日本眼科AI学会

APTOS
ASIA PACIFIC TELE-OPHTHALMOLOGY SOCIETY

RE-CONNECT

つなぎなおす

第6回日本眼科AI学会総会

The 6th Annual Meeting of the Japanese Society of Artificial Intelligence in Ophthalmology (JSAIO)

APTOS 2025

The 10th Asia Pacific Tele-Ophthalmology Society (APTOS) Symposium 2025

June 27th (Fri.)–28th (Sat.), 2025

As of June 16

Venue Congres Square Grand Green Osaka

President Ryo Kawasaki
Division of Public Health, Department of Social Medicine
Graduate School of Medicine, University of Osaka, Japan

PROGRAM BOOK

近視進行抑制点眼剤

アトロピン硫酸塩点眼液

劇薬

薬価基準未収載

リジュセア®ミニ点眼液0.025%

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新発売

2. 禁忌（次の患者には投与しないこと）

2.1 本剤の成分に対し過敏症の既往歴のある患者

2.2 緑内障及び狭隅角や前房が浅いなどの眼圧上昇の素因のある患者［急性閉塞隅角緑内障の発作を起こすおそれがある。］

4. 効能・効果

近視の進行抑制

5. 効能・効果に関連する注意

5.1 適切な調節の低減下で近視と診断された患者に投与すること（調節緊張により偽近視を呈していることがある）。また弱視等の治療を優先すべき他の眼科疾患を合併していないことを確認すること。

5.2 「17. 臨床成績」の項の内容を熟知し、臨床試験に組み入れられた患者の背景（年齢、近視の状態等）を十分に理解した上で、適応患者を選択すること。［17.1.1参照］

6. 用法・用量

通常、1回1滴、1日1回就寝前に点眼する。

7. 用法・用量に関連する注意

定期的に検査を行い近視の進行状況を確認すること。本剤の使用により効果が認められない場合には、漫然と投与を継続しないこと。

8. 重要な基本的注意

8.1 本剤の点眼後、散瞳の影響により羞明、霧視があらわれることがあるため、その症状が回復するまでは落下の恐れがある遊具の使用、自転車・自動車等の運転、機械類の操作は避けるよう注意すること。また、必要に応じてサングラスを着用する等、太陽光や強い光を直接見ないよう指導すること。

9. 特定の背景を有する患者に関する注意

9.6 授乳婦

治療上の有益性及び母乳栄養の有益性を考慮し、授乳の継続又は中止を検討すること。

9.7 小児等

低出生体重児、新生児、乳児、5歳未満の幼児を対象とした臨床試験は実施していない。

10. 相互作用

10.2 併用注意（併用に注意すること）

薬剤名等	臨床症状・措置方法	機序・危険因子
抗コリン作用を有する薬剤（三環系及び四環系抗うつ剤、フェノチアジン系薬剤、抗ヒスタミン剤等）	循環器系、精神神経系等の全身性の副作用があらわれるおそれがある。	相加的に作用（抗コリン作用）を増強させる。

11. 副作用

次の副作用があらわれることがあるので、観察を十分に行い、異常が認められた場合には投与を中止するなど適切な処置を行うこと。

11.2 その他の副作用

	5%以上	1～5%未満	1%未満
眼	羞明	視力障害、霧視、瞳孔障害	調節障害、眼瞼湿疹、グレア
精神神経系		頭痛	

21. 承認条件

医薬品リスク管理計画を策定の上、適切に実施すること。

25. 保険給付上の注意

本剤は保険給付の対象とならない（薬価基準未収載）。

●その他の使用上の注意については電子添文をご参照下さい

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参天製薬株式会社

大阪市北区大深町 4-20

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第 6 回日本眼科 AI 学会総会

The 6th Annual Meeting of the Japanese Society of Artificial Intelligence in Ophthalmology

APTOS 2025

The 10th Asia Pacific Tele-Ophthalmology Society (APTOS) Symposium 2025

RE-CONNECT・つなぎなおす

会　　期：2025 年 6 月 27 日（金）・28 日（土）

会　　場：コングレスクエア グラングリーン大阪

主　　催：日本眼科 AI 学会／
Asia Pacific Tele-Ophthalmology Society (APTOS)

会　　長：川崎　良
（大阪大学大学院医学系研究科　社会医学講座　公衆衛生学）

第 6 回日本眼科 AI 学会総会を開催するにあたって

第 6 回日本眼科 AI 学会総会
会長　**川崎　良**
（大阪大学大学院医学系研究科 社会医学講座 公衆衛生学）

第 6 回日本眼科 AI 学会総会・第 10 回 APTOS シンポジウム 2025 へようこそ。

この度、第 6 回日本眼科 AI 学会総会が 2025 年 6 月 27 日から 28 日にかけて大阪で開催されることとなりました。そして、今回、日本で初めて第 10 回目を迎える Asian Pacific Tele-Ophthalmology Society（APTOS）シンポジウム 2025（JSAIO × APTOS2025）を併催することをお知らせいたします。本イベントは日本初の APTOS シンポジウム開催となるだけでなく、同時期に開催される関西大阪万博のテーマ「いのち輝く未来社会のデザイン」にも深く共鳴する取り組みです。

今回の学会テーマは「RE-CONNECT・つなぎなおす」を掲げております。これは AI という新しい技術が、眼科医療がさまざまな分野と繋がり発展する新たな可能性を切り開き、この世の中のギャップを埋め、失われた関係をつなぎ直すことができると考えているからです。日本をはじめとしたアジア諸国は現在、高齢社会となっています。その中で、持続可能で質の高い眼科医療を提供するためには AI をはじめとした情報技術の活用が課題克服のために、新たな価値を創出していくために期待されています。それは、地域間での医療アクセスの格差、理想的な診療と現実の乖離、そして、日本とアジア、世界のギャップといった課題を「つなぎなおす」架け橋になるのではないでしょうか。

今回の JSAIO × APTOS2025 では、国内外の著名な眼科 AI 研究科、AI 専門家を招き、AI 研究の現在地、そして AI が眼科医療の発展と革新をどのように実世界の課題解決に実装し、寄与できるかを議論し、近い未来を構想する場を提供します。そして、一つのテーマに対して AI 技術を用いて挑戦する「AI コンペ」も開催されます。国内外の企業による AI を用いた臨床診断、スクリーニング、ロボティクス、医療コミュニケーションの展示誘致も進めております。また、本イベントに続き同会場で行われる第 7 回日本近視学会総会とは合同シンポジウムも企画しております。

本学会が、皆様の眼科 AI への興味を奮い立たせ、知識の深化、そして何より多くの人とネットワークを築くための場となることを願い、活気あふれる大阪でお目にかかれる日を楽しみにしております。

FOREWORD AND WELCOME MESSAGES

Mingguang He MD PhD FRANZCO
President, Asia Pacific Tele-Ophthalmology Society (APTOS)

Dear Colleagues and Friends,

On behalf of the Asia Pacific Tele-Ophthalmology Society (APTOS), it is my great honor to welcome you to the **10th APTOS Symposium**, held in conjunction with the **6th Annual Meeting of the Japanese Society of Artificial Intelligence in Ophthalmology (JSAIO)**. This year's symposium carries special significance as we host the landmark **APTOS Consensus Meeting on Best Practices for Adopting AI-Driven Diabetic Retinopathy Screening**, co-organized with the Research Centre for SHARP Vision (RCSV) of The Hong Kong Polytechnic University.

With diabetes affecting 629 million people globally by 2045 and diabetic retinopathy remaining a leading cause of preventable blindness, our collective mission has never been more urgent. This consensus meeting represents a critical step toward establishing standardized, evidence-based guidelines for implementing AI solutions in DR screening programs worldwide. Through rigorous literature review, expert deliberations, and consensus-building, we aim to address key challenges including validation protocols, ethical considerations, and health economic evaluations.

The outcomes of this meeting - including a published consensus statement and practical implementation guidelines - will directly contribute to improving screening accessibility, particularly in resource-limited settings, and ultimately help prevent vision loss for millions.

We are privileged to gather leading experts, policymakers, and stakeholders from across the globe for this important initiative. Your participation and insights will be invaluable in shaping the future of AI-driven eye care.

Thank you for joining us in Osaka for what promises to be a transformative event. Together, we can harness the power of innovation to create more equitable and effective healthcare solutions for all.

Warm regards,

Mingguang He MD PhD FRANZCO
President, Asia Pacific Tele-Ophthalmology Society (APTOS)

FOREWORD AND WELCOME MESSAGES

Andreas Mueller PhD, MPH
Secretary-General, Asia Pacific Tele-Ophthalmology Society (APTOS)

Dear Friends and Colleagues,

Welcome to APTOS-JSAIO 2025, the 10th Asia Pacific Tele-Ophthalmology Society Symposium and the 6th Annual Meeting of the Japanese Society of Artificial Intelligence in Ophthalmology.

The theme of this year's program is 'RE-CONNECTING', reminding us of the key objective for any advancement of AI in eye care: to benefit patients equitably, may it be through reconnecting patients to timely care they may otherwise be unable to access due to geographic or resource limitations, or through reconnecting research and treatment, using AI to analyze vast amounts of data to uncover new insights into diseases and help develop personalized treatment plans.

We hope you will find the congress stimulating and enjoyable and good luck to all participants joining the big data competition.

Yours sincerely,

Andreas Mueller, PhD, MPH
Secretary-General, Asia Pacific Tele-Ophthalmology Society

FOREWORD AND WELCOME MESSAGES

Paisan Ruamviboonsuk
Scientific Program Chair, Asia Pacific Tele-Ophthalmology Society (APTOS)

Welcome to Osaka and the World Expo 2025!

It is a great honor for the Asia-Pacific Teleophthalmology Society (APTOS) to host the 10th APTOS Congress in conjunction with the 6th Annual Meeting of the Japanese Society of Artificial Intelligence in Ophthalmology (JSAIO). This event is particularly significant as it coincides with the World Expo in Osaka, Japan.

APTOS and JSAIO present the finest elements of both societies in this year's scientific programs. The Symposia encompass a broad array of advanced artificial intelligence (AI), telemedicine, and digital health technologies, while the Free Paper sessions feature compelling studies from our Japanese and international colleagues across all ophthalmology specialties.

In addition to the renowned APTOS Big Data Competition, which has become a hallmark of our congress and is being held for the 5th time this year, a notable highlight of APTOS×JSAIO 2025 is the inaugural session on APTOS Consensus. The topic for this meeting, Standard Practice of AI-Driven Diabetic Retinopathy (DR) Screening, is especially relevant given the proliferation of AI models for DR screening currently available.

As Chair of the Scientific Committee, I extend my gratitude to all the esteemed invited speakers who have generously contributed their time and expertise to the program. I trust that all delegates will find the programs enriching and that they will seize opportunities to "Re-Connect" with friends and colleagues for future collaboration. Moreover, I hope attendees will be able to enjoy the World Expo during their visit.

Thank you all, and we look forward to seeing you at the APTOS Congress next year!

THE APTOS COUNCIL

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(China)

YOUNG INNOVATOR TRAVEL GRANTS

This year, the Asia Pacific Tele-Ophthalmology Society, along with the Japanese Society of Artificial Intelligence in Ophthalmology, offers up to 3 travel grants for outstanding presenters and young innovators to attend its annual symposium. Priority is given to young innovators who are aged 40 or below, come from a developing country, whose presentations (free paper or poster) have been accepted by the Scientific Program Committee and who have never received the APTOS Young Innovator Travel Grant before.

Chaoyu LEI
(China)

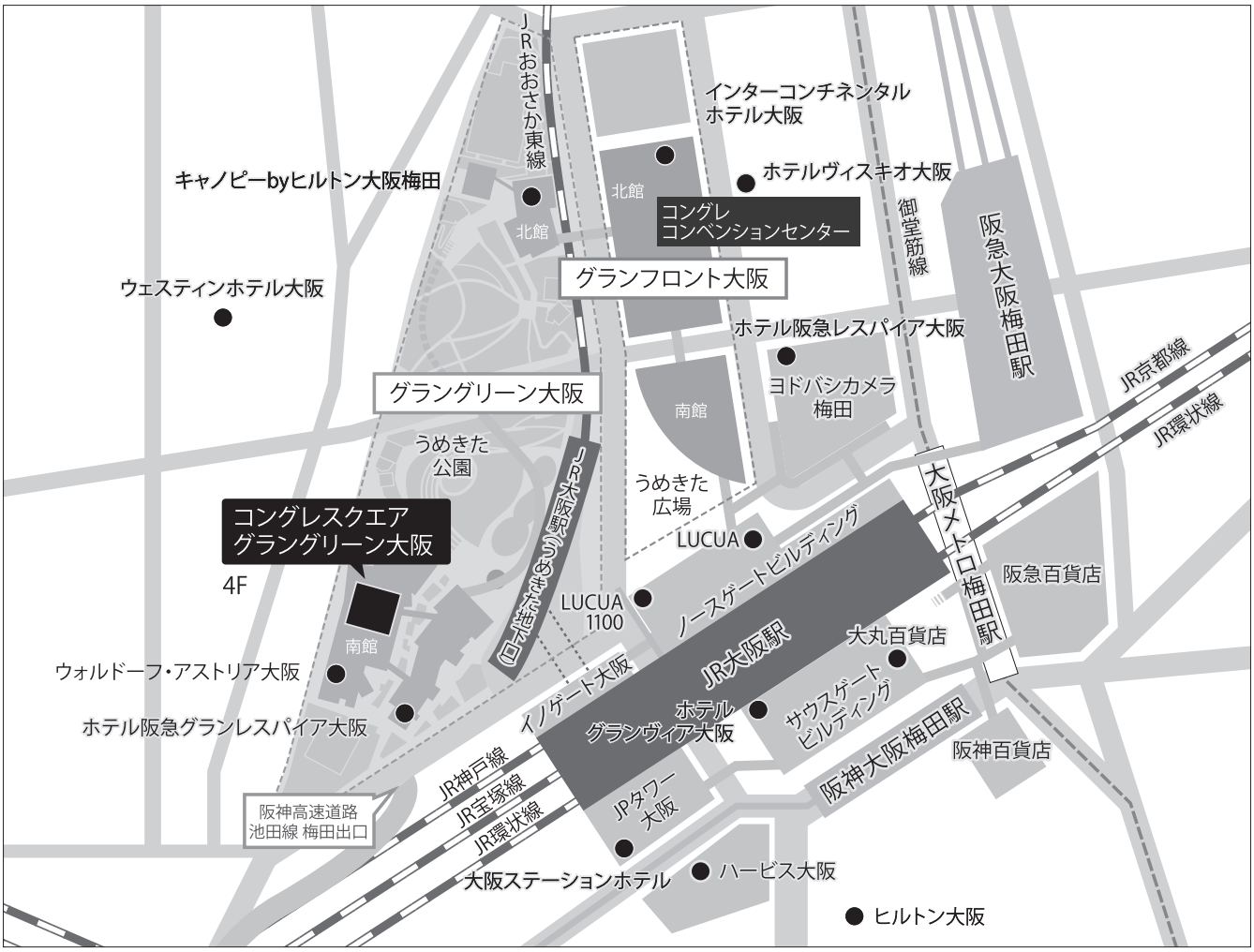
Christina
WUNARDI
(Indonesia)

Ruoyu CHEN
(Hong Kong)

交通のご案内

コングレスクエア グラングリーン大阪

所在地　〒530-0011　大阪市北区大深町5番54号 グラングリーン大阪 南館4階
TEL　06-6292-6047（代表）



■電車をご利用の場合

・JR「大阪駅」うめきた地下口より徒歩約5分（地下通路にて直結）
・大阪メトロ御堂筋線「梅田駅」北改札より徒歩約10分
・阪急「大阪梅田駅」2階中央改札口より徒歩約12分
・阪神「大阪梅田駅」西口より徒歩約8分

■空港をご利用の場合

1）大阪国際空港（伊丹空港）

・「ハービス大阪」行きリムジンバス（直行便）で約25分、バス停から徒歩約8分
・大阪モノレール「大阪空港駅」から「蛍池駅」で乗り換え、阪急「大阪梅田駅」まで約30分

2）関西国際空港

・「ハービス大阪」行きリムジンバスで約70分、バス停から徒歩約8分
・JR で「大阪駅」まで約70分

会場案内図

コングレスクエア グラングリーン大阪 4F
Congrès Square Grand Green Osaka

4F

参加者へのご案内

1. 開催に関しまして

1）第6回日本眼科 AI 学会総会は、コングレスクエア グラングリーン大阪にて行われる現地開催のみとなります。LIVE 配信および会期後のオンデマンド配信はございません。

2）指定演題および一般演題で口演発表をいただく全演者の先生には、会場へご来場いただき、現地にてご発表をいただきますよう、お願いいたします。

2. 受付方法

1）当日参加登録

2025年5月1日（木）～6月28日（土）正午

会場内での参加登録受付はございませんので、オンラインにてご登録の上ご来場ください。

2）参加費

登録区分	当日参加登録費
会員・非会員	13,000円
企業	16,000円
コメディカル・研修医	8,000円
学生※	無料

※「学生」は、主任教授または所属長等の証明書または学生証の写しが必要です。
登録区分証明書（PDF）をダウンロードし、必要事項を記入の上、ご提出ください。

3. ネームカード

入場の際は必ずご着用ください。

ネームカードを着用されていない方の入場はご遠慮願います。

4. 日本眼科学会専門医制度　単位取得

新専門医制度についての詳細は下記からご確認ください。

新専門医制度について　https://www.nichigan.or.jp/senmon/renewal/koshin_new.html

第6 回日本眼科 AI 学会総会では、以下の単位を付与する予定です。

詳細は6月上旬以降 HP にてご案内いたしますので、ご確認ください。

開催日	c) 眼科領域講習単位	d) 学会出席単位
	現地参加	
6月27日（金）	最大1.5単位	0.5単位
6月28日（土）	最大1.5単位	

参加者へのご案内

C)眼科領域講習単位

眼科領域講習の対象プログラムに参加した場合のみ、単位が取得できます。
単位の対象プログラムは以下の通りです。
・JMS-APTOS-JSAIO Joint Symposium「Basic and Clinical Perspectives – Artificial Intelligence and Myopia」※
・Symposium1「Foundation Models: Potentials and Challenges」
・Symposium2「Generative AI for Ophthalmology Practice」
・Symposium3「AI for DR Screening: Roadmap to AI implementation」
・Symposium4「AI Seeds Research and Tele-Ophthalmology」
・Symposium5「Database, Data Harmonization, Collaboration & Regulation」
・Symposium6「Oculomics Today」

【注意事項】
①現地参加者は、Joint Symposium および Symposium 参加時に単位受付が必要です。部屋の入口に単位受付デスクを設置し、入場時に単位受付を行います。
②単位を取得するプログラムは、開始から終了まで参加してください。
※「JMS-APTOS-JSAIO Joint Symposium」は日本近視学会との合同シンポジウムです。本会の参加者としてこのセッションの領域講習単位受付を行いますと、日本近視学会の領域講習単位を重複して取得することはできません。

d)学術業績・診療以外の活動実績(学会出席単位)

以下の場合に単位が取得できます。
① d)学会出席単位受付デスクで単位受付をした場合
② c)眼科領域講習単位を取得した場合※
※単位は自動で加算されますので、d)学会出席単位受付用デスクでの受付は不要です。
③セッション開始10分を過ぎると、単位が取得できませんのでご注意ください。
【注意事項】
学会出席単位の上限は5年間で6単位です。

単位受付について

単位受付のシステムは2022年10月から変更になりました。いずれの単位の取得手続きにも新しい更新登録証(青・白色のカード)が必要ですので、会場に必ずお持ちください。
カードをお忘れの方は、受付スタッフまでお声がけください。

5. クローク

クロークは4F ホワイエにございます
開設時間：6月27日(金)8：30 ～ 19：00
6月28日(土)8：00 ～ 18：45

6. 駐車場

総会専用の駐車場はございません。なるべく公共機関をご利用ください。

7. 撮影・録音厳禁

会場内における撮影・録音・録画は演者の著作権保護の目的で禁止しており、固くお断りいたします。
なお、総会会場内では携帯電話はマナーモードとし、通話はお断りいたします。

参加者へのご案内

8. 呼び出し

原則、呼び出しは行いません。

9. 主催

日本眼科 AI 学会 /Asia Pacific Tele-Ophthalmology Society (APTOS)

10. 事務局

株式会社コングレ
〒103-8276
東京都中央区日本橋3-10-5 オンワードパークビルディング
TEL：03-3510-3701　FAX：03-3510-3702
E-mail：jsaio@congre.co.jp

講演規定

1. 発表時間・言語

セッション	時間	発表言語	スライド
Symposium1 ～ 6	発表10分	英語	英語
Free papers	発表5分	英語	英語
E-poster	ホワイエにて終日放映	—	英語

2. データの受付

1)PC 受付　コングレスクエア グラングリーン大阪 4F ホワイエ

2)データ受付時間(当日)　6月27日(金)8：30 ～ 18：00
6月28日(土)8：00 ～ 16：00

①演者は、講演開始1時間前までに PC 受付にて動作確認を行ってください。

② PC 本体をご持参の演者は、PC 受付にて動作確認後、講演開始30分前までに会場内の PC オペレーター席に PC 本体を提出し、接続チェックを行ってください。講演終了後、オペレーター席にて PC 本体をご返却いたしますので、速やかにお引取りください。

③ 演台上にはモニター、キーボード、マウスを準備しておりますので発表にご利用ください。

3)発表データ

注意点：

【メディア持込の場合(Windows のみ)】

・会場で使用する PC の OS は Windows11で、インストールされているアプリは Microsoft365をご用意いたします。なお Macintosh をご希望の場合は、PC 本体を持ちこみいただければ対応いたします。
・発表用データは、USB フラッシュメモリーに保存してお持ちください。また、保存いただく際には、発表データのファイル名は「(演題番号)(氏名)」としてください。
・発表データは以下のものでご作成ください。
Windows 版 PowerPoint2010/2013/2019/2021/2024/Microsoft365
※ Macintosh 版 PowerPoint での作成は、映像に支障をきたしますので、ご遠慮ください。
・フォントは OS に標準で装備されているものでお願いいたします。画面レイアウトのバランス異常や文字化けを防ぐためにはフォントは「MS(MSP)ゴシック」、「MS(MSP)明朝」、「Times New Roman」、「Century」をご利用ください。
・画面の解像度は HD16：9(1920 × 1080ピクセル)です。このサイズより大きい場合、スライドの周囲が切れてしまいますので、画面の設定を HD に合わせてください。XGA4：3でも表示可能ですが画面の左右が黒くなります。
・動画や音声もご利用いただけます。動画データを使用の場合はご自身の PC をお持ちください。
・発表データは、会場内の PC に一旦コピーさせていただきますが、本学会終了後に運営事務局が責任を持って消去いたします。
・セッションの進行および演台スペースの関係上、「発表者ツール」は使用できません。発表原稿が必要な方は予めプリントアウトしてご持参ください。

【PC 本体持込の場合(Macintosh・Windows 動画使用)】

・PC(Macintosh・Windows の動画使用の場合)はご自身でご準備ください。
・お持込みいただきます PC は HDMI のモニター出力端子が必要となります。この端子が無い PC をお持込みいただく場合には、別途変換コネクタを必ずご用意ください。

講演規定

・動画ならびに画像の制限はありませんが、事前に再生できることをご確認ください。本体の液晶画面に動画ならびに画像が表示されても、実際に外部出力されない場合があります。発表データを作成されたPCとお持込みいただくPCが別の場合はご注意ください。
・スクリーンセーバーならびに省電力設定は予め解除してください。
・必ず電源ケーブルはお持ちください。バッテリーでのご発表はバッテリー切れとなることがあります。
・会場にて用意したプロジェクターと接続ができない場合に備え、バックアップ用のデータ(USBフラッシュメモリー)をご用意ください。
・PCの返却：発表終了後のPCは会場内「PCオペレーター席」にて返却を行います。
・セッションの進行および演台スペースの関係上、「発表者ツール」は使用できません。発表原稿が必要な方は予めプリントアウトしてご持参ください。

3. E-posterの方へ

1)ポスター会場
コングレスクエア グラングリーン大阪 4階 ホワイエ

2)会場での掲示
コングレスクエア グラングリーン大阪 4階 ホワイエにて、終日放映いたします。

3)ポスター掲示時間

日程	掲示
6月27日(金)	9：00 ～ 18：45
6月28日(土)	9：00 ～ 16：45

4)ポスターデータについて
複数枚スライドでの作成はせず、大判サイズ(学会指定のテンプレート)で発表スライドを作成してください。発表スライドには、利益相反(COI)の開示が必要となります。
指定のポスターテンプレートをご自身のパソコンのデスクトップなど、わかりやすいところに〔名前をつけて保存〕してください。

ファイル名	【演題番号(半角数字)_発表者名(英語).pptx】としてください。 (例：P1-1_TaroYamada.pptx) ※.pptxはMicrosoft Power Pointの拡張子です。
PowerPoint アニメーション、 動画	使用不可。 発表スライドは、レイアウト崩れ防止のために画像素材に変換します。そのため、動画、音声、画面切り替えアニメーション、ページ内アニメーションは使用できません。
フォントサイズ (推奨)	見出し：60pt以上 本文：36pt ～ 40pt ※フォントサイズが小さいと画面上で文字がつぶれる可能性があります。
データ容量	50MB以内に収まるよう作成をお願いします。

Participant Information & Presentation Guidelines

1. Onsite Registration

May 1 (Thu) - June 28 (Sat), 2025, 12:00 noon JST

Please note that there will be no onsite registration at the venue. All participants are required to complete their registration online prior to arrival.

2. Name Badge

All participants must wear their name badge at all times inside the venue. Admission will not be permitted without a badge.

3. Cloak Room

Location: 4F Foyer, Congress Square Grand Green Osaka

Opening Hours: June 27 (Fri) : 8:30 - 19:00

June 28 (Sat) : 8:00 - 18:45

4. Delegate Bag Pick Up – Registration Counter

Delegates can collect their delegate bags at the registration counter.

5. Coffee Breaks, Breakfast & Lunch

Coffee and refreshments will be available in the foyer during morning and afternoon breaks.

Lunch will be provided as boxed meals at each session room during the lunch sessions on both days.

Breakfast will be served on June 29 from 8:30 to 9:00 a.m. in the foyer.

It will include sandwiches and Japanese rice balls (onigiri) - individually wrapped, convenient items commonly enjoyed as grab-and-go breakfast in Japan.

Presentation Guidelines

1. Presentation Time

Session Type	Presentation Time
Symposium 1-6	10 minutes
Free Papers	5 minutes
E-posters	All day display in the Foyer

2. Data Submission (PC Preview)

Location: PC Preview Desk, 4F Foyer
Opening Hours: June 27 (Fri) : 8:30 - 18:00
June 28 (Sat) : 8:00 - 16:00

① Please check your presentation data at least 1 hour prior to your session.
② If you are bringing your own laptop, please complete the check and submit your PC to the operator desk 30 minutes before your session.
③ It will be returned to you after your presentation.

PC Environment

- OS: Windows 11
- Installed Software: Microsoft 365
- Supported Media: USB flash drive
- File name format: "[Presentation No.]_[Presenter Name]"
- Resolution: HD 16 : 9 (1920 × 1080)
- Recommended fonts: MS Gothic, MS Mincho, Times New Roman, Century
- Presenter tools are not available. Please bring a printed copy if needed.

Bringing Your Own Laptop

- HDMI output required
- Bring necessary adapters if your device lacks an HDMI port
- Ensure your laptop has screen saver and sleep mode disabled
- Bring your power adapter
- Prepare a USB backup
- Presenters must collect their laptop after the session from the operator desk

3. E-Poster Presentations

Venue: 4F Foyer, Congress Square Grand Green Osaka
Display Hours: June 27 (Fri) : 9:00 - 18:45
June 28 (Sat) : 9:00 - 16:45

June 27 (Fri.)

Congres Square Grand Green Osaka ROOM 1

session	program number	short title	speaker (country)
Keynote Lecture		**AI: History, Now and Beyond**	9:00 ～ 10:00
		Chairs：Ryo Kawasaki（Japan）, Tetsuro Oshika（Japan）, Mingguang He（Hong Kong）	
	KL1-1	Uniting for Vision: Global Collaborations Driving AI and Telehealth in Eye Care	Malvina Eydelman（U.S.）
	KL1-2	Creative GenAI Landscape	Kota Yamaguchi（Japan）
Symposium 1		**Foundation models Potentials and Challenges**	10:15 ～ 11:45
		Chairs：Hitoshi Tabuchi（Japan）, Yih Chung Tham（Singapore）	
	SY1-1	Impact of Pre-training Data on Medical Foundation Models	Yukun Zhou（U.S.）
	SY1-2	Improved prognostic model for RP	Kouya Honma（Japan）
	SY1-3	Emergence of Multiple Foundation Models in Ophthalmology: Which is the Right Fit?	Yih Chung Tham（Singapore）
	SY1-4	Towards Multi-Modal Foundation Models for Retinal Image Analysis	Julio Silva-Rodríguez（Canada）
	SY1-5	EyeFound, EyeClip & Fundus2video	Mingguang He（Hong Kong）
Luncheon Seminar 1		**AI × 医療 = ? Part Ⅳ / AI × Healthcare = ? Part IV**	12:00 ～ 13:00
		Chair：大鹿　哲郎 / Tetsuro Oshika（Japan）	
	LS1-1	第4世代AIの医療へのインパクト / The Impact of 4th Generation AI on Healthcare	清田　純 / Jun Seita（Japan）
	LS1-2	AIを活用したOCT画像の改善と網膜異常所見の検出支援 / AI-Based Improvement of OCT Images and Support for the Detection of Retinal Abnormalities	寺﨑　寛人 / Hiroto Terasaki（Japan）
	LS1-3	眼科文書作成における現状と挑戦 / Current Challenges and Advances in AI-Powered Documentation in Ophthalmology	佐渡　恵奈 / Keina Sado（Japan）
			共催 / sponsored：参天製薬 / Santen Pharmaceutical Co., Ltd.
Symposium 2		**Generative AI for Ophthalmology Practice**	13:00 ～ 14:30
		Chairs：Toshinori Murata（Japan）, Robert Chang（U.S.）, Yih Chung Tham（Singapore）	
	SY2-1	Video generation and potential use in pracice	Robert Chang（U.S.）
	SY2-2	Generative AI and DL Powered Teleconsultations Using Smartphone Captured Images of Corneal Diseases	Vineet Joshi（India）
	SY2-3	Application of Artificial Intelligence and Large Language Models in Ophthalmology	Gavin Tan（Singapore）
	SY2-4	Evaluation of changes in microaneurysms and retinal vascular leakage before and after anti-VEGF therapy for diabetic macular edema using an OCTA-based artificial intelligence-inferred fluorescein angiography system	Toshinori Murata（Japan）
	SY2-5	EyeAgent: an Interpretable Ophthalmology Multimodal Agent	Mingguang He（Hong Kong）
	SY2-6	Cancelled	
	SY2-7	Semantic Foundations in Ophthalmology: An Ontology-Based LLM Approach to Macular Degeneration	Su Jeong Song（Korea）
Sweets Seminar 1		**Applications of AI in Diagnostic Imaging**	14:30 ～ 15:30
		Chair：Ryo Kawasaki（Japan）	
	SS1-1	Delineation of Faricimab-Induced Leakage Reduction Using AI-Inferred Fluorescein Angiography Derived From OCT Angiography	Toshinori Murata（Japan）
			共催 / sponsored：中外製薬 / CHUGAI PHARMACEUTICAL CO.,LTD.
Symposium 3		**AI for DR Screening: Roadmap to AI implementation**	15:45 ～ 17:15
		Chairs：Ryo Kawasaki（Japan）, Paisan Ruamviboonsuk（Thailand）, Gavin Tan（Singapore）	
	SY3-1	What's Next for DR Screening Using AI	Paisan Ruamviboonsuk（Thailand）
	SY3-2	Diabetic Retinopathy Screening AI in Japan	Hidenori Takahashi（Japan）
	SY3-3	AI in Future of Diabetic Retinopathy Management	Gavin Tan（Singapore）
	SY3-4	Cancelled	
	SY3-5	Quality and Residents' Preference of Self-Service Fundus Diseases Screening Based on Automation and Artificial Intelligence	Haidong Zou（China）
	SY3-6	SMART (AI-enabled) DROP (Diabetic Retinopathy Outcomes and Pathways) Project: Real-World AI Integration Experience	Padmaja Kumari Rani（India）
	SY3-7	The Future of AI in DR screening in the South Pacific: Opportunities and Challenges	Rosamond Gilden（Aus）
	SY3-8	Current Landscape in the US and Longitudinal Deployment Experience at Johns Hopkins	Alvin Liu（U.S.）
OCULOMICS Coding workshop 1		**OCULOMICS workshop**	17:15 ～ 18:45
		Chairs：Yukun Zhou（UK）, Lisa Zhuoting Zhu（Aus）, Ryo Funatsu（JSAIO）, Yosuke Taki（JSAIO）	
	WS1-1	Historical VIEW - OCULOMICS -	Lisa Zhuoting Zhu（Aus）
	WS1-2	AutoMORPH	Yukun Zhou（UK）
	WS1-3	RetFOUND	Yukun Zhou（UK）
		※ In the practical session, it would be useful to create a simple protocol recommending that participants bring their own laptops and image samples they want to test (the session will be held on Google Cloud Platform, where GPUs can be used free of charge). This will encourage participant engagement and make the session more interactive. 参加者がノートパソコンとテストしたい画像サンプルを持参することを推奨する シンプルなプロトコルを作成すると役立ちます（セッションは Google Cloud Platform 上で開催され、GPU の無料利用が可能です）。	

June 27 (Fri.)

Congres Square Grand Green Osaka ROOM E (closed)

session	program number	short title	speaker (country)
Consensus meeting 1		APTOS - APOIS Consensus Mini-Workshop Chairs : Malvina Eydelman (U.S.) , Mingguang He (Hong Kong) , Ryo Kawasaki (Japan)	17:15 ～ 18:45 Alauddin Bhuiyan (U.S.) Carol CHEUNG (Hong Kong) Sheila JOHN (India) Haotian LIN (China) T.Y. Alvin LIU (U.S.) Masahiro MIYAKE (Japan) Padmaja RANI (India) Paisan RUAMVIBOONUK (Thailand) Hidenori TAKAHASHI (Japan) Gavin TAN (Singapore) Raba THAPA (Nepal) Angus TURNER (Australia) Tien-Yin WONG (China/Singapore) Honghua YU (China) Lisa ZHU (Australia) Haidong ZOU (China)

June 27 (Fri.)

Congres Square Grand Green Osaka ROOM 2

session	program number	short title	speaker (country)
Free papers 1		**Cornea/Orbita/Stra**	10:15 ～ 11:45
		Chairs：Hiroki Maehara（Japan）, Mao Tanabe（Japan）, Gavin Tan（Singapore）	
	O1-1	Performance comparison of YOLOv5 and YOLOX	Hiroki Maehara (Japan)
	O1-2	YOLO for Orbital Fractures	Yuto Nakamura (Japan)
	O1-3	Deep Learning for Orbital Fractures	Yuma Kanematsu (Japan)
	O1-4	AI & Video for Sebaceous CA	Mao Tanabe (Japan)
	O1-5	GravAI for TED Treatment Assessment	Taku Hayashi (Japan)
	O1-6	Development and Validation of a Deep Learning Algorithm for Detection of Orbital Disease Using Ocular Images from Multinational, Multiracial Populations	Chaoyu Lei (China)
	O1-7	The experience and challenges of an international tele-ophthalmology platform used in China	Qing Lu (China)
	O1-8	Effectiveness of Teleophthalmology enabled Primary eye care centres in diagnosis and management of Neuro Ophthalmic Conditions	Kowsalya Akkayasamy (India)
	O1-9	Leveraging a Generative AI-based chatbot to Triage Ophthalmic Emergencies in Tele-Ophthalmology	How Sheng Rubin Yong (Singapore)
	O1-10	Cancelled	
	O1-11	Smartphone-Based Teleophthalmology for After-Hours Emergency Eye Care: A Real-World Experience from a General Hospital in a rural setting	Soumya Nanaiah (India)
	O1-12	A remote tele ophthalmology assisted wet lab training model for surgical training of residents and fellows in a multi tier hospital network in South Asia	Kavya Chandran (India)
	O1-13	ProptoView: AI-based digital exophthalmometer for accurate proptosis measurement using multi-view images	Chaoyu Lei (China)
	O1-14	PITSTOP: BITS and HITS of Medial rectus Pulled in Two syndrome in a Filipino female patient	Helen Joy Dizon (Philippines)
	O1-15	Quantifying gender differences in orbital morphology with large MRI datasets	Xi Chen (China)
	O1-16	Generative Artificial Intelligence (AI) for Pre-dilation Image Enhancement	Jocelyn Hui Lin Goh (Singapore)
	O1-17	Screening for referable dry eye disease using deep learning: a multi center Asian study	Ralene Sim (Singapore)
	O1-18	Enhancing Patient-Clinic Communication in Refractive Practices through Generative AI: The Role of ZEISS VisioGen	Mansi Gupta (India)
Luncheon Seminar 2			12:00 ～ 13:00
		Chair：吉村　健佑 / Kensuke Yoshimura（Japan）	
	LS2-1	デジタルヘルスの展望～次世代の可能性～ / Prospects of Digital Health: Possibilities for the Next Generation	櫻井　陽一 / Yoichi Sakurai（Japan）
			共催 / sponsored：NTTcomm
Free papers 2		**Glaucoma/myopia/oculomics**	13:00 ～ 14:35
		Chairs：Hidenori Takahashi（Japan）, Padmaja Rani（India）	
	O2-1	Partial Fundus Image Analysis	Hiyori Sakemi (Japan)
	O2-2	Investigating Glaucoma Using AEs	Ikki Osaka (Japan)
	O2-3	OD and OC Segmentation by NAT-UNet	Syochu Setsu (Japan)
	O2-4	Fundus Photos to Cytokine AI	Hidenori Takahashi (Japan)
	O2-5	EyeDiff: text-to-image generative foundation model improves rare eye disease diagnosis	Ruoyu Chen (China)
	O2-6	Interpretable Longitudinal Glaucoma Visual Field Estimation Deep Learning System from Fundus Images and Clinical Narratives	Xiaoling Huang (China)
	O2-7	Evaluating the use of prompt engineering in Vision-Language Models (VLMs) for disc swelling identification on fundus photography	Kelvin Li (U.S.)
	O2-8	Eye-Brain Biomarkers in Neurological Disease Detection: Comparing OCT and Omics Approaches	Jiahui Cao (China)
	O2-9	Detection of Mild Cognitive Impairment Through Digital Phenotyping of Gaze Movement	Masahiro Miyake (Japan)
	O2-10	Cross-disease Retinal Vascular Pattern Recognition and Analysis via a Robust Multi-path Neural Network Framework	Peng Xiao (China)
	O2-11	Neurovascular retinomics for precision profiling of cancer risk	Wei Zhang (China)
	O2-12	OM-Agent: A Reinforcement Learning Agent for Optimizing Ophthalmic Modality Selection	Weiyi Zhang (China)
	O2-13	Using 3D-MRI Imaging to Quantitatively Analyze the Shape of Eyeballs with High Myopia and to Investigate Relationships between Myopic Traction Maculopathy and Posterior Staphyloma	Xi Chen (China)
	O2-14	ChatMyopia: An AI Agent for Myopia-Related Question-Answer in Primary Eye Care Settings	Yue Wu (Hong Kong)
	O2-15	Axial Length Percentiles and Growth Patterns in a Large Chinese Pediatric Cohort: The Real-world Myopia Evolution and Intervention Study (REMEDY)	Ziyao Wang (China)
	O2-16	Leveraging Teleophthalmology for Myopia Detection and Management: A Digital Approach to Eye Care	Kowsalya Akkayasamy (India)
	O2-17	Longitudinal Analysis of Spatial Variations in the Choroid During Myopia Progression	Jixuan Yuan (China)
	O2-19	TIA estimation from slit-lamp	Eisuke Shimizu (Japan)
Free papers 3		**Retina / LLM**	15:45 ～ 17:15
		Chairs：Keita Kihara（Japan）, Raba Thapa（Nepal）	
	O3-1	Unsupervised Choroid Seg. with MAE	Tomokazu Fukuchi (Japan)
	O3-2	Cancelled	
	O3-3	FFA Sora: generating fundus fluorescein angiography videos for healthcare data sharing	Ruoyu Chen (China)
	O3-4	Artificial Intelligence for Predicting Progression from Early and Intermediate to Late Age-Related Macular Degeneration: A Systematic Review and Meta-Analysis	Christina Wunardi (Indonesia)
	O3-5	Topographical Variations of Choroidal Thickness in Children and Associations with Different Ages and Refractive Status	Luxiao Chen (China)
	O3-6	Cancelled	
	O3-7	Cancelled	
	O3-8	Cancelled	
	O3-9	Intraoperative hand-held optical coherence tomography for assessing retinal structural changes during macular hole surgery	Erika Sekiya (Japan)
	O3-10	The Evolution of Artificial Intelligence in Retinal Diseases (2005-2024) : A 20-Year Perspective on Trends and Future Directions	Christina Wunardi (Indonesia)
	O3-11	Using 30 Questions from 7 Countries	Yosuke Toba (Japan)
	O3-12	LLMs in Ophthalmology	keita kihara (Japan)
	O3-13	Benchmarking Next-Generation Reasoning-Focused Large Language Models in Ophthalmology: A Head-to-Head Evaluation on 5888 Question Items in Ophthalmology	Minjie Zou (Singapore)
	O3-14	BEnchmarking LLMs for Ophthalmology (BELO) : A comprehensive benchmark for ophthalmological knowledge and reasoning	Sahana Srinivasan (Singapore)
	O3-15	Evaluating LLMs and LLM Agents in Healthcare: Key Challenges in Clinical Applications	Xiaolan Chen (China)
	O3-16	DeepSeek-R1 Outperforms Gemini 2.0 Pro, OpenAI o1, and o3-mini in Bilingual Complex Ophthalmology Reasoning	Pusheng Xu (China)
	O3-17	Artificial Intelligence in Ophthalmic Patient Education: A Comparative Analysis with AI, Search Engines, and Human Expertise	Saurabh Haral (India)
	O3-18	Leveraging Large Language Models for Medical Web Application Development: A Pilot Study in Ophthalmology	Anand Singh Brar (India)

June 27 (Fri.) • 28 (Sat.)

Congres Square Grand Green Osaka Foyer

session	program number	short title	speaker (country)
E-Poster 1			27 (Fri.) 9:00 ～ 18:45 28 (Sat.) 9:00 ～ 16:45
	P1-1	AI-Based CK Diagnosis	QIANNAN LI (Japan)
	P1-2	Comparison of the Accuracy Between AI for POAG Diagnosis and AI for PACG Diagnosis Using Corvis ST	Yuta Nakaniida (Japan)
	P1-3	limitation of ChatGPT O1 pro	YOSHIYASU SANO (Japan)
	P1-4	Cross-modal FA Generation	RONGKAI SUN (Japan)
	P1-5	Fundus image for Telemedicine	Kentaro Nishida (Japan)
	P1-6	物体検出AIによる眼位異常の検出	Kenji Yoshitsugu (Japan)
	P1-7	Ophthalmic Fees Q&A System Upgrade	Yoshimi Ooya (Japan)
	P1-8	Feedback System to Promote AI	Hitoshi Tabuchi (Japan)
	P1-9	A Remote Collaborative Model using a digital platform to Enhance Eye Care Accessibility and Reduce Waiting Times	Yang Xu (Singapore)
	P1-10	The Papilledema Dilemma: Myopic Pseudopapilledema from Peripapillary Hyper-reflective Ovoid Mass-like Structures (PHOMS)	Bryan Sim (Singapore)
	P1-11	CLASSIFYING BAD SCANS VERSUS PRE AND POST CATARACT SURGERY ITRACE IMAGES USING A MACHINE LEARNING ALGORITHM	Michael Mahr (U.S.)
	P1-12	Association between morphological characteristics of the optic disc and other anatomical features of the fundus in highly myopic eyes	Xi Chen (China)
	P1-13	Cancelled	
	P1-14	Home-Based Eye Care: Enhancing Patient Comfort and Reducing Carbon Footprint with Portable Technology	Samaresh Srivastava (India)
	P1-15	Cancelled	
	P1-16	Enhancing ophthalmology education through a mobile flipped classroom: a new teaching method	Nader Nassiri (Iran)
	P1-17	Sequential Serous Choroidal Detachment in Subjects Undergoing Bilateral Trabeculectomy	Nader Nassiri (Iran)
	P1-18	Risk Factors for Ahmed Glaucoma Valve (AGV) Failure in Glaucoma Patients	Nader Nassiri (Iran)
	P1-19	Alcohol-Assisted Debridement in PRK with Intraoperative Mitomycin C	Nader Nassiri (Iran)
	P1-20	Visual outcome and contrast sensitivity after photorefractive keratectomy in low to moderate myopia: Wavefront-optimized versus conventional methods	Nader Nassiri (Iran)
	P1-21	Corneal Endothelial Cell Changes after Ahmed™ Valve and Molteno™ Glaucoma Implants	Nader Nassiri (Iran)
	P1-22	Orthoptic Changes following Photorefractive Keratectomy	Nader Nassiri (Iran)
	P1-23	Ahmed glaucoma valve and single-plate Molteno implants in treatment of refractory glaucoma: a comparative study	Nader Nassiri (Iran)
	P1-25	Cancelled	
	P1-26	OPTICAL NEURITIS AND RETINOPATHY DUE TO DENGUE INFECTION IN CHILDREN: A FIRST DOCUMENTED RARE CASE REPORT	Ragil Yulianto (Indonesia)
	P1-27	Patterns of Uveitis in a Level Three Government Hospital: A Ten Year Study	Marie Chemantha Alexandria Buscayno (Philippines)
	P1-28	Bridging the Digital Divide: Implementing a Social Media Avatar for Ophthalmology Patient Education and Communication	Anand Singh Brar (India)
	P1-29	Sleep onset time as a mediator in the association between screen exposure and aging: a cross-sectional study	Senlin Lin (China)
	P1-30	Evaluating Imaging Repeatability of Fully Self-Service Fundus Photography within a Community-based Eye Disease Screening Setting	Juzhao Zhang (China)
	P1-31	The Effectiveness of Different Machine Learning Models in Predicting Keratoconus Progression	Metehan Karaatlı (Turkey)
	P1-32	Association between MRD1 and Dry Eye Syndrome in Korean adults: A Cross-Sectional Study	Sun Young Jang (Korea)
	P1-33	Prediction of Cataract Severity Using Slit Lamp Images from a Portable Smartphone Device: A Pilot Study	David Chen (Singapore)
	P1-34	Comparison of Machine Learning Algorithms for Predicting Subclinical Keratoconus Using Pentacam-Derived Numerical Data	Onur Özalp (Turkey)
	P1-35	Cancelled	
	P1-36	Cancelled	
	P1-37	VISUAL ANGLE MEASUREMENTS USING NEWLY DEVELOPED REAL-TIME VIDEO-BASED GAZE TRACKING DEVICE FOR OCULAR MOTOR PALSY	Dinda Ajeng Anindita (Indonesia)
	P1-38	How to Begin and sustain teleconsultation- An experience from a tertiary eye care centre with 117 Teleophthalmology enabled Primary eye Care centres	Kowsalya Akkayasamy (India)
	P1-39	Deep Learning-Based Predictive Model for Assessing the Adequacy of Skin-Only Removal in Upper Blepharoplasty for Novices	Yi-Chieh Lee (Taiwan)
	P1-40	Multicenter Evaluation of Deep Learning Algorithms in Detecting Treatment-requiring Retinopathy of Prematurity from Fundus Images	Yuling Xu (China)
	P1-41	Reclaiming Vision: Tackling Pediatric Retinal Detachment with Advanced Techniques	Padmaja Kumari Rani (India)
	P1-42	Standardized Evaluation of Artificial Intelligence Generated Patient Education Materials in Healthcare	Anand Singh Brar (India)

June 28 (Sat.)

Congres Square Grand Green Osaka ROOM 1

session	program number	short title	speaker (country)
Symposium 4		**AI seeds research and Tele-ophthalmology**	9:00 ～ 10:30
		Chairs : Yoshiyuki Kitaguchi (Japan) , Raba THAPA (Nepal)	
	SY4-1	CorneAI for iOS: Edge-Based AI Implementation for Anterior Segment Disease Classification on Mobile Devices	Yoshiyuki Kitaguchi (Japan)
	SY4-2	automatic classification of corneal images	Yuta Ueno (Japan)
	SY4-3	Federated Learning AI for IOL Calculation	Gaku Kiuchi (Japan)
	SY4-4	Blow-out Fracture detection using AI (TBC)	Naoki Okumura (Japan)
	SY4-5	Cancelled	
	SY4-6	Tele-ophthalmology service at rural and remote communities: achieving Sustainable Development Goal (SDG) at low resource setting	Raba THAPA (Nepal)
Joint Symposium 1		**Basic and Clinical Perspectives – Artificial Intelligence and Myopia**	10:30 ～ 11:30
		Chairs : Tetsuro Oshika (Japan) , Ryo Kawasaki (Japan)	
	JS1-1	AI for Medicine to Personalized Health Digital Twin	Kazuhiro Sakurada (Japan)
	JS1-2	Artificial Intelligence and High Myopia	Yining Wang (Taiwan)
	JS1-3	Adaptive AI-Driven Platform for Myopia Management	Sina Fateh (U.S.)
	JS1-4	Can We Predict & Control Myopia Using AI? Potential & Challenges of Using AI	Mingguang He (Hong Kong)
			中継会場
Luncheon Symposium 1		**Telemedicine & AI for ROP**	11:45 ～ 12:45
		Chairs : Yoko Fukushima (Japan) , Peter Campbell (U.S.)	
	SSY1-1	Non-Imaging ML for ROP	Yusuke Takeda (Japan)
	SSY1-2	Tele ROP screening by VR Headset mounted smartphone-based Indentation fundus live videography	Deependra V Singh (India)
	SSY1-3	Intelligent Diagnosis and Automatic Generation of Medical Imaging Reports for Retinopathy of Prematurity	Honghua Yu (China)
	SSY1-4	Innovations in AI-Assisted ROP Telemedicine	J. Peter Campbell (U.S.)
	SSY1-5	AI for ROP prediction based on NICU monitoring signals	Yoko Fukushima (Japan)
			共催 / sponsored : 株式会社ネオキュア / NeoCure Inc.
Symposium 5		**Database, Data Harmonization, Collaboration & Regulation**	13:00 ～ 14:20
		Chairs : Masahiro Miyake (Japan) , Malvina EYDELMAN (U.S.)	
	SY5-1	Japan Ocular Imaging Registry	Masahiro Miyake (Japan)
	SY5-2	Building Functional and Multimodal Imaging Data for Surgical Retinal Diseases	Ning Cheung (Singapore)
	SY5-3	Health Data Through the Lens of AI Ethics	Nan Liu (Singapore)
	SY5-4	Federated Optic Disc AI	Hitoshi Tabuchi (Japan)
	SY5-5	GEN Japanese Cohorts	Mariko Sasaki (Japan)
	SY5-6	Multimodal Data Integration in Ophthalmology: Enhancing Clinical Insights through AI-driven Analysis	Zongyuan Ge (Aus)
Symposium 6		**Oculomics today**	14:20 ～ 15:40
		Chairs : Lisa Zhuoting Zhu (Aus) , Yuta Nakashima (Japan) , T.Y. Alvin Liu (U.S.)	
	SY6-1	Oculomics and AI: Predicting Metabolic Syndrome from Retinal Images in the JOI Registry	Koichi Nishitsuka (Japan)
	SY6-2	How AI and Oculomics Will Unlock Secrets of Systemic Health and Change Care Delivery Beyond Ophthalmology	Alvin Liu (U.S.)
	SY6-3	From Vision to Value: A Cost-Effectiveness Framework for Oculomics Deployment	Lisa Zhuoting Zhu (Aus)
	SY6-4	Automated Diabetic Retinopathy Screening in the Primary Care Settings: Recent Progress and Future Potentials to Prevent Blindness	Alauddin Bhuiyan (U.S.)
	SY6-5	Leveraging Oculomics for Chronic Kidney Disease Detection: Evaluating the Performance of RETFound- Enhanced Deep Learning Models	Charumathi Sabanayagam (Singapore)
	SY6-6	Traditional Risk Factor Models and Oculomics for Major Adverse Cardiovascular Events Prediction	Yukun Zhou (UK)
	SY6-7	Age/CVD risk	Yuta Nakashima (Japan)
Closing & Big data competion award 1			15:45 ～ 16:45
		Chairs : Ryo Kawasaki (Japan) , Mingguang He (Hong Kong) , Tetsuro Oshika (Japan)	

Congres Square Grand Green Osaka Myopia Society Venue 1

session	program number	short title	speaker (country)
Joint Symposium 1		**Basic and Clinical Perspectives – Artificial Intelligence and Myopia**	10:30 ～ 11:30
		Chairs : Tetsuro Oshika (Japan) , Ryo Kawasaki (Japan)	
	JS1-1	AI for Medicine to Personalized Health Digital Twin	Kazuhiro Sakurada (Japan)
	JS1-2	Artificial Intelligence and High Myopia	Yining Wang (Taiwan)
	JS1-3	Adaptive AI-Driven Platform for Myopia Management	Sina Fateh (U.S.)
	JS1-4	Can We Predict & Control Myopia Using AI? Potential & Challenges of Using AI	Mingguang He (Hong Kong)

抄録
Abstract

Keynote lecture 1 AI: History, Now and Beyond June 27 (Fri.) 9:00〜10:00

Chairs : Ryo Kawasaki (Japan) , Tetsuro Oshika (Japan) , Mingguang He (Hong Kong)

KL1-1 Uniting for Vision: Global Collaborations Driving AI and Telehealth in Eye Care

○Malvina Eydelman

This presentation will explore how global collaboration is the key to unlocking the future of ophthalmic care. As the medical device sector becomes increasingly globalized and technologically complex, harmonized, efficient frameworks across economies are essential. Since its formation in 2011, the International Medical Device Regulators Forum (IMDRF) has driven regulatory convergence, defining terminology and requirements for AI/ML enabled medical devices. To truly revolutionize eye care, ophthalmology-specific global consensus is urgently needed. The Collaborative Community on Ophthalmic Innovation (CCOI) brings together the full medical product ecosystem—patients, clinicians, regulators, researchers, industry, payors, and investors—to forge consensus, align global priorities, and enable shared clinical and regulatory infrastructure. CCOI functions as a strategic coordination hub, bridging the gap between innovation and patient access. We invite all leaders in eye care to join us in shaping the future—accelerating development, regulatory clarity, and adoption of transformative ophthalmic devices worldwide.

KL1-2 Generative AI Landscape in Creative Workflow

○Kota Yamaguchi
Cyber Agent

The talk discusses the landscape of generative AI in the creative workflow. Generative AI has advanced in creating text, images, and videos, and various applications based on generative models are emerging. The creative domain is one of the most promising application areas, and text-to-image generation is expected to enhance the design workflow. While large language models (LLMs) can assist at various stages of the creative process, several challenges remain in implementing generative models in real-world applications due to the current models' limitations, such as lack of precise object control, limited capacity for iterative design, and difficulties in incorporating extensive design context and rules. Current research investigates an agentic approach and structured data to overcome these limitations. This talk briefly introduces a few state-of-the-art methods for text-to-template generation and concludes with discussions on open problems in the creative workflow.

Joint Symposium 1　Basic and Clinical Perspectives - Artificial Intelligence and Myopia　June 28 (Sat.) 10:30~11:30
Chairs : Tetsuro Oshika (Japan) , Ryo Kawasaki (Japan)

JS1-1　AI for Medicine to Personalized Health Digital Twin

○Kazuhiro Sakurada

AI-based learning is becoming essential to all scientific discovery. Just as mathematics is essential to physics, AI is essential to biology and medicine.
By the time symptoms appear, irreversible changes have already occurred in the patient's body. Simply suppressing symptoms isnot enough to restore a chronically ill patient to a healthy state. To overcome this problem, we need medical care that can predict changes in the body's condition before symptoms appear and prevent the onset of disease based on the root cause of the disease.The Personalized Health-Digital Twin has the ability to predict changes in each individual patient with the goal of achieving preventive medicine. Traditional biological methods, such as systems biology, have viewed disease as "existing" and modeled the events that occur there in terms of cause and effect. However, this method cannot interpret the process of "generating" disease.
Humans and other living organisms exhibit characteristic behavior as non-equilibrium open systems in dynamical systems. I introduced the concept of "state" to biological systems in order to structure life history data in a computable format. A state is expressed as a set of variables at a single point in space. The trajectory of the point in space as it moves over time represents the time variation of the state. In other words, the complex life course of living organisms and humans can be expressed in a learnable format by mapping it onto a virtual space called a state space. This method of data representation is called life history modeling.
In dissipative systems, there is a phenomenon where trajectories in phase space are attracted to a particular region (a collection of states) . Such a region is called an attractor. Based on the manifold hypothesis, the set of attractors that humans or life forms can adopt can be seen as a low-dimensional manifold. If we can identify the steady states that humans can reach in a reproducible way through self-learning, we can have the system learn from observational data over time to predict which steady state will be reached next. Using this type of learning, we can develop individualized predictive models for all types of diseases.
This standardization will not only improve the reproducibility and reliability of disease prediction models, but also develop a model that will form the basis for the Personal Health-Digital Twin that integrate medical domain knowledge, physics, and computer science.

JS1-2　Artificial Intelligence and High Myopia

○Yining Wang

Myopia has emerged as a major global public health concern, with its increasing prevalence placing a significant burden on healthcare systems. Among affected individuals, high myopia (HM) substantially elevates the risk of developing pathologic myopia (PM) , a leading cause of irreversible vision loss worldwide. Given the progressive nature of PM, early detection of pathological changes and accurate prediction of disease progression are crucial but remain clinically challenging.
In recent years, artificial intelligence (AI) has revolutionized medical imaging and data analysis, offering powerful tools to enhance diagnostic accuracy and prognostic assessment across various ocular diseases, including HM and PM. This presentation will introduce AI-driven approaches developed at the Ophthalmology Department of Institute of Science Tokyo, to tackle key challenges in PM management. Specifically, we have constructed: (1) a deep learning model for automated staphyloma detection using ultra-widefield optical coherence tomography (UWF-OCT) , (2) a deep learning model utilizing baseline fundus images to predict long-term macular neovascularization (MNV) development, and (3) a machine learning algorithm to predict visual acuity decline in high myopia. These advancements highlight the potential of AI in facilitating personalized disease management and improving clinical outcomes for patients with HM.

JS1-3 Adaptive AI-Driven Platform for Myopia Management

○Sina Fateh

The global prevalence of myopia has increased dramatically over the past decade. While genetic predisposition contributes to myopia development, the accelerated increase in prevalence strongly implicates contemporary environmental and lifestyle factors as dominant contributors, particularly extended near-work time and reduced outdoor activity.

Current specialized eyeglasses and contact lenses for myopia management, employ a static approach with a clear central zone and fixed peripheral treatment zone integrated into their lenses to inhibit and alter peripheral retinal signaling. Despite demonstrating efficacy in slowing myopia progression, these interventions lack adaptability to the progressive nature of myopia.

We present a novel AI deep learning software intervention that creates a computational model of the user's retina on the screen, allowing for customized image modulation in selected retinal areas. Unlike fixed optical approaches, our system uniquely adjusts image alteration and peripheral inhibition level in real-time, responding to myopia progression. This adaptive platform enables highly personalized myopia management protocols tailored to individual patient characteristics, visual needs, and lifestyle factors.

Furthermore, our solution is deployable through cutting-edge XR virtual glasses, providing two critical advantages: a large 130-inch virtual screen presented at 2.5 meter and a binocular capability that allows for customized treatment parameters for each eye individually. This advancement addresses the clinical challenge of asymmetric myopia progression while improving the binocular vision. Our preliminary clinical measurements are promising with enhanced user compliance and satisfaction due to its customizable nature and seamless integration into daily activities. MyopiaAI is part of Stanford StartX Accelerator program.

JS1-4 Can We Predict & Control Myopia Using AI? Potential & Challenges of Using AI

○Mingguang He

With the rising global prevalence of high myopia and its associated sight-threatening complications, there is an urgent need for accurate prediction models and effective intervention strategies. Our research team has established multiple large-scale cohort studies across China, collecting comprehensive longitudinal data including axial length progression, retinal imaging parameters, genetic markers, and environmental exposure profiles. These datasets have enabled us to develop robust risk prediction algorithms for high myopia progression and myopic macular degeneration.

This lecture will discuss: (1) our framework for predicting high myopia development and progression using multimodal data integration; (2) the application of AI technologies in analyzing complex ocular parameters; and (3) the clinical translation of these predictive models into personalized intervention strategies. We will also address current challenges and future directions in implementing these advanced approaches in real-world practice.

Symposium 1　Foundation models Potentials and Challenges　June 27 (Fri.) 10:15～11:45

Chairs : Hitoshi Tabuchi (Japan) , Yih Chung Tham (Singapore)

SY1-1　Impact of Pre-training Data on Medical Foundation Models

○Yukun Zhou

Medical foundation models (FMs) , pre-trained on large-scale unlabelled data, show strong performance and efficiency in clinical tasks. However, the role of pre-training data in shaping FM fairness and generalisability remains underexplored. To investigate this, we used two large retinal image cohorts from Moorfields Eye Hospital (UK) and the Shanghai Diabetes Prevention Program (China) , each with 904,170 images. We developed parallel FMs using identical pipelines and assessed their performance on downstream tasks. While FMs showed strong generalisability overall, they performed significantly better on tasks aligned with their pre-training data in about one-third of evaluations. We also found that age, but not sex or ethnicity, substantially influenced FM fairness and generalisability in retinal imaging. These findings support evidence-based selection of pre-training data and underscore the need for transparency in data sourcing to guide FM development and ensure more equitable applications in healthcare.

SY1-2　Improve performance of prognostic model for visual prognosis in Retinitis Pigmentosa

○Kouya Honma[1], Nagai Tatsuya[2], Kawamata Yuto[2], Yoshihara Masahito[1,3], Kawakami Eiryo[1,3,4], Baba Takayuki[2]

[1] Department of Artificial Intelligence Medicine, Graduate School of Medicine, Chiba University, Chiba, Japan.,
[2] Department of Ophthalmology and Visual Science, Graduate School of Medicine, Chiba University, Chiba, Japan,
[3] Institute for Advanced Academic Research (IAAR) , Chiba University, Chiba, Japan.,
[4] Advanced Data Science Project (ADSP) , RIKEN Information R&D and Strategy Headquarters, RIKEN, Yokohama, Kanagawa, Japan.

Purpose: We previously repurposed a deep learning diagnostic model to predict RP prognosis, achieving a moderate c-index of 0.79. However, its accuracy might be limited by the small number of RP cases and lower performance in males. In this study, we enhance the visual prognosis model by leveraging RETFound, a larger-scale retinal image foundation model.
Methods: To validate RETFound's usefulness, we used fundus images from 252 RP cases (496 eyes) and 103 non-RP cases (103 eyes) for RP diagnosis, age estimation, and gender determination. Additionally, we used machine learning survival analysis to predict visual acuity loss, leveraging RETFound's latent features as input.
Results: RETFound outperformed previous models in RP diagnosis, age estimation, and gender determination. However, its latent features showed no significant improvement in visual prognosis prediction, and accuracy remained low for males.
Conclusion: A larger foundation model enhances the characterization accuracy of small-scale data. However, gender differences in RP visual prognosis prediction likely stem from the disease itself rather than the model or training data.

SY1-3 Emergence of Multiple Foundation Models in Ophthalmology: Which is the Right Fit?

○Yih Chung Tham

SY1-4 Towards Multi-Modal Foundation Models for Retinal Image Analysis

○Julio Silva-Rodríguez

Foundation vision-language models demonstrate strong generalization in natural image domains but face persistent challenges in medical imaging, primarily due to its fine-grained and domain-specific nature. To address this, we introduced FLAIR, the first contrastive vision-language model specifically designed for retinal fundus image analysis. FLAIR is trained on 38 open-access datasets, spanning 101 target conditions and over 288,000 images. It incorporates expert domain knowledge through descriptive textual prompts, mitigating the limitations of the categorical supervision common in medical datasets. These prompts, curated from clinical literature and professional guidelines, capture subtle pathological features as well as inter-condition hierarchies. Extensive evaluations show that FLAIR generalizes robustly to unseen disease categories and across domain shifts. When adapted using a lightweight linear probe, FLAIR surpasses fully supervised, dataset-specific models—particularly in few-shot scenarios. It also significantly outperforms larger-scale generalist vision-language models and domain-specific self-supervised approaches, underscoring the value of integrating expert knowledge into medical AI systems.

SY1-5　EyeFound, EyeClip & Fundus2video

○Mingguang He

Symposium 2 Generative AI for Ophthalmology Practice

June 27 (Fri.) 13:00〜14:30

Chairs : Toshinori Murata (Japan) , Robert Chang (U.S.) , Yih Chung Tham (Singapore)

SY2-1 Video generation and potential use in pracice

○Robert Chang

Generative AI can enhance retinal imaging with synthetic data, enable multimodal chatbots for disease education, and reduce physician administrative overload. With the right data set and AI agents, algorithms can perform similarly to junior clinicians. Benefits include increased efficiency, diagnostic consistency, and broader access to care. However, risks such as inaccurate outputs, bias, and unclear decision-making require careful validation and oversight with physicians in the loop.

SY2-2 Generative AI and DL Powered Teleconsultations Using Smartphone Captured Images of Corneal Diseases

○Vineet Joshi

More than 50percent of corneal transplant patients lose to follow up after 12 months and are a major reason for graft failure. We developed a universal device and app to aid patients capture clinical grade images of cornea using their own smartphones from their home. We developed CNN based algorithms to detect corneal features, image quality, illumination to enhance clinical evaluation and teleophthalmology efficiency. Then we developed a LLM Chatbot to help deliver care in identifying graft related complications, seek emergency appointments, seek medical care and identify the images of grafts with complications and pattern recognition. This also covered a multilingual support on ground to help patients with corneal transplant to seek help in absence of clinicians.

SY2-3 Application of Artificial Intelligence and Large Language Models in Ophthalmology

○Gavin Tan

SY2-4 Evaluation of changes in microaneurysms and retinal vascular leakage before and after anti-VEGF therapy for diabetic macular edema using an OCTA-based artificial intelligence-inferred fluorescein angiography system

○Toshinori Murata[1], Takao Hirano[1], Hideaki Mizobe[2], Shuhei Toba[2]

[1] Shinshu University, Matsumoto, Japan., [2] Canon Inc, Tokyo, Japan

Optical coherence tomography angiography (OCTA) is a non-invasive imaging modality but has limitations in detecting microaneurysms (MAs) and vascular leakage compared to fluorescein angiography (FA). We evaluated an AI-inferred FA system, which generates FA-like images from OCTA, for assessing changes in MAs and leakage before and after anti-VEGF therapy in diabetic macular edema (DME). OCTA-based AI-inferred FA detected 86.3% of MAs identified by FA, compared to only 32.2% by OCTA. Both MAs and macular leakage area significantly decreased after treatment, as demonstrated by AI-inferred FA, closely matching FA findings. These results suggest that AI-inferred FA enhances the ability of OCTA to monitor vascular changes non-invasively, potentially improving DME management.

SY2-5 EyeAgent: an Interpretable Ophthalmology Multimodal Agent (from Danli Shi to Mingguang He)

Danli Shi, ○Mingguang He
The Hong Kong Polytechnic University, Hong Kong, Hong Kong

Artificial intelligence has advanced ophthalmology through task-specific models for disease classification and segmentation. However, clinical adoption remains limited due to these models' static, single-task design and lack of interpretability. We present EyeAgent, the first interpretable, tool-using multimodal agent for comprehensive ophthalmic analysis. Using a large language model as its brain, EyeAgent dynamically orchestrates 47 expert tools across over 20 imaging modalities and diverse tasks, including classification, segmentation, generation, and analysis, without retraining. It delivers step-by-step, interpretable outputs aligned with clinical workflows. EyeAgent achieved 93.7% tool selection accuracy in 200 real-world cases, with expert-rated acceptability scores of 88.0% (accuracy), 93.0% (completeness), 90.5% (safety), 94.0% (reasoning), and 88.5% (interpretability). It also performed strongly on visual question-answering benchmarks and in complex clinical tasks. EyeAgent offers a flexible, extensible, and transparent framework, marking a paradigm shift in ophthalmic decision support.

SY2-6 Cancelled

We will present evidence that use of a clinical decision support tool (CDSS) in primary eye care settings has the potential to increase the referral rate of glaucoma while keeping the false positive rate low. This decision support tool incorporates published scores that utilize OCT data in novel ways for this screening/identification. One score combines retinal nerve fiber layer (RNFL) and ganglion cell layer (GCL) data from Maestro2 (Topcon Corporation, Tokyo, Japan) based on a logistic regression published by Fukai et al, while another utilizes summary parameters from RNFL and GCL, together with clinical factors including IOP, CCT, visual field PSD, and age.

SY2-7 Semantic Foundations in Ophthalmology: An Ontology-Based LLM Approach to Macular Degeneration

○Su Jeong Song

Symposium 3 AI for DR Screening: Roadmap to AI implementation June 27 (Fri.) 15:45〜17:15
Chairs : Ryo Kawasaki (Japan) , Paisan Ruamviboonsuk (Thailand) , Gavin Tan (Singapore)

SY3-1 What's Next for DR Screening Using AI

○Paisan Ruamviboonsuk

SY3-2 Diabetic Retinopathy Screening AI in Japan: Current Status and Barriers to Adoption

○Hidenori Takahashi

In Japan, the Pharmaceuticals and Medical Devices Agency (PMDA) oversees the approval of medical devices, while certified private organizations handle certification for functions already approved in existing devices. The approval process typically takes about four years and costs around $500,000 USD, whereas certification usually requires only one-tenth of that cost, though there is substantial variability depending on the device class.

As of now, no AI-based diagnostic system for diabetic retinopathy (DR) has been officially approved in Japan. However, under Japanese regulations, the use of non-approved AI software as a reference tool during remote interpretation of screening images is not explicitly prohibited, and physicians may use such tools at their discretion. Leveraging this framework, DeepEyeVision Inc. offers a service in which AI acts as the primary reader, followed by secondary review by board-certified ophthalmologists.

In addition, DeepEyeVision for RetinaStation—a certified software incorporated into Nikon's fully automated fundus camera, RetinaStation—displays heatmaps indicating deviations from normality. While this function is not specific to DR, it can incidentally highlight suggestive findings. Another certified product, DeepEyeVision for California, enables visualization of deviations from normal vascular density in ultra-widefield color fundus images from the Optos California device, which may incidentally indicate areas of non-perfusion.

However, the performance level of certified AI alone is insufficient to meet the needs of ophthalmology specialists. Going forward, the commercialization of approved AI diagnostic software is anticipated. It is widely recognized that current AI systems, though highly accurate, may still misclassify cases that physicians would not. As long as such limitations exist, AI is unlikely to replace human graders—particularly in Japan, where this cautious stance is more pronounced. Consequently, physician-centered interpretations with AI assistance are expected to continue, and their adoption will likely expand gradually rather than rapidly.

SY3-3　AI in Future of Diabetic Retinopathy Management

○Gavin Tan

SY3-4　Cancelled

SY3-5 Quality and Residents' Preference of Self-Service Fundus Diseases Screening Based on Automation and Artificial Intelligence

○Haidong Zou

A facilitated self-service eye screening pattern has been newly established in 2022 in Shanghai, China, which may help solve the problem of insufficient human resources in primary healthcare institutions. We conducted a cross-sectional study in two communities in Hongkou District. The exposure group was the facilitated self-service fundus disease screening pattern, and the control group was the traditional telemedicine screening pattern. Residents' basic characteristics were balanced between the two groups. There was no significant difference between the service quality of the two groups (Image quality pass rate: p=0.79; the average screening time: p=0.57; No physiological discomfort rate: p=0.92; Safety rate: p=0.78; Convenience rate: p=0.95; Trustworthiness rate: p=0.20). However, the proportion of 'Prefer facilitated self-service eye screening' in the exposure group was significantly lower than the proportion of 'Prefer traditional manual screening' in the control group ($p<0.01$). Subgroup analysis indicated that distrust in the facilitated self-service eye screening might increase the probability of 'Refusal of screening'. Therefore, we suggest that the digital transformation of healthcare must be cautious.

SY3-6 SMART (AI-enabled) DROP (Diabetic Retinopathy Outcomes and Pathways) Project: Real-World AI Integration Experience

○Padmaja Kumari Rani[1], DurgaBhavani Kalavalapalli[2], Narayanan Raja[1], Shyam Kalavalapalli[2], Ritesh Narula[1], Rakesh K Sahay[2], Sarang Deo[3]

[1] LV Prasad Eye Institute, Hyderabad, India., [2] Idea clinics, Hyderabad, India.,
[3] Indian school of Business, Hyderabad, India

This talk delves into the real-world insights from the SMART (AI-enabled) DROP project, a systematic diabetic retinopathy (DR) screening initiative in India. By embedding artificial intelligence (AI) within physician clinics, this innovative program seeks to transform the early detection of DR, bridging the gap between diabetes clinics and specialized eye care centers through seamless referral pathways.

The presentation also focuses on the challenges and lessons learned from deploying AI in diverse healthcare settings, including the management of false positive referrals and the critical incorporation of technician-led grading to enhance diagnostic accuracy. It highlights the complexities of integrating AI with existing clinical workflows while ensuring patient trust and effective decision-making.

Through the lens of the SMART DROP project, this talk provides actionable insights into refining AI-enabled screening pathways, improving early detection, and creating scalable, efficient, and equitable models for managing chronic eye conditions like DR.

SY3-7　The Future of AI in DR screening in the South Pacific: Opportunities and Challenges

○Rosamond Gilden

Worldwide, 589 million adults have diabetes with this number projected to increase to 853 million by 2045. Eighty-one percent of people with diabetes reside in low-and-middle income countries where lifestyle changes, population growth and ageing are driving this increase. Preventing sight loss requires effective glycaemic control, annual eye screenings, and timely treatment. However, in many Pacific countries, systemic barriers such as limited screening access, inadequate trained personnel and fragmentation in the continuum of care hinder early detection and intervention. This presentation will explore the potential of artificial intelligence（AI）to improve diabetic eye care outcomes in the South Pacific. It will also examine key ethical, cultural, and logistical considerations for implementing AI in this region. A Pacific-driven approach designed with and led by Pacific communities, is essential to ensure that AI is embedded sustainably and delivers long-term, contextually relevant benefits.

SY3-8　Current Landscape in the US and Longitudinal Deployment Experience at Johns Hopkins

○Alvin Liu

Autonomous AI for diabetic eye disease testing is the first fully autonomous AI medical device approved by the US FDA in any medical field. It was first approved in 2018. This talk will provide an overview of the deployment experience of this technology in the United States, with a particular focus on the regulatory, commercial and logistical considerations. In addition, longitudinal deployment experience and data over 4 years at Johns Hopkins Medicine, an integrated health system with 6 hospitals and over 40 primary care sites, will be shared.

Symposium 4 AI seeds research and Tele-ophthalmology June 28 (Sat.) 9:00〜10:30
Chairs : Yoshiyuki Kitaguchi (Japan) , Raba THAPA (Nepal)

SY4-1 CorneAI for iOS: Edge-Based AI Implementation for Anterior Segment Disease Classification on Mobile Devices

○Yoshiyuki Kitaguchi

CorneAI is a deep learning model that classifies anterior segment diseases into nine categories—such as infectious keratitis, scar, tumor, and cataracts—with a validated accuracy of 86% on slit-lamp images. To overcome the accessibility limitations of this PC-based system, we developed and validated an edge-AI implementation that runs entirely on a smartphone. Our study confirms that the mobile app achieves diagnostic performance comparable to the original PC model when analyzing existing on-screen photographs. Future work will focus on fine-tuning the model with smartphone-captured images to enable accurate diagnoses directly from the device's camera. This mobile implementation transforms CorneAI into a highly accessible and powerful screening tool, holding significant potential to bring crucial diagnostic support to clinics and regions with limited access to specialists.

SY4-2 AI automatic classification of corneal color images captured by autorefractometer

○Yuta Ueno[1], Oda Masahiro[2], Maehara Hiroki[3,4], Ito Yoshikazu[1], Yamaguchi Takefumi[4], Kitaguchi Yoshiyuki[5], Miyazaki Dai[6], Chikama Taiichiro[7], Nejima Ryohei[8], Mori Kensaku[2], Oshika Tetsuro[1]
[1] University of Tsukuba, [2] Nagoya University, [3] Fukushima Medical University,
[4] Tokyo Dental College Ichikawa General Hospital, [5] Osaka University, [6] Tottori University, [7] Hiroshima University,
[8] Miyata Eye Hospital

Purpose: We have developed a corneal 9-classification program (CorneAI) trained on slit lamp images. Recently, it has become possible to acquire corneal color images via a multifunction autorefractometer (MR-6000, Tomey Corp.), so we aimed to develop a program with additional training for these new images.
Methods: A total of 573 eyes consisting of 9 categories of normal and 8 anterior segment diseases with abnormal findings in the corneal area (infectious corneal infiltration, non-infectious corneal infiltration, corneal scar, corneal deposit, bullous keratopathy, neoplastic lesion, lens opacity, and acute glaucoma attack) were included in this study. Anterior segment color images were captured using MR-6000, with up to 5 images taken per eye. We developed a classification model applied for MR-6000 by providing additional training to the original CorneAI with these images, conducted 5 fold cross validation of the classification accuracy, and compared it with the original version.
Results: 2,860 images were used for analysis. The 9 classification accuracy of the trained model was 83.5%, significantly exceeding the 69.5% accuracy achieved using the original CorneAI ($P<0.01$).
Conclusions: We created a prototype of an AI automatic classification program for images taken with an autorefractometer and achieved good classification accuracy.

SY4-3　Federated Learning AI for IOL Calculation

○Gaku Kiuchi

Machine learning-based intraocular lens (IOL) power calculation formulas have recently been developed, showing promising accuracy. However, large-scale training data is required, which is difficult to obtain at a single institution. Variations in devices and lens types may affect model generalisability and accuracy when aggregating data from multiple centers. Privacy concerns also arise when clinical data are transferred externally for training. Federated Learning (FL) enables each institution to train a model locally using its own data, sharing only model parameters for central aggregation. This approach preserves data privacy and facilitates collaborative modelling across multiple centres. FL can also be adapted to reflect the characteristics of each institution. We are currently developing a FL-based predictive model for postoperative refractive outcomes using preoperative biometric and IOL data. In this presentation, we will outline the current status of our FL model and discuss future challenges.

SY4-4　Blow-out Fracture detection using AI (TBC)

○Naoki Okumura
Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University, Kyotanabe, Japan.

Orbital fractures frequently present as emergencies, yet oculoplastic specialists are rarely available for initial assessment. Accurate diagnosis is challenging for non-specialists, particularly in distinguishing trap-door fractures requiring immediate surgery from depressed fractures that allow planned intervention. Misdiagnosis of trap-door fractures can result in permanent complications, while unnecessary emergency referrals strain healthcare resources.

We developed a hierarchical deep learning system for automated orbital fracture detection and classification using 46,013 CT slices from 686 patients. Our two-stage approach employs YOLOv8 for initial fracture detection, achieving 96.0% patient-level sensitivity and 96.4% specificity. Subsequently, Vision Transformer classifies detected fractures, demonstrating 90.0% sensitivity and 95.6% specificity for identifying trap-door fractures requiring emergency intervention.

This AI system enables accurate triage in non-specialist settings, ensuring emergency cases receive immediate specialist referral while allowing appropriate scheduling for stable fractures. The high diagnostic accuracy benefits both physicians and patients by reducing diagnostic uncertainty and optimizing treatment pathways.

Despite these promising results, challenges remain in clinical workflow integration and system deployment. This symposium will present our AI system's current capabilities, discuss implementation barriers encountered in real-world clinical settings, and introduce our ongoing initiatives to bridge the gap between technological innovation and practical healthcare delivery.

SY4-5 Cancelled

This talk presents our team's efforts in leveraging smartphones and AI for eye disease self-management. Traditional care depends on clinical visits, limiting accessibility. By integrating AI-driven image analysis, risk assessment, and decision support, we enable real-time monitoring, early detection, and personalized guidance. This innovative model empowers patients, enhances accessibility, and improves early intervention. I will discuss key findings, technological advances, and future directions, highlighting its potential to transform ophthalmic care.

SY4-6 Tele-ophthalmology service at rural and remote communities: achieving Sustainable Development Goal (SDG) at low resource setting

○Raba THAPA

The United Nations Sustainable Development Goal (SDG) are the universal call for action to build a healthier world for the global population and environment by 2030. It comprises of 17 major goals in various diverse disciplines. The third goal is good health and wellbeing. Vision of people plays a crucial role in the good health and wellbeing of people in their life. Low vision and blindness affects achievement of all 17 goals of SDGs. The low middle income countries are still struggling with the avoidable blindness and limited access to eye care. Besides this, there is unequal distribution of eye health service with limited access to the remote areas and marginalized population. Tele-ophthalmology service in rural and remote areas has been the effective modality of eye care services for early detection of the vision threatening cases, and prompt treatment by timely referral resulting in preservation of good vision.

Symposium 5　Database, Data Harmonization, Collaboration & Regulation　June 28 (Sat.) 13:00～14:20
Chairs : Masahiro Miyake (Japan) , Malvina EYDELMAN (U.S.)

SY5-1　Japan Ocular Imaging Registry

○Masahiro Miyake

The Japanese Ophthalmological Society (JOS) is encouraging the societal implementation of artificial intelligence (AI) in ophthalmology, with a particular focus on the development of the Japan Ocular Imaging Registry (JOI Registry) , a national database for ocular imaging and related data (Miyake et al., Japanese Journal of Ophthalmology, 2022). This project involves 22 university hospitals and two health check-up facilities across the country, establishing a system that automatically aggregates data from electronic medical records of ophthalmology. Portions of the collected data are made available to member institutions. Additionally, pretrained models developed through collaborative research with the National Institute of Informatics, based on these data, are also publicly accessible.

To pioneer the development of AI-based medical devices, the JOS has taken the lead in driving innovation in this field. In collaboration with the Japan Ophthalmic Instruments Association (JOIA) , the society has actively engaged with regulatory bodies. The first product developed under the society's initiative is expected to receive regulatory approval by the time of this symposium. Similarly, the Japan Cornea Society is advancing its own research and development efforts. Insights into regulatory science gained from these processes are being utilized to support member companies in their AI medical device development endeavors.

SY5-2　Building Functional and Multimodal Imaging Data for Surgical Retinal Diseases

○Ning Cheung

Surgical retinal diseases, such as retinal detachment and epiretinal membrane, are common sight-threatening eye diseases that often require surgical intervention. However, unlike common medical retinal diseases, such as age-related macular degeneration and diabetic retinopathy, there is a relative lack of contemporary clinical and imaging data on these surgical retinal diseases. In recent years, based on our cohort studies and clinical trials, we have begun to prospectively build a growing database for retinal detachment and epiretinal membrane at the Singapore National Eye Centre. These studies provide functional and multimodal imaging data, including M-chart, microperimetry, retinal photography, optical coherence tomography, as well as quality of life measures. These contemporary data offer unique opportunities for collaborative studies using artificial intelligence. However, it also creates new challenges in relation to harmonization, standardization and sharing of research data.

SY5-3 Health Data Through the Lens of AI Ethics

○Nan Liu

In the era of artificial intelligence, health data is both a powerful asset and a profound responsibility. This presentation will explore how AI ethics provides a critical framework for addressing the challenges of data harmonization, collaboration, and regulation in healthcare. I will discuss the ethical considerations that must guide data standardization and sharing, including transparency, fairness, privacy, and accountability. The talk will highlight the importance of building trustworthy AI systems that respect patient rights and societal values, and propose strategies for fostering effective collaboration across institutions while ensuring robust data governance.

SY5-4 Federated Learning Enables Multi-Institution Optic Disc/Cup Segmentation AI

○Hitoshi Tabuchi

Purpose: To evaluate whether federated learning (FL) can build an optic disc/cup segmentation model for glaucoma without moving images outside participating hospitals.

Methods: GPU workstations at Tsukazaki Hospital, Yamaike Eye Clinic and Niimi Eye Institute exchanged only model weights with a central server over VPN. Each site contributed 100 annotated color fundus photographs. Three convolutional neural networks were trained: P (optic nerve head), C (cup), and D (disc). FL was conducted in three phases that gradually increased local data (33, 66, 100 images per site); after each local epoch, weighted parameters were averaged on the server and redistributed.

Results: Loss declined as data accumulated: P 79.57→61.12→57.90, C 0.423→0.397→0.364, D 0.259→0.212→0.183. The final global model predicted vertical cup-to-disc ratios that agreed with specialist grading, and no raw images left the institutions.

Conclusion: FL safely produced a multi-center ophthalmic AI whose performance improved with data accrual, demonstrating a privacy-preserving path for collaborative imaging research.

SY5-5 GEN Japanese Cohort Studies: Collaborative Framework for Ophthalmic Epidemiology

○Mariko Sasaki

Japan, as a super-aged society, faces increasing demand for strategies to achieve healthy aging, including the prevention of visual impairment. However, nationwide ophthalmic cohort studies are limited in scale and regional diversity. To address this, we established the Ganka Ekigaku Network（GEN）, a collaborative framework linking four major population-based cohorts. Together, these studies include approximately 25,000 participants with ophthalmic imaging and systemic, genomic, and lifestyle data. GEN promotes harmonization of methods and facilitates pooled and meta-analyses without centralized data storage.
A recent example of GEN's international collaboration is a meta-analysis on geographic atrophy（GA）conducted with the Asia Eye Epidemiology Consortium（AEEC）, covering over 97,000 individuals across 22 studies. The pooled prevalence of GA was 0.16%, significantly lower than that of neovascular AMD（0.52%）and lower than previously reported rates in white populations. In particular, GA prevalence among Japanese cohorts was extremely low. These findings highlight the importance of international collaboration to investigate rare eye diseases and ensure representation of Asian populations. GEN continues to expand its contributions, including participation in the global RETFound Initiative for AI model development in ophthalmology.

SY5-6 Multimodal Data Integration in Ophthalmology: Enhancing Clinical Insights through AI-driven Analysis

○Zongyuan Ge

Integrating multimodal data, including textual clinical reports, retinal fundus images, and ophthalmic surgical records, offers significant potential to advance ophthalmic diagnosis, surgical planning, and patient outcomes. By synergistically combining narrative insights, detailed fundus imagery, and surgical procedure data through advanced AI methodologies, clinicians can achieve improved diagnostic accuracy, more precise surgical interventions, and personalized treatment strategies. This presentation examines recent advances, existing challenges, and future opportunities in multimodal data fusion, emphasizing the importance of interdisciplinary collaboration and effective data harmonization in ophthalmology.

Symposium 6 Oculomics today June 28 (Sat.) 14:20〜15:40

Chairs : Lisa Zhuoting Zhu (Aus) , Yuta Nakashima (Japan) , T.Y. Alvin Liu (U.S.)

SY6-1 Oculomics and AI: Predicting Metabolic Syndrome from Retinal Images in the JOI Registry

○Koichi Nishitsuka

Retinal fundus images are a noninvasive source of information that reflect systemic health and may be applicable to the prediction of metabolic disorders. This study constructed a deep learning model to predict the presence of metabolic syndrome using fundus photographs obtained from 5,000 health checkup participants in the Japan Ocular Imaging (JOI) registry. The model incorporated waist circumference as an auxiliary regression task within a multi-task learning framework, combined with fundus-specific data augmentation techniques. This approach led to a significant improvement in predictive performance compared to single-task models. The final ensemble model achieved an area under the curve (AUC) of 0.73178 and an accuracy of 0.696 on an independent test dataset. These findings suggest that multi-task learning is a promising approach for systemic disease prediction using retinal images. The study also highlights the potential for designing robust prediction models even under limited data conditions.

SY6-2 How AI and Oculomics Will Unlock Secrets of Systemic Health and Change Care Delivery Beyond Ophthalmology

○Alvin Liu
Wilmer Eye Institute, Baltimore, USA

Oculomics is the study of the association between ophthalmic biomarkers and system health states. Leading oculomics applications that combine deep learning and retinal imaging, with a particular focus on cardiovascular health and dementia, will be highlighted. In addition, this talk will examine how oculomics could be deployed at scale in the community on a population level and potentially impact healthcare delivery as a whole beyond ophthalmology.

SY6-3 From Vision to Value: A Cost-Effectiveness Framework for Oculomics Deployment

○Lisa Zhuoting Zhu

A cost-effectiveness framework to guide the implementation of oculomics—the use of AI-enabled retinal imaging for systemic disease screening—into clinical practice will be presented. The presentation highlighted how existing diabetic retinopathy (DR) screening infrastructure can be leveraged to opportunistically assess cardiovascular disease (CVD) risk in Australia, Singapore, and the UK.

Using decision-analytic models (including Markov models), the study evaluates various screening strategies and concluded that integrating CVD risk assessment into DR screening is both effective and cost-effective across the three countries. This integration is projected to yield significant health gains (increased QALYs), reduce non-fatal and fatal CVD events, and result in net monetary savings, especially when applied to broad age groups with high screening coverage.

The findings support the use of AI-powered oculomics as a scalable and economically viable strategy to enhance population health through early detection and prevention of systemic diseases via the eye.

SY6-4 Automated Diabetic Retinopathy Screening in the Primary Care Settings: Recent Progress and Future Potentials to Prevent Blindness

○Alauddin Bhuiyan

The presentation will focus on an automated tool, iPredict-DR, which uses AI and color fundus imaging for scalable screening of diabetic retinopathy (DR). Early diagnosis and intervention can prevent blindness, improve quality of life, and save massive amounts of downstream spending. The talk will focus on the benefits, current hurdles, and future potential of diabetic retinopathy screening in the primary care settings.

SY6-5 Leveraging Oculomics for Chronic Kidney Disease Detection: Evaluating the Performance of RETFound- Enhanced Deep Learning Models

○Charumathi Sabanayagam

Screening for chronic kidney disease (CKD) remains challenging, even in high-income countries. Leveraging fundus image-based oculomics, we developed two deep learning algorithms (RetiKid-Refined and RetiKid-Diab) using convolutional neural networks to detect CKD in general and diabetic populations. RETFound, a foundational model trained on over 900,000 unlabeled fundus images using self-supervised learning, has shown success in predicting systemic outcomes when fine-tuned for specific tasks using smaller labeled datasets. In this talk, I'll present results comparing the performance of our DLAs and RETFound-based models on the same datasets and highlight the potential of oculomics for non-invasive CKD detection.

SY6-6 Traditional Risk Factor Models and Oculomics for Major Adverse Cardiovascular Events Prediction

○Yukun Zhou

This presentation explores the efficacy of traditional cardiovascular risk factor models and emerging Oculomics approaches to predict major adverse cardiovascular events (MACE). Traditional models such as QRISK3 and SCORE2 rely on clinical and demographic variables but require complicated and heterogeneous input. Oculomics, the extraction of biomarkers from retinal images, offers a non-invasive window into systemic health. We will compare the predictive power and limitations of both approaches using UKB dataset. The talk highlights several strategies for facilitating and enhancing MACE risk stratification, offering more personalised, scalable, and accessible cardiovascular risk prediction pathways.

SY6-7　Age/CVD risk

○Yuta Nakashima

Despite extensive exploration of potential biomarkers of cardiovascular diseases (CVDs) derived from retinal images, it remains unclear how retinal images contribute to CVD risk profiling and how the results can inform lifestyle modifications. Therefore, we aimed to determine the performance of cardiovascular risk prediction model from retinal images via explicitly estimating 10 traditional CVD risk factors and compared it with models based on actual risk measurements. Experimental results over the UKBiobank data showed that our model can predict the risk factors with an accuracy ranging between 65% and 90%. Our model also performs MACE predictions with retinal images, and we found that our model outperforms score-based methods.

Luncheon Symposium 1 Neo Cure Telemedicine & AI for ROP June 28 (Sat.) 11:45〜12:45
Chairs : Yoko Fukushima (Japan) , Peter Campbell (U.S.)

SSY1-1 Non-Imaging Machine Learning Models for Treatment-Warranted ROP Prediction

○Yusuke Takeda[1], Kaneko Yutaka[1], Sugimoto Masahiko[1], Yamashita Hidetoshi[2], Mitsui Tetsuo[3]
[1] Department of Ophthalmology and Visual Sciences, Yamagata University Faculty of Medicine,
[2] Yamagata City Institute of Public Health, [3] Department of Pediatrics, Yamagata University Faculty of Medicine

PURPOSE
To develop non-imaging machine learning models using clinical data from the first screening to predict treatment-warranted retinopathy of prematurity (ROP).
METHODS
This multicenter study included neonates born between October 2016 and September 2018 and screened in four NICUs in Yamagata, Japan. Thirty-three variables at the first screening were used to develop decision tree, random forest, gradient boosted tree, neural network, and Naive Bayes models. Parameter tuning was performed using 10-fold cross-validation. The target outcome was treatment-warranted ROP. Mean (400-iteration) AUC, accuracy, sensitivity, and specificity were calculated.
RESULTS
Among 215 neonates, 20 (9.3%) required photocoagulation. Median gestational age and birth weight were 31.4 weeks (IQR: 28.1–33.4) and 1502 g (IQR: 967–1823). The random forest model achieved a mean AUC of 0.97, accuracy of 94.4%, sensitivity of 97.5%, and specificity of 64.5%. The gradient boosted tree model had a mean AUC of 0.95, accuracy of 94.3%, sensitivity of 97.3%, and specificity of 65.2%.
CONCLUSIONS
Non-imaging machine learning models showed high predictive performance and may be useful in resource-limited settings.

SSY1-2 Tele ROP screening by VR Headset mounted smartphone-based Indentation fundus live videography

○Deependra V Singh, Tejasvini Chandra, Awaneesh Upadhyay, Abhimanyu Sharma, Zakia Anwer
EYE-Q EYE HOSPITALS, GURUGRAM, India

PURPOSE: To describe a simple and novel technique that overcomes limitation of smartphone-based fundus photography and allows examiners to capture peripheral retinal images with indentation for ROP screening. Conventional Smartphone photography does not allow retina surgeon to indent sclera and examine peripheral retina, we tested feasibility of capturing retinal videos by a smartphone mounted on VR headset and streaming these videos to multiple retina colleagues.
METHODS: Smartphone with video camera with flash-on mounted on Virtual Reality Headset (VR-HMD). This was combined with +28D lens and soft cotton bud to capture high quality videos of peripheral fundus with indentation utilizing autofocus function of camera facilitated by examiner adjusting the distance by head movements akin to Indirect ophthalmoscopy. Feasibility of obtaining well focused retinal images during indentation was checked for 10 eyes of 10 premature babies after taking informed consent. We also tested if we could also stream these videos to different retina colleagues via zoom meeting and get accurate staging from them by watching those videos.
RESULTS: We could obtain good quality videos demonstrating indentation of peripheral fundus in 10 eyes showing pathologies like laser marks, immature vessels and demarcation lines and other ROP findings. The retina specialists reported reasonably good view to allow ROP detection and staging.
CONCLUSIONS: VR Headset mounted smartphone-based Indentation fundus videography is innovative cost-effective technique to capture peripheral retinal images. Technique can be useful for documenting ROP lesions and situations where widefield photography is not possible. Sharing these live retina videos has immense teleophthalmology value at a very low cost.

SSY1-3 Intelligent Diagnosis and Automatic Generation of Medical Imaging Reports for Retinopathy of Prematurity

○Honghua Yu

To address low screening rates and uninterpretable reports for Retinopathy of Prematurity (ROP), we developed an intelligent diagnosis and reporting system using 20,000+ multi-center newborn fundus photos. Key innovations include: 1) Automated fundus stitching (96.1% accuracy); 2) Precise retinal vascular segmentation (93.2% accuracy); 3) Deep residual models diagnosing ROP and predicting treatment needs by 45 weeks gestational age based on panoramic images and quantified features. Integrated with Guangdong Provincial People's Hospital's 5G telemedicine platform, the system was deployed across 10 hospitals, achieving high diagnostic accuracy (AUC=94.7%, Accuracy=92.3%) and effective ROP prediction (AUC=85.6%, Accuracy=84.1%). This solution significantly enhances ROP screening precision, efficiency, and accessibility in China, demonstrating substantial clinical and economic value, with related patents generating tens of millions in revenue.

SSY1-4 Innovations in AI-Assisted ROP Telemedicine

○J. Peter Campbell

Retinopathy of prematurity (ROP) remains a leading cause of preventable childhood blindness worldwide, yet access to timely, high-quality screening is limited by the scarcity of trained specialists. This talk highlights recent innovations in artificial intelligence (AI)-assisted telemedicine designed to close that gap. We will review advances in deep learning algorithms capable of detecting plus disease and staging ROP from retinal images, their validation against expert graders, and integration into tele-ophthalmology workflows. Special focus will be given to breakthrough-designated tools like i-ROP DL, and the role of portable, non-contact imaging platforms in expanding care to underserved populations. We will also address challenges in clinical deployment, such as regulatory approval, inter-observer variability, and infrastructure needs. By leveraging AI and novel imaging technologies, we can scale ROP screening globally and ensure that all infants—regardless of geography—receive timely diagnosis and intervention.

SSY1-5 AI for ROP prediction based on NICU monitoring signals

○Yoko Fukushima

Retinopathy of prematurity (ROP) is a major cause of childhood blindness worldwide, with over 30,000 affected annually. Although many cases regress spontaneously, severe ROP requires timely intervention to prevent irreversible vision loss. We aimed to develop an AI-based prediction model for severe ROP using only vital sign data routinely collected in neonatal intensive care units (NICUs), without the need for ophthalmic examinations.

Using minute-by-minute monitoring data from birth, we applied machine learning to create both forward- and backward prediction models. Our model achieved 90% accuracy in identifying treatment-requiring ROP cases four weeks before the actual treatment date.

This method leverages temporal physiological patterns to enable early risk stratification, even before ocular signs appear. We are currently developing a clinical support application based on this model to assist in screening prioritization and timely intervention. This approach has the potential to reduce ROP-related blindness, especially in resource-limited or telemedicine-based care settings.

Free papers 1　Cornea/Orbita/Stra　June 27 (Fri.) 10 : 15～11 : 45

Chairs : Hiroki Maehara (Japan) , Mao Tanabe (Japan) , Gavin Tan (Singapore)

O1-1　Performance comparison of YOLOv5 and YOLOX in AI classification of 9 anterior corneal diseases

○Hiroki Maehara[1], Ueno Yuta[2], Oda Masahiro[3], Ito Yoshikazu[2], Kitaguchi Yoshiyuki[4], Miyazaki Dai[5], Chikama Taiichiro[6], Nejima Ryohei[7], Mori Kensaku[3], Yamaguchi Takefumi[1], Oshika Tetsuro[2]

[1] Tokyo Dental College Ichikawa General Hospital, [2] University of Tsukuba, [3] Nagoya University, [4] Osaka University Graduate School of Medicine, [5] Tottori University, [6] Hiroshima University, [7] Miyata eye hospital

Introduction: We developed CorneAI (YOLOv5) , which classifies nine anterior segment corneal diseases, and have been preparing it for commercialization. After the release of YOLOX, we created a YOLOX version of CorneAI.

Objectives: The purpose of this presentation is to compare the performance of YOLOv5 and YOLOX on slit-lamp corneal disease images.

Methods: A total of 860 slit-lamp images taken by diffuser light of anterior segment corneal diseases were included in this study. The images were classified into nine categories (normal condition; 317, infectious keratitis; 85, immunological keratitis; 34, scarring; 103, corneal deposition/dystrophy; 88, bullous keratopathy; 68, ocular surface tumors; 102, cataract/IOL opacity; 51, and primary angle-closure glaucoma; 12) . We evaluated these images using CorneAI (YOLOv5) and CorneAI (YOLOX) and compared their accuracy.

Results: The accuracy of CorneAI (YOLOv5) was 87.4%, while CorneAI (YOLOX) achieved a significantly higher accuracy of 94.3% (P=0.034) . Additionally, the probability that the correct choice was included in the top three increased, though not significantly, from 93.8% with CorneAI (YOLOv5) to 97.7% with CorneAI (YOLOX) (P=0.058) .

Conclusions: When analyzing anterior segment corneal diseases in slit-lamp images using CorneAI, YOLOX is recommended due to its superior accuracy compared to YOLOv5.

O1-2　Development of an Automated Detection System for Orbital Fractures Using YOLO Architecture on CT Images

○Yuto Nakamura[1], Oku Hiroaki[2], Kanematsu Yuma[1], Akagi Ayumu[1], Kinoshita Shigeru[2], Sotozono Chie[2], Koizumi Noriko[1], Okumura Naoki[1], Watanabe Akihide[2]

[1] Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University, Kyotanabe, Japan, [2] Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kyoto, Japan

Purpose: The purpose of this study is to develop a deep learning model for the automated detection of orbital fracture sites by fine-tuning YOLO-based architecture on CT slice images.

Methods: We acquired CT slice images from 686 patients diagnosed with orbital fractures at Kyoto Prefectural University Hospital. The dataset comprised 46,013 CT images, which underwent ROI cropping for precise fracture site annotation. From a refined dataset of 7,809 images, 6,508 were utilized for model development through transfer learning with YOLO v8-based architecture. The remaining 1,301 independent images were reserved for performance evaluation, assessing the model's capabilities at both per-slice and per-patient levels.

Results: The YOLO v8-based model successfully detected and localized orbital fractures in CT images, accurately identifying regions annotated by physicians as fracture sites. The model achieved an accuracy of 80.5%, sensitivity of 80.1%, and specificity of 81.0% at the per-slice level in orbital fracture detection. At the per-patient level based on the prediction of serial slices, the performance improved substantially, reaching an accuracy of 97.4%, sensitivity of 98.2%, and specificity of 95.0%.

Conclusion: The YOLO-based architecture demonstrated effective performance in both detecting the presence of orbital fractures and localizing their precise locations in CT images. Future work will focus on implementing the AI model on mobile devices and evaluating its clinical utility through further research studies.

O1-3 Development of Deep Learning Models for Classifying Depressed and Trap-door Orbital Fractures on CT

○Yuma Kanematsu[1], Oku Hiroaki[2], Nakamura Yuto[1], Akagi Ayumu[1], Kinoshita Shigeru[2], Sotozono Chie[2], Koizumi Noriko[1], Okumura Naoki[1], Watanabe Akihide[2]

[1] Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University, Kyotanabe, Japan,
[2] Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kyoto, Japan

Purpose: Orbital fractures are categorized into depressed and trap-door fractures, with trap-door fractures requiring urgent treatment, making their differentiation crucial. The purpose of this study is to develop deep learning networks for classifying orbital fractures into depressed or trap-door types based on CT slice images.
Methods: We acquired CT slice images from 666 patients diagnosed with orbital fractures at the Kyoto Prefectural University of Medicine Hospital. The fracture sites were manually annotated and classified as either depressed or trap-door type. We used 601 cases as the training dataset and constructed deep learning networks for fracture classification using Vision Transformer (ViT), EVA-02, ResNet-50, DenseNet-169, and EfficientNet-B3. The remaining 65 cases were used as the evaluation dataset.
Results: ViT achieved an area under the receiver operating characteristic curve (AUC) of 0.945, while EVA-02, ResNet-50, DenseNet-169, and EfficientNet-B3 achieved 0.903, 0.843, 0.882, and 0.889, respectively. ViT showed an accuracy, sensitivity, and specificity of 88.7%, 87.3%, and 89.2% at the per-slice level. At the per-patient level based on the prediction of serial images, the accuracy, sensitivity, and specificity improved to 93.8%, 90.0%, and 93.3%, respectively.
Conclusion: Vision Transformer demonstrated superior performance in differentiating orbital fractures.

O1-4 Complementary AI Image and Video Learning for Sebaceous Carcinoma Diagnosis

○Mao Tanabe[1], Tabuchi Hitoshi[1,2], Nakajima Isana[3], Yoneda Tsuyoshi[4], Day Mhairi[5], Strang Niall[5], Engelmann Justin[6], Nishikawa Ryo[1], Tsuji Hideki[3]

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[2] Department of Technology and Design Thinking for Medicine, Hiroshima University.,
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[4] Department of Orthoptics, Kawasaki University of Medical Welfare,
[5] Department of Vision Sciences, Glasgow Caledonian University, Glasgow, UK.,
[6] School of Informatics, University of Edinburgh, Edinburgh, UK.

Purpose: To examine the complementary effects of AI-generated image training and traditional video-based education for diagnosing sebaceous carcinoma, a rare eyelid tumor often misdiagnosed as chalazion.
Methods: In a crossover design, 213 orthoptics students from three institutions were randomized to either AI-first (AI-generated images, then video) or Video-first (video, then AI). Diagnostic accuracy and response times were measured at pre-, mid-, and post-intervention.
Results: Both sequences improved accuracy (beta=9.96, $p<0.001$), but Video-first yielded greater time reduction (beta=-80.49, $p<0.001$). AI-based learning was highly effective for chalazion recognition (all 25 images improved), whereas video excelled at identifying sebaceous carcinoma (24 of 25 images). Fourth-year students reached proficiency 43% faster than first-year students, indicating increased efficiency with expertise.
Conclusion: AI-generated images and traditional video offer distinct but complementary benefits for rare disease education. Optimizing their sequence and using brief, targeted interventions can enhance diagnostic accuracy and learning efficiency in sebaceous carcinoma recognition.

O1-5 Smartphone App GravAI for Treatment Response Assessment in Thyroid Eye Disease

○Taku Hayashi[1], Kitaguchi Yoshiyuki[1], Kozaki Ai[2], Inoue Toshu[2], Kawasaki Ryo[3], Morimoto Takeshi[1,4], Nishida Kohji[1,5]

[1] Department of Ophthalmology, Osaka University Graduate School of Medicine, [2] Olympia Eye Hospital, Tokyo, Japan, [3] Division of Health Science, Department of Medical Physics and Engineering, Osaka University Graduate School of Medicine, Osaka, Japan, [4] Division of Public Health, Department of Social Medicine, Osaka University Graduate School of Medicine, Osaka, Japan, [5] Institute for Open and Transdisciplinary Research Initiatives (OTRI), Osaka University, Suita, Osaka, Japan

Purpose : GravAI is a smartphone application using deep learning to quantify thyroid eye disease (TED) similarity as a likelihood score (0-1). This study examined whether GravAI could detect periocular changes after TED treatment as decreased likelihood scores.

Methods : We studied 42 TED patients undergoing observation, steroid pulse therapy, or surgery. Periocular images were analyzed with GravAI, with likelihood decrease ≥0.3 defining the change group. Clinical Activity Score, Margin Reflex Distance (MRD-1, MRD-2, mm), exophthalmos (mm), and Gorman score were assessed.

Results : Likelihood decreases ≥0.3 occurred in 7% of observation, 25% of steroid, and 50% of surgical cases. Significant factors in the change group were MRD-1 change (-1.0 ± 1.5 vs. -0.2 ± 1.0, p=0.009), post-treatment MRD-1 (3.9 ± 1.1 vs. 4.7 ± 1.3, p=0.019), pre-treatment MRD-2 (4.9 ± 0.9 vs. 5.7 ± 1.1, p=0.001), post-treatment MRD-2 (5.1 ± 0.5 vs. 5.7 ± 1.0, p=0.007), and post-treatment exophthalmos (14.6 ± 1.9 vs. 16.4 ± 3.1, p=0.019). CAS and Gorman score showed no significance.

Conclusion : GravAI likelihood changes were strongly influenced by decreases in MRD-1 and exophthalmos. Large MRD-2 values likely prevents likelihood changes despite other improvements. Establishing clinically significant threshold values remains a challenge.

O1-6 Development and Validation of a Deep Learning Algorithm for Detection of Orbital Disease Using Ocular Images from Multinational, Multiracial Populations

○Chaoyu Lei

Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

PURPOSE: Orbital disease is a challenging and complex ophthalmic disease that can cause blindness, disability, and even death. Lack of screening method results into delays in the diagnosis of orbital diseases, particularly in low and middle-income countries. Therefore, we aimed to develop and evaluate a deep learning-based screening technology using ocular images to evaluate risk and advance automated identification of orbital diseases.

METHODS: We did a multinational, multiracial study to develop and validate deep learning models for detection of orbital diseases using ocular images from participants in six ophthalmic departments from three countries. We trained one screening model (with or without orbital diseases) and ten clinical sign identifying model (with or without one specific clinical sign within ten categories) using a development dataset, and we tested the models with two external test datasets. Additionally, we did a visual explanation and occlusion test.

RESULTS: A total of 5394 participants were consecutively enrolled and randomly divided into training (90%, n= 4855) and validation (10%, n= 539) groups for algorithm development; Another 1066 participants were enrolled in external test group for further algorithm test. The screening model achieved accuracy of 86.6%, specificity 88.5%, recall 84.5%, precision 86.6%, F1 score of 85.5%, and AUC of 94.4%. Identifying model achieved average AUC of 91.1%. Heatmaps demonstrated that the model identified pixels corresponding to clinical features of orbital diseases.

CONCLUSIONS: Our study provided a non-invasive, convenient, and complementary method for orbital disease screening, which has the potential to accelerate diagnosis and reduce mortality and morbidity through preventive care.

O1-7 The experience and challenges of an international tele-ophthalmology platform used in China

○Qing Lu
Orbis International, Beijing, China

PURPOSE: To explore the experience and challenges of using a free international distance ophthalmic leaning platform Cyberisght to provide large-scale, efficient and low-cost online trainings for Ophthalmologists in areas lacking ophthalmic education resources.
METHODS: The data of online ophthalmic trainings conducted by Cybersight in China from 2020 to 2024 were collected to analyze the changes in the number of participants and the challenges faced by Cybersight.
RESULTS: Since 2020, Cybersight has more than 5,100 registered users in China. The number of online Chinese learning materials such as surgical videos, webinars, textbooks & manuals increased from 5 in 2020 to over 280 in 2024. Over 7,500 Chinese eye care professionals have received online trainings through Cybersight from 2002 to 2024. Main Challenges are 1) Funding problem: Cybersight is affiliated with Orbis, an international NGO dedicated to prevention of blindness. Without donations, the platform will not be able to update its online Chinese materials or maintain its legal operations in China. 2) Data security issues: The platform has developed AI-assisted diagnosis for DR which cannot currently be implemented in China due to patient data security. 3) No substitute for face-to-face hands-on training.
CONCLUSIONS: Cybersight is a telemedicine learning platform that has been recognized and endorsed by most registered Chinese ophthalmologists. However, it is also affected by funds, compliance and other aspects. Its future may be uncertain in China

O1-8 Effectiveness of Teleophthalmology enabled Primary eye care centres in diagnosis and management of Neuro Ophthalmic Conditions

○Kowsalya Akkayasamy, Mohammed Gowth
Aravind Eye Hospital, MADURAI, India

PURPOSE: Teleophthalmology enabled primary eye care centers play a pivotal role in identifying patients with sight-threatening neuro-ophthalmic conditions and facilitating timely referrals to tertiary centers. Early detection of neuro-ophthalmic conditions affecting vision, is crucial for preventing vision loss and minimizing the progression of these conditions.Vision Centres (VCs) provide permanent primary eye care through teleconsultation where there is no permanent service provider communities, staffed by trained ophthalmic personnel.
METHODS: A retrospective analysis was conducted in vision centres tto evaluate the scope of identifying neuro-ophthalmology conditions from January- December 2024. Electronic medical records of patients who were idetified with neuro ophthamic conditions were analysed for examination findings, diagnosis and management.
RESULTS: Of 336,602 patient visits, 1,767 (0.5%) were identified with papilledema, , optic neuritis, anterior ischemic optic neuropathy, traumatic neuropathy, toxic neuropathy, and nerve palsy. Among these 1,393 patients (78%) were referred to tertiary care centers for further treatment. This referral process is essential for ensuring that patients receive specialized care. 75% attended the tertiary centre.This high follow-up rate suggests that telemedicine-enabled referrals from vision Centres to tertiary centers are effective in ensuring that patients receive timely and appropriate care.
CONCLUSIONS: The ability to detect neuro-ophthalmic conditions at the primary level and facilitate seamless referrals to tertiary centers has been instrumental in improving patient outcomes, ensuring that sight-threatening conditions are managed before they lead to permanent vision loss

O1-9 Leveraging a Generative AI-based chatbot to Triage Ophthalmic Emergencies in Tele-Ophthalmology

○How Sheng Rubin Yong[1], Wei Wei Dayna Yong[2], Ziyou David Chen[1,2]
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PURPOSE: To evaluate the accuracy and patient receptivity of a novel chatbot designed for self-triaging of acute ocular symptoms in teleophthalmology.
METHODS: A pilot study was conducted at a public hospital's eye clinic from October 2024 to December 2024. Patients with acute ocular symptoms at the emergency department were assessed by ophthalmologists, graded into high risk (emergency), medium risk (urgent), and low risk (minor), based on the Community Minor & Urgent Eye Care Service (CUES) V2 guidelines. Patients also interacted with the chatbot to generate triage recommendations. The agreement of recommendations was analyzed using Chi-square test and Cohen's Kappa. The patients' acceptance was evaluated using a modified Website User Survey.
RESULTS: 100 eligible responses were analyzed. Based on clinician recommendations, 10% were classified as emergency, 63% urgent and 27% minor. The chatbot accurately triaged 39% cases, with no significant differences between clinician grading and chatbot recommendations ($\chi 2=8.8$, $p=0.07$). 40% patients were over-triaged by 1 class, 8% by 2 classes; 10% were under-triaged by 1 class and 3 by 2 classes. There was slight agreement between the clinician grading and chatbot recommendations ($\kappa=0.113$). Patient feedback was positive, with 92% agreeing it is user-friendly, and 69% were willing to use the chatbot again before seeking in-person care by an ophthalmologist.
CONCLUSIONS: Generative AI-based (GenAI) chatbots demonstrate promise in triaging acute ocular symptoms, though the current model tended to over-triage. Further refinement could enhance accuracy, while positive patient feedback highlights their enhance healthcare accessibility in tele-ophthalmology.

O1-10 Cancelled

PURPOSE: This study analyzed the clinical data of a rare malignant transformation of orbital dermoid cyst patient to elucidate the possible mechanisms of its occurrence and enhance clinical awareness of the disease.
METHODS: This study collected the case data of the orbital dermoid cyst patient, reviewed the previous literature, and explored the clinical characteristics, imaging findings, and treatment.
RESULTS: Patient, male, 45 years old, admitted to the hospital due to right eye swelling and pain for half a year. Specialty examination revealed right eye exophthalmos and limited external rotation. CT and MRI showed a fat-containing lesion in the right lateral rectus muscle. The tumor contents were found to be white serous-like during surgery, and postoperative pathology diagnosed invasive squamous cell carcinoma, considered to originate from the malignant transformation of the dermoid cyst. Postoperative PET/CT scan reveal no abnormal images in other tissues, excluding extraocular metastasis. Orbital dermoid cysts are more common in pediatric patients with no gender difference, most often located in the upper temporal, with most deep dermoid cysts showing bone destruction on CT. Malignant transformation of dermoid cysts is most common in the ovaries and testes, but **orbital malignant transformation is extremely rare, with only 5 cases reported globally**. The specific mechanism is unclear, large cyst volume, age over 45 years, rapid growth rate, and thickened cyst wall are risk factors for dermoid cyst malignant transformation.
CONCLUSIONS: Orbital dermoid cysts are common benign orbital lesions in children. Surgical resection is an effective treatment method, and its malignant transformation is extremely rare.

O1-11 Smartphone-Based Teleophthalmology for After-Hours Emergency Eye Care: A Real-World Experience from a General Hospital in a rural setting

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PURPOSE: To study the feasibility, efficiency and accuracy of Smartphone-Based Teleophthalmology for after-hours Emergency Eye Care in a General Hospital in a rural setting.
METHODS: Over a period of 12 months, after-hours ophthalmic consultations were conducted via smartphone-captured photos sent by emergency department staff to the consulting ophthalmologist. Cases included conjunctivitis, foreign bodies, ocular trauma, lid lacerations, chemical injury and other acute conditions. The teleconsultation process involved initial image review, provisional diagnosis, and treatment recommendations. Follow-up confirmation of diagnoses and treatments was performed during in-person evaluations the following morning. Data was analysed for diagnostic accuracy, follow up adherence and patient outcomes.
RESULTS: A total of 120 cases were reviewed, with the following symptoms: Foreign body sensation (20%) , pain and redness (13%) , redness (13%) , trauma (50%) , Chemical injury (3%) . 67% patients reported to ophthalmology clinic the next day for a scheduled review. Cases that reviewed included trauma (35%) , foreign bodies (15%) , traumatic Uveitis (10%) , Hyphaema, Conjunctivitis, Chemical injury, subconjunctival haemorrhage, dendritic keratitis, epithelial defect amongst others. In 23% of cases diagnosis and medication were revised after detailed assessment. Cases requiring immediate surgical intervention were identified and prioritized. Patient outcomes were favourable. Challenges included inability to assess intraocular pressure, uveitis and posterior segment.
CONCLUSIONS: Smartphone-based teleophthalmology is a practical and efficient tool for managing after-hours ophthalmic emergencies and solves an important real world problem. It allows timely decision-making and improves patient outcomes. Improvements in image quality and integration with advanced diagnostics are necessary for accurate diagnosis. This model demonstrates the potential for scalability in resource-constrained settings.

O1-12 A remote tele ophthalmology assisted wet lab training model for surgical training of residents and fellows in a multi tier hospital network in South Asia

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PURPOSE: To describe the implementation and outcomes of a remote tele opthalmology assisted wet lab training model for surgical training of residents and fellows in South Asia
METHODS: Ophthalmology fellowship programs across the world vary in the level and extent of surgical exposure and hands on experience that can be offered to fellows. A robust system to ensure uniformity can be offered through tailored and monitored wet lab sessions across subspecialities. These wet lab sessions covering a wide range of surgical procedures in cornea like tissue adhesive application, amniotic membrane grafting, limbal biopsy, corneal tear repair, suturing techniques for keratoplasty and graft preparation for endothelial keratoplasty; strabismus surgeries like resection, recession, plication, transplantation and transposition; glaucoma surgeries like trabeculectomy flap preparation, minimally invasive glaucoma surgeries and retina surgeries like intravitreal injections and scleral buckle placement. In this paper, we will discuss in detail how to set up these wet lab sessions in goat eye and human cornea models in a low cost unique telemonitoring setting with the dual feed relay system monitored on a video conferencing software and the FOCUS device which will benefit both trainers and trainees as a part of distance education.
RESULTS: A survey conducted for the system of telemonitoring wet lab practice received favourable responses from students in practicatility and usability with a mean score of 9 out of 10.
CONCLUSIONS: Low-cost remote wet lab model has proved to be feasible and effective for surgical training. Regular and more frequent sessions hold promise for a more significant future impact.

O1-13 ProptoView: AI-based digital exophthalmometer for accurate proptosis measurement using multi-view images

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PURPOSE: Accurate proptosis measurement is vital for managing orbital diseases. Traditional methods have limitations: the Hertel exophthalmometer is convenient but imprecise, while computed tomography (CT) is accurate but costly and exposes patients to radiation.
METHODS: We developed ProptoView, an AI-based digital exophthalmometer, using 5676 images from patients with CT and Hertel measurements. External validation included 648 images, collected across three countries and five hospitals. Patients provided up to five images from four views. A three-stage deep learning approach, optimized with Adam and validated via five-fold cross-validation, was used to develop three models: single-view, multi-view, and dynamic input AI models.
RESULTS: The intraclass correlation coefficient (ICC) was 0.859 compared with CT for the single-view model, slightly lower than the Hertel exophthalmometer's ICC of 0.888. The multi-view model achieved an ICC of 0.890 compared with CT, surpassing the Hertel exophthalmometer (0.871). The dynamic input model achieved the highest accuracy with an ICC of 0.901. Two-view algorithms combining the frontal view with another angle showed the highest agreement when paired with the upward gaze view (ICC = 0.855). In external validation, ProptoView demonstrated strong agreement with the Hertel exophthalmometer (ICC = 0.845), comparable to its agreement in the development dataset. Additionally, ProptoView reduced misclassification at the 19-mm threshold (14.7% vs. 20.5% with the Hertel exophthalmometer).
CONCLUSIONS: ProptoView provides an accurate, non-contact, and cost-effective solution for proptosis measurement. Its flexibility and precision suggest significant potential for streamlining clinical workflows and enabling telemedicine applications.

O1-14 PITSTOP: BITS and HITS of Medial rectus Pulled in Two syndrome in a Filipino female patient

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PURPOSE: Pulled in two syndrome (PITS) is an intraoperative complication resulting in the rupture of an extraocular muscle. PITS stems from various conditions that may cause a disruption in the normal structural integrity of the extraocular muscle affected. The authors of this study aim to describe the clinical and radiologic characteristics of a patient who developed PITS, as well as increase the awareness of surgeons regarding this rare intraoperative complication of strabismus surgery.
METHODS: We present a case of a 27 year old female who presented with large angle esotropia of the left eye since infancy, severe limitation on abduction and a positive forced duction test. Preoperative MRI revealed an atrophic left lateral rectus. Intraoperatively, there was spontaneous rupture of the medial rectus muscle. Recovery of the posterior end of the muscle was unsuccessful, and no further surgical intervention was done. A significant decrease in esotropia as well as a negative forced duction test was immediately noted. Subsequent follow ups showed increasing angle of esodeviation post PITS, with repeat MRI revealing what appeared to be re-attachment of the ruptured ends of the medial rectus muscle.
RESULTS: Long standing esotropia, marked limitation on abduction, severe restriction and extremely tight forced duction tests, are important clinical characteristics that may be considered red flags that might predispose a patient to develop PITS.
CONCLUSIONS: In conclusion, preoperative detection of patients at risk for PITS, surgical planning and patient education is crucial. PITS is a rare intraoperative complication, with limited published case reports worldwide.

O1-15 Quantifying gender differences in orbital morphology with large MRI datasets

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PURPOSE: To investigate gender differences in orbital morphology using large MRI datasets.
METHODS: Using a deep learning-based approach, the orbit and eyeball were automatically segmented from high resolution 3D MRI images of the IXI and OASIS3 datasets. Orbital and eyeball morphological parameters, including orbital volume, eyeball volume, effective orbital volume (EOV, defined as the orbital cavity volume excluding the eyeball), and coronal orbital dimensions and shape, were quantitatively assessed. The volume index was defined as the ratio of orbital volume to eyeball volume.
RESULTS: This study included 1926 subjects with a mean age of 63.9 ± 15.3 years. The mean volumes of the eyeball and orbit were 7.1 ± 1.0 ml and 25.9 ± 3.5 ml, respectively. Significant gender differences (all $P < 0.001$) were observed in the following parameters (males versus females): orbital volume (28.3 ± 3.0 ml versus 24.0 ± 2.7 ml), EOV (25.1 ± 3.0 ml versus 21.1 ± 2.6 ml), eyeball volume (7.3 ± 1.0 ml versus 6.9 ± 1.0 ml), volume index (3.9 ± 0.6 versus 3.5 ± 0.5), orbital depth (40.0 ± 3.1 mm versus 37.4 ± 2.9 mm), coronal orbital height (40.8 ± 3.0 mm versus 38.4 ± 2.4 mm), coronal orbital width (38.0 ± 1.9 mm versus 36.6 ± 1.7 mm) and coronal orbital area (1292.5 ± 97.1 mm^2 versus 1177.9 ± 89.7 mm^2).
CONCLUSIONS: We identified significant gender differences in orbital parameters, with males generally having larger structures. Additionally, we established a normative database for orbital dimensions, providing a valuable resource for future research on orbital disorders and potentially improving clinical diagnosis and treatment.

O1-16 Generative Artificial Intelligence (AI) for Pre-dilation Image Enhancement

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PURPOSE: Retinal imaging is widely used in AI-driven image analysis for ocular and systemic diseases. However, image quality affects model performance and remains a challenge in deployment, especially where pupil dilation is impractical due to time and resource constraints. In this study, using a generative AI, we aimed to enhance low quality, non-dilated retinal images.
METHODS: 313 paired retinal images (non-dilated and dilated images of the same eyes) from the Singapore Chinese Eye Study (SCES) and the Singapore Indian Eye Study (SINDI), were used to finetune Cofe-Net model, an encoder-decoder network, to enhance low quality non-dilated images. The model was tested internally on 120 paired images and externally on 43 paired images. Using dilated images as ground truth, performance was evaluated based on the peak signal-to-noise ratio (PSNR) and structural similarity index (SSIM). Additionally, three professional graders independently evaluated the internal test images on a three-point gradability scale (gradable, force gradable, ungradable), and the final grading was based on majority consensus.
RESULTS: The enhanced retinal images recorded PSNR of 28.7 and SSIM of 0.923, higher than the non-dilated images (PSNR: 23.2, SSIM: 0.823). External validations showed consistent findings. Furthermore, gradability assessment showed increased proportions of gradable images from 41% to 76% and decreased proportions of ungradable images from 37% to 11%, after applying the model.
CONCLUSIONS: The model improved the quality of non-dilated retinal images with a high similarity to dilated images. It could potentially serve as an enhancement tool when pupil dilation is not feasible.

O1-17 Screening for referable dry eye disease using deep learning: a multi center Asian study

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PURPOSE: To assess whether AI technology can detect a subset of patients with DED who need specialist care using images that can be acquired in community settings.
METHODS: This is a multi-center retrospective comparative study. High quality cornea digital images were acquired with slit lamp microscopy on dry eye patients with significant corneal staining and those without such staining, to train the deep learning algorithm, split 7:1:2 for training:validation:testing. We used EfficientNet, a convolutional neural network model with inverted bottleneck residual blocks and squeeze-excitation blocks. The model was trained for 50 epochs and the best model was taken based on the best validation AUC over the training.
To externally validate the algorithm, images from 775 eyes of 775 patients from Singapore and China were used. We generated saliency maps using Gradient-weighted Class Activation Mapping to identify regions of an input image used by the neural network to make a prediction.
RESULTS: Images from 261 eyes were obtained from dry eye patients in Singapore to train the initial algorithm. Validation was performed with four external datasets (total 837 images). Validation on the Singapore dataset showed area under the curve [AUC] of 0.951 (95% CI 0.891 - 0.989), Accuracy of 0.855 (0.758 - 0.935). In the external dataset, AUC was 0.895 (0.859 - 0.926), Accuracy was 0.793 (0.749 - 0.831)
CONCLUSIONS: A single image of the stained ocular surface may be able to assist decision making in the primary care setting for dry eye, which is particularly useful in large countries with poor physical access to tertiary care.

O1-18 Enhancing Patient-Clinic Communication in Refractive Practices through Generative AI: The Role of ZEISS VisioGen

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PURPOSE: Refractive clinics face increased pressure to deliver timely, personalized, and consistent communication across the patient journey. Despite patients being better informed, clinical teams often lack time to manage inquiry volume and complexity—impacting patient conversion, satisfaction, and clinic efficiency. Clinics lose about 70% of potential patients due to a combination of low quality of response to inquiries, limited staff, and high competition. This abstract explores ZEISS VisioGen—a generative AI communication tool developed to address these challenges by delivering clinically sound, scalable communication.
METHODS: ZEISS VisioGen uses large language models to provide swift, context-specific, multilingual responses tailored to individual patients. Use cases evaluated include counselling before LASIK and SMILE® procedures, as well as post-operative and follow-up support. Features like Automated Drafting and Personalized Responses, automate understanding, researching, and generating responses to patient inquiries significantly reducing the manual workload of clinic. The easy-to-use interface, via browser plugin or website, enables quick and effective management of patient communications. Customized Settings allow integration of clinic-specific responses, streamlining operations for the clinic.
RESULTS: Early adopters of ZEISS VisioGen report significantly reduced response times, with every fourth clinic observing improved lead-to-appointment conversion. Notably, 53% of users have reported saving time in daily operations by leveraging the solution. By enabling near-instant responses, ZEISS VisioGen sustains patient interest and enhances operational efficiency.
CONCLUSIONS: ZEISS VisioGen provides a regulatory aligned, clinically integrated solution for transforming ophthalmic patient communication. Compliant with data-privacy standards and the EU AI Act, it augments—not replaces—human interaction, enabling high-quality, scalable engagement across the care continuum.

Free papers 2 Glaucoma/myopia/oculomics June 27 (Fri.) 13:00〜14:35
Chairs : Hidenori Takahashi (Japan) , Padmaja Rani (India)

O2-1 Searching for Glaucoma Diagnosis from Partial Fundus Images Using Deep Learning

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Glaucoma diagnosis relies on established clinical indicators, such as optic disc cupping and retinal nerve fiber layer defects. However, these criteria may overlook other subtle yet important fundus changes. By focusing on specific regions rather than the entire fundus image, we aimed to identify novel glaucomatous features that may not align with conventional diagnostic patterns.
We constructed a CNN using VGG16 with full fundus images and extracted optic disc and macula images as inputs. We then compared their classification accuracy. The results showed that using optic disc images achieved higher diagnostic accuracy compared to full images (full: 83.1%, optic disc: 85.4%) . Macular images also demonstrated predictive capability (78.0%) . Some cases were correctly classified using macular images, even when full or optic disc images were misclassified. To visualize the CNN's focus, we generated heatmaps using Grad-CAM. The maps showed deferent features for each area. In macular images, the model focused on the macula when predicting glaucoma as positive. These findings suggest that features present in the macular region could serve as new diagnostic criteria for glaucoma.

O2-2 Investigating Key Regions in Glaucoma Classification Using Adversarial Examples

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Glaucoma is a leading cause of irreversible blindness, yet its diagnosis remains challenging due to ambiguous criteria for detecting fundus changes. To better understand how deep learning models recognize glaucoma, we analyze the decision-making processes of CNNs trained for glaucoma classification when noise was introduced to fundus images. In this study, we investigate key anatomical regions influencing CNN predictions by applying Adversarial Examples with localized perturbations. Specifically, we introduced noise to the optic disc and the macular regions, each covering approximately 20% of the input image. As a result, the AUC dropped from 0.928 for original image to 0.2945 when perturbing the optic disc and 0.6108 when perturbing the macula region, suggesting that CNNs may rely not only on the optic disc but also on the macular region for glaucoma classification. By selectively perturbing different regions and comparing classification performance, we aim to identify crucial areas that contribute to CNN-based glaucoma assessment. This approach provides a novel perspective on how AI recognizes glaucomatous features and offers insights that could enhance clinical understanding.

O2-3 Segmentation of OD and OC from Fundus Images Using NAT-UNet

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Objective: The location of optic disc (OD) facilitates the detection of peripapillary choroidal atrophy and OD edema. Choroidal atrophy is a key indicator of pathological myopia, while OD edema is a symptom of various optic nerve-related fundus diseases. Additionally, an enlarged optic cup (OC) area is one of the most significant characteristics of glaucoma. Therefore, this study aims to accurately segment the OD and OC from fundus images, providing a foundation for the automated diagnosis of pathological myopia, glaucoma, and various other fundus diseases.
Methods: This study introduces a U-shaped model based on neighborhood attention, termed NAT-UNet, which leverages localized self-attention to extract prior features. The NAT-UNet was compared with existing models U-Net and Swin-UNet in terms of segmentation performance and was evaluated by Dice, Precision, and Recall metrics.
Results: NAT-UNet achieved superior OD segmentation (Dice: 97.33%, Precision: 96.99%, Recall: 97.77%) and OC segmentation (Dice: 86.31%, Precision: 86.46%, Recall: 88.78%).
Conclusion: NAT-UNet effectively mitigates the impact of vascular occlusion on OD and OC segmentation, yielding more accurate results. However, since the dataset primarily comprises normal and glaucomatous fundus images, future research is validating the model on fundus images associated with other diseases.

O2-4 AI-Based Prediction of Intraocular Cytokine Levels from Fundus Photographs

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Purpose:
We aimed to develop an AI model to estimate intraocular cytokine levels from fundus photographs.
Methods:
Machine learning was performed using the AutoGluon library, which automatically selects and optimizes models such as CatBoost and LightGBM. The prediction accuracy of both approaches was compared using the coefficient of determination (R^2).
Results:
A total of 176 aqueous humor samples from 152 eyes of 139 patients were analyzed. The cohort included 93 with exudative age-related macular degeneration, 19 cataract surgery controls, 15 retinal vein occlusion, 8 diabetic macular edema, and others. Fundus photographs (n = 155) were mainly captured with Triton (n = 94) and VX-10 (n = 52), and the remainder with Optos or VX-20.
A significant difference was observed with a P-value of 0.0428, indicating that the model using only fundus photographs had a higher R^2. Mean R2 was -0.19. The three cytokines with the highest R2 were IL-17, IL-8, and MCP-1, while G-CSF, Galectin, and MMP-9 had the lowest R2. VEGF ranked 31st in prediction accuracy among 36 cytokines.
Conclusions:
Fundus photographs without demographic data enabled a prediction of certain intraocular cytokine levels.

O2-5 EyeDiff: text-to-image generative foundation model improves rare eye disease diagnosis

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PURPOSE: Data scarcity and imbalance persist in training robust diagnostic models, particularly for rare cases. This study aims to introduce a generative foundation model designed to synthesize lesion-preserving ophthalmic images from textual descriptions, namely EyeDiff.

METHODS: EyeDiff was trained using a stable diffusion architecture with paired textual instructions and ophthalmic images across 14 modalities, including color fundus photography (CFP), fundus fluorescein angiography (FFA), optical coherence tomography (OCT), etc. Quantitative (VQAScore) and human evaluations were conducted to assess EyeDiff's ability to generate diagnostic lesions as guided by textual instructions. We utilized RETFound, an established foundation model, as the backbone and evaluated EyeDiff's generalizability across ten global datasets for minority class augmentation and disease diagnoses, encompassing various common and rare retinal diseases. The performance of retinal disease diagnosis was measured using the area under the receiver operating characteristic curve (AUROC) and the area under the precision-recall curve (AUPR).

RESULTS: The average VQAScore for lesions diagnosed based on OCT, CFP, and multimodal imaging is 0.822, 0.776, and 0.670, respectively. Authenticity evaluations by two clinicians indicated that the synthetic images were difficult to distinguish from real ones (Turing test: 50.0%–54.5%). EyeDiff-generated images can augment minority classes across ten datasets and enhance the diagnostic accuracy of the state-of-the-art RETFound model. These improvements were supported by increased AUROC and AUPR for multiple common and rare diseases.

CONCLUSIONS: EyeDiff demonstrates potential as a generalist model, offering an effective solution for obtaining rare ophthalmic images from simple text cues, thereby boosting the performance of expert-level disease detection models.

O2-6 Interpretable Longitudinal Glaucoma Visual Field Estimation Deep Learning System from Fundus Images and Clinical Narratives

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PURPOSE: Glaucoma is a globally prevalent disease that leads irreversible blindness. The visual field (VF) examination is an important but time-consuming tool for visual function evaluation with high requirement of cooperation and reliability of patients. While color fundus photographs (CFPs) are easy to access. Here, we proposed a multi-modal longitudinal estimation deep learning system (MLEDL), capable of predicting present and future VFs from CFPs and clinical text information.

METHODS: In this study, we proposed a multi-modal and longitudinal estimation DL system (MLEDL), utilizing multiple data covering CFPs and clinical text labels in glaucoma screening and follow-up process to realize pointwise SAP sensitivity estimation, either cross-sectional or longitudinal. The structure-function relationship was verified from the arranged activity map. In addition, the authentic and predicted VF images were graded by ophthalmologists to judge the clinical reliability.

RESULTS: All these 5 types of models have achieved good results, with pointwise MAE 4.131, 3.903, 3.980, 3.575 and 3.098 dB, and were tested on an external dataset from PKU. The heatmaps demonstrated the spatial relationship between fundus damage and vision loss. Two VF grading methods were employed for predicted and original VFs comparison, yielding high accuracy and enhancing clinical reliability.

CONCLUSIONS: In general, we designed a glaucoma VF estimation DL-assisted system, capable of predicting current and future VF by fundus images and clinical information, with clinical validation. The heatmaps were used to verify function-structure relationship. This system would valuable for vision function assessment in the long-duration course of glaucoma.

O2-7 Evaluating the use of prompt engineering in Vision-Language Models (VLMs) for disc swelling identification on fundus photography

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PURPOSE: The use of artificial intelligence to detect optic disc swelling (ODS) has the potential to improve timely identification of serious neuro-ophthalmic conditions that require expedited care. Vision-language models (VLM), with the ability to take into account additional information from textual prompts, combine image analysis with large language models (LLM) to provide image descriptions. We aim to determine the capabilities of VLM with various prompt engineering techniques for ODS classification on a set of open-sourced ODS and normal images.
METHODS: Cropped optic disc-centered fundus images consisting of normal optic discs and ODS were obtained from an online Kaggle database. 5 prompts, with increasing information contained in the prompts, were presented to Llama3.2-vision separately. Prompt 1 was a basic prompt, and Prompt 5 combined role-based prompting with chain-of-thought and few-shot prompting. The ability to correctly classify ODS was determined using the accuracy, F1 score, precision, sensitivity (recall) and specificity metrics.
RESULTS: 779 images of normal optic discs and 295 images of ODS were analysed. Based on accuracy, the best performing prompt (Prompt 4) was a combination of chain-of-thought and few-shot prompting (sensitivity: 78.3%, specificity: 33.4%, accuracy: 45.9%, precision: 31.2%, F1: 0.447). Increasing information in the prompts led to better VLM performances. The F1 scores from prompt 1 to 5 were 0.404, 0.430, 0.443, 0.447, 0.441.
CONCLUSIONS: Using a non-specialty trained VLM on fundus images, we demonstrate an ODS identification accuracy of 45.9%. This demonstrates the potential for VLMs to support neuro-ophthalmic diagnosis.

O2-8 Eye-Brain Biomarkers in Neurological Disease Detection: Comparing OCT and Omics Approaches

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PURPOSE: This study provides a head-to-head comparison of OCT-derived biomarkers, proteomic profiles, and metabolic signatures for predicting long-term neurological outcomes within a unified middle-aged and older adult cohort.
METHODS: We analyzed baseline OCT, proteomic, and metabolic data from 319,744 UK Biobank participants without neurological diseases, followed for 14.1 years. Feature selection was performed using elastic net regression and neural networks. Cox proportional hazards models assessed associations between biomarkers and eight neurological outcomes, including dementia, stroke, Parkinson's disease, epilepsy, migraine, sleep disorders, delirium, and depression, with results shown as hazard ratios (HRs) and 95% CIs. Predictive performance was evaluated using accuracy, precision, recall rate, F1-score, and AUC, with a comparative analysis of OCT versus omics-based risk stratification.
RESULTS: Among 44 OCT signatures, average INL-ELM and ELM-ISOS thickness showed strong associations with the majority of neurological outcomes. Notably, INL-RPE thickness of central subfield (HR=0.85, 95% CI=0.77-0.95) and ISOS-RPE thickness of outer subfield (HR=0.96, 95% CI=0.93-0.99) showing dementia-specific predictive capacity, while average ELM-ISOS thickness (HR=0.65, 95% CI=0.52-0.81) and INL-RPE thickness of inner subfield (HR=1.06, 95% CI=1.03-1.10) showing stroke-specific predictive capacity. Combining OCT signatures with demographics produced desirable predictions for dementia (AUC=0.768, 95% CI=0.695-0.841) and delirium (AUC=0.784, 95% CI=0.628-0.940). OCT biomarkers demonstrated superior performance compared to proteomic and metabolic profiles in four out of the eight outcomes (median C-index=0.670).
CONCLUSIONS: OCT biomarkers demonstrate decade-long predictive capability for neurological outcomes, offering a clinically valuable, non-invasive tool for risk stratification and preventive intervention in high-risk populations.

O2-9 Detection of Mild Cognitive Impairment Through Digital Phenotyping of Gaze Movement

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PURPOSE: To identify mild cognitive impairment (MCI) using gaze analysis.
METHODS: We developed a virtual reality (VR) device capable of recording eye movements while presenting video stimuli. A 3-minute 40-second video consisting of 14 different content segments was created. Participants were shown the video without any verbal or text-based instructions, and their gaze movements were recorded. From November 2022 to October 2024, we conducted the test on two groups: (1) Case group: Individuals diagnosed with MCI or mild dementia in the neurology department of our institution. (2) Control group: Individuals who underwent cataract surgery in the ophthalmology department and showed no evidence of cognitive decline. A total of 192 cases were split into a 4:1 ratio for training and testing data. A classification model was constructed using HIVE-COTE 2.0 using gaze movement data from the 153 training samples, evaluated through 5-fold cross-validation, and subsequently validated on 39 test samples.
RESULTS: The case group (n = 72) had a mean age of 76.7 ± 6.6 years, with a median MMSE-J score of 27.0 (IQR 4.75). The control group (n = 120) had a mean age of 71.6 ± 7.9 years, with a median MMSE-J score of 29.5 (IQR 1.0). Test accuracy was 87% (sensitivity 93%, specificity 79%).
CONCLUSIONS: We successfully developed an AI-based model that accurately distinguishes MCI using only gaze responses to video stimuli. The model demonstrated high generalization performance, suggesting that further applications of VR-based cognitive assessment may be promising.

O2-10 Cross-disease Retinal Vascular Pattern Recognition and Analysis via a Robust Multi-path Neural Network Framework

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PURPOSE: To establish an accurate retinal vascular segmentation algorithm for multiple fundus diseases, and to investigate the retinal vascular morphological alterations in these diseases.
METHODS: A multi-path segmentation network was developed and trained on the public FIVES dataset, comprising color fundus photography and the corresponding retinal vascular segmentations of diabetic retinopathy (DR), glaucoma, age-related macular degeneration (AMD), and healthy adults. Subsequently, a retrospective study involving 829 patients with fundus diseases and 146 healthy controls was conducted. The retinal vascular morphological parameters, including fractal dimension (D_f), vascular area ratio (VAR), mean diameter (Dm), tortuosity (τ), etc. were extracted post-segmentation and compared across groups.
RESULTS: The proposed multi-disease retinal vascular segmentation model achieved an accuracy of 0.987 and and AUC of 0.995. After adjustment for age and sex, significant differences were observed in D_f, VAR, D_m and τ among disease groups (F=27.87, 47.60, 26.48, 4.63; all P<0.001). D_f was significantly decreased in AMD, DR, diabetic macular edema (DME), retinitis pigmentosa (RP), branch retinal vein occlusion (BRVO) and central retinal vein occlusion (CRVO) compared to controls (all P<0.05). VAR was significantly decreased in all disease groups except optic neuritis group and central serous chorioretinopathy (all P<0.05). Dm was significantly lower in DME, RP, BRVO and CRVO groups (all at P<0.05). τ was significantly increased in DR and DME groups compared to controls (all P<0.05).
CONCLUSIONS: A robust and accurate retinal vascular segmentation method was developed and we demonstrated its utility in quantifying morphological alterations in multi-retinal diseases, paving the way for improved retinal disease diagnosis and monitoring.

O2-11 Neurovascular retinomics for precision profiling of cancer risk

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PURPOSE: To evaluate the predictive value of a comprehensive set of neurovascular retinomics for incident cancers, which could provide a novel, non-invasive approach for early cancer prediction and risk stratification in clinical practice.
METHODS: The retinomics comprised quantitative retinal profiles extracted from color fundus photography and optical coherence tomography. Least Absolute Shrinkage and Selection Operator was used for feature selection. The concordance index (C-index), cumulative hazard, detection rate (DR), positive likelihood ratio (LR+), and Kaplan-Meier survival curves were applied to evaluate the prediction performance, with four Cox regression models (Model 1-Model 4) employed for C-index, DR, and LR+ calculations.
RESULTS: After integrating retinal features, the C-index for uterine/endometrial cancer exhibited the most significant enhancement, rising by 0.198 from Model 1 to Model 3. Similarly, uterine/endometrial cancer demonstrated the largest increase of DR and LR+ from Model 2 to Model 4, with DR rising by 0.315 and LR+ increasing by 0.805. Breast cancer had the relative lower levels of C-index (0.554-0.572), DR (0.587–0.682) and LR+ (1.181–1.217) values across four models. Prostate and skin cancers had the highest hazard ratios (HRs), while breast cancer exhibited the lowest. Moreover, large-medium vessels and outer retinal layer were more strongly associated with cancers than other features.
CONCLUSIONS: Comprehensive retinal neurovascular biomarkers enhance the cancer prediction, showing particularly strong performance for uterine/endometrial cancer. Our findings offer valuable insights into the predictive performance of different models, underscoring the clinical significance of neurovascular retinomics as non-invasive tools for cancer prediction and risk stratification.

O2-12 OM-Agent: A Reinforcement Learning Agent for Optimizing Ophthalmic Modality Selection

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PURPOSE: AI in ophthalmic disease detection is limited by trade-offs between accuracy, cost, and resource allocation. Traditional diagnostic workflows rely on physician experience, often leading to over-testing or under-testing. This study introduces OM-Agent, a reinforcement learning (RL)-based ophthalmic modality decision agent, which dynamically selects imaging modalities, optimizing diagnostic accuracy while minimizing costs, time, and invasiveness. OM-Agent aims to improve efficiency, particularly in resource-limited settings.
METHODS: OM-Agent uses RL to dynamically select the sequence of imaging modalities, starting from a fundus image. The agent's state space includes modality sequences and patient data, while the action space consists of modalities yet to be selected. The reward function balances diagnostic accuracy with cost. The framework integrates RL with sequence generation and scorer optimization, ensuring efficient modality selection. Modality imbalance is addressed through novel designs to encourage exploration of underutilized modalities.
RESULTS: OM-Agent improves diagnostic accuracy by 10.3% and increases the ground truth sequence match ratio by 21.9% compared to random selection. Additionally, it reduces costs by over 30 USD and saves more than 30 minutes per case, improving both diagnostic precision and efficiency, especially in resource-constrained environments.
CONCLUSIONS: OM-Agent dynamically generates sequences of imaging modalities tailored to individual patient conditions, reducing unnecessary tests while maintaining high diagnostic performance. Its real-time adaptability makes it suitable for diverse healthcare settings, particularly in low-resource environments. OM-Agent paves the way for autonomous, cost-effective diagnostics, advancing access to high-quality eye care.

O2-13 Using 3D-MRI Imaging to Quantitatively Analyze the Shape of Eyeballs with High Myopia and to Investigate Relationships between Myopic Traction Maculopathy and Posterior Staphyloma

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PURPOSE: To quantitatively analyze the shape of eyes with high myopia using high-resolution three-dimensional (3D) magnetic resonance imaging (MRI) and investigate relationships between myopic traction maculopathy (MTM) and the morphological changes of posterior staphyloma (PS).
METHODS: This prospective study enrolled 105 patients with high myopia at Beijing Friendship Hospital. All participants underwent a comprehensive ophthalmic examination. MTM was divided into different types by optical coherence tomography, and ocular shapes were categorized by 3D-MRI.
RESULTS: A total of 105 patients (105 eyes) were studied, with a mean age of 60.4 ± 13.3 years and mean axial length of 28.71 ± 2.78 mm. Spheroidal shape was observed in 35 eyes (33.3%), ellipsoidal shape in 11 eyes (10.5%), conical shape in 17 eyes (16.2%), nasally distorted shaped in 18 eyes (17.1%), temporally distorted shape in 16 eyes (15.2%), and barrel shape in 8 eyes (7.7%). PS was identified in 84 eyes (80%), and the proportions for the elliptical, conical, nasal torsion, temporal torsion and barrel shapes were 27.9%, 23.1%, 12.9%, 9.5%, 17.1% and 9.5%, respectively. In eyes without PS, MTM accounted for 23.8%, while with PS the proportion increased to 53.8%. The proportion of MTM in spheroidal was lowest, and nasal and temporal torsion shapes were highest. 45.5% of the nasal torsion shapes were with MTM, and for nasal torsion shape were 83.3%.
CONCLUSIONS: Not all highly myopic eyes are deformed. Spheroid was the predominant ocular shape. Eyes with PS display more severe myopic maculopathy. Moreover, nasally and temporally distorted eyes present significantly high percentage of MTM.

O2-14 ChatMyopia: An AI Agent for Myopia-Related Question-Answer in Primary Eye Care Settings

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PURPOSE: This study aims to develop a patient-centered LLM-based AI agent (ChatMyopia) to handle both text-based and ophthalmic image-based inquiries in myopia
METHODS: ChatMyopia integrated two components in the tool module: the image-classifying transformer model which was developed using 2769 myopic fundus photos, and an RAG-based knowledge base from a diversity of books, literatures, expert consensus and guidelines. Mistral: 123B was used as the brain to combine tools. We evaluated the performance of ChatMyopia in myopic maculopathy classification task, single-choice question exam, myopia-related question-answering. A proof-of-concept randomized controlled study (n=70) was conducted to assess ChatMyopia' s effectiveness in enhancing patient education and satisfaction in primary eye care clinics.
RESULTS: Overall, ChatMyopia achieved high accuracy in myopic maculopathy grading. In simulated examinations, ChatMyopia showed a competent level of accuracy to specialists in SCQ assessments and performed better than general eye care practitioners (ECPs). In manual evaluation of myopia-related consultations by three specialists, ChatMyopia showed equivalent performance to ECPs in terms of utility, relevance, safety, and harmfulness. In the randomized controlled trial, patients who interact with ChatMyopia demonstrated higher satisfaction with the entire medical service than those who receive traditional leaflet. ChatMyopia enhanced patient education and information quality in terms of accuracy, empathy, disease self-consciousness, patient-ECP communication, though no significant decision conflict differences were observed between groups.
CONCLUSIONS: Overall, our AI agent framework has the capability to deliver personalized, high-quality, accurate, and safe responses to myopia-related inquiries, as well as to serve as a valuable tool for patient-centered health-information seeking in primary eye care settings.

O2-15 Axial Length Percentiles and Growth Patterns in a Large Chinese Pediatric Cohort: The Real-world Myopia Evolution and Intervention Study (REMEDY)

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PURPOSE: The distribution and progression patterns of myopia among children and adolescents in large-scale real-world settings remain poorly understood. This study utilizes 20-year cumulated data to generate axial length (AL) and AL growth percentile curves in Chinese children.

METHODS: The Real-world Myopia Evolution and Intervention Study (REMEDY) is a real-world study based in a municipal eye hospital in South China. The dataset spans from 2004 to 2023 and includes all registered outpatients in the children and adolescent myopia center, with comprehensive eye examinations such as visual acuity testing, slit-lamp examination, optometry, intraocular pressure measurement, AL measurement, wide-field fundus photography, and intervention methods. AL percentile scores were calculated. Additionally, we generated AL growth percentiles at different ages using follow-up data to track progression over time.

RESULTS: The study included 230,032 participants aged 3-18, with 61,593 attending at least three visits and 2,507 attending at least seven visits. AL percentiles showed a consistent growth trend, with the most pronounced increases in the upper 5% distribution (compared with age 3, AL in age 18 increased by 19.1% in the upper 5% versus 10.9% in the lower 5%). Among children without myopia interventions, AL growth naturally decelerated with age, except for notable acceleration at ages 6–7 and 12–13, coinciding with transitions to primary and secondary school, respectively.

CONCLUSIONS: This study offers a large-scale longitudinal analysis of AL distribution and growth in Chinese children, identifying critical periods of myopia progression tied to school transitions. These findings emphasize the need for targeted interventions during key educational stages.

O2-16 Leveraging Teleophthalmology for Myopia Detection and Management: A Digital Approach to Eye Care

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PURPOSE: This study aims to assess the role of tech-enabled primary eye care centers through teleconsultation in managing myopia, evaluating their capacity to provide timely intervention.

METHODS: A retrospective study was conducted at a selected tech-enabled primary eye care center of a tertiary eye care facility in South India from April 2022 to March 2024. Electronic medical records of 20,485 of patients were analyzed including 8,273 (40.3%) individuals aged 5–40 years, assessing their visual acuity, refractive status, and access to corrective measures. Data on patient demographics, compliance with spectacle use, and referral patterns were collected and analyzed.

RESULTS: The prevalence of myopia among school-aged children and young adults was 17.3% (1,434) cases. Among them, 1,220 (14.7%) received prescription glasses, while only 80 patients were referred to a higher center for specialized care. These findings highlight the effectiveness of vision centers through teleophthalmology in diagnosing and managing myopia at an early stage.

CONCLUSIONS: Teleophthalmology-enabled primary eye care centers offer a promising solution for early detection, remote monitoring, and timely management of myopia, especially in underserved regions. By providing timely spectacle correction and appropriate interventions, they enhance work productivity, quality of life, and academic performance in schoolchildren. This approach plays a vital role in combating the myopia epidemic and reducing preventable blindness.

O2-17 Longitudinal Analysis of Spatial Variations in the Choroid During Myopia Progression

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PURPOSE: To investigate the spatiotemporal variation of choroidal thickness in a longitudinal cohort and explore its clinical relevance to myopia progression.
METHODS: Longitudinal spectral-domain OCT scans from 317 participants were analyzed over two years. Choroidal thickness maps were generated using deep learning-based segmentation across 31 horizontal B-scans per eye, with thickness calculated along surface normal vectors. High-resolution 3D maps were reconstructed via upsampling interpolation. The macular region (9×9 mm^2) was divided into a 9×9 grid, with each square measuring approximately 1 mm^2. Regional thickness variations were quantified by calculating the mean thickness change in each grid square. Mixed-effects models assessed the relationship between choroidal changes, axial length (AL), spherical equivalent (SE), and baseline morphology.
RESULTS: Distinct spatial patterns of choroidal thinning were observed, with nasal-superior thinning in high myopia ($r = -0.72$, $p < 0.001$), macular thinning in moderate myopia ($r = -0.65$, $p < 0.001$), and temporal thinning in low myopia ($r = -0.48$, $p < 0.01$). SE progression showed similar patterns, reinforcing localized choroidal remodeling with myopia progression. Kruskal-Wallis analysis revealed significant choroidal variation across myopia severities ($p = 0.0435$), with nasal thinning being most pronounced in high myopia. Radial correlation and hotspot location changes were not significant ($p = 0.1553$ and $p = 0.1063$), suggesting shared spatial progression trends.
CONCLUSIONS: Choroidal thickness changes exhibit spatial patterns corresponding to myopia severity and progression, suggesting that these alterations may serve as biomarkers for monitoring and predicting myopia development. Identifying these dynamic features enhances our understanding of the choroid's role in ocular growth and myopization.

O2-19 AI for estimating trabecular iris angle from slit-lamp images using AS-OCT

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Trabecular iris angle (TIA) is an anatomical parameter for diagnosing angle closure. However, the current gold standards for TIA evaluation, such as biomicroscopies, are costly, require specialized training, and are not widely accessible for screening purposes. Recent advancements in artificial intelligence (AI) offer new opportunities for ophthalmic imaging. This study aims to develop a novel AI algorithm to quantitatively estimate TIA from anterior segment photographs obtained using a smartphone-based slit-lamp microscope.
We retrospectively collected 16,731 frames from anterior segment videos captured using a Smart Eye Camera in 821 eyes. TIA values were measured by anterior-segment OCT. An AI algorithm was designed to estimate the TIA . EfficientNetV2 was utilized as the deep-learning model.
The AI algorithm achieved a mean absolute error (MAE) of $7.31 \pm 6.78°$ for inferior TIA. Moreover, MAE as $7.39 \pm 5.76°$, and $8.03 \pm 6.52°$ for nasal and temporal TIA respectively.
We successfully developed the AI-based method for estimating TIA from smartphone-captured slit-lamp images. This approach provides a foundation for future screening applications in angle closure management in glaucoma.

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O3-1　Unsupervised Choroidal Segmentation of OCT via Masked Autoencoders & Clustering

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【Objective】
Although recent OCT technology has improved choroidal imaging, manual annotation remains a major obstacle to robust segmentation. This study aims to establish an unsupervised choroidal segmentation framework using unlabeled OCT data, thereby reducing physician workload and facilitating earlier, more accurate diagnoses.
【Methods】
A total of 51,140 unlabeled SD-OCT images were obtained from the public datasets (Kermany et al., 2018) . A Masked Autoencoder (MAE) was employed for feature extraction, followed by a Gaussian Mixture Model (GMM) for fine-grained clustering.
【Results】
Through iterative refinements of MAE and GMM parameters, clustering performance across various OCT layers showed steady improvement. Increasing the clustering granularity enabled further subdivision of the retina and choroid into multiple internal layers.
【Conclusion】
These findings demonstrate the feasibility of an unsupervised choroidal segmentation strategy that requires no expert annotations. Future work will focus on quantitative validation, handling diverse pathologies, and refining sub-layer segmentation, aiming to achieve a high-precision solution for clinical application.

O3-2　Cancelled

PURPOSE: The financial burden and uncertain efficacy of anti-vascular endothelial growth factor (anti-VEGF) therapy create critical demand for precise prognosis prediction in neovascular age-related macular degeneration (nAMD) . Thus, we aim to develop and validate a deep learning model to predict the short-, medium-, and long-term visual and anatomical prognosis of nAMD patients undergoing anti-VEGF therapy.
METHODS: In this prospective multicenter study across 18 Chinese hospitals, a large dataset was established for nAMD patients receiving Conbercept (0.5 mg/0.05 mL, 3+PRN regimen) . A Structural-Attention Guided Therapeutic Response Prediction Model (KongMing Model) , based on Transformer architecture, was developed to predict short-term (4-6 weeks after a single injection) , medium-term (4-6 weeks after the first three injections) , and long-term (1-year post-treatment) visual and anatomical outcomes. Model performance was evaluated using various metrics, including AUC, precision, sensitivity, specificity, human-machine comparisons, and mean absolute error (MAE) . Heatmaps and SHAP analysis identified prognosis-related features.
RESULTS: The internal dataset included 33,350 OCT images from 1,240 patients, with 6,830 OCT images from 248 patients in the external validation set. The model achieved AUCs exceeding 0.94 for all VA change predictions, significantly outperforming ophthalmologists across experience levels ($p<0.05$) . VA value prediction yielded low MAEs (0.048–0.058) . Post-treatment OCT predictions showed high structural fidelity. Heatmaps and SHAP images identified critical prognosis-related features.
CONCLUSIONS: The KongMing Model, tested with a nationwide dataset, demonstrated excellent performance in predicting the short-, medium-, and long-term prognosis of nAMD patients undergoing anti-VEGF therapy. It provides a robust, non-invasive method for personalized treatment planning, enhancing patient compliance, and reducing healthcare system burdens.

O3-3 FFA Sora: generating fundus fluorescein angiography videos for healthcare data sharing

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PURPOSE: To address the patient privacy concerns in cross-centre data sharing, we developed and evaluated a text-to-video generative model that converted textual description into dynamic FFA videos, facilitating diverse visual representations of retinal vascular and structural abnormalities.
METHODS: The text-to-video model named FFA Sora was trained on 3,625 anonymized paired FFA videos and text reports (train: validation: test = 8:1:1). The model integrated two key components: the Wavelet-Flow Variational Autoencoder (WF-VAE) and the diffusion transformer (DiT). Its performance was rigorously assessed through objective metrics and human evaluations. FFA domain-specific evaluation was measured using the Bidirectional Encoder Representations from Transformers Score (BERTScore), and privacy-preserving performance was evaluated through retrieval evaluations using Recall@K.
RESULTS: The generated FFA videos demonstrated high authenticity, as validated by objective metrics: Fréchet Video Distance (FVD) = 329.78, Learned Perceptual Image Patch Similarity (LPIPS) = 0.48 (95% CI [0.3991, 0.5664]), and Visual-question-answering Score (VQAScore) = 0.61 (95% CI [0.4278, 0.7080]). Domain-specific evaluations showed high alignment between the generated videos and textual prompts, with Bidirectional Encoder BERTScore of 0.35 (95% CI [0.1935, 0.5692]). Human assessments indicated visual quality, with an average score of 1.570 ± 0.440 (1=best, 5=worst). Additionally, the model demonstrated privacy-preserving capabilities in retrieval evaluations, achieving an average Recall@K of 0.073.
CONCLUSIONS: This study demonstrated that FFA Sora, an AI-driven text-to-video model, could generate FFA videos which do not contain any real patient disease information, potentially improving privacy-preserving data sharing. The diverse synthetic generated videos might also serve as an interactive learning tool for clinical and educational applications.

O3-4 Artificial Intelligence for Predicting Progression from Early and Intermediate to Late Age-Related Macular Degeneration: A Systematic Review and Meta-Analysis

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PURPOSE: Artificial intelligence (AI) has shown promise in predicting Age-related macular degeneration (AMD) progression, yet its clinical utility remains unclear. This systematic review and meta-analysis evaluate the diagnostic performance of machine learning (ML) and deep learning (DL) models in predicting conversion to late-stage dry and wet AMD.
METHODS: A systematic search of PubMed, Scopus, Web of Science, IEEE Xplore, and ACM Digital Library identified studies evaluating AI-based prediction of AMD progression. Risk of bias was assessed using QUADAS-2, and certainty of evidence was evaluated with GRADE. A bivariate diagnostic random-effects meta-analysis was performed to pool diagnostic accuracy estimates, stratified by AMD subtype (dry vs. wet) and time points (6 months, 1 year, and 2 years). The bootstrap method was used to calculate the area under the curve (AUC).
RESULTS: Nine studies, including 7,871 eyes, met the inclusion criteria, , all with a low risk of bias. For wet AMD prediction, pooled sensitivity and specificity were highest at 6 months (0.88 [95% CI: 0.76–0.95] and 0.72 [0.51–0.87]; AUC: 0.88), declining at 12 and 24 months. For dry AMD prediction, pooled sensitivity and specificity were 0.82 [95% CI: 0.50–0.95] and 0.73 [95% CI: 0.57–0.84] at 12 months (AUC: 0.81), and 0.74 [95% CI: 0.67–0.79] and 0.68 [95% CI: 0.56–0.78] at 24 months (AUC: 0.76).
CONCLUSIONS: ML and DL models demonstrate strong potential for predicting AMD progression, with higher performance at shorter time intervals. These findings highlight their potential role in early risk stratification, personalized disease management, and guiding future treatment decisions.

O3-5 Topographical Variations of Choroidal Thickness in Children and Associations with Different Ages and Refractive Status

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PURPOSE: Choroid thickness (ChT) is dynamic with ocular growth and myopia development. Though its measurement in local and limited subfield has been analyzed, its pattern and distribution in children on a larger scale is unexplored. To evaluate the topographical distribution of ChT in children, we used spectral-domain optical coherence tomography (SD-OCT) centered on macula and measured three-dimensional metrics for further analysis of associations with ages and refractive status.

METHODS: In this population-based study, 4037 right eyes from 4046 subjects aged from 7 to 21 years without ocular and systemic diseases were examined. Comprehensive ocular evaluations were performed, and high-resolution 9 × 9 - mm OCT-B scans were obtained to generate three-dimensional ChT maps. In addition to qualitative analysis including symmetry, quantitative measurements of regional ChT and the location of the thickest point were obtained. These metrics were correlated with demographic and ocular parameters to assess the ChT pattern influenced by age, refractive error and other factors.

RESULTS: The result displayed that temporal choroid was thickest, followed by subfoveal and further nasal region. Most ChT maps displayed symmetrical pattern across horizontal meridian through fovea, and the ChT gradient was distributed temporo-nasally, rather than superio-inferiolly. The thickest choroidal point was mostly distributed in the temporal region, and its temporo-superior movement was found to be positively associated with refractive errors.

CONCLUSIONS: The distribution of choroid thickness was influenced by age and refractive errors in children.

O3-6 Cancelled

PURPOSE: VEGF165 is the pathological VEGF isoform, that causes leukostasis in different models. Privous experimental evidence supports that the heparin-binding VEGF165 isoform, but not the VEGF121 isoform that lacks the heparin-binding domain (HBD), is responsible for inducing retinal leukostasis. Preliminary data suggest that the purified HBD protein can interfere with the pro-inflammatory activity of the VEGF165. Thus, we hypothesize that the HBD maybe a novel, effective and safe way to anti-leukostasis and angiogenesis.

METHODS: Intravitreal injection of VEGF165 with and without HBD in age-matched wild type non-diabetic C57BL/6 male mice will serve for the leukostasis assay. Treated-eyes were removed, and retinas will be isolated and flat-mounted for visualization by fluorescence microscopy. For the angiogenesis experiment, P7 litter will be placed in a chamber under 75 % oxygen for 5 days then returned to room air for 5 days to establish an oxygen-induced retinopathy (OIR) model. Intravitreal injection of the purified HBD protein was given at P12 and pathological neovascular tufts observed at P17 were stained with Isolectin GS-IB4.

RESULTS: Injection of VEGF (2 pmol) significantly induced leukostasis, while co-injection with HBD protein (10 pmol) significantly suppressed VEGF-induced retinal leukostasis. Quantification of retinal leukostasis showed that HBD can restore the number of leukocytes to near normal level. Isolectin GS-IB4 stain showed that intravitreally injected recombinant HBD protein (50 pmol) significantly suppressed formation of pathological vascular tufts twice less than vehicle and promotes appropriate revascularization in OIR model.

CONCLUSIONS: These studies demonstrate that Recombinant HBD is a potential therapeutic for pathological leukostasis and angiogenesis induced by VEGF165.

O3-7 Cancelled

PURPOSE: VistaView is a smartphone-based retinal camera which offers mydriatic retinal imaging. This study compares the diagnostic accuracy of the VistaView camera compared to a traditional desk mounted fundus camera (Triton Topcon). We also compare the agreement between graders for DR screening between VistaView images and Topcon images.
METHODS: This prospective study took place between December 2021 and June 2022 in Pakistan. Diabetic patients were imaged following mydriasis using both VistaView and Topcon cameras. All images were graded independently by two graders based on the International Classification of Diabetic Retinopathy (ICDR) criteria. Individual grades were assigned for severity of DR and maculopathy in each image. Diagnostic accuracy was calculated using the Topcon camera as the gold standard. Agreement between graders for each device was calculated as intraclass correlation coefficient (ICC) (95% CI) and Cohen's weighted kappa (k).
RESULTS: After excluding ungradable images, a total of 1231 images were graded. The sensitivity of VistaView for any DR was 69.9% (95% CI 62.2–76.6%) while the specificity was 92.9% (95% CI 89.9–95.1%), and PPV and NPV were 80.5% (95% CI 73–86.4%) and 88.1% (95% CI 84.5–90.9) respectively. For VistaView, the ICC of DR grades was 78% (95% CI, 75–82%) between the two graders and that of maculopathy grades was 66% (95% CI, 59–71%). The Cohen's kappa for retinopathy grades of VistaView images was 0.61 (95% CI, 0.55–0.67, $p<0.001$).
CONCLUSIONS: The VistaView offers moderate diagnostic accuracy for DR screening and may be used as a screening tool in LMIC like Pakistan

O3-8 Cancelled

PURPOSE: Diabetic retinopathy (DR) is one of the leading causes of blindness worldwide. The gold standard DR screening is stereoscopic fundus photography with desktop cameras. VistaView (Volk Optical Inc, Ohio) is a smartphone-based retinal camera which offers mydriatic retinal imaging
METHODS: This prospective study took place between December 2021 and June 2022 at a hospital in Karachi, Pakistan. Diabetic patients were imaged following mydriasis using both VistaView and Topcon cameras. All images were graded independently by two graders based on the International Classification of Diabetic Retinopathy (ICDR) criteria. Individual grades were assigned for DR and maculopathy in each image. Agreement between graders for each device was calculated as intraclass correlation coefficient (ICC) and Cohen's weighted kappa (95% CI).
RESULTS: A total of 1428 images were available from 371 patients with both cameras. A total of 1231 images were graded. For VistaView, the ICC of DR grades was 78% (95% CI) between the two graders while that of maculopathy grades was 66% (95% CI). The Cohen's kappa for DR grades of VistaView images was 0.61 (95% CI), while that for maculopathy grades it was 0.49 (95% CI). For images from desktop camera, the ICC of DR grades was 85% (95% CI, 83–87%), while that of maculopathy grades was 79% (95% CI, 75– 82%). The Cohen's kappa for DR grades of desktop images was 0.68 (95% CI), for maculopathy grades it was 0.65 (95% CI).
CONCLUSIONS: Agreement levels between graders using both fundus cameras are comparable. VistaView may be utilized for DR screening in teleophthalmology.

O3-9 Intraoperative hand-held optical coherence tomography for assessing retinal structural changes during macular hole surgery

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PURPOSE: To report the retinal anatomical changes in macular holes before and after internal limiting membrane (ILM) peeling during vitrectomy, as observed using hand-held optical coherence tomography (OCT).
METHODS: A hand-held portable OCT (ACT100, MiiS, Taiwan) was used to examine morphological changes during macular hole surgery in three cases: two under local anesthesia and one under general anesthesia
RESULTS: In the case operated on under general anesthesia, the retinal structure was clearly delineated, but the macular hole could not be detected. Under general anesthesia, where our instruction to look at the fixation target could not be followed by the patients, identification of macular hole was difficult. In the two cases operated on under local anesthesia, where the patients were able to look at and fixate near the fixation light, the macular hole was easily detected. After ILM peeling, curling at both edges of the macular hole decreased, the distance between the edges narrowed, and some inner parts of the retina came into direct contact.
CONCLUSIONS: The hand-held portable OCT used during surgery was able to detect the edge of the peeled ILM, confirm the reduction of the macular hole cuff, and assess the subtle apposition of both edges of the macular hole

O3-10 The Evolution of Artificial Intelligence in Retinal Diseases (2005–2024) : A 20-Year Perspective on Trends and Future Directions

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PURPOSE: This study explores the evolution of artificial intelligence (AI) in retinal diseases over two decades, highlighting key research trends, dominant models, and challenges to guide future advancements.
METHODS: We conducted a Bibliometric-Systematic Literature Review (B-SLR) using the Web of Science Core Collection as the primary database, cross-validating with Scopus. Bibliometric analysis was performed using VOSviewer, Bibliometrix, and CiteSpace to assess publication trends, influential authors, institutions, journal impact, and keyword co-occurrence. Co-word analysis identified major research clusters, and a systematic review was conducted on a representative subset of high-impact studies.
RESULTS: An analysis of 2,967 publications revealed a sharp rise in AI-driven retinal disease research after 2017, with China leading contributions (816 articles) and Sun Yat-sen University as the most prolific institution (75 articles). IEEE was the most impactful journal, and diabetic retinopathy was the most studied pathology, accounting for 47.4% of all publications. Three major research clusters emerged: (1) Deep Learning for Retinal Disease Diagnosis and Classification, (2) AI for Disease Progression and Treatment Decision-Making, and (3) AI Validation, Generalizability, and Clinical Translation. The systematic review highlighted convolutional neural networks (CNNs) as the most widely used model, alongside emerging architectures such as Inception-v3, U-Net, and ResNet. OCT and fundus images were the primary imaging modalities, while key challenges included limited external validation and generalizability issues.
CONCLUSIONS: This B-SLR integrates bibliometric insights with a qualitative synthesis of AI advancements in retinal diseases, providing a foundation for future research. Overcoming validation and generalization barriers will be critical for clinical translation of AI in ophthalmology.

O3-11 Study on a NEW Q&A System Without Hallucination Using Large Language Models

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In recent years, hospitals and clinics have increasingly implemented ChatGPT-based Q&A systems, but the risk of hallucinations remains a challenge.
To address this, we developed a structured method to ensure hallucination-free responses: (1) ChatGPT generates Q&A pairs from reference materials, which experts review to create a database. (2) The system retrieves the closest matching question to a user inquiry. (3) The user confirms whether it matches their intent. (4) If confirmed, the corresponding answer is provided; if not, the user refines their question. (5) After three unsuccessful attempts, the session is cleared, and unanswered questions are later incorporated into the database.
To evaluate the system, we created a 110-question database from Tsukazaki Hospital's "Glaucoma Eye Drops" page and tested it with 30 glaucoma-related questions from G7 glaucoma societies' websites. The initial accuracy was 6.7% . Expanding the database with 279 additional Q&A pairs from the "About Glaucoma" page increased accuracy to 60%. Finally, adding answers for previously unanswered questions resulted in 100% accuracy, with 0% hallucination rate throughout the study.
While database expansion theoretically allows for 100% accuracy, the key challenge is minimizing labor costs. Since unlimited expansion is impractical, future research will focus on optimizing Q&A database creation efficiency.

O3-12 Performance Gap Between Text and Image Interpretation of LLMs in Ophthalmology

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Background: We tested three ChatGPT-based LLMs (4o, O1, O1pro) with the 2023 Japanese Ophthalmology Board Exam in both Japanese and English to assess text-only vs. image-based question performance.
Methods: Each model answered 150 questions (18,000 total) across 20 trials per language. We evaluated overall scores, hallucinations, and the correlation of image reading accuracy with PubMed literature.
Results: All models exceeded the certification threshold (>=128/200). Text-only scores reached 87-88/100 vs. specialists' 76/100, whereas image-based scores were 75-79/100 vs. 82/100. Critical hallucinations (2.3% of responses) included unsafe surgical advice. Image misreadings strongly correlated with limited literature (Spearman's r=-0.80, p<1e-6) . Interpretation: Despite certification-level performance and superior text-based scores, these LLMs show concerning hallucinations and significant limitations in ophthalmic image interpretation. The identified weaknesses in spatial reasoning and rare condition recognition require enhanced safety protocols and specialized data to improve clinical reasoning and visual comprehension in future ophthalmology-specific AI.

O3-13 Benchmarking Next-Generation Reasoning-Focused Large Language Models in Ophthalmology: A Head-to-Head Evaluation on 5888 Question Items in Ophthalmology

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PURPOSE: The advent of large language models (LLMs) with reasoning-focus show promise in healthcare. However, its performance in specialized medical domain remains understudied. We aimed to comprehensively evaluate the accuracy and reasoning capabilities of four newly released reasoning-focused LLMs—DeepSeek-R1, OpenAI o1, OpenAI o3-mini, and Gemini 2.0 Flash-Thinking.

METHODS: We used 5,888 multiple-choice-questions from the MedMCQA's ophthalmology subset. LLMs were prompted to select an answer and provide a structured justification. Accuracy, Macro-F1, text-generation metrics (METEOR, ROUGE-L, BERTScore, BARTScore, AlignScore) and inference time were assessed. A qualitative assessment was performed to examine clarity, completeness and reasoning structure.

RESULTS: O1 (0.902) and DeepSeek-R1 (0.888) showed highest accuracy ($p < 0.001$). Based on text-generation metrics, inconsistent trends across models were observed. O1 performed best on METEOR (0.232 ± 0.091), while o3-mini led on ROUGE-L (0.151 ± 0.069) and AlignScore (0.181 ± 0.145). DeepSeek-R1 (0.673 ± 0.049) and o3-mini (0.673 ± 0.052) tied for BERTScore; DeepSeek-R1 (-4.105 ± 0.926) and Gemini 2.0 Flash-Thinking (-4.127 ± 0.939) performed best on BARTScore. Inference time across the models varied, DeepSeek-R1 was slowest (40.3s ± 21.6s) and Gemini 2.0 Flash-Thinking fastest (6.7s ± 2.4s). DeepSeek-R1 and Gemini 2.0 Flash-Thinking tended to present detailed thinking processes, o1 and o3-mini tended to show "summarised thinking process" before generating eventual responses.

CONCLUSIONS: Reasoning-focused LLMs demonstrate promise in ophthalmology, each version presented distinct advantages and trade-offs. While DeepSeek-R1 offer high accuracy, slower speed may limit usage for simple queries. O3-mini excels in direct and concise explanations. These findings underscore the importance of balancing accuracy, inference speed, and clarity when deploying LLMs clinically, effectively in real-world practice.

O3-14 BEnchmarking LLMs for Ophthalmology (BELO) : A comprehensive benchmark for ophthalmological knowledge and reasoning

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PURPOSE: There is no standardised benchmark for evaluating large language models (LLMs) in ophthalmology. We introduce BELO (BEnchmarking LLMs for Ophthalmology), designed to rigorously assess model accuracy and reasoning in ophthalmological tasks.

METHODS: We curated ophthalmology-specific multiple-choice-questions (MCQs) from diverse medical examination and research datasets - BCSC, MedMCQA, MedQA, BioASQ, and PubMedQA, - using a hybrid extraction approach combining keyword-based retrieval and a fine-tuned BERT model. The dataset underwent four rounds of expert validation. Outdated, duplicate, or substandard questions were systematically removed. Nine board-certified ophthalmologists extensively refined 132 substandard reasonings, followed by adjudication by three senior ophthalmologists to ensure robustness. To demonstrate BELO's utility, we quantitatively evaluated OpenAI o1, o3-mini, GPT-4o, Deepseek-R1, Llama-3-8B, and Gemini 1.5 using accuracy, macro-F1, and five text-generation metrics (ROUGE-L, BERTScore, BARTScore, METEOR, and AlignScore) to establish a leaderboard. Likewise, two ophthalmologists qualitatively evaluated 50 randomly chosen questions for reasoning accuracy, comprehensiveness, and completeness.

RESULTS: BELO consists of 900 high-quality questions (BCSC: 260, BioASQ: 10, MedMCQA: 572, MedQA: 40, PubMedQA: 18). O1 achieved the highest accuracy (0.88) and macro-F1 (0.78). Furthermore, o1, o3-mini, and GPT-4o excelled across different text-generation metrics. Qualitative analysis by human experts ranked GPT-4o highest, with statistical difference in readability with Gemini 1.5.

CONCLUSIONS: BELO is the first ophthalmology-specific benchmark, repurposed from multiple sources, rigorously quality-checked and enriched with expert-driven reasonings, addressing a critical gap in standardised LLM evaluation. This multi-stage quality assurance process ensures robustness and reliability. By establishing a gold standard for ophthalmology-focused LLM assessment, BELO lays the groundwork for advancing ophthalmological LLMs development and integration.

O3-15 Evaluating LLMs and LLM Agents in Healthcare: Key Challenges in Clinical Applications

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PURPOSE: Large language models (LLMs) are transforming healthcare by supporting clinical decisions and patient education, but evaluating their performance in medical contexts is challenging due to the high-risk nature of healthcare and diverse data. We aim to provide a comprehensive overview of current evaluation practices for LLMs and LLM agents in medicine.
METHODS: This research followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, systematically searching PubMed, Google Scholar, and Web of Science for peer-reviewed articles and conference proceedings from 1 January 2023 to 13 November 2024. After filtering for relevance and quality, 256 studies were included to analyze the evaluation of LLMs and LLM agents in medicine, with a particular focus on data sources, task scenarios, evaluation methods, and dimensions.
RESULTS: Evaluation of LLMs and LLM agents in medical contexts relied primarily on data from existing medical resources and manually curated questions. Task scenarios assessed included closed-ended tasks, open-ended tasks, image processing tasks, and real-world multitask scenarios involving LLM agents. Evaluation methods encompassed automatic and human assessment. For evaluation dimensions, accuracy and completeness were commonly emphasized, while aspects like hallucinations, stability, cost-effectiveness, as well as LLM agent-specific metrics such as tool usage and reasoning capabilities were comparatively underexplored.
CONCLUSIONS: The intricate and diverse task scenarios and evaluation dimensions of LLMs in the medical field underscore the crucial need for constructing precise and effective evaluation frameworks. This emphasizes the importance of continued research and innovation to ensure the responsible integration of LLMs into clinical practice.

O3-16 DeepSeek-R1 Outperforms Gemini 2.0 Pro, OpenAI o1, and o3-mini in Bilingual Complex Ophthalmology Reasoning

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PURPOSE: To evaluate the accuracy and reasoning ability of DeepSeek-R1 and three recently released LLMs in bilingual complex ophthalmology cases.
METHODS: A total of 130 multiple-choice questions (MCQs) related to diagnosis (n = 39) and management (n = 91) were collected from the Chinese ophthalmology senior professional title examination and categorized into six topics. These were translated into English. Responses from DeepSeek-R1, Gemini 2.0 Pro, OpenAI o1 and o3-mini were generated under default configurations between February 15 and February 20, 2025. Accuracy was calculated as the proportion of correctly answered questions, with omissions and extra answers considered incorrect. Reasoning ability was evaluated through analyzing reasoning logic and the causes of reasoning error.
RESULTS: DeepSeek-R1 demonstrated the highest overall accuracy, achieving 0.862 in Chinese MCQs and 0.808 in English MCQs. Gemini 2.0 Pro, OpenAI o1, and OpenAI o3-mini attained accuracies of 0.715, 0.685, and 0.692 in Chinese MCQs (all $P<0.001$ compared with DeepSeek-R1), and 0.746 ($P=0.115$), 0.723 ($P=0.027$), and 0.577 ($P<0.001$) in English MCQs, respectively. DeepSeek-R1 achieved the highest accuracy across five topics in both Chinese and English MCQs. It also excelled in management questions conducted in Chinese (all $P<0.05$). Reasoning ability analysis showed that the four LLMs shared similar reasoning logic. Ignoring key positive history, ignoring key positive signs, misinterpretation medical data, and too aggressive were the most common causes of reasoning errors.
CONCLUSIONS: DeepSeek-R1 demonstrated superior performance in bilingual complex ophthalmology reasoning tasks than three other state-of-the-art LLMs. While its clinical applicability remains challenging, it shows promise for supporting diagnosis and clinical decision-making.

O3-17 Artificial Intelligence in Ophthalmic Patient Education: A Comparative Analysis with AI, Search Engines, and Human Expertise

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PURPOSE: To compare the accuracy, comprehensiveness, clarity, consistency, and credibility of LASIK surgery information provided by AI models, Google, and ophthalmologists.
METHODS: A structured questionnaire covering key LASIK topics—including procedure details, eligibility, risks, post-operative care, and long-term outcomes was developed based on previously published literature. Three AI models (ChatGPT, Gemini, Claude), Google search results, and ophthalmologists were asked to respond to the same set of questions. A scoring system (0-10) was applied to evaluate the responses across five parameters: accuracy, comprehensiveness, clarity, consistency, and source credibility. The final scores were analyzed to determine the most reliable source of LASIK-related information.
RESULTS: Ophthalmologists provided the most accurate and comprehensive responses, achieving the highest total score of **24.9/25**. AI models demonstrated better clarity and consistency compared to Google search results but lacked medical nuance and credibility, with ChatGPT scoring **20.0/25**, Gemini **19.3/25**, and Claude **18.5/25**. Google scored lowest **15.3/25**, due to inconsistencies, outdated sources, and the influence of non-medical content. AI models provided structured and easy-to-understand responses but failed to cite authoritative medical sources, reducing their credibility.
CONCLUSIONS: While AI models offer clear and consistent LASIK-related information, their lack of depth and verified sources limits their reliability in patient education. Google search results remain inconsistent and prone to misinformation. Human ophthalmologists continue to be the most accurate and comprehensive source of LASIK information, emphasizing the need for professional consultations in medical decision-making. AI models can serve as supplementary tools but require improvements in source citation and depth to enhance their effectiveness in ophthalmic patient education.

O3-18 Leveraging Large Language Models for Medical Web Application Development: A Pilot Study in Ophthalmology

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PURPOSE: This pilot study explores the feasibility of using Large Language Models (LLMs) to enable medical professionals without programming background to develop specialty-specific web applications. Using ophthalmology as the initial test case, we investigated whether LLMs could effectively bridge the technical knowledge gap in creating clinical tools.
METHODS: We conducted an in-depth case study following an ophthalmologist's journey in developing three distinct web applications using LLM-guided development. The process utilized a structured approach combining LLM prompting strategies with Streamlit and Python, with applications hosted on GitHub. Development time, successful feature implementation rate, and encountered challenges were systematically documented over a 3-week period.
RESULTS: The participant successfully developed three applications: "a literature search assistant, a retinal image analyzer, and a patient education interface". Average development time was 5.5 hours per application, with 90% of intended features successfully implemented. Key challenges included prompt engineering optimization and handling specialty-specific requirements.
CONCLUSIONS: This pilot demonstrates the potential of LLMs in enabling medical professionals to create domain-specific applications. While the single-subject design limits generalizability, the successful development of functional applications suggests promise for broader implementation. Future research should expand to multi-specialty evaluation and larger participant pools.

P1-1 Diagnostic efficacy of segmentation AI for Crystalline Keratopathy

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Background
Crystalline keratopathy (CK) is a rare corneal disease that presents diagnostic challenges. To improve CK identification and explore potential etiologies, we developed an AI-based segmentation model.
Methods
A dataset of 2,497 images of infectious keratitis without CK and 153 images of CK was annotated for crystalline features and other disease signs. Using this dataset, we trained an instance segmentation model (Mask R-CNN R50-FPN 2x). We also evaluated whether CK could be classified as infectious or non-infectious using CorneAI (YOLOvX). Segmentation performance was assessed using standard metrics, and the accuracy of region-of-interest (ROI) detection was measured with the Dice Similarity Coefficient (DSC).
Results
The Mask R-CNN model successfully distinguished CK from other corneal diseases, achieving an accuracy of 0.61, precision of 0.92, recall of 0.61, and AUC of 0.730. Crystalline regions were effectively detected, with a DSC of 0.52. However, classification of CK as infectious or non-infectious was relatively limited, with an accuracy of 0.54, precision of 0.84, recall of 0.54, and AUC of 0.65.
Conclusions
AI-based segmentation shows promise in detecting CK. However, due to the atypical presentation of infection signs in CK, distinguishing between infectious and non-infectious causes remains challenging.
Keywords
Crystalline keratopathy, Artificial intelligence, Deep learning, Infectious crystalline keratopathy, Noninfectious crystalline keratopathy, Corneal imaging, Ophthalmology

P1-2 Comparison of the Accuracy Between AI for POAG Diagnosis and AI for PACG Diagnosis Using Corvis ST

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Purpose: An AI was developed to diagnose Primary Open-Angle Glaucoma (POAG) and Primary Angle-Closure Glaucoma (PACG) using Corvis ST parameters, and its accuracy was compared between the two conditions.
Methods: A total of 144 POAG eyes, 92 PACG eyes, and 180 normal eyes were analyzed. The data were standardized, and 80% of the dataset was used for training while 20% was used for testing. Age, axial length, intraocular pressure, central corneal thickness, and 15 Corvis ST parameters (A1 time, A1 velocity, A1 length, A1 deformation amplitude, A2 time, A2 velocity, A2 length, A2 deformation amplitude, HC time, HC length, HC deformation amplitude, Peak distance, Radius, Whole eye movement, and Whole eye movement time) were used to compare the performance of two binary classification AIs—one distinguishing normal eyes from POAG and the other distinguishing normal eyes from PACG. Light Gradient Boosting Machine (LightGBM) was used as the classifier. Hyperparameters were optimized using GridSearchCV with 10-fold cross-validation, selecting the combination with the highest evaluation score.
Results: The AI classifying normal eyes and POAG achieved an accuracy of 0.938, precision of 0.942, recall of 0.938, and F-score of 0.939, with an AUC of 0.94. The AI for normal and PACG classification achieved an accuracy of 0.927, precision of 0.928, recall of 0.927, and F-score of 0.926, with an AUC of 0.92. The top five important features for the normal vs. POAG classification AI were Age, CCT, A2 time, HC time, and IOP, while for the normal vs. PACG AI, they were A2 time, Age, AL, HC time, and A1 length.
Conclusion: The POAG and PACG diagnostic AIs using Corvis ST parameters both demonstrated high diagnostic accuracy. Given that A2 time and HC time—parameters related to mid-to-late deformation response—were common significant features for both POAG and PACG, the application of AI using Corvis ST parameters shows promise for the early detection and differential diagnosis of glaucoma in clinical settings.

P1-3 Evaluating ChatGPT O1 pro for Diabetic Retinopathy Follow-up Decisions

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Purpose: This study aimed to determine whether ChatGPT O1 pro, a large-scale language model, can effectively implement follow-up decisions for diabetic retinopathy (DR).

Methods: We collected 41 fundus photographs from 16 DR patients at Tsukazaki Hospital. Thirty pairs of images from the same patient at different times were analyzed by O1 pro. The model compared image pairs on a 3-point scale: worsening, no significant change, or improvement. Three DR doctors performed the same evaluation, with the supervisor's judgment used as the criterion in cases of disagreement.

Results: O1 pro achieved a correct response rate of 70% (21/30 pairs). Analysis revealed limitations in understanding retinal anatomy and misinterpreting hard exudates and hemorrhages.

Conclusion: While O1 pro shows potential, further innovations are necessary to improve its performance for automatic DR follow-up assessments. Enhancements in anatomical understanding and feature detection are crucial for clinical application.

P1-4 A Literatures Review of on Cross-modal Deep Learning Generation Methods for Fluorescein Angiography (FA)

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This review investigates cross-modal transformation (CMT) techniques for generating fluorescein angiography (FA) images from non-invasive modalities such as color fundus photography, infrared (IR), and optical coherence tomography angiography (OCTA). CMT offers a safer, cost-effective alternative to traditional FA, which is invasive and poses risks. A total of 497 records were retrieved from four academic databases and three search platforms, from which 27 peer-reviewed studies were selected for analysis. These studies employed deep learning methods such as generative adversarial networks. Results show that paired datasets generally yield better structural preservation, while high-quality inputs like OCTA or IR produce more realistic FA outputs. Despite progress, challenges remain, including limited public datasets, lack of standardized evaluation metrics, and insufficient clinical validation. The most common evaluation metric is the Structural Similarity Index (SSIM), with reported values ranging from 4.2 to 9.1 (mean: 6.9), showing a trend of improvement over time. Diffusion models and Transformer-based architectures are promising but underexplored. Synthetic FA shows potential for AI-based diagnosis and data augmentation. Future work should focus on dataset expansion, model improvement, and unified evaluation standards to enable clinical translation.

P1-5 Evaluation of the Coverage Area of Ultra-wide field fundus photography for Telemedicine in Diabetic Retinopathy

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Purpose: To evaluate the area captured in ultra-wide field fundus photography of diabetic patients in the real world by software
Methods: Diabetic patients (n=68) who visited Osaka University Hospital from April 2022 to February 2025 were included. The extent of diabetic patients' fundus was evaluated using ultra-wide field fundus autofluorescence (FAF) imaging (Optos: Silverstone, Nikon) . The area of ETDRS 7 standard 30-degree fields (Area A) , the area extending up to the equatorial region (Area B) , and a wide elliptical area equivalent in size to Area B (Area C) were determined using software (MIPAR: MIPAR) .
Results: 136 ultra-wide field FAF images were evaluated. Area A was captured in ultra-wide field photography in 97.8% of cases (n=133) , Area B in 1.5% (n=2) , and Area C in 38.2% (n=52) , respectively. The probability of detecting Area A, Area B and Area C were significantly different ($p < 0.05$) .
Conclusions: The ETDRS 7 standard 30-degree fields area is almost entirely visible in ultra-wide-field fundus photography, whereas the equatorial regions are barely captured. In a horizontally range, a relatively wide area is often visible. Since diabetic retinopathy exhibits diffuse spread, it was deemed that evaluation could be conducted using the ultra-wide field fundus photography.

P1-6 物体検出ＡＩによる眼位異常の検出

○Kenji Yoshitsugu[1,2], Nishimura Hiroki[2,3,4], Ito Takashige[2,3], Sano Mizuho[2,3], Tozawa Koharu[2,3], Kuroiwa Robin[2], Khemlani Rohan[2,3], Sato Mari[3,4], Nakayama Shintaro[2,4], Shimizu Eisuke[2,3,4]
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【概要】hirschberg試験及びカバーアンカバー試験を、手持ち細隙灯顕微鏡(Smart Eye Camera)で撮影した動画から、物体検出AIで両眼と角膜の位置を検出することで、眼位異常を定量的に検出する手法を考案して検証した。
【方法】
(1)南青山アイクリニック倫理審査委員会(委員会番号:15000127)承認のもと、試験の様子を撮影した動画を後向きに収集
(2)専門医が動画ごとに眼位異常の有無を判定
(3)20の動画から各10フレームずつ、計200フレームに対して眼と角膜の位置を矩形アノテーション
(4)アノテーションしたデータで物体検出AI(YOLO11)を学習
(5)67の動画の全フレームに対して、物体検出AIで左右の眼と角膜を検出(17160件)
(6)診断対象として有効な検出結果を抽出(12230件)
(7)左右の眼位差の絶対値を算出して特徴量に追加
(8)検出結果の左右の眼と角膜の位置座標を正規化
(9)学習データとテストデータに分離(1:9)
(10) LightGBM、XGBoost、CatBoost、ロジスティック回帰、AdaBoost、サポートベクタマシン、RandomForestで学習／予測を実行して検証。
【結果】感度と特異度のバランス指標であるF値で評価すると、サポートベクタマシンの結果がもっとも良く、感度、特異度、F値、正解率がそれぞれ、0.39、0.94、0.55、0.67であった。
【考察】特異度の値は高いが、それに比べて感度(眼位異常検出率)が低いのは、眼位に異常がある場合でも撮影されたフレームによって眼位差のバラつき(分散)が大きいためと考えられる。これは被験者単位で見た場合に、眼位差のバラつきの大きさから眼位の異常を判定できることが示唆されるので、アノテーションした教師データを増やすことで、眼位差のバラつきを分析したいと考える。また今回は画像フレーム毎に検出予測を行ったが、これを被験者単位にすれば検出予測精度を高められるのではないかと考える。具体的には、被験者の動画から抽出された静止画フレームに対して物体検出AIで検出を行い、眼位異常の有無の数を比べて多い方を検出結果とする方法である。
【結論】物体検出AIによる両眼と角膜の検出で、眼位の異常を検出できることが示唆された。

P1-7 Q&A System for Niigata's Ophthalmology Medical Fee Calculation Rules and Its Improvement

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【Purpose】Niigata Prefecture's medical fee calculation rules are disseminated to ophthalmologists via printed materials and PDFs, making retrieval problematic. To address this issue, we developed a question-answering system and then aimed to improve its accuracy through evaluation.
【Methods】We compiled 234 calculation rules from 21 PDF files into a CSV file and used it as the dataset to build a chatbot with Dify, a platform for developing LLM applications. The chatbot was based on Retrieval-Augmented Generation (RAG). A self-constructed Q&A set was used for evaluation with the Retrieval-Augmented Generation Assessment (RAGAS) framework. Also, a post-usage survey was conducted among ophthalmologists.
【Results】RAGAS evaluation results were faithfulness: 0.8617, response relevancy: 0.6996, context precision: 1.0000, and context recall: 0.9701. The survey showed normalized scores for accuracy: 0.6, relevance: 0.65, and readability: 0.85. We attribute the lower accuracy to users entering synonyms absent from the dataset, reducing the response rate. Implementation of a synonym search significantly improved accuracy.
【Conclusion】Our system educates ophthalmologists on appropriate insurance claim practice, while streamlining medical fee statement preparation. Continuous improvements stemming from feedback are crucial for practical implementation.

P1-8 Visual Feedback System to Promote AI Safety System

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BACKGROUND:
AI safety systems in medicine are effective in preventing medical errors. However, their effectiveness depends on consistent operation. Our previous study found that the rate of medical errors reaches 80% in cases where AI safety systems were not used. To address this issue, we developed a visual feedback system integrated with a timeout monitor.
METHODS:
This study was conducted as a before-and-after comparative study. Utilizing the timeout monitor already installed in our department for displaying patient information, a dynamic frame display was added to visualize the authentication status of the AI safety system in real time. The dynamic frame was designed to change from flashing red to fixed green when authentication was completed. This visual feedback was intended to encourage staff to complete the authentication process consistently. The rate of incomplete authentication was compared between four months before (April–July 2024) and after (September–December 2024) the introduction of the system. In addition, a satisfaction survey using the Net Promoter Score (NPS) was conducted among operating room nurses.
RESULTS:
The rate of incomplete authentication decreased significantly from 0.35% before implementation to 0.12% after ($p < 0.01$). In addition, Net Promoter Score (NPS) results improved from -5.6% before implementation to 38.9% after implementation. Furthermore, the percentage of respondents who rated the AI safety management system as "recommended" with a score of 9-10 increased from 33.3% before implementation to 61.1% after implementation.
CONCLUSIONS:
The visual feedback system was effective in encouraging operating room nurses to use the AI safety system. Furthermore, the satisfaction survey using the Net Promoter Score (NPS) indicated that user satisfaction increased after system implementation. The system requires little additional hardware, has a language-independent design, and is adaptable to various authentication modules. Although this study was limited to single-center ophthalmic surgery, the system is expected to be applied to other surgical areas due to its high level of integration with existing infrastructure. Future studies should examine the long-term sustainability and adaptability to various clinical settings through multicenter studies.

P1-9 A Remote Collaborative Model using a digital platform to Enhance Eye Care Accessibility and Reduce Waiting Times

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PURPOSE: This study evaluates a remote collaborative model aimed at improving access to eye care and reducing patient waiting times by utilizing optometrists for in-person assessments and ophthalmologists for remote consultations.
METHODS: Since 2020 to 2021, selected optometrists at Singapore National Eye Centre have conducted physical examinations, documenting patient histories, clinical findings, diagnoses, and management plans. For urgent cases, optometrists have direct access to on-call physicians and ophthalmologists. A total of 1394 cases were reviewed remotely by physicians, with additional oversight provided by ophthalmologists for targeted cases as needed.
RESULTS: 100% of patient records were co-signed by physicians. 232 cases were referred to ophthalmologists for specialist treatments. The implementation of this model led to a significant reduction in waiting times and improved access to specialized care.
CONCLUSIONS: The remote collaborative model demonstrates an effective approach to delivering high-quality and accessible eye care. By utilizing optometrists for direct evaluations and ophthalmologists for remote oversight, this model ensures comprehensive patient care while minimizing delays, offering a scalable solution to meet the increasing demand for eye care services.

P1-10 The Papilledema Dilemma: Myopic Pseudopapilledema from Peripapillary Hyper-reflective Ovoid Mass-like Structures (PHOMS)

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PURPOSE: PHOMS are recently described, benign optic nerve head findings, representing the most common cause of pseudopapilledema in children. Due to herniation of distended axons into the peripapillary space, PHOMS are diagnosed exclusively on OCT. Seen in conditions with axonal crowding and axoplasmic stasis (optic neuritis, ODD), isolated PHOMS are usually benign and non-progressive.
METHODS: Optical coherence tomography (OCT) of the optic discs was performed and revealed isolated bilateral peripapillary hyper-reflective ovoid mass-like structures (PHOMS), with no signs of papilledema.
RESULTS: A 11-year-old Chinese boy with early onset of myopia was evaluated for intracranial hypertension, in a context of headache and suspected bilateral papilledema (*Figure A*). His neurological examination was unremarkable. *Optical coherence tomography (OCT) of the optic discs (Figure B) ruled out* optic disc drusen (ODD), but confirmed isolated bilateral peripapillary hyper-reflective ovoid mass-like structures (PHOMS), with no signs of papilledema. Brain MRI with contrast was normal.
CONCLUSIONS: Myopia, a risk factor for PHOMS, has become epidemic worldwide. As a consequence, PHOMS-related pseudopapilledema in myopes is a more common, often underrecognized differential diagnosis of true papilledema.

P1-11 CLASSIFYING BAD SCANS VERSUS PRE AND POST CATARACT SURGERY ITRACE IMAGES USING A MACHINE LEARNING ALGORITHM

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PURPOSE: Being able to label iTrace scans as pre versus cataract surgery has potential to allow for more advanced analytics related to the optical impact of cataract surgery. It is additionally equally important to avoid performing analytics on poor quality (aka "bad") scans. In that context, the purpose of this study is to determine if a machine learning algorithm can be trained to classify iTrace scan images as "bad scans" versus pre or post cataract surgery.
METHODS: A machine learning neural net was trained to classify iTrace scans into one of three cataract surgery categories: pre-op, post-op, or bad scans. Training was performed using a pre-trained ResNet101 model with 25 epochs of additional training using the labeled iTrace images. Training was performed using a single Nvidia A6000 GPU. 80% of data was used for training and 20% was held back for validation. Results were then compared to the known status from the electronic medical record and expert Ophthalmologist scan review.
RESULTS: A total of 1,023 iTrace scans were classified using the ML algorithm. Specifically, 585 cataract surgery pre-op scans, 387 post-op, and 51 bad scans were analyzed. The overall accuracy was 98.0%. In the validation set: 100% of bad scans, 99.2% of pre-op, and 96% of post-op scans were classified correctly.
CONCLUSIONS: A machine learning model has been developed which can accurately classify iTrace scans as bad quality, pre-op, or post cataract surgery. This can facilitate more advanced analytics regarding optical changes related to cataract surgery while additionally avoiding performing analytics on poor scans.

P1-12 Association between morphological characteristics of the optic disc and other anatomical features of the fundus in highly myopic eyes

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PURPOSE: To describe optic disc characteristics of highly myopic eyes and investigate associated factors.
METHODS: According to the International Photographic Classification and Grading System, patients were divided into groups from categories 1 (C1) to C4. Using fundus photographs, the diameters of optic disc, parapapillary gamma and delta zone, the optic disc tilt ratio, and degree of rotation were measured among other morphometric variables.
RESULTS: The study included 147 eyes (84 patients). Longer horizontal optic disc diameter was associated with larger optic disc tilt ratio ($P < 0.001$, unstandardized regression coefficient B: -0.59), greater degree of optic disc rotation ($P < 0.001$, B: 001) and longer horizontal delta zone diameter ($P < 0.001$, B: 0.09). Longer vertical optic disc diameter was associated with longer vertical delta zone diameter ($P < 0.001$, B: 0.16), smaller degree of rotation ($P < 0.001$, B: 0.01) and longer disk-fovea distance (DFD; $P < 0.024$, B: 0.14). Generally, the horizontal optic disc diameter of C3 and C4 groups decreased, while vertical diameter and tilt ratio became greater than in C1 and C2. After setting axial length (AL) as an independent variable, horizontal diameters and tilt ratio still showed significant differences, while vertical diameters did not show significant differences.
CONCLUSIONS: Along with sagittal enlargement of the eyeball, vertical optic disc diameter increased with delta zone diameters and DFD. However, the change in horizontal optic disc diameter did not depend on the AL. This may be explained by the synthetic effect of axial elongation and optic disc tilt.

P1-13 Cancelled

PURPOSE: To design an easily accessible Artificial intelligence-based application for doctors to quickly look up the syndrome causing constellation of signs and symptoms. It should also be able to provide the appropriate line of management and mention the required specialty referrals and essential investigations.
METHODS: The tool used in the app runs on a large language model specifically fine-tuned on medical text / data thus accurately identifies the disease. The tool captures patients' details including current symptoms, past medical history etc. and generates possible diagnosis and treatment plan. The tool also has the capability to follow up on the information previously provided, ask additional queries to better understand the disease and then arrive at the final diagnosis.
RESULTS: We have used this app with 150 patients presenting with various syndromes. The sensitivity of diagnosis by the app was 92%. Depending on the severity of presentation, the app demonstrated a variability in response time, complex diagnosis taking longer time. The specificity of the model was estimated at 88%, indicating a strong ability to correctly rule out conditions that are not present in the patient. Feedback gathered from doctors indicated a satisfaction level of 85%, highlighting the tool's accuracy and utility in busy clinical settings. The generated treatment plans aligned with current medical guidelines in 90% of cases.
CONCLUSIONS: With the advent of local models, the entire setup can be hosted within the hospital to cater for data privacy risk, that is, the highly sensitive medical data is not sent to any third party service.

P1-14 Home-Based Eye Care: Enhancing Patient Comfort and Reducing Carbon Footprint with Portable Technology

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PURPOSE: To evaluate the impact of a home-based eye care service model on patient comfort, time savings, and environmental sustainability, using portable diagnostic equipment and eco-friendly transport.
METHODS: Sight Sprint offers vision check-ups, intraocular pressure measurements, fundus photography, and postoperative follow-ups at patients' homes. Optometrists equipped with portable diagnostic tools travel using electronic vehicles. Data on patient satisfaction, time saved, and the reduction in carbon emissions were analyzed to assess the model's efficacy.
RESULTS: Our model significantly improved patient convenience by eliminating hospital visits, saving an average of 4-5 hours per appointment for patients and their attendants. Optometrists achieved over 95% diagnostic accuracy with portable equipment. The use of electronic vehicles reduced the carbon footprint by 60%, aligning with sustainability goals.
CONCLUSIONS: The Sight Sprint home-based care model redefines eye care delivery, enhancing patient comfort, reducing logistical burdens, and promoting environmental sustainability. This innovative approach provides high-quality care while addressing modern challenges of time efficiency and climate responsibility, paving the way for scalable and eco-friendly healthcare solutions.

P1-15 Cancelled

PURPOSE: To describe clinical characteristics, morphological types and visual outcome in pediatric posterior lenticular opacities operated at a tertiary care eye hospital in south India. To suggest a new classification of pediatric posterior polar cataracts

METHODS: Retrospective study of pediatric posterior lenticular opacities underwent cataract surgery. Morphology, location of cataract, persistent hyaloid vasculature, anisometropia, amblyopia, strabismus and associated systemic conditions were assessed.1 year postoperative visual acuity was taken

RESULTS: Total 121 pediatric posterior lenticular opacities met criteria.68% cases were unilateral with exotropia (17%). Visual outcome following cataract surgery was significant ($p < 0.01$), improvement with amblyopia therapy was significant in bilateral cases ($p=0.041$). 93% intraocular lens was implanted in the bag.Anisometropia (18%) more common. Strabismus, PHPV, total cataract with ruptured lenticonus were associated with poor visual outcome

CONCLUSIONS: We suggest a new classification of pediatric posterior lenticular opacities (SILC CLASSIFICATION) with 3 categories (SIMPLE, LENTICONAL, COMPLICATED POSTERIOR) and 9 subcategories for ease of diagnosis, surgical management, correlating systemic conditions and prognosis.

P1-16 Enhancing ophthalmology education through a mobile flipped classroom: a new teaching method

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PURPOSE: Glaucoma is a major cause of irreversible blindness globally. Optical coherence tomography (OCT) aids early glaucoma diagnosis. Interpreting OCT scans requires familiarity with the technology and image analysis. This study aimed to evaluate the effects of a mobile flipped classroom model on learning outcomes and satisfaction for teaching optical coherence tomography (OCT) interpretation skills in glaucoma.

METHODS: In this quasi-experimental pre/post-test study, a total of 22 ophthalmology residents participated in a 4-session mobile flipped classroom educational intervention (90 min/session) and were assessed on OCT interpretation. Learning was measured via pre/post-tests designed by a panel. Satisfaction was assessed using a validated questionnaire.

RESULTS: Mean participant age was 29.42 (± 2.09) years. Compared to pre-intervention, post-test scores showed significant improvement after the mobile flipped classroom ($p < 0.001$). Mean satisfaction score was 74.05 (± 16.09), denoting high satisfaction.

CONCLUSIONS: Implementing a mobile flipped classroom significantly improved OCT interpretation skills and was associated with high satisfaction ratings among ophthalmology residents. This model shows promise for enhancing clinical knowledge in graduate medical education.

P1-17 Sequential Serous Choroidal Detachment in Subjects Undergoing Bilateral Trabeculectomy

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PURPOSE: This study aims to assess the incidence of serous choroidal detachment (SCD) in the second eye of patients undergoing bilateral trabeculectomy (BT) and evaluate its impact on the clinical outcomes and failure rate of trabeculectomy in the second-operated eyes.
METHODS: This retrospective case–control study analyzed 90 eyes of 45 patients who underwent BT. Surgical success was defined as maintaining intraocular pressure (IOP) between 5 and 21 mmHg, requiring no additional glaucoma surgery, and exhibiting a visual acuity of at least light perception. Relevant patient data, such as age, glaucoma type, systemic diseases, preoperative and postoperative IOP, and complications, were extracted from medical records.
RESULTS: The mean age of patients was 59.8 ± 11.1 years. The five-year cumulative probability of success in the first- and second-operated eyes was 61.0% and 67.6%, respectively (log rank = 0.085, P = 0.77). Among the participants, 28.9% experienced SCD, and 76.9% of those who had SCD in the first-operated eye developed the same condition in the second eye as well (P < 0.001). In the first-operated eyes, the five-year cumulative probability of survival was 71.7% without SCD and 35.0% with SCD (log rank = 2.59, P = 0.107).
CONCLUSIONS: The occurrence of SCD in the first eye following trabeculectomy may indicate a predisposition to its development in the second eye during BT. Furthermore, the surgical success rate of the second-operated eye is comparable to the outcomes of the first eye undergoing BT.

P1-18 Risk Factors for Ahmed Glaucoma Valve (AGV) Failure in Glaucoma Patients

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PURPOSE: To investigate the Risk factors for AGV (Ahmed glaucoma valve) failure.
METHODS: A retrospective review was conducted on the medical records of patients with varying causes of glaucoma who had undergone AGV implantation. The primary measure of success was the cumulative achievement of an intraocular pressure (IOP) between 5 and 21 mmHg, with a 20% reduction from baseline, with or without medication to lower IOP. The secondary measures of success were the IOP levels and the number of medications used for glaucoma treatment.
RESULTS: The study enrolled a total of 120 participants, with an average age of 48.9 ± 19.6 years and an average follow-up period of 4.5 ± 1.4 years. The mean survival duration was 5.3 ± 0.5 years in patients with high pressure (HP), which was significantly shorter than the 6.4 ± 0.2 years in those without HP. The likelihood of surgical failure increased with higher baseline IOP, with an odds ratio of 1.07 (95% confidence interval: 1.02-1.12). In a logistic regression model, neovascular glaucoma was the only factor significantly associated with the occurrence of HP, with an odds ratio of 3.14 (95% confidence interval: 1.2-8.1).
CONCLUSIONS: Neovascular glaucoma and a Higher Baseline IOP are risk factors for AGV failure.

P1-19 Alcohol-Assisted Debridement in PRK with Intraoperative Mitomycin C

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PURPOSE: To compare corneal stromal and endothelial cells after photorefractive keratectomy with intraoperative mitomycin C in alcohol-assisted versus mechanical epithelial debridement using confocal microscopy.
METHODS: This prospective randomized comparative study was performed on 88 eyes (44 patients) with myopia up to −6.00 diopters. The right eye of each patient was randomly assigned to either mechanical or alcohol-assisted groups, and the left eye was assigned to the alternate group. Confocal microscopy was performed preoperatively and at 3 months postoperatively. The main outcome measures were epithelial thickness; number of keratocytes in the anterior, mid-, and posterior stroma; and characteristics of the central corneal endothelial cells in terms of density, mean cell area, and polymegathism and hexagonality.
RESULTS: Three months after surgery, no statistically significant difference was noted between the study groups in terms of epithelial thickness. We also found no statistically significant difference in central corneal endothelial cells regarding cell density, mean cell area, hexagonality, or polymegathism. Compared with baseline values, the density of mid- and posterior stromal keratocytes showed no significant change in either group, whereas it decreased significantly in the anterior stroma in both groups 3 months after surgery.
CONCLUSIONS: We found that the adverse effects of photorefractive keratectomy with mitomycin C on central corneal endothelial cells were comparable between the mechanical and alcohol-assisted epithelial debridement groups and the significant decrease in postoperative keratocyte density in anterior stroma was comparable between the two groups. The choice of their application could be left to the discretion of the ophthalmologist.

P1-20 Visual outcome and contrast sensitivity after photorefractive keratectomy in low to moderate myopia: Wavefront-optimized versus conventional methods

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PURPOSE: To compare visual outcomes and contrast sensitivity after wavefront-optimized or conventional photorefractive keratectomy (PRK) in myopic patients with or without astigmatism.
METHODS: Patients with low to moderate myopia with or without astigmatism were allocated into 2 groups. The study group was treated with wavefront-optimized PRK (Allegretto Wave Eye-Q software version 2.020 default treatment) and the control group, with conventional PRK (Technolas 217z). In all cases, treatments were bilateral and performed with the same device. Baseline and 3-month postoperative measures were uncorrected and corrected distance visual acuities, manifest refraction, and contrast sensitivity.
RESULTS: Each group comprised 66 eyes. The mean preoperative spherical equivalent refraction improved from −2.99 diopters (D) ± 1.02 (SD) preoperatively to −0.08 ± 0.26 D 3 months postoperatively in the study group and from −2.66 ± 0.95 D to 0.01 ± 0.30 D, respectively, in the control group. In both groups, the postoperative mesopic and photopic contrast sensitivity decreased significantly at most spatial frequencies. The postoperative decrease in contrast sensitivity in both groups was comparable except at spatial frequencies of 3 cycles per degree (cpd) under mesopic conditions and 12 cpd under photopic conditions, frequencies at which the control group had a greater reduction.
CONCLUSIONS: Visual acuity and refractive error outcomes were similar in both treatment groups. After 3 months, mesopic and photopic contrast sensitivity were significantly decreased in both groups; the reduction in the 2 groups was almost comparable.

P1-21 Corneal Endothelial Cell Changes after Ahmed™ Valve and Molteno™ Glaucoma Implants

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PURPOSE: Changes in corneal endothelial cell (CEC) indices 24 months after Ahmed valve (New World Medical, Inc., Rancho Cucamonga, CA) and single-plate Molteno implants (Molteno Ophthalmic Limited, Dunedin, New Zealand) were evaluated.
METHODS: This cohort included Ahmed valve (29 eyes) or single-plate Molteno (28 eyes) implants. Preoperative and postoperative central CEC indices were compared. Main outcome measure was endothelial cell count.
RESULTS: Twenty-four months postoperatively, no difference in visual acuity improvement or decrease in antiglaucoma medications was observed between groups. The Molteno group showed better postoperative intraocular pressure control ($P < .001$). An 11.52% (Ahmed) and 12.37% (Molteno) reduction in CEC density (cells/mm (2)) and 3.78 (Ahmed) and 2.48 (Molteno) increase in CEC area (mm (2)) was observed, but no significant between-group difference in CEC density and area or corneal thickness.
CONCLUSIONS: Twenty-four months after Ahmed valve or Molteno implant, statistically significant quantitative (cell density) and minor qualitative (cell area) changes in central CEC were observed. Both groups appeared to have similar CEC damage.

P1-22 Orthoptic Changes following Photorefractive Keratectomy

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PURPOSE: To report orthoptic changes after photorefractive keratectomy (PRK).
METHODS: This interventional case series included 297 eyes of 150 patients scheduled for PRK. Complete ophthalmologic evaluations focusing on orthoptic examinations were performed before and 3 months after PRK.
RESULTS: Before PRK, 2 (1.3%) patients had esotropia which remained unchanged; 3 (2%) patients had far exotropia which improved after the procedure. Of 12 cases (8%) with initial exotropia at near, 3 (2%) cases became orthophoric, however 6 patients (4%) developed new near exotropia. A significant reduction in convergence and divergence amplitudes ($P < 0.001$) and a significant increase in near point of convergence (NPC) ($P < 0.006$) were noticed after PRK. A reduction ≥ 10 PD in convergence amplitude and ≥ 5 PD in divergence amplitude occurred in 10 and 5 patients, respectively. Four patients had initial NPC > 10 cm which remained unchanged after surgery. Out of 9 (6%) patients with baseline stereopsis > 60 seconds of arc, 2 (1.33%) showed an improvement in stereopsis following PRK. No patient developed diplopia postoperatively.
CONCLUSIONS: Preexisting strabismus may improve or remain unchanged after PRK, and new deviations can develop following the procedure. A decrease in fusional amplitudes, an increase in NPC, and an improvement in stereopsis may also occur after PRK. Preoperative evaluation of orthoptic status for detection of baseline abnormalities and identification of susceptible patients seem advisable.

P1-23 Ahmed glaucoma valve and single-plate Molteno implants in treatment of refractory glaucoma: a comparative study

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PURPOSE: To report 2-year follow-up data after Ahmed valve implantation (New World Medical, Inc) and Molteno single-plate implantation surgical treatment of refractory glaucoma.

METHODS: Patients with refractory glaucoma, defined as uncontrolled intraocular pressure (IOP) of more than 21 mm Hg despite maximal antiglaucoma medication, previously failed nonseton surgical treatment, or a combination thereof were included. Ninety-two patients were allocated randomly to each of the study groups and underwent implantation of either the Ahmed valve implant (model FP7; 184 mm (2) surface area) or Molteno single-plate implant (134 mm (2) surface area) and were followed up for 24 months. Main outcome measures were IOP and surgical success rate. Other outcome measures were changes in visual acuity, number of ant-glaucoma medications, mean deviation of visual field, and rate of intraoperative and postoperative complications.

RESULTS: Those who successfully completed the trial (28 in the Molteno group and 29 in the Ahmed group) achieved significantly less IOP and fewer glaucoma medications, but worse visual acuity 24 months after surgery. The Molteno group, compared with the Ahmed group, achieved significantly lower IOPs after the early postoperative period until the end of the study. Both groups reasonably maintained visual field during the follow-up. The rate of surgical failure was comparable in both groups. Median survival time was 24 months for both groups. There were no devastating intraoperative or postoperative complications in either group.

CONCLUSIONS: Both Ahmed and Molteno implants successfully preserved visual field, although IOP control was more pronounced in the Molteno implant group.

P1-25 Cancelled

PURPOSE: To determine the benefit of preoperative swept source optical coherence tomography (SS-OCT) to detect occult retinal pathologies in patients with advanced diabetic eye disease

METHODS: Fundus photos and SS-OCT were performed in all patients scheduled for diabetic vitrectomy between January 2017 to August 2022. Fundus photos and SS-OCT scans were reviewed by two retina specialists. Modified BIO-score was used on to evaluate fundus clarity. This modified BIO-score was based on Nussenblat scale of vitreous haze (5). According to this score a 5+ vitreous haze is the one in which no fundus can be seen while 0 score was given to clear view of fundus. Findings on fundus photos were compared with findings on SS-OCT.

RESULTS: Of the 61 potentially eligible patients, preoperative fundus photos and SS-OCT was performed in 41 patients. Mean age was 53±9.8 years. Median duration of diabetes was 12 years. Vitreous hemorrhage was present in 36 (87.80%) patients in which 07 (17.07%) patients had no fundus view (modified BIO-score 5/5). On fundus photos TRD was visible in 20 (48.78%) patients and ERM in 01 (2.43%) patients. Compared to this SS-OCT revealed TRD in 23 (56.10%) patients, ERM in 07 (17.07%), macular hole in 02 (4.87%) and DME in 07 (17.07%) patients.

CONCLUSIONS: SS-OCT may be beneficial in preoperative assessment of diabetic vitrectomy especially in cases of vitreous hemorrhage. SS-OCT should be considered as an adjunct to clinical examination for preoperative evaluation of retina even when the fundus view is hazy such as in presence of vitreous hemorrhage

P1-26 OPTICAL NEURITIS AND RETINOPATHY DUE TO DENGUE INFECTION IN CHILDREN: A FIRST DOCUMENTED RARE CASE REPORT

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PURPOSE: Report the first documented Complication of Dengue as Optic Neuritis
METHODS: A Case Report according to CARE Guideline 2012. Patients were asked for informed consent to be documented with personal data masked. Documentation data such as laboratory results, fundoscopy and OCT were compiled in manuscripts.
RESULTS: After a verified episode of dengue hemorrhagic fever, a 10-year-old child showed signs of increasing bilateral vision loss one month later. His visual acuity, which was 20/400 in both eyes, remained significantly compromised even after systemic recovery. A fundoscopic examination showed pallor in the optic disc, hard exudates, ghost vessels, and large retinal hemorrhages. Ocular coherence tomography（OCT）indicated ischemic retinal injury but did not reveal macular edema. Vision remained severely impaired even after first corticosteroid treatment, underscoring the severity and protracted course of dengue retinopathy. Endothelial dysfunction brought on by the dengue virus causes a cytokine storm that weakens the blood-retinal barrier and causes retinal ischemia and bleeding. Dengue retinopathy, in contrast to other prevalent eye illnesses, has no known cure, but corticosteroids may be helpful. Since a delayed diagnosis could result in irreparable visual loss, early detection is essential. This example highlights the need for increased clinical suspicion and highlights the difficulty in differentiating dengue retinopathy from other viral and autoimmune retinal disorders.
CONCLUSIONS: The case highlights the importance of ophthalmic assessment in dengue patients with visual symptoms, emphasizing the need for multidisciplinary collaboration between ophthalmologists and infectious disease specialists for early diagnosis and potentially life-saving treatments.

P1-27 Patterns of Uveitis in a Level Three Government Hospital: A Ten Year Study

○Marie Chemantha Alexandria Buscayno[1], Vicente Victor Ocampo Jr.[1,2]
[1] Ospital ng Maynila Medical Center, Manila, Philippines., [2] Ospital ng Makati, Manila, Philippines

PURPOSE: This study aimed to elucidate the prevalence of uveitis in a tertiary government hospital. Such insights are critical for designing interventions and formulating health policies to improve surveillance and the handling of such diseases.
METHODS: A retrospective chart review of 118 patients diagnosed with uveitis from January 2014 to December 2023 in Ospital ng Maynila Medical Center was conducted. Data included demographics, presentation based on the Standardization of Uveitic Nomenclature（SUN）Classification, treatment and outcomes.
RESULTS: The mean patient age was 51 years, with equal gender distribution. Most cases were chronic, with anterior uveitis as the predominant type, followed by panuveitis. Unilateral involvement was more common. Idiopathic and infectious etiologies were the most frequent causes, with tuberculosis leading among infectious origins. Non-infectious causes, such as VKH and sympathetic ophthalmia, were less common.
Majority of the treatment given to patients were steroids. Visual acuity improved significantly with steroids, whereas minimal improvement was observed with azathioprine. Cataract and glaucoma were noted as steroid-related complications in 11.11% and 4.76% of cases, respectively, while 40% of patients on azathioprine developed glaucoma.
CONCLUSIONS: This study highlights the predominance of anterior uveitis, idiopathic and infectious etiologies, and chronic courses, most especially among older patients. The differences in terms of the demographics, laterality, and clinical courses emphasize the importance of exact diagnostic and management approaches. Comparisons with local and international studies underscore geographic differences in uveitis profiles, emphasizing the need to have localized strategies for optimal care.

P1-28 Bridging the Digital Divide: Implementing a Social Media Avatar for Ophthalmology Patient Education and Communication

○Anand Singh Brar[1], Manirattan Singh Brar[2]
[1] Brar Eye Hospital, Bathinda, India., [2] Independent Researcher, Bathinda, India

PURPOSE: To explore the feasibility and implementation of a Large Language Model powered avatar system designed specifically for ophthalmology patient education, combining the accessibility of social media platforms with Artificial Intelligence (AI) technology to enhance doctor-patient communication.
METHODS: An AI avatar was developed using Meta AI Studio and deployed on Instagram to serve as a virtual ophthalmology educator. The avatar was programmed to communicate complex eye-health concepts, treatment procedures, and preventive care measures in an accessible, engaging format. Development process, content creation workflow, and platform integration methods were documented.
RESULTS: The implementation resulted in a functional AI avatar capable of delivering personalized eye health information through Instagram's widely accessible platform. Key features include multilingual communication supporting major regional languages, real-time image generation for visual explanations of eye conditions, and web-based information retrieval for up-to-date medical information. The avatar demonstrates the potential for scaling personalized patient education while maintaining consistent medical messaging across language barriers and cultural contexts.
CONCLUSIONS: This proof-of-concept demonstrates how social media-integrated AI avatars can serve as valuable tools in modern ophthalmology practice, potentially improving patient education accessibility and engagement. The combination of multilingual support, visual content generation, and dynamic information access suggests promising applications for global healthcare communication and education.

P1-29 Sleep onset time as a mediator in the association between screen exposure and aging: a cross-sectional study

○Senlin Lin, Juzhao Zhang, Tao Yu
Shanghai Eye Disease Prevention and Treatment Center, Shanghai, China

PURPOSE: Excessive screen exposure has become a significant health concern. This study investigates the impact of screen time on aging in middle-aged and elderly populations.
METHODS: Healthy working adults over 45 years old in Shanghai, China, underwent general and ocular examinations. Questionnaires collected demographics, medical history, and screen exposure details. Aging was assessed using the retinal age gap, defined as the difference between the retinal age predicted by deep learning algorithms based on fundus images and chronological age. Pathway analysis tested the mediation effect of sleep duration and onset time on the relationship between screen usage and retinal age gap.
RESULTS: The retinal age gap increased with longer screen exposure, from 0.49 ± 3.51 years in the lowest tertile to 5.13 ± 4.96 years in the highest tertile (Jonckheere-Terpstra test, $p < 0.001$). Each additional hour of screen exposure accelerated the retinal age gap by 0.087 years (95% CI, 0.027, 0.148, $p = 0.005$) in the fully adjusted linear model. Sleep onset time mediated the impact of screen usage on the retinal age gap (indirect effect, $\beta = 0.11$; 95% CI 0.04-0.24). The impact of screen usage in a light-off environment on the retinal age gap was fully mediated by sleep onset time (indirect effect, $\beta = 0.22$; 95% CI 0.07-0.38), with the proportion being 100%.
CONCLUSIONS: Our study identified a correlation between excessive screen time and a wider retinal age gap in elderly individuals, likely due to delayed sleep onset. To mitigate the adverse effects, limiting screen usage and avoid screens before bedtime might be useful.

P1-30 Evaluating Imaging Repeatability of Fully Self-Service Fundus Photography within a Community-based Eye Disease Screening Setting

○Juzhao Zhang, Tao Yu, Senlin Lin, Haidong Zou
Shanghai Eye Disease Prevention and Treatment Center, Shanghai, China

PURPOSE: This study aimed to investigate the imaging repeatability of self-service fundus photography compared to traditional fundus photography performed by experienced operators.
METHODS: Prospective cross-sectional study. In a community-based eye diseases screening site, we recruited 65 eyes (65 participants) from the resident population of Shanghai, China. All participants were devoid of cataract or any other conditions that could potentially compromise the quality of fundus imaging. Participants were categorized into fully self-service fundus photography or traditional fundus photography group. Image quantitative analysis software was used to extract clinically relevant indicators from the fundus images. Finally, a statistical analysis was performed to depict the imaging repeatability of fully self-service fundus photography.
RESULTS: There was no statistical difference in the absolute differences, or the extents of variation of the indicators between the two groups. The extents of variation of all the measurement indicators, with the exception of the optic cup area, were below 10% in both groups. The Bland-Altman plots and multivariate analysis results were consistent with results mentioned above.
CONCLUSIONS: The image repeatability of fully self-service fundus photography is comparable to that of traditional fundus photography performed by professionals, demonstrating promise in large-scale eye disease screening programs.

P1-31 The Effectiveness of Different Machine Learning Models in Predicting Keratoconus Progression

○Metehan Karaatlı[1], Nilgün Yıldırım[2], Özer Çelik[2]
[1] Bitlis State Hospital, Bitlis, Turkey., [2] Eskişehir Osmangazi University, Eskişehir, Turkey

PURPOSE: We aimed to predict keratoconus progression at the time of diagnosis with a machine learning model using clinical risk factors, corneal topography and biomechanical parameters at the first visit of keratoconus patients.
METHODS: 562 eyes of 325 keratoconus patients were divided into two groups: progression (300 eyes) and non-progression (262 eyes). The Belin ABCD progression display on the Pentacam (Oculus, Wetzlar, Germany) was used for progression decision. A data set was created with clinical risk factors, Pentacam topography and Oculer Response Analyzer (Reichert Ophthalmic Instruments, Inc., Buffalo, NY, USA) parameters of all patients. XGB, LGBM, AVG Blender, Extra Trees, Random Forest and Logistic Regression modelling algorithms were used for machine learning.
RESULTS: Of all the algorithms, the XGB model was the best predictor of keratoconus progression with 68% accuracy. This model correctly predicted progression in approximately 7 out of 10 keratoconus patients based on data from the patients' first visit. The sensitivity of this model was 0.64 and the specificity was 0.70.
CONCLUSIONS: There is still no definitive marker for keratoconus progression. Once keratoconus has been diagnosed, it is important to be able to predict progression in advance in order to monitor the frequency of patient visits and plan treatment. In this study, we obtained a moderately successful model for predicting keratoconus progression at the time of diagnosis. A model with higher accuracy can be developed with a data set that includes data from follow-up visits of patients.

P1-32 Association between MRD1 and Dry Eye Syndrome in Korean adults: A Cross-Sectional Study

○Sun Young Jang
Soonchunhyang Univeristy Bucheon Hospital, Bucheon, Korea, Republic of

PURPOSE: To investigate the role of margin reflex distance 1 (MRD1) in dry eye syndrome (DES) in a nationally representative Korean population.
METHODS: We investigated 11,385 subjects with DES through a cross-sectional study using the Korean National Health and Nutrition Examination Survey (KNHANES), 2010 – 2012.
RESULTS: The DES patients were predominantly women, non-smokers and non-drinkers, living in urban regions, with a higher percentage of hypertension, depressive disorder, hyperlipidemia, thyroid diseases, and MRD1. As the level of MRD1 increased, there is a tendency to increase odds ratio of DES in the right eye and the left eye and it is statistically significant (p=0.0043, right eye, p=0.0055, left eye, respectively).
CONCLUSIONS: MRD1 was associated with DES in a nationally representative Korean population. Close evaluation of ptosis is consequently needed when treating patients with DES.

P1-33 Prediction of Cataract Severity Using Slit Lamp Images from a Portable Smartphone Device: A Pilot Study

○David Chen[1], Changshuo Liu[2], Junran Wu[2], Beng Chin Ooi[2]
[1] National University Hospital, Singapore, Singapore., [2] National University of Singapore, Singapore, Singapore

PURPOSE: There is currently no effective means to objectively screen for cataract in the community using portable devices without dilation. We hypothesize it would be possible to predict cataract severity using deep learning on images taken using a portable smartphone-based slit lamp prototype, with and without dilation.
METHODS: In this prospective cross-sectional pilot study, slit lamp images were captured from eligible patients with cataracts in a tertiary clinic using a portable slit lamp prototype attached to a smartphone. Pentacam Nuclear Staging score (PNS, Pentacam®, Oculus, Washington, USA) was taken from dilated pupils and served as ground truth. A transformer prototypical network with Swin-Transformer on the images was trained to assign the class label corresponding to the highest predicted probability. Heat maps were generated based on attribution masks to identify the anatomical areas of concern.
RESULTS: A total of 1900 images from 198 eyes of 99 patients were captured. The average age was 61.2 ± 6.5 years (range, 41.0 to 78.0 years) and average PNS score was 1.63 ± 0.89 (range, 0 to 4). The model achieved an average accuracy of 81.25% and 74.38% for undilated and dilated eyes respectively. Heat map visualization using the integrated gradient method successfully identified the anatomical area of interest in certain images.
CONCLUSIONS: This study suggests the possibility of estimating cataract density using a portable smartphone slit lamp device without dilation. Further work is under way to validate this technique in a larger and more diverse group of eyes with cataracts.

P1-34 Comparison of Machine Learning Algorithms for Predicting Subclinical Keratoconus Using Pentacam-Derived Numerical Data

○Onur Özalp[1], Betin Bilkan Karaman[2], Eray Atalay[1]
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[2] Eskişehir Osmangazi University, Faculty of Medicine, Eskişehir, Turkey

PURPOSE: We aimed to predict subclinical keratoconus (SKC) comparing various machine learning methods based on numerical data from Pentacam imaging.
METHODS: The dataset includes corneal measurements from 248 individuals with 74 Pentacam-derived parameters, comprising 186 healthy and 62 SKC eyes. The dataset was balanced by a method of the Synthetic Minority Over-sampling Technique (SMOTE), which improved the minority class. A Pearson correlation criterion of 0.5 was used to exclude multicollinear features after all characteristics were normalised using a min-max scaler. After excluding multicollinear features, 15 features remained, and following SMOTE, the minority class sample size increased to 149. The dataset was split into a training set (70%) and a testing set (30%) using a predetermined random state. A technique of five-fold cross-validation was used to reduce overfitting. The machine learning model with the greatest AUC was selected, trained, and tested for SKC prediction using PyCaret, which was used to automate the comparison among multiple models.
RESULTS: The Gaussian Process Classifier achieved the highest AUC among all evaluated models, demonstrating outstanding predictive performance with an AUC of 96.33% and an accuracy of 90.67%. The model's F1-score was 82.93%, precision was 77.27%, and recall was 89.47%. The Cohen's Kappa of 76.55% and the Matthews Correlation Coefficient (MCC) of 76.94% showed significant agreement. The most predictive parameter was overall deviation of normality (D).
CONCLUSIONS: This study demonstrates the potential of machine learning, particularly the Gaussian Process Classifier, in predicting subclinical keratoconus based on Pentacam-derived attributes.

P1-35 Cancelled

PURPOSE: The study aimed to investigate the shared environmental factors contributing to the comorbidity of Alzheimer's disease (AD) and age-related macular degeneration (AMD), which have been previously linked in clinical and genetic studies. The goal was to identify and categorize these factors using advanced data analysis techniques.
METHODS: A knowledge graph was constructed based on existing literature, incorporating all statistically significant risk factors for AD and AMD. An environment-wide association study (EWAS) was conducted using data from the UK Biobank to evaluate the contribution of various environmental factors to the comorbidity of AD and AMD. Conditional Q-Q plots and a Bayesian algorithm were employed to identify shared environmental factors, which were then categorized into domains such as health conditions, biological sample parameters, body index, and attendance availability.
RESULTS: Several shared environmental factors were identified, falling into the domains of health conditions, biological sample parameters, body index, and attendance availability. These findings were integrated with existing knowledge to generate a shared etiology landscape for AD and AMD.
CONCLUSIONS: The study successfully identified and categorized shared environmental factors contributing to the comorbidity of AD and AMD. By combining novel findings with existing knowledge, a comprehensive shared etiology landscape was developed, providing insights into the environmental underpinnings of these conditions.

P1-36 Cancelled

PURPOSE: Glaucoma, the leading cause of irreversible blindness worldwide, presents critical diagnostic challenges due to its asymptomatic progression until advanced stages. Current biomarker limitations in early detection and therapeutic targeting underscore the urgent need for robust, multi-functional biomarkers. This study aims to identify network-based hub biomarkers with dual diagnostic and therapeutic potential through integrative multi-omics analysis.
METHODS: We developed a novel computational framework integrating:
1. Disease-biomarker interaction networks using multi-omics data
2. Drug-target-disease tripartite networks
3. Greedy search algorithm optimized for network topology analysis
4. Validation leveraged UK Biobank data and cross-referenced with GWAS catalog.
5. Functional analysis examined pathway enrichment.
RESULTS: We identified 10 key hub biomarkers/drug targets for the diagnosis, treatment, and prognosis of glaucoma, with validation through text mining and genomic/epidemiological data. Additionally, we proposed novel applications of BMP1 and MMP9 for glaucoma diagnosis, further supporting the theory of hub biomarkers with multiple clinical applications. Furthermore, pivotal pathways associated with these hub biomolecules were uncovered, which may serve as a foundation for future biomarker and drug target identification in glaucoma.
CONCLUSIONS: This computational methodology successfully identifies glaucoma-relevant hub biomarkers, demonstrating network medicine's potential in bridging biomarker discovery and clinical applications. The validated framework provides a template for ophthalmic biomarker research.

P1-37 VISUAL ANGLE MEASUREMENTS USING NEWLY DEVELOPED REAL-TIME VIDEO-BASED GAZE TRACKING DEVICE FOR OCULAR MOTOR PALSY

○Dinda Ajeng Anindita[1,2], Ganjar Sulaksmono[1,2], Natalia Christina Angsana[1,2], Amelia Devy Indriasari[1,2], Indra Tri Mahayana[1,2]

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PURPOSE: To measure objective visual angle in normal eyes and eyes with oculomotor (III) and abducens (VI) cranial nerve palsy using a newly developed real-time video-based gaze-tracking device.
METHODS: This single-center cross-sectional analytic observational study included 50 eyes from patients with normal eye, oculomotor nerve palsy, and abducens nerve palsy from the neuro-ophthalmology subdivision of the Ophthalmology outpatient clinic, RSUP Dr. Sardjito, Yogyakarta, from December 2022 to December 2023.
RESULTS: There were significant differences between patient and control in nerve III group in 3 visual angles: the upgaze, primary gaze, and downgaze (12.49 ± 5.22 vs 24.68 ± 6.75, p=0.014; 4.17 ± 3.22 vs 20.25 ± 9.01, p=0.003; and 17.09 ± 0.29 vs 24.69 ± 2.54, p=0.005, respectively). However, in nerve VI group showed not significant difference in lateral gaze (24.15 ± 1.83 vs 20.66 ± 6.22, p=0.242).
CONCLUSIONS: The results demonstrated that this device can accurately and objectively measure the visual angle while distinguishing specific patterns characteristic of each group. With its advantages in affordability, accessibility, and ease of implementation, this device shows significant potential as a valuable tool for diagnostics and research in the field of neuro-ophthalmology.

P1-38 How to Begin and sustain teleconsultation- An experience from a tertiary eye care centre with 117 Teleophthalmology enabled Primary eye Care centres

○Kowsalya Akkayasamy[1], Mohammed Gowth[2]
[1] Aravind Eye care System, Madurai, India., [2] Aravind Eye Care System, Madurai, India

PURPOSE: The impact of telemedicine in ophthalmology is analysed in this research for enhancing eye care access to rural ar eas, maximizing specialist time, and saving costs for the patients.
METHODS: Teleconsultations, were established in a population of 50,000 where initial examinations and documentation we re done by certified ophthalmic technicians using an Electronic Medical Record (EMR). Diagnoses, treatment plans, and follow-up care were provided through teleconsultations by ophthalmologists. This technology used a referral system following patient outcomes through unique identification numbers. Information on cost savings, patient satisfaction, and clinical outcomes was gathered over the course of a year.
RESULTS: Telemedicine technology enabled at least 86% of patients to be treated through it. It saves approximately INR 800 per visit in travel and associated costs per patient. It was able to save a massive amount of INR 6.8 Crore for the rural economy in 2023-24. Also, early diagnosis of pathologies like Diabetic Retinopathy and Age- Related Macular Degeneration, resulted in decrease in disability in the general population
CONCLUSIONS: Telemedicine not only significantly increases access of eyecare in isolated parts of the world but also leaves almost no environmental footprint. Only 14% patients need Base Hospital intervention. It improves early detection of ocular pathologies, helps in patient's adherence to the health care and maximizes health system's resources. This model is an example of how Telemedicine can revolutionize not only eyecare but the healthcare in general, ultimately giving more efficient and patient centred care.

P1-39 Deep Learning-Based Predictive Model for Assessing the Adequacy of Skin-Only Removal in Upper Blepharoplasty for Novices

○Yi-Chieh Lee
National Taiwan University Hospital, Hsin-Chu Branch, Hin-Chu City, Taiwan

PURPOSE: Upper blepharoplasty is a common procedure, yet determining whether skin-only removal is sufficient remains challenging, especially for novice practitioners. This study develops a deep learning-based model to assist in evaluating the adequacy of skin-only removal, aiming to enhance decision-making and improve outcomes.
METHODS: We collected preoperative characteristics, clinical parameters, surgical outcomes and photos. Data preprocessing involved normalization and feature selection. A convolutional neural network (CNN) was trained (80%) and tested (20%) to classify the adequacy of skin-only removal. Model performance was assessed using accuracy, sensitivity, specificity, and AUC. Hyperparameter tuning was performed for optimization.
RESULTS: The model achieved 92.6% training accuracy but only 76% on the test set. Sensitivity and specificity were 97.2% and 72%, respectively, with an AUC of 0.96. The CNN-based model outperformed traditional methods. Feature analysis identified key predictors, including age, skin laxity, and eyelid measurements.
CONCLUSIONS: This deep learning model provides a reliable tool for assessing skin-only removal adequacy in upper blepharoplasty, benefiting novice surgeons. It offers data-driven insights to reduce uncertainty and enhance training. Further validation with larger datasets is needed for refinement and clinical application.

P1-40 Multicenter Evaluation of Deep Learning Algorithms in Detecting Treatment-requiring Retinopathy of Prematurity from Fundus Images

○Yuling Xu, Qiaowei Wu, Xiayin Zhang, Honghua Yu, Wei Sun
guangdong provincial people's hospital, Guangzhou, China

PURPOSE: Retinopathy of Prematurity is a major cause of childhood blindness worldwide. The disease progresses with high diagnostic variability and screening barriers, leading to considerable malpractice liability. We aimed to develop a novel model to evaluate treatment-requiring retinopathy of prematurity (TR-ROP) and ROP reactivation after treatment (RA-ROP).
METHODS: A multicentered, retrospective and prospective cohort study was conducted in premature infants who received fundus examination at six centers ranging from Guangzhou to rural areas in the Guangdong Telemedicine-assisted Retinopathy of Prematurity Cohort (GTROP). We developed a model to predict the risk of TR-ROP and RA-ROP based on retinal fundus images, participant metadata or the combination of both data types. Participants from Guangdong Provincial Peoples' Hospital (GDPH) were recruited for external validation.
RESULTS: We included 33,648 fundus images for training and 10,784 images for prospective validation in the multicenter cohort. 5,931 images in the GDPH for external validation. The fundus-only, metadata-only and the combined model achieved AUCs of 0.870, 0.816 and 0.924 respectively in predicting TR-ROP, and achieved AUCs of 0.796, 0.730 and 0.816 respectively in predicting RA-ROP in the training cohort. In the prospective validation cohort, the combined model predicted TR-ROP and RA-ROP with AUCs of 0.890 and 0.826 respectively. The combined model also significantly performed AUCs of 0.915 and 0.830 in predicting TR-ROP and RA-ROP in the GDPD.
CONCLUSIONS: Automated ROP prognosis prediction model enhances the capabilities of pediatricians to develop individualized screening and take timely treatment for TR-ROP and RA-ROP. The model serves as a potential solution to mitigate the scarcity of pediatrician.

P1-41 Reclaiming Vision: Tackling Pediatric Retinal Detachment with Advanced Techniques

○Padmaja Kumari Rani, Akshita Agarwal
LV Prasad Eye Institute, Hyderabad, India

PURPOSE: In this video, we discuss the complex case of a 17-year-old boy with diminished vision in both eyes for 40 days, presenting with open funnel vascular retinal detachment in the right eye (vision 20/600) and closed funnel retinal detachment in the left eye (vision PL+PR inaccurate). The treatment plan involved vitreoretinal surgery on the right eye, focusing on membrane peeling, a challenging procedure in pediatric patients.
METHODS: Preoperative bevacizumab was administered to reduce vascularity. During surgery, tractional retinal breaks were isolated, and extensive membrane proliferation was managed. Intravitreal triamcinolone acetonide (IVTA) stained the posterior vitreous, and brilliant blue dye assisted in creating cleavage planes for membrane removal. Perfluorocarbon liquid (PFCL) flattened the retina, and forceps separated vitreous attachments. Despite preoperative bevacizumab, intraoperative bleeding was controlled with diathermy. Endolaser treatment anchored the retina, and PFCL-air exchange followed by a 5000-centistoke silicone oil tamponade ensured sustained attachment.
RESULTS: Postoperatively, vision improved from HM to 20/160.
CONCLUSIONS: This case highlights the importance of preoperative planning, meticulous surgical technique, and individualized approaches for successful management of pediatric retinal detachment, ensuring favorable anatomical and functional outcomes. Key techniques included dye-assisted ILM peeling and the use of heavy silicone oil tamponade

P1-42 Standardized Evaluation of Artificial Intelligence Generated Patient Education Materials in Healthcare

○Anand Singh Brar
Brar Eye Hospital, Bathinda, India

PURPOSE: To demonstrate a systematic methodology for evaluating the quality, accuracy, and appropriateness of artificial intelligence (AI) generated patient education materials through a web-based evaluation tool.
METHODS: This 76-second instructional video presents a step-by-step walkthrough of the evaluation process for AI-generated patient education materials. The demonstration covers the complete workflow from initial patient data input to final evaluation submission, including detailed assessment criteria and quality control measures.
RESULTS: The video illustrates six key components of the evaluation process: 1) patient demographic data entry, 2) educational material generation, 3) preliminary quality screening for technical errors, 4) structured evaluation using standardized criteria including medical accuracy, clarity, cultural appropriateness, and formatting, 5) detailed feedback collection, and 6) results documentation and data export capabilities.
CONCLUSIONS: This standardized evaluation approach provides healthcare professionals with a structured framework to assess AI-generated patient education materials, ensuring quality and appropriateness for clinical use. The tool demonstrates potential for streamlining the validation process of AI-generated content in healthcare settings.

Santen

AI×医療＝? Part IV

本セミナーは英語セッションとなります。(The seminar will be conducted in English.)

座長

大鹿 哲郎 先生
(筑波大学)

人工知能(AI)技術の急速な進展は医療分野にも大きな影響を与えており、なかでも大規模言語モデル(LLM: Large Language Model)の登場と実装は、これまでの診療や研究の枠組みを大きく変えつつあります。本講演会では、医療・眼科領域におけるAIの活用について、その理論的背景から具体的応用まで、3人の演者に解説していただきます。

清田 純先生(理化学研究所)には、第4世代AIが医療全体にもたらすインパクトについて概説していただきます。大規模言語モデルがどのように構築されているのか、医療知識との統合はどう実現されているのか、そして医師の診療支援や教育・研究分野における応用の可能性について、ご紹介くださいます。これにより、AI技術の進化が今後の医療の在り方にどのような影響を与えるかを考察いたします。

寺﨑 寛人先生(鹿児島大学)は、画像診断分野におけるAIの具体的な活用事例として、AIによるOCT(光干渉断層計)画像の画質改善や、網膜疾患の異常所見を自動で検出・可視化する支援技術について講演してくださいます。ディープラーニング技術を活用することで、より鮮明な画像の取得が可能となり、医師の診断を補助するツールとしての実用性が高まっています。

佐渡 恵奈先生(京都大学)のご講演では、眼科診療における文書作成支援に焦点を当て、AIがどのように診療録や紹介状、診療要約などの文書業務をサポートできるのか、現状と今後の展望を解説していただきます。実際の医療現場では、医師の負担軽減を目的としたAI導入が進みつつありますが、正確性や信頼性、法的・倫理的な側面の検討も欠かせません。本講演では、現在の取り組みとともに、実装に向けた課題や展望についてもご紹介いただきます。

本講演会を通じて、AI技術が眼科医療にもたらす新たな価値と可能性について理解を深めていただくとともに、今後の臨床や研究におけるAIの活用について考えるきっかけとなれば幸いです。

演者1

第4世代AIの医療へのインパクト

清田 純 先生
(理化学研究所)

演者2

AIを活用したOCT画像の改善と網膜異常所見の検出支援

寺﨑 寛人 先生
(鹿児島大学)

演者3

眼科文書作成における現状と挑戦

佐渡 恵奈 先生
(京都大学)

共催：参天製薬株式会社

AI×医療＝? Part Ⅳ

本セミナーは英語セッションとなります。(The seminar will be conducted in English.)

座　長

大鹿 哲郎 先生（筑波大学）

1985年　東京大学 医学部 卒業
　　東京大学 医学部 眼科学教室
1995年　東京大学 医学部 講師
1997年　Louisiana State University,
　　Visiting Assistant Professor
1998年　東京大学 医学部 助教授
2002年　筑波大学 教授
2019年　日本眼科AI学会 理事長
2025年　アジア太平洋眼科学会（APAO） President
　　現在に至る

演 者 1

第4世代AIの医療へのインパクト
清田　純 先生（理化学研究所）

1996年　筑波大学 医学専門学群 卒業
　　筑波大学附属病院 外科/心臓血管外科レジデント
2002年　東京大学大学院 医学系研究科 博士課程
2006年　スタンフォード大学 医学部 博士研究員
2016年　理化学研究所 統合生命医科学研究センター 上級研究員
2017年　同 医科学イノベーションハブ推進プログラム ユニットリーダー
2019年　同 チームリーダー
2020年　同 生命医科学研究センター チームリーダー（兼務）
2021年　同 情報統合本部 先端データサイエンスプロジェクト チームリーダー
　　同 情報統合本部 基盤研究開発部門 ユニットリーダー（兼務）
2025年　同 数理創造研究センター 数理展開部門 チームディレクター他
　　現在に至る

演 者 2

AIを活用したOCT画像の改善と網膜異常所見の検出支援
寺﨑 寛人 先生（鹿児島大学）

2007年　鹿児島大学医学部・歯学部付属病院 感覚器センター眼科 入局
2008年　九州厚生年金病院 眼科
2009年　鹿児島大学医学部・歯学部付属病院 感覚器センター眼科 医員
2014年　鹿児島大学大学院 医歯学総合研究科 博士課程（眼科学）修了
2015年　カリフォルニア大学ロサンゼルス校ドヘニー眼研究所 リサーチフェロー
2017年　鹿児島大学病院 感覚器センター眼科 医員
2018年　医療法人青雲会 青雲会病院 眼科
2019年　鹿児島大学病院 感覚器センター眼科 医員
2020年　鹿児島大学病院 感覚器センター眼科 特任助教
2021年　鹿児島大学病院 感覚器センター眼科 助教
2022年　鹿児島大学病院 感覚器センター眼科 講師
2024年　鹿児島大学病院 感覚器センター眼科 准教授
　　現在に至る

演 者 3

眼科文書作成における現状と挑戦
佐渡 恵奈 先生（京都大学）

2019年　東北大学 卒業
2022年　University of St.Andrews Masters of Digital Health 卒業
2023年ー　京都大学 眼科学教室 後期研修医
　　現在に至る

共催：参天製薬株式会社

第6回日本眼科AI学会総会
NTTコミュニケーションズ　ランチョンセミナー

日時　2025. **6.27** 金 **12:00-13:00**

会場　コングレスクエア　グラングリーン大阪　Room2「Park Hall 2」

デジタルヘルスの展望～次世代の可能性～

スマートフォン、ウェアラブル、IoT、ヘルスケアアプリ、そして生成AIの普及、政府の掲げる「医療DX令和ビジョン2030」により医療・ヘルスケア分野においてもデジタル化が進んでいます。
臨床研究、治験などでもPatient Centricity の考え方やDecentralized Clinical Trials（DCT）に注目が集まってきており、ePRO、eConsent の活用も期待が高まっております。
これらで生み出され、利活用に期待が集まっているデジタルデータについては、プライバシー保護に対して一層配慮が求められてきております。
これらの背景を踏まえ、NTT コミュニケーションズのデジタルヘルスケアにおける取り組みと、今後の広がりの可能性についてお話しさせていただきます。

千葉大学医学部附属病院
次世代医療構想センター
センター長・特任教授
吉村　健佑

＜現職＞
千葉大学医学部附属病院次世代医療構想センター　センター長・特任教授
千葉県健康福祉部医療整備課　医師確保・地域医療推進室
＜学歴＞
2007年　千葉大学医学部卒
2012年　東京大学大学院医学系研究科公共健康医学専攻修了（公衆衛生学修士MPH.）
2018年　千葉大学大学院医学薬学府博士課程修了（医学博士Ph.D.）
＜職歴・委員など＞
2007年　千葉大学医学部附属病院などで精神科医・産業医として勤務
2015年　厚生労働省　課長補佐（保険局・医政局）、
2017年　厚生労働省　国立保健医療科学院主任研究官
2018年　千葉大学病院特任講師・産業医
　　同時に千葉県健康福祉部医療整備課　医師確保・地域医療推進室
2019年　千葉大学医学部附属病院次世代医療構想センター　センター長・特任教授
2020年　COVID-19 対策として千葉県新型コロナ対策本部事務局に参画
　　同時に成田空港検疫官として診療支援
2024年　厚生労働省「特定機能病院及び地域医療支援病院のあり方に関する検討会」委員
2024年　千葉大学 子どものこころの発達教育研究センター特任教授（併任）
2024年　千葉県市原市 医療政策参与
＜専門＞
医療政策、公共健康、産業保健、精神保健
＜資格＞
精神保健指定医・精神科専門医/指導医・労働衛生コンサルタント
＜著書＞
「医良戦略2040-2040年の医療を生き抜く13の戦略-」(ロギカ書房．2022年)
「医良戦略2040PartⅡ　-熱意を理性でドライブせよ-」(ロギカ書房．2025年)

NTTコミュニケーションズ
スマートヘルスケア推進室
担当部長
櫻井　陽一

マイナンバー関連システムや地域医療関連システムをはじめとするの公共・医療分野のシステム開発に従事。認証認可、秘密計算、匿名加工等のデータプライバシー対策関連の技術を軸とし、内閣府、デジタル庁等の国家プロジェクトに従事すると共に、析秘、SmartPRO、SDPF for Healthcare等のSmart Healthcare関連サービス開発を主導。保有資格はPMP、CISSP、NTTグループ認定セキュリティプリンシパル、JDLA認定E資格等。

共催：NTTコミュニケーションズ株式会社

SeCIHI

NTTコミュニケーションズが提供する、デジタルヘルスにおけるプライバシー保護を実現する秘密計算クラウドサービス

・析秘で実現できること

データを秘匿化したまま分析することで、新しい価値創出を加速します。

強固なセキュリティで機密情報を守る

NTTグループの高度な秘密計算技術に加え、安全に運用し続ける通信インフラレベルのオペレーション技術も保有し、大切な機密データを安心して預けることができます。

データの連携で組織の壁を越える

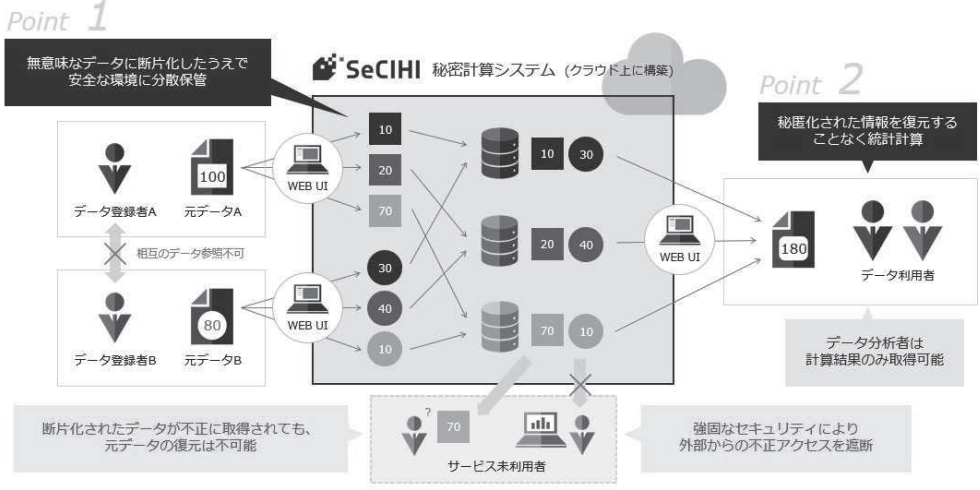
データの中身を見ないまま分析できるため、組織の外に開示することが難しかった機微なデータを持ち寄り、企業や業界の枠を越えた新しいデータ活用の可能性が広がります。

より多くの人が安全にデータを活かす

機微なデータにアクセスできなかった人が安全にデータ分析ができ、これまで実現できなかった分析ができるようになるため、新しいデータ分析の可能性が拓かれます。

・サービスのしくみ

秘密計算は秘匿化※された情報を復元せずに演算処理可能な技術。
秘密計算を用いることで事業者における安全な情報活用への貢献が可能。
※ある情報を無意味な複数の断片データにして分散保持(秘密分散)すること



・析秘が選ばれる理由

- 世界最高レベルの秘密計算技術
- 実用可能な演算速度
- 充実した演算バリエーション
- クラウドベースのWebサービス
- 大企業ならではの技術者層の厚み
- NTTグループの中立性

お問い合わせ
NTTコミュニケーションズ株式会社
サイト www.ntt.com/business/services/secihi.html
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第6回日本眼科AI学会総会(JSAIO) / APTOS2025

Applications of AI in Diagnostic Imaging

═ Sweets Seminar ═

日時
2025年06月27日(金)
14:30〜15:30

会場
第1会場　「パークホール1」
コングレスクエア グラングリーン大阪

Ryo Kawasaki

Professor
Division of Public Health, Department of Social Medicine
Graduate School of Medicine, University of Osaka, Japan

「Delineation of Faricimab-Induced Leakage Reduction Using AI-Inferred Fluorescein Angiography Derived From OCT Angiography」

Toshinori Murata

Professor and Chairman
Department of Ophthalmology, Shinshu University, Japan

共催（Co-sponsored）
第6回日本眼科AI学会総会(JSAIO) / APTOS2025
CHUGAI PHARMACEUTICAL　日本眼科AI学会
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共催：中外製薬株式会社

Applications of AI in Diagnostic Imaging

═ Sweets Seminar ═

Ryo Kawasaki

Professor
Division of Public Health, Department of Social Medicine
Graduate School of Medicine, University of Osaka, Japan

Biography

1997 – 2008	Assistant Professor in Research,Department of Ophthalmology and Visual Science, Yamagata University, Japan
2007 – 2013	Retinal Vascular Imaging Centre Grading Centre Manager / Research Fellow Centre for Eye Research Australia, University of Melbourne, Australia
2013 – 2015	Assistant Professor,Department of Public Health Graduate School of Medical Science, Yamagata University, Japan
2015 – 2017	Associate Professor,Department of Public Health Graduate School of Medical Science, Yamagata University, Japan
2017 – 2023	Endowed Chair Professor,Department of Vision Informatics（TOPCON） Graduate School of Medicine, Osaka University, Japan
2023 –	Professor,Division of Public Health, Department of Social Medicine Graduate School of Medicine, University of Osaka, Japan

Toshinori Murata

Professor and Chairman
Department of Ophthalmology, Shinshu University, Japan

Biography

1986	Graduate from Kyushu University, School of medicine, Japan
1996-1998	Research Associate, Doheny Eye Institute, University of Southern California, Los Angeles, California USA
1998-1999	Research Fellow, Children's Hospital Boston, Harvard Medical School, Boston Massachusetts USA
1999-2004	Assistant Professor of the Department of Ophthalmology Kyushu University, School of Medicine
2004-present	Professor and Chairman of the Department of Ophthalmology, Shinshu University School of Medicine, Japan

共催（Co-sponsored）

第6回日本眼科AI学会総会(JSAIO) / APTOS2025

CHUGAI PHARMACEUTICAL 日本眼科AI学会

A member of the Roche group

共催：中外製薬株式会社

Luncheon symposium APTOS 2025 × JSAIO

AI for ROP

Applying artificial Intelligence for the diagnosis and management of retinopathy of prematurity

Date and Time: June 28th, 11:45 – 12:45

Session Chair: Yoko Fukushima and Peter Campbell

Dr. Yusuke Takeda

Non-Imaging Machine Learning Models for Treatment-Warranted ROP Prediction

Dr. Deependra v Singh

Tele ROP screening by VR Headset mounted smartphone-based Indentation fundus live videography

Dr. Honghua Yu

Intelligent Diagnosis and Automatic Generation of Medical Imaging Reports for ROP

Dr. Peter Campbell

Innovations in AI-Assisted ROP Telemedicine

Dr. Yoko Fukushima

AI for ROP prediction based on NICU monitoring signals

Co-sponsored by:

APTOS 2025 x JSAIO & NeoCure Inc.

NeoCure

共催：株式会社ネオキュア

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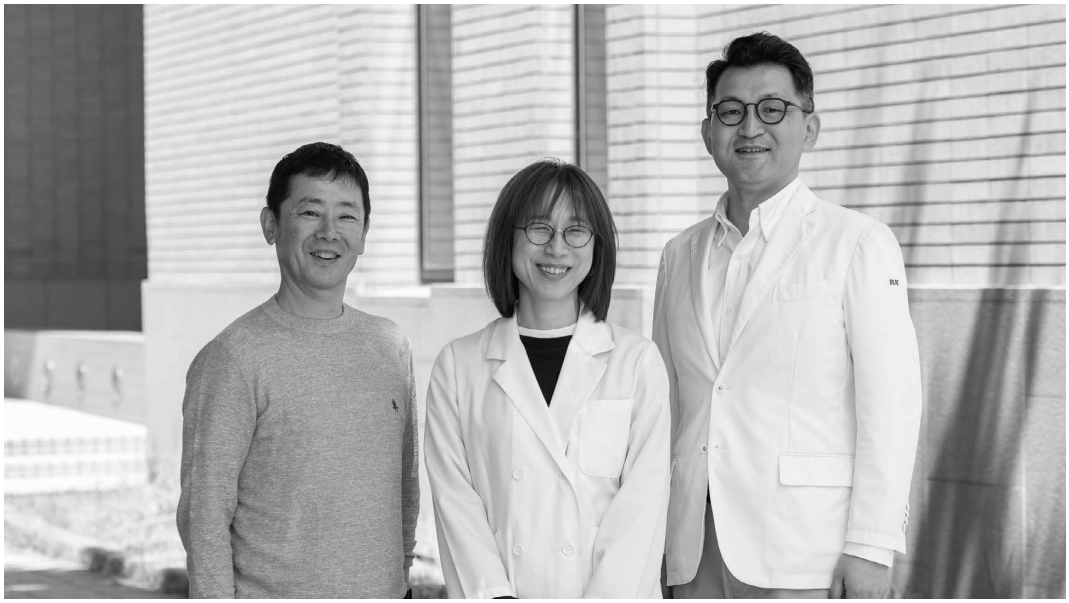
株式会社ネオキュア

We are NeoCure Inc.
A brand new venture company from the University of Osaka established in June 2025. We develop a programmed medical device to prevent blindness due to retinopathy of prematurity.



From left to right:

Motoshi Sobue Representative Director
Professor (Eng. Ph.D.) at Nara Institute of Science and Technology University, serial entrepreneur, in charge of overall management based on his experience at MNC in Japan and abroad.

Yoko Fukushima CEO
Specially Appointed Associate Professor (MD PhD), Graduate School of Medicine, Osaka University. In charge of technology development.

Ryo Kawasaki CSO
Professor of Public Health, Osaka University Graduate School of Medicine (MD MPH PhD), responsible for medical strategy with broad insight.

NeoCure Inc. 株式会社ネオキュア
Established in Jun 2025 in Kyoto, Japan
Web https://neocure.jp ／ E-mail info@neocure.jp

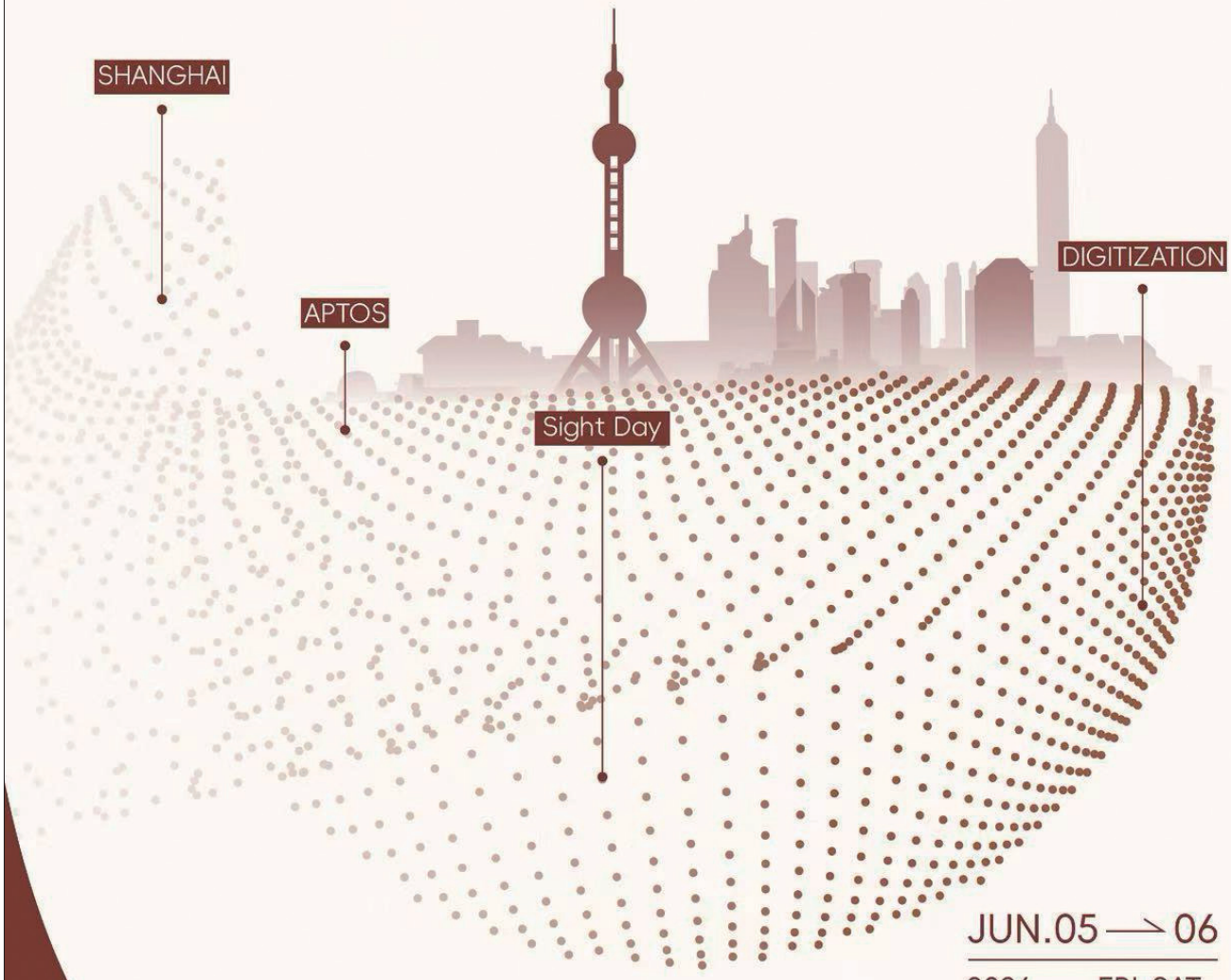
NeoCure

共催：株式会社ネオキュア

APTOS
2026

The 11th Asia Pacific Tele-Ophthalmology Society (APTOS) Symposium 2026

2026年第11届亚太远程眼科学会年会 (APTOS)



JUN.05 → 06

2026 FRI-SAT

2026 National "Sight Day" Shanghai Theme Activity

2026年全国“爱眼日”上海市主题活动

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Co-Hosts

Supporting Organizations

HONG KONG FEB 5-8, 2026

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The 37th Annual Scientific Meeting
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Jason YAM
President
APAO 2026 Congress

Dennis LAM
Chair
APAO 2026 Scientific Program Committee

Tetsuro OSHIKA
President
Asia-Pacific Academy of Ophthalmology

Clement C THAM
Secretary-General and CEO
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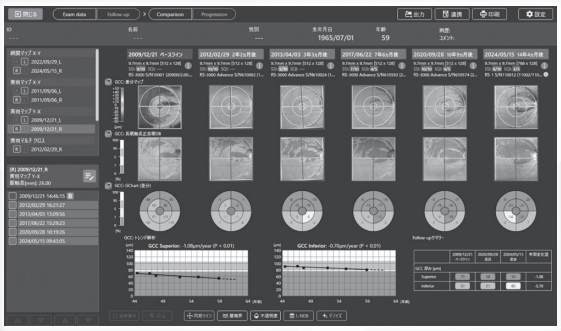
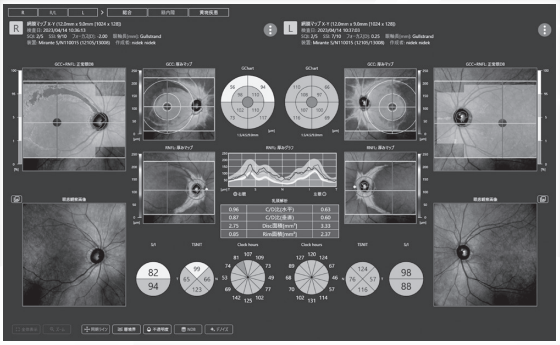
X (Twitter)

“狙った位置を撮る”から
“必要な画像を選ぶ”へ

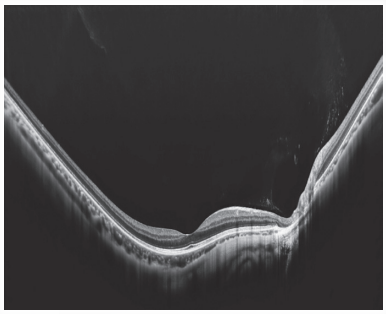


フォローアップ解析 黄斑マップ



網膜マップ 両眼解析表示

最大
250,000
A-scans/秒



4.2mm Deep scan

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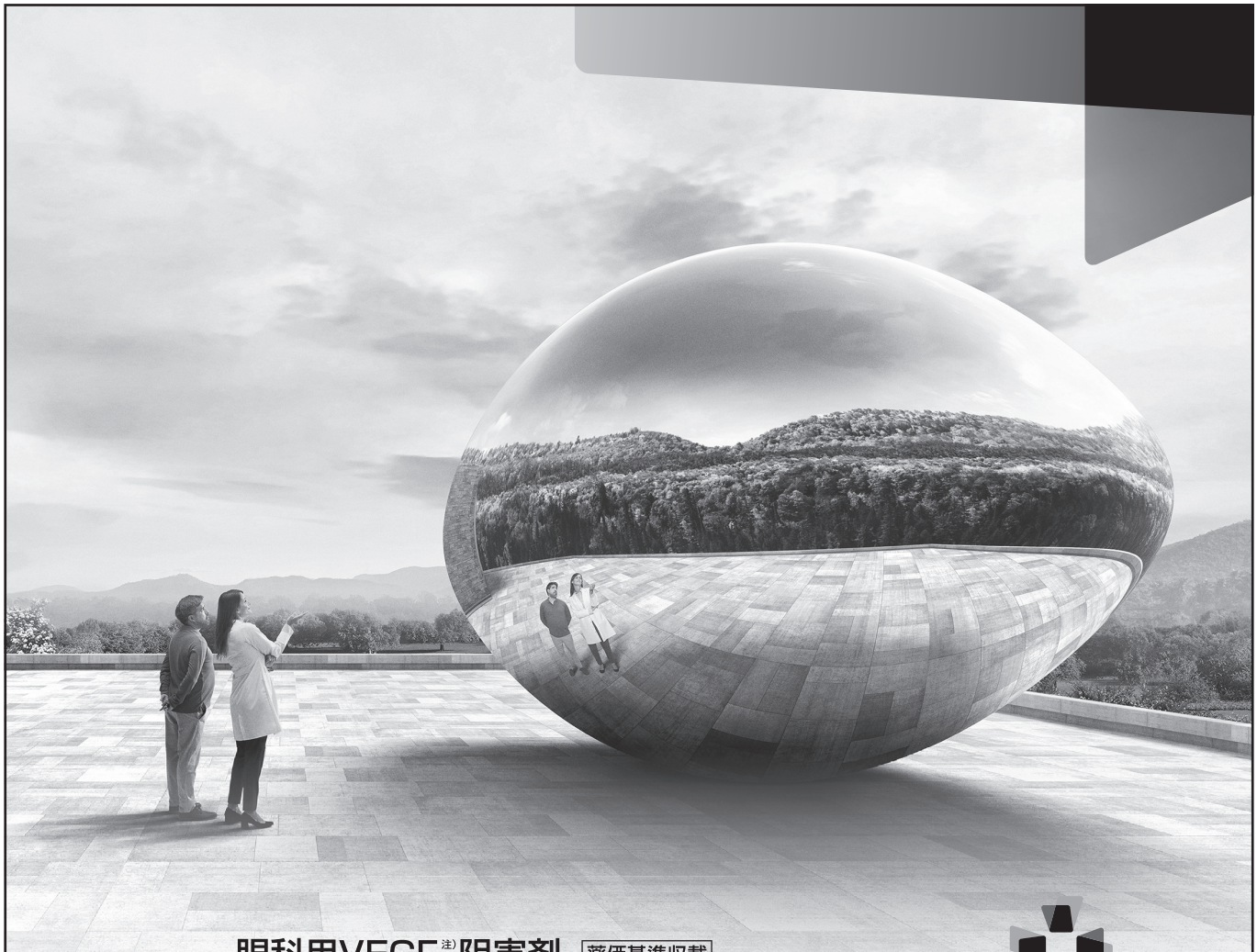

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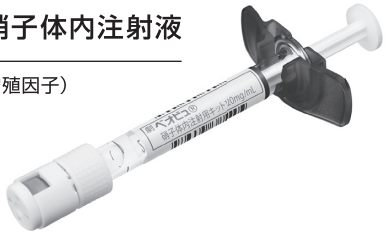

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白内障手術後の新しい世界を覗いてみよう

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単焦点眼内レンズの見え方は?

多焦点眼内レンズの見え方は?

遠方や近方で明所や暗所でどう見える?

監修：
東京歯科大学水道橋病院
名誉教授・特任教授
ビッセン宮島弘子先生

提供：
エイエムオー・ジャパン株式会社

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※)VEGF: vascular endothelial growth factor(血管内皮増殖因子)

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