AI in Medical Diagnosis:
AI Prediction vs Human Judgement

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Physicians already work with AI in diagnosis.
And this creates many practical issues…

- **Tool, Assistant or Peer?**
- **Should not use "AI says…"**
- **What's in AI's "mind"?**
- **Working differently with AI**

Future of diagnosis will be a mix of human mastery and AI, and this shall be well-designed and properly implemented into practice.

Tool, Assistant or Peer? (Role of AI)

Tool
- Processing power
- Well-structured tasks

"The younger, less experienced dermatologists might think of AI as a peer colleague, while the most experienced ones said they could look at AI as a resident assisting them."
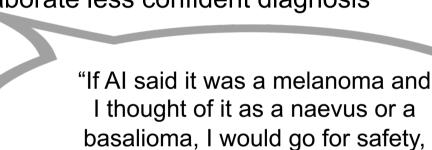
Assistant
- Learn habits of users
- Prepare things to assist physician
- A less experienced/qualified helper

Peer
- Double-check idiagnosis
- Help to form opinion
- Experienced vs novice dermatologists may use AI differently
- Elaborate less confident diagnosis

"If AI said it was a melanoma and I thought of it as a naevus or a basalioma, I would go for safety, and I would still cut it off."

Should not use "AI says…" (Responsibility)

"The AI system can assist but can never become the one who makes the final diagnosis."

Prediction → Judgement → Decision → Action

- Physicians must interpret any automated diagnostic results
- Reducing risk of human errors but keeping humans in the loop
- Final decision about diagnosis and treatment plan remains within physicians' remit (also regulatory)
- Not only diagnozing but also communicating to the patient
- Potentially high stakes/risks involved

Also
- human supervision (vigilance/situation awareness) may be an issue when "automation" is in charge ("automation bias")

"My patients want to talk and discuss every little detail..."

What's in AI's mind? (Explainability)

"Probably the longer I use such an AI tool and previously gave me good predictions, the more I could rely on that in the next cases."

Trust
- Develops over time and experience working with AI + consistency/clinical validity of predictions
- May depend on mastery level of physician
- May depend on level of confidence

Understand
- How AI generates prediction for a specific case (probabilities, samples, visualization, etc.)
- How AI works scientifically, in general (accuracies, error rates, tendencies, weakness, limitations, etc.)
- Human-relatable understanding of AI performance, "theory of mind" (thinking about it as a peer with diagnostic „style", patterns)

"One key factor is knowing that the outcome of each diagnosis was looped back into the system, which could further train the AI system reliability."

Working differently with AI (New operating model)

May changes physician's approach and process of diagnosis

New mental model
- incorporate both human and AI
- learn and adapt to each other
- work as a team, joint performance

Clinical workflow
- use physicians' tacit knowledge and experience
- Seperate prediction from judgement in diagnosis
- AI should adopt to physicians' mastery level and experience

Example tasks done by AI (and change of the workflow):

Gathering info	Examination &tests	Assessment &diagnosis	Treatment plan&comm	Monitoring &feedback
prescreening/ triage	initial check of all moles	probabilities for differential diagnoses	personalized plan	track mole evolution over time

"Some moles might cause surprises, and checking with my eyes or a dermatoscope might lead to a different diagnosis."