Supplementary Online Content


eMethods. Literature search strategies
eTable. Quality assessment criteria

This supplementary material has been provided by the authors to give readers additional information about their work.
eMethods. Literature Search Strategies

Search Strategy

Key:
/ = MeSH subject heading
$ = truncation
* = truncation
? = wildcard
ab = word in abstract
ae = adverse effects
adj# = adjacent within x number of words
near/# = adjacent within x number of words
kw = keyword
mo = mortality
su = surgery
ti = word in title

Cochrane Central Register of Controlled Clinical Trials

#1 (skin or derm* or cutaneous or epithelial or epithelium or epiderm*):ti,ab,kw near/3 (cancer* or neoplasm* or carcinoma* or tumor* or tumour* or malignan* or lesion* or metasta* or dysplas*):ti,ab,kw
#2 melanoma*:ti,ab,kw
#3 (naevoid or nevoid):ti,ab,kw near/3 syndrome*:ti,ab,kw
#4 (dysplastic or malignant):ti,ab,kw near/2 (nevus or naevus or nevi or naevi):ti,ab,kw
#5 "Hutchinson's Melanotic Freckle":ti,ab,kw
#6 "lentigo maligna":ti,ab,kw
#7 basal:ti,ab,kw next cell:ti,ab,kw next (carcinoma* or neoplasm* or carcinoma* or tumor* or tumour* or malignan* or lesion* or metasta* or epithelioma*):ti,ab,kw
#8 (basocellular* or basosquamous):ti,ab,kw next carcinoma*:ti,ab,kw
#9 squamous:ti,ab,kw next cell:ti,ab,kw next (carcinoma* or neoplasm* or carcinoma* or tumor* or tumour* or malignan* or lesion* or metasta* or epithelioma*):ti,ab,kw
#10 merkel:ti,ab,kw next cell:ti,ab,kw next (carcinoma* or neoplasm* or carcinoma* or tumor* or tumour* or malignan* or lesion* or metasta* or epithelioma*):ti,ab,kw
#11 "actinic keratosis":ti,ab,kw
#12 bowen*:ti,ab,kw next disease:ti,ab,kw
#13 cutaneous:ti,ab,kw near/2 lymphoma*:ti,ab,kw
#14 {or, #1-#13}
#15 screen*:ti,ab,kw
#16 (skin or body or physical):ti,ab,kw near/3 (exam* or inspect*):ti,ab,kw
#17 (dermoscop* or dermatoscop*):ti,ab,kw
#18 visual*:ti,ab,kw next inspect*:ti,ab,kw
#19 photography:ti,ab,kw
#20 {or #15-#19}
#21 #14 and #20 Publication Year from 1995 to 2015, in Trials
#22 (biopsy* or biopsies or biopsied):ti,ab,kw
#23 (excise* or excision*):ti,ab,kw
#24 rebiops*:ti,ab,kw
#25 #22 or #23 or #24
#26 (harm or harms or harmful or harmed):ti,ab,kw
#27 (death or deaths):ti,ab,kw
#28 (adverse or negative or unintended):ti,ab,kw next (effect* or event* or outcome* or reaction*):ti,ab,kw

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MEDLINE search strategy

Database: Ovid MEDLINE(R) <1946 to July Week 3 2015>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <June 1, 2015>, Ovid MEDLINE(R) Daily Update <June 1, 2015>
Search Strategy:

#29 complication*:ti,ab,kw
#30 side:ti,ab,kw next effect*:ti,ab,kw
#31 safety:ti,ab,kw
#32 false:ti,ab,kw next negative*:ti,ab,kw
#33 misdiagnos*:ti,ab,kw
#34 overdiagnos*:ti,ab,kw
#35 (unneeded or unnecessary):ti,ab,kw near/5 (treat* or therap* or surg* or procedure*):ti,ab,kw
#36 label*:ti,ab,kw
#37 psychological:ti,ab,kw next effect*:ti,ab,kw
#38 (cicatrix or scar*):ti,ab,kw
#39 {or #26-#38}
#40 #14 and #25 and #39 Publication Year from 1995 to 2015, in Trials
#41 (detect* or diagnos* or biops*):ti,ab,kw near/5 stage:ti,ab,kw
#42 (late* or distant or advanced or end):ti,ab,kw next stage:ti,ab,kw
#43 (early or earlier):ti,ab,kw next (diagnos* or detect* or discovery or findings):ti,ab,kw
#44 #41 or #42 or #43
#45 #14 and #44 Publication Year from 1995 to 2015, in Trials
#46 (surger* or surgical):ti
#47 curettage:ti,ab,kw
#48 dessicat*:ti,ab,kw
#49 electrodessicat*:ti,ab,kw
#50 cryosurg*:ti,ab,kw
#51 "laser ablation":ti,ab,kw
#52 mohs:ti,ab,kw
#53 metastasectom*:ti,ab,kw
#54 lymphadenectom*:ti,ab,kw
#55 ("lymph node" or "lymph nodes" or lymphoid):ti,ab,kw near/3 (remov* or dissect* or resect*):ti,ab,kw
#56 {or #46-#55}
#57 (lymphedema or lymphoedema):ti,ab,kw
#58 (surg* or postsurg* or post-surg*):ti,ab,kw near/2 infect*:ti,ab,kw
#59 {or #26-#31, #38, #57-#58}
#60 #14 and #56 and #59 Publication Year from 1995 to 2015, in Trials1
#61 #21 or #40 or #45 or #60

1 Skin Neoplasms/
2 Melanoma/
3 Melanoma, Amelanotic/
4 Nevus/
5 Dysplastic Nevus Syndrome/
6 Hutchinson's Melanotic Freckle/
7 Carcinoma, Basal Cell/
8 Carcinoma, Squamous Cell/
9 Carcinoma, Merkel Cell/
10 Neoplasms, Basal Cell/
11 Neoplasms, Squamous Cell/

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"Neoplasms, Adnexal and Skin Appendage"/
Actinic keratosis/
Bowen disease/
Lymphoma, T-Cell, Cutaneous/
((skin or derm$ or cutaneous or epithelial or epithelium or epiderm$) adj3 (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or dysplas$)).ti.
melanoma$.ti.
((naevoid or nevoid) adj3 syndrome$).ti.
((dysplastic or malignant) adj2 (nevus or naevus or nevi or naevi)).ti.
Hutchinson$ Melanotic Freckle.ti.
lentigo maligna.ti.
(basal cell adj (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or epithelioma$)).ti.
((basocellular$ or basosquamous) adj carcinoma$).ti.
(squamous cell adj (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or epithelioma$)).ti.
(merkel cell adj (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or epithelioma$)).ti.
actinic keratosis.ti.
bowen$ disease.ti.
(cutaneous adj2 lymphoma$).ti.
1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28
((skin or derm$ or cutaneous or epithelial or epithelium or epiderm$) adj3 (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or dysplas$)).ti,ab.
melanoma$.ti,ab.
((naevoid or nevoid) adj3 syndrome$).ti,ab.
((dysplastic or malignant) adj2 (nevus or naevus or nevi or naevi)).ti,ab.
Hutchinson$ Melanotic Freckle.ti,ab.
lentigo maligna.ti,ab.
(basal cell adj (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or epithelioma$)).ti,ab.
((basocellular$ or basosquamous) adj carcinoma$).ti,ab.
(squamous cell adj (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or epithelioma$)).ti,ab.
(merkel cell adj (cancer$ or neoplas$ or carcinoma$ or tumo?r$ or malignan$ or lesion$ or metasta$ or epithelioma$)).ti,ab.
actinic keratosis.ti,ab.
bowen$ disease.ti,ab.
(cutaneous adj2 lymphoma$).ti,ab.
30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42
limit 43 to ("in data review" or in process or "pubmed not medline")
29 or 44
Mass screening/
Early detection of Cancer/
(screen$ or detect$).ti,ab.
46 or 47 or 48
Physical Examination/
Dermoscopy/
Photography/
((skin or body or physical) adj3 (exam$ or inspect$)).ti,ab.
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(adverse or negative or unintended) adj (effect$ or event$ or outcome$ or reaction$)).ti,ab.
80 complication$.ti,ab.
81 side effect$.ti,ab.
82 safety$.ti,ab.
83 false negative$.ti,ab.
84 misdiagnos$.ti,ab.
85 overdiagnos$.ti,ab.
86 ((unneeded or unnecessary) adj5 (treat$ or therap$ or surg$ or procedure$)).ti,ab.
87 label$.ti,ab.
88 psychological effect$.ti,ab.
89 Cicatrix/
90 (cicatrix or scar$).ti,ab.
91 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90
92 45 and 72 and 91
93 limit 92 to (english language and yr="1995 -Current")
94 remove duplicates from 93
95 Neoplasm Staging/
96 ((detect$ or diagnos$ or biops$) adj5 stage).ti,ab.
97 ((late$ or distant or advanced or end) adj stage).ti,ab.
98 ((early or earlier) adj (diagnos$ or detect$ or discovery or findings)).ti,ab.
99 95 or 96 or 97 or 98
100 Registries/
101 Survival Analysis/
102 SEER program/
103 Morbidity/
104 Mortality/
Death/mo.fs. (registr$ or register$).ti,ab.
SEER.ti,ab.
"Surveillance epidemiology and end results".ti,ab.
morbidit$.ti,ab.
mortalit$.ti,ab.
(death or deaths).ti,ab.
survival.ti,ab.
110 or 111 or 112 or 113
limit 114 to ("in data review" or in process or "pubmed not medline")
100 or 101 or 102 or 103 or 104 or 105 or 106 or 107 or 108 or 109 or 115
45 and 99 and 116
limit 117 to (english language and yr="1995 -Current")
remove duplicates from 118
Dermatologic Surgical Procedures/
Curettage/
Dessication/
Cryosurgery/
Laser Therapy/
Mohs Surgery/
Lymph Node Excision/
(surger$ or surgical).ti.
curettage.ti,ab.
dessication.ti,ab.
electrodessication.ti,ab.
cryosurgery.ti,ab.
laser ablation.ti,ab.
mohs.ti,ab.
metastasectomy.ti,ab.
lymphadenectomy.ti,ab.
((lymph node$ or lymphoid) adj3 (remov$ or dissect$ or resect$)).ti,ab.
127 or 128 or 129 or 130 or 131 or 132 or 133 or 134 or 135 or 136
limit 137 to ("in data review" or in process or "pubmed not medline")
120 or 121 or 122 or 123 or 124 or 125 or 126 or 127
45 and 139
Skin Neoplasms/su
Melanoma/su
Melanoma, Amelanotic/su
Nevus/su
Dysplastic Nevus Syndrome/su
Hutchinson's Melanotic Freckle/su
Carcinoma, Basal Cell/su
Carcinoma, Squamous Cell/su
Carcinoma, Merkel Cell/su
Neoplasms, Basal Cell/su
Neoplasms, Squamous Cell/su
"Neoplasms, Adnexal and Skin Appendage"/su
Actinic keratosis/su
Bowen disease/su
Lymphoma, T-Cell, Cutaneous/su
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PubMed search strategy [publisher-supplied references only]

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<th>Search</th>
<th>Query</th>
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<tbody>
<tr>
<td>#62</td>
<td>Search (((#61) AND publisher[sb]) AND English[Language]) AND (&quot;1995&quot;[Date - Publication] : &quot;3000&quot;[Date - Publication])</td>
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<td>#61</td>
<td>Search #12 AND #60</td>
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<td>#59</td>
<td>Search #55 AND #58</td>
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<td>#58</td>
<td>Search #22 OR #23 OR #24 OR #25 OR #26 OR #32 OR #56 OR #57</td>
</tr>
<tr>
<td>#57</td>
<td>Search (surg*[tiab] OR postsurg*[tiab] OR postsurg*[tiab]) AND infect*[tiab]</td>
</tr>
<tr>
<td>#56</td>
<td>Search lymphedema*[tiab] OR lymphoedema*[tiab]</td>
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<td>#55</td>
<td>Search #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54</td>
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<td>#54</td>
<td>Search (lymph node*[tiab] OR lymphoid*[tiab]) AND (remov*[tiab] OR dissect*[tiab] OR resect*[tiab])</td>
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<td>Search metastasectomy*[tiab]</td>
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<td>#38</td>
<td>Search #35 OR #36 OR #37</td>
</tr>
<tr>
<td>#37</td>
<td>Search early diagnos*[tiab] OR early detection*[tiab] OR earlier diagnos*[tiab] OR earlier detection*[tiab] OR diagnosed earl*[tiab] OR detected earl*[tiab]</td>
</tr>
<tr>
<td>#36</td>
<td>Search late stage*[tiab] OR distant stage*[tiab]</td>
</tr>
<tr>
<td>#35</td>
<td>Search (detect*[tiab] OR diagnos*[tiab] OR biops*[tiab]) AND stage*[tiab]</td>
</tr>
</tbody>
</table>

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Search #21 AND #33

Search #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32

Search scar*[tiab] OR cixatrix*[tiab]

Search psychological effect*[tiab]

Search label*[tiab]

Search ((unneeded*[tiab] OR unnecessary*[tiab]) AND (treat*[tiab] OR therap*[tiab] OR surg*[tiab] OR procedure*[tiab]))

Search misdiagnos*[tiab] OR overdiagnos*[tiab]

Search false negative*[tiab]

Search safety*[tiab]

Search side effect*[tiab]

Search complication*[tiab]

Search adverse effect*[tiab] OR adverse event*[tiab] OR adverse outcome*[tiab] OR adverse reaction*[tiab]


Search #18 OR #19 OR #20

Search rebiopsy*[tiab]

Search excise*[tiab] OR excision*[tiab]

Search biopsy*[tiab] OR biopsies*[tiab] OR biopsied*[tiab]

Search #13 OR #14 OR #15 OR #16

Search dermoscop*[tiab] OR dermatoscop*[tiab] OR photography*[tiab]

Search visual inspect*[tiab] OR visually inspect*[tiab]

Search skin exam*[tiab] OR body exam*[tiab] OR physical exam*[tiab]

Search screen*[tiab]

Search #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11

Search cutaneous*[ti] AND lymphoma*[ti]

Search Bowen disease*[ti]

Search actinic keratosis*[ti]

Search basocellular carcinoma*[ti] OR basosquamous carcinoma*[ti]


Search "lentigo maligna"*[ti]

Search "hutchinson’s melanotic freckle"*[ti]

Search (dysplastic*[ti] OR malignant*[ti]) AND (nevus*[ti] OR naevus*[ti] OR nevi*[ti] OR naevi*[ti])

Search (naevoid*[ti] OR nevoid*[ti]) AND syndrome*[ti]

Search melanoma*[ti]

### eTable. Quality assessment criteria

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Adapted Quality Criteria</th>
</tr>
</thead>
</table>
| Randomized controlled trials, adapted from the USPSTF methods¹ | - Valid random assignment?  
- Was allocation concealed?  
- Was eligibility criteria specified?  
- Were groups similar at baseline?  
- Were measurements equal, valid and reliable?  
- Was there intervention fidelity?  
- Was there adequate adherence to the intervention?  
- Were outcome assessors blinded?  
- Was there acceptable followup?  
- Were the statistical methods acceptable?  
- Was the handling of missing data appropriate?  
- Was there evidence of selective reporting of outcomes?  
- Was the device calibration and/or maintenance reported? |
| Ecologic studies adapted from Dufault 2011² and Tu 2008³ | - A priori information: is the identified ecological relationship between the exposure and the outcomes biologically plausible and consistent which what is already known about a given topic at an individual subject level?  
- Adequate sample size  
- Level of aggregation appropriate / are the subjects in the ecologic study representative of the group, place or population of interest?  
- Level of inference (individual, ecologic, unclear)  
- Pre-specification of ecologic units  
- Classification of primary outcomes; were the exposure and outcome variables measured and defined in a similar or same way across the different populations or groups that are being studied?  
- Analytic methodology: would it be practical to conduct alternative ways of studying the same question? Or was the ecologic study the only alternative?  
- Validity of regression  
- Use of covariates; have the data been collected on important confounding variables that might also explain the exposure-outcome relationship and have they been statistically adjusted for? If data are not available on key factors, is it reasonable to assume that heir prevalence is similar in the different groups or populations being compared?  
- Discussion of cross-level bias / have the investigators interpreted their data with appropriate caveats? Did they acknowledge the possibility of an ecological fallacy? Were alternative explanations for the association between the exposure and outcomes considered by the investigators?  
- Have the study data been collected at multiple levels? If yes, was multilevel modeling considered or used for analyzing the data? |

**Abbreviations:** USPSTF = U.S. Preventive Services Task Force

Good quality studies generally meet all quality criteria. Fair quality studies do not meet all the criteria but do not have critical limitations that could invalidate study findings. Poor quality studies have a single fatal flaw or multiple important limitations that could invalidate study findings. Critical appraisal of studies using a priori quality criteria are conducted independently by at least two reviewers. Disagreements in final quality assessment are resolved by consensus, and, if needed, consultation with a third independent reviewer.
References

