

# Tele Dermatology for Skin Cancer Management

## Abstract

Teledermatology plays a significant role in the UK National Health Service (NHS) for the management of skin cancers by enhancing early detection, diagnosis, and treatment pathways. It uses digital platforms to allow dermatologists to remotely evaluate skin lesions, including potential malignancies, based on high-quality images and patient information submitted by general practitioners (GPs) or other healthcare providers.

This approach has proven particularly valuable in reducing wait times for specialist consultations, which is critical for skin cancers where early detection greatly improves outcomes. Through teledermatology, GPs can rapidly refer suspicious lesions to dermatologists, who assess whether further investigation, such as a biopsy or urgent in-person consultation, is required. It helps prioritize high-risk patients for fast-track appointments under the NHS's two-week referral rule for suspected cancers. Teledermatology also facilitates efficient triaging of cases, enabling healthcare systems to manage resources more effectively. Low-risk cases can often be monitored remotely or managed within primary care, reducing unnecessary hospital visits, and easing the burden on specialist services. During the COVID-19 pandemic, the adoption of teledermatology surged, helping maintain continuity of care for skin cancer patients despite restrictions on in-person visits. Overall, teledermatology in the NHS enhances access to specialist care, speeds up the diagnostic process, and improves the management of skin cancers, making it a crucial tool in modern dermatological practice. This article describes a tele-dermatology service and its outcomes.

Keywords: teledermatology, UK, NHS

Lubna Gul, Monica Bhushan

*Wrightington, Wigan and Leigh  
NHS Foundation Trust*

Email: [lubna.gul@wwl.nhs.uk](mailto:lubna.gul@wwl.nhs.uk)

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## Background

In 2023, our department saw an increase in suspected skin cancer referrals compared to the previous financial year, and we anticipate a further climb of at least 15% in the next 12 months (equivalent to 4,623 referrals). Our workload reflects the trend across the UK, where dermatology services receive 1.2 million referrals each year from primary care, with approximately 60% comprising urgent referrals for suspected skin cancer. Of these, only 6% are confirmed to be melanoma and squamous cell carcinoma (SCC) and the remaining 94% are either non-urgent or non-cancer cases.

These figures are in part a reflection of limited dermatology training at both undergraduate and postgraduate level and reduced confidence in diagnosing skin cancer. The reduction in National Training Numbers year on year means that dermatology remains a fiercely competitive speciality to enter, yet frustratingly, 25% of dermatology consultant posts remain unfilled across the UK. At present there is only one part time substantive consultant in our department and like many others we rely heavily on locum support to achieve performance targets. The constant rearrangement of dermatology clinic slots to achieve the mandatory 28- and 62-day skin cancer targets has also placed additional pressures on waiting times for patients with inflammatory dermatoses (our "routine" waiting time stands at 9 months).

Tele dermatology is the use of digital images to triage, diagnose, monitor, or assess skin conditions without the patient physically present. Tele dermatology can both reduce the number of face-to-face interactions yet still offer an accurate diagnostic service for skin lesions, if high quality macroscopic and dermoscopic images can be obtained. The outcome can be an efficient one-where both the patient and referring health care professional can be reassured quickly that the lesion is deemed benign.

However, a high-quality tele dermatology service can support a transformation of

dermatology services in other ways too. Its use in primary care has seen rapid uptake with Advice and Guidance (A&G) services used to obtain specialist advice on the management of patients with inflammatory dermatoses, such as eczema and psoriasis. We, like many other dermatology departments, have used A&G particularly during the pandemic, but also since 'business as usual' resumed. A&G can promote helpful two-way dialogue with the referrer, maximising primary care management while the patient waits for their secondary care appointment or preventing a referral being needed at all.

However, for the purpose of this article, we will concentrate on the impact of tele dermatology on skin cancer pathways. The national Tele dermatology Roadmap has been recently updated to support the implementation of all tele dermatology pathways in England, and many of the principles outlined in that key document are congruent with our service.

### Tele-dermatology Skin Cancer Service

After an initial 4-month planning period, with weekly team meetings involving 20 colleagues from both clinical and operational backgrounds, across primary and secondary care, our tele-dermatology service went live. Patients after being referred with a suspected melanoma or SCC by their primary care health professional are informed about their tele dermatology pathway in a compassionate and timely manner by a dedicated appointments team and with a bespoke patient information leaflet. If they agree to attend, a photography appointment is arranged within 5 working days in the Rapid Access Clinic based in our fully equipped Medical Illustration Department studio (**Figure 1a**). High quality images (including dermoscopy ones) are taken of the suspected skin cancer and a detailed clinical questionnaire filled in by the patient; **Figure 1b**). A patient feedback form specific to the process up to this point is also completed.



Tele Dermatology Patient Questionnaire

**NHS**  
 Wrightington, Wigan and  
 Leigh Teaching Hospitals  
 NHS Foundation Trust

Patient Details Sticker Here

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
 Patient Age: \_\_\_\_  
 Present Occupation: \_\_\_\_  
 Previous Occupation: \_\_\_\_

Location of the Lesions for which you have been referred? \_\_\_\_\_

How long have you had this lesion? \_\_\_\_\_ UNSURE

	Lesion 1			Lesion 2		
	YES	NO	UNSURE	YES	NO	UNSURE
Has the lesion changed in the last 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion changed in size?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion changed in shape?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion changed in colour?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion been itchy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion been rough?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion been crusting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion been bleeding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the lesion been painful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	YES	NO	ADDITIONAL DETAILS
Has a member of your family ever had skin cancer?	<input type="checkbox"/>	<input type="checkbox"/>	_____
Do you sunburn easily?	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have you ever lived somewhere hot and sunny?	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have you ever worked outside regularly?	<input type="checkbox"/>	<input type="checkbox"/>	_____
Do you have any hobbies that take place outside?	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have you ever used sun beds?	<input type="checkbox"/>	<input type="checkbox"/>	_____
Did you ever have severe or blistering sun burn as a child?	<input type="checkbox"/>	<input type="checkbox"/>	_____

Have you had a previous skin cancer? Yes  No

If Yes please tick applicable: BCC  SCC  Melanoma  Unknown

Are you immunosuppressed due to any of the following? N/A

Organ Transplant  Medication  Cancer  Illness  Other (details) \_\_\_\_\_

Figure 1(a) Medical Illustration Tele Dermatology studio  
 (b) Patient clinical questionnaire (first page)



**Figure 2 (a) Macroscopic appearance of nonspecific, pink/red lesion**

**(b) Dermoscopy reveals residual pigmentation, atypical blood vessels and white streaks suspicious of regressing melanoma (histologically proven)**

We have found that images taken by a fully accredited Institute of Medical Illustration photographer has reduced unnecessary 'double activity' of a tele dermatology referral followed by a face-to-face consultation. In addition, in several cases, subtle changes of atypical melanomas could be more easily appreciated with dermoscopy (**Figure 2 a and b**). Once the images, plus original referral letter and patient questionnaire, are uploaded to a secure Trust server, these can be assessed

online by a dermatologist with experience in skin cancer tele dermatology (24 cases in a 4-hour session online compared to 12 in a face-to-face clinic). The turnaround for clinical review is 24 hours (versus 10 days for face-to-face appointments). A clinical and outcome letter is sent to the patient and the referring healthcare professional within 2 working days. Patients who are discharged or will be followed up (maximum 3 months) receive safety netting advice on how to monitor their

skin lesion, signs of skin cancer and how to access further care if they have future concerns.

Over the 6-month period the service has been operational, 432 patients' images have been reviewed; 81% of our patients were triaged for the pathway as per validated inclusion and exclusion criteria (no difference in access to the service noted against socioeconomic markers). A 1% DNA rate (7% with face-to-face clinics) was recorded with 100% compliance with the patient feedback questionnaire: 99% of patients stated they would use the tele-dermatology pathway again and were especially complimentary about the easy access to the service.

After review of the images, 30% of patients were discharged back to their referring health care professional, and 30% of patients downgraded from the cancer pathway, resulting in our Trust performing the best in house and (at present!) second across the region for the 28-day faster diagnosis standard despite being one of the smallest departments, staffing levels-wise. One face to face appointment with a clinician has been saved for 66% of the patients managed through the tele-dermatology pathway. This has allowed us to reduce the number of such patients being booked to locum led clinics so that "long waiters" can access these clinic slots instead. We have also reduced our locum expenditure by £150,000.

34% of tele dermatology patients have been referred directly to an urgent surgery list with all lesions suspected to be melanoma and squamous cell carcinoma histologically proven to be so (sensitivity 100%) with a specificity of 60% comparable to face to face clinic data. The images of the melanomas and squamous cell carcinomas are now integrated into our skin cancer MDT discussions to assist quality of care and education.

Based on the development of our pathway and outcomes, our team has acquired funding for a tele dermatology skin cancer Band 7 nursing post from Cancer Alliance and been shortlisted from a total of 861 entries for a Trust "Star" award, in the Research and Innovation category. Our trust has also been awarded a full grant by NHS England to integrate an artificial

intelligence platform into our existing tele dermatology pathway.

### **What next for our tele dermatology skin cancer service?**

An expansion in clinical, photography and administration staff will allow us to advance our tele dermatology service, with a projected increase in activity likely to drive waiting lists down. This ambition must always be contingent on continued quality assurance such as the root- cause analyses of missed or delayed skin cancer diagnoses, and continued feedback from stakeholders, particularly our patients. There is ongoing work measuring such indicators, with comparison against face-to-face skin cancer appointments, where the ability to palpate the index lesion, ask more probing questions and perform a total body skin examination makes this still the gold standard consultation. Furthermore, we are acutely aware that tele- dermatology using photography might introduce inequity in certain scenarios- for example, in patients with brown and black skin, or where the lesion of concern is in a sensitive site. All clinicians undertaking tele dermatology activity will thus maintain their clinical skills by doing face-to-face skin cancer consultations.

However, as our online diagnostic skills evolve, there is hope that by working collaboratively, we can give and receive rapid second opinions for borderline or difficult cases, share learning across primary and secondary care, and reduce the risk of mistakes when using this new method of diagnosing skin cancer. Regular opportunities for continuing professional development in this rapidly expanding clinical and technological field has been therefore specifically proposed in our business plan for a permanent service.

Although this article aims to concentrate on tele dermatology using photography, it would be remiss not to highlight the growing interest in Artificial intelligence as Medical Devices (AIaMD) for skin cancer diagnosis. At the time of writing, there is only one UKCA Class IIA-certified AIaMD used in skin cancer pathways at various centres across England. AIaMDs appear to have the potential to manage the increased demand for dermatology services by accurately recognising benign skin lesions in

primary and secondary care but the pathways at present include a consultant dermatologist review of all cases, benign or malignant, following categorisation by the AI. The feeling, at least for now amongst dermatologists, is that this “second read” is needed to build confidence in the technology, while appreciating that this will require further investment in specialist clinician time and in the short term, diminished cost/benefit ratios.

NHS England targets mandate that 55% of skin cancer referrals be managed via tele-dermatology pathways by 2025. There is still much to do to extend our own service, but we are hopeful that with the correct skill mix amongst our staff, and continued team working and support from our Trust, we can meet this challenges head on, maintain excellent patient care, and contribute to the rebuilding of our NHS.

No conflicts of interests

### References

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