

The impact of biologics and tofacitinib on cardiovascular risk factors and outcomes in patients with rheumatic disease: a systematic literature review

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Electronic database search strategy

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1946 to December 2015> Search Strategy:

1. exp Arthritis, Rheumatoid/ or exp Arthritis, Psoriatic/ or exp Spondylarthritis/ or exp Spondylitis, Ankylosing/ or exp Spondylarthropathies/ or exp Arthritis, Juvenile/
2. rheumatoid arthritis.tw.
3. (psoria\$ adj2 (arthrit\$ or arthropath\$)).tw.
4. (spondyloarthritis or spondyloarthritides or spondyloarthropathies).tw.
5. (Axial SpA or axial spondyloarthritis or axSpA or ax-SpA).tw.
6. (ankylosing spondylitis or 'AS').tw.
7. (bekhterev or bechterew or marie strumpell or rheumatoid spondylitis or ankylos* or spondyl* or axial).tw.
8. (Non\$radiographic or radiograph* or nr-axSpA).tw.
9. ((Juvenile adj2 arthritis) or JIA or JRA).tw.
10. or/1-9
11. exp Coronary diseases/
12. Heart Score.tw.
13. ETHRISK.tw.
14. (Framingham adj3 score).tw.
15. PROCAM.tw.
16. ASSIGN score.tw.
17. Reynolds risk.tw.
18. ((risk or score or calcul*) adj5 (heart* or cardio* or cardia* or isch\$em* or angina or coronary or infarct* or cvd or stroke or strokes
19. HeartScore.tw.
20. (sheffield adj2 table).tw.
21. (new Zealand adj2 risk calculator).tw.
22. ASSIGN tool.tw.
23. Cardiovascular risk
24. exp cardiovascular disease/
25. Cardio*.tw.
26. cardia*.tw.
27. heart*.tw.
28. coronary*.tw.
29. angina*.tw.
30. ventric*.tw.
31. vasc*.tw.
32. pericard*.tw.
33. isch\$em*.tw.
34. emboli*.tw.
35. aneur*.tw.
36. arrhythmi*.tw.
37. thrombo*.tw.
38. atrial fibrillat*.tw.
39. tachycardi*.tw.
40. endocardi*.tw.
41. (sick adj sinus).tw.
42. exp Stroke/

43. (stroke or strokes).tw.
44. cerebrovasc*.tw.
45. cerebral vascular.tw.
46. apoplexy.tw.
47. ((brain* or cerebral or lacunar) adj2 infarct*).tw.
48. peripheral arter* disease*.tw.
49. exp Arteriosclerosis/
50. exp Diabetes Mellitus/
51. (diabetes adj3 mellitus).tw.
52. exp Hyperglycemia/
53. hyperglycemia*.tw.
54. glycemia*.tw.
55. exp Hypertension/
56. hypertensi*.tw.
57. ((high or increased or elevated) adj2 blood pressure).tw.
58. exp Blood Pressure/
59. ((systolic or diastolic) adj blood pressure).tw.
60. exp Dyslipidemias/
61. dyslipidemia*.tw.
62. dyslipoproteinemia*.tw.
63. hypercholesterolemia*.tw.
64. hypercholesteremia*.tw.
65. exp Hyperlipidemia/
66. hyperlipidemia*.tw.
67. hyperlipemia*.tw.
68. lipidemia*.tw.
69. lipemia*.tw.
70. hyperlipoproteinemia*.tw.
71. hyperchylomicronemia*.tw.
72. lipoproteinemia*.tw.
73. hypertriglyceridaemia*.tw.
74. exp Cholesterol/
75. cholesterol*.tw.
76. Cholesterol, HDL/
77. Cholesterol, LDL/
78. exp Triglycerides/
79. triglyceride*.tw.
80. triacylglycerol*.tw.
81. ((low or high) adj3 lipoprotein*).tw.
82. or/11-81
83. (Abatacept or BMS 188667 or ctla4 ig).mp.
84. (Adalimumab or humira or hum\$ra).mp.
85. (certolizumab or CDP870 or CDP 870 or PHA738144 or PHA 738144 or Cimzia).mp.
86. (certolizumab adj2 pegol).mp.
87. (Etanercept or Enbrel or ETA or ETN).mp.
88. (golimumab or CNTO 148 or CNTO148 or Simponi).mp.
89. (Infliximab or Remicade or Avakine).mp.
90. (Rituximab or rituxan or Mabthera).mp.
91. (secukinumab or cosentyx).mp.
92. (Tocilizumab or actemra or atlizumab).mp.
93. (Ustekinumab or stelara or CNTO 1275 or CNTO-1275).mp.
94. (Tofacitinib or tasocitinib or jakvinus or xeljanz or cp690550 or cp 690550 or cp 690550).mp.
95. (biosimilars or biologics or CT-P13 or inflectra or remsima or SB4).mp.
96. or/83-95

97. randomized controlled trial.pt.
98. controlled clinical trial.pt.
99. randomi\$ed.ab.
100. placebo.tw.
101. drug therapy.fs.
102. clinical trials as topic.sh.
103. randomly.ab.
104. trial.ab.
105. groups.ab.
106. (crossover or cross-over or cross over).tw.
107. ((singl\$ or double\$ or triple\$ or treble\$) and (blind\$ or mask\$)).tw,sh.
108. Epidemiologic Studies/ or exp Case-Control Studies/ or exp Cohort Studies/ or exp Cross-Sectional Studies/or exp Control Groups/ or Longitudinal Studies/ or Prospective Studies/ or Retrospective Studies/ or Comparative Study/ or research design/ or Observational Study/
109. (case control or case-control).ti,ab.
110. ((follow up or follow-up) adj (study or studies)).ti,ab.
111. (Longitudinal or retrospective or prospective or comparative or cohort or cross sectional or cross-sectional).ti,ab.
112. ((observ\$ or registry) adj3 (study or studies)).ti,ab.
113. (Epidemiolog\$ adj (study or studies or analysis)).ti,ab.
114. or/97-113
115. 10 and 82 and 96 and 114
116. (animal\$ not human\$).sh,hw.
117. 115 not 116
118. (editorial or comment* or letter or note or case series or case study or case studies or case report).pt. or (editorial/ or letter/ or case study/ or case report/ or note/)
119. 117 not 118
120. limit 119 to english language

Limit search results from 2000 to December 2015

Database: Embase <1988 to 2015 Week 50> Search Strategy:

1. exp rheumatoid arthritis/ or exp psoriatic arthritis/ or exp spondylarthritis/ or exp ankylosing spondylitis/ or exp spondyloarthropathy/ or exp juvenile rheumatoid arthritis/
2. rheumatoid arthritis.tw.
3. (psoria\$ adj2 (arthrit\$ or arthropath\$)).tw.
4. (spondyloarthritis or spondyloarthritides or spondyloarthropathies).tw.
5. (Axial SpA or axial spondyloarthritis or axSpA or ax-SpA).tw.
6. (ankylosing spondylitis or 'AS').tw.
7. (bekhterev or bechterew or marie strumpell or rheumatoid spondylitis or ankylos* or spondyl* or axial).tw.
8. (Non\$radiographic or radiograph* or nr-axSpA).tw.
9. ((Juvenile adj2 arthritis) or JIA or JRA).tw.
10. or/1-9
11. Heart Score.tw.
12. ETHRISK.tw.
13. (Framingham adj3 score).tw.
14. PROCAM.tw.
15. ASSIGN score.tw.
16. ((risk or score or calcul*) adj5 (heart* or cardio* or cardia* or isch\$em* or angina or coronary or infarct* or cvd or stroke or strokes
17. HeartScore.tw.
18. (sheffield adj2 table).tw.
19. (new Zealand adj2 risk calculator).tw.
20. ASSIGN tool.tw.
21. Reynolds risk.tw.
22. exp cardiovascular risk/
23. exp coronary disease/
24. exp cardiovascular disease/
25. cardio*.tw.
26. cardia*.tw.
27. heart*.tw.
28. coronary*.tw.
29. angina*.tw.
30. ventric*.tw.
31. vasc*.tw.
32. pericard*.tw.
33. isch?em*.tw.
34. emboli*.tw.
35. aneur*.tw.
36. arrhythmi*.tw.
37. thrombo*.tw.
38. atrial fibrillat*.tw.
39. tachycardi*.tw.
40. endocardi*.tw.
41. (sick adj sinus).tw.
42. exp stroke/
43. (stroke or strokes).tw.
44. cerebrovasc*.tw.
45. cerebral vascular.tw.
46. apoplexy.tw.
47. ((brain* or cerebral or lacunar) adj2 infarct*).tw.
48. peripheral arter* disease*.tw.
49. exp Arteriosclerosis/
50. exp diabetes mellitus/

51. (diabetes adj3 mellitus).tw.
52. exp hyperglycemia/
53. hyperglycemia*.tw.
54. glycemia*.tw.
55. exp hypertension/
56. hypertensi*.tw.
57. ((high or increased or elevated) adj2 blood pressure).tw.
58. exp blood pressure/
59. ((systolic or diastolic) adj blood pressure).tw.
60. exp dyslipidemia/
61. dyslipidemia*.tw.
62. dyslipoproteinemia*.tw.
63. hypercholesterolemia*.tw.
64. hypercholesteremia*.tw.
65. exp Hyperlipidemia/
66. hyperlipidemia*.tw.
67. hyperlipemia*.tw.
68. lipidemia*.tw.
69. lipemia*.tw.
70. hyperlipoproteinemia*.tw.
71. hyperchylomicronemia*.tw.
72. lipoproteinemia*.tw.
73. hypertriglyceridaemia*.tw.
74. exp Cholesterol/
75. cholesterol*.tw.
76. Cholesterol, HDL/
77. Cholesterol, LDL/
78. exp Triglyceride/
79. triglyceride*.tw.
80. triacylglycerol*.tw.
81. ((low or high) adj3 lipoprotein*).tw.
82. or/11-81
83. exp abatacept/ or exp adalimumab/ or exp certolizumab pegol/ or exp etanercept/ or exp infliximab/ or exp golimumab/ or exp secukinumab/ or exp rituximab/ or exp tocilizumab/ or exp ustekinumab/ or exp tofacitinib/
84. (Abatacept or orenicia or BMS 188667 or ctla4 ig).mp.
85. (Adalimumab or Humira or Hum?ra).mp.
86. (certolizumab or CDP870 or CDP 870 or PHA738144 or PHA 738144 or Cimzia).mp.
87. (certolizumab adj2 pegol).mp.
88. (Etanercept or Enbrel or ETA or ETN).mp.
89. (Infliximab or Remicade or Avakine).mp.
90. (golimumab or CNTO 148 or CNTO148 or Simponi).mp.
91. (Rituximab or rituxan or Mabthera).mp.
92. (secukinumab or cosentyx).mp.
93. (Tocilizumab or actemra or atlizumab).mp.
94. (Ustekinumab or stelara or CNTO 1275 or CNTO-1275).mp.
95. (Tofacitinib or tasocitinib or jakvinus or xeljanz or cp690550 or cp 690550 or cp 690 550).mp.
96. (biosimilars or biologics or CT-P13 or inflectra or remsima or SB4).mp.
97. or/83-96
98. clinical trial/
99. random\$.tw.
100. randomized controlled trial/
101. trial\$.tw.
102. controlled study/

- 103. double blind procedure/
- 104. placebo\$.tw.
- 105. placebo/
- 106. (singl\$ adj (blind\$ or mask\$)).tw.
- 107. factorial\$.ti,ab.
- 108. (crossover\$ or cross-over\$).ti,ab.
- 109. (double\$ adj (blind\$ or mask\$)).tw.
- 110. assign\$.ti,ab.
- 111. allocat\$.ti,ab.
- 112. volunteer\$.ti,ab.
- 113. Crossover Procedure/
- 114. Single Blind Procedure/
- 115. ((triple\$ or treble\$) adj (blind\$ or mask\$)).tw.
- 116. epidemiology/ or exp case control study/ or exp cohort analysis/ or exp cross-sectional study/ or exp control group/ or clinical study/ or longitudinal study/ or prospective study/ or retrospective study/ or comparative study/ or observational study/
- 117. (Epidemiolog\$ adj (study or studies or analysis)).ti,ab.
- 118. (case control or case-control).ti,ab.
- 119. ((follow up or follow-up) adj (study or studies)).ti,ab.
- 120. (Longitudinal or retrospective or prospective or comparative or cohort or cross sectional or cross sectional).ti,ab.
- 121. ((observ\$ or registry) adj3 (study or studies)).ti,ab.
- 122. or/98-121
- 123. 10 and 82 and 97 and 122
- 124. (editorial or comment* or letter or note or case series or case study or case studies or case report).pt. or (editorial/ or letter/ or case study/ or case report/ or note/)
- 125. 123 not 124
- 126. (animal\$ not human\$).sh,hw.
- 127. 125 not 126
- 128. limit 127 to english language

Limit search results from 2000 to December 2015

Database: Cochrane Search Strategy:

1. MeSH descriptor: [Arthritis, Rheumatoid] explode all trees
2. MeSH descriptor: [Arthritis, Psoriatic] explode all trees
3. MeSH descriptor: [Spondylarthritis] explode all trees
4. MeSH descriptor: [Spondylitis, Ankylosing] explode all trees
5. MeSH descriptor: [Spondylarthropathies] explode all trees
6. MeSH descriptor: [Arthritis, Juvenile] explode all trees
7. (rheumat* near/2 arthrit*):ti,ab,kw
8. (psor* near/2 (arthrit* or athropath*)):ti,ab,kw
9. (spondylarthritis or spondyloarthritis or spondyloarthropathies):ti,ab,kw
10. (Axial SpA or axial spondyloarthritis or axSpA or ax-SpA):ti,ab,kw
11. (ankyl* near/2 spondyl*):ti,ab,kw
12. (bekhterev or bechterew or marie strumpell or rheumatoid spondylitis or ankylos* or spondyl* or axial):ti,ab,kw
13. (Non\$radiographic or radiograph* or nr-axSpA):ti,ab,kw
14. ((juvenile near/2 arthritis) or JIA or JRA):ti,ab,kw
15. #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
16. Heart Score:ti,ab,kw
17. ETHRISK:ti,ab,kw
18. (Framingham near/3 score) :ti,ab,kw
19. PROCAM:ti,ab,kw
20. ASSIGN score:ti,ab,kw
21. ((risk or score or calcul*) near/5 (heart* or cardio* or cardia* or isch\$em* or angina or coronary or infarct* or cvd or stroke or strokes or myocard* or cerebrovasc*)):ti,ab,kw
22. (sheffield near/2 table):ti,ab,kw
23. (new Zealand near/2 risk calculator):ti,ab,kw
24. ASSIGN tool:ti,ab,kw
25. Cardiovascular near/2 risk:ti,ab,kw
26. MeSH descriptor: [Coronary disease] explode all trees
27. MeSH descriptor: [Cardiovascular disease] explode all trees
28. Cardio*:ti,ab,kw
29. Cardia*:ti,ab,kw
30. Heart*:ti,ab,kw
31. Coronary*:ti,ab,kw
32. Angina*:ti,ab,kw
33. Ventric*:ti,ab,kw
34. Vasc*:ti,ab,kw
35. pericard*:ti,ab,kw
36. Isch\$em*:ti,ab,kw
37. emboli*:ti,ab,kw
38. Aneur*:ti,ab,kw
39. arrhythmi*:ti,ab,kw
40. thrombo*:ti,ab,kw
41. atrial fibrillat*:ti,ab,kw
42. tachycardi*:ti,ab,kw
43. endocardi*:ti,ab,kw
44. (sick near sinus):ti,ab,kw
45. MeSH descriptor: [Stroke] explode all trees
46. (stroke or strokes):ti,ab,kw
47. Cerebrovasc*:ti,ab,kw
48. cerebral vascular:ti,ab,kw
49. apoplexy:ti,ab,kw
50. ((brain* or cerebral or lacunar) near/2 infarct*):ti,ab,kw

51. peripheral arter* disease*:ti,ab,kw
52. MeSH descriptor: [Arteriosclerosis] explode all trees
53. MeSH descriptor: [Diabetes Mellitus] explode all trees
54. (diabetes near/3 mellitus):ti,ab,kw
55. MeSH descriptor: [Hyperglycemia] explode all trees
56. hyperglycemia*:ti,ab,kw
57. glycemia*:ti,ab,kw
58. MeSH descriptor: [Hypertension] explode all trees
59. hypertensi*:ti,ab,kw
60. ((high or increased or elevated) adj2 blood pressure):ti,ab,kw
61. MeSH descriptor: [Blood Pressure] explode all trees
62. ((systolic or diastolic) adj blood pressure):ti,ab,kw
63. MeSH descriptor: [Dyslipidemia] explode all trees
64. dyslipidemia*:ti,ab,kw
65. dyslipoproteinemia*:ti,ab,kw
66. hypercholesterolemia*:ti,ab,kw
67. hypercholesteremia*:ti,ab,kw
68. MeSH descriptor: [Hyperlipidemia] explode all trees
69. hyperlipidemia*:ti,ab,kw
70. hyperlipemia*:ti,ab,kw
71. lipidemia*:ti,ab,kw
72. lipemia*:ti,ab,kw
73. hyperlipoproteinemia*:ti,ab,kw
74. hyperchylomicronemia*:ti,ab,kw
75. lipoproteinemia*:ti,ab,kw
76. hypertriglyceridaemia*:ti,ab,kw
77. MeSH descriptor: [Cholesterol] explode all trees
78. cholesterol*:ti,ab,kw
79. (HDL near/2 cholesterol):ti,ab,kw
80. (LDL near/2 cholesterol):ti,ab,kw
81. MeSH descriptor: [Triglycerides] explode all trees
82. triglyceride*:ti,ab,kw
83. triacylglycerol*:ti,ab,kw
84. ((low or high) near/3 lipoprotein*):ti,ab,kw
85. #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 or #29 or #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 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #65 or #66 or #67 or #68 or #69 or #70 or #71 or #72 or #73 or #74 or #75 or #76 or #77 or #78 or #79 or #80 or #81 or #82 or #83 or #84
86. (Abatacept or orenicia or nulojix or belatacept or LEA29Y or BMS-224818 or BMS 188667):ti,ab,kw
87. (adalimumab or humira or hum?ra or trudexa):ti,ab,kw
88. (certolizumab or CDP870 or CDP 870 or PHA738144 or PHA 738144 or Cimzia):ti,ab,kw
89. (certolizumab near/2 pegol):ti,ab,kw
90. (Etanercept or Enbrel or ETA or ETN):ti,ab,kw
91. (golimumab or CNTO 148 or CNTO148 or simponi):ti,ab,kw
92. (Infliximab or remicade or avakine):ti,ab,kw
93. (rituximab or rituxan or mabthera):ti,ab,kw
94. (secukinumab or cosentyx):ti,ab,kw
95. (Tocilizumab or actemra or atlizumab):ti,ab,kw
96. (ustekinumab or stelara or CNTO 1275 or CNTO-1275):ti,ab,kw
97. (Tofacitinib or tasocitinib or jakvinus or xeljanz or cp690550 or cp 690550 or cp 690 550):ti,ab,kw
98. (biosimilars or biologics or CT-P13 or inflectra or remsima or SB4):ti,ab,kw
99. #86 or #87 or #88 or #89 or #90 or #91 or #92 or #93 or #94 or #95 or #96 or #97 or #98
100. #15 and #85 and #99

Limit search results from 2000 to December 2015