital)
Masaya	Iwakawa	(Part-time Lecturer, Minami Akita eye clinic)
Chie	Iwase	(Part-time Lecturer, Department of Ophthalmology Nagoya University Hospital)
Hiroyuki	Uchiyama	(Part-time Lecturer, Uchiyama eye clinic)
Hiroki	Kaneko	(Part-time Lecturer, Department of Ophthalmology Nagoya University Hospital)
Ryoma	Kamada	(Part-time Lecturer)
Kazuhiro	Kimura	(Part-time Lecturer)
Toshiaki	Goseki	(Part-time Lecturer)
Noriko	Sato	(Part-time Lecturer, Nabechima eye clinic)
Koichi	Hayakawa	(Part-time Lecturer, Akita Kousei Medical Center)
Toshiyuki	Fujiwara	(Part-time Lecturer, Ito eye clinic)
Tsutomu	Yasukawa	(Part-time Lecturer, Department of Ophthalmology Nagoya City University Hospital)

3. **Course Description Outline(Course Objectives)**

（ねらい）
眼・視覚系の構造と機能を理解し、眼・視覚系疾患の症候、病態、診断と治療を理解する。
Understand the structure and function of the eye / visual system, the symptoms, pathophysiology, diagnosis and treatment of eye / visual system diseases.

（1）眼球と付属器の構造と機能の説明。
（2）視覚情報の受容のしくみと伝導路の説明。
（3）眼球運動のしくみの説明。
（4）対光反射、輻輳反射、角膜反射の機能の説明。
（5）基本的眼科検査（視覚検査、視野検査、細隙灯顕微鏡検査、眼圧検査、眼底検査）
（6）屈折異常（近視、遠視、乱視）と調節障害の病態生理の説明。
（7）感染性角結膜疾患の症候、診断と治療の説明。
（8）白内障の病因、症候、診断と治療の説明。
（9）緑内障の病院を列挙し、それらの発症機序、症候と治療の説明。
（10）裂孔原性網膜剥離の症候、診断と治療の説明。
（11）糖尿病、高血圧・動脈硬化による眼底変化の説明。
（12）ぶどう膜炎の病因、症候、診断と治療の説明。
（13）視神経炎（症）・うっ血乳頭の病因、症候と診断の説明。
（14）アルカリ、酸による化学損傷の症候と救急処置の説明。

（15）網膜静脈閉塞症と動脈閉塞症の症候、診断と治療の説明。
（16）網膜芽細胞腫の症候、診断と治療の説明。

(1) Explanation of the structure and function of the eye and adnexa.
(2) Explanation of the mechanism of receiving visual information and the conducting pathway.
(3) Explanation of the mechanism of eye movement.
(4) Explanation of the functions of light reflex, vergence reflex, and corneal reflex.
(5) Basic ophthalmologic examination (visual acuity examination, visual field examination, slit lamp microscopic examination, intraocular pressure examination, fundus examination)
(6) Explanation of pathophysiology of refractive error (myopia, hyperopia, astigmatism) and accommodation disorder.
(7) Explanation of symptoms, diagnosis and treatment of infectious keratoconjunctival disease.
(8) Explanation of the etiology, symptoms, diagnosis and treatment of cataract.
(9) List glaucoma hospitals and explain their pathogenic mechanism, symptoms and treatment.
(10) Explanation of symptoms, diagnosis and treatment of rhegmatogenous retinal detachment.
(11) Explanation of changes in the fundus due to diabetes, hypertension and arteriosclerosis.
(12) Explanation of the etiology, symptoms, diagnosis and treatment of uveitis.
(13) Explanation of the cause, symptoms and diagnosis of optic neuritis (symptom) and papilledema.
(14) Explanation of symptoms of chemical damage caused by alkali and acid and emergency first aid.
(15) Explanation of symptoms, diagnosis and treatment of retinal vein occlusion and arterial occlusion.
(16) Explanation of symptoms, diagnosis and treatment of retinoblastoma.

4. **Textbook/Reference Books**

現代の眼科学（改訂第 13 版　所敬監修　吉田晃敏/谷原秀信　編）金原出版
標準眼科学（第 12 版　木下茂/中澤満/天野史郎　編）医学書院

5. **Assessment**

出席率並びに小テストの結果より評価する。

Evaluate based on attendance rate and mini-examination.

6. **Out of Class Study/Message**

列記した講義内容にのっとって参考図書で予習。
講義後、小テストに向けて各自復習を行うこと。

Prepare with reference books according to the lecture contents listed.
After the lecture, review each person for the mini-examination.

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
1	5 / 23 (Thu)	1-2	Lecture	Theme: 網膜疾患から目を守る　Protect eyes from retinal disease 1 冒頭で、眼科学の重要性、特に、視覚における身体障害の主要原因疾患の多くが網膜疾患であることを解説し、次に、網膜の生理機能と加齢黄斑変性などの代表疾患の病態について、各論ではなく視野を広げて概説する。次に、実臨床における問題点（アンメットニーズ）について学生とともに考え、そこからさらなる病態解明と新規治療法開発の必要性について考える。そして、現在の基礎研究から臨床研究のトピックについて紹介する。最後に、最近、人工知能（AI）が第３次ブームとなり、医療業界においても画像認識による自動診断の試みや、電子カルテのビッグデータの解析、音声認識によるコミュニケーションロボットを活用した医療業務のサポートなどで実用化されつつある。今後の医療人は AI が行う単純作業のみでは精度や処理速度で存在価値がなくなるため、ますます人間らしい AI にない Creativity や Hospitality の育成が求められる。医学生にこれらについて考える機会を与え、未来型の医師育成に役立つことを目標に講義を行う。 At the beginning, I will explain the importance of ophthalmology, especially that many of the major causative diseases of physical disabilities in vision are retinal diseases, and then the physiological functions of the retina and the pathophysiology of typical diseases such as age-related macular degeneration. Next, I will consider the problems (unmet needs) in actual clinical practice with students, and then consider the need for further elucidation of pathological conditions and development of new treatment methods. Then, I will introduce the topics of clinical research from the current basic research. Finally, recently, artificial intelligence (AI) has become the third boom, and even in the medical industry, trials of automatic diagnosis by image recognition, analysis of big data of electronic medical records, support of medical work using communication robots by voice recognition are being put to practical use. In the future, medical association would lose their existence value in terms of accuracy and processing speed only by simple tasks performed by AI, so it will be required to foster Creativity and Hospitality that are not found in human-like AI. Lectures will be given with the goal of giving medical students the opportunity to think about these things and helping to develop future-type doctors.	Tsutomu Yasukawa	病院多目的室 Hospital multipurpose room

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2	5 / 23 (Thu)	3-4	Lecture	Theme: 網膜疾患から目を守る　Protect eyes from retinal disease 2 冒頭で、眼科学の重要性、特に、視覚における身体障害の主要原因疾患の多くが網膜疾患であることを解説し、次に、網膜の生理機能と加齢黄斑変性などの代表疾患の病態について、各論ではなく視野を広げて概説する。次に、実臨床における問題点（アンメットニーズ）について学生とともに考え、そこからさらなる病態解明と新規治療法開発の必要性について考える。そして、現在の基礎研究から臨床研究のトピックについて紹介する。最後に、最近、人工知能（AI）が第３次ブームとなり、医療業界においても画像認識による自動診断の試みや、電子カルテのビッグデータの解析、音声認識によるコミュニケーションロボットを活用した医療業務のサポートなどで実用化されつつある。今後の医療人は AI が行う単純作業のみでは精度や処理速度で存在価値がなくなるため、ますます人間らしい AI にない Creativity や Hospitality の育成が求められる。医学生にこれらについて考える機会を与え、未来型の医師育成に役立つことを目標に講義を行う。 At the beginning, I will explain the importance of ophthalmology, especially that many of the major causative diseases of physical disabilities in vision are retinal diseases, and then the physiological functions of the retina and the pathophysiology of typical diseases such as age-related macular degeneration. Next, I will consider the problems (unmet needs) in actual clinical practice with students, and then consider the need for further elucidation of pathological conditions and development of new treatment methods. Then, I will introduce the topics of clinical research from the current basic research. Finally, recently, artificial intelligence (AI) has become the third boom, and even in the medical industry, trials of automatic diagnosis by image recognition, analysis of big data of electronic medical records, support of medical work using communication robots by voice recognition are being put to practical use. In the future, medical association would lose their existence value in terms of accuracy and processing speed only by simple tasks performed by AI, so it will be required to foster Creativity and Hospitality that are not found in human-like AI. Lectures will be given with the goal of giving medical students the opportunity to think about these things and helping to develop future-type doctors.	Tsutomu Yasukawa	病院多目的室 Hospital multipurpose room

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3	5 / 23 (Thu)	5-6	Lecture	Theme: 後眼部疾患の病態各論　Pathophysiology of Posterior Segment Eye Diseases 後眼部疾患は眼球の後部にあたる網膜、脈絡膜、強膜の疾患であり、糖尿病網膜症、黄斑上膜、網膜静脈閉塞症などの網膜疾患から加齢黄斑変性、原田病、脈絡膜腫瘍などの脈絡膜疾患のことを指す。各疾患について病態生理から治療方法までも網羅的に解説する。 Posterior ocular diseases are diseases of the retina, choroid, and sclera at the back of the eye, and include retinal diseases such as diabetic retinopathy, epiretinal membrane, and retinal vein occlusion, as well as choroidal diseases such as age-related macular degeneration, Harada disease, and choroidal tumor. Each disease will be explained comprehensively from pathophysiology to treatment methods as well.	Jiro Kogo	病院多目的室 Hospital multipurpose room
4	5 / 23 (Thu)	7-8	Lecture	Theme: 結膜疾患、角膜・強膜疾患　Conjunctival disease, corneal / scleral disease 結膜と角膜は眼球表面の重要な構成要素である、細菌やウィルス、抗原などに対する生体防御機能を有する。この防御機能が破綻すれば感染症やアレルギー性疾患の原因となり、多彩な症候、検査所見を呈することになる。本講義では、主に角結膜の感染症、アレルギー性疾患治療を取り上げ、重点的に取り上げて解説する。 The conjunctiva and cornea have a biological defense function against bacteria, viruses, antigens, etc., which are important components on the surface of the eyeball. If this defense function is broken, it causes infectious diseases and allergic diseases, and presents various symptoms and laboratory findings. In this lecture, we will mainly focus on the treatment of keratoconjunctival infections and allergic diseases.	Ryoma Kamada	病院多目的室 Hospital multipurpose room

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	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
5	5 / 23 (Thu)	9-10	Lecture	Theme: 神経眼科・視神経・視路疾患、外眼筋疾患 Neuro-ophthalmology, optic nerve and visual tract diseases, external ocular muscle diseases 眼は中枢神経系、自立神経系、および脳神経機能の表現器である、と言われている。 講義では、眼球自体の診察や検査だけではなく、その結果から直接目にすることの出来ない眼球より後方の眼窩内疾患や頭蓋内疾患について常に意識する大切さや、緊急に対処しなければならない疾患についても紹介する。 「小さな臓器である眼球から何を考えなければいけないのか？」今後に役立つ知識の習得を目的とする。 It has been said that the eye is an expression of the central nervous system, the autonomic nervous system, and cerebral nerve function. In this lecture, I will introduce not only the examination and testing of the eye itself, but also the importance of being constantly aware of intra-orbital and intracranial diseases behind the eye that we cannot see directly from the results of the examination and testing, as well as diseases that need to be treated urgently. What do we need to consider in the small organ of the eye? The goal is to acquire knowledge that will be useful in the future.	Masaya Iwakawa	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
6	5 / 30 (Thu)	1-2	Lecture	Theme: 視機能とその検査　Visual function and its examination 視機能は視力のみならず、様々な眼科検査で評価される。本講義では、各種ある視機能検査の中から視野、色覚、光覚の検査方法とその評価方法について学習する。 　また、近年パソコンやスマートフォン、タブレットなどのデジタル機器が私たちの生活に広く浸透したことにより、眼精疲労や“ スマホ老眼 ”などの症状を訴える患者が増加している。眼精疲労の原因や、調節に影響する瞳孔の生理と観察方法、瞳孔に異常をきたす疾患についても講義する。 ・視野 ・色覚 ・光覚 ・眼性疲労 ・瞳孔 Visual function is assessed not only by visual acuity but also by various ophthalmic tests. In this lecture, we will learn about visual field, color vision, and light vision and their evaluation methods from among the various types of visual function tests. 　In recent years, as digital devices such as computers, smartphones, and tablets have widely penetrated our lives, the number of patients complaining of eye strain and ”smartphone presbyopia” has been increasing. In this lecture, we will discuss the causes of eye strain, the physiology of the pupil and how to observe the pupil, and diseases that cause abnormalities in the pupil. Visual field Color vision Light vision Ocular fatigue Pupil Translated with www.DeepL.com/Translator (free version)	Noriko Sato	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
7	5 / 30 (Thu)	3-4	Lecture	Theme: 斜視について　Strabismus 正常な両眼視機能を有する人は、両眼からの視覚情報が脳で統合され、立体視を得る。しかし、斜視を発症すると中枢での視覚情報の統合が崩れ、両眼視機能に支障をきたし、複視を訴える。また、生後３歳までに発症した斜視は正常な両眼視の発育を妨げる可能性がある。加えて、斜視は整容面での影響により、社会的不利益および精神発達への影響を及ぼす可能性がある。 斜視の有病率を、日本人では 3.6 %、米国では 4 %と報告されており、その数は決して少なくはない。2021 年の斜視治療の全国実態調査の結果、1 年間で総数 10767 例の斜視患者の治療（斜視手術＋ボツリヌス毒素療法）が行われていた。 成人の斜視の原因の鑑別では、頭蓋内疾患や甲状腺眼症・重症筋無力症など全身疾患も重要となる。中には脳動脈瘤など、生死に関わる疾患も潜んでいる。本講義では、複視・大人斜視の原因鑑別そして治療に関し説明する。 また、アメリカで眼科医として働いた経験を元に、アメリカの眼科医療についてもふれることができればと思っている。 In people with normal binocular function, visual information from both eyes is integrated in the brain to obtain stereopsis. However, when a person develops strabismus, the integration of visual information at the center of the brain is disrupted, causing problems with binocular function and resulting in complaints of diplopia. In addition, strabismus that develops before the age of three may interfere with the development of normal binocular vision. In addition, strabismus can have a disadvantageous social and psychiatric developmental impact due to its cosmetic consequences. The prevalence of strabismus is reported to be 3.6% in the Japanese population and 4% in the U.S. The results of a national survey of strabismus treatment in 2021 showed that a total of 10,767 strabismus patients were treated (strabismus surgery plus botulinum toxin therapy) in one year. In differentiating the causes of strabismus in adults, intracranial diseases and systemic diseases such as thyroid eye disease and myasthenia gravis are also important. Some of these diseases, such as cerebral aneurysms, may be life-threatening. In this lecture, the causes and treatment of diplopia and adult strabismus will be explained. In addition, based on my experience working as an ophthalmologist in the U.S., I would like to touch on American ophthalmic care.	Toshiaki Goseki	病院多目的室 Hospital multipurpose room

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8	5 / 30 (Thu)	5-6	Lecture	Theme: 屈折異常と調整異常の病態生理 Pathophysiology of refractive and accommodative abnormalities 「屈折異常と調節異常の病態生理」 屈折って何のこと？近視は遠くが見えなくて、遠視は近くが見えないの？視力のこと、白内障のこと、そして研修医が救急外来で注意すべき疾患についてもお話します。 キーワード：白内障、屈折、視力、救急 Pathophysiology of Refractive Error and Dysregulation What does refraction mean? Does myopia mean you can't see far and farsightedness mean you can't see near? We will also discuss vision, cataracts, and diseases that residents should be aware of in the emergency room. Keywords: cataract, refraction, vision, emergency	Hiroki Kaneko	病院多目的室 Hospital multipurpose room

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9	5 / 30 (Thu)	7-8	Lecture	Theme: 網膜硝子体内視鏡手術　Vitreoretinal endoscopic surgery 硝子体手術は、通常、手術顕微鏡を用いて瞳孔を通して眼内を観察しながら行う。しかしながら、瞳孔からの観察が不可能な場合、いろいろな手技、器具さらには機器を駆使して硝子体手術が可能となる。水晶体切除や摘出、角膜上皮剥離、角膜移植、人工角膜装着などを行い、硝子体手術が可能となります。さらに、眼内視鏡を使用することにより従来不可能とされていた条件下の硝子体手術が可能となる。本講義では、経瞳孔的な硝子体手術が困難である難治性網膜硝子体疾患への実践的なアプローチを眼内視鏡手術を中心に解説する。 眼外傷 角膜混濁 網膜剥離 増殖性硝子体網膜症 糖尿病網膜症 未熟児網膜症 Vitrectomy is usually performed using an operating microscope while observing the inside of the eye through the pupil. However, when observation through the pupil is not possible, vitrectomy can be performed using a variety of techniques, instruments and equipment. Vitrectomy can be performed by lens resection or extraction, corneal epithelial detachment, corneal transplantation and artificial cornea fitting. Furthermore, the use of an ocular endoscope enables vitrectomy to be performed under conditions previously considered impossible. In this lecture, a practical approach to refractory vitreoretinal diseases for which transpupillary vitrectomy is difficult will be described, focusing on ocular endoscopic surgery. Ocular trauma Corneal opacity Retinal detachment Proliferative vitreoretinopathy Diabetic retinopathy Retinopathy of prematurity	Kazuhiro Kimura	病院多目的室 Hospital multipurpose room

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10	5 / 30 (Thu)	9-10	Lecture	Theme: ぶどう膜疾患 Uveal disease ぶどう膜の疾患ではぶどう膜炎が重要である。ぶどう膜炎を起こす疾患で重要なサルコイドーシス，Vogt-小柳-原田病，ベーチェット病を中心に，ぶどう膜炎の総論，各ぶどう膜炎の病名の由来，原因や疫学，自覚症状，眼科所見，眼外所見，診断法，治療（局所治療・全身治療）について学ぶ。また秋田大学にゆかりのある急性網膜壊死（桐沢型ぶどう膜炎）についても学ぶ。 Uveitis is important in uveal disorders. I will explain uveal disorders focusing on sarcoidosis, Vogt-Koyanagi-Harada disease, and Bechet's disease, which are important in the diseases that cause uveitis, general remarks on uveitis, origin of each uveitis disease name, causes and epidemics, subjective symptoms, ophthalmic findings, diagnostic methods, and treatment (local / systemic treatment). I will explain about acute retinal necrosis, which is related to Akita University.	Koichi Hayakawa	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
11	6 / 6 (Thu)	1-2	Lecture	Theme: 網膜硝子体疾患 1　Retinal vitreous diseases 1 日本における失明の半数以上を網膜硝子体疾患が占めており，網膜硝子体疾患の理解は良好な視機能の保持において重要である． 代表的な疾患としては，網膜に裂孔を生じる網膜剥離，夜盲を来し難治性である網膜色素変性，糖尿病の合併症である糖尿病網膜症，動脈硬化等が原因で出血をきたす網膜静脈閉塞症，網膜血管が閉塞して発症する網膜動脈閉塞症，ウイルスが原因で発症し急激な視力低下を生じるウイルス性網膜疾患，未熟児に発症し早急に加療を行わないと失明に至る未熟児網膜症などがある．また，網膜の中でも一番視力に大きな影響を及ぼすのは黄斑部であり，この部位が障害されると病変の大きさは小さいが大きく視力が低下する．その黄斑部に円孔を生じる黄斑円孔，黄斑部に薄い膜が張ってしまう黄斑上膜，食事の欧米化に伴い日本でも増加傾向にある加齢黄斑変性，またその類似疾患などがある．それら種々の網膜硝子体疾患の病態について解説する． ・網膜剥離 ・網膜色素変性 ・糖尿病網膜症 ・網膜静脈閉塞症 ・網膜動脈閉塞症 ・ウイルス性網膜疾患 ・未熟児網膜症 ・黄斑円孔 ・黄斑前膜 ・加齢黄斑変性およびその類似疾患 Retinal vitreous disease accounts for more than half of blindness in Japan, and understanding of retinal vitreous disease is important for maintaining good visual function. Typical diseases include retinal detachment from retinal tears, retinal pigment degeneration that causes night blindness and is intractable, diabetic retinopathy that is a complication of diabetes, and retinal vein occlusion that causes bleeding due to arteriosclerosis, retinal artery occlusion that develops due to obstruction of retinal blood vessels, viral retinal disease that develops due to virus and causes rapid deterioration of vision, retinopathy of prematurity that develops in premature infants and leads to blindness if not treated immediately and so on. In addition, the macula has the greatest effect on visual acuity in the retina, and if this area is damaged, the size of the lesion is small but the visual acuity deteriorates significantly. There are macular holes that form circular holes in the macula, epiretinal membranes that have a thin film on the macula, age-related macular degeneration, which is increasing in Japan with the westernization of the diet, and similar diseases. The pathophysiology of these various retinal vitreous diseases will be explained. ・Retinal detachment ・ Retinitis pigmentosa ・ Diabetic retinopathy ・ Retinal vein occlusion ・ Retinal artery occlusion	Takeshi Iwase	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
12	6 / 6 (Thu)	3-4	Lecture	Theme: 網膜硝子体疾患 2　Retinal vitreous diseases 2 様々な網膜硝子体疾患が存在することを網膜硝子体疾患１で解説した．現代では，疾患の病態生理の理解が深まってきている背景により，手術加療も含めて新しい治療法が登場してきている．下記の疾患における加療の変遷や現代の加療法について解説する． ・網膜剥離 ・網膜色素変性 ・糖尿病網膜症 ・網膜静脈閉塞症 ・網膜動脈閉塞症 ・ウイルス性網膜疾患 ・未熟児網膜症 ・黄斑円孔 ・黄斑前膜 ・加齢黄斑変性およびその類似疾患 The existence of various retinal vitreous diseases is explained in Retinal vitreous disease 1. In modern times, new treatment methods including surgical treatment have developed due to the background of deepening understanding of the pathophysiology of diseases. I will explain the transition of treatment for the following diseases and modern treatment. ・Retinal detachment ・ Retinitis pigmentosa ・ Diabetic retinopathy ・ Retinal vein occlusion ・ Retinal artery occlusion ・ Viral retinal disease ・ Retinopathy of prematurity ・ Macular hole ・ Epiretinal membrane ・Age-related macular degeneration and similar diseases	Takeshi Iwase	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
13	6 / 6 (Thu)	5-6	Lecture	Theme: アルカリ、酸による化学損傷の症候と救急処置　Symptoms and first aid for chemical damage caused by alkalis and acids 診断には検査が必要である。内科からオーダーされる採血、採尿、心電図は臨床検査部で検査を行う。糖尿病による眼筋麻痺を発症した場合、採血、採尿、CT もしくは MRI といった画像検査が必要になる。 眼科検査は臨床検査部等に依頼することは非常に少なく、眼科外来内で行われるためあまり目にすることがないが検査数にすると 50 種類以上の検査がある。 この講義では検査結果からどのように検査が行われ、その結果がどうであるか臨床配属で役に立つよう要点を絞って解説する。 ・視力検査（裸眼視力検査・矯正視力検査） ・屈折検査（他覚的屈折検査・自覚的屈折検査） ・涙液検査 ・眼圧検査 ・眼底検査（写真・OCT） ・視野検査、色覚検査、光覚検査 ・調節検査、瞳孔検査 ・眼位検査 ・眼球運動検査 ・両眼視機能検査 Laboratory tests are necessary for diagnosis. Blood samples, urine samples, and electrocardiograms ordered by the internal medicine department are performed in the clinical laboratory. In the case of diabetic patients with ophthalmoplegia, blood and urine samples and imaging studies such as CT or MRI are required. Ophthalmological examinations are rarely ordered by the clinical laboratories and are performed in the ophthalmology outpatient clinic, so they are not often seen. However, there are more than 50 types of tests. In this lecture, I will explain how tests are performed and what the results are, focusing on the main points so that they will be useful in clinical assignments. Visual acuity test (naked eye acuity test and corrected visual acuity test) Refraction test (subjective and objective refraction test) Lacrimal fluid examination Intraocular pressure test Fundus examination (photograph and OCT) Visual field test, color vision test, light vision test Adjustment test, pupil test Eye position test Eye movement test Binocular function test	Shungo Nishiyama	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
14	6 / 6 (Thu)	7-8	Lecture	Theme: 検査学　Examination Studies アルカリ、酸による化学損傷の症候と救急処置 化学外傷により引き起こされる眼部における組織変化や深達度は、化学薬品の種類や濃度によって異なる。眼化学外傷の重症度や予後、緊急時の対応について学ぶ。 Tissue changes and depth of penetration in the eye caused by chemical trauma vary depending on the type and concentration of the chemical. Learn about the severity and prognosis of ocular chemical trauma and what to do in an emergency.	Chie Iwase	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
15	6 / 6 (Thu)	9-10	Lecture	Theme: 網膜治療の cutting edge と future　Cutting edge and future of retinal treatment 近年の科学技術の進歩に伴い、再生医療・AI・VR 等の技術が網膜の治療にもどんどん応用されてきている。 1. 網膜疾患の手術治療の cutting edge 最初に現在の網膜硝子体手術の基本的な流れを供覧し、さらに最新の網膜疾患の手術治療のトピックを手術動画を交えながら紹介する。 2. 人工視覚 次に重篤な視覚障害者のために開発された人工視覚システムのしくみと将来の可能性について解説し、そこからあらためて感覚器としての眼とその中の網膜の役割について理解を深めたい。 3. Heads up Surgery と Robotics 最後に、顕微鏡の鏡筒を覗かずにゴーグルを装着して３ D モニターを見ながら行う硝子体手術、いわゆる Heads up Surgery を紹介し、現代の VR ワールドの根幹をなす立体覚について再考し、この手術の可能性と、Robotics と組み合わせた眼科 VR 手術の近未来について語りたい。 With the progress of science and technology in recent years, technologies such as regenerative medicine, AI, and VR are being applied more and more to the treatment of the retina. 1. Cutting edge for surgical treatment of retinal diseases First, I will show the basic flow of current retinal vitreous surgery, and then introduce the latest topics of surgical treatment for retinal diseases with surgical videos. 2. Artificial vision Next, I would like to explain the mechanism and future potential of the artificial visual system developed for the severely visually impaired. In addition, I will explain the role of the eye as a sensory organ and the retina in it. 3. Heads up Surgery and Robotics Finally, I introduce the Heads up Surgery, which is a vitreous surgery performed while wearing goggles and looking at a 3D monitor without looking into the microscope, reconsidering the stereoscopic vision that is the basis of the modern VR world, and this surgery I would like to talk about the possibilities of this and the near future of ophthalmic VR surgery combined with Robotics.	Toshiyuki Fujiwara	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
16	6 / 13 (Thu)	1-2	Lecture	Theme: 眼瞼疾患、涙器疾患　Eyelid disease, lacrimal disease 眼瞼は眼球の上下を覆っているだけでなく、顔面の一部として表情の形成に関与するなど重要な役割を果たす。さらに眼瞼は、内部にはマイボーム腺を含み、涙液に油層を供給する。涙器は、涙腺と涙道からなる。涙腺は涙液の主成分である液相を供給する。涙液は眼瞼の瞬目によって、角結膜表面を潤した後、涙小管から涙嚢、鼻涙管へと排泄される。このように、眼瞼と涙器は互いに関わって、眼表面を保護している。本講義では、眼瞼と涙器の構造と機能、さらに先天・後天疾患に関して、症候、検査所権、治療を解説する。 The eyelids not only cover the top and bottom of the eyeball, but also play an important role, such as being involved in the formation of facial expressions as part of the face. In addition, the eyelids contain the meibomian glands inside and supply the tear fluid with an oil layer. The lacrimal apparatus consists of the lacrimal glands and the lacrimal duct. The lacrimal gland supplies the liquid phase, which is the main component of tear fluid. Tear fluid is excreted from the canaliculi to the lacrimal sac and nasolacrimal duct after moistening the surface of the keratoconjunctiva by the blink of the eyelid. In this way, the eyelids and lacrimal apparatus interact with each other to protect the surface of the eye. In this lecture, we will explain the symptoms, laboratory rights, and treatment of the structure and function of the eyelids and lacrimal apparatus, as well as congenital and acquired diseases.	Ryoma Kamada	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
17	6 / 13 (Thu)	3-4	Lecture	Theme: 緑内障　Glaucoma 日本における失明原因の第１位は緑内障であり、重要な疾患である。この疾患の有病率は年齢とともに増加するので、高齢化とともに今後ますます患者数は増加し、この疾患の診断治療は社会的にも重要である。 緑内障の分類としては下記のようになっている。 １．原発緑内障 原発開放隅角緑内障 (広義) 正常眼圧緑内障 原発閉塞隅角緑内障 ２．続発緑内障 ３．小児緑内障 緑内障の症状には、眼痛、頭痛、霧視、視野欠損があり、診断に必要な検査として細隙灯顕微鏡で行う検査、眼圧検査、隅角鏡検査、眼底検査、視野検査（動的、静的視野検査）などがあり、その詳細について解説する。 緑内障の治療は眼圧下降治療が主なものであり、薬物治療（点眼薬)、レーザー治療、手術治療があり、その詳細についても解説する。 緑内障治療薬の分類（点眼薬） 1. コリン作動薬 2. アドレナリン作動薬 3. β遮断剤 4. プロスタグランディン製剤 5. 炭酸脱水酵素阻害剤 6. α遮断薬 7. α２作動薬 Glaucoma Glaucoma is an important disease because it is the leading cause of blindness in Japan. Since the prevalence of this disease increases with age, the number of patients will increase with the aging of the population, and the diagnosis and treatment of this disease is socially important. The classification of glaucoma is as follows 1. Primary glaucoma Primary open-angle glaucoma (broad sense) Normal tension glaucoma Primary angle-closure glaucoma 2. Secondary glaucoma 3. Pediatric glaucoma Symptoms of glaucoma include ocular pain, headache, foggy vision, and visual field defects. The tests that are necessary for diagnosis include examination using slit lamp microscope, intraocular pressure test, corner angle mirror test, fundus test, and visual field test. The main treatment for glaucoma is intraocular pressure lowering, which includes drug therapy (eye drops), laser therapy, and surgical treatment. Classification of Glaucoma Drugs (Ophthalmic Drugs) 1. cholinergic agonists 2. adrenergic agonists 3. beta-blockers 4. prostaglandins 5. carbonic anhydrase inhibitors 6. alpha-blockers 7. Alpha 2 agonist	Sanae Abe	病院多目的室 Hospital multipurpose room

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	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
18	6 / 13 (Thu)	5-6	Lecture	Theme: 水晶体疾患 Cataract 白内障は高齢者の視力低下の原因となる最もポピュラーかつ重大な疾患である。 本講義では、水晶体の解剖・生理をはじめとして、特殊な白内障を含めた多様な水晶体疾患を解説し、診察の仕方や治療方法を学ぶ。 Cataract is one of the most popular and serious diseases that cause vision loss in the elderly. In this lecture, we will start with the anatomy and physiology of the lens, explain various lens diseases including special cataracts, and learn how to examine and treat them.	Sanae Abe	病院多目的室 Hospital multipurpose room

Topics and Contents of class, Course Objectives						
	Class Date	**Period**	**Class Format**	**Topics and Contents of class, Course Objectives**	**Instructors**	**Class Room**
19	6 / 13 (Thu)	7-8	Lecture	Theme: 小児眼科・斜視 Pediatric Ophthalmology/Strabismus 「小児眼科」 生直後の視力は光覚程度と言われている。その後、視力は徐々に発達し 8 歳頃までに完成する。視覚の発達時期に、眼疾患があると視機能は十分に発達しない。そのため、早期に眼疾患を見つけ、早期に治療することが重要である。また、小児は胎生期の問題や遺伝子の異常で、成人にはない特有の眼疾患を来すことがある。 本講義では小児の視機能の発達、小児特有の眼疾患、成人との違いなどについてお話をしたい。 「複視」 ものが二つに見えることを複視という。複視には単眼性と両眼性複視に分けられる。本講義では両眼性複視をさらに、核・核下性、核上性、視神経筋接合部性、筋原性及び機会的眼球運動制限にわけ解説する。更に、アメリカで小児・斜視の専門医として働いた経験を元に、眼科医療についてもふれることができればと思っている。 Pediatric Ophthalmology. Vision after birth is said to be about the level of light perception. Thereafter, visual acuity develops gradually and is completed by the age of 8. If there is an eye disease during the period of visual development, the visual function will not be fully developed. Therefore, it is important to detect eye diseases at an early stage and treat them as early as possible. In addition, children may develop unique ocular diseases not seen in adults due to embryonic problems or genetic abnormalities. In this lecture, I would like to discuss the development of visual function in children, eye diseases unique to children, and the differences between children and adults. Diplopia Diplopia is the double vision of seeing two objects. There are two types of diplopia: monocular and binocular. In this lecture, binocular diplopia will be further divided into subnuclear, supranuclear, optic neuromuscular junction, myogenic, and occasional eye movement restriction. Furthermore, based on my experience as a pediatrician and strabismus specialist in the U.S., I would like to touch on ophthalmologic treatment.	Chie Iwase	病院多目的室 Hospital multipurpose room
20	6 / 13 (Thu)	9-10	Lecture	Theme: 眼形成 Ophthalmoplasty Explain Ophthalmoplasty	Hiroyuki Uchiyama	病院多目的室 Hospital multipurpose room