

Supplement 1. Search strategy

Database for original search: Ovid Medline(R) 1946 to September Week 1 2014

Databases for update searches: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present

Date original search conducted: 14 September 2014

Date first update search conducted: 24 February 2016

Date second update search conducted: 31 July 2017

Strategy:

1. Adrenal Cortex Hormones/
2. Anti-Inflammatory Agents/
3. Beclomethasone/
4. Budesonide/
5. exp Glucocorticoids/
6. exp Hydroxycorticosteroids/
7. Pregnenediones/
8. Triamcinolone Acetonide/
9. adrenal cortex hormone*.tw,nm.
10. advair*.tw,nm.
11. alvesco*.tw,nm.
12. azmacort*.tw,nm.
13. becl?met*.tw,nm.
14. beclazone*.tw,nm.
15. beclo?ort*.tw,nm.
16. beclovent*.tw,nm.
17. beconase*.tw,nm.
18. becotide*.tw,nm.
19. betamet?asone*.tw,nm.
20. betnesol*.tw,nm.
21. budesonide*.tw,nm.
22. ciclesonide*.tw,nm.
23. clobetasol*.tw,nm.
24. cortiso*.tw,nm.
25. cortodoxone*.tw,nm.
26. corticosteroid*.tw,nm.
27. decadron*.tw,nm.
28. depo medrone*.tw,nm.
29. desoximet?asone*.tw,nm.
30. dexamethasone*.tw,nm.
31. deflazacort*.tw,nm.
32. diflucortolone*.tw,nm.
33. flixotide*.tw,nm.
34. flumethasone*.tw,nm.

35. flunisolide*.tw,nm.
36. fluocino*.tw,nm.
37. fluocortolone*.tw,nm.
38. fluorometholone*.tw,nm.
39. flurandrenolone*.tw,nm.
40. fluticasone*.tw,nm.
41. glucocortico*.tw,nm.
42. hydrocortisone*.tw,nm.
43. hydroxycorticostero*.tw,nm.
44. hydrocortone*.tw,nm.
45. hydroxypregnenolone*.tw,nm.
46. kenacort*.tw,nm.
47. kenalog*.tw,nm.
48. medrone*.tw,nm.
49. methylprednisolone*.tw,nm.
50. mometasone furoate*.tw,nm.
51. nasonex*.tw,nm.
52. paramethasone*.tw,nm.
53. predniso*.tw,nm.
54. pregnenolone*.tw,nm.
55. pulmicort*.tw,nm.
56. qvar*.tw,nm.
57. rhinocort*.tw,nm.
58. seretide*.tw,nm.
59. solu cortef*.tw,nm.
60. symbicort*.tw,nm.
61. tetrahydrocortisol*.tw,nm.
62. triamcinolone*.tw,nm.
63. tricort*.tw,nm.
64. vanceril*.tw,nm.
65. or/1-64
66. Acute Disease/ and (asthma* or pneumonia* or wheez*).mp.
67. exp Asthma/ and (acute* or emergenc* or exacerbation* or severe*).mp.
68. Bronchial Hyperreactivity/
69. Bronchial Spasm/
70. exp Bronchiolitis/
71. Croup/
72. exp Dyspnea/
73. Emergencies/ and (asthma* or pneumonia* or wheez*).mp.
74. Emergency Medical Services/ and (asthma* or pneumonia* or wheez*).mp.
75. Emergency Services, Hospital/ and (asthma* or pneumonia* or wheez*).mp.
76. exp Pharyngitis/
77. exp Pneumonia/ and (acute* or emergenc* or exacerbation* or severe*).mp.
78. exp Respiratory Syncytial Viruses/

79. exp Respiratory Syncytial Virus Infections/
 80. Rhinitis/
 81. exp Sinusitis/
 82. Status Asthmaticus/
 83. Respiratory Sounds/ and (acute* or emergenc* or exacerbation* or severe*).mp.
 84. ((acute* or emergenc* or exacerbation* or severe*) adj5 (asthma* or pneumonia* or wheez*)).tw.
 85. (breath* adj2 (difficult* or gasp* or hard* or labo?r* or shallow* or short*)).tw.
 86. (bronch* adj3 (constrict* or spas*)).tw.
 87. bronchiolitis*.tw.
 88. bronchoconstrict*.tw.
 89. bronchospasm*.tw.
 90. croup*.tw.
 91. dyspne*.tw.
 92. (lung* adj2 (disease* or infect*)).tw.
 93. ((naso pharynx or nasopharynx or para nasal or paranasal or sinus*) adj3 (infect* or inflam*)).tw.
 94. (nasosinusit* or rhinosinusit*).tw.
 95. pharyngitis*.tw.
 96. (respiratory adj2 (attack* or infect* or inflam* or virus*)).tw.
 97. rhinit*.tw.
 98. sinusit*.tw.
 99. tonsillitis*.tw.
 100. or/66-99
 101. exp child/
 102. exp infant/
 103. exp Pediatrics/
 104. (baby* or babies or child* or infant* or infancy or neonat* or newborn*).mp.
 105. (boy* or girl* or paediatric* or peadiatric* or pediatric* or prepubescen*).mp.
 106. or/101-105
 107. and/65,100,106 [steroids/respiratory illness/children]
 108. randomized controlled trial.pt.
 109. controlled clinical trial.pt.
 110. randomi?ed.ab.
 111. placebo.ab.
 112. drug therapy.fs.
 113. randomly.ab.
 114. trial.ab.
 115. groups.ab.
 116. or/108-115
 117. exp Case control studies/
 118. case reports.pt.
 119. Cross-sectional studies/
 120. exp Cohort Studies/
 121. Epidemiologic studies/
 122. case control.tw.

123. (case adj (report* or study or studies or series)).tw.
124. cohort analy*.tw.
125. (cohort adj (study or studies)).tw.
126. cross sectional.tw.
127. (follow up adj (study or studies)).tw.
128. longitudinal.tw.
129. (observational adj (study or studies)).tw.
130. retrospective.tw.
131. or/117-130
132. 116 or 131
133. exp animals/ not humans.sh.
134. 132 not 133
135. 107 and 134
136. (comment or editorial or letter or meta analysis or review).pt.
137. 135 not 136
138. remove duplicates from 137

Database for original search: Ovid Medline(R) In-Process & Other Non-Indexed Citations, September 12, 2014

Date original search conducted: 14 September 2014

Strategy:

1. adrenal cortex hormone*.tw,nm.
2. advair*.tw,nm.
3. alvesco*.tw,nm.
4. azmacort*.tw,nm.
5. becl?met*.tw,nm.
6. beclazone*.tw,nm.
7. beclo?ort*.tw,nm.
8. beclovent*.tw,nm.
9. beconase*.tw,nm.
10. becotide*.tw,nm.
11. betamet?asone*.tw,nm.
12. betnesol*.tw,nm.
13. budesonide*.tw,nm.
14. ciclesonide*.tw,nm.
15. clobetasol*.tw,nm.
16. cortiso*.tw,nm.
17. cortodoxone*.tw,nm.
18. corticosteroid*.tw,nm.
19. decadron*.tw,nm.
20. depo medrone*.tw,nm.
21. desoximet?asone*.tw,nm.
22. dexamethasone*.tw,nm.

23. deflazacort*.tw,nm.
24. diflucortolone*.tw,nm.
25. flixotide*.tw,nm.
26. flumethasone*.tw,nm.
27. flunisolide*.tw,nm.
28. fluocino*.tw,nm.
29. fluocortolone*.tw,nm.
30. fluorometholone*.tw,nm.
31. flurandrenolone*.tw,nm.
32. fluticasone*.tw,nm.
33. glucocortico*.tw,nm.
34. hydrocortisone*.tw,nm.
35. hydroxycorticostero*.tw,nm.
36. hydrocortone*.tw,nm.
37. hydroxypregnenolone*.tw,nm.
38. kenacort*.tw,nm.
39. kenalog*.tw,nm.
40. medrone*.tw,nm.
41. methylprednisolone*.tw,nm.
42. mometasone furoate*.tw,nm.
43. nasonex*.tw,nm.
44. paramethasone*.tw,nm.
45. predniso*.tw,nm.
46. pregnenolone*.tw,nm.
47. pulmicort*.tw,nm.
48. qvar*.tw,nm.
49. rhinocort*.tw,nm.
50. seretide*.tw,nm.
51. solu cortef*.tw,nm.
52. symbicort*.tw,nm.
53. tetrahydrocortisol*.tw,nm.
54. triamcinolone*.tw,nm.
55. tricort*.tw,nm.
56. vanceril*.tw,nm.
57. or/1-56
58. ((acute* or emergenc* or exacerbation* or severe*) adj5 (asthma* or pneumonia* or wheez*)).tw.
59. (breath* adj2 (difficult* or gasp* or hard* or labo?r* or shallow* or short*)).tw.
60. (bronch* adj3 (constrict* or spas*)).tw.
61. bronchiolitis*.tw.
62. bronchoconstrict*.tw.
63. bronchospasm*.tw.
64. croup*.tw.
65. dyspne*.tw.
66. (lung* adj2 (disease* or infect*)).tw.

67. ((naso pharynx or nasopharynx or para nasal or paranasal or sinus*) adj3 (infect* or inflam*)).tw.
68. (nasosinusit* or rhinosinusit*).tw.
69. pharyngitis*.tw.
70. (respiratory adj2 (attack* or infect* or inflam* or virus*)).tw.
71. rhinit*.tw.
72. sinusit*.tw.
73. tonsillitis*.tw.
74. or/58-73
75. (baby* or babies or child* or infant* or infancy or neonat* or newborn*).tw.
76. (boy* or girl* or paediatric* or peadiatric* or pediatric* or prepubescen*).tw.
77. or/75,76
78. and/57,74,77
79. randomi?ed.tw.
80. placebo.tw.
81. randomly.tw.
82. trial.tw.
83. groups.tw.
84. or/79-83
85. case control.tw.
86. (case adj (report* or study or studies or series)).tw.
87. cohort analy*.tw.
88. (cohort adj (study or studies)).tw.
89. cross sectional.tw.
90. (follow up adj (study or studies)).tw.
91. longitudinal.tw.
92. (observational adj (study or studies)).tw.
93. retrospective.tw.
94. or/85-93
95. 84 or 94
96. 78 and 95
97. (comment* or editorial* or letter*).mp.
98. 96 not 97
99. remove duplicates from 98

Database: Cochrane Central Register of Controlled Trials (CENTRAL) via Wiley Cochrane Library

Date original search conducted: 14 September 2014

Date first update search conducted: 24 February 2016

Date second update search conducted: 31 July 2017

Strategy:

1. [mh ^ "Adrenal Cortex Hormones"]
2. [mh ^ "Anti-Inflammatory Agents"]
3. [mh ^ Beclomethasone]
4. [mh ^ Budesonide]

5. [mh Glucocorticoids]
6. [mh Hydroxycorticosteroids]
7. [mh ^ Pregnenediones]
8. [mh ^ "Triamcinolone Acetonide"]
9. "adrenal cortex" next hormone*:ti,ab,kw
10. advair*:ti,ab,kw
11. alvesco*:ti,ab,kw
12. azmacort*:ti,ab,kw
13. becl?met*:ti,ab,kw
14. beclazone*:ti,ab,kw
15. beclo?ort*:ti,ab,kw
16. beclovent*:ti,ab,kw
17. beconase*:ti,ab,kw
18. becotide*:ti,ab,kw
19. betamet?asone*:ti,ab,kw
20. betnesol*:ti,ab,kw
21. budesonide*:ti,ab,kw
22. ciclesonide*:ti,ab,kw
23. clobetasol*:ti,ab,kw
24. cortiso*:ti,ab,kw
25. cortodoxone*:ti,ab,kw
26. corticosteroid*:ti,ab,kw
27. decadron*:ti,ab,kw
28. depo next medrone*:ti,ab,kw
29. desoximet?asone*:ti,ab,kw
30. dexamethasone*:ti,ab,kw
31. deflazacort*:ti,ab,kw
32. diflucortolone*:ti,ab,kw
33. flixotide*:ti,ab,kw
34. flumethasone*:ti,ab,kw
35. flunisolide*:ti,ab,kw
36. fluocino*:ti,ab,kw
37. fluocortolone*:ti,ab,kw
38. fluorometholone*:ti,ab,kw
39. flurandrenolone*:ti,ab,kw
40. fluticasone*:ti,ab,kw
41. glucocortico*:ti,ab,kw
42. hydrocortisone*:ti,ab,kw
43. hydroxycorticostero*:ti,ab,kw
44. hydrocortone*:ti,ab,kw
45. hydroxypregnenolone*:ti,ab,kw
46. kenacort*:ti,ab,kw
47. kenalog*:ti,ab,kw
48. medrone*:ti,ab,kw

49. methylprednisolone*:ti,ab,kw
50. mometasone next furoate*:ti,ab,kw
51. nasonex*:ti,ab,kw
52. paramethasone*:ti,ab,kw
53. predniso*:ti,ab,kw
54. pregnenolone*:ti,ab,kw
55. pulmicort*:ti,ab,kw
56. qvar*:ti,ab,kw
57. rhinocort*:ti,ab,kw
58. seretide*:ti,ab,kw
59. solu next cortef*:ti,ab,kw
60. symbicort*:ti,ab,kw
61. tetrahydrocortisol*:ti,ab,kw
62. triamcinolone*:ti,ab,kw
63. tricort*:ti,ab,kw
64. vanceril*:ti,ab,kw
65. {OR #1-#64}
66. [mh ^ "Acute Disease"] and (asthma* or pneumonia* or wheez*)
67. [mh Asthma] and (acute* or emergenc* or exacerbation* or severe*)
68. [mh "Bronchial Hyperreactivity"]
69. [mh "Bronchial Spasm"]
70. [mh Bronchiolitis]
71. [mh ^ Croup]
72. [mh Dyspnea]
73. [mh ^ Emergencies] and (asthma* or pneumonia* or wheez*)
74. [mh ^ "Emergency Medical Services"] and (asthma* or pneumonia* or wheez*)
75. [mh ^ "Emergency Services, Hospital"] and (asthma* or pneumonia* or wheez*)
76. [mh Pharyngitis]
77. [mh Pneumonia] and (acute* or emergenc* or exacerbation* or severe*)
78. [mh "Respiratory Syncytial Viruses"]
79. [mh "Respiratory Syncytial Virus Infections"]
80. [mh Rhinitis]
81. [mh Sinusitis]
82. [mh ^ "Status Asthmaticus"]
83. [mh ^ "Respiratory Sounds"] and (acute* or emergenc* or exacerbation* or severe*)
84. ((acute* or emergenc* or exacerbation* or severe*) near/5 (asthma* or pneumonia* or wheez*)):ti,ab,kw
85. (breath* near/2 (difficult* or gasp* or hard* or labo?r* or shallow* or short*)):ti,ab,kw
86. (bronch* near/3 (constrict* or spas*)):ti,ab,kw
87. bronchiolitis*:ti,ab,kw
88. bronchoconstrict*:ti,ab,kw
89. bronchospasm*:ti,ab,kw
90. croup*:ti,ab,kw
91. dyspne*:ti,ab,kw

92. (lung* near/2 (disease* or infect*)):ti,ab,kw
93. (("nasopharynx" or nasopharynx* or "paranasal" or paranasal* or sinus*) near/3 (infect* or inflam*)):ti,ab,kw
94. (nasosinusit* or rhinosinusit*):ti,ab,kw
95. pharyngitis*:ti,ab,kw
96. (respiratory* near/2 (attack* or infect* or inflam* or virus*)):ti,ab,kw
97. rhinit*:ti,ab,kw
98. sinusit*:ti,ab,kw
99. tonsillitis*:ti,ab,kw
100. {or #66-#99}
101. [mh child]
102. [mh infant]
103. [mh Pediatrics]
104. (baby* or babies or child* or infant* or infancy or neonat* or newborn*):ti,ab,kw
105. (boy* or girl* or paediatric* or peadiatric* or pediatric* or prepubescen*):ti,ab,kw
106. {or #101-#105}
107. #65 and #100 and #106
108. #65 and #100 and #106 in Trials

Database: Ovid Embase 1974 to 2014 September 12

Date original search conducted: 14 September 2014

Strategy:

1. antiinflammatory agent/
2. beclometasone/
3. budesonide/
4. corticosteroid/
5. exp glucocorticoid/
6. hydroxycorticosteroid/
7. pregnane derivitative/
8. triamcinolone acetonide/
9. adrenal cortex hormone*.tw,tn.
10. advair*.tw,tn.
11. alvesco*.tw,tn.
12. azmacort*.tw,tn.
13. becl?met*.tw,tn.
14. beclazone*.tw,tn.
15. beclo?ort*.tw,tn.
16. beclovent*.tw,tn.
17. beconase*.tw,tn.
18. becotide*.tw,tn.
19. betamet?asone*.tw,tn.
20. betnesol*.tw,tn.
21. budesonide*.tw,tn.

22. ciclesonide*.tw,tn.
23. clobetasol*.tw,tn.
24. cortiso*.tw,tn.
25. cortodoxone*.tw,tn.
26. corticosteroid*.tw,tn.
27. decadron*.tw,tn.
28. depo medrone*.tw,tn.
29. desoximet?asone*.tw,tn.
30. dexamethasone*.tw,tn.
31. deflazacort*.tw,tn.
32. diflucortolone*.tw,tn.
33. flixotide*.tw,tn.
34. flumethasone*.tw,tn.
35. flunisolide*.tw,tn.
36. fluocino*.tw,tn.
37. fluocortolone*.tw,tn.
38. fluorometholone*.tw,tn.
39. flurandrenolone*.tw,tn.
40. fluticasone*.tw,tn.
41. glucocortico*.tw,tn.
42. hydrocortisone*.tw,tn.
43. hydroxycorticostero*.tw,tn.
44. hydrocortone*.tw,tn.
45. hydroxypregnenolone*.tw,tn.
46. kenacort*.tw,tn.
47. kenalog*.tw,tn.
48. medrone*.tw,tn.
49. methylprednisolone*.tw,tn.
50. mometasone furoate*.tw,tn.
51. nasonex*.tw,tn.
52. paramethasone*.tw,tn.
53. predniso*.tw,tn.
54. pregnenolone*.tw,tn.
55. pulmicort*.tw,tn.
56. qvar*.tw,tn.
57. rhinocort*.tw,tn.
58. seretide*.tw,tn.
59. solu cortef*.tw,tn.
60. symbicort*.tw,tn.
61. tetrahydrocortisol*.tw,tn.
62. triamcinolone*.tw,tn.
63. tricort*.tw,tn.
64. vanceril*.tw,tn.
65. or/1-64

66. acute disease/ and (asthma* or pneumonia* or wheez*).mp.
67. exp asthma/ and (acute* or emergenc* or exacerbation* or severe*).mp.
68. exp breathing disorder/ and (acute* or emergenc* or exacerbation* or severe*).mp.
69. bronchospasm/
70. bronchus hyperreactivity/
71. exp bronchiolitis/
72. croup/
73. exp dyspnea/
74. emergency/ and (asthma* or pneumonia* or wheez*).mp.
75. emergency health service/ and (asthma* or pneumonia* or wheez*).mp.
76. exp emergency treatment/ and (asthma* or pneumonia* or wheez*).mp.
77. emergency ward/ and (asthma* or pneumonia* or wheez*).mp.
78. exp pharyngitis/
79. exp pneumonia/ and (acute* or emergenc* or exacerbation* or severe*).mp.
80. Respiratory syncytial pneumovirus/
81. respiratory syncytial virus infection/
82. exp rhinitis/
83. exp sinusitis/
84. ((acute* or emergenc* or exacerbation* or severe*) adj5 (asthma* or pneumonia* or wheez*)).tw.
85. (breath* adj2 (difficult* or gasp* or hard* or labo?r* or shallow* or short*)).tw.
86. (bronch* adj3 (constrict* or spas*)).tw.
87. bronchiolitis*.tw.
88. bronchoconstrict*.tw.
89. bronchospasm*.tw.
90. croup*.tw.
91. dyspne*.tw.
92. (lung* adj2 (disease* or infect*)).tw.
93. ((naso pharynx or nasopharynx or para nasal or paranasal or sinus*) adj3 (infect* or inflam*)).tw.
94. (nasosinusit* or rhinosinusit*).tw.
95. pharyngitis*.tw.
96. (respiratory adj2 (attack* or infect* or inflam* or virus*)).tw.
97. rhinit*.tw.
98. sinusit*.tw.
99. tonsillitis*.tw.
100. or/66-99
101. exp child/
102. exp infant/
103. exp Pediatrics/
104. (baby* or babies or child* or infant* or infancy or neonat* or newborn*).mp.
105. (boy* or girl* or paediatric* or peadiatric* or pediatric* or prepubescen*).mp.
106. or/101-105
107. and/65,100,106
108. crossover procedure/
109. double blind procedure/

110. randomized controlled trial/
110. single blind procedure/
111. allocat*.tw.
112. assign*.tw.
113. cross over*.tw.
114. crossover*.tw.
115. doubl* adj blind*.tw.
116. factorial*.tw.
117. placebo*.tw.
118. random*.tw.
119. singl* adj blind*.tw.
120. volunteer*.tw.
121. or/108-120
122. exp case control study/
123. case report/
124. case study/
125. cross-sectional study/
126. cohort analysis/
127. case control.tw.
128. (case adj (report* or study or studies or series)).tw.
129. cohort analy*.tw.
130. (cohort adj (study or studies)).tw.
131. cross sectional.tw.
132. (follow up adj (study or studies)).tw.
133. longitudinal.tw.
134. (observational adj (study or studies)).tw.
135. retrospective.tw.
136. or/122-135
137. 121 or 136
138. animals/ not (animals/ and humans/)
139. 137 not 138
140. 107 and 139
141. (editorial or journal editorial or journal letter or journal note or letter or review).pt.
142. 140 not 141
143. limit 142 to embase

Database: Drugs@FDA

URL: <http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm>

Date original search conducted: 5 September 2014

Strategy:

Searched Drugs@FDA for drug name keywords:

1. beclametasone dipropionate
2. budesonide

3. ciclesonide
4. fluticasone propionate
5. mometasone furoate
6. triamcinolone acetonide

Retrieved all available medical and statistical reviews for drugs in these classes with systemic routes of administration

Database: Health Canada Drug Products Database

URL: <http://www.hc-sc.gc.ca/dhp-mps/prodpharma/databasdon/index-eng.php>

Date original search conducted: 8 September 2014

Strategy:

Searched Health Canada Drug Products Database for drug name keywords:

1. beclomethasone
2. budesonide
3. ciclesonide
4. fluticasone propionate
5. mometasone furoate
6. triamcinolone acetonide

Retrieved all available monographs for drugs in these classes with systemic routes of administration

Database: European Medicines Agency's European Public Assessment Reports

URL:

http://www.ema.europa.eu/ema/index.jsp?curl=pages/medicines/landing/epar_search.jsp&mid=WC0b01ac058001d124

Date original search conducted: 9, 10 September 2014

Strategy:

Searched EMA reports for drug name keywords:

1. beclomethasone
2. beclometasone
3. beclamethasone
4. beclometasone
5. budesonide
6. ciclesonide
7. fluticasone
8. mometasone
9. triamcinolone acetonide
10. Also searched for "corticosteroids" as a pharmaco therapeutic group

Retrieved all available reports for drugs in these classes with systemic routes of administration