

Draft

Asthma Management

Search strategies appendix

NICE guideline

Appendices

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Draft

*Commissioned by the National Institute for
Health and Care Excellence*

Disclaimer

Healthcare professionals are expected to take NICE guidelines fully into account when exercising their clinical judgement. However, the guidance does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of each patient, in consultation with the patient and, where appropriate, their guardian or carer.

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Appendix A: Literature search strategies

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Search strategies used for the Asthma Management guideline are outlined below and were run in accordance with the methodology in the NICE guidelines manual (2014), available from <https://www.nice.org.uk/article/pmg20/>. All searches were run up to 12/09/2016 unless otherwise stated. Any studies added to the databases after this date (even those published prior to this date) were not included unless specifically stated in the text. Electronic, ahead of print or ‘online early’ publications are not routinely searched for. Where possible searches were limited to retrieve material published in English.

Table 1: Database date parameters

Database	Dates searched
Medline	1946 – 12 September 2016
Embase	1974 – 12 September 2016
The Cochrane Library	Cochrane Reviews to 2016 Issue 9 of 12 CENTRAL to 2016 Issue 9 of 12 DARE, HTA and NHSEED to 2015 Issue 2 of 4
AMED	Inception – 12 September 2016

Searches for the **clinical reviews** were run in Medline (OVID), Embase (OVID) and the Cochrane Library (Wiley). Additional searches were run in AMED, Allied and Complementary Medicine (Ovid), see Table 2.

Searches for **intervention and diagnostic studies** were usually constructed using a PICO format where population (P) terms were combined with Intervention (I) and sometimes Comparison (C) terms. An intervention can be a drug, a procedure or a diagnostic test. Outcomes (O) are rarely used in search strategies for interventions. Search filters were also added to the search where appropriate.

Searches for **prognostic studies** were usually constructed combining population terms with prognostic variable terms and sometimes outcomes. Search filters were added to the search where appropriate.

Table 2: Databases searched

Question	Question number	Databases
Adherence	A.4.1	Medline, Embase, Cochrane Library
Breathing Exercises	A.4.2	Medline, Embase, AMED, Cochrane Library
PAAP - Personalised Asthma Action Plan	A.4.3	Medline, Embase, Cochrane Library
Pharma	A.4.4	Medline, Embase, Cochrane Library
Risk Stratification	A.4.5	Medline, Embase, Cochrane Library
Self- Management	A.4.6	Medline, Embase, Cochrane Library
Step Down	A.4.7	Medline, Embase, Cochrane Library
Health Economic Reviews	A.5.1	Medline, Embase, NHS EED, HTA
Quality of Life Review	A.5.2	Medline, Embase, NHS EED, HTA

Searches for the health economic reviews were run in Medline, Embase, the NHS Economic Evaluations Database (NHS EED) and the Health Technology Assessment (HTA) database. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD).

For Medline and Embase an economic filter (instead of a study type filter) was added to the same clinical search strategy. Searches in CRD were constructed using population terms only.

A.2 Population search strategies

A.2.1 Standard asthma management population

Medline, Embase and AMED search terms

1.	exp asthma/
2.	asthma*.ti.
3.	or/1-2

Cochrane search terms

#1.	MeSH descriptor: [asthma] explode all trees
#2.	Asthma*:ti
#3.	#1 or #2

CRD search terms

#4.	MeSH descriptor: [asthma] explode all trees
#5.	(Asthma*)

#6.	#1 or #2
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A.3

Study filter search terms

A.3.1 Excluded study designs and publication types

The following study designs and publication types were removed from retrieved results using the NOT operator.

Medline search terms

1.	letter/
2.	editorial/
3.	news/
4.	exp historical article/
5.	anecdotes as topic/
6.	comment/
7.	case report/
8.	(letter or comment*).ti.
9.	or/1-8
10.	randomized controlled trial/ or random*.ti,ab.
11.	9 not 10
12.	animals/ not humans/
13.	exp animals, laboratory/
14.	exp animal experimentation/
15.	exp models, animal/
16.	exp rodentia/
17.	(rat or rats or mouse or mice).ti.
18.	or/11-17

Embase search terms

1.	letter.pt. or letter/
2.	note.pt.
3.	editorial.pt.
4.	case report/ or case study/
5.	(letter or comment*).ti.
6.	or/1-5
7.	randomized controlled trial/ or random*.ti,ab.
8.	6 not 7
9.	animal/ not human/
10.	nonhuman/
11.	exp animal experiment/
12.	exp experimental animal/
13.	animal model/
14.	exp rodent/
15.	(rat or rats or mouse or mice).ti.

16.	or/8-15
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AMED search terms

1.	case report/
2.	(letter or comment*).ti.
3.	or/1-2
4.	randomized controlled trials/ or random*.ti,ab.
5.	3 not 4
6.	animals/ not humans/
7.	(rat or rats or mouse or mice).ti.
8.	or/5-7

A.3.2 Randomised controlled trials (RCT)

Medline search terms

(Based on the sensitivity and precision maximising version reported in the Cochrane Handbook (<http://handbook.cochrane.org/>)).

1.	randomized controlled trial.pt.
2.	controlled clinical trial.pt.
3.	randomi#ed.ti,ab.
4.	placebo.ab.
5.	randomly.ab.ti
6.	clinical trials as topic.sh.
7.	trial.ti.
8.	or/1-7

Embase search terms

1.	random*.ti,ab.
2.	factorial*.ti,ab.
3.	(crossover* or cross over*).ti,ab.
4.	((doubl* or singl*) adj blind*).ti,ab.
5.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
6.	crossover procedure/
7.	double blind procedure/
8.	single blind procedure/
9.	randomized controlled trial/
10.	or/1-9

A.3.3 Systematic reviews (SR)

Medline search terms

1.	meta-analysis/
2.	meta-analysis as topic/
3.	(meta analy* or metanaly* or metaanaly*).ti,ab.
4.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
5.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.

7.	(search* adj4 literature).ab.
8.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9.	cochrane.jw.
10.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
11.	or/1-10

Embase search terms

1.	systematic review/
2.	meta-analysis/
3.	(meta analy* or metanaly* or metaanaly*).ti,ab.
4.	((systematic or evidence) adj3 (review* or overview*).ti,ab.
5.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
6.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
7.	(search* adj4 literature).ab.
8.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
9.	cochrane.jw.
10.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
11.	or/1-10

A.3.4 Health economic studies (HE)

Medline search terms

1.	economics/
2.	value of life/
3.	exp "costs and cost analysis"/
4.	exp economics, hospital/
5.	exp economics, medical/
6.	economics, nursing/
7.	economics, pharmaceutical/
8.	exp "fees and charges"/
9.	exp budgets/
10.	budget*.ti,ab.
11.	cost*.ti.
12.	(economic* or pharmaco?economic*).ti.
13.	(price* or pricing*).ti,ab.
14.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*).ab.
15.	(financ* or fee or fees).ti,ab.
16.	(value adj2 (money or monetary)).ti,ab.
17.	or/1-16

Embase search terms

1.	health economics/
2.	exp economic evaluation/
3.	exp health care cost/
4.	exp fee/

5.	budget/
6.	funding/
7.	budget*.ti,ab.
8.	cost*.ti.
9.	(economic* or pharmaco?economic*).ti.
10.	(price* or pricing*).ti,ab.
11.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
12.	(financ* or fee or fees).ti,ab.
13.	(value adj2 (money or monetary)).ti,ab.
14.	or/1-13

A.3.5 Quality of life studies (QoL)

Medline search terms

1.	quality-adjusted life years/
2.	sickness impact profile/
3.	(quality adj2 (wellbeing or well-being)).ti,ab.
4.	sickness impact profile.ti,ab.
5.	disability adjusted life.ti,ab.
6.	(qal* or qtime* or qwb* or daly*).ti,ab.
7.	(euroqol* or eq5d* or eq 5d*).ti,ab.
8.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
9.	(health utility* or utility score* or disutilit*).ti,ab.
10.	(hui or hui1 or hui2 or hui3).ti,ab.
11.	health* year* equivalent*.ti,ab.
12.	(hye or hyes).ti,ab.
13.	rosser.ti,ab.
14.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
15.	(sf36 or sf 36 or short form 36 or shortform 36 or shortform36).ti,ab.
16.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
17.	(sf12 or sf 12 or short form 12 or shortform 12 or shortform12).ti,ab.
18.	(sf8 or sf 8 or short form 8 or shortform 8 or shortform8).ti,ab.
19.	(sf6 or sf 6 or short form 6 or shortform 6 or shortform6).ti,ab.
20.	or/1-19

Embase search terms

1.	quality adjusted life year/
2.	"quality of life index"/
3.	short form 12/ or short form 20/ or short form 36/ or short form 8/
4.	sickness impact profile/
5.	(quality adj2 (wellbeing or well-being)).ti,ab.
6.	sickness impact profile.ti,ab.
7.	disability adjusted life.ti,ab.
8.	(qal* or qtime* or qwb* or daly*).ti,ab.
9.	(euroqol* or eq5d* or eq 5d*).ti,ab.
10.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.

11.	(health utility* or utility score* or disutilit*).ti,ab.
12.	(hui or hui1 or hui2 or hui3).ti,ab.
13.	health* year* equivalent*.ti,ab.
14.	(hye or hyes).ti,ab.
15.	rosser.ti,ab.
16.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
17.	(sf36 or sf 36 or short form 36 or shortform 36 or shortform36).ti,ab.
18.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
19.	(sf12 or sf 12 or short form 12 or shortform 12 or shortform12).ti,ab.
20.	(sf8 or sf 8 or short form 8 or shortform 8 or shortform8).ti,ab.
21.	(sf6 or sf 6 or short form 6 or shortform 6 or shortform6).ti,ab.
22.	or/1-21

A.3.6 Observational studies (OBS)

Medline search terms

1.	epidemiologic studies/
2.	exp case control studies/
3.	exp cohort studies/
4.	cross-sectional studies/
5.	case control.ti,ab.
6.	(cohort adj (study or studies or analys*)).ti,ab.
7.	((follow up or observational or uncontrolled or non randomi#ed or nonrandomi#ed or epidemiologic*) adj (study or studies)).ti,ab.
8.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort*)).ti,ab.
9.	or/1-8

Embase search terms

1.	clinical study/
2.	exp case control study/
3.	family study/
4.	longitudinal study/
5.	retrospective study/
6.	prospective study/
7.	cross-sectional study/
8.	cohort analysis/
9.	follow-up/
10.	cohort*.ti,ab.
11.	9 and 10
12.	case control.ti,ab.
13.	(cohort adj (study or studies or analys*)).ti,ab.
14.	((follow up or observational or uncontrolled or non randomi#ed or nonrandomi#ed or epidemiologic*) adj (study or studies)).ti,ab.
15.	((longitudinal or retrospective or prospective or cross sectional) and (study or studies or review or analys* or cohort*)).ti,ab.
16.	or/1-8,11-15

A.4 Search Strategies for Specific Questions

A.4.1 Adherence

- What are the most clinically and cost-effective strategies to improve medicines adherence in children, young people and adults with asthma who are non-adherent to prescribed medicines?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	medication adherence/
6.	patient compliance/
7.	((adhere* or comply or complian* or complie*) adj4 (therap* or treat* or medicat* or drug* or dose* or medicine* or patient* or regimen)).ti,ab.
8.	(adhere* adj4 (improv* or increas* or enhanc* or strateg* or implement* or facilitat* or barrier* or manag*)).ti,ab.
9.	(adhere* adj3 (alert* or alarm* or review* or educat* or consult* or text* or app* or tool* or remind* or educat* or advice)).ti,ab.
10.	or/5-9
11.	(non-adhere* or non-complian* or nonadhere* or noncomplian*).ti,ab.
12.	((poor* or low* or lack*) adj3 (adhere* or complian*)).ti,ab.
13.	or/11-12
14.	10 or 13
15.	Study filters RCT (A.3.2) or SR (A.3.3) or OBS (A.3.6)
16.	4 and 14 and 15

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	medication compliance/
6.	patient compliance/
7.	((adhere* or comply or complian* or complie*) adj4 (therap* or treat* or medicat* or drug* or dose* or medicine* or patient* or regimen)).ti,ab.
8.	(adhere* adj4 (improv* or increas* or enhanc* or strateg* or implement* or facilitat* or barrier* or manag*)).ti,ab.
9.	(adhere* adj3 (alert* or alarm* or review* or educat* or consult* or text* or app* or tool* or remind* or educat* or advice)).ti,ab.
10.	or/5-9
11.	(non-adhere* or non-complian* or nonadhere* or noncomplian*).ti,ab.
12.	((poor* or low* or lack*) adj3 (adhere* or complian*)).ti,ab.
13.	11 or 12
14.	10 or 13
15.	Study filters RCT (A.3.2) or SR (A.3.3) or OBS (A.3.6)
16.	4 and 14 and 15

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [medication adherence] this term only
#3.	MeSH descriptor: [patient compliance] this term only
#4.	((adhere* or comply or complian* or complie*) near/4 (therap* or treat* or medicat* or drug* or dose* or medicine* or patient* or regimen)):ti,ab
#5.	(adhere* near/4 (improv* or increas* or enhanc* or strateg* or implement* or facilitat* or barrier* or manag*)):ti,ab
#6.	(adhere* near/3 (alert* or alarm* or review* or educat* or consult* or text* or app* or tool* or remind* or educat* or advice)):ti,ab
#7.	{or #2-#6}
#8.	(non-adhere* or non-complian* or nonadhere* or noncomplian*):ti,ab
#9.	((poor* or low* or lack*) near/3 (adhere* or complian*)):ti,ab
#10.	#8 or #9
#11.	#7 or #10
#12.	#1 and #11

A.4.2 Breathing Exercises

- Are breathing exercises clinically and cost effective for people with asthma?

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	breathing exercise/
6.	((breath* or respirat* or bronchial) adj1 (exercise* or train* or retrain* or technique* or manipul* or rehab* or practice* or programme* or therap*)):ti,ab.
7.	(buteyko or papworth or pranayama or lotorp).ti,ab.
8.	yoga/
9.	(yoga or pilates or yogic breathing).ti,ab.
10.	((breath* or respirat* or bronchial) adj3 (physiotherap* or physical therapy or rehab*)):ti,ab.
11.	or/5-10
12.	4 and 11
13.	Study filters RCT (A.3.2) or SR (A.3.3)
14.	12 and 13

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	breathing exercises/
6.	((breath* or respirat* or bronchial) adj1 (exercise* or train* or retrain* or technique* or manipul* or rehab* or practice* or programme* or therap*)):ti,ab.
7.	(buteyko or papworth or pranayama or lotorp).ti,ab.
8.	yoga/
9.	(yoga or pilates or yogic breathing).ti,ab.

10.	((breath* or respirat* or bronchial) adj3 (physiotherap* or physical therapy or rehab*)).ti,ab.
11.	or/5-10
12.	4 and 11
13.	Study filters RCT (A.3.2) or SR (A.3.3)
14.	12 and 13

AMED search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	breathing exercises/
5.	((breath* or respirat* or bronchial) adj1 (exercise* or train* or retrain* or technique* or manipul* or rehab* or practice* or programme* or therap*)).ti,ab.
6.	(buteyko or papworth or pranayama or lotorp).ti,ab.
7.	yoga/
8.	(yoga or pilates or yogic breathing).ti,ab.
9.	((breath* or respirat* or bronchial) adj3 (physiotherap* or physical therapy or rehab*)).ti,ab.
10.	or/4-9
11.	3 and 10

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [breathing Exercises] this term only
#3.	((breath* or respirat* or bronchial) next/1 (exercise* or train* or retrain* or technique* or manipul* or rehab* or practice* or programme* or therap*)):ti,ab
#4.	(buteyko or papworth method or pranayama or lotorp method):ti,ab
#5.	MeSH descriptor: [yoga] this term only
#6.	(yoga or pilates or yogic breathing):ti,ab
#7.	((breath* or respirat* or bronchial) near/3 (physiotherap* or physical therapy or rehab*)):ti,ab
#8.	{or #2-#7}
#9.	#1 and #8

A.4.3 PAAP – Personalised Asthma Action Plan

- What is the optimal increase in preventer therapy within supported self- management when control is lost?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	self care/ or self administration/
6.	((self-manage* or self-monitor* or self-care) adj3 (strateg* or program* or guide* or information or educat* or plan* or paap or pap or diary or diaries or tool* or booklet* or manual* or pamphlet* or leaflet* or review*)).ti,ab.
7.	((supported or patient* or individualis* or individualiz*) adj3 (self-manage* or self manage* or self-care or self care or self-monitor* or self monitor* or plan* or paap or pap)).ti,ab.
8.	((patient* or individualis* or individualiz*) adj3 (diary or diaries or program* or tool* or

	educat*).ti,ab.
9.	(dose* adj5 (doubl* or exacerbat* or maintenance* or maintain* or prevent* or reliev*).ti,ab.
10.	or/ 5-9
11.	(inhaled corticosteroid* or ics).ti,ab.
12.	triamcinolone/
13.	budesonide/
14.	beclomethasone/
15.	(budesonide or beclomethasone* or ciclesonide or fluticasone* or flunisolide or triamcinolone or pulmicort flexhaler or qvar or formoterol or fostair or ciclesonide or alvesco or mometasone* or asmanex or aerobid).ti,ab.
16.	or/ 11-15
17.	10 and 16
18.	4 and 17

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	self care/ or drug self administration/
6.	((self-manage* or self-monitor* or self-care) adj3 (strateg* or program* or guide* or information or educat* or plan* or paap or pap or diary or diaries or tool* or booklet* or manual* or pamphlet* or leaflet* or review*).ti,ab.
7.	((supported or patient* or individualis* or individualiz*) adj3 (self-manage* or self manage* or self-care or self care or self-monitor* or self monitor* or plan* or paap or pap)).ti,ab.
8.	((patient* or individualis* or individualiz*) adj3 (diary or diaries or program* or tool* or educat*).ti,ab.
9.	(dose* adj5 (doubl* or exacerbat* or maintenance* or maintain* or prevent* or reliev*).ti,ab.
10.	or/ 5-9
11.	(inhaled corticosteroid* or ics).ti,ab.
12.	*triamcinolone/
13.	*budesonide/
14.	*beclomethasone/
15.	(budesonide or beclomethasone* or ciclesonide or fluticasone* or flunisolide or triamcinolone or pulmicort flexhaler or qvar or formoterol or fostair or ciclesonide or alvesco or mometasone* or asmanex or aerobid).ti,ab.
16.	or/ 11-15
17.	10 and 16
18.	4 and 17

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [self care] this term only
#3.	MeSH descriptor: [self administration] this term only
#4.	((self-manage* or self-monitor* or self-care) near/3 (strateg* or program* or guide* or information or educat* or plan* or paap or pap or diary or diaries or tool* or booklet* or manual* or pamphlet* or leaflet* or review*)):ti,ab
#5.	((supported or patient* or individualis* or individualiz*) near/3 (self-manage* or self manage* or self-care or self care or self-monitor* or self monitor* or plan* or paap or pap)):ti,ab

#6.	((patient* or individualis* or individualiz*) near/3 (diary or diaries or program* or tool* or educat*)):ti,ab
#7.	(dose* near/5 (doubl* or exacerbat* or maintenance* or maintain* or prevent* or relief*)):ti,ab
#8.	#2 or #3 or #4 or #5 or #6 or #7
#9.	(inhaled corticosteroid* or ics):ti,ab
#10.	MeSH descriptor: [Triamcinolone] this term only
#11.	MeSH descriptor: [Budesonide] this term only
#12.	MeSH descriptor: [Beclomethasone] this term only
#13.	(budesonide or beclomethasone* or ciclesonide or fluticasone* or flunisolide or triamcinolone or pulmicort flexhaler or qvar or formoterol or fostair or ciclesonide or alvesco or mometasone* or asmanex or aerobid):ti,ab
#14.	#9 or #10 or #11 or #12 or #13
#15.	#8 and #14
#16.	#1 and #15

A.4.4 Pharmacological

Searches for the following five questions were run as one search:

- In children, young people and adults with asthma who are treatment-naïve, what is the most clinically and cost effective initial therapy to be started on?
- What is the most clinically and cost effective preventer drug (class or combination of drug classes) for the management of children, young people and adults with asthma who are uncontrolled on SABA alone (preventer-naïve) or who are treatment-naïve?
- What is the most clinically and cost effective drug (class or combination of drug classes) for the management of children, young people and adults with asthma who are currently taking an optimal single preventer (see previous question) when this fails to provide adequate control?
- What is the most clinically and cost effective drug (class or combination of drug classes) for the management of children, young people and adults with asthma who are currently taking optimal preventer therapy according to step 3 (see previous question) when this fails to provide adequate control?
- In children, young people and adults with asthma on ICS preventer therapy, is intermittent ICS more clinically and cost effective than regular ICS?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	adrenergic beta-2 receptor agonists/
6.	(adrenergic beta-2 receptor agonist* or saba or short acting beta agonist* or short-acting beta agonist* or short acting adrenoceptor agonist* or short-acting beta-adrenoceptor agonist* or short acting beta2 agonist* or short-acting beta-2 agonist*).ti,ab.
7.	albuterol/
8.	terbutaline/
9.	(albuterol or salbutamol or terbutaline).ti,ab.
10.	(airolin or airomir or asmasal or buventol or inspiryl or proventil or salamol or salbulin).ti,ab.
11.	(brethine or bricanyl).ti,ab.

12.	or/5-11
13.	(inhaled corticosteroid* or ics).ti,ab.
14.	triamcinolone/
15.	budesonide/
16.	beclomethasone/
17.	(budesonide or beclomethasone* or ciclesonide or fluticasone* or flunisolide or triamcinolone or pulmicort flexhaler or qvar or formoterol or fostair or ciclesonide or alvesco or mometasone* or asmanex or aerobid).ti,ab.
18.	or/13-17
19.	leukotriene antagonists/
20.	cromolyn sodium/
21.	theophylline/ or aminophylline/
22.	nedocromil/
23.	(leukotriene receptor antagonist* or leukotriene antagonist* or ltra or theophylline or aminophylline or cromolyn* or sodium cromoglicate or nedocromil or montelukast or zafirlukast or singulair or accolate).ti,ab.
24.	or/19-23
25.	((smart or mart or symbicort) adj1 therapy).ti,ab.
26.	(laba or long acting beta agonist* or long-acting beta agonist* or long acting adrenoceptor agonist* or long-acting beta-adrenoceptor agonist* or long acting beta2 agonist* or long-acting beta-2 agonist*).ti,ab.
27.	(salmeterol or formoterol or vilanterol or serevent or Seretide or foradil or atimos modulite or duaklir genuair or ANORO or relvar or fostair).ti,ab.
28.	or/25-27
29.	muscarinic antagonists/
30.	(long acting muscarinic antagonist* or muscarinic antagonist* or LAMA).ti,ab.
31.	ipratropium/
32.	(ipratropium or tiotropium or ATROVENT or SPIRIVA).ti,ab.
33.	or/29-32
34.	(cortisone acetate or dexamethasone or cortef or orapred or relone or OCS or oral corticosteroid* or delzacort).ti,ab.
35.	(betadexamethasone or betamethasone or celeston* or cellederm or flubenisolone or dexasone or dexpak or hexadrol or maxidex).ti,ab.
36.	(methylfluorprednisolone or millicorten or oradexon or cortifair or cortisol or cortril or epicortisol or hydrocortisone or medrol or methylprednisolone or metipred or urbason or predate or prednisolone or predonine or apo-prednisone or cortan or cortancyl or cutason or dacortin or decortin or decortisyl or dehydrocortisone or deltasone or encorton or encortone or enkortolon or kortancyl or meticorten or orasone or panafcort or panasol or predniment or prednison galen or prednison hexal or prednison acsis or prednisone or pronisone or rectodelt or sterapred or ultracorten or winpred or alpha fluorohydrocortisone or astonin or fludrocortisone).ti,ab.
37.	betamethasone/ or dexamethasone/ or methylprednisolone/ or prednisolone/ or prednisone/
38.	or/34-37
39.	12 or 18 or 24 or 28 or 33 or 38
40.	4 and 39
41.	Study filters RCT (A.3.2) or SR (A.3.3)
42.	40 and 41

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	*beta 2 adrenergic receptor stimulating agent/
6.	(adrenergic beta-2 receptor agonist* or saba or short acting beta agonist* or short-acting beta agonist* or short acting adrenoceptor agonist* or short-acting beta-adrenoceptor agonist* or short acting beta2 agonist* or short-acting beta-2 agonist*).ti,ab.
7.	*salbutamol/
8.	*terbutaline/
9.	(albuterol or salbutamol or terbutaline).ti,ab.
10.	(airolin or airomir or asmasal or buventol or inspiryl or proventil or salamol or salbulin).ti,ab.
11.	(brethine or bricanyl).ti,ab.
12.	or/5-11
13.	(inhaled corticosteroid* or ics or icss).ti,ab.
14.	*triamcinolone/
15.	*budesonide/
16.	*beclomethasone/
17.	(budesonide or beclomethasone* or ciclesonide or fluticasone* or flunisolide or triamcinolone or pulmicort flexhaler or qvar or formoterol or fostair or ciclesonide or alvesco or mometasone* or asmanex or aerobid).ti,ab.
18.	or/13-17
19.	*leukotriene receptor blocking agent/
20.	*cromoglycate disodium/
21.	*theophylline/
22.	*aminophylline/
23.	*nedocromil/
24.	(leukotriene receptor antagonist* or leukotriene antagonist* or ltra or theophylline or aminophylline or cromolyn* or sodium cromoglycate or nedocromil or montelukast or zafirlukast or singulair or accolat).ti,ab.
25.	or/19-24
26.	((smart or mart or symbicort) adj1 therapy).ti,ab.
27.	(laba or long acting beta agonist* or long-acting beta agonist* or long acting adrenoceptor agonist* or long-acting beta-adrenoceptor agonist* or long acting beta2 agonist* or long-acting beta-2 agonist*).ti,ab.
28.	(salmeterol or formoterol or vilanterol or serevent or seretide or foradil or atimos modulite or duaklir genuair or anoro or relvar or fostair).ti,ab.
29.	or/26-28
30.	*muscarinic receptor blocking agent/
31.	(muscarinic antagonist* or lama).ti,ab.
32.	*ipratropium bromide/
33.	(ipratropium or tiotropium or atrovent or spiriva).ti,ab.
34.	or/30-33
35.	(cortisone acetate or dexamethasone or cortef or orapred or prelone or ocs or oral corticosteroid* or delazacort).ti,ab.
36.	(betadexamethasone or betamethasone or celeston* or cellestoderm or flubenisolone or dexasone or dexpak or hexadrol or maxidex).ti,ab.

37.	(methylfluorprednisolone or millicorten or oradexon or cortifair or cortisol or cortril or epicortisol or hydrocortisone or medrol or methylprednisolone or metipred or urbason or predate or prednisolone or predonine or apo-prednisone or cortan or cortancyl or cutason or dacortin or decortin or decortisyl or dehydrocortisone or deltasone or encorton or encortone or enkortolon or kortancyl or meticorten or orasone or panafcort or panasol or predniment or prednison galen or prednison hexal or prednison acsis or prednisone or pronisone or rectodelt or steraped or ultracorten or winpred or alpha fluorohydrocortisone or astonin or fludrocortisone).ti,ab.
38.	betamethasone/ or dexamethasone/ or methylprednisolone/ or prednisolone/ or prednisone/
39.	or/35-38
40.	12 or 18 or 25 or 29 or 34 or 39
41.	4 and 40
42.	Study filters RCT (A.3.2) or SR (A.3.3)
43.	41 and 42

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [adrenergic beta-2 receptor agonists] this term only
#3.	(adrenergic beta-2 receptor agonist* or saba or short acting beta agonist* or short-acting beta agonist* or short acting adrenoceptor agonist* or short-acting beta-adrenoceptor agonist* or short acting beta2 agonist* or short-acting beta-2 agonist*):ti,ab
#4.	MeSH descriptor: [albuterol] this term only
#5.	MeSH descriptor: [terbutaline] this term only
#6.	(albuterol or salbutamol or terbutaline):ti,ab
#7.	(airolin or airomir or asmasal or buventol or inspieryl or proventil or salamol or salbulin):ti,ab
#8.	(brethine or bricanyl):ti,ab
#9.	{or #2-#8}
#10.	(inhaled corticosteroid* or ics):ti,ab
#11.	MeSH descriptor: [triamcinolone] this term only
#12.	MeSH descriptor: [budesonide] this term only
#13.	MeSH descriptor: [beclomethasone] this term only
#14.	(budesonide or beclomethasone* or ciclesonide or fluticasone* or flunisolide or triamcinolone or pulmicort flexhaler or qvar or formoterol or fostair or ciclesonide or alvesco or mometasone* or asmanex or aerobid):ti,ab
#15.	{or #10-#14}
#16.	MeSH descriptor: [leukotriene antagonists] this term only
#17.	MeSH descriptor: [cromolyn sodium] this term only
#18.	MeSH descriptor: [theophylline] this term only
#19.	MeSH descriptor: [aminophylline] this term only
#20.	MeSH descriptor: [nedocromil] this term only
#21.	(leukotriene receptor antagonist* or leukotriene antagonist* or ltra or theophylline or aminophylline or cromolyn* or sodium cromoglycate or nedocromil or montelukast or zafirlukast or singulair or accolate):ti,ab
#22.	{or #16-#21}
#23.	((smart or mart or symbicort) next/1 therapy):ti,ab
#24.	(laba or long acting beta agonist* or long-acting beta agonist* or long acting adrenoceptor agonist* or long-acting beta-adrenoceptor agonist* or long acting beta2 agonist* or long-acting beta-2 agonist*):ti,ab
#25.	(salmeterol or formoterol or vilanterol or serevent or seretide or foradil or atimos modulite or

	duaklir genuair or anoro or relvar or fostair):ti,ab
#26.	{or #23-#25}
#27.	MeSH descriptor: [muscarinic antagonists] this term only
#28.	(long acting muscarinic antagonist* or muscarinic antagonist* or lama):ti,ab
#29.	MeSH descriptor: [ipratropium] this term only
#30.	(ipratropium or tiotropium or atrovent or spiriva):ti,ab
#31.	{or #27-#30}
#32.	(cortisone acetate or dexamethasone or cortef or orapred or prelone or ocs or oral corticosteroid* or delazacort):ti,ab
#33.	(betadexamethasone or betamethasone or celeston* or cellestoderm or flubenisolone or dexasone or dexpak or hexadrol or maxidex):ti,ab
#34.	(methylfluorprednisolone or millicorten or oradexon or cortifair or cortisol or cortril or epicortisol or hydrocortisone or medrol or methylprednisolone or metipred or urbason or predate or prednisolone or predonine or apo-prednisone or cortan or cortancyl or cutason or dacortin or decortin or decortisyl or dehydrocortisone or deltasone or encorton or encortone or enkortolon or kortancyl or meticorten or orasone or panafcort or panasol or predniment or prednison galen or prednison hexal or prednison acis or prednisone or pronisone or rectodelt or sterapred or ultracorten or winpred or alpha fluorohydrocortisone or astonin or fludrocortisone):ti,ab
#35.	MeSH descriptor: [betamethasone] this term only
#36.	MeSH descriptor: [dexamethasone] this term only
#37.	MeSH descriptor: [methylprednisolone] this term only
#38.	MeSH descriptor: [prednisolone] this term only
#39.	MeSH descriptor: [prednisone] this term only
#40.	{or #32-#39}
#41.	{or #9, #15, #22, #26, #31, #40}
#42.	#1 and #41

A.4.5 Risk Stratification

- What is the clinical and cost effectiveness of delivering asthma care stratified according to risk of asthma attacks to improve outcomes for children, young people and adults with asthma?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	delivery of health care/
6.	patient care/
7.	(deliver* adj3 (care or heathcare or service* or opportunistic or treatment or intervention* or therap*)):ti,ab.
8.	or/ 5-7
9.	((frequen* or sever* or risk* or control* or uncontrol* or reduce* or increase*) adj3 (attack* or exacerbat* or flare up*)):ti,ab.
10.	((frequen* or regular* or irregular* or urgent or emergenc* or routine or reduce* or increase*) adj3 (review* or respiratory consult* or refer* or hospitaliz* or hospitaliz* or appointment* or visit*)):ti,ab.
11.	((reliever or rescue or emergenc* or increase*) adj3 (medicine or medication* or prescription*

	or dose* or dosage)).ti,ab.
12.	((lung function or peak flow) adj3 (test* or exam* or assess* or review* or score* or scoring* or screen*)).ti,ab.
13.	registries/
14.	risk assessment/
15.	*severity of illness index/
16.	or/ 9-15
17.	8 and 16
18.	((risk or at-risk or at risk) adj3 (register* or registr* or stratif* or assess* or model* or algorithm* or score* or scoring* or screen* or strateg* or index*)).ti,ab.
19.	(stratif* adj3 (organis* or manag* or care or healthcare or treatment* or approach*)).ti,ab.
20.	18 or 19
21.	4 and (17 or 20)

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	health care delivery/
6.	patient care/
7.	(deliver* adj3 (care or healthcare or service* or opportunistic or treatment or intervention* or therap*)).ti,ab.
8.	or/ 5-7
9.	((frequen* or sever* or risk* or control* or uncontrol* or reduce* or increase*) adj3 (attack* or exacerbat* or flare up*)).ti,ab.
10.	((frequen* or regular* or irregular* or urgent or emergenc* or routine or reduce* or increase*) adj3 (review* or respiratory consult* or refer* or hospitalis* or hospitaliz* or appointment* or visit*)).ti,ab.
11.	((reliever or rescue or emergenc* or increase*) adj3 (medicine or medication* or prescription* or dose* or dosage)).ti,ab.
12.	((lung function or peak flow) adj3 (test* or exam* or assess* or review* or score* or scoring* or screen*)).ti,ab.
13.	register/
14.	risk assessment/
15.	*severity of illness index/
16.	or/ 9-15
17.	8 and 16
18.	((risk or at-risk or at risk) adj3 (register* or registr* or stratif* or assess* or model* or algorithm* or score* or scoring* or screen* or strateg* or index*)).ti,ab.
19.	(stratif* adj3 (organis* or manag* or care or healthcare or treatment* or approach*)).ti,ab.
20.	18 or 19
21.	4 and (17 or 20)

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [delivery of health care] this term only
#3.	MeSH descriptor: [patient care] this term only

#4.	(deliver* near/3 (care or healthcare or service* or opportunistic or treatment or intervention* or therap*)):ti,ab
#5.	((future care or care or healthcare or treatment*) near/3 (organis* or stratif* or manag* or patient* or variation* or intensit* or approach*)):ti,ab
#6.	{or #2-#6}
#7.	((frequen* or sever* or risk* or control* or uncontrol* or reduce* or increase*) near/3 (attack* or exacerbat* or flare up*)):ti,ab
#8.	((frequen* or regular* or irregular* or urgent or emergenc* or routine or reduce* or increase*) near/3 (review* or respiratory consult* or refer* or hospitalis* or hospitaliz* or appointment* or visit*)):ti,ab
#9.	((reliever or rescue or emergenc* or increase*) near/3 (medicine or medication* or prescription* or dose or dosage)):ti,ab
#10.	((lung function or peak flow) near/3 (test* or exam* or assess* or review* or score* or scoring* or screen*)):ti,ab
#11.	MeSH descriptor: [registries] this term only
#12.	MeSH descriptor: [risk assessment] this term only
#13.	MeSH descriptor: [severity of illness index] this term only
#14.	{or #7-#13}
#15.	((risk or at-risk or at risk) near/3 (register* or registr* or stratif* or assess* or model* or algorithm* or score* or scoring* or screen* or strateg* or index*)):ti,ab
#16.	(stratif* near/3 (organis* or manag* or care or healthcare or treatment* or approach*)):ti,ab
#17.	{or #15-#16}
#18.	#6 and #14
#19.	#17 or #18
#20.	#1 and #19

A.4.6 Self-Management

- What is the clinical and cost effectiveness of supported self-management (including self-management education, self-monitoring and a personalised asthma action plan, PAAP) in comparison to standard care (asthma review only), for improving outcomes for children, young people and adults with asthma in primary care?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	self care/ or self administration/ or self medication/
6.	patient education as topic/
7.	pamphlets/
8.	((patient* or individualis* or individualiz*) adj4 (self-manage* or self manage* or self-care or self care or self-monitor* or self monitor* or action plan* or paap or train* or written plan* or verbal plan* or diary or diaries or program* or tool* or educat*)):ti,ab.
9.	or/ 5-8
10.	Study filters RCT (A.3.2) or SR (A.3.3) or OBS (A.3.6)
11.	4 and 9
12.	10 and 11

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	self care/
6.	patient education/
7.	((patient* or individualis* or individualiz*) adj4 (self-manage* or self manage* or self-care or self care or self-monitor* or self monitor* or action plan* or paap or train* or written plan* or verbal plan* or diary or diaries or program* or tool* or educat*)).ti,ab.
8.	((self-manage* or self manage* or self-monitor* or self monitor* or self-care or self care) adj4 (strateg* or program* or consult* or review* or guide* or support* or information or educat* or action plan* or paap or train* or teach* or written plan* or verbal plan* or diary or diaries or program* or tool* or instruct* or learn* or booklet* or manual* or pamphlet* or leaflet*)).ti,ab.
9.	or/ 5-8
10.	Study filters RCT (A.3.2) or SR (A.3.3) or OBS (A.3.6)
11.	4 and 9
12.	10 and 11

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	MeSH descriptor: [self care] this term only
#3.	MeSH descriptor: [patient education as topic] this term only
#4.	MeSH descriptor: [pamphlets] this term only
#5.	((patient* or individualis* or individualiz*) near/4 (self-manage* or self manage* or self-care or self care or self-monitor* or self monitor* or action plan* or paap or train* or written plan* or verbal plan* or diary or diaries or program* or tool* or educat*)).ti,ab
#6.	#2 or #3 or #4 or #5
#7.	#1 and #6

A.4.7 Step Down

- What are the clinical features (symptoms and/or objective measurements) which indicate that a step down in treatment is appropriate?

Medline search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	(step* down or step* off or step-off).ti,ab.
6.	((stepwise or step-wise or step wise) adj3 (reduc* or discontin* or lower* or taper* or cut* or switch* or change* or stop*)).ti,ab.
7.	((reduc* or discontin* or lower* or taper* or cut* or switch* or change* or stop*) adj3 (therap* or treat* or dose* or drug* or medicat* or medicine* or asthma*)).ti,ab.
8.	or/ 5-7
9.	((duration or period* or current* or prolong* or month* or length) adj3 (control* or stable or stabilise* or stabilize*) adj3 (therap* or treat* or medicat* or drug* or dose* or medicine* or maintenance or maintain* or asthma*)).ti,ab.

10.	(rescue adj3 (therap* or treat* or dose* or drug* or medicat* or medicine* or SABA or short acting beta agonist* or short-acting beta agonist* or short acting adrenoceptor agonist* or short-acting beta-adrenoceptor agonist* or short acting beta2 agonist* or short-acting beta-2 agonist*)).ti,ab.
11.	(exacerbat* or attack* or flare* up or feno or Fractional exhaled nitric oxide level* or acq score or act score or asthma controlled questionnaire* or asthma controlled test*).ti,ab.
12.	or/9-11
13.	8 and 12
14.	4 and 13

Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	(step* down or step* off or step-off).ti,ab.
6.	((stepwise or step-wise or step wise) adj3 (reduc* or discontin* or lower* or taper* or cut* or switch* or change* or stop*)).ti,ab.
7.	((reduc* or discontin* or lower* or taper* or cut* or switch* or change* or stop*) adj3 (therap* or treat* or dose* or drug* or medicat* or medicine* or asthma*)).ti,ab.
8.	or/ 5-7
9.	((duration or period* or current* or prolong* or month* or length) adj3 (control* or stable or stabilise* or stabilize*) adj3 (therap* or treat* or medicat* or drug* or dose* or medicine* or maintenance or maintain* or asthma*)).ti,ab.
10.	(rescue adj3 (therap* or treat* or dose* or drug* or medicat* or medicine* or SABA or short acting beta agonist* or short-acting beta agonist* or short acting adrenoceptor agonist* or short-acting beta-adrenoceptor agonist* or short acting beta2 agonist* or short-acting beta-2 agonist*)).ti,ab.
11.	(exacerbat* or attack* or flare* up or feno or Fractional exhaled nitric oxide level* or acq score or act score or asthma controlled questionnaire* or asthma controlled test*).ti,ab.
12.	or/9-11
13.	8 and 12
14.	4 and 13

Cochrane search terms

#1.	Standard population [A.2.1]
#2.	(step* down or step* off or step-off):ti,ab
#3.	((stepwise or step-wise or step wise) near/3 (reduc* or discontin* or lower* or taper* or cut* or switch* or change* or stop*)):ti,ab
#4.	((reduc* or discontin* or lower* or taper* or cut* or switch* or change* or stop*) near/3 (therap* or treat* or dose* or drug* or medicat* or medicine* or asthma*)):ti,ab
#5.	{or #2-#4}
#6.	((duration or period* or current* or prolong* or month* or length) near/3 (control* or stable or stabilise* or stabilize*) near/3 (therap* or treat* or medicat* or drug* or dose* or medicine* or maintenance or maintain* or asthma*)):ti,ab
#7.	(rescue near/3 (therap* or treat* or dose* or drug* or medicat* or medicine* or SABA or short acting beta agonist* or short-acting beta agonist* or short acting adrenoceptor agonist* or short-acting beta-adrenoceptor agonist* or short acting beta2 agonist* or short-acting beta-2

	agonist*)):ti,ab
#8.	(exacerbate* or attack* or flare* up or feno or Fractional exhaled nitric oxide level* or acq score or act score or asthma controlled questionnaire* or asthma controlled test*):ti,ab
#9.	{or #6-#8}
#10.	#5 and #9
#11.	#1 and #10

A.5 Health economics search

A.5.1 Health economic (HE) reviews

Economic searches were conducted in Medline, Embase, and CRD for NHS EED and HTA.

Medline & Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	Study filter HE (A.3.4)
6.	4 and 5
	Date parameters: 2014 – 13 September 2016

CRD search terms

#1.	Standard population [A.2.1]
#2.	(#1) in NHSEED, HTA from 2014 to 2016

A.5.2 Quality of life (QoL) reviews

Economic searches were conducted in Medline and Embase only

Medline & Embase search terms

1.	Standard population [A.2.1]
2.	Excluded study designs and publication types [A.3.1]
3.	1 not 2
4.	Limit 3 to English language
5.	Study filter QOL (A.3.5)
6.	4 and 5
	See table 1 for date parameters