

APPENDIX A. SEARCH STRATEGIES

KEY QUESTION 1

Database: MEDLINE (via PubMed)

Search date: 6/28/2019

#1	"Osteoporosis"[Mesh:NoExp] OR "Bone Density"[Mesh] OR "Bone Diseases, Metabolic"[Mesh:NoExp] OR "Osteoporotic Fractures"[Mesh] OR osteoporosis[tiab] OR osteoporoses[tiab] OR osteoporotic[tiab] OR osteopenia[tiab] OR osteopenias[tiab] OR osteopenic[tiab] OR "bone loss"[tiab] OR "bone losses"[tiab] OR "bone mineral density"[tiab] OR "bone mineral densities"[tiab] OR BMD[tiab] OR "bone mineral content"[tiab] OR "bone mineral contents"[tiab] OR "bone density"[tiab] OR "bone densities"[tiab] OR "bone demineralization"[tiab] OR "bone demineralizations"[tiab] OR "bone decalcification"[tiab] OR "bone decalcifications"[tiab] OR "fragility fracture"[tiab] OR "fragility fractures"[tiab] OR "bone fragility"[tiab] OR "bone fragilities"[tiab]	144,180
#2	"Male"[Mesh] OR male[tiab] OR males[tiab] OR man[tiab] OR men[tiab] OR gender[tiab] OR "sex characteristic"[tiab] OR "sex characteristics"[tiab] OR "sex difference"[tiab] OR "sex differences"[tiab] OR "biological sex"[tiab]	8,591,644
#3	"Risk assessment"[Mesh] OR "risk assessment"[tiab] OR "risk assessments"[tiab] OR "risk estimation"[tiab] OR "risk estimations"[tiab] OR "risk evaluation"[tiab] OR "risk evaluations"[tiab] OR "risk tool"[tiab] OR "risk tools"[tiab] OR "risk prediction"[tiab] OR "risk predictions"[tiab] OR "risk calculator"[tiab] OR "risk calculators"[tiab] OR "risk score"[tiab] OR "risk scores" OR "risk scoring"[tiab] OR "fracture prediction"[tiab] OR "fracture predictions"[tiab] OR "fracture assessment"[tiab] OR "fracture assessments"[tiab] OR "fracture estimation"[tiab] OR "fracture estimations"[tiab] OR FRAX[tiab] OR OST[tiab] OR "Self-Assessment Tool"[tiab] OR ORAI[tiab] OR OSTA[tiab] OR "Osteoporosis Self-assessment Tool for Asians"[tiab] OR OSIRIS[tiab] OR "Osteoporosis Index of Risk"[tiab] OR SOFSURF[tiab] OR "Study of Osteoporotic Fractures Simple Useful Risk"[tiab] OR "Male Osteoporosis Screening Tool"[tiab] OR OPRA[tiab] OR FRISK[tiab] OR FRC[tiab] OR MSCORE[tiab] OR MORES[tiab] OR "Garvan Fracture Risk"[tiab] OR QFracture[tiab] OR "Q Fracture"[tiab]	309,022
#4	#1 AND #2 AND #3	2,555
#5	"randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "cohort studies"[MeSH] OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR ((controlled[tiab] AND (trial[tiab] OR study[tiab]))	7,175,132
#6	"pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR "pre-test"[tiab] OR "repeated measure"[tiab] OR "repeated measures"[tiab]	66,760

#7	(before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])	108
#8	"time series"[tiab] AND interrupt*[tiab]	2,671
#9	("time points"[tiab]) AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR hourly[tiab])	59,141
#10	#5 OR #6 OR #7 OR #8 OR #9	7,214,155
#11	#4 AND #10	1,618
#12	#11 NOT (Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR Comment[ptyp])	1,561
#13	#12 NOT (animals[mh] NOT humans[mh])	1,545

Database: MEDLINE (via PubMed) Search Update

Search date: 2/23/2021

#1	"Osteoporosis"[Mesh:NoExp] OR "Bone Density"[Mesh] OR "Bone Diseases, Metabolic"[Mesh:NoExp] OR "Osteoporotic Fractures"[Mesh] OR osteoporosis[tiab] OR osteoporoses[tiab] OR osteoporotic[tiab] OR osteopenia[tiab] OR osteopenias[tiab] OR osteopenic[tiab] OR "bone loss"[tiab] OR "bone losses"[tiab] OR "bone mineral density"[tiab] OR "bone mineral densities"[tiab] OR BMD[tiab] OR "bone mineral content"[tiab] OR "bone mineral contents"[tiab] OR "bone density"[tiab] OR "bone densities"[tiab] OR "bone demineralization"[tiab] OR "bone demineralizations"[tiab] OR "bone decalcification"[tiab] OR "bone decalcifications"[tiab] OR "fragility fracture"[tiab] OR "fragility fractures"[tiab] OR "bone fragility"[tiab] OR "bone fragilities"[tiab]	158,583
#2	"Male"[Mesh] OR male[tiab] OR males[tiab] OR man[tiab] OR men[tiab] OR gender[tiab] OR "sex characteristic"[tiab] OR "sex characteristics"[tiab] OR "sex difference"[tiab] OR "sex differences"[tiab] OR "biological sex"[tiab]	9,255,526
#3	"Risk assessment"[Mesh] OR "risk assessment"[tiab] OR "risk assessments"[tiab] OR "risk estimation"[tiab] OR "risk estimations"[tiab] OR "risk evaluation"[tiab] OR "risk evaluations"[tiab] OR "risk tool"[tiab] OR "risk tools"[tiab] OR "risk prediction"[tiab] OR "risk predictions"[tiab] OR "risk calculator"[tiab] OR "risk calculators"[tiab] OR "risk score"[tiab] OR "risk scores" OR "risk scoring"[tiab] OR "fracture prediction"[tiab] OR "fracture predictions"[tiab] OR "fracture assessment"[tiab] OR "fracture assessments"[tiab] OR "fracture estimation"[tiab] OR "fracture estimations"[tiab] OR FRAX[tiab] OR OST[tiab] OR "Self-Assessment Tool"[tiab] OR ORAI[tiab] OR OSTA[tiab] OR "Osteoporosis Self-assessment Tool for Asians"[tiab] OR OSIRIS[tiab] OR "Osteoporosis Index of Risk"[tiab] OR SOFSURF[tiab] OR "Study of Osteoporotic Fractures Simple Useful Risk"[tiab] OR "Male Osteoporosis Screening Tool"[tiab] OR OPRA[tiab] OR FRISK[tiab] OR FRC[tiab] OR MSCORE[tiab] OR MORES[tiab] OR "Garvan Fracture Risk"[tiab] OR QFracture[tiab] OR "Q Fracture"[tiab]	358,174
#4	#1 AND #2 AND #3	2,991
#5	"randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "cohort studies"[MeSH]	7,790,112

	OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR ((controlled[tiab]) AND (trial[tiab] OR study[tiab]))	
#6	"pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR "pre-test"[tiab] OR "repeated measure"[tiab] OR "repeated measures"[tiab]	79,063
#7	(before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])	68
#8	"time series"[tiab] AND interrupt*[tiab]	3,718
#9	("time points"[tiab]) AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR hourly[tiab])	68,877
#10	#5 OR #6 OR #7 OR #8 OR #9	7,836,590
#11	#4 AND #10	1,916
#12	#11 NOT (Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR Comment[ptyp])	1,852
#13	#12 NOT (animals[mh] NOT humans[mh])	1,836
#14	#13 AND ("2019/06/01"[mhda] : "3000"[mhda])	350

Database: EMBASE (via Elsevier)

Search date: 6/28/2019

#1	'bone demineralization'/de OR 'osteoporosis'/de OR 'corticosteroid induced osteoporosis'/de OR 'idiopathic osteoporosis'/de OR 'posttraumatic osteoporosis'/de OR 'primary osteoporosis'/de OR 'secondary osteoporosis'/de OR 'senile osteoporosis'/de OR 'metabolic bone disease'/de OR 'bone density'/exp OR 'fragility fracture'/exp OR steoporosis:ti,ab OR osteoporoses:ti,ab OR osteoporotic:ti,ab OR osteopenia:ti,ab OR osteopenias:ti,ab OR osteopenic:ti,ab OR 'bone loss':ti,ab OR 'bone losses':ti,ab OR 'bone mineral density':ti,ab OR 'bone mineral densities':ti,ab OR BMD:ti,ab OR 'bone mineral content':ti,ab OR 'bone mineral contents':ti,ab OR 'bone density':ti,ab OR 'bone densities':ti,ab OR 'bone demineralization':ti,ab OR 'bone dimineralizations':ti,ab OR 'bone decalcification':ti,ab OR 'bone decalcifications':ti,ab OR 'fragility fracture':ti,ab OR 'fragility fractures':ti,ab OR 'bone fragility':ti,ab OR 'bone fragilities':ti,ab	218,310
#2	'male'/exp OR male:ti,ab OR males:ti,ab OR man:ti,ab OR men:ti,ab OR gender:ti,ab OR 'sex characteristic':ti,ab OR 'sex characteristics':ti,ab OR 'sex difference':ti,ab OR 'sex differences':ti,ab OR 'biological sex':ti,ab	9,238,793

#3	'risk assessment'/exp OR 'risk assessment':ti,ab OR 'risk assessments':ti,ab OR 'risk estimation':ti,ab OR 'risk estimations':ti,ab OR 'risk evaluation':ti,ab OR 'risk evaluations':ti,ab OR 'risk tool':ti,ab OR 'risk tools':ti,ab OR 'risk prediction':ti,ab OR 'risk predictions':ti,ab OR 'risk calculator':ti,ab OR 'risk calculators':ti,ab OR 'risk score':ti,ab OR 'risk scores' OR 'risk scoring':ti,ab OR 'fracture prediction':ti,ab OR 'fracture predictions':ti,ab OR 'fracture assessment':ti,ab OR 'fracture assessments':ti,ab OR 'fracture estimation':ti,ab OR 'fracture estimations':ti,ab OR FRAX:ti,ab OR OST:ti,ab OR 'Self Assessment Tool':ti,ab OR ORAI:ti,ab OR OSTA:ti,ab OR 'Osteoporosis Self-assessment Tool for Asians':ti,ab OR OSIRIS:ti,ab OR 'Osteoporosis Index of Risk':ti,ab OR SOFSURF:ti,ab OR 'Study of Osteoporotic Fractures Simple Useful Risk':ti,ab OR 'Male Osteoporosis Screening Tool':ti,ab OR OPRA:ti,ab OR FRISK:ti,ab OR FRC:ti,ab OR MSCORE:ti,ab OR MORES:ti,ab OR 'Garvan Fracture Risk':ti,ab OR QFracture:ti,ab OR 'Q Fracture':ti,ab	577,199
#4	#1 AND #2 AND #3	5,452
#5	'randomized controlled trial'/exp OR 'crossover procedure'/exp OR 'double blind procedure'/exp OR 'single blind procedure'/exp OR randomization:ti,ab OR randomisation:ti,ab OR randomized:ti,ab OR randomised:ti,ab OR randomly:ti,ab OR crossover:ti,ab OR 'cross over':ti,ab OR placebo:ti,ab OR 'double blind':ti,ab OR 'double blinded':ti,ab OR 'single blind':ti,ab OR 'single blinded':ti,ab OR 'clinical study'/exp OR 'clinical trial':ti,ab OR 'clinical trials':ti,ab OR 'controlled study'/exp OR 'evaluation study'/exp OR 'evaluation study':ti,ab OR 'evaluation studies':ti,ab OR 'intervention study'/exp OR 'intervention study':ti,ab OR 'intervention studies':ti,ab OR 'case control study'/exp OR 'case control':ti,ab OR 'cohort analysis'/exp OR cohort:ti,ab OR cohorts:ti,ab OR longitudinal:ti,ab OR longitudinally:ti,ab OR prospective:ti,ab OR prospectively:ti,ab OR retrospective:ti,ab OR 'follow up'/exp OR 'follow up':ti,ab OR 'comparative effectiveness'/exp OR 'comparative study'/exp OR 'comparative study':ti,ab OR 'comparative studies':ti,ab	15,450,373
#6	pre-post:ti,ab OR prepost:ti,ab OR post-test:ti,ab OR posttest:ti,ab OR pretest:ti,ab OR pre-test:ti,ab OR quasi-experiment:ti,ab OR quasiexperiment:ti,ab OR quasi-experimental:ti,ab OR quasiexperimental:ti,ab OR quasirandom:ti,ab OR quasi-random:ti,ab OR quasi-control:ti,ab OR quasicontrol:ti,ab OR 'repeated measure':ti,ab OR 'repeated measures':ti,ab	110,907
#7	('time series':ti,ab AND interrupt:ti,ab) OR (before:ti,ab AND after:ti,ab) OR (before:ti,ab AND during:ti,ab)	1,224,588
#8	'time points':ti,ab AND (multiple:ti,ab OR one:ti,ab OR two:ti,ab OR three:ti,ab OR four:ti,ab OR five:ti,ab OR six:ti,ab OR seven:ti,ab OR eight:ti,ab OR nine:ti,ab OR ten:ti,ab OR month:ti,ab OR monthly:ti,ab OR day:ti,ab OR days:ti,ab OR daily:ti,ab OR week:ti,ab OR weekly:ti,ab OR hour:ti,ab OR hourly:ti,ab)	99,174
#9	#5 OR #6 OR #7 OR #8	15,875,500
#10	#4 AND #9	4,487
#11	#10 NOT ('case report'/exp OR 'case study'/exp OR 'editorial'/exp OR 'letter'/exp OR 'note'/exp OR [conference abstract]/lim)	3,015
#12	#11 AND [humans]/lim	2,949

Database: CINAHL (via EBSCO)

Search date: 6/28/2019

#1	(MH "Osteoporosis") OR (MH "Osteoporotic Fractures") OR (MH "Bone Diseases, Metabolic") OR (MH "Bone Density") OR TI (osteoporosis OR osteoporoses OR osteoporotic OR osteopenia OR osteopenias OR osteopenic OR "bone loss" OR "bone losses" OR "bone mineral density" OR "bone mineral densities" OR BMD OR "bone mineral content" OR "bone mineral contents" OR "bone density" OR "bone densities" OR "bone demineralization" OR "bone dimineralizations" OR "bone decalcification" OR "bone decalcifications" OR "fragility fracture" OR "fragility fractures" OR "bone fragility" OR "bone fragilities") OR AB (osteoporosis OR osteoporoses OR osteoporotic OR osteopenia OR osteopenias OR osteopenic OR "bone loss" OR "bone losses" OR "bone mineral density" OR "bone mineral densities" OR BMD OR "bone mineral content" OR "bone mineral contents" OR "bone density" OR "bone densities" OR "bone demineralization" OR "bone dimineralizations" OR "bone decalcification" OR "bone decalcifications" OR "fragility fracture" OR "fragility fractures" OR "bone fragility" OR "bone fragilities")	41,298
#2	(MH "Male") OR TI (male OR males OR man OR men OR gender OR "sex characteristic" OR "sex characteristics" OR "sex difference" OR "sex differences" OR "biological sex") OR AB (male OR males OR man OR men OR gender OR "sex characteristic" OR "sex characteristics" OR "sex difference" OR "sex differences" OR "biological sex")	1,580,410
#3	(MH "Risk Assessment") OR TI ("risk assessment" OR "risk assessments" OR "risk estimation" OR "risk estimations" OR "risk evaluation" OR "risk evaluations" OR "risk tool" OR "risk tools" OR "risk prediction" OR "risk predictions" OR "risk calculator" OR "risk calculators" OR "risk score" OR "risk scores" OR "risk scoring" OR "fracture prediction" OR "fracture predictions" OR "fracture assessment" OR "fracture assessments" OR "fracture estimation" OR "fracture estimations" OR FRAX OR OST OR "Self-Assessment Tool" OR ORAI OR OSTA OR "Osteoporosis Self-assessment Tool for Asians" OR OSIRIS OR "Osteoporosis Index of Risk" OR SOFSURF OR "Study of Osteoporotic Fractures Simple Useful Risk" OR "Male Osteoporosis Screening Tool" OR OPRA OR FRISK OR FRC OR MSCORE OR MORES OR "Garvan Fracture Risk" OR QFracture OR "Q Fracture") OR AB ("risk assessment" OR "risk assessments" OR "risk estimation" OR "risk estimations" OR "risk evaluation" OR "risk evaluations" OR "risk tool" OR "risk tools" OR "risk prediction" OR "risk predictions" OR "risk calculator" OR "risk calculators" OR "risk score" OR "risk scores" OR "risk scoring" OR "fracture prediction" OR "fracture predictions" OR "fracture assessment" OR "fracture assessments" OR "fracture estimation" OR "fracture estimations" OR FRAX OR OST OR "Self-Assessment Tool" OR ORAI OR OSTA OR "Osteoporosis Self-assessment Tool for Asians" OR OSIRIS OR "Osteoporosis Index of Risk" OR SOFSURF OR "Study of Osteoporotic Fractures Simple Useful Risk" OR "Male Osteoporosis Screening Tool" OR OPRA OR FRISK OR FRC OR MSCORE OR MORES OR "Garvan Fracture Risk" OR QFracture OR "Q Fracture")	726,519
#4	#1 AND #2 AND #3	3,113
#5	(MH "Randomized Controlled Trials+") OR TI ("randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "randomization" OR "randomised" OR "randomisation" OR "randomly" OR "trial" OR "groups" OR "comparative study" OR "nonrandom" OR "non-random" OR "nonrandomized" OR "non-randomized" OR "nonrandomised" OR "non-randomised" OR quasi-experiment* OR quasiexperiment* OR quasirandom* OR quasi-random* OR quasi-control* OR quasicontrol* OR (controlled AND (trial OR study)) OR "pre-post" OR	748,301

	"posttest" OR "post-test" OR "pretest" OR "pre-test" OR "repeated measure" OR "repeated measures" OR ("time series" AND "interrupt") OR ("time points" AND (multiple OR one OR two OR three OR four OR five OR six OR seven OR eight OR nine OR ten OR month OR monthly OR day OR daily OR week OR weekly OR hour OR hourly)) OR (before AND after) OR (before AND during)) OR AB ("randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "randomization" OR "randomised" OR "randomisation" OR "randomly" OR "trial" OR "groups" OR "comparative study" OR "nonrandom" OR "non-random" OR "nonrandomized" OR "non-randomized" OR "nonrandomised" OR "non-randomised" OR quasi-experiment* OR quasiexperiment* OR quasirandom* OR quasi-random* OR quasi-control* OR quasicontrol* OR (controlled AND (trial OR study)) OR "pre-post" OR "posttest" OR "post-test" OR "pretest" OR "pre-test" "repeated measure" OR "repeated measures" OR ("time series" AND "interrupt") OR ("time points" AND (multiple OR one OR two OR three OR four OR five OR six OR seven OR eight OR nine OR ten OR month OR monthly OR day OR daily OR week OR weekly OR hour OR hourly)) OR (before AND after) OR (before AND during))	
#6	#4 AND #5	1,030
#7	#6 NOT PT (Abstract OR Book OR Book Chapter OR Book Review OR Case Study OR Commentary OR Doctoral Dissertation OR Editorial OR Letter OR Masters Thesis OR Pamphlet OR Pamphlet Chapter OR Poetry) NOT TI (Editorial OR Letter OR "Case Report" OR Comment)	1,004

KEY QUESTION 2

Database: MEDLINE (via PubMed)

Search date: 6/28/2019

#1	"Osteoporosis"[Mesh:NoExp] OR "Bone Density"[Mesh] OR "Bone Diseases, Metabolic"[Mesh:NoExp] OR "Osteoporotic Fractures"[Mesh] OR osteoporosis[tiab] OR osteoporoses[tiab] OR osteoporotic[tiab] OR osteopenia[tiab] OR osteopenias[tiab] OR osteopenic[tiab] OR "bone loss"[tiab] OR "bone losses"[tiab] OR "bone mineral density"[tiab] OR "bone mineral densities"[tiab] OR BMD[tiab] OR "bone mineral content"[tiab] OR "bone mineral contents"[tiab] OR "bone density"[tiab] OR "bone densities"[tiab] OR "bone demineralization"[tiab] OR "bone dimineralizations"[tiab] OR "bone decalcification"[tiab] OR "bone decalcifications"[tiab] OR "fragility fracture"[tiab] OR "fragility fractures"[tiab] OR "bone fragility"[tiab] OR "bone fragilities"[tiab]	144,180
#2	"Veterans"[Mesh] OR "Veterans Health"[Mesh] OR "United States Department of Veterans Affairs"[Mesh] OR "Veterans Disability Claims"[Mesh] OR "Hospitals, Veterans"[Mesh] OR "Warfare and Armed Conflicts"[Mesh:NoExp] OR "Armed Conflicts"[Mesh:NoExp] OR "Afghan Campaign 2001-"[Mesh] OR "Gulf War"[Mesh] OR "Iraq War, 2003-2011"[Mesh] OR "Korean War"[Mesh] OR "Vietnam Conflict"[Mesh] OR "World War I"[Mesh] OR Veteran[tiab] OR veterans[tiab] OR "Afghan Campaign"[tiab] OR "Afghan War"[tiab] OR "Operation Enduring Freedom"[tiab] OR "Operation New Dawn"[tiab] OR "Operation Iraqi Freedom"[tiab] OR "Gulf War"[tiab] OR "Iraq War"[tiab] OR "Operation Desert Shield"[tiab] OR "Operation Desert Storm"[tiab] OR "Vietnam War"[tiab] OR "Viet Nam War"[tiab] OR "Vietnam Conflict"[tiab] OR "Viet Nam Conflict"[tiab] OR "Vietnamese War"[tiab] OR "Vietnamese Conflict"[tiab] OR "Indochina War"[tiab] OR "Korean War"[tiab] OR "World War I"[tiab] OR "World War II"[tiab] OR WWI[tiab] OR WWII[tiab]	51,169

#3	#1 AND #2	217
#4	"randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "cohort studies"[MeSH] OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR ((controlled[tiab]) AND (trial[tiab] OR study[tiab]))	7,175,132
#5	"pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR "pre-test"[tiab] OR "repeated measure"[tiab] OR "repeated measures"[tiab]	66,760
#6	(before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])	108
#7	"time series"[tiab] AND interrupt*[tiab]	2,671
#8	("time points"[tiab]) AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR hourly[tiab])	59,141
#9	#4 OR #5 OR #6 OR #7 OR #8	7,214,155
#10	#3 AND #9	155
#11	#10 NOT (Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR Comment[ptyp])	154
#12	#11 NOT (animals[mh] NOT humans[mh])	153

MEDLINE (via PubMed) Search update

Search date: 2/23/2021

#1	"Osteoporosis"[Mesh:NoExp] OR "Bone Density"[Mesh] OR "Bone Diseases, Metabolic"[Mesh:NoExp] OR "Osteoporotic Fractures"[Mesh] OR osteoporosis[tiab] OR osteoporoses[tiab] OR osteoporotic[tiab] OR osteopenia[tiab] OR osteopenias[tiab] OR osteopenic[tiab] OR "bone loss"[tiab] OR "bone losses"[tiab] OR "bone mineral density"[tiab] OR "bone mineral densities"[tiab] OR BMD[tiab] OR "bone mineral content"[tiab] OR "bone mineral contents"[tiab] OR "bone density"[tiab] OR "bone densities"[tiab] OR "bone demineralization"[tiab] OR "bone dimineralizations"[tiab] OR "bone decalcification"[tiab] OR "bone decalcifications"[tiab] OR "fragility fracture"[tiab] OR "fragility fractures"[tiab] OR "bone fragility"[tiab] OR "bone fragilities"[tiab]	158,583
#2	"Veterans"[Mesh] OR "Veterans Health"[Mesh] OR "United States Department of Veterans Affairs"[Mesh] OR "Veterans Disability Claims"[Mesh] OR "Hospitals, Veterans"[Mesh] OR "Warfare and Armed Conflicts"[Mesh:NoExp] OR "Armed Conflicts"[Mesh:NoExp] OR "Afghan Campaign 2001-"[Mesh] OR "Gulf War"[Mesh] OR "Iraq War, 2003-2011"[Mesh] OR "Korean War"[Mesh] OR "Vietnam Conflict"[Mesh] OR "World War I"[Mesh] OR Veteran[tiab] OR veterans[tiab] OR "Afghan Campaign"[tiab] OR "Afghan War"[tiab] OR	57,162

	"Operation Enduring Freedom"[tiab] OR "Operation New Dawn"[tiab] OR "Operation Iraqi Freedom"[tiab] OR "Gulf War"[tiab] OR "Iraq War"[tiab] OR "Operation Desert Shield"[tiab] OR "Operation Desert Storm"[tiab] OR "Vietnam War"[tiab] OR "Viet Nam War"[tiab] OR "Vietnam Conflict"[tiab] OR "Viet Nam Conflict"[tiab] OR "Vietnamese War"[tiab] OR "Vietnamese Conflict"[tiab] OR "Indochina War"[tiab] OR "Korean War"[tiab] OR "World War I"[tiab] OR "World War II"[tiab] OR WWI[tiab] OR WWII[tiab]	
#3	#1 AND #2	253
#4	"randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "cohort studies"[MeSH] OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR ((controlled[tiab]) AND (trial[tiab] OR study[tiab]))	7,790,112
#5	"pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR "pre-test"[tiab] OR "repeated measure"[tiab] OR "repeated measures"[tiab]	79,063
#6	(before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])	68
#7	"time series"[tiab] AND interrupt*[tiab]	3,718
#8	("time points"[tiab]) AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR hourly[tiab])	68,877
#9	#4 OR #5 OR #6 OR #7 OR #8	7,836,590
#10	#3 AND #9	175
#11	#10 NOT (Editorial[ptyp] OR Letter[ptyp] OR Case Reports[ptyp] OR Comment[ptyp])	173
#12	#11 NOT (animals[mh] NOT humans[mh])	172
#13	#12 AND ("2019/06/01"[mhda] : "3000"[mhda])	31

Database: EMBASE (via Elsevier)

Search date: 6/28/2019

#1	'bone demineralization'/de OR 'osteoporosis'/de OR 'corticosteroid induced osteoporosis'/de OR 'idiopathic osteoporosis'/de OR 'posttraumatic osteoporosis'/de OR 'primary osteoporosis'/de OR 'secondary osteoporosis'/de OR 'senile osteoporosis'/de OR 'metabolic bone disease'/de OR 'bone density'/exp OR 'fragility fracture'/exp OR osteoporosis:ti,ab OR osteoporoses:ti,ab OR osteoporotic:ti,ab OR osteopenia:ti,ab OR osteopenias:ti,ab OR osteopenic:ti,ab OR 'bone loss':ti,ab OR 'bone losses':ti,ab OR 'bone mineral density':ti,ab OR 'bone mineral densities':ti,ab OR BMD:ti,ab OR 'bone mineral content':ti,ab OR 'bone mineral contents':ti,ab OR 'bone density':ti,ab OR 'bone densities':ti,ab OR 'bone demineralization':ti,ab OR 'bone dimineralizations':ti,ab OR 'bone decalcification':ti,ab OR 'bone decalcifications':ti,ab OR 'fragility fracture':ti,ab OR 'fragility fractures':ti,ab OR 'bone fragility':ti,ab OR 'bone fragilities':ti,ab	218,238
#2	'veteran'/exp OR 'war'/exp OR 'military phenomena'/de OR 'military service'/exp OR 'warfare'/exp OR 'military deployment'/exp OR veteran:ti,ab OR veterans:ti,ab OR 'Afghan Campaign':ti,ab OR 'Afghan War':ti,ab OR 'Operation Enduring Freedom':ti,ab OR 'Operation New Dawn':ti,ab OR 'Operation Iraqi Freedom':ti,ab OR 'Gulf War':ti,ab OR 'Iraq War':ti,ab OR 'Operation Desert Shield':ti,ab OR 'Operation Desert Storm':ti,ab OR 'Vietnam War':ti,ab OR 'Viet Nam War':ti,ab OR 'Vietnam Conflict':ti,ab OR 'Viet Nam Conflict':ti,ab OR 'Vietnamese War':ti,ab OR 'Vietnamese Conflict':ti,ab OR 'Indochina War':ti,ab OR 'Korean War':ti,ab OR 'World War I':ti,ab OR 'World War II':ti,ab OR WWI:ti,ab OR WWII:ti,ab	109,714
#3	#1 AND #2	434
#4	'randomized controlled trial'/exp OR 'crossover procedure'/exp OR 'double blind procedure'/exp OR 'single blind procedure'/exp OR randomization:ti,ab OR randomisation:ti,ab OR randomized:ti,ab OR randomised:ti,ab OR randomly:ti,ab OR crossover:ti,ab OR 'cross over':ti,ab OR placebo:ti,ab OR 'double blind':ti,ab OR 'double blinded':ti,ab OR 'single blind':ti,ab OR 'single blinded':ti,ab OR 'clinical study'/exp OR 'clinical trial':ti,ab OR 'clinical trials':ti,ab OR 'controlled study'/exp OR 'evaluation study'/exp OR 'evaluation study':ti,ab OR 'evaluation studies':ti,ab OR 'intervention study'/exp OR 'intervention study':ti,ab OR 'intervention studies':ti,ab OR 'case control study'/exp OR 'case control':ti,ab OR 'cohort analysis'/exp OR cohort:ti,ab OR cohorts:ti,ab OR longitudinal:ti,ab OR longitudinally:ti,ab OR prospective:ti,ab OR prospectively:ti,ab OR retrospective:ti,ab OR 'follow up'/exp OR 'follow up':ti,ab OR 'comparative effectiveness'/exp OR 'comparative study'/exp OR 'comparative study':ti,ab OR 'comparative studies':ti,ab	15,450,373
#5	pre-post:ti,ab OR prepost:ti,ab OR post-test:ti,ab OR posttest:ti,ab OR pretest:ti,ab OR pre-test:ti,ab OR quasi-experiment:ti,ab OR quasiexperiment:ti,ab OR quasi-experimental:ti,ab OR quasiexperimental:ti,ab OR quasirandom:ti,ab OR quasi-random:ti,ab OR quasi-control:ti,ab OR quasicontrol:ti,ab OR 'repeated measure':ti,ab OR 'repeated measures':ti,ab	110,907
#6	('time series':ti,ab AND interrupt:ti,ab) OR (before:ti,ab AND after:ti,ab) OR (before:ti,ab AND during:ti,ab)	1,224,588
#7	'time points':ti,ab AND (multiple:ti,ab OR one:ti,ab OR two:ti,ab OR three:ti,ab OR four:ti,ab OR five:ti,ab OR six:ti,ab OR seven:ti,ab OR eight:ti,ab OR nine:ti,ab OR ten:ti,ab OR month:ti,ab OR monthly:ti,ab OR day:ti,ab OR days:ti,ab OR OR daily:ti,ab OR week:ti,ab OR weekly:ti,ab OR hour:ti,ab OR hourly:ti,ab)	99,174

#8	#4 OR #5 OR #6 OR #7	15,875,500
#9	#3 AND #8	328
#10	#9 NOT ('case report'/exp OR 'case study'/exp OR 'editorial'/exp OR 'letter'/exp OR 'note'/exp OR [conference abstract]/lim)	207
#11	#10 AND [humans]/lim	201

Database: CINAHL (via EBSCO)

Search date: 6/28/2019

#1	(MH "Osteoporosis") OR (MH "Osteoporotic Fractures") OR (MH "Bone Diseases, Metabolic") OR (MH "Bone Density") OR TI (osteoporosis OR osteoporoses OR osteoporotic OR osteopenia OR osteopenias OR osteopenic OR "bone loss" OR "bone losses" OR "bone mineral density" OR "bone mineral densities" OR BMD OR "bone mineral content" OR "bone mineral contents" OR "bone density" OR "bone densities" OR "bone demineralization" OR "bone demineralizations" OR "bone decalcification" OR "bone decalcifications" OR "fragility fracture" OR "fragility fractures" OR "bone fragility" OR "bone fragilities") OR AB (osteoporosis OR osteoporoses OR osteoporotic OR osteopenia OR osteopenias OR osteopenic OR "bone loss" OR "bone losses" OR "bone mineral density" OR "bone mineral densities" OR BMD OR "bone mineral content" OR "bone mineral contents" OR "bone density" OR "bone densities" OR "bone demineralization" OR "bone demineralizations" OR "bone decalcification" OR "bone decalcifications" OR "fragility fracture" OR "fragility fractures" OR "bone fragility" OR "bone fragilities")	41,298
#2	(MH "Veterans+") OR (MH "Vietnam Veterans") OR (MH "United States Department of Veterans Affairs") OR (MH "Hospitals, Veterans") OR (MH "War+") OR (MH "Biological Warfare") OR (MH "Chemical Warfare") OR (MH "Military Deployment+") OR (MH "Overseas Deployment") OR (MH "Nuclear Warfare") OR TI (Veteran OR veterans OR "Afghan Campaign" OR "Afghan War" OR "Operation Enduring Freedom" OR "Operation New Dawn" OR "Operation Iraqi Freedom" OR "Gulf War" OR "Iraq War" OR "Operation Desert Shield" OR "Operation Desert Storm" OR "Vietnam War" OR "Viet Nam War" OR "Vietnam Conflict" OR "Viet Nam Conflict" OR "Vietnamese War" OR "Vietnamese Conflict" OR "Indochina War" OR "Korean War" OR "World War I" OR "World War II" OR WWI OR WWII) OR AB (Veteran OR veterans OR "Afghan Campaign" OR "Afghan War" OR "Operation Enduring Freedom" OR "Operation New Dawn" OR "Operation Iraqi Freedom" OR "Gulf War" OR "Iraq War" OR "Operation Desert Shield" OR "Operation Desert Storm" OR "Vietnam War" OR "Viet Nam War" OR "Vietnam Conflict" OR "Viet Nam Conflict" OR "Vietnamese War" OR "Vietnamese Conflict" OR "Indochina War" OR "Korean War" OR "World War I" OR "World War II" OR WWI OR WWII)	39,683
#3	#1 AND #2	110
#4	(MH "Randomized Controlled Trials+") OR TI ("randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "randomization" OR "randomised" OR "randomisation" OR "randomly" OR "trial" OR "groups" OR "comparative study" OR "nonrandom" OR "non-random" OR "nonrandomized" OR "non-randomized" OR "nonrandomised" OR "non-randomised" OR quasi-experiment* OR quasiexperiment* OR quasirandom* OR quasi-random* OR quasi-control* OR quasicontrol* OR (controlled AND (trial OR study)) OR "pre-post" OR "posttest" OR "post-test" OR "pretest" OR "pre-test" OR "repeated measure" OR "repeated measures" OR ("time series" AND "interrupt") OR ("time points" AND (multiple OR	748,301

	one OR two OR three OR four OR five OR six OR seven OR eight OR nine OR ten OR month OR monthly OR day OR daily OR week OR weekly OR hour OR hourly)) OR (before AND after) OR (before AND during)) OR AB ("randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "randomization" OR "randomised" OR "randomisation" OR "randomly" OR "trial" OR "groups" OR "comparative study" OR "nonrandom" OR "non-random" OR "nonrandomized" OR "non-randomized" OR "nonrandomised" OR "non-randomised" OR quasi-experiment* OR quasiexperiment* OR quasirandom* OR quasi-random* OR quasi-control* OR quasicontrol* OR (controlled AND (trial OR study)) OR "pre-post" OR "posttest" OR "post-test" OR "pretest" OR "pre-test" "repeated measure" OR "repeated measures" OR ("time series" AND "interrupt") OR ("time points" AND (multiple OR one OR two OR three OR four OR five OR six OR seven OR eight OR nine OR ten OR month OR monthly OR day OR daily OR week OR weekly OR hour OR hourly)) OR (before AND after) OR (before AND during))	
#5	#3 AND #4	20
#6	#5 NOT PT (Abstract OR Book OR Book Chapter OR Book Review OR Case Study OR Commentary OR Doctoral Dissertation OR Editorial OR Letter OR Masters Thesis OR Pamphlet OR Pamphlet Chapter OR Poetry) NOT TI (Editorial OR Letter OR "Case Report" OR Comment)	19

KEY QUESTION 3

Database: MEDLINE (via PubMed)

Search date: 7/22/2019

#1	"Osteoporosis"[Mesh:NoExp] OR "Bone Density"[Mesh] OR "Bone Diseases, Metabolic"[Mesh:NoExp] OR "Osteoporotic Fractures"[Mesh] OR osteoporosis[tiab] OR osteoporoses[tiab] OR osteoporotic[tiab] OR osteopenia[tiab] OR osteopenias[tiab] OR osteopenic[tiab] OR osteopaenia[tiab] OR osteopaenias[tiab] OR osteopaenic[tiab] OR "bone loss"[tiab] OR "bone losses"[tiab] OR "bone mineral density"[tiab] OR "bone mineral densities"[tiab] OR BMD[tiab] OR "bone mineral content"[tiab] OR "bone mineral contents"[tiab] OR "bone density"[tiab] OR "bone densities"[tiab] OR "bone demineralization"[tiab] OR "bone dimineralizations"[tiab] OR "bone decalcification"[tiab] OR "bone decalcifications"[tiab] OR "fragility fracture"[tiab] OR "fragility fractures"[tiab] OR "bone fragility"[tiab] OR "bone fragilities"[tiab]	144,719
#2	"Risk assessment"[Mesh] OR "Mass screening"[Mesh] OR "Early Diagnosis"[Mesh:NoExp] OR "Absorptiometry, Photon"[Mesh] OR "Densitometry"[Mesh] OR "Ultrasonography"[Mesh] OR "Tomography, X-Ray Computed"[Mesh] OR risk[tiab] OR risks[tiab] OR screening[tiab] OR screenings[tiab] OR marker[tiab] OR markers[tiab] OR detect[tiab] OR detects[tiab] OR detection[tiab] OR detections[tiab] OR detected[tiab] OR "case finding"[tiab] OR "case findings"[tiab] OR "incidental finding"[tiab] OR "incidental findings"[tiab] OR "incidental detection"[tiab] OR "incidental detections"[tiab] OR DEXA[tiab] OR DXA[tiab] OR "dual-energy x-ray"[tiab] OR absorptiometry[tiab] OR Ultrasonography[tiab] OR ultrasonographies[tiab] OR ultrasound[tiab] OR ultrasounds[tiab] OR "computed tomography"[tiab] OR "CT scan"[tiab] OR "CT scans"[tiab] OR densitometry[tiab] OR densitometries[tiab] OR densitometer[tiab] OR densitometers[tiab] OR photodensitometry[tiab] OR "digital x-ray radiogrammetry"[tiab] OR DXR[tiab] OR "fracture prediction"[tiab] OR "fracture predictions"[tiab] OR "fracture assessment"[tiab] OR "fracture assessments"[tiab] OR "fracture estimation"[tiab] OR "fracture estimations"[tiab] OR FRAX[tiab] OR OST[tiab] OR "Self-Assessment Tool"[tiab] OR ORAI[tiab] OR OSTA[tiab] OR	5,552,090

	"Osteoporosis Self-assessment Tool for Asians"[tiab] OR OSIRIS[tiab] OR SOFSURF[tiab] OR "Male Osteoporosis Screening Tool"[tiab] OR OPRA[tiab] OR FRISK[tiab] OR FRC[tiab] OR MSCORE[tiab] OR MORES[tiab] OR QFracture[tiab] OR "Q Fracture"[tiab]	
#3	("Reminder systems"[Mesh] OR systems[tiab] OR "system-level"[tiab] OR "systems-level"[tiab] OR "health system"[tiab] OR reminder[tiab] OR reminders[tiab] OR alert[tiab] OR alerts[tiab] OR notification[tiab] OR notifications[tiab] OR prompt[tiab] OR prompts[tiab] OR automate[tiab] OR automates[tiab] OR automated[tiab] OR automation[tiab] OR mail[tiab] OR mailing[tiab] OR mailed[tiab] OR email[tiab] OR emails[tiab] OR emailed[tiab] OR "text message"[tiab] OR "text messages"[tiab] OR "electronic communication"[tiab] OR "electronic communications"[tiab] OR phone[tiab] OR phoned[tiab] OR phones[tiab] OR telephone[tiab] OR telephoned[tiab] OR telephones[tiab] OR pamphlet[tiab] OR pamphlets[tiab] OR brochure[tiab] OR brochures[tiab] OR coordinate[tiab] OR coordinates[tiab] OR coordinated[tiab] OR coordination[tiab] OR "models of care"[tiab] OR "model of care"[tiab] OR "care model"[tiab] OR "care models"[tiab] OR "case manage"[tiab] OR "case manager"[tiab] OR "case managers"[tiab] OR "case management"[tiab] OR "fracture liaison"[tiab] OR "fracture liaisons"[tiab] OR "bone health clinic"[tiab] OR "bone health clinics"[tiab] OR "Project ECHO"[tiab] OR "Extension for Community Healthcare Outcomes"[tiab] OR "academic detailing"[tiab] OR "multi-modal care"[tiab] OR "multimodal care"[tiab] OR "remote consultation"[tiab] OR "remote consultations"[tiab] OR "self-referral"[tiab] OR "self referral"[tiab] OR "self-referrals"[tiab] OR "self referrals"[tiab] OR "self schedule"[tiab] OR "self-schedule"[tiab] OR "self scheduled"[tiab] OR "self-scheduled"[tiab] OR "self scheduling"[tiab] OR "self-scheduling"[tiab] OR (self[tiab] AND (schedule[tiab] OR schedules[tiab] OR scheduled[tiab] OR scheduling[tiab])))	1,399,427
#4	("Education, Continuing"[Mesh:NoExp] OR "Education, Medical, Continuing"[Mesh] OR "Education, Nursing, Continuing"[Mesh] OR "Physicians/education"[Mesh] OR "Nurses/education"[Mesh] OR ((education[tiab] OR educate[tiab] OR educates[tiab] OR educated[tiab] OR educating[tiab]) AND (physician[tiab] OR physicians[tiab] OR doctor[tiab] OR doctors[tiab] OR provider[tiab] OR providers[tiab] OR patient[tiab] OR patients[tiab] OR clinician[tiab] OR clinicians[tiab] OR nurse[tiab] OR nurses[tiab] OR pharmacist[tiab] OR pharmacists[tiab] OR "hospital staff"[tiab] OR "health personnel"[tiab] OR "health staff"[tiab] OR "clinic staff"[tiab] OR "clinic personnel"[tiab])))	254,571
#5	("Reimbursement mechanisms"[Mesh] OR ((financial[tiab] OR economic[tiab] OR physician[tiab] OR physicians[tiab] OR doctor[tiab] OR doctors[tiab] OR clinician[tiab] OR clinicians[tiab] OR reimbursement[tiab]) AND (incentive[tiab] OR incentives[tiab])))	45,609
#6	("Decision Making, Computer-Assisted"[Mesh] OR ((computer[tiab] OR computers[tiab]) AND (decision[tiab] OR decisions[tiab]) AND (support[tiab] OR aid[tiab] OR assisted[tiab])))	139,295
#7	("Interdisciplinary Communication"[Mesh] OR (("provider-to-provider"[tiab] OR "physician-to-physician"[tiab] OR "doctor-to-doctor"[tiab] OR "nurse-to-nurse"[tiab] OR "physician-to-nurse"[tiab] OR "nurse-to-physician"[tiab]) AND (consult[tiab] OR consultation[tiab] OR consultations[tiab] OR communication[tiab] OR communications[tiab])))	16,436
#8	((("Nurses"[Mesh] OR "Nurse's Role"[Mesh] OR "Nursing Process"[Mesh] OR "Nursing Staff"[Mesh:NoExp] OR "Pharmacists"[Mesh] OR nurse[tiab] OR nursing[tiab] OR nurses[tiab] OR pharmacist[tiab] OR pharmacists[tiab]))) AND (((("Diagnostic Tests, Routine"[Mesh] OR "Medication Therapy Management"[Mesh] OR "Referral and Consultation"[Mesh] OR driven[tiab] OR intervention[tiab] OR interventions[tiab] OR managed[tiab] OR run[tiab] OR led[tiab] OR implemented[tiab] OR clinic[tiab] OR clinics[tiab]))) OR (((medication[tiab] OR	98,222

	drug[tiab] OR drugs[tiab]) AND (adjust[tiab] OR adjustment[tiab] OR manage[tiab] OR management[tiab] OR initiate[tiab] OR initiated[tiab])) AND (adjust[tiab] OR adjustment[tiab] OR manage[tiab] OR management[tiab] OR initiate[tiab] OR initiated[tiab])) OR (((order[tiab] OR ordered[tiab] OR ordering[tiab])) AND (diagnostic[tiab] OR test[tiab] OR tests[tiab]))	
#9	#3 OR #4 OR #5 OR #6 OR #7 OR #8	1,853,457
#10	#1 AND #2 AND #9	4,268
#11	"randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "cohort studies"[MeSH] OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR ((controlled[tiab] AND (trial[tiab] OR study[tiab]))	7,198,417
#12	"pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR "pre-test"[tiab] OR "repeated measure"[tiab] OR "repeated measures"[tiab]	67,071
#13	(before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])	108
#14	"time series"[tiab] AND interrupt*[tiab]	2,707
#15	("time points"[tiab] AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR hourly[tiab])	59,441
#16	#11 OR #12 OR #13 OR #14 OR #15	7,237,642
#17	#10 AND #16	2,337

MEDLINE (via PubMed) Search update

Search date: 2/23/2021

#1	"Osteoporosis"[Mesh:NoExp] OR "Bone Density"[Mesh] OR "Bone Diseases, Metabolic"[Mesh:NoExp] OR "Osteoporotic Fractures"[Mesh] OR osteoporosis[tiab] OR osteoporoses[tiab] OR osteoporotic[tiab] OR osteopenia[tiab] OR osteopenias[tiab] OR osteopenic[tiab] OR osteopaenia[tiab] OR osteopaenias[tiab] OR osteopaenic[tiab] OR "bone loss"[tiab] OR "bone losses"[tiab] OR "bone mineral density"[tiab] OR "bone mineral densities"[tiab] OR BMD[tiab] OR "bone mineral content"[tiab] OR "bone mineral contents"[tiab] OR "bone density"[tiab] OR "bone densities"[tiab] OR "bone demineralization"[tiab] OR "bone dimineralizations"[tiab] OR "bone decalcification"[tiab] OR "bone decalcifications"[tiab] OR "fragility fracture"[tiab] OR "fragility fractures"[tiab] OR "bone fragility"[tiab] OR "bone fragilities"[tiab]	158,618
#2	"Risk assessment"[Mesh] OR "Mass screening"[Mesh] OR "Early Diagnosis"[Mesh:NoExp] OR "Absorptiometry, Photon"[Mesh] OR "Densitometry"[Mesh] OR "Ultrasonography"[Mesh] OR "Tomography, X-Ray	6,211,,363



	<p>Computed"[Mesh] OR risk[tiab] OR risks[tiab] OR screening[tiab] OR screenings[tiab] OR marker[tiab] OR markers[tiab] OR detect[tiab] OR detects[tiab] OR detection[tiab] OR detections[tiab] OR detected[tiab] OR "case finding"[tiab] OR "case findings"[tiab] OR "incidental finding"[tiab] OR "incidental findings"[tiab] OR "incidental detection"[tiab] OR "incidental detections"[tiab] OR DEXA[tiab] OR DXA[tiab] OR "dual-energy x-ray"[tiab] OR absorptiometry[tiab] OR Ultrasonography[tiab] OR ultrasonographies[tiab] OR ultrasound[tiab] OR ultrasounds[tiab] OR "computed tomography"[tiab] OR "CT scan"[tiab] OR "CT scans"[tiab] OR densitometry[tiab] OR densitometries[tiab] OR densitometer[tiab] OR densitometers[tiab] OR photodensitometry[tiab] OR "digital x-ray radiogrammetry"[tiab] OR DXR[tiab] OR "fracture prediction"[tiab] OR "fracture predictions"[tiab] OR "fracture assessment"[tiab] OR "fracture assessments"[tiab] OR "fracture estimation"[tiab] OR "fracture estimations"[tiab] OR FRAX[tiab] OR OST[tiab] OR "Self-Assessment Tool"[tiab] OR ORAI[tiab] OR OSTA[tiab] OR "Osteoporosis Self-assessment Tool for Asians"[tiab] OR OSIRIS[tiab] OR SOFSURF[tiab] OR "Male Osteoporosis Screening Tool"[tiab] OR OPRA[tiab] OR FRISK[tiab] OR FRC[tiab] OR MSCORE[tiab] OR MORES[tiab] OR QFracture[tiab] OR "Q Fracture"[tiab]</p>	
#3	<p>("Reminder systems"[Mesh] OR systems[tiab] OR "system-level"[tiab] OR "systems-level"[tiab] OR "health system"[tiab] OR reminder[tiab] OR reminders[tiab] OR alert[tiab] OR alerts[tiab] OR notification[tiab] OR notifications[tiab] OR prompt[tiab] OR prompts[tiab] OR automate[tiab] OR automates[tiab] OR automated[tiab] OR automation[tiab] OR mail[tiab] OR mailing[tiab] OR mailed[tiab] OR email[tiab] OR emails[tiab] OR emailed[tiab] OR "text message"[tiab] OR "text messages"[tiab] OR "electronic communication"[tiab] OR "electronic communications"[tiab] OR phone[tiab] OR phoned[tiab] OR phones[tiab] OR telephone[tiab] OR telephoned[tiab] OR telephones[tiab] OR pamphlet[tiab] OR pamphlets[tiab] OR brochure[tiab] OR brochures[tiab] OR coordinate[tiab] OR coordinates[tiab] OR coordinated[tiab] OR coordination[tiab] OR "models of care"[tiab] OR "model of care"[tiab] OR "care model"[tiab] OR "care models"[tiab] OR "case manage"[tiab] OR "case manager"[tiab] OR "case managers"[tiab] OR "case management"[tiab] OR "fracture liaison"[tiab] OR "fracture liaisons"[tiab] OR "bone health clinic"[tiab] OR "bone health clinics"[tiab] OR "Project ECHO"[tiab] OR "Extension for Community Healthcare Outcomes"[tiab] OR "academic detailing"[tiab] OR "multi-modal care"[tiab] OR "multimodal care"[tiab] OR "remote consultation"[tiab] OR "remote consultations"[tiab] OR "self-referral"[tiab] OR "self referral"[tiab] OR "self-referrals"[tiab] OR "self referrals"[tiab] OR "self schedule"[tiab] OR "self-schedule"[tiab] OR "self scheduled"[tiab] OR "self-scheduled"[tiab] OR "self scheduling"[tiab] OR "self-scheduling"[tiab] OR (self[tiab] AND (schedule[tiab] OR schedules[tiab] OR scheduled[tiab] OR scheduling[tiab])))</p>	1,590,094
#4	<p>("Education, Continuing"[Mesh:NoExp] OR "Education, Medical, Continuing"[Mesh] OR "Education, Nursing, Continuing"[Mesh] OR "Physicians/education"[Mesh] OR "Nurses/education"[Mesh] OR ((education[tiab] OR educate[tiab] OR educates[tiab] OR educated[tiab] OR educating[tiab]) AND (physician[tiab] OR physicians[tiab] OR doctor[tiab] OR doctors[tiab] OR provider[tiab] OR providers[tiab] OR patient[tiab] OR patients[tiab] OR clinician[tiab] OR clinicians[tiab] OR nurse[tiab] OR nurses[tiab] OR pharmacist[tiab] OR pharmacists[tiab] OR "hospital staff"[tiab] OR "health personnel"[tiab] OR "health staff"[tiab] OR "clinic staff"[tiab] OR "clinic personnel"[tiab])))</p>	286,583
#5	<p>("Reimbursement mechanisms"[Mesh] OR ((financial[tiab] OR economic[tiab] OR physician[tiab] OR physicians[tiab] OR doctor[tiab] OR doctors[tiab] OR clinician[tiab] OR clinicians[tiab] OR reimbursement[tiab]) AND (incentive[tiab] OR incentives[tiab])))</p>	48,129

#6	("Decision Making, Computer-Assisted"[Mesh] OR ((computer[tiab] OR computers[tiab]) AND (decision[tiab] OR decisions[tiab]) AND (support[tiab] OR aid[tiab] OR assisted[tiab])))	127,513
#7	("Interdisciplinary Communication"[Mesh] OR (("provider-to-provider"[tiab] OR "physician-to-physician"[tiab] OR "doctor-to-doctor"[tiab] OR "nurse-to-nurse"[tiab] OR "physician-to-nurse"[tiab] OR "nurse-to-physician"[tiab]) AND (consult[tiab] OR consultation[tiab] OR consultations[tiab] OR communication[tiab] OR communications[tiab])))	17,763
#8	((("Nurses"[Mesh] OR "Nurse's Role"[Mesh] OR "Nursing Process"[Mesh] OR "Nursing Staff"[Mesh:NoExp] OR "Pharmacists"[Mesh] OR nurse[tiab] OR nursing[tiab] OR nurses[tiab] OR pharmacist[tiab] OR pharmacists[tiab]) AND (("Diagnostic Tests, Routine"[Mesh] OR "Medication Therapy Management"[Mesh] OR "Referral and Consultation"[Mesh] OR driven[tiab] OR intervention[tiab] OR interventions[tiab] OR managed[tiab] OR run[tiab] OR led[tiab] OR implemented[tiab] OR clinic[tiab] OR clinics[tiab]) OR ((medication[tiab] OR drug[tiab] OR drugs[tiab]) AND (adjust[tiab] OR adjustment[tiab] OR manage[tiab] OR management[tiab] OR initiate[tiab] OR initiated[tiab]))) OR ((order[tiab] OR ordered[tiab] OR ordering[tiab]) AND (diagnostic[tiab] OR test[tiab] OR tests[tiab])))	112,316
#9	#3 OR #4 OR #5 OR #6 OR #7 OR #8	2,071,224
#10	#1 AND #2 AND #9	4,699
#11	"randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "cohort studies"[MeSH] OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR ((controlled[tiab]) AND (trial[tiab] OR study[tiab]))	7,790,112
#12	"pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR "pre-test"[tiab] OR "repeated measure"[tiab] OR "repeated measures"[tiab]	79,063
#13	(before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])	68
#14	"time series"[tiab] AND interrupt*[tiab]	3,718
#15	("time points"[tiab]) AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR hourly[tiab])	68,877
#16	#11 OR #12 OR #13 OR #14 OR #15	7,836,590
#17	#10 AND #16	2,531
#18	#17 AND ("2019/06/01"[mhda] : "3000"[mhda])	378

Database: EMBASE (via Elsevier)

Search date: 7/22/2019

#1	'bone demineralization'/de OR 'osteoporosis'/de OR 'corticosteroid induced osteoporosis'/de OR 'idiopathic osteoporosis'/de OR 'posttraumatic osteoporosis'/de OR 'primary osteoporosis'/de OR 'secondary osteoporosis'/de OR 'senile osteoporosis'/de OR 'metabolic bone disease'/de OR 'bone density'/exp OR 'fragility fracture'/exp OR osteoporosis:ti,ab OR osteoporoses:ti,ab OR osteoporotic:ti,ab OR osteopenia:ti,ab OR osteopenias:ti,ab OR osteopenic:ti,ab OR osteopaenia:ti,ab OR osteopaenias:ti,ab OR osteopaenic:ti,ab OR 'bone loss':ti,ab OR 'bone losses':ti,ab OR 'bone mineral density':ti,ab OR 'bone mineral densities':ti,ab OR BMD:ti,ab OR 'bone mineral content':ti,ab OR 'bone mineral contents':ti,ab OR 'bone density':ti,ab OR 'bone densities':ti,ab OR 'bone demineralization':ti,ab OR 'bone dimineralizations':ti,ab OR 'bone decalcification':ti,ab OR 'bone decalcifications':ti,ab OR 'fragility fracture':ti,ab OR 'fragility fractures':ti,ab OR 'bone fragility':ti,ab OR 'bone fragilities':ti,ab	231,849
#2	'risk assessment'/exp OR 'mass screening'/exp OR 'early diagnosis'/exp OR 'photon absorptiometry'/exp OR 'densitometry'/exp OR 'echography'/exp OR 'computer assisted tomography'/exp OR risk:ti,ab OR risks:ti,ab OR screening:ti,ab OR screenings:ti,ab OR marker:ti,ab OR markers:ti,ab OR detect:ti,ab OR detects:ti,ab OR detection:ti,ab OR detections:ti,ab OR detected:ti,ab OR 'case finding':ti,ab OR 'case findings':ti,ab OR 'incidental finding':ti,ab OR 'incidental findings':ti,ab OR 'incidental detection':ti,ab OR 'incidental detections':ti,ab OR DEXA:ti,ab OR DXA:ti,ab OR 'dual energy xray':ti,ab OR absorptiometry:ti,ab OR Ultrasonography:ti,ab OR ultrasonographies:ti,ab OR ultrasound:ti,ab OR ultrasounds:ti,ab OR 'computed tomography':ti,ab OR 'CT scan':ti,ab OR 'CT scans':ti,ab OR densitometry:ti,ab OR densitometries:ti,ab OR densitometer:ti,ab OR densitometers:ti,ab OR photodensitometry:ti,ab OR 'digital xray radiogrammetry':ti,ab OR DXR:ti,ab OR 'fracture prediction':ti,ab OR 'fracture predictions':ti,ab OR 'fracture assessment':ti,ab OR 'fracture assessments':ti,ab OR 'fracture estimation':ti,ab OR 'fracture estimations':ti,ab OR FRAX:ti,ab OR OST:ti,ab OR 'Self Assessment Tool':ti,ab OR ORAI:ti,ab OR OSTA:ti,ab OR 'Osteoporosis Self assessment Tool for Asians':ti,ab OR OSIRIS:ti,ab OR SOFSURF:ti,ab OR 'Male Osteoporosis Screening Tool':ti,ab OR OPRA:ti,ab OR FRISK:ti,ab OR FRC:ti,ab OR MSCORE:ti,ab OR MORES:ti,ab OR QFracture:ti,ab OR 'Q Fracture':ti,ab	7,932,430
#3	('reminder system'/exp OR systems:ti,ab OR 'system level':ti,ab OR 'health system':ti,ab OR reminder:ti,ab OR reminders:ti,ab OR alert:ti,ab OR alerts:ti,ab OR notification:ti,ab OR notifications:ti,ab OR prompt:ti,ab OR prompts:ti,ab OR automate:ti,ab OR automates:ti,ab OR automated:ti,ab OR automation:ti,ab OR mail:ti,ab OR mailing:ti,ab OR mailed:ti,ab OR email:ti,ab OR emails:ti,ab OR emailed:ti,ab OR 'text message':ti,ab OR 'text messages':ti,ab OR 'electronic communication':ti,ab OR 'electronic communications':ti,ab OR phone:ti,ab OR phoned:ti,ab OR phones:ti,ab OR telephone:ti,ab OR telephoned:ti,ab OR telephones:ti,ab OR pamphlet:ti,ab OR pamphlets:ti,ab OR brochure:ti,ab OR brochures:ti,ab OR coordinate:ti,ab OR coordinates:ti,ab OR coordinated:ti,ab OR coordination:ti,ab OR 'models of care':ti,ab OR 'model of care':ti,ab OR 'care model':ti,ab OR 'care models':ti,ab OR 'case manage':ti,ab OR 'case manager':ti,ab OR 'case managers':ti,ab OR 'case management':ti,ab OR 'fracture liaison':ti,ab OR 'fracture liaisons':ti,ab OR 'bone health clinic':ti,ab OR 'bone health clinics':ti,ab OR 'Project ECHO':ti,ab OR 'Extension for Community Healthcare Outcomes':ti,ab OR 'academic detailing':ti,ab OR 'multi modal care':ti,ab OR 'multimodal care':ti,ab OR 'remote consultation':ti,ab OR 'remote consultations':ti,ab OR 'self referral':ti,ab OR 'self referrals':ti,ab OR 'self	1,701,895

	schedule':ti,ab OR 'self scheduled':ti,ab OR 'self scheduling':ti,ab OR (self:ti,ab AND (schedule:ti,ab OR schedules:ti,ab OR scheduled:ti,ab OR scheduling:ti,ab)))	
#4	('continuing education'/exp OR 'continuing medical education'/exp OR 'nursing education'/exp OR ((education:ti,ab OR educate:ti,ab OR educates:ti,ab OR educated:ti,ab OR educating:ti,ab) AND (physician:ti,ab OR physicians:ti,ab OR doctor:ti,ab OR doctors:ti,ab OR provider:ti,ab OR providers:ti,ab OR patient:ti,ab OR patients:ti,ab OR clinician:ti,ab OR clinicians:ti,ab OR nurse:ti,ab OR nurses:ti,ab OR pharmacist:ti,ab OR pharmacists:ti,ab OR 'hospital staff':ti,ab OR 'health personnel':ti,ab OR 'health staff':ti,ab OR 'clinic staff':ti,ab OR 'clinic personnel':ti,ab)))	396,572
#5	('reimbursement'/exp OR ((financial:ti,ab OR economic:ti,ab OR physician:ti,ab OR physicians:ti,ab OR doctor:ti,ab OR doctors:ti,ab OR clinician:ti,ab OR clinicians:ti,ab OR reimbursement:ti,ab) AND (incentive:ti,ab OR incentives:ti,ab)))	66,679
#6	('decision support system'/exp OR ((computer:ti,ab OR computers:ti,ab) AND (decision:ti,ab OR decisions:ti,ab) AND (support:ti,ab OR aid:ti,ab OR assisted:ti,ab)))	25,987
#7	('interdisciplinary communication'/exp OR (('provider to provider':ti,ab OR 'physician to physician':ti,ab OR 'doctor to doctor':ti,ab OR 'nurse to nurse':ti,ab OR 'physician to nurse':ti,ab OR 'nurse to physician':ti,ab) AND (consult:ti,ab OR consultation:ti,ab OR consultations:ti,ab OR communication:ti,ab OR communications:ti,ab)))	11,775
#8	(('nurse'/exp OR 'nurse attitude'/exp OR 'nursing process'/exp OR 'nursing staff'/exp OR 'pharmacist'/exp OR nurse:ti,ab OR nursing:ti,ab OR nurses:ti,ab OR pharmacist:ti,ab OR pharmacists:ti,ab) AND (('diagnostic test'/exp OR 'medication therapy management'/exp OR 'patient referral'/exp OR driven:ti,ab OR intervention:ti,ab OR interventions:ti,ab OR managed:ti,ab OR run:ti,ab OR led:ti,ab OR implemented:ti,ab OR clinic:ti,ab OR clinics:ti,ab) OR ((medication:ti,ab OR drug:ti,ab OR drugs:ti,ab) AND (adjust:ti,ab OR adjustment:ti,ab OR manage:ti,ab OR management:ti,ab OR initiate:ti,ab OR initiated:ti,ab)) OR ((order:ti,ab OR ordered:ti,ab OR ordering:ti,ab) AND (diagnostic:ti,ab OR test:ti,ab OR tests:ti,ab))))	152,884
#9	#3 OR #4 OR #5 OR #6 OR #7 OR #8	2,219,293
#10	#1 AND #2 AND #9	7,592
#11	'randomized controlled trial'/exp OR 'crossover procedure'/exp OR 'double blind procedure'/exp OR 'single blind procedure'/exp OR randomization:ti,ab OR randomisation:ti,ab OR randomized:ti,ab OR randomised:ti,ab OR randomly:ti,ab OR crossover:ti,ab OR 'cross over':ti,ab OR placebo:ti,ab OR 'double blind':ti,ab OR 'double blinded':ti,ab OR 'single blind':ti,ab OR 'single blinded':ti,ab OR 'clinical study'/exp OR 'clinical trial':ti,ab OR 'clinical trials':ti,ab OR 'controlled study'/exp OR 'evaluation study'/exp OR 'evaluation study':ti,ab OR 'evaluation studies':ti,ab OR 'intervention study'/exp OR 'intervention study':ti,ab OR 'intervention studies':ti,ab OR 'case control study'/exp OR 'case control':ti,ab OR 'cohort analysis'/exp OR cohort:ti,ab OR cohorts:ti,ab OR longitudinal:ti,ab OR longitudinally:ti,ab OR prospective:ti,ab OR prospectively:ti,ab OR retrospective:ti,ab OR 'follow up'/exp OR 'follow up':ti,ab OR 'comparative effectiveness'/exp OR 'comparative study'/exp OR 'comparative study':ti,ab OR 'comparative studies':ti,ab OR nonrandom:ti,ab OR 'non random':ti,ab OR nonrandomized:ti,ab OR 'non randomized':ti,ab OR nonrandomised:ti,ab OR 'non randomised':ti,ab OR quasiexperiment*:ti,ab OR quasirandom*:ti,ab OR quasicontrol*:ti,ab OR ((controlled:ti,ab) AND (trial:ti,ab OR study:ti,ab))	15,592,201
#12	'pre post':ti,ab OR 'posttest':ti,ab OR 'post test':ti,ab OR pretest:ti,ab OR 'pre test':ti,ab OR 'repeated measure':ti,ab OR 'repeated measures':ti,ab	99,513

#13	(before:ti,ab AND after:ti,ab) OR (before:ti,ab AND during:ti,ab)	1,229,709
#14	'time series':ti,ab AND interrupt*:ti,ab	3,282
#15	('time points':ti,ab) AND (multiple:ti,ab OR one:ti,ab OR two:ti,ab OR three:ti,ab OR four:ti,ab OR five:ti,ab OR six:ti,ab OR seven:ti,ab OR eight:ti,ab OR nine:ti,ab OR ten:ti,ab OR month:ti,ab OR monthly:ti,ab OR day:ti,ab OR daily:ti,ab OR week:ti,ab OR weekly:ti,ab OR hour:ti,ab OR hourly:ti,ab)	95,855
#16	#11 OR #12 OR #13 OR #14 OR #15	16,010,630
#17	#10 AND #16	5,045
#18	#17 NOT ('case report'/exp OR 'case study'/exp OR 'editorial'/exp OR 'letter'/exp OR 'note'/exp OR [conference abstract]/lim)	2,905

Database: CINAHL Complete (via EBSCO)

Search date: 7/22/2019

#1	(MH "Osteoporosis") OR (MH "Osteoporotic Fractures") OR (MH "Bone Diseases, Metabolic") OR (MH "Bone Density") OR TI (osteoporosis OR osteoporoses OR osteoporotic OR osteopenia OR osteopenias OR osteopenic OR osteopaenia OR osteopaenias OR osteopaenic OR "bone loss" OR "bone losses" OR "bone mineral density" OR "bone mineral densities" OR BMD OR "bone mineral content" OR "bone mineral contents" OR "bone density" OR "bone densities" OR "bone demineralization" OR "bone dimineralizations" OR "bone decalcification" OR "bone decalcifications" OR "fragility fracture" OR "fragility fractures" OR "bone fragility" OR "bone fragilities") OR AB (osteoporosis OR osteoporoses OR osteoporotic OR osteopenia OR osteopenias OR osteopenic OR osteopaenia OR osteopaenias OR osteopaenic OR "bone loss" OR "bone losses" OR "bone mineral density" OR "bone mineral densities" OR BMD OR "bone mineral content" OR "bone mineral contents" OR "bone density" OR "bone densities" OR "bone demineralization" OR "bone dimineralizations" OR "bone decalcification" OR "bone decalcifications" OR "fragility fracture" OR "fragility fractures" OR "bone fragility" OR "bone fragilities")	41,428
#2	(MH "Risk Assessment") OR (MH "Health Screening+") OR (MH "Early Diagnosis") OR (MH "Absorptiometry, Photon") OR (MH "Densitometry+") OR (MH "Ultrasonography+") OR (MH "Tomography, X-Ray Computed+") OR TI (risk OR risks OR screening OR screenings OR marker OR markers OR detect OR detects OR detection OR detections OR detected OR "case finding" OR "case findings" OR "incidental finding" OR "incidental findings" OR "incidental detection" OR "incidental detections" OR DEXA OR DXA OR "dual-energy x-ray" OR absorptiometry OR ultrasonography OR ultrasonographies OR ultrasound OR ultrasounds OR "computed tomography" OR "CT scan" OR "CT scans" OR densitometry OR densitometries OR densitometer OR densitometers OR photodensitometry OR "digital x-ray radiogrammetry" OR DXR OR "fracture prediction" OR "fracture predictions" OR "fracture assessment" OR "fracture assessments" OR "fracture estimation" OR "fracture estimations" OR FRAX OR OST OR "Self-Assessment Tool" OR ORAI OR OSTA OR "Osteoporosis Self-assessment Tool for Asians" OR OSIRIS OR SOFSURF OR "Male Osteoporosis Screening Tool" OR OPRA OR FRISK OR FRC OR MSCORE OR MORES OR QFracture OR "Q Fracture") OR AB (risk OR risks OR screening OR screenings OR marker OR markers OR detect OR detects OR detection OR detections OR detected OR "case finding" OR "case findings" OR "incidental finding" OR "incidental findings" OR "incidental detection" OR "incidental detections" OR DEXA OR DXA OR "dual-energy x-ray" OR absorptiometry OR ultrasonography OR ultrasonographies OR ultrasound OR ultrasounds OR "computed tomography" OR "CT scan" OR "CT scans" OR densitometry OR densitometries OR densitometer OR densitometers OR	1,509,704

	photodensitometry OR "digital x-ray radiogrammetry" OR DXR OR "fracture prediction" OR "fracture predictions" OR "fracture assessment" OR "fracture assessments" OR "fracture estimation" OR "fracture estimations" OR FRAX OR OST OR "Self-Assessment Tool" OR ORAI OR OSTA OR "Osteoporosis Self-assessment Tool for Asians" OR OSIRIS OR SOFSURF OR "Male Osteoporosis Screening Tool" OR OPRA OR FRISK OR FRC OR MSCORE OR MORES OR QFracture OR "Q Fracture")	
#3	(MH "Reminder Systems") OR TI (systems OR "system-level" OR "systems-level" OR "health system" OR reminder OR reminders OR alert OR alerts OR notification OR notifications OR prompt OR prompts OR automate OR automates OR automated OR automation OR mail OR mailing OR mailed OR email OR emails OR emailed OR "text message" OR "text messages" OR "electronic communication" OR "electronic communications" OR phone OR phoned OR phones OR telephone OR telephoned OR telephones OR pamphlet OR pamphlets OR brochure OR brochures OR coordinate OR coordinates OR coordinated OR coordination OR "models of care" OR "model of care" OR "care model" OR "care models" OR "case manage" OR "case manager" OR "case managers" OR "case management" OR "fracture liaison" OR "fracture liaisons" OR "bone health clinic" OR "bone health clinics" OR "Project ECHO" OR "Extension for Community Healthcare Outcomes" OR "academic detailing" OR "multi-modal care" OR "multimodal care" OR "remote consultation" OR "remote consultations" OR "self-referral" OR "self referral" OR "self-referrals" OR "self referrals" OR "self schedule" OR "self-schedule" OR "self scheduled" OR "self-scheduled" OR "self scheduling" OR "self-scheduling" OR (self AND (schedule OR schedules OR scheduled OR scheduling)) OR AB (systems OR "system-level" OR "systems-level" OR "health system" OR reminder OR reminders OR alert OR alerts OR notification OR notifications OR prompt OR prompts OR automate OR automates OR automated OR automation OR mail OR mailing OR mailed OR email OR emails OR emailed OR "text message" OR "text messages" OR "electronic communication" OR "electronic communications" OR phone OR phoned OR phones OR telephone OR telephoned OR telephones OR pamphlet OR pamphlets OR brochure OR brochures OR coordinate OR coordinates OR coordinated OR coordination OR "models of care" OR "model of care" OR "care model" OR "care models" OR "case manage" OR "case manager" OR "case managers" OR "case management" OR "fracture liaison" OR "fracture liaisons" OR "bone health clinic" OR "bone health clinics" OR "Project ECHO" OR "Extension for Community Healthcare Outcomes" OR "academic detailing" OR "multi-modal care" OR "multimodal care" OR "remote consultation" OR "remote consultations" OR "self-referral" OR "self referral" OR "self-referrals" OR "self referrals" OR "self schedule" OR "self-schedule" OR "self scheduled" OR "self-scheduled" OR "self scheduling" OR "self-scheduling" OR (self AND (schedule OR schedules OR scheduled OR scheduling))	458,949
#4	(MH "Education, Continuing+") OR (MH "Physicians+/ED") OR (MH "Nurses+/ED") OR TI (((education OR educate OR educates OR educated OR educating) AND (physician OR physicians OR doctor OR doctors OR provider OR providers OR patient OR patients OR clinician OR clinicians OR nurse OR nurses OR pharmacist OR pharmacists OR "hospital staff" OR "health personnel" OR "health staff" OR "clinic staff" OR "clinic personnel"))) OR AB (((education OR educate OR educates OR educated OR educating) AND (physician OR physicians OR doctor OR doctors OR provider OR providers OR patient OR patients OR clinician OR clinicians OR nurse OR nurses OR pharmacist OR pharmacists OR "hospital staff" OR "health personnel" OR "health staff" OR "clinic staff" OR "clinic personnel")))	142,630
#5	(MH "Reimbursement, Incentive") OR (MH "Reimbursement Mechanisms+") OR TI (((financial OR economic OR physician OR physicians OR doctor OR doctors OR clinician OR clinicians OR reimbursement) AND (incentive OR incentives))) OR AB	22,473

	((financial OR economic OR physician OR physicians OR doctor OR doctors OR clinician OR clinicians OR reimbursement) AND (incentive OR incentives)))	
#6	(MH "Decision Making, Computer Assisted+") OR TI ((computer OR computers) AND (decision OR decisions) AND (support OR aid OR assisted)) OR AB ((computer OR computers) AND (decision OR decisions) AND (support OR aid OR assisted))	39,456
#7	(MH "Interprofessional Relations+") OR (MH "Nurse-Physician Relations") OR TI (("provider-to-provider" OR "physician-to-physician" OR "doctor-to-doctor" OR "nurse-to-nurse" OR "physician-to-nurse" OR "nurse-to-physician") AND (consult OR consultation OR consultations OR communication OR communications)) OR AB (("provider-to-provider" OR "physician-to-physician" OR "doctor-to-doctor" OR "nurse-to-nurse" OR "physician-to-nurse" OR "nurse-to-physician") AND (consult OR consultation OR consultations OR communication OR communications))	28,405
#8	((MH "Nurses+") OR (MH "Nursing Role") OR (MH "Nursing Process+") OR (MH "Nursing Staff, Hospital") OR (MH "Staff Nurses") OR (MH "Nurse Liaison") OR (MH "Nursing Leaders") OR (MH "Nurse Consultants+") OR (MH "Nurse Administrators+") OR (MH "Case Managers") OR (MH "Advanced Practice Nurses+") OR (MH "Pharmacists") OR TI (nurse OR nursing OR nurses OR pharmacist OR pharmacists) OR AB (nurse OR nursing OR nurses OR pharmacist OR pharmacists)) AND ((MH "Diagnostic Tests, Routine") OR (MH "Medication Management") OR (MH "Referral and Consultation+") OR TI (driven OR intervention OR interventions OR managed OR run OR led OR implemented OR clinic OR clinics) OR AB (driven OR intervention OR interventions OR managed OR run OR led OR implemented OR clinic OR clinics)))	75,332
#9	#3 OR #4 OR #5 OR #6 OR #7 OR #8	694,705
#10	#1 AND #2 AND #9	2,245
#11	(MH "Randomized Controlled Trials+") OR TI ("randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "randomization" OR "randomised" OR "randomisation" OR "randomly" OR "trial" OR "groups" OR "comparative study" OR "nonrandom" OR "non-random" OR "nonrandomized" OR "non-randomized" OR "nonrandomised" OR "non-randomised" OR quasi-experiment* OR quasiexperiment* OR quasirandom* OR quasi-random* OR quasi-control* OR quasicontrol* OR (controlled AND (trial OR study)) OR "pre-post" OR "posttest" OR "post-test" OR "pretest" OR "pre-test" OR "repeated measure" OR "repeated measures" OR ("time series" AND "interrupt") OR ("time points" AND (multiple OR one OR two OR three OR four OR five OR six OR seven OR eight OR nine OR ten OR month OR monthly OR day OR daily OR week OR weekly OR hour OR hourly)) OR (before AND after) OR (before AND during)) OR AB ("randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "randomization" OR "randomised" OR "randomisation" OR "randomly" OR "trial" OR "groups" OR "comparative study" OR "nonrandom" OR "non-random" OR "nonrandomized" OR "non-randomized" OR "nonrandomised" OR "non-randomised" OR quasi-experiment* OR quasiexperiment* OR quasirandom* OR quasi-random* OR quasi-control* OR quasicontrol* OR (controlled AND (trial OR study)) OR "pre-post" OR "posttest" OR "post-test" OR "pretest" OR "pre-test" OR "repeated measure" OR "repeated measures" OR ("time series" AND "interrupt") OR ("time points" AND (multiple OR one OR two OR three OR four OR five OR six OR seven OR eight OR nine OR ten OR month OR monthly OR day OR daily OR week OR weekly OR hour OR hourly)) OR (before AND after) OR (before AND during))	751,483
#12	#10 AND #11	643
#13	#12 NOT PT (Abstract OR Book OR Book Chapter OR Book Review OR Case Study OR Commentary OR Doctoral Dissertation OR Editorial OR Letter OR	612

	Masters Thesis OR Pamphlet OR Pamphlet Chapter OR Poetry) NOT TI (Editorial OR Letter OR "Case Report" OR Comment)	
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APPENDIX B. KQ 1 AND KQ 2 STUDY CHARACTERISTICS TABLE

Please refer to the main report’s reference list for citations in this Appendix.

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Adler, 2003 ⁵⁴ Cross-sectional USA Yes KQ 1 and KQ 2	181 100% 64.3 (12.3) White: 68.5% Black: 29.8% Other: 1.7%	Men enrolled in pulmonary clinic or rheumatology clinic who had not previously undergone DXA	OST	OST score 1 OST score 3	Osteoporosis (NHANES data for hip, manufacturer database for spine)	At risk
Adler, 2010 ⁴⁸ Cohort USA Yes KQ 1 and KQ 2	115 100% 77 (8) Black: ~60% (Androgen deprivation therapy)	Convenience sample of men undergoing ADT with analogs of gonadotropin-releasing hormone and/or androgen-blocking agents or because of orchiectomy because of localized prostate cancer that were referred for a DXA; men with known metastases to bone were excluded	FRAX	Hip fracture 3.8% major osteoporotic fracture: 20%	Osteoporosis Osteopenia (NHANES data for hip, Hologic database of normative male of the same races used for other regions)	Low risk
Akhter, 2009 ⁷⁸ Cohort USA Yes KQ 2	112 100% 63.9 (14) Black: 100%	Patients were African American men ≥35 years of age without metabolic bone disease or medication to treat low bone mass (with the exception of calcium and vitamin D). Patients were recruited from a VA clinic over an 11-month period in 2004	Risk factor: vitamin D deficiency and insufficiency	NA	Osteoporosis (GE Lunar machine’s reference values)	Unclear risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Cass, 2016 ²⁷ Cross-sectional USA No KQ 1	1,498 100% 64.2 (9.7) White: 88.5% Black: 8.5%	US men ≥ 50 of age from NHANES III validation sample who had a valid DXA result	FRAX MORES (10-year risk)	(USPSTF) FRAX: 9.3%	Osteoporosis (NHANES III Female)	At risk
Cass, 2013 ⁶¹ Cross-sectional USA No KQ 1	386 100% 70.2 (6.9) White: 76.0% Black 11.8% Hispanic: 10.7% Other: 1.4%	Men ≥ 60 years of age from university-based primary care outpatient clinics of family medicine, divisions of general internal medicine and geriatrics	MORES	MORES: ≥6	Osteoporosis (NHANES III Female)	Low risk
Collins, 2011 ⁵⁸ Cohort UK No KQ 1	2,244,636 100% Age: median derivation cohort: 46 (range 37-59); median validation cohort: 47 (range 37-59) Race: NR	Patients in THIN database, which comprises records from 20% UK general practices; eligible patients 30-85 years of age, no prior fractures, were permanent residents of UK, and had no interrupted periods of registration with a practice	QFracture (10-year fracture risk)	NA	MOF Hip fracture	Low risk
Dagan, 2017 ⁴⁰ Cohort Israel No KQ 1	1,054,815 45.4% (478,825) Age (range depended on tool): FRAX (50-90) Qfracture (30-100) Garvan (60-95)	Electronic health database, 50-90 years of age, January 2010 to December 2014	FRAX Garvan Qfracture (5-year risk)	NA	Hip fracture	At risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
	White: 98.8% Black: 1.2%					
Diem, 2017 ²⁹ Cohort USA KQ 1	4,043 100% 76.3 (4.8) White: 90.8%	<ul style="list-style-type: none"> Excluded men with a bilateral hip replacement or unable to walk without assistance Men were eligible if they had no history of nontraumatic hip or clinical vertebral fracture and reported no bisphosphonate or other anti-fracture treatment and were ≥70 years of age 	FRAX OST (10-year risk)	(USPSTF) FRAX: 9.3%	Osteoporosis Osteopenia (female reference group)	At risk
Ettinger, 2012 ⁶⁶ Cohort USA No KQ 1	5,893 100% 73.62 (5.86) White: 89% Black: 4% Hispanic: 2% Asian: 2% Other: 1%	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> Ability to walk without assistance Absence of bilateral hip replacements Ability to provide self-reported data Residence near a clinical site for the duration of the study Absence of medical condition that (in the judgment of the investigator) would result in imminent death Ability to understand and sign an informed consent 	FRC (10-year risk estimates of both hip fracture and major osteoporotic fracture; hip, clinical spine, forearm, shoulder)	(NOF) FRAX: ≥3% for hip fracture probability (NOF and ACR) FRAX: ≥20% for a major osteoporotic fractures	MOF Hip fracture	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
		<ul style="list-style-type: none"> This study included community-dwelling men ≥65 years of age enrolled at 6 clinical centers without bisphosphonate use 30 days prior to the baseline visit 				
Ettinger, 2013 ²⁵ Cohort USA No KQ 1	5,891 100% 73.6 (5.9) White: 89.4%	Inclusion criteria: <ul style="list-style-type: none"> Ability to walk without assistance Absence of bilateral hip replacements Ability to provide self-reported data Residence near a clinical site for the duration of the study Absence of medical condition that (in the judgment of the investigator) would result in imminent death Ability to understand and sign an informed consent This study included community-dwelling men ≥65 years of age enrolled at 6 clinical centers without bisphosphonate use 30 days prior to the baseline visit 	FRAX (10-year risk)	(NOF) FRAX: ≥3% for hip fracture probability	Hip fracture	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Francesco, 2017 ⁶⁴ Cohort Italy No KQ 1	407,771 45% (183,308) 59.09 (12.36) Race NR	Health Search: IMS Health Longitudinal Patients Database (HSD), an Italian general practice database; patients ≥ 40 years of age during period between January 1, 1999, and December 31, 2002	FRA-HS (10-year risk)	NA	MOF Hip fracture	Low risk
Friis-Holmberg, 2014 ³³ Cohort Denmark No KQ 1	12,758 40.8% (5,206) 58.3 (10.6) Race NR	Cohort men and women participating in Danish Health Examination Survey 2007-2008; study included patients who responded to invitation for a health examination 40-90 years of age, excluded if no height/weight measurement	FRAX (10-year risk)	FRAX: Low <10% Intermediate 10% to 19.99% High ≥20%	MOF	At risk
Gourlay, 2017 ³⁰ Cohort USA No KQ 1	5,994 100% 65-69: 67.1 (1.4) 70-74: 71.9 (1.4) 75-79: 76.8 (1.4) ≥80: 83 (2.9) White: 89.5% Black: 4.1% Asian 3.2% Hispanic: 2.1% Other: 1.2%	Inclusion criteria: • Ability to walk without assistance • Absence of bilateral hip replacements • Ability to provide self-reported data • Residence near a clinical site for the duration of the study • Absence of medical condition that (in the judgment of the investigator) would result in imminent death	<ul style="list-style-type: none"> • FRAX • Garvan • Qfracture 	FRAX: 1.60, 6.03	MOF Hip fracture	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
		<ul style="list-style-type: none"> • Ability to understand and sign an informed consent • Men <65 of age were excluded from this analysis 				
Hall, 2018 ⁷³ Cohort USA Yes KQ 2	712,918 100% 73 (5.2) Black: 7.5% (Chronic kidney disease)	Men ≥65 with CKD (eGFR <60) and no prior diagnosis of osteoporosis, fracture, or bisphosphonate use in the 3 years prior, and a random sample without CKD as control group	Risk factor: CKD stage	NA	Fracture	Unclear risk
Hain, 2011 ⁷⁶ Cohort USA Yes KQ 2	320 100% 62.89 (5.8) White: 98% Black: 2% (PTSD; POW)	Vietnam-era prisoners of war (PTSD and non-PTSD lifetime diagnosis) and matched non-PTSD control group	Risk factor: PTSD	NA	Osteoporosis (young-adult reference population)	High risk
Hamdy, 2018 ³¹ Cross-sectional USA No KQ 1	726 100% 61.16 (4.82) White: 100%	Consecutive white male subjects 50-70 years of age referred to Osteoporosis Center	FRAX (10-year risk)	MOF >20 Hip >3	Osteoporosis (NHANES III Female)	Low risk
Hippisley-Cox, 2009 ³² Cohort UK No KQ 1	1,807,996 100% Age: derivation cohort median 46 (IQR 37 to 59), validation cohort median 46 (IQR 37 to 69) Race NR	Large primary care population from the QResearch database over 11 million patients from general practices EMIS computer system	FRAX Qfracture	NA	MOF Hip fracture	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Hippisley-Cox, 2012 ⁵⁷ Cohort UK No KQ 1	4,726,046 49.1% Total cohort age: 50 (16) White: 95% Black: 1% Asian: 3% Other: 1.5%	Patients 30-100 registered with eligible practices, minimum of 1 year's complete data in medical record	QFracture QFracture plus updated algorithm (10-year fracture risk)	NA	Hip fracture	Low risk
Hoff, 2017 ³⁵ Cohort Norway No KQ 1	13,585 100% 64.0 (9.3) Race NR	Participants of third survey in HUNT study, population cohort	FRAX FRAX adjusted for anti-osteoporosis drugs and age (10-year risk)	10-year hip >4%	Hip fracture	Low risk
Holloway-Kew, 2019 ⁴³ Cohort Australia No KQ1	821 100% 69.0 (range: 59.0 to 78.0) Race NR	Men aged 50 to 90 were recruited from the local electoral roll from between 2001-2006	FRAX Garvan	FRAX: 10-year probability \geq 20% for MOF; \geq 3% for hip fracture Garvan: 10-year probability \geq 14% for fragility; \geq 3% for hip fracture	MOF Hip fracture	Low risk
Hsieh, 2019 ⁷¹ Cohort USA Yes KQ 2	24,451 100% 55.6 (5.4) Black: 46.2% (HIV)	Males 50-70 years of age in VACS database in year 2000 with complete fracture-associated data (ie, data on/or that allowed estimation of 9 specific variables of 11 used in calculation of FRAX)	Osteomyelitis adjusted for some of the FRAX risk factors	NA	MOF	Unclear risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Jang, 2016 ³⁹ Cohort South Korea No KQ 1	768 47.3% (363) 61.3 (7.1) Race NR	<ul style="list-style-type: none"> • Ansung cohort consisting of rural region residents 40-69 years of age and available to participate in clinical examinations in 2000. • Patients who did not have a history of anti-osteoporotic drug use were included in this analysis 	FRAX (7-year risk)	NR	Osteoporotic fracture	At risk
Khan, 2013 ⁷⁴ Cohort USA Yes KQ 2	34,665 100% 60 (SD NR) White: 76% (Ulcerative colitis)	<ul style="list-style-type: none"> • Male Veterans seen and followed up in VA health care system from 10/1/2001 to 10/1/2011; identified via electronic medical record codes for ulcerative colitis 	Risk factor: ulcerative colitis and other predictors of low BMD and fragility fracture (age, race, alcoholism, smoking, hypogonadism, malnutrition, hyperparathyroidism, obesity, and vitamin D deficiency, prednisone)	NA	Fracture	High risk
Kim, 2015 ³⁸ Cross-sectional South Korea No KQ 1	2,706 46.5% (1,260) Age NR Race NR	<ul style="list-style-type: none"> • Population drawn from KNHANES Osteoporosis Survey and included men and women who had face-to-face interviews in their homes 	FRAX (10-year fracture risk for major osteoporosis fracture and hip fracture)	NA	MOF	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
		<ul style="list-style-type: none"> The population studied excluded participants younger than 50 and older than 89 or who had missing data. Participants who received osteoporosis interventions were also excluded 				
Kim, 2016 ⁶⁸ Cohort South Korea No KQ 1	370,255 100% 59.77 (7.86) Race NR	Randomly selected individuals in the Korean NHIS database who received the National Health Checkup every 2 years	Korean Fracture Risk Score (7-year risk includes age, body mass index, recent fragility fracture, current smoking, high alcohol intake, lack of regular exercise, recent use of oral glucocorticoid, rheumatoid arthritis, and other causes of secondary osteoporosis)	NA	Osteoporotic fracture	Low risk
Leslie, 2012 ⁴² Cohort Canada No KQ 1	39,603 7.3% (2,873) 68.2 (10.1) Race NR	All individuals ≥50 years of age with medical coverage and valid DXA measurements from the lumbar spine and femoral neck	FRAX (10-year fracture risk)	(NOF) FRAX: ≥3% for hip fracture probability	Hip fracture	Low risk
1085, Machado, 2010 ⁵⁰ Cohort Portugal	202 100% 63.8 (8.2)	<ul style="list-style-type: none"> Data collected 1998-1999 on residents from a Portuguese town; randomly selected from registered 	OST OSTA	OST score < 3	Osteoporosis (NHANES male for hip, Hologic male for spine)	At risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
No KQ 1	Race NR	voters, 6000 invitations sent out, 1745 responded; no exclusion criteria. <ul style="list-style-type: none"> Current report focuses on men ≥ 50 years of age (n = 202) 				
Marques, 2017 ³⁶ Cohort Portugal No KQ 1	683 100% 58.2 (10.2) Race NR	<ul style="list-style-type: none"> Patients from 3 Portuguese cohorts were included if >40 years of age and had a complete set of FRAX RFs 	FRAX (10-year risk)	NR	MOF Hip fracture	At risk
Munigala 2016 ⁶⁹ Cross-sectional USA Yes KQ 2	453,912 88% (400,606) 54.7 (14.1) White: 74% Black: 17% Other: 9% (Chronic pancreatitis)	Patients with conditions known to cause bone loss were excluded	Risk factor: chronic pancreatitis	NA	Osteoporotic fracture	high risk
Nakato, 2013 ³⁷ Cohort Japan No KQ 1	520 100% 71.1 (6.9) Race NR	Participants ≥40 years of age from 1 geographic area were eligible if they attended 1 of 2 health check-ups; 1 in 2009 and 1 in 2010	FRAX	<ul style="list-style-type: none"> 6.2%, 10% risk 	Osteoporosis Osteopenia (Young Adult Mean)	At risk
Nguyen, 2008 ⁶³ Cohort Australia No KQ 1	858 100% 70.5 (6.2) Race NR	Participants in Dubbo study	<ul style="list-style-type: none"> Model I (age+ baseline BMD+ prior fracture + fall) Model II (age + baseline weight + prior fracture) 	<ul style="list-style-type: none"> NA 	Fracture rate	At risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
			+ fall) Model IV(baseline BMD only) (5- and 10-year fracture risk)			
Oh, 2016 ⁵⁵ Cross-sectional South Korea No KQ 1	2,450 100% 63.4 (8.6) Race NR	<ul style="list-style-type: none"> Men ≥50 years of age who participated in 2009 KNHANES or 2010 KNHANES. Patients were excluded from this analysis if they were missing BMD or blood tests, had previously diagnosed osteoporosis, or treatment for osteoporosis 	<ul style="list-style-type: none"> OSTA Korean Osteoporosis Risk-Assessment Model for Men (KORAM-M); included age and weight; model 2 also included exercise, model 3 added vitamin D and alkaline phosphatase 	OSTA: ≤0; ≤1; ≤0; ≤1; <3 KORAM-M: ≤-9; ≤-10; ≤-12; ≤-9; ≤-10; m≤-12	Osteoporosis (gender-specific normal values for young Japanese men)	Low risk
Papaleontiou, 2019 ⁷⁰ Case-control USA Yes KQ 2	20,740 83.8% (8,689) Patients with thyroid cancer median age 61; without thyroid cancer median age 61 Race NR (Thyroid cancer)	<ul style="list-style-type: none"> Male and female Veterans >18 years of age with diagnosis of thyroid cancer; on thyroid hormone replacement with at least 2 TSH measurements; controls did not have diagnosis of thyroid cancer; were not on replacement 	<ul style="list-style-type: none"> Risk factor: thyroid cancer 	NA	Osteoporosis (NR)	Unclear risk
Richards, 2009 ⁵⁶ Cohort USA Yes KQ 1 and KQ 2	795 100% 65.4 (10.5) White: 81% Black: 14%	Men enrolled in the VARA registry (multicenter registry of patients age 18+ who meet ACR criteria for a diagnosis of RA)	OST	OST > 4 OST ≤ -2 OST ≤ 4	Osteoporosis (NHANES III Male)	At risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
	Other: 5% (Rheumatoid arthritis)					
Shahani, 2019 ^{79 10268} Cohort USA Yes KQ 2	195 94% (183) Median age: 57 White: 36.7% (HIV)	HIV-positive patients with a DXA scan at the Huston VA between 2007 and 2014	VACS Index	NA	Low BMD (NR)	High risk
Shepherd, 2007 ⁵⁹ Cross-sectional USA No KQ 1	2,995 100% 64 (10) White: 88.7% Black: 8.3% Hispanic: 3%	Men ≥50 years of age from NHANES III study with valid DXA test	MORES	MORES: ≥6	Osteoporosis (NHANES III Male)	At risk
Shepherd, 2010 ⁶⁰ Cross-sectional USA No KQ 1	2,944 100% 63 (95% CI, 62.53 to 63.44) White: 81% Black: 8% Hispanic: 4% Other: 7%	<ul style="list-style-type: none"> Eligible participants included 2,984 men ≥50 years of age, included in any NHANES 1999 to 2000, 2001 to 2002, and 2003 to 2004 datasets, and who had a valid whole-body DXA scan Forty subjects were excluded because of missing values for variables essential for a weighted analysis 	MORES	MORES: ≥6	Osteoporosis (NHANES III Male)	Low risk
Short, 2014 ³⁴ Cross-sectional UK No	168 100% 45 (range 38-51) White: 97%	Recruited May-August 2008, male ≥18 years of age, and diagnosed with HIV infection	FRAX (10-year risk)	NOGG intervention threshold (approximates ≥7.5 or <7.5% 10-year	Osteoporosis and age adjusted Z score ≤ -2.0 for lower than expected bone mass (NR)	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
KQ 1	(HIV)	<ul style="list-style-type: none"> Patients were purposively sampled to represent a range of exposures to cART, including: cART naïve; a group recently exposed for the first time to cART (<3 years) and those exposed to longer-term cART 		risk of major osteoporotic fracture)		
Sinnott, 2006 ⁵¹ Cohort USA Yes KQ 1 and KQ 2	128 100% 63.8 (14.8) Black: 100%	African American men >35 years of age without metabolic bone disease, atraumatic fractures, or comorbidities associated with bone loss	OST Weight-based criterion (weight alone)	OST: 4	Osteoporosis (Caucasian male normative database for the hip and the manufacturer's female spine database)	At risk
Skedros, 2007 ⁵² Cohort USA No KQ 1	158 100% 67.50 (13.09) White: 100%	Conducted study only on non-hospitalized white men who deemed representative of patients seeking orthopaedic consultation in their area; patients enrolled through a paper advertisement or individuals going to the orthopaedic specialty clinic	OST Clinic questionnaire of 32 known or suspected risk factors; OST and (low body weight, >65 years of age), Final model (low body weight, >65 years of age)	OST: <2	Osteoporosis (NR)	At risk
Richards 2014 ⁵³ Cohort USA Yes KQ 1 and KQ 2	520 100% 66 (10.2) White: 71.9% Black: 25% Other: 3.1%	Male VA primary care patients without history of osteoporosis or metabolic bone disease	OST (10-year fracture risk)	OST: ≤6	Osteoporosis (NHANES III Male)	At risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Weaver, 2019 ⁷² Cohort USA Yes KQ 2	12,773 89% 56.7 (57) Race NR (Antipsychotic use)	Antipsychotic use for 3+ months based on ICD codes 2007-2017; patients excluded if reported a fracture prior to taking antipsychotic medication or had a diagnosis of osteopenia or osteoporosis, received treatment for decreased BMD prior to inclusion into the study	Risk factor: antipsychotic use	NA	Fracture	High risk
Williams, 2017 ²⁸ Cross-sectional USA Yes KQ 1 and KQ 2	463 100% 80.4 (5.8) White: 94.2%	Patients of Bone Health Team at Salt Lake City VA from 2012 to 2013	eFRAX OST VA-FARA	<ul style="list-style-type: none"> Threshold cutoff points for VA-FARA and eFRAX were set at 20% for any major fracture and 3% for hip fracture The 10-year risk threshold for FRAX without BMD was set at 6.5% for any major fracture and 3% for hip fracture A cutoff value of 0.99 was used for OST 	Osteoporosis (NA)	Low risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Womack, 2011 ⁷⁷ Cohort USA Yes KQ 2	119,318 100% >50 (34%) Black or Hispanic: 55% (HIV)	HIV-infected and uninfected men who enrolled in the VACS-VC study 1997-2009	Risk factor: HIV	NA	Fragility fracture of hip, vertebrae, or upper arm	Unclear risk
Womack 2013 ⁷⁵ Cohort USA Yes KQ 2	40,115 100% 46 (10) White: 37% (HIV)	All HIV-infected male Veterans with ≥2 outpatient or 1 inpatient ICD-9 codes for HIV who received care VHA) 1997-2009; women were excluded due to low fracture prevalence	VACS clinical risk index possessing many traits of a frailty index; associated with inflammation markers; and based on lab data routinely collected on HIV-infected patients	NA	Fracture	Unclear risk
Yang, 2019 ⁴¹ Cohort Canada No KQ 1	61,041 92% (55,425) 66.3 (9.8) Race NR	Individuals ≥50 years in Manitoba Bone Mineral Density Database at their first BMD test, April 1, 1997-March 31, 2013	Tool: FRAX, FRAX A, FRAX A+, FRAX (age-sex), FRAX (age-sex-fracture) (10 year risk)	NA	MOF	At risk
Yin, 2016 ²⁶ Cohort USA Yes KQ 1 and KQ 2	24,451 100% 55.6 (5.4) White: 44.8% Black: 46.3% Hispanic: 8.7% Asian: 0.2% (HIV)	HIV-infected Veterans who enrolled for care at the VA plus HIV-uninfected Veterans matched by age, sex, race/ethnicity, geographic region	Modified FRAX (total, HIV-infected, HIV-uninfected, 10-year risk)	(NOF) FRAX: ≥3% for hip fracture probability and European osteoporosis societies (6.3% to 13.4% in 50-70 years of age)	Major osteoporotic fracture Hip fracture	At risk
Zimering, 2007 ⁶⁷	970	Community-dwelling men ≥40 years of age	Mscore	Mscore: 9	Osteoporosis (NHANES III Male)	At risk

Study Design Country Veteran? Key Question	N Enrolled % Male Mean Age (SD) Race % (Special Population)	Eligibility Criteria	Screening Tool(s)	Threshold	Primary Outcome(s) (Reference population)	ROB
Cohort USA Yes KQ 1 and KQ 2	100% 68 (10.2) White: 78.4% Black: 17.5% Other: 4.2%					

APPENDIX C. KQ 3 STUDY CHARACTERISTICS TABLE

Please refer to the main report’s reference list for citations in this Appendix.

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
Alibhai, 2018 ⁹⁷ Canada Randomized controlled trial 119 3 arms No	<ul style="list-style-type: none"> Men 50 years of age who were initiating or continuing ADT for a minimum of 6 months for nonmetastatic or castration-sensitive metastatic prostate cancer Life expectancy greater than 6 months, no BMD test or osteoporosis clinic visit within the past 2 years, and fluent in English 	Arm 1: Patient education + care management (telephone coaching) Arm 2: Patient education (written) + provider education (brief) Comparator: Usual care	<u>Men with androgen deprivation therapy</u> Age arm 1: 72.4 (7.5) Age arm 2: 71.7 (8.1) Age comparator: 73.3 (10.5) Women: 0% Race: 77% White	Screening rates 10month follow-up	Objective: NA Patient-reported: Unclear
Ayoub, 2009 ¹¹⁰ USA Controlled before-after study 13722 arms No	All women in the 4 participating clinics >65 years of age who had not had a DXA scan in the previous 2 years and were not taking osteoporosis medications	Intervention: Patient self-referral Comparator: Usual care	<u>Women</u> Age intervention: 75.5 (7.3) Age comparator: 75.6 (7.2) Women: NR Race: NR	Screening rates 5 month follow-up	Objective: Low Patient-reported: Low
Curtis, 2007 ⁹⁴ USA Randomized controlled trial 949	Patients receiving glucocorticosteroids for more than 90 days and had 4 months of follow-up	Intervention: Provider education Comparator: Usual care	<u>Long-term glucocorticoid users</u> Age intervention: 53 (14) Age comparator: 50 (13) Women: 71%	Screening rates 1 year follow-up	Objective: Unclear Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
2 arms No			Race: NR		
Denberg, 2019 ¹⁰⁴ USA Interrupted time series 564 2 arms No	<ul style="list-style-type: none"> Women were eligible for outreach if they did not have a prior administrative claim for a DXA examination within the health system, had seen a PCP in the practice at least once in the preceding 18 months, and were 65-79 years of age Women were excluded from outreach if they were ≥80 years of age, had clinic notes suggesting active cancer or a terminal diagnosis, were currently taking a bisphosphonate, had died, or no longer appeared to be receiving care within the system 	Intervention: Patient education + navigation Comparator: Usual care	<u>Women</u> Age intervention: 65-69 (136) 70-74 (93) 75-79 (52) Age comparator: 65-69 (118) 70-74 (94) 75-79 (71) Women: NR Race: 5% Asian 13% Black 19% Hispanic 28% Other 49% White	Screening rates 13 month follow-up	Overall risk of bias for IT studies: Low
Dolan, 2015 ⁹² USA Randomized controlled trial	Residents at the continuity clinic	Intervention: Provider education Comparator: Usual care	<u>None</u> Age: NR Women: NR Race: NR	Screening rates 10 month follow-up	Objective: High Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
50 2 arms No					
EI-Kareh, 2011 ⁹⁹ USA Nonrandomized controlled trial 3849 2 arms No	Patients were eligible if they were determined to have a high risk of fracture, and if they received care at the academic medical center conducting the study	Intervention: System reminder–provider Comparator: Usual care	<u>None</u> Age: NR Women: NR Race: NR	Screening rates	Objective: High Patient-reported: NA
Garton, 1992 ¹¹¹ UK Randomized controlled trial 1200 3 arms No	Women 45-49 years of age living in 20 postcode sectors within 32 km of Aberdeen	Arm 1: Patient self-referral (fixed appointment) Arm 2: Patient self-referral (confirmable appointment) Arm 3: Patient self-referral (open appointment)	<u>Women</u> Age: NR Women: 100% Race: NR	Screening rates	Objective: Unclear Patient-reported: NA
Heyworth, 2014 ¹⁰⁵ USA Cluster- randomized controlled trial 4,685 3 arms No	Women between 50-64 years of age who presented with a risk factor for osteoporosis; not permitted to be taking an FDA-approved treatment for osteoporosis	Intervention: Patient risk assessment and feedback Comparator: Usual care	<u>Women</u> Age: 57 (NR) Women: 100% Race: NR	Screening rates 12 month follow-up	Objective: Unclear Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
Kastner, 2014 ¹⁰³ Canada Interrupted time series 18,309 No	Family physicians and their patients at risk for osteoporosis (women ≥50 years of age, men ≥65)	Intervention: Clinical decision support tool Comparator: Usual care	<u>None</u> Age: 67(NR) Women: 79%	Screening rates	Overall risk of bias for IT studies: Unclear
Lafata, 2007 ¹⁰² USA Cluster-randomized controlled trial 10,354 3 arms No	Women 65-89 years of age with a PCP visit between 2001 and 2003; patients should have also visited the PCP during study time	Arm 1: Patient mailed reminder and education Arm 2: Patient mailed reminder and education + embedded EHR provider reminder Comparator: Usual care	<u>Women</u> Age arm 1: 75.8 (6.3) Age arm 2: 75.6 (6.3) Age comparator: 75.4 (6.4) Women: 100% Race: 16% Black	Screening rates 12 month follow-up	Objective: Unclear Patient-reported: NA
Levy, 2009 ¹⁰⁰ USA Cluster-randomized controlled trial 195 3 arms No	Women ≥65 years of age scheduled for upcoming annual examination visits	Arm 1: Chart reminder + patient education (not targeted or tailored) Arm 2: Chart reminder Comparator: Usual care	<u>Women</u> Age: 74 (NR) Women: 100% Race: NR	Screening rates Avg 6.7 months follow-up	Objective: Unclear Patient-reported: Low
Loo, 2011 ¹⁰¹ USA	Patients ≥65 years of age at start of study, having a designated faculty PCP at the start of study, and completion	Arm 1: System reminder-provider	<u>None</u> Age arm 1: 75 (8) Age arm 2: 75 (8)	Screening rates 1 year follow-up	Objective: Unclear Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
Nonrandomized controlled trial 4660 3 arms No	of at least 1 visit to the practice in the 18 months before the start of study	Arm 2: System reminder–provider + panel management Comparator: Usual care	Age comparator: 74 (7) Women: 57% Race: NR		
Pazirandeh, 2002 ⁹⁶ USA Nonrandomized controlled trial 672 2 arms No	Eligibility criteria unclear	Intervention: Provider education (CME) Comparator: Usual care	<u>Women</u> Age: 53 (range 36 to 76) Women: 100% Race: NR	Screening rates	Objective: NA Patient-reported: High
Rubin, 2018 ¹⁰⁷ Denmark Randomized controlled trial 34,229 2 arms No (Rubin, 2015 ¹²³)	Women 65-80 years of age living in region of southern Denmark who were registered in the Danish Civil Registration system and who had not died or emigrated at the time of the questionnaire mailing	Intervention: Patient risk assessment + feedback Comparator: Usual care	<u>Women</u> Median age intervention: 71 (IQR 68 to 76) Median age comparator: 71 (IQR 68 to 76) Women: 100% Race: NR	Fracture rates Data pulled 1995-2016	Objective: Unclear Patient-reported: NA
Solomon, 2003 ⁹⁵ USA Cluster-randomized controlled trial	Patients who visited the participating physicians within 2 months of the intervention and had an rheumatoid arthritis diagnosis; patients not receiving oral steroids	Intervention: Provider education and panel management Comparator: Usual care	<u>Rheumatoid arthritis population</u> Age intervention: 59 (17) Age comparator: 60 (16) Women: 80%	Screening rates	Objective: Unclear Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
373 2 arms No	and not to participate in investigational drugs trials, and had at least 1 follow-up visit 6 months after the initial visit		Race: NR		
Solomon, 2007 ⁹³ USA Cluster- randomized controlled trial 13,455 4 arms No	Patients eligible for this study must also be enrolled in a state-run pharmacy benefits program (PACE)	Arm 1: Provider education and patient education Arm 2: Provider education Arm 3: Patient education Comparator: Usual care	<u>None</u> Age arm 1: 82 (7) Age arm 2: 82 (7) Age arm 3: 82 (7) Age comparator: 82 (7) Women: 99% Race: 97% White	Screening rates 16 month follow- up	Objective: Unclear Patient-reported: NA
Solomon, 2007 ⁹⁸ USA Randomized controlled trial 1973 2 arms No	At least 2 years of enrollment before intervention and a prescription drug benefit; patients with BMD testing during the baseline 26 months were excluded	Intervention: Provider education and patient education Comparator: Usual care	<u>None</u> Age intervention: 68 (9) Age comparator: 69 (8) Women: 92% Race: NR	Screening rates 10 month follow- up	Objective: Unclear Patient-reported: NA
Warriner, 2014 ¹⁰⁹ USA Randomized controlled trial 12,128 3 arms	Women ≥65 years of age without a DXA in past 5 years	Arm 1: Self-referral Arm 2: Self-referral + education Comparator: Usual care	<u>Women</u> Age: 73.5 (6.8) Women: 100% Race: 12% Black; 18% Other; 70% White	Screening rates 90 day follow-up	Objective: Unclear Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
No					
Warriner 2012 ¹⁰⁸ USA Cluster- randomized controlled trial 5140 2 arms No	<ul style="list-style-type: none"> • Women >65 years of age who had visited a PCP over the last 12 months and not received a DXA at UAB over the last 4 years • Women were not permitted to be taking an FDA-approved treatment for osteoporosis 	Intervention: Patient self-referral Comparator: Usual care	<u>Women</u> Age cohort 1: Age 65-69 (23.9%) 70-74 (23%) 75-79 (21.8%) 80-84 (14.7%); 85+ (16.6%) Age cohort 2: Age 65-69 (23.1%) 70-74 (19.8%) 75-79 (21.3%) 80-84 (14.8%) 85+ (19.2%) Age comparator cohort 1: Age 65-69 (23.9%) 70-74 (23%) 75-79 (21.8%) 80-84 (14.7%); 85+ (16.6%) Age comparator cohort 2: Age 65-69 (23.1%) 70-74 (19.8%) 75-79 (21.3%); 80-84 (14.8%) 85+ (19.2%) Women: 100% Race: 2% Other	Screening rates 90 day follow-up	Objective: Unclear Patient-reported: NA

Study Country Study Design # Enrolled # of Arms Veteran? (Companion Study)	Eligibility	Intervention and Comparator	<u>Specific population of interest</u> Mean Age (SD) Women % Race %	Outcomes Reported Time Points	Risk of Bias for Objective and Patient-Reported Outcomes
Yuksel, 2010 ¹⁰⁶ Canada Randomized controlled trial 262 2 arms No	<ul style="list-style-type: none"> Patients were recruited based on national guidelines for BMD testing, including patients ≥65 years of age or age 50-64 with a previous fracture or with multiple other risk factors Patients were excluded who had a BMD in the past 2 years or if they were on current treatment for osteoporosis 	Intervention: Patient Risk Assessment and feedback Comparator: Usual care	37% Black 62% White <u>None</u> Median age: 62 (IQR: 56 to 71) Women: 66% Race: NR	Screening rates 4 month follow-up	Objective: Low Patient-reported: Low

APPENDIX D. KQ 1 AND KQ 2 EXCLUDED STUDIES

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Abderhalden, 2017 ¹	X						
Ackman, 2014 ²				X			
Adami, 2003 ³		X					
Adams, 2019 ⁴		X					
Adler, 2003 ⁵						X	
Aguirre, 2017 ⁶				X			
Alajlouni, 2020 ⁷		X					
Albaba, 2012 ⁸	X						
Albright, 2014 ⁹		X					
Alcalde Vargas, 2012 ¹⁰		X					
Allin, 2016 ¹¹	X						
Almog, 2020 ¹²	X						
Amin , 2001 ¹³							X
Andersen , 2015 ¹⁴		X					
Arabi, 2005 ¹⁵							X
Asirvatham, 2019 ¹⁶	X						
Aspray, 2006 ¹⁷	X						
Aubry-Rozier, 2013 ¹⁸	X						
Aynardi , 2013 ¹⁹							X
Ayres, 2012 ²⁰	X						
Barbour, 2010 ²¹		X					
Barrett-Connor, 2012 ²²		X					
Bass, 2007 ²³				X			
Bauer, 2009 ²⁴		X					
Beaton, 2017 ²⁵	X						

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Beattie, 2014 ²⁶	X						
Beattie, 2015 ²⁷	X						
Beaudoin, 2019 ²⁸					X		
Beck, 1996 ²⁹		X					
Bedimo, 2012 ³⁰	X						
Berry , 2007 ³¹							X
Bethel, 2016 ³²	X						
Bethel, 2016 ³³		X					
Bethel, 2016 ³⁴		X					
Bhat, 2017 ³⁵							X
Bisson, 2019 ³⁶	X						
Blanchard, 2019 ³⁷	X						
Blomeier , 2005 ³⁸				X			
Bolton, 2017 ³⁹	X						
Borade, 2016 ⁴⁰	X						
Bours, 2016 ⁴¹	X						
Bow, 2011 ⁴²							X
Brinton, 2019 ⁴³					X		
Broussard , 2004 ⁴⁴		X					
Broussard , 2008 ⁴⁵		X					
Calmy, 2009 ⁴⁶						X	
Caplan, 2011 ⁴⁷		X					
Carnevale, 2014 ⁴⁸				X			
Caughey, 2010 ⁴⁹		X					
Cervinka, 2017 ⁵⁰					X		
Chalhoub, 2015 ⁵¹		X					
Chalhoub, 2016 ⁵²				X			

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Chan, 2012 ⁵³		X					
Chang, 2016 ⁵⁴							X
Chang, 2016 ⁵⁵							X
Chao, 2020 ⁵⁶							X
Chen, 2014 ⁵⁷		X					
Chen, 2015 ⁵⁸							X
Chen, 2016 ⁵⁹							X
Cheng, 2010 ⁶⁰	X						
Chuang, 2019 ⁶¹							X
Cirnigliaro, 2019 ⁶²	X						
Clarke, 2014 ⁶³					X		
Colon-Emeric, 2002 ⁶⁴	X						
Colon-Emeric, 2018 ⁶⁵		X					
Couraud, 2017 ⁶⁶	X						
Couris, 2012 ⁶⁷		X					
Cronholm, 2019 ⁶⁸		X					
De Laet, 1998 ⁶⁹		X					
Dell, 2009 ⁷⁰	X						
Derkatch, 2019 ⁷¹	X						
Dicken, 2016 ⁷²	X						
Duncan, 2014 ⁷³				X			
E, 2020 ⁷⁴		X					
Edwards, 2013 ⁷⁵		X					
El Maghraoui, 2008 ⁷⁶							X
El-Gabalawy, 2018 ⁷⁷	X						
Elliott, 2000 ⁷⁸		X					
Ensrud, 2014 ⁷⁹	X						

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Faulkner, 2009 ⁸⁰		X					
Fink, 2014 ⁸¹		X					
Forgetta, 2020 ⁸²				X			
Fransiska, 2012 ⁸³							X
Fraser, 2011 ⁸⁴					X		
Frost, 2009 ⁸⁵		X					
Fu, 2021 ⁸⁶					X		
Funkhouser, 2002 ⁸⁷	X						
Gadam, 2013 ⁸⁸	X						
Geusens, 2012 ⁸⁹							X
Giangregorio, 2012 ⁹⁰	X						
Gielen, 2014 ⁹¹		X					
Gill, 2015 ⁹²		X					
Gimigliano, 2015 ⁹³	X						
Gómez Alonso, 2000 ⁹⁴		X					
Gotthardt, 2017 ⁹⁵		X					
Gould, 2013 ⁹⁶		X					
Gourlay, 2016 ⁹⁷		X					
Greenwald, 2003 ⁹⁸	X						
Gruber, 2013 ⁹⁹		X					
Gupta, 2019 ¹⁰⁰	X						
Hanusch, 2017 ¹⁰¹		X					
Harvey, 2018 ¹⁰²		X					
Harvey, 2018 ¹⁰³							X
Hayashi, 2015 ¹⁰⁴			X				
Hoff, 2018 ¹⁰⁵		X					
Ho-Le, 2017 ¹⁰⁶		X					

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Holloway, 2015 ¹⁰⁷			X				
Holloway, 2018 ¹⁰⁸		X					
Holloway-Kew, 2021 ¹⁰⁹				X			
Hsu, 2020 ¹¹⁰							X
Huang, 2017 ¹¹¹							X
Jain, 2017 ¹¹²		X					
Jamal, 2014 ¹¹³	X						
Jefferies, 2016 ¹¹⁴		X					
Jehle, 2013 ¹¹⁵		X					
Jin, 2004 ¹¹⁶	X						
Johansson, 2014 ¹¹⁷		X					
Johansson, 2019 ¹¹⁸		X					
Kalinowski, 2019 ¹¹⁹			X				
Kanazawa, 2019 ¹²⁰	X						
Kanis, 2002 ¹²¹		X					
Kanis, 2007 ¹²²	X						
Kaptoge, 2004 ¹²³		X					
Kaptoge, 2006 ¹²⁴	X						
Katon, 2015 ¹²⁵	X						
Kauppi, 2013 ¹²⁶		X					
Kennedy, 2014 ¹²⁷		X					
Khatib, 2018 ¹²⁸					X		
Kimber, 2011 ¹²⁹				X			
Kirk, 2018 ¹³⁰		X					
Kleiber Balderrama, 2017 ¹³¹			X				
Klop, 2015 ¹³²		X					
Klop, 2016 ¹³³	X						

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Knobe, 2018 ¹³⁴				X			
Korpi-Steiner, 2014 ¹³⁵							X
Krege, 2013 ¹³⁶		X					
Krupski, 2004 ¹³⁷		X					
Kruse, 2017 ¹³⁸		X					
Kung, 2005 ¹³⁹							X
LaFleur, 2015 ¹⁴⁰	X						
LaFleur, 2018 ¹⁴¹	X						
Lalmohamed, 2012 ¹⁴²		X					
Lam, 2020 ¹⁴³							X
Langsetmo, 2011 ¹⁴⁴		X					
Langsetmo, 2018 ¹⁴⁵		X					
Lapi, 2012 ¹⁴⁶		X					
Lazo, 2001 ¹⁴⁷					X		
Lazzari, 2013 ¹⁴⁸		X					
Lee, 2010 ¹⁴⁹		X					
Lee, 2012 ¹⁵⁰	X						
Lee, 2014 ¹⁵¹				X			
Lee, 2015 ¹⁵²	X						
Leib, 2014 ¹⁵³		X					
Leslie, 2010 ¹⁵⁴	X						
Leslie, 2010 ¹⁵⁵		X					
Leslie, 2010 ¹⁵⁶		X					
Leslie, 2011 ¹⁵⁷		X					
Leslie, 2011 ¹⁵⁸		X					
Leslie, 2011 ¹⁵⁹		X					
Leslie, 2012 ¹⁶⁰		X					

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Leslie , 2013 ¹⁶¹		X					
Leslie , 2014 ¹⁶²		X					
Leslie , 2016 ¹⁶³		X					
Leslie , 2017 ¹⁶⁴		X					
Leslie , 2018 ¹⁶⁵		X					
Leslie , 2019 ¹⁶⁶		X					
Leslie, 2019 ¹⁶⁷		X					
Leslie, 2020 ¹⁶⁸	X						
Leslie, 2020 ¹⁶⁹	X						
Li, 2014 ¹⁷⁰							X
Lim, 2016 ¹⁷¹		X					
Lin, 2016 ¹⁷²							X
Lin, 2017 ¹⁷³							X
Lindgren, 2017 ¹⁷⁴		X					
Lippuner, 2009 ¹⁷⁵	X						
Lippuner, 2010 ¹⁷⁶				X			
Liu, 2011 ¹⁷⁷							X
Lix, 2011 ¹⁷⁸	X						
Li-Yu, 2005 ¹⁷⁹							X
Looker , 2008 ¹⁸⁰		X					
López, 2005 ¹⁸¹		X					
López-Larramona, 2015 ¹⁸²					X		
Luukinen, 2000 ¹⁸³		X					
Lynn, 2005 ¹⁸⁴							X
Lynn, 2008 ¹⁸⁵							X
Ma, 2016 ¹⁸⁶							X
Madore, 2004 ¹⁸⁷							X

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Magnus , 2008 ¹⁸⁸		X					
Majumdar, 2016 ¹⁸⁹	X						
Marques, 2017 ¹⁹⁰		X					
Martineau, 2018 ¹⁹¹		X					
Mazzantini, 2010 ¹⁹²		X					
McCarthy, 2015 ¹⁹³					X		
McDiarmid, 2018 ¹⁹⁴	X						
McDonald, 2016 ¹⁹⁵				X			
Meier, 2005 ¹⁹⁶		X					
Melcer, 2017 ¹⁹⁷				X			
Melton, 2012 ¹⁹⁸		X					
Michalski, 2019 ¹⁹⁹							X
Montagnani, 2001 ²⁰⁰		X					
Morse, 2009 ²⁰¹		X					
Morse, 2009 ²⁰²	X						
Mrgan, 2013 ²⁰³	X						
Nassar, 2014 ²⁰⁴		X					
Nayak , 2016 ²⁰⁵					X		
Naylor, 2015 ²⁰⁶	X						
Nethander, 2020 ²⁰⁷		X					
Neubecker, 2011 ²⁰⁸	X						
Nguyen, 2007 ²⁰⁹		X					
Nicoll, 2016 ²¹⁰				X			
Ogunwale, 2020 ²¹¹				X			
Ogura-Tomomatsu, 2012 ²¹²					X		
Pang , 2014 ²¹³	X						
Paniagua, 2006 ²¹⁴					X		

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Park, 2013 ²¹⁵	X						
Park, 2016 ²¹⁶	X						
Pasco, 2014 ²¹⁷		X					
Patil, 2021 ²¹⁸		X					
Pepe, 2012 ²¹⁹					X		
Pérez-Castrillón, 2007 ²²⁰		X					
Pham, 2016 ²²¹		X					
Pluskiewicz, 2014 ²²²		X					
Poh, 2008 ²²³	X						
Poór, 1995 ²²⁴		X					
Pourmalek, 2017 ²²⁵			X				
Przedlacki, 2018 ²²⁶	X						
Pundole, 2018 ²²⁷				X			
Ranstam, 1996 ²²⁸		X					
Reber, 2018 ²²⁹	X						
Rendl, 2013 ²³⁰	X						
Richards, 2007 ²³¹		X					
Riggs, 2006 ²³²		X					
Rodondi, 2012 ²³³	X						
Roig Vilaseca, 2011 ²³⁴		X					
Rotondi, 2016 ²³⁵	X						
Roumie, 2005 ²³⁶	X						
Routh, 2005 ²³⁷		X					
Roux, 2014 ²³⁸	X						
Rubin, 2018 ²³⁹				X			
Rudman, 1994 ²⁴⁰					X		
Salvig, 2016 ²⁴¹		X					

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Samelson, 2019 ²⁴²		X					
Sandhu, 2010 ²⁴³					X		
Sanfelix-Genoves, 2010 ²⁴⁴					X		
Satyaraddi, 2017 ²⁴⁵							X
Schmidt, 2019 ²⁴⁶	X						
Schousboe, 2013 ²⁴⁷			X				
Schousboe, 2016 ²⁴⁸		X					
Schwartz, 2011 ²⁴⁹		X					
Schwartz, 2013 ²⁵⁰		X					
Shahla, 2011 ²⁵¹							X
Shan-Fu, 2017 ²⁵²							X
Sheer, 2020 ²⁵³	X						
Shojaei, 2006 ²⁵⁴							X
Sieber, 2012 ²⁵⁵		X					
Siggeirsdottir, 2014 ²⁵⁶				X			
Siminoski, 2007 ²⁵⁷							X
Slemenda, 1992 ²⁵⁸			X				
Smith, 2005 ²⁵⁹	X						
Stanley, 1991 ²⁶⁰					X		
Starr, 2019 ²⁶¹		X					
Starup-Linde, 2016 ²⁶²		X					
Stefanovics, 2018 ²⁶³	X						
Stehman-Breen, 2001 ²⁶⁴					X		
Stephens, 2016 ²⁶⁵		X					
Stockbrügger, 2002 ²⁶⁶	X						
Su, 2017 ²⁶⁷							X
Su, 2017 ²⁶⁸							X

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Su, 2018 ²⁶⁹							X
Su, 2019 ²⁷⁰							X
Su, 2019 ²⁷¹		X					
Sutton, 2020 ²⁷²							X
Szulc, 2005 ²⁷³		X					
Tang, 2007 ²⁷⁴							X
Taylor, 2016 ²⁷⁵		X					
Timmer, 2009 ²⁷⁶	X						
Torstensson, 2015 ²⁷⁷		X					
Tortora, 2018 ²⁷⁸					X		
Travers-Gustafson, 1995 ²⁷⁹		X					
Tugcu, 2009 ²⁸⁰					X		
Välimäki, 2005 ²⁸¹			X				
Välimäki, 2006 ²⁸²		X					
van der Veer, 2014 ²⁸³				X			
van Staa, 2002 ²⁸⁴		X					
van Varsseveld, 2015 ²⁸⁵		X					
Vanderschueren, 2000 ²⁸⁶							X
Verdijk, 2009 ²⁸⁷	X						
Vokes, 2003 ²⁸⁸	X						
Vokes, 2010 ²⁸⁹		X					
Waljee, 2016 ²⁹⁰					X		
Wang, 2012 ²⁹¹		X					
Ward, 2014 ²⁹²	X						
Wehrli, 2000 ²⁹³		X					
Westfall, 2001 ²⁹⁴		X					
Wilcox, 2006 ²⁹⁵		X					

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Wildberger, 2017 ²⁹⁶							X
Wilson, 2009 ²⁹⁷							X
Woo, 2004 ²⁹⁸		X					
Wu, 2020 ²⁹⁹		X					
Xu, 2020 ³⁰⁰	X						
Yang, 2015 ³⁰¹							X
Yang, 2017 ³⁰²	X						
Yaturu, 2009 ³⁰³		X					
Yazdanpanah, 2007 ³⁰⁴	X						
Ye, 2020 ³⁰⁵		X					
Yeh, 2002 ³⁰⁶					X		
Yoon, 2010 ³⁰⁷	X						
Yu, 2017 ³⁰⁸							X
Zhang, 2012 ³⁰⁹							X
Zhang, 2016 ³¹⁰							X
Zhang, 2018 ³¹¹							X
Zhang, 2018 ³¹²					X		
Zhong, 2017 ³¹³							X
Zhou, 2016 ³¹⁴		X					
Zhu, 2011 ³¹⁵	X						

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APPENDIX E. KQ 3 EXCLUDED STUDIES

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Abdulameer, 2017 ¹			X				
Adebajo, 2006 ²				X			
Adler, 2003 ³		X					
Ahmed, 2012 ⁴	X						
Ashe, 2004 ⁵	X						
Axelsson, 2016 ⁶	X						
Bahrs, 2008 ⁷	X						
Baker, 2011 ⁸			X				
Barrack, 2009 ⁹	X						
Barry, 2007 ¹⁰				X			
Ben Sedrine, 2004 ¹¹				X			
Berarducci, 2002 ¹²				X			
Berggren, 2008 ¹³	X						
Binaghi, 1993 ¹⁴		X					
Birks, 2004 ¹⁵		X					
Blake, 2009 ¹⁶					X		
Blau, 2003 ¹⁷	X						
Bowen, 2018 ¹⁸					X		
Bruyere, 2008 ¹⁹	X						
Buist, 2004 ²⁰					X		
Bultijnck, 2018 ²¹					X		
Bunta, 2016 ²²	X						
Cadarette, 2011 ²³		X					
Cameron, 2011 ²⁴		X					
Carceller, 2015 ²⁵		X					

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Chan, 2012 ²⁶		X					
Chan, 2015 ²⁷				X			
Chan, 2018 ²⁸		X					
Chang, 2011 ²⁹		X					
Chang, 2017 ³⁰							X
Chen, 2006 ³¹						X	
Chen, 2009 ³²		X					
Chitre, 2008 ³³		X					
Ciaschini, 2010 ³⁴	X						
Clark, 2012 ³⁵	X						
Collinge, 2008 ³⁶				X			
Compston, 2016 ³⁷				X			
Cooper, 2006 ³⁸	X						
Cox, 2008 ³⁹						X	
Cram, 2006 ⁴⁰		X					
Cram, 2016 ⁴¹		X					
Crockett, 2008 ⁴²					X		
Curry, 2002 ⁴³		X					
D'Alesio, 2011 ⁴⁴		X					
Danila, 2016 ⁴⁵	X						
Davis, 2000 ⁴⁶				X			
Daya, 2016 ⁴⁷		X					
Demark-Wahnefried, 2007 ⁴⁸		X					
Dewing, 2013 ⁴⁹					X		
Dobson, 2013 ⁵⁰	X						
Dore, 2013 ⁵¹	X						
Dugard, 2010 ⁵²		X					

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Edmonds, 2016 ⁵³			X				
Edwards, 2011 ⁵⁴	X						
Elias, 2011 ⁵⁵	X						
Elliott, 2002 ⁵⁶				X			
Elliott, 2002 ⁵⁷				X			
Elliott, 2011 ⁵⁸					X		
Eyigör, 2008 ⁵⁹		X					
Feskanich, 1997 ⁶⁰		X					
Fournier, 2017 ⁶¹		X					
Freedman, 2007 ⁶²	X						
Gadkaree, 2015 ⁶³		X					
Ganda, 2014 ⁶⁴	X						
Gardner, 2002 ⁶⁵	X						
Gardner, 2005 ⁶⁶	X						
Genuis, 2012 ⁶⁷		X					
Giannini, 2018 ⁶⁸	X						
Giusti, 2009 ⁶⁹	X						
Glidewell, 2015 ⁷⁰		X					
Goldshtein, 2020 ⁷¹				X			
Gomez, 2019 ⁷²				X			
Gonnelli, 2005 ⁷³		X					
Goode, 2017 ⁷⁴	X						
Gossec, 2019 ⁷⁵	X						
Greene, 2010 ⁷⁶					X		
Greenspan, 2012 ⁷⁷	X						
Gupta, 2018 ⁷⁸	X						
Hall, 2009 ⁷⁹	X						

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Hansen, 2007 ⁸⁰					X		
Hansma, 2010 ⁸¹					X		
Hawker, 2003 ⁸²	X						
Hawley, 2016 ⁸³	X						
Heilmann, 2012 ⁸⁴	X						
Hess, 2013 ⁸⁵			X				
Ho, 2006 ⁸⁶	X						
Hodsman, 2004 ⁸⁷		X					
Hofflich, 2014 ⁸⁸	X						
Hudson, 2011 ⁸⁹				X			
Huntjens, 2011 ⁹⁰	X						
Huntjens, 2011 ⁹¹	X						
Iki, 2009 ⁹²		X					
Inderjeeth, 2010 ⁹³	X						
Ioannidis, 2008 ⁹⁴					X		
Irwin, 2014 ⁹⁵	X						
Izuora, 2011 ⁹⁶		X					
Jaglal, 2009 ⁹⁷	X						
Jensen, 2012 ⁹⁸		X					
Jiang, 2016 ⁹⁹		X					
Jones, 2011 ¹⁰⁰	X						
Joy, 2000 ¹⁰¹	X						
Kastner, 2010 ¹⁰²				X			
Kennedy, 2015 ¹⁰³			X				
Kesman, 2010 ¹⁰⁴					X		
Kim, 2016 ¹⁰⁵	X						
Kimber, 2009 ¹⁰⁶				X			

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Kirk, 2002 ¹⁰⁷				X			
Kruger, 2013 ¹⁰⁸							X
Kuczynski, 1989 ¹⁰⁹			X				
Lakatos, 2014 ¹¹⁰		X					
Laliberte, 2010 ¹¹¹					X		
Laslett, 2007 ¹¹²	X						
Laufer, 2014 ¹¹³				X			
Law, 2005 ¹¹⁴			X				
Lee, 2007 ¹¹⁵	X						
Lee, 2016 ¹¹⁶	X						
Lee, 2020 ¹¹⁷		X					
Leeangkoonathian, 2012 ¹¹⁸							X
Leslie, 2011 ¹¹⁹		X					
Leslie, 2010 ¹²⁰		X					
Lin, 2007 ¹²¹							X
Long, 2010 ¹²²					X		
Lord, 1996 ¹²³		X					
Lovric, 2016 ¹²⁴		X					
Lufkin, 1998 ¹²⁵	X						
Lukert, 2011 ¹²⁶		X					
MacIntyre, 2019 ¹²⁷					X		
MacLaughlin, 2005 ¹²⁸				X			
Magill-Lewis, 2006 ¹²⁹					X		
Majumdar, 2004 ¹³⁰	X						
Majumdar, 2007 ¹³¹	X						
Majumdar, 2008 ¹³²	X						
Majumdar, 2010 ¹³³	X						

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Majumdar, 2011 ¹³⁴	X						
Malgo, 2016 ¹³⁵	X						
Mastaglia, 2005 ¹³⁶	X						
Merchant, 2010 ¹³⁷	X						
Merz, 2006 ¹³⁸		X					
Mosekilde, 1999 ¹³⁹		X					
Nakamoto, 2008 ¹⁴⁰		X					
Naunton, 2004 ¹⁴¹			X				
Navarro, 2011 ¹⁴²	X						
Nelson, 2014 ¹⁴³					X		
Nendaz, 2005 ¹⁴⁴					X		
Newman, 2001 ¹⁴⁵				X			
O'Brien, 2015 ¹⁴⁶	X						
Oh, 2012 ¹⁴⁷					X		
Olegario, 2008 ¹⁴⁸					X		
O'Neil, 2007 ¹⁴⁹	X						
O'Neill, 1995 ¹⁵⁰		X					
O'Neill, 1995 ¹⁵¹		X					
Orimo, 2017 ¹⁵²		X					
Parri, 2015 ¹⁵³	X						
Patel, 2010 ¹⁵⁴	X						
Penning-van Beest, 2006 ¹⁵⁵		X					
Peris, 1995 ¹⁵⁶		X					
Peters, 2006 ¹⁵⁷					X		
Pezzotto, 2010 ¹⁵⁸		X					
Pfimlin, 2019 ¹⁵⁹	X						
Pluijm, 1999 ¹⁶⁰				X			

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Polinski, 2005 ¹⁶¹				X			
Prihar, 2008 ¹⁶²					X		
Puisto, 2011 ¹⁶³	X						
Radford, 2014 ¹⁶⁴		X					
Rapp, 2016 ¹⁶⁵					X		
Ravn, 2002 ¹⁶⁶					X		
Rencken, 1991 ¹⁶⁷	X						
Reuben, 2017 ¹⁶⁸					X		
Rucker, 2006 ¹⁶⁹	X						
Ryder, 2012 ¹⁷⁰		X					
Saadi, 1999 ¹⁷¹		X					
Şahin, 2013 ¹⁷²	X						
Sale, 2010 ¹⁷³	X						
Salovaara, 2010 ¹⁷⁴		X					
Salvig, 2016 ¹⁷⁵					X		
Schmajuk, 2010 ¹⁷⁶		X					
Schoon, 2011 ¹⁷⁷	X						
Schousboe, 2005 ¹⁷⁸			X				
Schousboe, 2005 ¹⁷⁹		X					
Seuffert, 2016 ¹⁸⁰		X					
Sheffet, 2006 ¹⁸¹	X						
Shu, 2009 ¹⁸²			X				
Sikon, 2006 ¹⁸³		X					
Solomon, 2005 ¹⁸⁴					X		
Solomon, 2006 ¹⁸⁵			X				
Stock, 1998 ¹⁸⁶					X		
Summers, 2005 ¹⁸⁷				X			

Study	Exclusion Reason						
	Population	Intervention	Outcomes	Comparator	Design	Setting	OECD
Talalaj, 2005 ¹⁸⁸		X					
Tamburino, 1990 ¹⁸⁹	X						
Torgerson, 1993 ¹⁹⁰					X		
Tsang, 2018 ¹⁹¹					X		
Unni, 2015 ¹⁹²		X					
Uusi-Rasi, 2012 ¹⁹³					X		
van Boven, 2014 ¹⁹⁴		X					
van Helden, 2007 ¹⁹⁵	X						
Varacallo, 2013 ¹⁹⁶	X						
Vogel, 2006 ¹⁹⁷		X					
Wang, 2008 ¹⁹⁸							X
Warriner, 2009 ¹⁹⁹		X					
Warriner, 2015 ²⁰⁰			X				
Warshaw, 2013 ²⁰¹					X		
Werner, 2002 ²⁰²		X					
Werner, 2003 ²⁰³		X					
Wolinsky, 2017 ²⁰⁴			X				
Woltman, 2010 ²⁰⁵	X						
Wong, 2004 ²⁰⁶	X						
Woo, 2004 ²⁰⁷				X			
Wu, 2014 ²⁰⁸			X				
Wyshak, 2010 ²⁰⁹		X					
Yi, 2014 ²¹⁰							X
Yuksel, 2006 ²¹¹		X					
Zhang, 2012 ²¹²							X
Zisblatt, 2013 ²¹³					X		
Zwart, 2011 ²¹⁴		X					

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APPENDIX F. PEER REVIEW COMMENTS

Question Text	Reviewer Number	Comment	Response
Are the objectives, scope, and methods for this review clearly described?	1	Yes	
	2	Yes	
	3	Yes	
	4	Yes	
	5	Yes	
	6	Yes	
	7	Yes	
	8	Yes	
Is there any indication of bias in our synthesis of the evidence?	1	No	
	2	No	
	3	No	
	4	No	
	5	No	
	6	No	
	7	No	
	8	No	
Are there any <u>published</u> or <u>unpublished</u> studies that we may have overlooked?	1	No	
	2	No	
	3	No	
	4	No	
	5	Yes: Recent article in Journal of Clinical Densitometry on use of OST in Irish Men (J Carey senior author)	Thank you. This study would not meet eligibility criteria. Vertebral fracture scanning would be an “additional imaging technology” and not a triage tool for identifying people who should be sent on to imaging (e.g., DXA, VFA scan). ¹²⁴
	6	No	

	7	No	
	8	No	
Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.	1	The review was comprehensive and focused and addressed the question. As noted in my review [copied below], it is definitive.	Acknowledged
	1	The ESP was a comprehensive review of the literature on screening tools for male osteoporosis. From my perspective it will enable an informed discussion on the issue of which tools to consider for identification of older men at higher osteoporosis risk, and thus subsequent bone density testing.	Acknowledged
	1	The presentation was superb.	Acknowledged
	2	Thank you for this excellent and thorough report. Some suggestions regarding clarity and readability below.	Acknowledged
	2	Major 1. In introduction, would justify why the key questions are among men not identified by prior fracture (i.e., guideline consensus that these individuals should be tested/treated)	Language describing that the goal of this review is centered around primary prevention has been added to the introduction of the main report and the executive summary. We have also added language to the study eligibility sections describing the potential for enriching the study population with high numbers of fractures.
	2	2. The authors report a very large range of AUCs for the tools described, likely due to study heterogeneity. It would be useful to add a qualitative description of which population(s) had excellent vs. poor discrimination if possible.	The range of AUCs is likely due to multiple variables. While some of these are population-based, heterogeneity is also driven by some of the methodological choices in the individual studies that are not easily explained via population variables only.
	2	a. Specifically describing evidence and/or gaps in underrepresented racial and ethnic groups would be appropriate in the summary	Thank you for this comment. We have added some contextualizing statements about race/ethnicity in the results sections and the evidence gaps sections.
	2	3. When you discuss the ability of tools to predict “osteoporosis”, please confirm how this was defined. By DXA only, by FRAX threshold to treat OP, including low trauma hip/vertebral fractures?	Thank you. We defined osteoporosis as BMD T score ≤ -2.5 and osteopenia as BMD T score between -1.0 and 2.5 in the study selection section of the executive summary.
	2	4. Page 68 – would not repeat the same introductory paragraphs in the discussion as in the	Thank you for this suggestion, we have reduced the redundancy in the first paragraphs of the summary and

	prior sections. Would like to see more synthesis of findings, clinical/policy suggestions, research gaps described here.	discussion section and added some future research and clinical context.
2	Minor 1. Table 16 – not clear why “Antipsychotic use on risk of fracture” is listed in the outcomes category; shouldn’t this be a special population? Why just antipsychotics and not other medications where evidence is conflicting and use is high in VA (e.g., opiates, gabapentinoids)	Thank you. We have added these as examples of special populations of interest.
2	2. Table 17 – isn’t “Limited studies conducted with average risk male only populations” just a subset of “Limited studies conducted with male only populations”? Why are both listed? Is the point that evidence is needed separately for average and high-risk populations?	Thank you. We have clarified that there are limited studies with average-risk men and with men at elevated risk (eg, ADT).
2	3. Throughout the manuscript, there is frequent use of “eg” or “ie” followed by lists, instead of the standard “e.g.,” and “i.e.,”	Thank you, this is the ESP style for the use of these items.
2	4. Page 2: please clarify if there was an I2 cutpoint for conducting meta-analysis; <90% is still very high	Thank you, this language is in our methods section (data synthesis section of the methods, paragraph 2)
2	5. Page 3 typo - “impact the easy” rather than “impact the ease”	Thank you. We have resolved this typo.
2	6. Page 4 typos/grammar issues in sentence “Clinical decision support tool that combine tailored risk-based education for patients and tailored provider recommendations at the point of clinic visit showed promise but were only evaluated in 1 study. .”	Resolved.
3	Overall an impressive manuscript with good summaries of findings, risk of bias and certainty of evidence. Thanks to the authors for their dedication in producing this paper!	Thank you. We appreciate this comment.

3	Within the Executive Summary and the Introduction, please provide more information related to the sentence “Veterans of both sexes are at higher risk of osteoporotic fracture than civilians.” I recommend an overall summary (1 paragraph) of the rate of fracture, along with relevant citations.	Thank you for this suggestion. We have revised the Executive Summary per your suggestion and have included citations in the introduction section.
3	I understand why you are excluding men with prior fracture from your literature search, but the general person reading this summary might not. Thus, please explain this approach within the Executive Summary and Introduction.	Thank you for this suggestion. See the response to a similar comment above.
3	Page 1 line 19, suggest adding a comma between “how to screen men” and “when screening is warranted”	Resolved.
3	Page 1 line 26: focuses on individuals at high risk of fracture who do not have BMD defined osteoporosis. Would therefore delete the phrase “at high risk of osteoporosis.”	Thank you, we have removed “high risk of osteoporosis” from the second paragraph of the introduction to the executive summary
3	Page 7 line 43: Given the focus of this report, please dedicate some space to summarizing the data demonstrating that veterans have more fragility fractures than civilians.	Thank you for this suggestion. We have added this information.
3	Page 9: please explain how disagreement was resolved. Was a 3rd party involved?	Thank you, we added details about how disagreements were resolved (<i>ie</i> , via consensus or third investigator) to the study selection section of the executive summary and main report.
3	Page 9: please add a sentence and citation, describing validity of the Distiller AI	Thank you for this suggestion. Two sentences on the validity of the DistillerAI citing an AHRQ report on the topic have been added to the study selection section of the methods in the main report.
3	Page 19 table 2: Should state “number of subjects”	Thank you. We added “number of participants” to the total N row of the Evidence Profile table.
3	Figures 3, 4, 5, 7, 8, 9: recommend adding summary statistic for AUC to each Forest plot (similar to that reported in Figure 6).	Thank you for this comment. We have presented summary estimates when possible given statistical homogeneity (<i>ie</i> , $I^2 < 90\%$). Further details and rationale

		have been added to the data synthesis section of the executive summary and main report body.
3	Page 31: Line 11 seems to contain a typographical error since the AUC is reported as 77.8. Did you mean 0.778?	Thank you, this error has been corrected.
3	The International Society for Clinical Densitometry guidelines state: "Use a uniform Caucasian (non-race adjusted) female reference for men of all ethnic groups.*" Thus it is critical to note which of the studies cited in this tome are an exception to that guideline. As it stands now, the only paper in which this issue is mentioned is by Sinnott (128 Black veterans) on page 37.	Thank you, information on the reference standards used for each study has been added to the KQ 1 and KQ 2 study characteristics appendix table where applicable. We have also added details of the ISCD guidelines on reference standards to the study selection section of the main report.
3	Page 42 line 12-13: "for these outcomes (see Table 4)" should end with a period, not a comma The title for Table 4 mentions fracture as one outcome of the studies cited. However in the Table, no studies used fracture as an outcome. I suggest deleting "fracture" from the title.	We have rewritten this sentence to improve clarity.
3	Page 43: In my opinion it seems reasonable to exclude the osteomyelitis study from this review. Clinicians don't consider osteomyelitis to be a risk factor for osteoporosis, and given the number of excluded veterans I question whether this would be a valid study.	This study fits our eligibility criteria. However, we agree that this study is of questionable quality (<i>ie</i> , high rate of missing data). We rated the risk of bias for this study as "at risk".
3	Page 43 and related: I was surprised that there were no studies investigating the risk of osteoporosis among veterans with COPD.	Agreed. This is interesting. However, many of the included studies may have included COPD as a proxy for smoking status.
3	Table 10: Patient navigation. Was the second study excluded from the table because it focused on women? Suggest adding the study, since KQ3 is not restricted to men.	Thank you. We have added this study to Table 10.
3	Page 72 line 47: should state "studies" rather than "students"	Corrected.

3	<p>Page 73 line 7: Currently states “Among an average risk in the male Veteran population, FRAX and OST were the most common tools assessed for predicting fracture and/or osteoporosis”. Suggest revising this to state “Among male Veterans at average risk of osteoporosis and/or fracture, FRAX and OST were assessed most often.”</p>	<p>We have made the suggested change.</p>
3	<p>Page 76 line 12: calcaneal is misspelled</p>	<p>Corrected.</p>
3	<p>Page 76 line 21: DXA is spelled “DAX”</p>	<p>Corrected.</p>
3	<p>Page 82 line 19: currently states “Tools predicting hip fracture or MOF, each tool also displayed heterogenous AUCs..” and is confusing. Suggest changing the sentence to something like: “Tools such as FRAX, QFracture and Garvan display poor to excellent discrimination in predicting hip fracture and MOF”</p>	<p>Thank you for this suggestion. The language in the conclusion section has been changed.</p>
3	<p>Page 82 line 23: “approached” should be “approaches”</p>	<p>Corrected.</p>
3	<p>In the final sentences, could you go back to the overall risk of osteoporosis and fracture in male veterans, and provide advice to the general clinician? As Veterans Affairs health care providers, do you screen your men for osteoporosis? At our Madison Wisconsin VA, there is no barrier to screening so any man who is referred, gets screened. Despite the fact that there is not great data on whether to screen male veterans for osteoporosis, the general practitioner needs guidance.</p>	<p>Thank you for this comment. We have further contextualized of finding in the Clinical Implications section.</p>
4	<ul style="list-style-type: none"> • General themes <ul style="list-style-type: none"> ○ I wonder if more time should be spent clarifying that osteoporosis is based on T-scores (not fx) which as stated in certain places had a change of reference group (sex/race matched vs. white females) throughout this 	<p>Thank you for suggesting this clarification. Further context for the definition of osteoporosis and osteopenia via BMD T-score has been added to the study selection section of the main report.</p>

	<p>timeline. Although part of the questions- it might be helpful to clarify that this osteoporosis definition does NOT include clinical osteoporosis by prior fracture.</p>	
4	<ul style="list-style-type: none"> • Page 1 <ul style="list-style-type: none"> ○ Line 37- sentence confusing- are these patient-important outcomes? <ul style="list-style-type: none"> ▪ Also missing punctuation 	Resolved.
4	<ul style="list-style-type: none"> • Page 3 <ul style="list-style-type: none"> ○ Line 46- “easy” should be “ease” <ul style="list-style-type: none"> ▪ Also unclear if this statement about deployment of these tools within the VA is necessary. 	Resolved.
4	<ul style="list-style-type: none"> • Page 4 <ul style="list-style-type: none"> ○ Line 50 extra punctuation ○ Line 52- Sentence confusing. May be aided by defining fixed appointments. 	Thank you. We have revised this sentence to provide better clarity.
4	<ul style="list-style-type: none"> • Page 5 <ul style="list-style-type: none"> ○ Line 13- may want to say the OST had the “least amount of variables” rather than “relatively few”. Or just define the # of variables. 	Thank you, this change has been made.
4	<ul style="list-style-type: none"> ○ Line 21- should it be clarified which outcomes we are discriminating between? BMD and Fracture? 	Thank you, the outcomes have been clarified in the key findings section of the executive summary discussion.
4	<ul style="list-style-type: none"> ○ Line 25- from above summary (pg4) it appears that patient-focused targets more often associated with increased screening uptake? I don’t see clearly where combined patient/provider interventions have highest impact. Please clarify. 	We have revised this section to improve clarity.
4	<ul style="list-style-type: none"> • Page 6 	Thank you, this has been addressed.

	<ul style="list-style-type: none"> ○ Line 25- just say that OST has 2 variables. ○ Line 40- extra space 	
4	<ul style="list-style-type: none"> ● Page 21 <ul style="list-style-type: none"> ○ Line 36- OST = 2variables (same suggestion as above) 	Thank you, this has been addressed.
4	<ul style="list-style-type: none"> ● Page 22 <ul style="list-style-type: none"> ○ line 41- define prevalence. % or in 1,000? 	Thank you, the prevalence of fracture has been marked as a percentage of the study population's results section of the KQ 1.
4	<ul style="list-style-type: none"> ● Line 53- extra underline at the end “_The 2” 	Thank you, this has been addressed in the final report.
4	<ul style="list-style-type: none"> ● Page 23 <ul style="list-style-type: none"> ○ Tables- define denominator for prevalence. I generally don't think of it as a pure % esp w/ rare outcomes. 	Thank you, the prevalence of fracture has been marked as a percentage of the study population's results section of the KQ 1.
4	<ul style="list-style-type: none"> ○ Line 60- extra underline “(Figure 5)” 	Thank you, this has been addressed in the final report.
	<ul style="list-style-type: none"> ○ Again- Prevalence rate is not a term I have seen used (although I see it is a true term). Consider denominator. 	Thank you, we have changed the prevalence rate to prevalence in the results section of KQ 1.
5	It is disappointing that the literature review ended in mid-2019 but the report was finished in late 2021. I hope that other studies were not missed by this (in addition to the recent one listed above).	Acknowledged. We updated the search and integrated new studies for the final report.
5	In the discussion, it would have been interesting to cite a similar review of screening in women - to compare how some of the same tools (e.g. FRAX, Garvan, OST) worked in women compared to men. Are the disappointing results in men so different from what we seem to accept less critically in women? The SCOOP Study (Shepstone et al.) is very recent, showing the efficacy of FRAX in women. Finally, the tools to predict osteoporosis by DXA were studied mostly using the male normative database for the	<p>Thank you, we have added reference to the SCOOP study in the Clinical Implications section.</p> <p>The comment was added to the KQ1 summary discussion on page 78.</p>

	<p>definition of osteoporosis, whereas FRAX uses the white female database for all. This may change the discrimination of the various tools to identify osteoporosis by DXA. Finally, it is not surprising that system interventions to improve osteoporosis screening in men have failed, as have most osteoporosis interventions in women.</p>	
5	<p>The contribution of each author should be provided.</p>	<p>Thank you for this suggestion, we have updated the authorship section to include contributions.</p>
6	<p>I am not aware of any publications that were not identified through the literature search. All the papers that I know on the subject are included.</p>	<p>Acknowledged</p>
6	<p>See email for comments a paper that is listed incorrectly in PubMed. First author for reference #50 is listed as Steuart Richards J. The correct name should be Richards JS as in reference #53 - See attachment</p>	<p>Thank you for bringing this indexing error to our attention. We have made the changes in our citation manager and corrected the name as referenced in our figures and text.</p>
7	<p>The authors have performed a comprehensive and clearly articulated review addressing the three clinical questions pertaining to osteoporosis and fracture risk identification tools in men and in Veterans, as well as interventions that increase screening/primary prevention of osteoporosis. My comments are summarized below.</p>	<p>Thank you.</p>
7	<p>1. For Key Question 1: I realize the focus of this question is on tools and does not include risk factors. It seems confusing to apply FRAX to those with ADT as existing guidelines recommend DXA screening to be obtained in people on chronic ADT, as this is an established risk factor for osteoporosis by DXA and fragility fracture, similar to chronic steroids. In this case, the ADT alone, would be the risk factor prioritizing the patient for DXA. The FRAX would be applied after DXA result is obtained to help determine treatment indication. Is the goal of key question 1 and 2 to identify the evidence for clinical risk tools and/or risk factors</p>	<p>Thank you for this clarification. The purpose of KQ 1 and 2 was to determine how best to identify those at the highest risk for fracture (which includes patients with osteoporosis).</p>

that identify patients at highest risk of osteoporosis or major fracture in order to facilitate prioritization of screening with DXA? Or treatment without DXA? Or both?

7 2. The paragraph on page 30 describing the Williams, et. al. study lists the risk factors for VA-FARA incorrectly. The factors listed are those for e-FRAX. The risk factors for VA-FARA include prior fracture, age>80, underweight, malnutrition, opioid exposure, proton-pump inhibitor use, depression diagnosis, stroke, seizure disorder, alcohol abuse disorder, fall risk, and clinic visits in prior year (*Osteoporos Int* (2012) 23:1017–1027). Technically, the VA-FARA and FRAX tools do identify those with prior fracture and are designed to predict fracture risk over osteoporosis by DXA, and the OST does not include prior fracture and is more useful for predicting osteoporosis by DXA scan.

Thank you, we have corrected this in the text.

7 3. For Key Question 3: The authors limited studies to randomized, non-randomized, controlled before-after, and interrupted time-series studies to reduce problems with study quality, publication bias and risk for confounding. However, it is possible that some observational studies might be more directly applicable to the population of interest and may reflect a more real-life setting than RCTs. Have the authors considered including some observational studies for Key Question 3? An observational cohort study published in the *Journal of Primary Care & Community Health* 2017, Vol. 8(3) 135–140 saw significantly increased rates of DXA screening in US Veterans through a systems redesign approach utilizing a bone health team telephone clinic dedicated to screening and managing Veterans in primary care panels.

We appreciate this comment and affirm the value of other study designs. As in all systematic reviews, we make methodological choices to balance rigor, responsiveness to questions of interest, and feasibility to complete the review. Thus, we constrained eligibility for KQ 3 to studies designs best suited to assess the effectiveness of system-level interventions as outlined by the Cochrane Effective Practice and Organization of Care (EPOC) Group.

APPENDIX G. TOOLS

Please refer to the main report's reference list for citations in this Appendix.

Tool	Components	Number of Studies
FRAX (with and without variation)	<ul style="list-style-type: none"> • Age • Sex • Weight • Height • Previous fracture • Parental history of hip fracture • Smoking status • Glucocorticoid use • Rheumatoid arthritis • Secondary osteoporosis • ≥ 3 units of alcohol per day • Femoral neck BMD 	19 ^{25,27-43,48}
OST	<ul style="list-style-type: none"> • Weight • Age <p>Test if score < 2 $0.2 \times (\text{body weight in kilograms} - \text{age in years})$, truncate to yield an integer</p>	8 ^{28,29,50-54,56}
OSTA	<ul style="list-style-type: none"> • Test if score < 2 • $0.2 \times \text{body weight in kilograms}$ (truncate to yield an integer) $- 0.2 \times \text{age in years}$ (truncate to yield an integer) 	2 ^{50,55}
QFracture (2009)	<ul style="list-style-type: none"> • Age at study entry • Body mass index • Smoking status (non-smoker, ex-smoker, light smoker (<10 cigarettes/day), moderate smoker (10-19 cigarettes/day), heavy smoker (≥ 20 cigarettes/day)) • Parental history of osteoporosis or hip fracture in a first degree relative (binary variable; yes/no) • Cardiovascular disease (binary variable; yes/no) • Alcohol intake (none, trivial (<1 unit/day), light (1-2 units/day), medium (3-6 units/day), heavy (7-9 units/day), very heavy (>9 units/day)) • Rheumatoid arthritis (binary variable; yes/no) • Type 2 diabetes (binary variable; yes/no) • Asthma (binary variable; yes/no) • History of falls (binary variable; yes/no) • Chronic liver disease (binary variable; yes/no) • Gastrointestinal conditions likely to result in malabsorption (that is, Crohn's disease, ulcerative 	5 ^{30,32,40,57,58}

Tool	Components	Number of Studies
	<p>colitis, celiac disease, steatorrhoea, blind loop syndrome) at baseline (binary variable; yes/no)</p> <ul style="list-style-type: none"> • Other endocrine conditions (thyrotoxicosis, primary or secondary hyperparathyroidism, Cushing's syndrome) at baseline (binary variable; yes/no) • At least two prescriptions for systemic corticosteroids in the six months preceding baseline (binary variable; yes/no) • At least two prescriptions for tricyclic antidepressants in the six months preceding baseline (binary variable; yes/no) • At least two prescriptions for hormone replacement therapy (in women) in the six months preceding baseline (binary variable; yes/no) • Menopausal symptoms in women (binary variable; yes/no) 	
QFracture (updated 2016)	<ul style="list-style-type: none"> • Age • Sex • Ethnicity • Smoking status (non smoker, ex smoker, light, moderate, heavy) • Alcohol use • Type 1 or Type 2 diabetes • Parental history of hip fracture/osteoporosis • Nursing or care home residence • History of prior osteoporotic (wrist, spine, hip, or shoulder) fracture • History of falls • Dementia • Cancer • Asthma or COPD • Cardiovascular disease • Chronic liver disease • Chronic kidney disease • Parkinson's disease • Rheumatoid arthritis or systemic lupus erythematosus (SLE) • Gastrointestinal malabsorption (including Crohns disease, ulcerative colitis, celiac disease, steatorrhoea, blind loop syndrome) • Epilepsy or use of anticonvulsants • Use of antidepressants (at least 2 scripts in last 6 months) • Use of corticosteroids (at least 2 scripts in last 6 months) • Body mass index 	1 ⁵⁷

Tool	Components	Number of Studies
	Additional factors are used for women only: <ul style="list-style-type: none"> • Use of oestrogen only Hormone Replacement Therapy • Endocrine problems (thyrotoxicosis, primary or secondary hyperparathyroidism, Cushings syndrome) 	
MORES	<ul style="list-style-type: none"> • Age • COPD • Weight 	4 ^{27,59-61}
Garvan	<ul style="list-style-type: none"> • Age • Bone mineral density • Body weight • A history of prior fracture after the age of 50 • Any falls during the past 12 months 	3 ^{30,40,43}}
FRA-HS	<ul style="list-style-type: none"> • BMI • Sex • Age • Long-term use of corticosteroids (At least 180 DDD within the year preceding the index date) • alcohol abuse (ie, >40 and >20 g daily for men and women, respectively) or alcohol-related diseases • current smoking • Rheumatoid arthritis • history of osteoporotic fractures • other causes of secondary osteoporosis 	1 ⁶⁴
Korean Fracture Risk Score (KFRS)	<ul style="list-style-type: none"> • Age • BMI • history of recent fragility fracture • regular exercise (Weekly exercise of one or more times) • high alcohol intake (Five or more units for men, three or more units for women) • current smoking status • recent use of oral glucocorticoid • history of rheumatoid arthritis • use of medication or disease causing a low BMD 	1 ⁶⁸
KORAM-M: Model 1 (age and body weight)	<ul style="list-style-type: none"> • Age • Weight (age in years/10)×(-3)+(weight in kilograms/ 10)×8] 	1 ⁵⁵
KORAM-M: Model 2 (age, weight, and exercise)	<ul style="list-style-type: none"> • Age • Weight • Health behavior 	1 ⁵⁵

Tool	Components	Number of Studies
	$[(\text{age in years}/10) \times (-3) + (\text{weight in kilograms}/10) \times 8 + (\text{if no regular exercise}) \times (-2)]$	
KORAM-M: Model 3 (age, weight, exercise, vitamin D, and ALP)	<ul style="list-style-type: none"> • Age • Weight • Exercise • Blood tests (Vitamin D & ALP) $[(\text{age in years}/10) \times (-3) + (\text{weight in kilograms}/10) \times 8 + (\text{if no regular exercise}) \times (-2) + (\text{if low vitamin D}) \times (-2) + (\text{if elevated ALP}) \times (-6)]$	1 ⁵⁵
FRC	<ul style="list-style-type: none"> • Age • Sex • Race/ethnicity • BMI • BMD • Smoking, current • Alcohol >3 units/day • Glucocorticoid exposure • Fracture after age 45 y • Parent with hip fracture • Rheumatoid arthritis • Secondary cause of bone loss <p>Specific patient characteristics (body mass index [BMI], history of fracture, parental history of hip fracture, smoking and alcohol consumption, use of corticosteroids, prevalence of rheumatoid arthritis, and secondary osteoporosis) are compared with the base population and relative risks are applied to factors that differ between the individual patient and the base population. Race/ethnicity offsets are based on published fracture risk ratios relative to Caucasian. Data on age, gender, race, and BMI are required.</p>	1 ⁶⁶
Model 1: low body weight and age >65	<ul style="list-style-type: none"> • Low body weight • Age of >65 yr 	1 ⁵²
Model 3: OST + low body weight and age >65	<ul style="list-style-type: none"> • Low body weight • Age of >65 yr • OST score, per 1 unit increase 	1 ⁵²
FRAX-A	<ul style="list-style-type: none"> • Age • Sex • Prior fracture • COPD diagnosis (smoking proxy) • Prolonged glucocorticoid use • Rheumatoid arthritis diagnosis • Secondary osteoporosis • Alcohol/substance abuse (high alcohol use proxy) 	1 ⁴¹

Tool	Components	Number of Studies
FRAX-A+	<ul style="list-style-type: none"> • Age • Sex • Prior fracture • COPD diagnosis (smoking proxy) • Prolonged glucocorticoid use • Rheumatoid arthritis diagnosis • Secondary osteoporosis • Alcohol/substance abuse (high alcohol use proxy) • Aggregated Diagnostic Groups score • Number of hospitalizations, three years prior to BMD test • Depression diagnosis • Dementia diagnosis 	1 ⁴¹
Model II: age+baseline weight+prior fracture+fall	<ul style="list-style-type: none"> • Age • Baseline weight • Prior fracture • Fall 	1 ⁶³
e-FRAX	<ul style="list-style-type: none"> • Prior fracture • Age ≥ 80 years • Normal or underweight versus overweight • Malnutritive disorder • Opioid exposure • Proton-pump inhibitor (PPI) use • Depression diagnosis • Stroke • Smoking • Seizure disorder • Alcohol abuse disorder • 6–12 clinic visits in prior year versus 5 or fewer • 13+ clinic visits in prior year versus 5 or fewer • Fall risk 	1 ²⁸
VA-FARA	<ul style="list-style-type: none"> • Age • Sex • BMI • Previous fracture • History of parental hip fracture • Current smoking • Glucocorticoids • Rheumatoid arthritis • Alcohol use • BMD (optional) 	1 ²⁸

Tool	Components	Number of Studies
"Modified FRAX" (without BMD)	<ul style="list-style-type: none"> • Age • Race/ethnicity limited to categories utilized in FRAX (white, black, Asian, Hispanic) • Weight (kg) • Height (cm²) • History of previous fragility fracture • Ever glucocorticoid use • Rheumatoid arthritis • Alcohol use 	1 ²⁶
Mscore	<ul style="list-style-type: none"> • Age • Weight • Gastrectomy • Emphysema • Prior fractures <p data-bbox="488 835 1149 930">[2 x (patient age in decades) - (weight in lb/10) + 4 if gastrectomy, + 4 if emphysema, + 3 if two or more prior fractures + 14]</p>	1 ⁶⁷
Weight-based calculation	Weight	1 ⁵¹
BMI-based calculation	Weight in kilograms divided by height in meters squared	1 ⁵¹