



## Topic Exploration Report <sup>1</sup>

Topic explorations are designed to provide a high-level briefing on new topics submitted for consideration by Health Technology Wales. The main objectives of this report are to:

- Determine the quantity of evidence available for a technology of interest.
- Identify any gaps in the evidence.
- Inform decisions on topics that warrant fuller assessment by Health Technology Wales (HTW).

Topic exploration report number	TER 529
Topic	Store-and-forward teledermatology for triage of primary care referrals
Summary of findings	<p>Store-and-forward teledermatology is the process in which patient information e.g., photographs and background information are sent as digital files to a clinician in a dermatology department. Referred information is then reviewed by a dermatologist and a management plan is made. The plan may include, but not limited to, an in-person consultation, direct booking for a procedure, other treatment options, or further advice.</p> <p>HTW researchers identified one HTA and two systematic reviews about store-and-forward teledermatology for triage of primary care referrals. Outcomes include diagnostic accuracy, inter-rater agreement of teledermatology decisions versus in-person consultation, patient satisfaction, reduction in missed appointments, mean time-to-assessment, time-to-treatment, and cost-effectiveness data. Overall, the HTA found teledermatology reduces the number of face-to-face secondary care appointments required, facilitates more accurate allocation of referral priority, reduces waiting times for specialist dermatology input, reduces time to commence treatment, and offers similar clinical outcomes, quality of life and patient satisfaction as conventional referral. The systematic reviews found similar outcomes e.g., good patient satisfaction, reduction in waiting times and similar diagnostic accuracy outcomes in comparison to in-person dermatology.</p> <p>The scope of this topic is potentially wide, and further research could help establish the populations or settings in which it is most likely to have value, and how this could be measured. Potential areas of concern include any barriers to access, and any additional work or training needed to carry out teledermatology in primary care.</p>

<sup>1</sup> [Cyfieithu dogfennau HTW wedi'u cyhoeddi o'r Saesneg i'r Gymraeg](#)  
[Translation of published technical HTW documents from English into Welsh](#)

## Introduction and aims

Store-and-forward teledermatology refers to a process in which photographs and patient data are sent as digital files from primary care to a dermatology clinic (secondary care). This way of working proposes several benefits such as the potential to free up in person specialist appointments and reduce waiting times.

The Scottish Health Technologies Group (SHTG) have published an assessment on store-and-forward teledermatology for triage of primary care referrals in February 2023. HTW researchers searched for evidence on store-and-forward teledermatology for triage of primary care referrals since the SHTG search, which was carried out in September 2022.

## Evidence overview

### Health Technology Assessments

SHTG conducted a review of the evidence on the clinical effectiveness, cost effectiveness and safety of store-and-forward teledermatology for secondary care triage (SHTG 2023). In the assessment, no systematic reviews or guidelines were identified which focused specifically on teledermatology for triage of primary care referrals.

Six RCTs and five comparative observational studies were identified. Across the evidence base there was evidence that teledermatology for secondary care triage of referrals reduces the number of face-to-face secondary care appointments required, facilitates more accurate allocation of referral priority, reduces waiting time for specialist dermatology input, reduces time to commencing treatment, and offers similar clinical outcomes, quality of life and patient satisfaction as conventional referral. The assessment also reported that where dermatology specialist triage provided advice or reassurance, published studies reported that in the region of 50% of referrals could be managed in primary care.

Safety concerns of teledermatology include the risk of clinically significant incidental lesions being missed because of fewer in person examinations. A prospective study (Aldridge et al. 2013 cited in SHTG 2023) examined the rate of incidental melanomas detected through a full body skin examination at a skin cancer clinic found that without a full body skin examination, a third of melanomas in their patient population would be missed. However, a Cochrane review published in 2018 cited in SHTG (2023) showed that less than 7% of malignant skin lesions were missed by teledermatology. It was also reported that the time taken for GP consultations is likely to increase for people requiring teledermatology referrals when compared with standard primary care referral processes.

### Secondary evidence

HTW researchers identified two systematic reviews (Burshtein et al. 2023, Nikolakis et al. 2024) published since the SHTG search, although some of the primary studies used in Nikolakis et al (2024) are also referenced in the SHTG assessment and some of the reported outcomes would be excluded by the SHTG research protocol such as inter-rater agreement.

Burshtein (2023) explored the efficacy, perception, and utilisation of paediatric teledermatology. The review included 44 primary studies with a mixture of literature reviews, prospective observational studies, retrospective studies, clinical trials, case series, and surveys. Outcomes included diagnostic concordance between paediatric tele dermatologist and in-person dermatologist, patient satisfaction, reduction in missed appointments, and reduction in waiting times. The authors concluded that patient satisfaction with teledermatology was between 70% to 98%. It was also reported that the integration of teledermatology can reduce missed appointments and wait times among paediatric patients.

## Evidence overview

Nikolakis et al (2024) explored insights, advantages, and barriers of teledermatology versus face-to-face dermatology for the diagnosis and follow up of non-melanomas skin cancer. The review included 33 primary studies with a mixture of RCTs, prospective observational studies, and retrospective studies. Outcomes include diagnostic accuracy and inter-rater agreement, patient satisfaction, reduction in waiting times, reduction in face-to-face dermatology appointments, mean time-to-assessment, time-to-treatment, and cost-effectiveness outcomes. The systematic review concluded that the diagnostic accuracy and inter-rater agreement outcomes were lower than in-person consultations although, outcomes were similar.

### Primary studies

HTW researchers searched for any primary studies published since September 2022. No studies were identified.

### Cost-effectiveness evidence

SHTG (2023) reported a de novo cost consequence analysis for NHS Scotland which estimated that an increased uptake of a store-and-forward teledermatology referral triage system would likely lead to a reduction in healthcare resource use, decreased travel requirements and costs for patients, leading to decreased carbon emissions.

A UK study referenced in Nikolakis et al (2024) found using teledermatology during primary care triage led to 58% of lesions being managed in primary care, saving £12,460 in unnecessary referrals over three years (Livingstone et al. 2015). The review concluded that the ability of the method to accurately assess non-malignant cases effectively reduces in person visits and could therefore reduce costs for the health system and increase the number of appointments available for other people.

### Ongoing research

HTW researchers did not identify any ongoing research about store-and-forward teledermatology for triage of primary care referrals to be completed within the next 6-12 months.

## Areas of uncertainty

Based on this high-level search, there are some outcomes that could be missing from the evidence base such as the proportion of patients redirected (from secondary care dermatology) to specific pathways, and quality of life outcomes. Caution should be given to the potential overlap of studies referenced in both the HTA and subsequent systematic reviews.

If this topic were to proceed to a fuller appraisal, it could be useful to narrow down the scope of the population and outcome measures to be included such as whether to include inter-rater agreement between teledermatology and in-person dermatology.

Since the HTA published in 2023, there is a lack of data to support the cost-effectiveness of rolling out teledermatology when compared directly with in-person dermatology.

If this topic were to proceed to fuller appraisal, clarity about what is standard care in Wales would be useful and whether there are variations in standard care between, for example, different dermatology conditions and pathways.

## Areas of uncertainty

Potential areas of concern include any barriers to access (e.g. if photographs were required from people less able to use such technology), and any additional work or training needed to carry out teledermatology in primary care.

## Literature search results

<b>Health technology assessments and guidance</b>
SHTG. (2023). Store-and-forward teledermatology for triage of primary care referrals. SHTG Assessment. Scotland: Healthcare Improvement Scotland. Available at: <a href="https://shtg.scot/our-advice/store-and-forward-teledermatology-for-triage-of-primary-care-referrals/">https://shtg.scot/our-advice/store-and-forward-teledermatology-for-triage-of-primary-care-referrals/</a> [Accessed 19 February 2024].
<b>Evidence reviews and economic evaluations</b>
Burshtein J, Bueth MG, Ghias MH, et al. (2023). Efficacy, perception, and utilization of pediatric teledermatology: A systematic review. JAAD Int. 12: 3-11. doi: 10.1016/j.jdin.2023.03.005. Available at: <a href="https://pubmed.ncbi.nlm.nih.gov/37228364/">https://pubmed.ncbi.nlm.nih.gov/37228364/</a>
Nicolakis G, Vaiopoulos AG, Georgopoulos I, et al. (2024). Insights, Advantages, and Barriers of Teledermatology vs. Face-to-Face Dermatology for the Diagnosis and Follow-Up of Non-Melanoma Skin Cancer: A Systematic Review. Cancers (Basel). 16(3). doi: 10.3390/cancers16030578. Available at: <a href="https://pubmed.ncbi.nlm.nih.gov/38339329/">https://pubmed.ncbi.nlm.nih.gov/38339329/</a>
<b>Individual studies</b>
No evidence identified
<b>Ongoing research</b>
No evidence identified

<b>Date of search</b>	19 February 2024
<b>Concepts used</b>	"teledermatology", "tele dermatology", "store-and-forward"

## Proposed research question and evidence selection criteria (if selected)

<b>Proposed Research question</b>	<b>What is the clinical and cost effectiveness of store and forward teledermatology for the triage of primary care referrals?</b>
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	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
<b>Population</b>	Adults and children who require a new referral from primary care to secondary care dermatology	
<b>Intervention</b>	Store-and-forward teledermatology: Inclusion of photo-documentation with all referrals to facilitate teledermatology triage  Photographs may be taken by patients or carers, GPs, medical photographers	Studies that only examine and compare image quality.
<b>Comparison/ Comparators</b>	Current practice-written descriptive referrals without photo documentation	
<b>Outcome measures</b>	<ul style="list-style-type: none"> <li>• Diagnostic accuracy outcomes</li> <li>• Waiting times for patients with all referred conditions (variously defined)</li> <li>• Time to treatment</li> <li>• Number of face-to-face specialist consultations</li> <li>• Proportion of referred patients managed virtually (without face-to-face appointment)</li> <li>• Proportion of patients redirected (from secondary care dermatology) to specific pathways</li> <li>• Satisfaction, acceptability.</li> <li>• Quality of life</li> <li>• Safety/harms e.g., missed cancers because of fewer in person visits for full body clinical examination</li> <li>• Equity around access/use of technology/ethnicity skin tones</li> <li>• Cost-effectiveness outcomes</li> </ul>	

<b>Proposed speciality</b>	<b>Dermatology</b>
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