Using an artificial intelligence telephone call to automate cataract pre-assessment appointments

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Background

Pre-operative assessment is often the bottleneck leading to delays in surgery for patients.

We evaluate the real-world effectiveness of an artificial intelligence powered telephone conversation agent *(Dora R3, Ufonia Limited, Oxford, UK)* for performing automated cataract surgery pre-operative assessment history taking.

Results

Evaluation period: March 2023- March 2024

Demographics

Total number of Dora calls	1504
Patient age in years (mean / SD)	76 / 10
Female	812 (54%)

Effectiveness: Time in motion study

Time period	Pre-assessment appointment duration
Baseline	30 minutes
With Dora	18 minutes

12 minute reduction with Dora

Accuracy: Comparing Dora to human labeller listening to the call

Overall 91% agreement across 36,054 questions

Example responses:

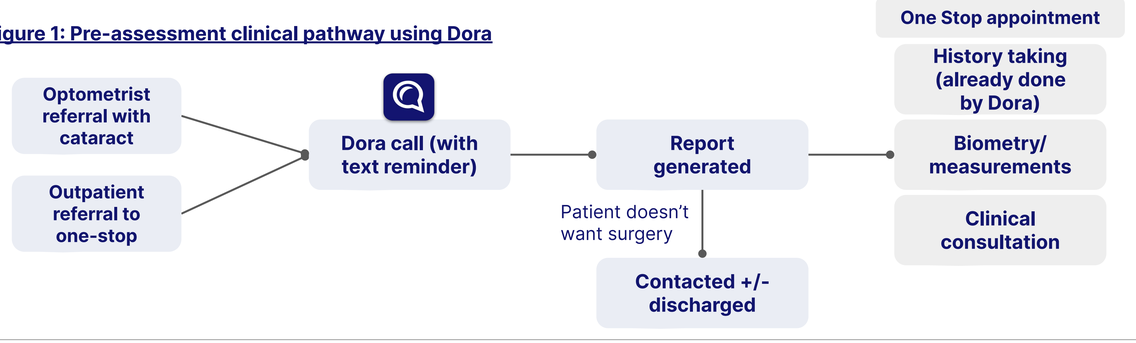
Question	Total patient responses	Agreement %
Patient unsure or did not want surgery	76	93.6%
Uses wheelchair	154	93.0%
Can manage LA	1328	91.5%

Methods

All patients referred for routine cataract surgery at a large teaching hospital had a call from Dora before their one-stop cataract assessment (Figure 1) as standard of care.

We performed a mixed methods evaluation including:
Acceptability: A Net-Promoter of the likelihood of recommending Dora was captured (score 1-10).
Effectiveness was assessed through time in motion studies. Patients were tracked in a pre-assessment clinic with and without using Dora, to calculate the time spent with each clinician in the one stop clinic.
Accuracy of clinical assessment by Dora was compared to:
- A human listening to the calls and labelling each question response
- Ground-truth from face-to-face assessments where nurses asked the same questions as Dora

Figure 1: Pre-assessment clinical pathway using Dora



Results

Accuracy: Comparing Dora to ground truth clinician assessment

11 September- 6 October 2023
32 patient assessments

Overall **86% agreement** across 654 questions

Examples of disagreements between Dora and clinician

Question	Agreement	Reasons for disagreement	Safety
Patient had previous laser eye surgery	90%	Patient explained they had previously had YAG laser to improve vision in their other eye Another patient unsure on type of laser they have previously had.	Dora errs on the side of caution and highlights patients who have potentially had laser refractive surgery.
Cataract has negative impact on quality of life	80%	Subjective question. One patient was referred from diabetic screening to improve fundal view.	If a patient indicates they don't want surgery, their referral will be reviewed prior to discharge

Conclusion

In this population, automated cataract pre-operative assessment reliably collects key clinical information from patients. This information can improve surgery conversion rates, shorten appointments, and free clinician time within the eye service.

What is Dora?

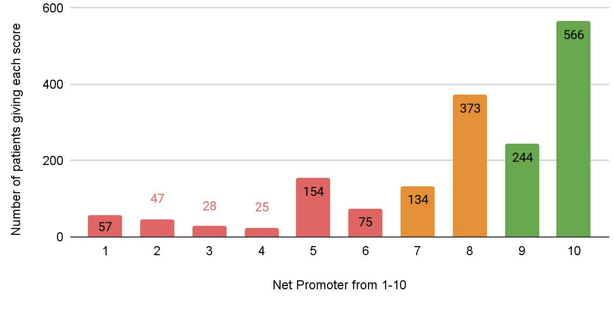
- UKCA regulated clinical conversation assistant
- Calls patients on landline or mobile
- Has a natural- language conversation to elicit clinical information
- A similar experience to speaking to a human clinician
- No apps, websites, training or smartphones required

What questions are included in the Dora call?

Shared decision making | Medical history | Medications | Social history | Suitability for LA

Figure 2: Patient Acceptability

On a scale of 1-10 how likely would you be to recommend this automated system to a friend or colleague?



Disclosures: AH, EL, VH, RM, SK, LS, JG are employees of Ufonia Ltd