NICE National Institute for Health and Care Excellence

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Improving the precision of search strategies for guideline surveillance

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Introduction

An analysis of NICE guideline surveillance searches indicated that a low number of retrieved studies are included by the analyst following sifting

Aim: to improve the precision of surveillance searches using additional search techniques, without impacting on surveillance decisions to update

In this talk…

- NICE background
- Guideline surveillance
- Searching
- What we did
- Conclusions

The background: why NICE was set up

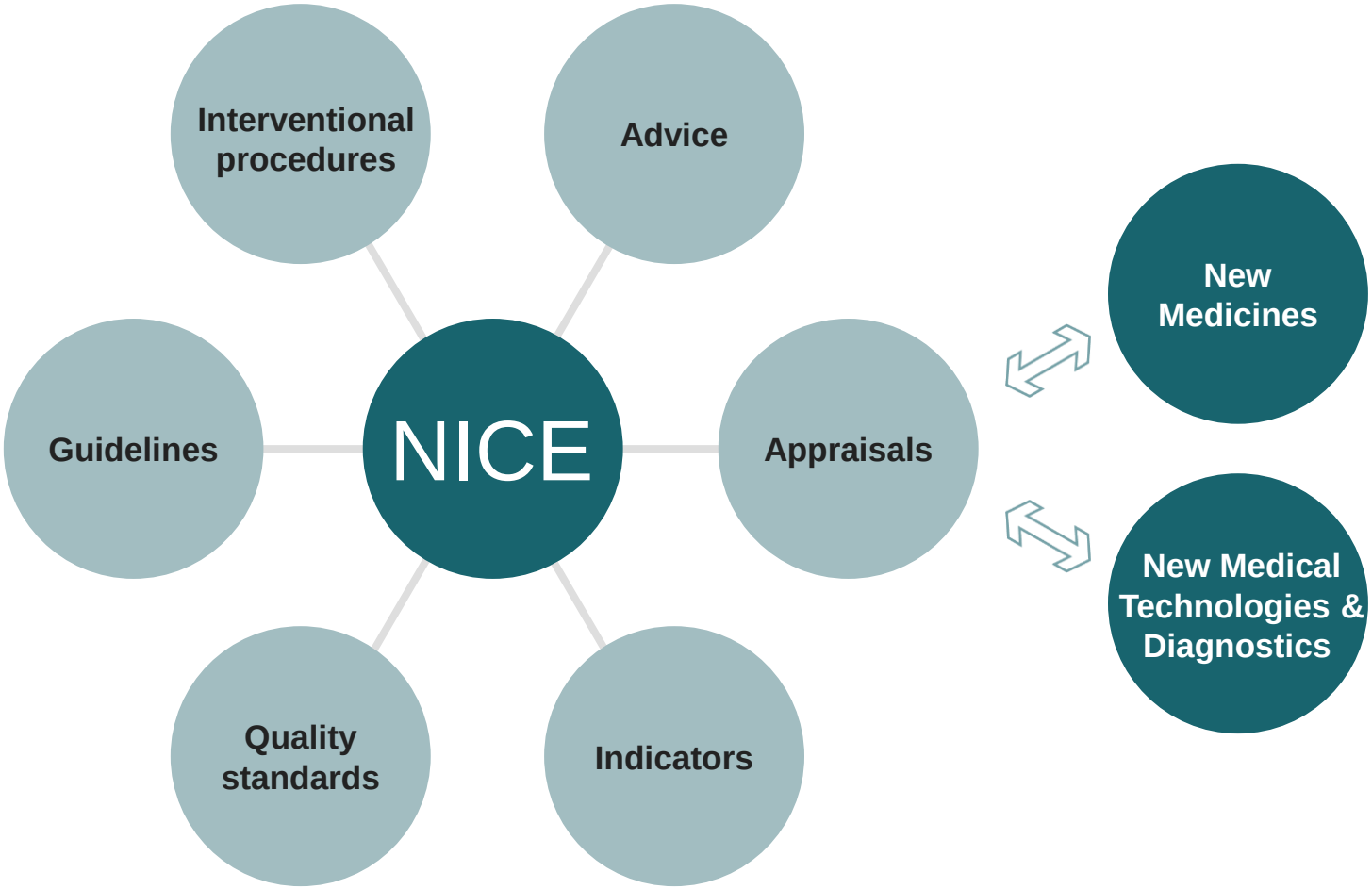
- Established in 1999
- Aim: to reduce variation in the availability and quality of treatments and care (the so called ‘postcode lottery’)
- To resolve uncertainty about which medicines and treatments work best and which represent best value for money for the NHS

The NICE portfolio in 2018

Health

Public Health

Social Care



Guideline Surveillance

A formal check of the need to update a guideline is undertaken by the Guideline Surveillance team.

Broadly relies on assessing 2 elements that influence the decision to update a published guideline

1. Intelligence gathering - questionnaire responses, external enquiries, information on implementation, related NICE guidance, relevant national policy, medicines licensing
2. Abstracts of primary or secondary evidence

At each time point, decisions on the need to update a guideline are based on a cumulative assessment of the relevant evidence since guideline publication.

Background - Searching for evidence

- Searches use the population of interest in the guideline
- Study type search filters are normally used – usually RCT and SRs
- Limits applied – date, English language
- Some publication types are excluded (notes, editorials, letters etc)
- Databases searched using both thesaurus and free text terms

MEDLINE	MEDLINE In-Process	Embase	PsycINFO	Cochrane Central Register of Controlled Trials	Cochrane Database of Systematic Reviews (CDSR)

Additional search techniques

Approach	Technique
Focused subject headings	Apply Focus to the subject headings e.g. Fever/ becomes *Fever/
Subheadings	Apply selected subheadings to the subject headings (Medline and Embase) e.g. fever/dt [drug therapy]
Frequency operator to free text terms	Apply the frequency operator to lines with the title and abstract search fields. e.g. (child* or toddler*).ti,ab. Becomes: (child* or toddler*).ti. or (child* or toddler*).ab. /freq=2
Title only on free text terms	All free text lines with title and abstract search field (ti,ab.) changed to just title (ti.) *Note: subject headings were still used in the search*
Combination techniques	
Title only and Focus	Focussed subject headings and ti. only search
Focus and Frequency	Focussed subject headings and frequency operator

Methods

- Select 5 guidelines where there was low precision
- Re-run the original searches retrospectively to get the baseline precision and Number Needed to Read (NNR)
- Run each search using each of the selected additional search techniques
- Record the precision and NNR for each search technique
- Determine if there is an ‘optimum’ search approach
- Re-run search using optimum approach to determine the overall recall, precision and NNR

Precision: number of relevant records identified divided by the total number of records identified.
NNR: the mean number of records that must be screened for each relevant record retrieved.

Guidelines

Guideline	Search Information		
	Retrieved	Includes	Precision
CG141: Acute upper gastrointestinal bleeding in over 16s: management	1790	9	0.50%
CG142: Autism spectrum disorder in adults: diagnosis and management	1929	38	1.97%
CG149: Neonatal infection (early onset): antibiotics for prevention and treatment	4263	51	1.20%
CG155: Psychosis and schizophrenia in children and young people: recognition and management	1332	9	0.68%
CG160: Fever in under 5s: assessment and initial management	702	11	1.57%

Recording Results

CG160 Fever in under 5s																						Original search numbers – no re-run			
	Baseline search	Precision search	Medline baseline	Medline Focus	Medline Freq	Medline Freq and Focus	Medline ti only (free text)	Medline ti only and Focus	Medline MeSH sub headings	Embase baseline	Embase Focus	Embase Freq	Embase Freq and Focus	Embase ti only (free text)	Embase ti only and Focus	Embase Emtree sub headings	PsycINFO baseline	Psycinfo Focus	Psycinfo Freq	Psycinfo ti only (free text)	Psycinfo ti only and Focus	MIP	Medline Ahead	Central	CDSR
Number retrieved	702	210	176	140	84	57	54	26	164	579	268	421	105	352	34	356	N/A	N/A	N/A	N/A	N/A	94	16	4	153
Number of references found	11	7	10	9	8	6	7	5	8	8	7	8	5	7	3	7	0	0	0	0	0	0	0	2	0
Precision	1.57%	3.33%	5.68%	6.43%	9.52%	10.53%	12.96%	19.23%	4.88%	1.38%	2.61%	1.90%	4.76%	1.99%	8.82%	1.97%	######	######	######	######	######	0.00%	0.00%	50.00%	0.00%
NNR	64	30	18	16	11	10	8	5	21	72	38	53	21	50	11	51	######	######	######	######	######	#DIV/0!	#DIV/0!	2	#DIV/0!
Includes (11)																									
Simplified antibiotic regimens compared with injectable procaine benzylpenicillin plus gentamicin for treatment of neonates and young infants with clinical signs of possible serious bacterial infection when referral is not possible: a randomised, open-label, equivalence trial	x	x	x		x		x																	X	
Clinical and Cost-Effectiveness of Procalcitonin Test for Prodromal Meningococcal Disease-A Meta-Analysis	x	x	x	x	x	x			x	x	x	x	x			x									
Use of serum procalcitonin in evaluation of febrile infants: a meta-analysis of 2317 patients	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x									
The Diagnostic Value of Capillary Refill Time for Detecting Serious Illness in Children: A Systematic Review and Meta-Analysis	x	x	x	x	x	x	x	x																	
Early treatment with corticosteroids in patients with Mycoplasma pneumoniae pneumonia: a randomized clinical trial	x		x	x	x		x		x	x	x	x		x		x									
Supporting decisions to increase the safe discharge of children with febrile illness from the emergency department: a systematic review and meta-analysis	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x									
Impact of the lab-score on antibiotic prescription rate in children with fever without source: a randomized controlled trial	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x								X	
A Meta-analysis of the Rates of Listeria monocytogenes and Enterococcus in Febrile Infants	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x									
3-day versus 5-day course of intravenous antibiotics for suspected early onset neonatal sepsis: A randomized controlled trial	x									x		x		x											
Clinical features for diagnosis of pneumonia in children younger than 5 years: a systematic review and meta-analysis	x		x	x					x	x	x	x		x		x									
Comparison of oral amoxicillin given thrice or twice daily to children between 2 and 59 months old with non-severe pneumonia: a randomized controlled trial	x		x	x					x																
Key																									
Original includes			x																						
Found by additional technique			x																						
Search not required																									

Initial Results

		Medline						Embase						PsycINFO				
		Baseline	Focus	Freq	Title only (free text)	Title only and Focus	MeSH sub headings	Baseline	Focus	Freq	Title only (free text)	Title only and Focus	Emtree sub headings	Baseline	Focus	Freq	Title only (free text)	Title only and Focus
CG141	Retrieved	457	400	274	227	188	419	1870	805	1640	1594	303	855					
	Include	4	4	4	4	4	4	6	6	6	6	6	6					
	Precision	0.88%	1.00%	1.46%	1.76%	2.13%	0.95%	0.32%	0.75%	0.37%	0.38%	1.98%	0.70%					
	NNR	114	100	69	57	47	105	312	134	273	266	51	143					
CG142	Retrieved	555	544	487	477	447	550	1000	828	940	934	636	862	652	647	562	551	520
	Include	20	20	19	18	18	20	24	23	23	23	21	24	22	22	20	19	19
	Precision	3.60%	3.68%	3.90%	3.77%	4.03%	3.64%	2.40%	2.78%	2.45%	2.46%	3.30%	2.78%	3.37%	3.40%	3.56%	3.45%	3.65%
	NNR	28	27	26	27	25	28	42	36	41	41	30	36	30	29	28	29	27
CG149	Retrieved	2510	1322	1795	1687	564	1296	3967	2512	3044	2593	626	3473					
	Include	33	33	32	28	22	32	37	36	35	27	18	37					
	Precision	1.31%	2.50%	1.78%	1.66%	3.90%	2.47%	0.93%	1.43%	1.15%	1.04%	2.88%	1.07%					
	NNR	76	40	56	60	26	41	107	70	87	96	35	94					
CG155	Retrieved	511	510	374	344	293	509	1117	603	866	736	306	671	374	370	254	213	201
	Include	2	2	2	2	2	2	3	3	3	2	2	3	7	7	7	7	7
	Precision	0.39%	0.39%	0.53%	0.58%	0.68%	0.39%	0.27%	0.50%	0.35%	0.27%	0.65%	0.45%	1.87%	1.89%	2.76%	3.29%	3.48%
	NNR	256	255	187	172	147	255	372	201	289	368	153	224	53	53	36	30	29
CG160	Retrieved	176	140	84	54	26	164	579	268	421	352	34	356					

CG141: Acute upper gastrointestinal bleeding in over 16s: management

CG142: Autism spectrum disorder in adults: diagnosis and management

CG149: Neonatal infection (early onset): antibiotics for prevention and treatment

CG155: Psychosis and schizophrenia in children and young people: recognition and management

CG160: Fever in under 5s: assessment and initial management

Focus and Frequency Results

		Medline		Embase		PsycINFO	
		Baseline	Focus & Freq	Baseline	Focus & Freq	Baseline	Focus & Freq
CG141	**Retrieved**	457	247	1870	445		
	Include	4	4	6	6		
	Precision	0.88%	1.62%	0.32%	1.35%		
	NNR	114	62	312	74		
CG142	**Retrieved**	555	463	1000	663	652	540
	Include	20	19	24	22	22	20
	Precision	3.60%	4.10%	2.40%	3.30%	3.37%	3.70%
	NNR	28	24	42	30	30	27
CG149	**Retrieved**	2510	781	3967	1201		
	Include	33	30	37	34		
	Precision	1.31%	3.84%	0.93%	2.83%		
	NNR	76	26	107	35		
CG155	**Retrieved**	511	361	1117	379	374	246
	Include	2	2	3	3	7	7
	Precision	0.39%	0.55%	0.27%	0.79%	1.87%	2.85%
	NNR	256	181	372	126	53	35
CG160	**Retrieved**	176	57	579	105		
	Include	10	6	8	5		
	Precision	5.68%	10.53%	1.38%	4.76%		
	NNR	18	10	72	21		

CG141: Acute upper gastrointestinal bleeding in over 16s: management	CG142: Autism spectrum disorder in adults: diagnosis and management
CG149: Neonatal infection (early onset): antibiotics for prevention and treatment	CG155: Psychosis and schizophrenia in children and young people: recognition and management
CG160: Fever in under 5s: assessment and initial management	

Overall Results – using Focus and Frequency

	Baseline vs Precision search	Number Retrieved	Number of included references	Precision	Number needed to read
CG141	Baseline	1790	9	0.50%	199
	Precision	837	9	1.08%	93
CG142	Baseline	1929	38	1.97%	51
	Precision	1750	38	2.17%	46
CG149	Baseline	4263	51	1.20%	84
	Precision	1720	47*	2.73%	37
CG155	Baseline	1332	9	0.68%	148
	Precision	924	9	0.97%	103
CG160	Baseline	702	11	1.57%	64
	Precision	210	7**	3.33%	30

*Of the 4 studies not retrieved 1 was of low importance, 2 were useful but not key and 1 was of moderate importance
** Of the 4 studies not retrieved 2 were of low importance and 2 were of moderate importance to the update decision

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Conclusion

Focused subject headings and frequency operators could be used to improve the precision of surveillance searches without impacting on the decision to update the guideline.

The number needed to read was lower in all topics, which would reduce the time needed to review abstracts by the analyst

Implemented the use of focused subject headings and frequency operators as an option to when retrieving large search results for surveillance searches

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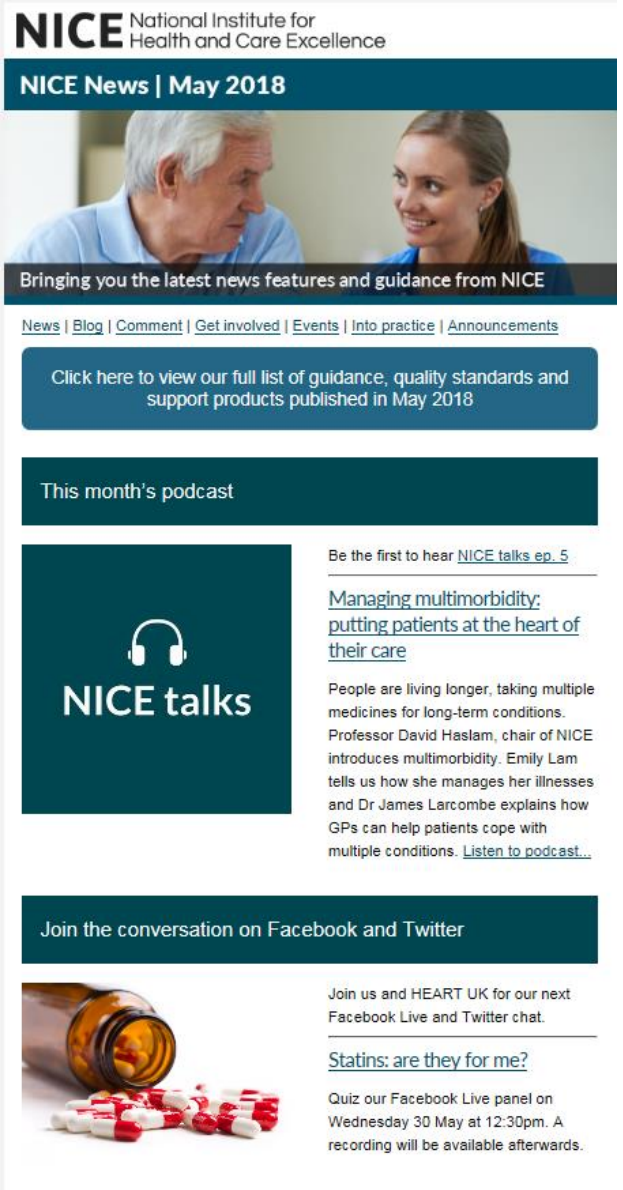

Further resources via NICE Evidence Search

www.evidence.nhs.uk