

Skin Analytics Case Study

University Hospitals Birmingham
NHS Foundation Trust

Artificial Intelligence in Health and Care Award


University Hospitals Birmingham
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 | National Institute
for Health Research



Background

The team at University Hospitals Birmingham NHS Foundation Trust (UHB) have worked in partnership with Skin Analytics to deliver a service for suspected skin cancer. Skin Analytics is a solutions-providing partner that uses AI products to enable innovative Dermatology pathways within the NHS. UHB and Skin Analytics have partnered together since April 2020 seeing over 27,000 patients across two pathways. As part of the Artificial Intelligence (AI) in Health and Care Award, UHB have most recently implemented an AI-powered pre-referral pathway within the community setting.

Challenge

Since April 2020, UHB have collaborated with Skin Analytics on an AI Teledermatology post-referral pathway in secondary care. To date, this pathway has avoided in excess of 15,000 two-week-wait (2ww) face-to-face appointments in secondary care. As part of the Dermatology service's continuous improvement cycle, the team at UHB were committed to expanding the pathway into primary care to improve patient access to dermatology care, diagnostics and treatment, as well as helping to release primary care capacity.

Solution

As part of the AI in Health and Care Award, UHB have implemented a pre-referral pathway to deliver a reduction in outpatient appointments for primary, as well as secondary care, whilst supporting an early diagnosis for those patients with suspected skin cancer. Rather than having to book in to see their GP, patients run through a clinically-agreed questionnaire to check eligibility before being booked into a diagnostic hub appointment.

The patient attends a community-based diagnostic hub where images are taken, uploaded, and analysed by the AI (Deep Ensemble for the Recognition of Malignancy (DERM), which provides an immediate referral decision. If the patient has a suspected skin cancer lesion, the patient will be referred directly to UHB's two-week-wait teledermatology service by the medical photographer within the hub. If the lesion is suspected to be pre-cancerous or benign, the patient will be discharged back to primary care, following a review by a Skin Analytics dermatologist, a temporary additional step in the pathway as part of the pilot. GPs receive a report identifying the patient history and photographic images captured for their patients, as well as a suggested care plan from the Skin Analytics dermatologist. From these, the GP will determine whether the patient can be managed appropriately within primary care (through GPs with specialist Dermatology interests), or require onward referral through advice & refer 18 week pathway via UHB.

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"At UHB we've already redesigned our 2ww post-referral pathway to leverage AI, providing resilience against clinical challenges and enabling us to manage seasonal variations in Dermatology. Next for us was to implement a primary care pathway that enabled earlier patient assessment as well as improved access to skin cancer services, whilst also helping reduce pressures on GP practices and ultimately find more cancers earlier."

Nick Barlow, Chief Digital Transformation Officer,
University Hospitals Birmingham NHS
Foundation Trust

Performance

From 13th September 2022 to 13th April 2023

Pathway sensitivity for all cancers

100%

CI: 67.6% - 100% (8/8)

Benign specificity

78%

CI: 69.3% - 84.7% (85/109)

Negative Predictive Value for skin cancer

100%

CI: 96.4% - 100% (104/104)

Sensitivity targets

>95% for melanoma and squamous cell carcinoma (SCC)

>90% for basal cell carcinoma (BCC)

Impact

299

Patients seen through pathway

206

GP appointments saved

57%

Patients avoid a 2ww referral

Patient satisfaction

90%

Patients said their experience was "Very Good"

No patients had a "Poor" or "Very poor" experience

From a patient ringing up, to an appointment being made, and the medical photographer making a 2ww referral = 6-7 days

Pathway

Clinical pathways are individually designed in partnership with NHS sites. With the UKCA Class IIa approval and continued high performance of DERM, UHB and Skin Analytics plan to remove the remote review by a Skin Analytics Dermatologist as they move beyond the pilot phase.

