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Supplementary Material

Supplementary Table 1: Eligibility criteria defined by PICOS

P	**Participants:** - Patients above 18 years with one or more concurrent chronic condition, regardless of sex, education, marital status, employment status, income, or other socioeconomic factors who were managed in a primary care setting using a EHR or clinical registry) supported by a computerised, knowledge-based CDSS. - Chronic conditions were defined and limited to the following conditions: o Asthma, chronic obstructive pulmonary disease (COPD), heart failure, myocardial ischemia, hypertension, type II diabetes mellitus, hyperlipidaemia, arthritis, and osteoporosis.
I	**Interventions:** Computerised knowledge based CDSS embedded EHRs or clinical registries in primary care settings as an intervention with the following inclusion and exclusion criteria: **Studies will be included if:** - They focus on evaluating a CDSS for medical management of the selected chronic diseases - The CDSS is of knowledge-based type (informed by CPGs). - Included CDSS is synchronous, meaning alerts are electronically presented to the clinician in real-time during the physician-patient encounter. - The CDSS users are primary care physicians (PCPs). - They report at least: one quantifiable patient clinical outcome/patient-related measure in adult populations in the specified chronic disease entities **Studies will be excluded if:** - Not published in English. - Not conducted in primary care settings. - Include care provided by subspecialized physicians (not PCPs). - Evaluates a CDSS for other outcome measures such as system usability, or other quality outcomes, not including patient or clinical outcomes. - Interventions that are used for other direct care purposes other than chronic disease management or non-direct care purposes, such as research purposes. - Evaluate the effect of a CDSS in other diseases not specified in the inclusion criteria. - Include a CDSS that does not produce real-time recommendations based on CPGs (non-knowledge based CDSS). - Web-based CDSS, paper-based CDSS, standalone CDSS (not integrated with EHRs), CDSS integrated with EHR but not producing electronic alerts, and other CDSS that use e-mail, phone, or pagers to notify the user. - Studies without a comparator group - Comparator group is another type of CDSS.
C	**Comparators:** Usual care not utilising CDSS
O	**Outcomes:** - Patient-related health and clinical outcomes in chronic disease management (such as HBA1C, FEV_1, or other biomarkers of chronic diseases), morbidity, mortality, HRQoL, preventable co-morbidities, or disease activity) - Practitioner-related, patient-related, and cost-effectiveness outcomes were not included.
S	**Study types:** Randomised controlled trials (RCTs), cluster RCTs, quasi-RCTs, interrupted time series (ITS) and controlled before-and-after (CBA) studies

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Supplementary Table 2: List of search terms

CDSS terms	Dashboard*, registry, clinical decision support system*, medical order entry system*, computeri?ed physician order entry system*, CPOE, order set*, computer assisted decision making, (computer$ adj3 decision$), knowledge management system*, case-finding algorithm*, advisory decision support, (computer* adj2 therap*)

AND

General Practice/Primary care	general practi*, family practice, family clinic*, family practi*, family physician*, family doctor*, primary care physician*, primary care clinic*, primary care practi*,

OR each of the below individual entities combined with AND

Chronic Disease Entities	
Asthma	asthma*, antiasthma*, wheez*, (bronch* adj3 spasm*), bronchoconstrict*, (bronch$ adj3 constrict$), ((bronchial$ or respiratory or airway$ or lung$) adj3 (hypersensitiv$ or hyperreactiv$ or allerg$ or insufficiency)),
Heart Failure/ Myocardial Ischemia	(heart* adj2 decomp*), ((heart* or cardiac* or myocard*) adj2 (fail* or insuff* or infarct* or ishcem* or disease*)), ((heart* or cardiac* or myocard*) adj2 (fail* or insuff* or infarct* or ishcem* or disease*))
Hypertension	((elevat$ or increas$ or lower or high or rais$ or rising) adj2 (arterial pressure or blood pressure or diastolic pressure or systolic pressure)), hypertens$ or prehypertens$),
Diabetes Mellitus	(IDDM or T2DM or T2D), (insulin* depend* or insulin?depend*)., (non insulin* depend* or noninsulin* depend* or non insulin?depend* or noninsulin?depend*)., diabet*.
Hyperlipidemia	LDL, (dyslipid?emia* or lipoprotein* or dyslipidprotein?emia* or hyperlipoprotein?emia), (hyperlipid?emia* or cholesterol* or lip?emia* or hypercholesterol?emia* or hypercholester?emia* or hyperlip?emia* or triglycerid* or hypertriglycerid?emia*).,
COPD	(COPD or COAD or COBD or AECB), ((obstruct$ adj3 lung$) or (obstruct$ adj 3 airway$)), (obstruct$ adj3 pulmonary), (chronic* adj3 bronchiti*), emphysema*.,
Arthritis	Osteoarthritis, undifferentiated oligoarthritis, ((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat$ or reumat$ or revmarthrit$) adj3 (arthrit$ or artrit$ or diseas$ or condition$ or nodule$))., (joint pain or chronic joint symptoms or gonarthrosis or osteoarthrosis or astoarthrosis or degeneretive arthritis or joint diseases or arthralgia),
Osteoporosis	Densitometry, osteopenia, bone mass, bone densit*, osteoporos?s, (osteoporosis or osteopenia or (bone and (density or mass or loss))) or hepatic osteodystrophy),

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Supplementary Table 3 - Full Search Strategy

Full Medline Search Strategy

1   Dashboard*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1228)

2   registry.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (109312)

3   registries.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (104552)

4   exp Registries/ (95452)

5   1 or 2 or 3 or 4 (173943)

6   exp Decision Support Systems, Clinical/ (7925)

7   clinical decision support system*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (2132)

8   medical order entry system*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (2297)

9   computeri?ed physician order entry system*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (224)

10   CPOE.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1113)

11   order set*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1009)

12   exp Decision Making, Computer-Assisted/ (144386)

13   computer assisted decision making.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (76)

14   (computer$ adj3 decision$).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (4723)

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15   knowledge management system*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (109)

16   case-finding algorithm*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (84)

17   advisory decision support.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1)

18   exp Therapy, Computer-Assisted/ (63908)

19   (computer* adj2 therap*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (8758)

20   exp Reminder Systems/ (3443)

21   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 (159108)

22   5 or 21 (331941)

23   exp Asthma/ (127501)

24   asthma*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (179286)

25   antiasthma*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1458)

26   exp Respiratory Sounds/ (12994)

27   wheez*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (13724)

28   exp Bronchial Spasm/ (4303)

29   (bronch* adj3 spasm*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (4523)

30   exp Bronchoconstriction/ (4131)

31   bronchoconstrict*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (11491)

4

32   (bronch$ adj3 constrict$).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (715)

33   exp Bronchial Hyperreactivity/ (7348)

34   exp Respiratory Hypersensitivity/ (154474)

35   ((bronchial$ or respiratory or airway$ or lung$) adj3 (hypersensitiv$ or hyperreactiv$ or allerg$ or insufficiency)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (66254)

36   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 (261794)

37   exp Heart Failure/ (120835)

38   (heart* adj2 decomp*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (4261)

39   ((heart* or cardiac* or myocard*) adj2 (fail* or insuff* or infarct* or ishcem* or disease*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (664015)

40   ((heart* or cardiac* or myocard*) adj2 (fail* or insuff* or infarct* or ishcem* or disease*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (664015)

41   exp Myocardial Ischemia/ (428216)

42   exp Coronary Disease/ (216812)

43   37 or 38 or 39 or 40 or 41 or 42 (842183)

44   exp Hypertension/ (253393)

45   exp Essential Hypertension/ (2255)

46   (hypertens$ or prehypertens$).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (510526)

47   ((elevat$ or increas$ or lower or high or rais$ or rising) adj2 (arterial pressure or blood pressure or diastolic pressure or systolic pressure)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (63244)

48   44 or 45 or 46 or 47 (537839)

49   exp Diabetes Mellitus/ (423542)

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50   diabet*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (693674)

51   (non insulin* depend* or noninsulin* depend* or non insulin?depend* or noninsulin?depend*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (12372)

52   (insulin* depend* or insulin?depend*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (29531)

53   (IDDM or T2DM or T2D).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (37329)

54   exp Diabetes Mellitus, Type 2/ (132230)

55   49 or 50 or 51 or 52 or 53 or 54 (697363)

56   exp Hyperlipidemias/ (65918)

57   exp Dyslipidemias/ (79414)

58   exp Cholesterol/ (159670)

59   (hyperlipid?emia* or cholesterol* or lip?emia* or hypercholesterol?emia* or hypercholester?emia* or hyperlip?emia* or triglycerid* or hypertriglycerid?emia*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (389543)

60   (dyslipid?emia* or lipoprotein* or dyslipidprotein?emia* or hyperlipoprotein?emia*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (209412)

61   LDL.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (101128)

62   56 or 57 or 58 or 59 or 60 or 61 (479855)

63   exp Pulmonary Disease, Chronic Obstructive/ (55377)

64   exp Lung Diseases, Obstructive/ (210481)

65   emphysema*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (35893)

6

66   (chronic* adj3 bronchiti*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (11493)

67   (obstruct$ adj3 pulmonary).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (67392)

68   ((obstruct$ adj3 lung$) or (obstruct$ adj 3 airway$)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (24368)

69   (COPD or COAD or COBD or AECB).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (46979)

70   63 or 64 or 65 or 66 or 67 or 68 or 69 (256014)

71   exp Arthritis/ (258204)

72   exp Osteoarthritis/ (62805)

73   osteoarthritis.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (88630)

74   exp Joint Diseases/ (378029)

75   exp Arthralgia/ (13069)

76   (joint pain or chronic joint symptoms or gonarthrosis or osteoarthrosis or astoarthrosis or degeneretive arthritis or joint diseases or arthralgia).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (49768)

77   ((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat$ or reumat$ or revmarthrit$) adj3 (arthrit$ or artrit$ or diseas$ or condition$ or nodule$)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (176792)

78   undifferentiated oligoarthritis.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (36)

79   71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 (466351)

80   exp Osteoporosis/ (55499)

81   (osteoporosis or osteopenia or (bone and (density or mass or loss)) or hepatic osteodystrophy).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading

7

word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (229156)

82   osteoporos?s.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (86861)

83   exp Bone Density/ (52984)

84   bone densit*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (70284)

85   exp Bone Demineralization, Pathologic/ (652)

86   exp Bone Diseases, Metabolic/ (76180)

87   bone mass.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (18851)

88   osteopenia.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (9555)

89   exp Densitometry/ (34775)

90   densitometry.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (20649)

91   80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 (266936)

92   exp General Practitioners/ (7841)

93   exp General Practice/ (74873)

94   general practi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (91362)

95   exp Physicians, Family/ (16348)

96   exp Family Practice/ (65161)

97   family practice.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (68324)

98   family clinic*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (470)

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99   family physician*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (14677)

100   family practi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (69798)

101   family doctor*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (4649)

102   primary care physician*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (19694)

103   primary care clinic*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (7532)

104   exp Physicians, Primary Care/ (3421)

105   primary care practi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (7576)

106   92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 (180127)

107   22 and 106 (4326)

108   91 and 107 (50)

109   79 and 107 (76)

110   70 and 107 (184)

111   62 and 107 (206)

112   55 and 107 (568)

113   48 and 107 (239)

114   43 and 107 (343)

115   36 and 107 (148)

116   108 or 109 or 110 or 111 or 112 or 113 or 114 or 115 (1211)

117   from 116 keep 1-1211 (1211)

Full Embase Search Strategy

1   Dashboard*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (2390)

2   registry.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (208322)

3   registries.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (39715)

4   exp register/ (115531)

5   1 or 2 or 3 or 4 (266586)

6   exp clinical decision support system/ (3039)

7   clinical decision support system*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (4672)

8   medical order entry system*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (136)

9   computeri?ed physician order entry system*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (362)

10   CPOE.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (1664)

11   order set*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (2621)

12   exp decision support system/ (25185)

13   computer assisted decision making.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (116)

14   (computer$ adj3 decision$).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (2950)

15   knowledge management system*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (141)

16   case-finding algorithm*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (141)

17   advisory decision support.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (1)

18   exp computer assisted therapy/ (15163)

19   (computer* adj2 therap*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (5331)

20   exp reminder system/ (2611)

21   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 (48813)

22   5 or 21 (314449)

23   exp asthma/ (275547)

24   asthma*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (309894)

25   antiasthma*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (9548)

26   exp abnormal respiratory sound/ (60406)

27   wheez*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (33727)

28   exp bronchospasm/ (27974)

29   (bronch* adj3 spasm*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (861)

30   exp bronchoconstriction/ (29996)

31   bronchoconstrict*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (12976)

32   (bronch$ adj3 constrict$).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (1187)

33   exp bronchus hyperreactivity/ (12410)

34   exp respiratory tract allergy/ (316133)

35   ((bronchial$ or respiratory or airway$ or lung$) adj3 (hypersensitiv$ or hyperreactiv$ or allerg$ or insufficiency)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (55027)

36   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 (435382)

37   22 and 36 (3673)

38   exp heart failure/ (531445)

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39   (heart* adj2 decomp*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (9079)

40   ((heart* or cardiac* or myocard*) adj2 (fail* or insuff* or infarct* or ishcem* or disease*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (1152207)

41   exp heart muscle ischemia/ (94337)

42   exp coronary artery disease/ (340285)

43   38 or 39 or 40 or 41 or 42 (1486256)

44   22 and 43 (46272)

45   exp hypertension/ (772502)

46   exp essential hypertension/ (30699)

47   (hypertens$ or prehypertens$).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (988948)

48   ((elevat$ or increas$ or lower or high or rais$ or rising) adj2 (arterial pressure or blood pressure or diastolic pressure or systolic pressure)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (92975)

49   45 or 46 or 47 or 48 (1084030)

50   22 and 49 (18606)

51   exp diabetes mellitus/ (1000793)

52   diabet*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (1186708)

53   (non insulin* depend* or noninsulin* depend* or non insulin?depend* or noninsulin?depend*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (257419)

54   (insulin* depend* or insulin?depend*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (355610)

55   (IDDM or T2DM or T2D).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (63858)

56   51 or 52 or 53 or 54 or 55 (1195069)

57   22 and 56 (26835)

58   exp hyperlipidemia/ (164564)

59   exp dyslipidemia/ (70815)

12

60   exp cholesterol/ (335599)

61   (hyperlipid?emia* or cholesterol* or lip?emia* or hypercholesterol?emia* or hypercholester?emia* or hyperlip?emia* or triglycerid* or hypertriglycerid?emia*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (619049)

62   (dyslipid?emia* or lipoprotein* or dyslipidprotein?emia* or hyperlipoprotein?emia*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (401478)

63   LDL.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (117119)

64   58 or 59 or 60 or 61 or 62 or 63 (764638)

65   22 and 64 (8600)

66   exp chronic obstructive lung disease/ (134392)

67   emphysema*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (58780)

68   (chronic* adj3 bronchiti*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (23183)

69   (obstruct$ adj3 pulmonary).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (82519)

70   ((obstruct$ adj 3 lung$) or (obstruct$ adj 3 airway$)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (1)

71   (COPD or COAD or COBD or AECB).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (90187)

72   66 or 67 or 68 or 69 or 70 or 71 (226781)

73   22 and 72 (3785)

74   exp arthritis/ (511276)

75   exp osteoarthritis/ (137512)

76   exp osteoarthritis/ (137512)

77   osteoarthritis.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (149492)

78   exp arthropathy/ (816046)

79   exp arthralgia/ (61579)

13

80   (joint pain or chronic joint symptoms or gonarthrosis or osteoarthrosis or astoarthrosis or degeneretive arthritis or joint diseases or arthralgia).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (79510)

81   ((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat$ or reumat$ or revmarthrit$) adj3 (arthrit$ or artrit$ or diseas$ or condition$ or nodule$)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (304665)

82   ((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat$ or reumat$ or revmarthrit$) adj3 (arthrit$ or artrit$ or diseas$ or condition$ or nodule$)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (304665)

83   undifferentiated oligoarthritis.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (39)

84   74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 (897748)

85   22 and 84 (13224)

86   exp osteoporosis/ (134965)

87   (osteoporosis or osteopenia or (bone and (density or mass or loss)) or hepatic osteodystrophy).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (383399)

88   osteoporos?s.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (160054)

89   exp bone density/ (93700)

90   bone densit*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (108740)

91   exp bone demineralization/ (137263)

92   bone mass.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (38017)

93   osteopenia.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (23760)

94   exp bone densitometry/ (5807)

95   densitometry.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (34380)

96   86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 (411752)

97   22 and 96 (3018)

98   exp general practitioner/ (102749)

99   exp general practice/ (84760)

100   general practi*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (208636)

101   family practice.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (9954)

102   family clinic*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (652)

103   family practi*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (12786)

104   family physician.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (6553)

105   family doctor.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (4317)

106   98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 (216919)

107   97 and 106 (71)

108   85 and 106 (192)

109   73 and 106 (173)

110   65 and 106 (271)

111   57 and 106 (738)

112   50 and 106 (341)

113   44 and 106 (612)

114   37 and 106 (180)

115   107 or 108 or 109 or 110 or 111 or 112 or 113 or 114 (1655)

Full Health Management Information Consortium Search Strategy

1.   Dashboard*.mp. [mp=title, other title, abstract, heading words]

2.   registry.mp. [mp=title, other title, abstract, heading words]

3.   registries.mp. [mp=title, other title, abstract, heading words]

4.   exp Registers/ or exp Medical registers/ or exp Patient registers/ or exp Disease registers/

5.   1 or 2 or 3 or 4

6.   exp Information systems/ or exp Decision support systems/

7.   clinical decision support system*.mp. [mp=title, other title, abstract, heading words]

8.   medical order entry system*.mp. [mp=title, other title, abstract, heading words]

9.   computeri?ed physician order entry system*.mp. [mp=title, other title, abstract, heading words]

10. CPOE.mp. [mp=title, other title, abstract, heading words]

11. order set*.mp. [mp=title, other title, abstract, heading words]

12. computer assisted decision making.mp. [mp=title, other title, abstract, heading words]

13. (computer$ adj3 decision$).mp. [mp=title, other title, abstract, heading words]

14. knowledge management system*.mp. [mp=title, other title, abstract, heading words]

15. case-finding algorithm*.mp. [mp=title, other title, abstract, heading words]

16. advisory decision support.mp. [mp=title, other title, abstract, heading words]

17. exp Computer systems/

18. (computer* adj2 therap*).mp. [mp=title, other title, abstract, heading words]

19. 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

20. 5 or 19

21. exp Asthma/

22. asthma*.mp. [mp=title, other title, abstract, heading words]

23. antiasthma*.mp. [mp=title, other title, abstract, heading words]

24. exp Bronchial spasm/ or exp Lung function/

25. wheez*.mp. [mp=title, other title, abstract, heading words]

26. exp Bronchial spasm/

27. (bronch* adj3 spasm*).mp. [mp=title, other title, abstract, heading words]

28. bronchoconstrict*.mp. [mp=title, other title, abstract, heading words]

29. (bronch$ adj3 constrict$).mp. [mp=title, other title, abstract, heading words]

30. ((bronchial$ or respiratory or airway$ or lung$) adj3 (hypersensitiv$ or hyperreactiv$ or allerg$ or insufficiency)).mp. [mp=title, other title, abstract, heading words]

31. 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30

32. exp Heart diseases/ or exp Coronary diseases/ or exp Congestive heart failure/

33. (heart* adj2 decomp*).mp. [mp=title, other title, abstract, heading words]

16

34. ((heart* or cardiac* or myocard*) adj2 (fail* or insuff* or infarct* or ishcem* or disease*)).mp. [mp=title, other title, abstract, heading words]

35. exp Cardiovascular diseases/

36. exp Heart diseases/ or exp Heart arrest/ or exp Myocardial infarction/

37. 32 or 33 or 34 or 35 or 36

38. exp Hypertension/

39. (hypertens$ or prehypertens$).mp. [mp=title, other title, abstract, heading words]

40. ((elevat$ or increas$ or lower or high or rais$ or rising) adj2 (arterial pressure or blood pressure or diastolic pressure or systolic pressure)).mp. [mp=title, other title, abstract, heading words]

41. exp Diabetes/

42. diabet*.mp. [mp=title, other title, abstract, heading words]

43. (non insulin* depend* or noninsulin* depend* or non insulin?depend* or noninsulin?depend*).mp. [mp=title, other title, abstract, heading words]

44. (insulin* depend* or insulin?depend*).mp. [mp=title, other title, abstract, heading words]

45. (IDDM or T2DM or T2D).mp. [mp=title, other title, abstract, heading words]

46. 41 or 42 or 43 or 44 or 45

47. exp Hyperlipidaemia/

48. exp Cholesterol measurement/ or exp Cholesterol/

49. (hyperlipid?emia* or cholesterol* or lip?emia* or hypercholesterol?emia* or hypercholester?emia* or hyperlip?emia* or triglycerid* or hypertriglycerid?emia*).mp. [mp=title, other title, abstract, heading words]

50. (dyslipid?emia* or lipoprotein* or dyslipidprotein?emia* or hyperlipoprotein?emia*).mp. [mp=title, other title, abstract, heading words]

51. LDL.mp. [mp=title, other title, abstract, heading words]

52. 47 or 48 or 49 or 50 or 51

53. exp chronic obstructive pulmonary disease/

54. emphysema*.mp. [mp=title, other title, abstract, heading words]

55. (chronic* adj3 bronchiti*).mp. [mp=title, other title, abstract, heading words]

56. (obstruct$ adj3 pulmonary).mp. [mp=title, other title, abstract, heading words]

57. ((obstruct$ adj3 lung$) or (obstruct$ adj 3 airway$)).mp. [mp=title, other title, abstract, heading words]

58. (COPD or COAD or COBD or AECB).mp. [mp=title, other title, abstract, heading words]

59. 53 or 54 or 55 or 56 or 57 or 58

60. exp Arthritis/

61. exp Osteoarthritis/

17

62. Arthritis/ or exp Rheumatoid arthritis/

63. exp Joint diseases/ or exp Bone diseases/

64. (joint pain or chronic joint symptoms or gonarthrosis or osteoarthrosis or astoarthrosis or degeneretive arthritis or joint diseases or arthralgia).mp. [mp=title, other title, abstract, heading words]

65. ((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat$ or reumat$ or revmarthrit$) adj3 (arthrit$ or artrit$ or diseas$ or condition$ or nodule$)).mp. [mp=title, other title, abstract, heading words]

66. ((rheumatoid or reumatoid or revmatoid or rheumatic or reumatic or revmatic or rheumat$ or reumat$ or revmarthrit$) adj3 (arthrit$ or artrit$ or diseas$ or condition$ or nodule$)).mp. [mp=title, other title, abstract, heading words]

67. undifferentiated oligoarthritis.mp. [mp=title, other title, abstract, heading words]

68. 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67

69. exp Osteoporosis/

70. (osteoporosis or osteopenia or (bone and (density or mass or loss)) or hepatic osteodystrophy).mp. [mp=title, other title, abstract, heading words]

71. osteoporos?s.mp. [mp=title, other title, abstract, heading words]

72. bone densit*.mp. [mp=title, other title, abstract, heading words]

73. bone mass.mp. [mp=title, other title, abstract, heading words]

74. osteopenia.mp. [mp=title, other title, abstract, heading words]

75. densitometry.mp. [mp=title, other title, abstract, heading words]

76. 69 or 70 or 71 or 72 or 73 or 74 or 75

77. exp General practitioners/

78. exp General practice/

79. general practi*.mp. [mp=title, other title, abstract, heading words]

80. family clinic*.mp. [mp=title, other title, abstract, heading words]

81. family practi*.mp. [mp=title, other title, abstract, heading words]

82. family physician*.mp. [mp=title, other title, abstract, heading words]

83. family doctor*.mp. [mp=title, other title, abstract, heading words]

84. primary care physician*.mp. [mp=title, other title, abstract, heading words]

85. primary care clinic*.mp. [mp=title, other title, abstract, heading words]

86. primary care practi*.mp. [mp=title, other title, abstract, heading words]

87. 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86

88. 20 and 87

89. 31 and 88

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90.	37 and 88
91.	38 or 39 or 40
92.	88 and 91
93.	46 and 88
94.	52 and 88
95.	59 and 88
96.	68 and 88
97.	76 and 88
98.	89 or 90 or 92 or 93 or 94 or 95 or 96 or 97

Full Scopus Search Strategy

((*"Dashboard"* OR *"registry"* OR *"registries"* OR *"clinical decision support system"* OR *"medical order entry system"* OR *"CPOE"* OR *"decision support system"* OR *"computer assisted decision making"* OR *"case-finding algorithm"* OR *"advisory decision support"* OR *"computer assisted therapy"*) AND (*"general practi*"* OR *"family practi*"* OR *"family clinic*"* OR *"family physician"* OR *"family doctor"* OR *"primary care clinic*"* OR *" primary care physician"*)) AND ((*"asthma*"* *"wheez*"* OR *"bronchus hyperreactivity"* OR *"heart failure"* OR *"heart insufficiency"* OR *"cardiac failure"* OR *" cardiac insufficiency"* OR *"myocardial infarction"* OR *"myocardial insufficiency"* OR *"myocardial ischemia"* OR *"cardiac disease"* OR *"coronary artery disease"*) OR (*"diabet*"* OR (*"non insulin* depend*"* OR *"noninsulin* depend*"* OR *"non insulin depend*"* OR *"noninsulin?depend*"*) OR *"IDDM"* OR *"T2DM"* OR *"T2D"*) OR (*"hyperlipidemia"* OR *"dyslipidemia"* OR *"hyperlipid?emia*"* OR *"cholesterol*"* OR *"lip?emia*"* OR *"hypercholesterol?emia*"* OR *"hypercholester?emia*"* OR *"hyperlip?emia*"* OR *"triglycerid*"* OR *"hypertriglycerid?emia*"* OR *"dyslipid?emia*"* OR *"lipoprotein*"* OR *"dyslipidprotein?emia*"* OR *"hyperlipoprotein?emia*"* OR *"chronic obstructive lung disease"* OR *"emphysema*"* OR ((*"obstruct* N/3lung*"*) OR (*"obstruct* N/3 airway*"*)) OR *copd* OR *coad* OR *cobd* OR *aecb*) OR (*"hypertension"* OR *"Prehypertension"* OR ((*"elevat* OR increas* OR lower OR high OR rais* OR rising"*) W/2 (*"arterial pressure"* OR *"blood pressure"* OR *"diastolic pressure"* OR *"systolic pressure"*))) OR (*"arthritis"* OR *"osteoarthritis"* OR *"joint pain"* OR *"chronic joint symptoms"* OR *"gonarthrosis"* OR *"osteoarthrosis"* OR *"arthrosis"* OR *"degeneretive arthritis"* OR *"joint diseases"* OR *"arthralgia"* OR *"rheumat*"* OR *"reumat*"* OR *"arthrit*"* OR *"artrit*"*) OR (*"osteoporosis"* OR *"osteopenia"* OR *bone* AND *density* AND *loss* OR *"osteopenia"* OR *"bone mass loss"*)) AND NOT INDEX (*medline*) AND (LIMIT-TO (SRCTYPE , *"j"*)) AND (LIMIT-TO (DOCTYPE , *"ar"*)) AND (LIMIT-TO (SUBJAREA , *"MEDI"*)) AND (LIMIT-TO (LANGUAGE , *"English"*))

Supplementary Table 4: Risk of bias in included studies as per the Cochrane tool

Key
- 🟢 Low risk
- 🔴 High risk
- 🟡 Unclear

Trial	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective outcome reporting	Other bias	Selective recruitment of cluster members
Shnipper et al.(2010)	🟢	🔴	🟡	🟡	🟡	🟢	🟢	NA
Gill et al. (2017)	🔴	🟢	🟢	🟢	🔴	🔴	🟢	🟢
Hesselman et al.(2020)	🟢	🟢	🟢	🟢	🔴	🟢	🟢	🟢
Eccles et al. (2002)	🟢	🟢	🟢	🟢	🔴	🔴	🟢	🟢
Gill et al. (2009)	🔴	🟢	🟡	🟡	🔴	🟢	🟢	🟢
Cobos et al. (2006)	🟢	🟢	🟡	🟡	🟢	🟢	🟢	🟢
Hicks et al. (2008)	🔴	🟢	🟡	🟡	🔴	🟢	🟢	🟢
Lopez et al. (2019)	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟢

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Supplementary Table 5: Adapted risk of bias table detailing methodological risks and characteristics. PCPs refers to primary care practitioners (clinicians)

Trial	Randomization — Truly Random	Randomization — Allocation Concealment	Number Stated — Patients	Number Stated — PCPs	Baseline Comparability — Presented	Baseline Comparability — Achieved	Inclusion/Exclusion Criteria Specified — Patients	Inclusion/Exclusion Criteria Specified — PCPs	Blinding — Assessors	Blinding — Patients	Blinding — PCPs	Withdrawal — >80% in final analysis	Withdrawal — Reason stated	Withdrawal — Intention to treat
Shnipper et al.(2010)	✔	✘	✔	✘	✔	✔	✔	✔	NS	NS	NA	✘	NS	✔
Gill et al. (2017)	✘	✘	✔	✔	✔	✘	✔	✔	✔	✘	NA	✘	✔	✘
Hesselman et al.(2020)	✔	✔	✔	✔	✔	✘	✔	✔	✔	✔	NA	✘	✔	✔
Eccles et al. (2002)	✔	✔	✔	✔	⚠	⚠	✔	✔	✔	✔	NA	✔	✔	✔
Gill et al. (2009)	⚠	✘	✔	✔	✔	✘	✔	✔	✘	✘	NA	⚠	✔	✘
Cobos et al. (2006)	✔	✔	✔	✔	✔	✔	✔	✔	NS	NS	NA	✘	✔	✔
Hicks et al. (2008)	⚠	✘	⚠	✔	✘	✔	✔	✔	NS	NS	NA	✘	✔	✔
Lopez et al. (2019)	✘	✘	✘	✘	✘	✘	✔	✔	✘	✘	NA	⚠	NA	⚠

Key

✔	Adequately addressed
⚠	Partially addressed
✘	Not adequately addressed
NS	Not stated
NA	Not applicable

22

Risk of Bias Assessment: Type 2 Diabetes Mellitus

Referring to **Supplementary Tables 4 and 5**, Schnipper et al was rated at 'low risk' for random sequence generation as a random number generation on Excel was used [1].Allocation concealment was rated as 'high' after considering the randomisation an open allocation method. Blinding of personnel was not cited. Thus, it was rated as unclear. There was no mention of withdrawals; hence, the risk was unclear for incomplete outcome reporting. All outcomes set be studied were reported, and no other risks related to study funding were detected.

Gill et al's study was rated at 'high risk' for incomplete and selective outcome reporting due to analysing subgroups of patients for A1C and LDL-C for the narrated study limitations in the following section [2].Randomisation was at 'high risk' since clusters of practices were allocated based on the number of clinicians. Although the randomisation method could be considered open to predictability, eligibility criteria for patients within clusters of practices were pre-defined, which could not have been subverted by allocation knowledge. All other elements were considered at 'low risk.'

Heselmans et al's study was at 'low risk' for all elements except incomplete outcome data due to the withdrawal of a significant number of practices, with less than 80% of practices remaining after randomisation for analysis[3]. Reasons for system concerns were attributed to withdrawals.

3.2.2 Risk of Bias Assessment: Asthma and Angina

Referring to **Supplementary Tables 4 and 5**, the risk of bias in Eccles et al. 's study was 'low' for all elements due to the use of a computerised randomisation process and blinding of assessors[4]. However, less than 80% of eligible patients completed the provided questionnaires, which could have introduced attrition bias. Baseline characteristics of patients and practitioners were not sufficiently addressed, but there was a mention that participating practices were of similar size and training. Selective recruitment of clusters was adequately prevented by recruiting practices and enrolling all patients who met the inclusion criteria.

Risk of Bias Assessment: Hyperlipidaemia

Referring to Supplementary T**ables 4 and 5**, Cobos et al. 's study was rated at 'low-risk' for random sequence generation and allocation concealment due to the use of a random number table to randomise, which does not allow predictable sequences[5]. There was no mention of blinding of assessors, statisticians, or patients. Although <80% of randomised patients had follow-up visits and LDL-C follow-up tests, the study was rated as 'low risk' for attrition and reporting bias because the ITT analysis yielded insignificant outcomes as did the PP analyses. Study funding did not seem to introduce methodological bias since the outcome was patient-reported. Selective recruitment of clusters was adequately prevented by recruiting practices and enrolling all patients of randomised practices who met the inclusion criteria.

Gill et al 's trial was rated at 'high risk' for random sequence generation but 'low risk' for allocation concealment due to randomising clusters of practices based on practice similarities, which is not preferable randomisation[6]. The Eligibility criteria for patients within clusters of practices were pre-defined, which could not have been subverted by allocation knowledge. Blinding of assessors and

statisticians was not mentioned. The number of patients analysed was not reported. However, all outcomes set to be studied were undertaken. The first author is a consultant researcher at the company that holds the concerned EHR's licensing rights, but this conflict of interest did not seem to reflect in methodological risks. Similarly, selective recruitment of clusters was prevented.

Risk of Bias Assessment: Hypertension

Referring to **Supplementary Tables 4 and 5,** Hick's et al 's study was rated 'high risk' for random sequence generation, as clusters of practices were randomised by size and type of practice, which may not be a desirable method of randomisation [7]. Although randomisation could have been open to predictability, patient eligibility criteria practices were pre-defined, which could not have been subverted by allocation knowledge. Thus, the study was rated at 'low risk' for allocation concealment. Blinding of assessors or patients was not mentioned. Thus, the study was rated 'unclear' for blinding participants and outcome assessments. Due to the high number of randomised patients that were withdrawn due to stated reasons, it was rated at 'high risk' for attrition bias. All outcomes were explored, and there was a 'low risk' for selective recruitment of cluster members.

Lopez et al. 's study was rated at 'high risk' for random sequence generation and allocation concealment due to its non-randomised design[8]. There was no mention of blinding personnel, hence it was rated 'unclear' for blinding. There was no mention of withdrawals, and all outcomes were reported. Thus, it was rated as 'low risk' for attrition and selective outcome reporting. No other risks related to funding were significant.

Supplementary Table 6: Quality of Evidence from individual studies evaluated using GRADE

Study	Outcome	Risk of bias	Level of inconsist-ency	Level of indirect-ness	Level of imprecise-on	Public-ation bias	Quality	Reason for downgrading
Schnipper et al. (2010)	Difference in proportion of patients meeting management goals at the end compared to the beginning of the study	severe	NA	some	low	NA	⊕⊕◯◯ LOW	**RoB:** High risk for allocation concealment and unclear whether personnel blinding occurred **Indirectness:** population identification and management goals were not pre-defined
Gill et al. (2017)	• Difference in HbA1c from baseline • Difference in LDL-C from baseline • % patients achieving HbA1c goals	some	NA	low	low	NA	⊕⊕⊕◯ MODERATE	**RoB:** High risk for random sequence generation and selective outcome reporting
Heselmans et al. (2020)	• Difference between the mean value of HbA1c, LDL-C, and blood pressure of the previous year at the moment of the study start and the mean value of HbA1c, LDL-C, and blood pressure of the previous year at 6 and 12 months.	low	NA	some	low	NA	⊕⊕⊕◯ MODERATE	**Indirectness:** patients had reasonable HbA1c mean values, which does not necessarily reflect diabetic populations with a higher severity of illness
Eccles et al. (2002)	Quality of life and condition specific outcomes using validated questionnaires	some	NA	low	low	NA	⊕⊕⊕◯ MODERATE	**RoB:** High risk for incomplete and selective outcome reporting
Gill et al. (2009)	The percentage of patients with most recent LDL-C at goal	severe	NA	low	low	NA	⊕⊕◯◯ LOW	**RoB:** High risk for random sequence generation and incomplete outcome data. Unclear for personnel blinding
Cobos et al. (2006)	• Between-group differences in means of lipid values	some	NA	some	low	NA	⊕⊕⊕◯ MODERATE	**ROB:** Unclear for blinding of personnel **Indirectness:** excludes general populations with more severe elevations of LDL
Hicks et al. (2008)	• Percentage of patients with controlled blood pressure • Odds of blood pressure control at outcome visit	severe	NA	low	low	NA	⊕⊕◯◯ LOW	**RoB:** High risk for random sequence allocation, incomplete outcome reporting and unclear for personnel blinding
Lopez et al. (2019)	• Odds of blood pressure control post-intervention	severe	NA	low	low	NA	⊕⊕◯◯ LOW	**RoB:** NRCT, non-randomised and high risk for blinding of personnel

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