APPENDIX A. SEARCH STRATEGY

Database: Ovid MEDLINE(R) <1950 to April Week 3 2009>

Search Strategy:

---

1 (remote: adj2 consult:).tw. (158)

2 exp electronic mail/ (1025)

3 exp Telecommunications/ (36778)

4 exp remote consultation/ (2661)

5 telemed$.mp. or exp Telemedicine/ (10571)

6 exp telepathology/ (504)

7 or/1-6 (37311)

8 derm$.mp. or exp dermatology/ (180688)

9 7 and 8 (534)

10 telederm$.mp. (269)

11 9 or 10 (576)

12 limit 11 to yr="1990 -Current" (559)

PubMed search (06-03-09):

(((remote* AND consult*[tw]) OR (electronic mail[mh]) OR (telecommunications[mh]) OR (remote consultation[mh]) OR (telemed* OR telemedicine[mh]) OR (telepathology[mh])) AND (dermatol* OR dermatology[mh])) OR (telederm*) [587]

Search results from OVID MEDLINE (556 references) and PubMed (587 references) were combined, resulting in a total of 657 unique references

APPENDIX B. DATA EXTRACTION FORM

First author: _____

Year published: _____

Country where study performed (country of first author or multicenter): _____

Source of funding for study: _____

Extractor: _____

DESIGN (circle):

Systematic review

Randomized controlled clinical trial

Non-randomized controlled clinical trial

Cohort study

Case-control study

Other evaluation of diagnostic test

Cross-sectional study

Case series

Case report

Qualitative

Editorial/opinion piece/letter

KEY QUESTION(S) (circle):

KQ1: Diagnostic accuracy/reliability

KQ2: Clinical management accuracy/reliability

KQ3: Clinical outcomes (clinical course, satisfaction, quality of life, visits avoided, etc.)

KQ4: Costs

KQ5: Implementation

Background

NOTES:

□ Study contains/may contain same data as another study (specify study: _____
_____)

STUDY SETTING/EQUIPMENT:

Single- or Multi-center trial? (*circle one*)

a. # of sites where photos obtained _____

setting for each site (e.g., patient home, physician office, hospital, nursing home, etc.)

1.
2.
3.
4.

b. # of sites where photos interpreted _____

setting for each site (e.g., dermatology clinic [or other type of clinic], hospital, VA or non-VA, academic or community-based, etc.)

1.
2.
3.
4.

Technology used: Store & Forward Live Interactive

Purpose of examination: Diagnosis Therapy Follow-up Other _____

Camera type: _____ Pixels: _____

Special imaging technique(s) (describe): _____
_____

Image interpretation technique(s): _____
_____

PROVIDERS (e.g., family practice dermatologist, specialist dermatologist, dermatopathologist):

A. Gold Standard Test Provider

1. Clinical dermatologist (in-person evaluation)
   Level of training
   Experience with teledermatology (volume of cases, if reported)
2. Histodermatologist
   Level of training
   Experience with teledermatology (volume of cases, if reported)

B. Index Test Provider
   Level of training
   Experience with teledermatology (volume of cases, if reported)

C. Photographer/History Taker (if different from Index Test Provider)
   Level of training
   Experience with teledermatology (volume of cases, if reported)

STUDY PARTICIPANTS:

Number enrolled: _____

How were patients recruited? _____

Inclusion Criteria: _____

Exclusion Criteria: _____

Age Mean _____ yrs Range _____ yrs

Gender Female _____% Male _____%

Veterans _____%

Race (describe) _____

Other population characteristics (describe): _____

_____

Number of lesions/conditions evaluated: _____

Dermatologic condition(s): Rash _____ Lesion _____ Mixed _____

Other details about condition(s), if provided _____

Gold standard: In-person Dermatology _____ Histopathology _____
Other (specify) _____

STUDY FEATURES/QUALITY:

FOR DIAGNOSTIC ACCURACY TESTS (Yes, No, Unclear):

(NOTE: index test is new, unproven test; gold standard is established reference test)

1. Study patients representative of actual patient population to be tested	Y	N	U	
2. Inclusion/exclusion criteria clearly described		Y	N	U
3. Appropriate (accurate) gold standard		Y	N	U
4. Time between index and gold standard assessments appropriate (i.e., insufficient time for disease progression or recovery)		Y	N	U
5. All (or random sample) of patients received both tests		Y	N	U
6. Same gold standard used for all patients		Y	N	U
7. Gold standard independent of index test		Y	N	U
8. Sufficient detail provided to replicate index test		Y	N	U
9. Sufficient detail provided to replicate gold standard test		Y	N	U
10. Index test interpreted without knowledge of gold standard results	Y	N	U	
11. Gold standard interpreted without knowledge of index results		Y	N	U
12. Similar clinical data available during test interpretation as in practice		Y	N	U
13. Uninterpretable/indeterminate test results reported (i.e., all test results reported)		Y	N	U
14. All patients accounted for at end of study	Y	N	U	

FOR CONTROLLED TRIALS (Yes, No, Unclear, Not Applicable) (adapted from USPSTF approach):

1. Initial assembly of comparable groups				
a. Randomized trials				
True randomization	Y	N	U	NA
Concealment	Y	N	U	NA
b. Other studies				
Inclusion/exclusion criteria defined and applied to all groups	Y	N	U	NA
Potential confounders considered	Y	N	U	NA
2. Groups similar at baseline	Y	N	U	NA
If not, describe significant differences _____				
3. Comparable groups maintained (attrition, cross-overs, adherence, etc.)	Y	N	U	NA
Loss to follow-up (%): _____				
If not comparable for all groups, explain: _____				
4. Blinding (masking)				
a. Participants	Y	N	U	NA
b. Outcome Assessment	Y	N	U	NA
5. All important outcomes considered	Y	N	U	NA
6. Outcome measures reliable and valid	Y	N	U	NA
7. Analysis				
a. RCT – Intention-to-treat	Y	N	U	NA
b. Other – confounders adjusted for, if needed	Y	N	U	NA

RESULTS:

Number of patients with complete data: _____

Reasons for incomplete data: _____

Significant differences between patients enrolled and patients who completed study? _____
_____

Time between photograph and gold-standard interpretation of condition (mean and/or range): _____

Length of follow-up (for follow-up studies only): _____

Study duration: _____

FOR STUDIES THAT REPORT SENSITIVITY AND SPECIFICITY:

Complete the following table if possible (see definitions at end of form):

		Reference (Gold Standard) Test Findings		
		Positive	Negative	
Index Test Findings	Positive			PPV=
	Negative			NPV=
		Sens.=	Spec.=	

OTHER AGREEMENT OUTCOMES:

Kappa Coefficient: _____

Percent Agreement: _____

Other Outcomes (describe): _____

_____

CLINICAL MANAGEMENT OUTCOMES:

Clinical course (describe outcomes):

Patient satisfaction with teledermatology (assessment tool, outcomes):

Quality of life (assessment tool, outcomes):

Clinic visits avoided? Yes (# if provided _____) No

Did test results influence treatment selected for patients?
Describe: _____

_____

_____

Did test results influence management strategy for patients?

Describe: _____

_____

_____

OTHER RELEVANT FINDINGS:

AUTHORS' CONCLUSIONS:

APPENDIX C. PEER REVIEW COMMENTS AND AUTHOR RESPONSES

REVIEWER COMMENT	RESPONSE
1. Are the objectives, scope, and methods for this review clearly described?	
Yes	NA
Yes	NA
2. Is there any indication of bias in our synthesis of the evidence?	
No	NA
No	NA
3. Are there any published or unpublished studies on the use of teledermatology for the diagnosis and management of skin conditions (including studies of clinical outcomes, patient satisfaction, or associated costs) that we may have overlooked?	
None that I am aware of	NA
None that I'm aware of	NA
4. Additional comments	
The current format serves as a comprehensive review of the status of the literature.	Thank you
Quality of teledermatology – how is the quality of the test itself ensured?	We assume the reviewer is asking about the quality of the picture image. We did not specifically look at image techniques but we only included studies published after 1990 to insure technical relevance.
EXECUTIVE SUMMARY:	
In the summary for KQ4, clarify the statement "The long duration to achieve definitive dermatologic care … is not consistent with current VA practice …"	We have clarified this statement.
In the executive summary I would prefer to see the Key Question stated followed by the conclusion. Following that, there could be the brief discussion of the results from the literature (that supports that conclusion).	Thank you for the suggestion. We have placed the conclusions immediately following the questions.
In "Methods" state that all-pediatric studies were excluded	To shorten the Executive Summary, we have deleted the inclusion/exclusion details. We have clarified the inclusion/exclusion criteria for studies in the full report.
KQ3 – Clarify the "clinical outcomes of interest"	We have specified the outcomes of interest.

Conclusion – As worded, the conclusion may be misinterpreted as overly negative; the true comparison needed for many populations is between telederm and primary care diagnosis and management	We agree that this type of study is needed and have clarified the conclusion statements to reflect that.
Interpretation of 'raw' comparisons – I'm not sure what it means that 'weighted mean absolute difference was 19% better for UC than teledermatology' (page v) – perhaps include some concrete examples to make the numbers more meaningful or at least place them in some context (e.g., for other comparisons of diagnostic tests)	These comparisons have been reworded to clarify that these differences are differences in accuracy rates.
Define abbreviations before using them	We have made this change.
Not sure why inclusion was limited to randomized trials for questions 1-2; does this mean that retrospective reviews of telederm consults were not included? (page iii)	Inclusion was for controlled trials (not randomized); most were repeated measure design. Retrospective reviews were included if a control group was utilized. This has been clarified in the inclusion/exclusion criteria.
Did teledermoscopy improve accuracy of teledermatology to *better* than UC, or at least much closer? (page v)	This statement has been revised to clarify that accuracy improved, but still was not better than usual care.
Conclusion should probably include the information that the accuracy and concordance for malignancies may not be acceptable (page xlvii)	This information has been added.
INTRODUCTION/BACKGROUND:	
Do you have data to support the statement "SAF is the more widely used form of teledermatology in the VA"?	An informal survey of dermatology chiefs is included in the introduction.
METHODS:	
On the literature flow diagram, clarify the "other" and "not eligible study setting" exclusion criteria	We have modified the study exclusion criteria, eliminating these two criteria.
List the inclusion and exclusion criteria for studies (bulleted format)	These have been reformatted into bullet structure.
Inclusion/exclusion criteria – could have used more explanation	These are now described.
Clarify the asterisk on the search results (657 references)	The explanation was inadvertently deleted from the draft sent for review; please see updated flow diagram.
Clarify why 1990 was chosen as the start date for the review	This has been clarified in the text.
Difficult for the reader to interpret the QUADAS scores – how do these compare with, say, the quality scores of primary studies in other systematic reviews?	There is no direct comparison. The QUADAS scale is, however, the most relevant for assessing the quality of studies of diagnostic tests.
RESULTS:	
Did we compare US vs. non-US studies? Do the results vary?	The results of the US vs. non-US studies were similar. We have revised the results section putting more emphasis on VA/DoD studies.
KQ2a – the conclusion is based on two studies from one center; it may be worth noting that the result may be hard to generalize to other health care setting/populations in active programs	This information has been added.
KQ5 – "Several publications have described …" - please make sure you include the VA Teledermatology Ops Manual	The references for this statement have been clarified – the Ops Manual is cited.

KQ5 – "Because store and forward is the method used … " – I don't think this is true based on coding data	An e-mail survey of chiefs of VA dermatology services was conducted to confirm that SAF is more commonly used than LI in the VA setting.
CONCLUSIONS:	
Make the conclusions relevant to VA dermatology – readily usable by policy makers and clinicians	The conclusion section has been revised to focus on VA relevance.
How do the findings apply to situations with no available in-person dermatology? Is it possible to group studies based on the setting (very rural and urban)?	The conclusion section has been revised to address this.
FUTURE RESEARCH:	
Emphasize gaps in the current research – be specific, prioritize	The future research section has been revised to address specific needed study outcomes and settings.
OVERALL:	
Consider changing the title to indicate that report is focused on adult population	Twenty of the included studies enrolled a mixed (adult/pediatric) population; it would not be possible to report only the results from the adults included in those trials.
A particular strength of this review is the overall framework that examines the diagnostic test(s) 'teledermatology' with respect to measurement characteristics, effects on patient care processes and outcomes, and organizational features related to successful implementation	Thank you.
The quality of this review is high in that it is clear, accurate, completed, and clinically relevant … the study questions were well-defined and important, the literature search appeared comprehensive, the methods of abstraction were adequate, judgments of methodological quality were included, the pooling of results seemed sensible and conservative, and the conclusions were reasonable.	Thank you.
No reference is made to the 2006 AHRQ Telemedicine review that covered teledermatology.	This reference has been added to the Summary and Discussion section.
It is usually acknowledged that there is a lack of concordance between face-to-face dermatology consultations and the difference between face-to-face and teledermatology is usually couched in this context.	A statement has been added to the Future Research Recommendations section.
Programs usually acknowledge the issues with pigmented lesions and expedite referral for these with teledermatology (a "triage" in which pigmented lesions and suspected malignancies are seen more rapidly)	We have noted the inferior management accuracy rates for malignant and pre-malignant lesions in our conclusion statements for Key Question 2 and in the Conclusions Section.
It is not clear whether the differences noted in the studies result in altered clinical outcomes for patients or are hypothetical.	We agree. As noted in the results for Key Question 3, there are few studies that directly address clinical outcomes.
Given the profound challenges with providing dermatology, especially in rural areas, issue of access are often that of teledermatology versus a general practitioner – this was alluded to but more emphasis could be placed on the issues with providing face-to-face dermatology nationwide.	We have added the need for research of this nature to the Conclusion section.
A further model of teledermatology is that of using a dermatology trained nurse practitioner.	None of the studies identified for the review evaluated this model. The need to include dermatology trained nurse practitioners was added to the Future Research section.

APPENDIX D. ABBREVIATIONS

CD =	Clinic dermatology/clinic dermatologist; in-person dermatology care/in-person dermatologist
CID =	Contact immersion dermatoscopy
DoD =	Department of Defense
DSC =	Dermatoscopy
Hrs =	Hours
k =	Kappa coefficient
KC=	Keratinocyte Carcinoma (BCC, SCC, Keratoacanthoma, SCC-in-situ)
KQ=	Key question
LI =	Live interactive teledermatology
95%CI =	95 percent confidence intervals
NPSL=	Non-pigmented skin lesions
NA=	Not applicable
NR =	Not reported
PLD =	Polarized light dermatoscopy
PSL =	Pigmented skin lesions
Pt =	Patient
RCT =	Randomized controlled trial
QUADAS =	Quality Assessment of Diagnostic Accuracy Studies
SAF =	Store and forward teledermatology
SD =	Standard deviation
SL =	Skin lesions
TD =	Teledermatology/teledermatologist
TDSC =	Teledermatoscopy
UC =	Usual care (in-person dermatology)
VA =	Veterans Affairs
vs. =	Versus

APPENDIX E. EVIDENCE TABLE
OVERVIEW OF STUDIES FOR KEY QUESTIONS 1 AND 2

Diagnostic Accuracy, Diagnostic Concordance, Management Accuracy, Management Concordance

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
A. Store and forward systems studies (n=41)					
Warshaw 2009[5] United States, US armed service personnel/veterans Repeated Measure Funding: Department of Veterans Affairs Health Services R&D Service	542 542	Mean age (range): 66 years (23-94) Gender: female 4%, male 96% Race/ethnicity: white 97% Condition characteristics: Benign Neoplasm:267 Keratinocyte Carcinoma:84 Dysplastic Nevus: 155 Melanoma:36 Inclusion criteria: PSL Exclusion criteria: Skin tags, previously biopsied lesions Study duration (months): 3	Nikon Coolpix 4500, 3Gen Dermlite, Minolta X370 with Heine dermphot (TDSC) Photographer: Support staff Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: Yes Management Concordance: No	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Warshaw 2009[6] United States, US armed service personnel/veterans Repeated Measure Funding: Department of Veterans Affairs Health Services R&D Service	728 728	Mean age (range): 71 years (21-94) Gender: female 2%, male 98% Race/ethnicity: white 99% Condition Characteristics: Keratinocyte Carcinoma - 385 Actinic Keratosis - 81 Benign Neoplasm - 258 Other - 4 Inclusion criteria: Non-pigmented neoplasms Exclusion criteria: Skin tags, previously biopsied lesions Study duration (months): 34	Nikon Coolpix 4500 3Gen Dermlite (TDSC) Photographer: Support staff Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: Yes Management Concordance: No	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2
Edison 2008[7] United States Repeated Measure Both SAF and LI Funding: Federal Office for the Advancement of Telehealth, Health Resources and Services Administration	110 110	Mean age (range): 42 (7-92) Gender: female 69%, male 31% Race/ethnicity: white 85%, black 12%, Asian 2%, Hispanic 1% Condition Characteristics (Only reported for 70): Actinic Keratosis - 10 Acneiform - 12 Benign Neoplasm - 19 Dysplastic nevus - 1 Infectious - 7 Eczematous - 8 Other – 13 Inclusion criteria: New pts on study days Exclusion criteria: NR Study duration (months): 18	Camera: NR Photographer: NR Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Fabbrocini 2008[8] Italy Repeated Measure Funding: NR	NR 44	Age: NR Gender: NR Race/Ethnicity: NR Condition characteristics: Melanoma - 22 Benign Neoplasm - 15 Dysplastic nevi - 7 Inclusion criteria: Non-pigmented, absence of regular network, or diameter <5 mm Exclusion criteria: NR Study duration (months): NR	Nikon 4500 Coolpix, Wild M650 Steromicroscope Photographer: Dermatologist Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 8/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 1/3 Data analysis: 1/2
Di Stefani 2007[9] Italy Repeated Measure Funding: NR	18 465	Mean age (range): 28.4 years (10-55) Gender: female 39%, male 61% Race/ethnicity: NR Condition characteristics: PSL Inclusion criteria: ≥3 clinically atypical nevi on back Exclusion criteria: NR	Nikon 990 (macro), Videocap digital videodermoscopy Photographer: NR Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: No Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Ferrandiz 2007[10] Spain Repeated Measure Funding: Instituto Carlos III	134 134	Mean age: 70.3 years Gender: female 39%, male 61% Race/ethnicity: NR Condition characteristics: Keratinocyte Carcinoma - 95 Actinic keratosis - 14 Melanoma - 1 Other - 3 Benign Neoplasm - 17 Inclusion criteria: Non-melanoma skin cancer or fast-growing vascular tumor Exclusion criteria: "Lesions expected to require major reconstruction", melanoma Study duration (months): 12	Nikon Coolpix 4300 Photographer: NR Time between photograph and gold standard (days): mean 26 days	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 6/7 Reference test: 3/3 Data analysis: 0/2
Moreno-Ramirez[11] 2007 Spain Repeated Measure Funding: Instituto Carlos III	882 890	Mean age: 41.5 years Gender: female 59%, male 41% Race/ethnicity: NR Condition characteristics: Benign Neoplasm - 548 Keratinocyte Carcinoma - 119 Actinic keratosis - 102 Melanoma - 18 Infectious - 9 Papulosquamous/Other - 15 Other Malignant Neoplasm - 3 Dysplastic nevus - 76 Inclusion criteria: Circumscribed lesions Exclusion criteria: NR Study duration (months): 15	Nikon Coolpix 4300 Photographer: NR Time between photograph and gold standard (days): <31	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 6/7 Reference test: 3/3 Data analysis: 2/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Bowns 2006[12] United Kingdom Randomized controlled trial; Data extracted from TD arm Funding: National Health Service R&D grant	92 92	Mean age: intervention 43.6 years, Gender: female 63%, male 37% Race/ethnicity: NR Condition characteristics: Malignancy- 3 Benign Neoplasm –5 Infectious - 4 Eczematous – 11 Papulosquamous/Other - 62 Acneiform - 7 Inclusion criteria: ≥ 16 years old, had not seen dermatologist in last year Exclusion criteria: genital lesions Study duration (months): NR	Nikon Coolpix 900 Photographer: Primary care staff, often general practitioner Time between photograph and gold standard (days): mean 60	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 4/7 Reference test: 2/3 Data analysis: 2/2
Bowns 2006[13] United Kingdom Repeated Measure Funding: National Health Service R&D grant	256 256	Mean age: NR Gender: female 53%, male 47% Race/ethnicity: NR Condition characteristics: Keratinocyte Carcinoma – 54 Actinic keratosis-15 Dysplastic nevus-3 Melanoma-24 Benign neoplasm-159 Other-1 Inclusion criteria: Suspected skin cancer Exclusion criteria: NR Study duration (months): NR	Camera: NR Photographer: Medical Photography Department Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 6/7 Reference test: 3/3 Data analysis: 2/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Moreno-Ramirez 2006[14] Spain Repeated Measure Funding: Instituto Carlos III	61 61	Mean age (range): 39 years (1-73) Gender: female 71%, male 29%, Race/ethnicity: NR Condition characteristics: Keratinocyte Carcinoma - 2 Benign Neoplasm - 54 Melanoma - 1 Dysplastic Nevus - 1 Inclusion criteria: PSL Exclusion criteria: Pts who did not show to CD Study duration (months): 2	Nikon Coolpix 4500 DermLite (TDSC) Photographer: General practitioner Time between photograph and gold standard (days): <30	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 6/7 Reference test: 3/3 Data analysis: 1/2
Oakley 2006[15] New Zealand Repeated Measure Funding: NR	73 109	Mean age (range): 59 years (16-93) Gender: female 64%, male 36% Race/ethnicity: NR Condition characteristics: Keratinocyte Carcinoma - 43 Actinic keratoses - 17 Melanoma - 8 Benign neoplasms - 37 Papulosquamous/Other - 4 Inclusion criteria: New pts with skin growth Exclusion criteria: Inflammatory dermatoses, infections, resolved lesions, poor quality images Study duration (months): NR	Nikon Coolpix 955 38 TD (6 were trainee dermatologists) Photographer: medical student Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Baba 2005[17] Turkey Repeated Measure Both SAF and LI Funding: NR	 228 242	Mean age (range): 35 years (2-82) Gender: female 63%, male 37% Race/ethnicity: NR Condition characteristics: Acneiform - 41 Infectious - 54 Pre-malignant/Malignant- 2 Eczematous - 46 Benign Neoplasms - 45 Papulosquamous/Other - 54 Inclusion criteria: New dermatology pts Exclusion criteria: None Study duration (months): 2.3	Canon Powershot S10 Two dermatologists with 3 to 5 years experience. Photographer: Nurse Time between photographing and gold standard test (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 6/7 Reference test: 2/3 Data analysis: 0/2
Mahendran 2005[16] United Kingdom Repeated Measure Funding: NR	 163 163	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: Benign Neoplasm - 81 Keratinocyte Carcinoma - 48 Actinic keratoses - 10 Melanoma - 5 Infectious - 3 Papulosquamous/Other - 10 Dysplastic nevus - 6 Inclusion criteria: Pts with suspected skin cancer, informed consent Exclusion criteria: Pts who did show to CD (number NR) Study duration (months): 18	Nikon Coolpix 950 2 different dermatologists and a 3rd year trainee dermatologist viewed all the cases as well Photographer: General practitioner Time between photograph and gold standard (days): <14	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 8/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 5/7 Reference test: 2/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Moreno-Ramirez 2005[18] Spain Repeated Measure Funding: Grant from Instituto Carlos III	108 108	Mean age (range): 43 years (2 to 84 Gender: female 65%, male 35% Race/ethnicity: NR Condition characteristics (for 57 biopsied PSL): Keratinocyte Carcinoma - 23 Benign Neoplasm - 12 Dysplastic Nevi -16 Melanoma - 6 Inclusion criteria: changing, new, symptomatic or concerning pigmented lesions Exclusion criteria: NR Study duration (months): 3	Nikon Coolpix 4300 Photographer: General practitioner Time between photograph and gold standard (days): mean 8 days (range 5-14)	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 2/3 Data analysis: 0/2
Tucker 2005[19] United Kingdom Repeated Measure Funding: NR	75 84	Mean age: NR Gender: female 64%, male 36% Race/ethnicity: NR Condition characteristics: NR Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 1	Fujifilm MX-1700 Photographer: dermatologists Time between photograph and gold standard (days): 0	Diagnostic Accuracy : No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 2/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Ferrara 2004[21] Italy Repeated Measure Funding: NR	12 12	Median age (range): 41 years (14-71) Gender: female 17%, male 83% Race/ethnicity: NR Condition characteristics: PSL Benign Neoplasm - 5 Melanoma - 7 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): NR	TDSC: Heine Dermaphot Molemax Videocap Photographer: NR Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 6/7 Reference test: 3/3 Data analysis: 0/2
Oztas 2004[20] Turkey Repeated Measure Funding: NR	125 125	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: Infectious - 50 Tumors (not further defined) -12 Eczematous - 10 Acneiform - 8 Papulosquamous/ Other - 39 Benign Neoplasm - 6 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): NR	Canon Powershot 70 Photographer: NR Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Piccolo 2004[22] Italy Repeated Measure Funding: NR	73 77	Mean age (range): 28 years (4-77) Gender: female 53%, male 47% Race/ethnicity: NR Condition characteristics: Acral PSL Benign - 71 Melanomas - 6 Inclusion criteria: Acral melanocytic lesions Exclusion criteria: NR Study duration (months): NR	TDSC: Molemax II, Heine Dermaphot Photographer: NR Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 2/3 Data analysis: 0/2
Shapiro 2004[23] United States Repeated Measure Funding: University of Pennsylvania Department of Dermatology	49 49	Mean age: NR Gender: female 46%, male 54% Race/ethnicity: NR Condition characteristics: Skin growths Inclusion criteria: Skin growth referred by general practitioner Exclusion criteria: Previous dermatology evaluation Study duration (months): NR	Olympus D-600L Photographer: General practitioner Time between photograph and gold standard (days): <16	Diagnostic Accuracy: No Diagnostic Concordance: No Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 2/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Coras 2003[24] Germany Repeated Measure Funding: NR	 NR 45	Age, gender, and race/ethnicity: NR Condition characteristics: PSL Benign Neoplasm - 24 Dysplastic Nevus - 5 Melanoma - 16 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 16	Dermogenius ultra Photographer: Clinic dermatoscopic examiner Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2
Du Moulin 2003[25] Netherlands Repeated Measure Funding: University Hospital Maastricht and Ministry of Economic Affairs	 106 106	Mean age: 47 years Gender: NR Race/ethnicity: NR Condition characteristics: Malignant/Premalignant - 6 Benign Neoplasms - 12 Eczematous 28 Infectious- 15 Acneiform - 13 Papulosquamous/Other - 22 Inclusion criteria: Pts referred from general practitioner Exclusion criteria: Dermatologic referral clearly indicated Study Duration (months): 11	Ricoh 5000 Photographer: General practitioner Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Pak 2003 *(Part I[27] and Part II[26])* United States, 100% army veterans, or relatives Repeated Measure Funding: Walter Reed Army Medical Center	404 404	Mean age (range): 59 years (18-92) Gender: female 43%, male 57% Race/ethnicity: white 82%, black 13%, Asian/Hispanic 5% Condition characteristics: Infectious - 31 Premalignant/Malignant - 54 Acneiform - 28 Benign neoplasm - 115 Eczematous - 44 Papulosquamous/Other - 132 Inclusion criteria: Adult new pts Exclusion criteria: Medical emergencies Study duration (months): 4	Olympus D-600L Nikon Coolpix 900 Photographer: Nurse Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 6/7 Reference test: 2/3 Data analysis: 0/2
Rashid 2003[28] Pakistan Repeated Measure Funding: NR	33 33	Age, gender, and race/ethnicity: NR Condition characteristics: Keratinocyte Carcinoma - 1 Infectious - 9 Eczematous - 4 Benign Neoplasm - 3 Papulosquamous/Other - 16 Inclusion criteria: NR Exclusion criteria: Common conditions such as acne and melasma Study duration (months):NR	Kodak DC-210 Photographer: "Trainee doctor" Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Oliveira 2002[29] Brazil Repeated Measure Funding: NR	92 NR	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: NR Inclusion criteria: NR Exclusion criteria: NR Study duration (months): NR	Kodak DC265 Photographer: nurse Time between photograph and gold standard (days): <7	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 6/7 Reference test: 2/3 Data analysis: 1/2
Jolliffe 2001[30] United Kingdom Repeated Measure Funding: National Health Service R&D grant	138 144	Age range: 15-94 years Gender: female 66%, male 34% Race/ethnicity: NR Condition characteristics: PSL Inclusion criteria: PSL Exclusion criteria: NR Study duration (months): NR	Sanyo HiFi video Photographer: Dermatologist Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Jolliffe 2001[31] United Kingdom Repeated Measure Funding: National Health Service Executive London R&D grant	611 819	Age range: 8 to 94 years Gender: female 76%, male 24% Race/ethnicity: NR Condition characteristics: PSL Benign Neoplasm - 635 Keratinocyte Carcinoma - 20 Dysplastic Nevi - 112 Actinic keratoses - 13 Melanoma - 9 Infectious - 10 Acneiform - 5 Rash/Other - 13 Eczematous - 2 Inclusion criteria: PSL Exclusion criteria: Genital lesions, mental impairment, fear of technical equipment Study duration (months): NR	Sanyo HiFi video Photographer: Dermatologist Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: No Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 6/7 Reference test: 2/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Lim 2001[32] Australia Repeated Measure Funding: Australian Dermatology Research and Education Foundation	23 27	Age: NR Gender: NR Race/ethnicity: NR Condition Characteristics: Eczematous - 18 Benign Neoplasm - 9 Infectious - 12 Keratinocyte Carcinoma - 3 Acneiform - 6 Paulosquamous/Other - 5 Inclusion criteria: new skin condition Exclusion criteria: wart or acne Study duration (months): 3	Kodak DC265 Photographer: Dermatologist Time between photograph and gold standard (days): ≤7	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 1/3 Data analysis: 0/2
Taylor 2001[33] United Kingdom Repeated Measure Funding: NR	188 NR	Age: NR Gender: NR Race/ethnicity: "42% of the conditions from pigmented pts" Condition characteristics (most common diagnoses in 127): Eczematous - 21 Keratinocyte carcinoma - 9 Papulosquamous/Other - 15 Benign Neoplasm - 69 Acneiform - 8 Infectious - 5 Inclusion criteria: New dermatology pts Exclusion criteria: NR Study duration (months): 3	NR Photographer: Nurse Time between photograph and gold standard test: NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 13/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 2/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Barnard 2000[34] United States Repeated Measure Funding: NR	50 "cases"	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: 8 skin cancer cases Inclusion criteria: NR Exclusion criteria: NR Study duration (months): NR	Nikon Fujix DS505, Nikon SLR Photographer: NR Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2
Braun 2000[35] Switzerland Repeated Measure Funding: NR	51 55	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: PSL Benign Neoplasm - 37 Dysplastic Nevus - 3 Melanoma - 9 Keratinocyte Carcinoma - 4 Other -2 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 6	TDSC: Mitsubishi CCD Photographer: 6 dermatologists Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 2/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
High 2000[36] United States Repeated Measure Funding: Mayo Clinic and Foundation, Minnesota Academy of Family Physicians	92 106	Mean age (range): 39.7 years (10 months - 81 years) Gender: female 48%, male 52% Race/ethnicity: NR Condition characteristics: Benign Neoplasm - 35 Keratinocyte Carcinoma - 6 Actinic keratoses -2 Melanoma - 1 Infectious - 12 Acneiform - 8 Papulosquamous/Other - 25 Eczematous - 17 Inclusion criteria: NR Exclusion criteria: None Study duration (months): 1.5	Sony DCS-F1 Photographer: Medical student Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2
Piccolo 2000[37] Italy Repeated Measure Funding: Osterreichische Krebshilfe Steiermark, Graz, Austria	40 43	Mean age (range): 39.5 years (3-91) Gender: female 47.5%, male 52.5% Race/ethnicity: NR Condition characteristics: PSL Keratinocyte carcinoma - 3 Melanoma - 11 Benign Neoplasm - 29 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 3	TDSC: video camera and stereomicroscope Photographer: NR Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: No Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Krupinski 1999[38] United States Repeated Measure Funding: USDA Rural Utilities Service , US Dept. of Commerce, Health and Human Services	308 308	Age, gender, and race/ethnicity: NR Condition characteristics: Melanoma - 4 Actinic keratoses - 20 Keratinocyte Carcinoma - 49 Dysplastic nevus - 16 Benign Neoplasm - 106 Infection - 20 Eczematous - 36 Papulosquamous/Other - 57 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): NR	Canon Powershot 600 Photographer: Medical students Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 2/3 Data analysis: 0/2
Lewis 1999[39] United Kingdom Repeated Measure Funding: NR	56 cases	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: NR Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 7	Kodak DC40 Photographer: NR Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 8/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 5/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Piccolo 1999[40] Italy Repeated Measure Funding: NR	66 66	Mean age (range): 41.2 years (8-82) Gender: female 52%, male 48% Race/ethnicity: NR Condition characteristics: PSL Melanocytic- 57 Nonmelanocytic-9 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 0.75	TDSC: video camera and stereomicroscope Photographer: NR Time between photograph and gold standard (days): NR	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2
Tait 1999[41] Australia Repeated Measure Funding: NR	30 NR	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: NR Inclusion criteria: Visible skin lesion Exclusion criteria: NR Study duration (months): NR	Ricoh RDC 300 Photographer: NR Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 6/7 Reference test: 2/3 Data analysis: 0/2
Whited 1999[42] United States, US armed service personnel/veterans Repeated Measure Funding: Veterans Affairs Health Service R&D	129 168	Mean age (range): 61 years (22 to 82) Gender: female 2%, male 98% Race/ethnicity: white 80%, black 20% Condition characteristics: NR Inclusion criteria: Diagnostic uncertainty Exclusion criteria: Previous dermatology evaluation Study duration (months): NR	Fujix DS-515 Photographer: Research assistant Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Whited 1998[43] United States, VA pts Repeated Measure Funding: NR	12 13	Age: NR Gender: NR Race/ethnicity: NR Condition Characteristics: Benign neoplasm - 2 Keratinocyte carcinoma - 7 Actinic keratoses – 1 Other – 1 No biopsy - 1 Inclusion criteria: Suspected skin cancer Exclusion criteria: NR Study duration (months): NR	Fujix DS-515 digital camera, 1280x1000 pixels Photographer: NR Time between photograph and gold standard test (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2
Kvedar 1997[44] United States Repeated Measure Funding: Massachusetts General Hospital Dermatology Service	116 123	Mean age (range): 40 years (18-84) Gender: NR Race/ethnicity: NR Condition characteristics: NR Inclusion criteria: NR Exclusion criteria: Acne or warts cases Study duration (months): 2	Kodak DCS 420 Photographer: Non-dermatologists Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 13/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Lyon 1997[45] United Kingdom Repeated Measure Funding: NR	100 100	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: Eczematous - 12 Acneiform - 3 Infectious - 5 Other - 20 Benign Neoplasm - 41 Keratinocyte Carcinoma - 19 Actinic keratoses - 5 Inclusion criteria: Dermatology referral Exclusion criteria: NR Study duration (months): NR	DC-40 Kodak Photographer: Dermatology resident Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 8/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 4/7 Reference test: 3/3 Data analysis: 0/2
Zelickson 1997[46] United States Repeated Measure Funding: NR	29 30	Age: NR Gender: NR Race/ethnicity: NR Condition characteristics: Rash-18 Lesion-12 Inclusion criteria: Nursing home resident with a skin condition Exclusion criteria: NR Study duration (months): NR	Sony CCD-TR400 video Photographer: Nurse Time between photograph and gold standard (days): <2	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
B. Live interactive studies (n=10)					
Edison 2008[7] United States Repeated Measure Both SAF and LI Funding: Federal Office for the Advancement of Telehealth, Health Resources and Services Administration	110 110	Mean age (range): 42 (7-92) Gender: female 69%, male 31% Race/ethnicity: white 85%, black 12%, Asian 2%, Hispanic 1% Condition Characteristics for 70: Actinic Keratosis - 10 Acneiform - 12 Benign Neoplasm - 19 Dysplastic nevus - 1 Infectious - 7 Eczematous - 8 Other – 13 Inclusion criteria: New pts on study days Exclusion criteria: NR Study duration (months): 18	Camera: NR Photographer: NR Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 1/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Baba 2005[17] Turkey Repeated Measure SAF +LI Funding: NR	 228 242	Mean age (range): 35 years (2-82) Gender: female 63%, male 37% Race/ethnicity: NR Condition characteristics: Acneiform - 41 Infectious - 54 Pre-malignant/Malignant- 2 Eczematous - 46 Benign Neoplasms - 45 Papulosquamous/Other - 54 Inclusion criteria: None Exclusion criteria: None Study duration (months): 2.3	Mustek camera Photographer: Nurse Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2
Nordal 2001[47] Norway Repeated Measure Funding:	 112 112	Mean age (range): 40 years (17-82) Gender: female 51%, male 49% Race/ethnicity: NR Condition characteristics: Eczematous - 7 Acneiform - 1 Papulosquamous/Other - 6 Benign neoplasm - 1 Inclusion criteria: New dermatologic conditions Exclusion criteria: Surgical treatment, emergency cases and most nevi Study duration (months): NR	Sony CCD DXC 930P video Photographer: General practitioner Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 13/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 6/7 Reference test: 3/3 Data analysis: 2/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Gilmour 1998[48] United Kingdom Repeated Measure Funding: National Health Service	126 155	Age range: 3 month -83 years Gender: female 51%, male 49% Race/ethnicity: NR Condition characteristics: Eczematous - 55 Papulosquamous/Other - 37 Infection - 23 Acneiform - 12 Tumor - 20 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): 12	Camera NR Photographer: General practitioner or trained assistant Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 6/7 Reference test: 2/3 Data analysis: 0/2
Lesher 1998[49] United States Repeated Measure Funding: Telemedicine Center of Medical College of Georgia	60 68	Age: ≥ 18 years of age Gender: NR Race/ethnicity: NR Condition characteristics: Eczematous - 17 Benign Neoplasm -12 Keratinocyte Carcinoma - 3 Actinic keratosis - 6 Infectious - 4 Acneiform - 11 Papulosquamous/Other -15 Inclusion criteria: Adults with skin condition Exclusion criteria: NR Study duration (months): NR	VC TK-1280U, Panasonic WV-E550 Photographer: NR Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 11/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Loane, 1998[50] United Kingdom Repeated Measure Funding: National Health Service	351 427	Mean age (range): 41 years (5 months-89 years) Gender: female 55%, male 45% Race/ethnicity: NR Condition characteristics (preliminary results): Tumor - 78 Eczema - 54 Infection - 28 Benign Neoplasm - 21 Acneiform - 13 Papulosquamous/Other - 42 Inclusion criteria: Dermatology referral Exclusion criteria: NR Study duration (months): 18	VC7000 video, KY-F55B JVC video Photographer: General practitioner Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 6/7 Reference test: 2/3 Data analysis: 0/2
Lowitt 1998[51] United States, US armed service personnel/veterans Repeated Measure Funding: Baltimore Research and Education Foundation	102 130	Median age (range): 65 (range 23 to 85) Gender: male 95%, female 5% Race/ethnicity: white 60%, black 40% Condition characteristics: Acneiform - 17 Eczematous - 33 Infectious - 9 Papulosquamous/Other -17 Benign Neoplasm - 36 Premalignant Tumor - 16 Malignant Neoplasm - 6 Inclusion criteria: consecutive dermatology outpts Exclusion criteria: Pts transported by stretcher Study duration (months): 2	3-CCS JVC video Photographer: Nurse escort Time between photograph and gold standard (days): 0	Diagnostic Accuracy: Yes Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 12/14 *Sources of bias identified by QUADAS* Selection: 2/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Phillips 1998[52] United States Repeated Measure Funding: NR	51 107	Mean age: 47 Gender: female 84%, male 16% Race/ethnicity: NR Condition characteristics: Benign Neoplasm - 81 Keratinocyte Carcicnoma - 5 Melanoma - 1 Premalignant - 14 Dysplastic Nevi - 5 Inclusion criteria: NR Exclusion criteria: NR Study duration (months): NR	Panasonic video, Canon video Photographer: Dermatologist Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: Yes	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2
Oakley 1997[53] New Zealand Repeated Measure Funding: Waikato Information Services Department of Health	104 135	Age range: 2-86 years, Gender: female 60%, male 40% Race/ethnicity: NR Condition characteristics: Eczematous - 17 Benign Neoplasm - 24 Malignant Neoplasm - 25 Actinic Keratosis - 15 Infectious - 7 Acneiform - 13 Melanoma - 4 Papulosquamous/Other -30 Inclusion criteria: New dermatology pts Exclusion criteria: NR Study duration (months): NR	Canon VC-C1 video, Vtel system Photographer: Dermatologist Time between photograph and gold standard (days): 0	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 9/14 *Sources of bias identified by QUADAS* Selection: 1/2 Index test: 6/7 Reference test: 2/3 Data analysis: 0/2

Study Country Study design Funding	# Subjects # Conditions	Population and Study Characteristics	Teledermatology Characteristics	Outcomes Evaluated	Quality Rating
Phillips 1997[54] United States Repeated Measure Funding: NR	60 79	Mean age (range): 37 years (1-68) Gender: female, 60%, male 40% Race/ethnicity: white 73%, black 25% Condition characteristics: Eczematous - 14 NMSC - 4 Actinic keratosis - 5 Acneiform - 9 Infection - 8 Melanoma - 1 Benign Neoplasm - 26 Papulosquamous/Other -12 Inclusion criteria: Referral Exclusion criteria: NR Study duration (months): NR	Picture-Tel System 4000 video, Elmo model MN401X dc Photographer: trained nurse Time between photograph and gold standard (days): NR	Diagnostic Accuracy: No Diagnostic Concordance: Yes Management Accuracy: No Management Concordance: No	Overall QUADAS score: 10/14 *Sources of bias identified by QUADAS* Selection: 0/2 Index test: 7/7 Reference test: 3/3 Data analysis: 0/2