

## SUPPLEMENTAL APPENDIX

### Search strategy

Date: September 12, 2018

#### Databases

##### Medline

(((obsole\* or ("not" or "no longer") adj (effective or essential or efficient)) or ineffective or ineffective or low-value or overuse\* or inappropriate or "old habits") adj4 ("health system" or healthcare or care or policy or policies or practice or technology or procedure\* or treatment\* or intervention\* or "health services" or strateg\* or "clinical use" or referral\* or diagnosis or regulatory or approach or prescrib\* or therap\*)) or (overtest\* or overdiagnos\*)) adj5 (reduce or avoid or minimise or discontinu\* or minimise or decreas\* or stop or stopping or revers\* or replace\* or avert or "trim down" or (cut adj (down or back)) or substitute or decrement)).mp. OR ("de-implementation" or deimplementation or "do-not-do" or "deadopt\*" or decommission\*).mp.

##### Embase

#1 (((obsole\* or ("not" or "no longer") adj (effective or essential or efficient)) or ineffective or ineffective or low-value or overuse\* or inappropriate or "old habits") adj4 ("health system" or healthcare or care or policy or policies or practice or technology or procedure\* or treatment\* or intervention\* or "health services" or strateg\* or "clinical use" or referral\* or diagnosis or regulatory or approach or prescrib\* or therap\*)) or (overtest\* or overdiagnos\*)) adj5 (reduce or avoid or minimise or discontinu\* or minimise or decreas\* or stop or stopping or revers\* or replace\* or avert or "trim down" or (cut adj (down or back)) or substitute or decrement)).mp. OR ("de-implementation" or deimplementation or "do-not-do" or "deadopt\*" or decommission\*).mp.

#2 limit (conference abstract OR conference paper OR conference review)

Rx for change

"de-adoption" OR "Decrease use" OR "abandoning" OR "Discontinue" OR "discontinuation" OR "Abandon" OR "Reassess" OR "reassessment" OR "Obsolete" OR "Medical reversal" OR "Re-invest" OR "Withdraw\*" OR "de-implementation" OR "Reduc\*" OR "Decline in use" OR "Health technology reassessment" OR "Change in use" OR "De-implement\*" OR "De-list" OR "De-commission" OR "Do not do" OR "Reallocation" OR "relinquishing" OR "Over use" OR "Stop" OR "Inappropriate use" OR "Relinquish\*" OR "Ineffective" OR "Misuse" OR "Re-appraisal" OR "Re-prioritization" OR "Clinical redesign" OR "Disadoption" OR "Redeploy" OR "Reversal" OR "Drop in use" OR "stopping"

Websites

- Canadian Agency for Drugs and Technologies in Health - <https://www.cadth.ca/resources/rx-for-change/database/browse>
- Agency for Healthcare Research and Quality - <http://www.ahrq.gov/>
- Right Care - <http://www.rightcare.nhs.uk/>
- National Institute for Health and Care Excellence - <https://www.nice.org.uk/>
- Choosing Wisely - <http://www.choosingwisely.org/>
- Kingsfund - <http://www.kingsfund.org.uk/>
- Nuffield Trust - <http://www.nuffieldtrust.org.uk/>

## Detailed information of included studies

Study	Study design	Goal article	Intervention	Factors				
				provider	patient	social context	Organisa-tional	Economic-political
Awad, 2006(1)	RCT	Measure effectiveness deimplementation	Antibiotic	X	X	X	X	
Barnes, 2017(2)	Other, mixed methods	Identification factors influencing low-value care	Diagnostic laboratory	X			X	
Batuwitage, 2006(3)	Before-after	Measure effectiveness deimplementation	Gastric acid suppressives	X				
Bauchner, 1999(4)	Survey	Identification factors influencing low-value care	Antibiotic	X	X	X	X	
Belongia, 2001(5)	Before-after	Measure effectiveness deimplementation	Antibiotic		X			
Bishop, 2017(6)	Qualitative	Identification factors influencing low-value care	Several therapeutic and diagnostic interventions	X	X	X	X	
Brady, 2017(7)	Non-RCT	identification factors influencing low-value care	Diagnostic laboratory			X	X	
Calderon-Margalit, 2005(8)	Before-after	Measure effectiveness deimplementation	Diagnostic laboratory			X		
Chirima, 2016(9)	Cohort	Measure effectiveness deimplementation	antibiotic		X			
Clyne, 2017(10)	Qualitative	identification factors influencing low-value care	Benzodiazepines	X				
Colla, 2017(11)	Other, mixed methods	Identification factors influencing low-value care	Several therapeutic and diagnostic interventions	X			X	

Cossette, 2016(12)	Cohort	Measure effectiveness deimplementation	Polypharmacy	X				
Davies, 2002(13)	RCT	Measure effectiveness deimplementation	Diagnostic imaging	X		X		
De Miguel, 2000(14)	ITS	Measure effectiveness deimplementation	Therapeutic other	X				
Dempsey, 2014(15)	Qualitative	Identification factors influencing low-value care	Antibiotic		X	X	X	
Duane, 2016(16)	Qualitative	Identification factors influencing low-value care	Antibiotic	X	X		X	X
Flottorp, 2003(17)	Other, mixed methods	identification factors influencing low-value care	Several interventions	X		X	X	
Freeborn, 1997(18)	Before-after	Measure effectiveness deimplementation	Diagnostic imaging	X	X			
Gordon, 2000(19)	ITS	Measure effectiveness deimplementation	Benzodiazepines	X	X		X	
Graham, 2004(20)	Qualitative	Identification factors influencing low-value care	Diagnostic imaging	X	X		X	
Green, 2018(21)	Qualitative	Identification factors influencing low-value care	Several therapeutic and diagnostic interventions		X	X		X
Hammond, 2009(22)	qualitative	identification factors influencing low-value care	Diagnostic resource use (referrals)		X	X	X	
Hatam, 2010(23)	Chart review	identification factors influencing low-value care	Therapeutic other	X			X	X
Hooper, 2009(24)	Before-after	Measure effectiveness deimplementation	Benzodiazepines					X
Hussein, 2010(25)	Survey	Identification factors influencing low-value care	Gastric acid suppressives	X				

Kakkar, 2004(26)	Before-after	Measure effectiveness deimplementation	Blood transfusion					<b>X</b>
Kanzaria, 2015(27)	Other, mixed methods	identification factors influencing low-value care	Diagnostic laboratory		<b>X</b>			
King, 2013(28)	Before-after	identification factors influencing low-value care	Blood transfusion			<b>X</b>	<b>X</b>	
Klein, 2017(29)	Survey	identification factors influencing low-value care	Antibiotic	<b>X</b>	<b>X</b>		<b>X</b>	
Kline, 2017(30)	Survey	identification factors influencing low-value care	Diagnostic imaging	<b>X</b>	<b>X</b>			
Kumar, 2003(31)	Qualitative	Identification factors influencing low-value care	Antibiotic	<b>X</b>		<b>X</b>		
Lambert-Kerzner, 2018(32)	Qualitative	Identification factors influencing low-value care	Device surgical procedure	<b>X</b>	<b>X</b>			
Lee, 2017(33)	Survey	Identification factors influencing low-value care	Antibiotic	<b>X</b>			<b>X</b>	<b>X</b>
Liao, 2017(34)	Survey	Identification factors influencing low-value care	Several interventions					<b>X</b>
Lin, 2016(35)	Qualitative	Measure effectiveness deimplementation	Diagnostic imaging	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Lin, 2017(36)	Survey	identification factors influencing low-value care	Antibiotic	<b>X</b>				
Linder, 2007(37)	Before-after	Measure effectiveness deimplementation	Antibiotic				<b>X</b>	
Linsky, 2015(38)	Qualitative	Identification factors influencing low-value care	Polypharmacy	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>
Liu, 2012(39)	ITS	Measure effectiveness deimplementation	Antibiotic	<b>X</b>				
Lum, 2017(40)	Qualitative	Identification factors influencing low-value care	Antibiotic	<b>X</b>	<b>X</b>	<b>X</b>		

Macfarlane, 1997(41)	Survey	Identification factors influencing low-value care	Antibiotic	X	X			
Mahalingam, 2015(42)	Before-after	Measure effectiveness deimplementation	Diagnostic resource use (referrals)	X				
Maughan, 2015(43)	Qualitative	Identification factors influencing low-value care	Several interventions	X			X	
May, 2006(44)	Before-after	Measure effectiveness deimplementation	Diagnostic laboratory			X	X	
McKay, 2017(45)	Qualitative	Identification factors influencing low-value care	Therapeutic other	X		X	X	
McNicholl, 2017(46)	Chart review	Measure effectiveness deimplementation	Several interventions		X			
Melnick, 2015(47)	Qualitative	Identification factors influencing low-value care	Diagnostic imaging	X	X		X	
Miyakis, 2006(48)	Before-after	Measure the effectiveness of de-implementation	Diagnostic laboratory	X	X		X	
Murray, 2000(49)	Survey	Identification factors influencing low-value care	Antibiotic		X			
Murthy, 2006(50)	Survey	Identification factors influencing low-value care	Gastric acid suppressives	X				
Palmer, 1997(51)	Survey	Identification factors influencing low-value care	Antibiotic		X			
Perz, 2002(52)	Before-after	Measure effectiveness deimplementation	Antibiotic				X	
Pittenger, 2015(53)	ITS	Measure effectiveness deimplementation	Antibiotic				X	
Pollock, 2000(54)	Qualitative	Identification factors influencing low-value care	Gastric acid suppressives		X			
Raghunath, 2005(55)	Qualitative	Identification factors influencing low-value care	Gastric acid suppressives	X	X		X	

Ralston, 2013(56)	ITS	Measure effectiveness deimplementation	Diagnostic resource use (referrals)			X		
Ralston, 2016(57)	Before-after	Measure effectiveness deimplementation	Diagnostic resource use (referrals)			X		
Ralston, 2017(58)	Other, mixed methods	Identification factors influencing low-value care	Therapeutic other	X		X	X	X
Reed - Antibiotics in acute bronchitis, 2015 (59)	Other, mixed methods	Identification factors influencing low-value care	Antibiotic		X		X	X
Reed - Carotid artery stenosis, 2015(60)	Other, mixed methods	Identification factors influencing low-value care	Diagnostic screening		X		X	X
Reed - low back pain, 2015(61)	Other, mixed methods	Identification factors influencing low-value care	Diagnostic imaging	X	X		X	X
Reed - Pap testing, 2015(62)	Other, mixed methods	Identification factors influencing low-value care	Diagnostic screening	X	X	X	X	X
Reed - Percutaneous coronary interventions, 2015(63)	Other, mixed methods	Identification factors influencing low-value care	Device surgical procedure	X	X			X
Reed - Preoperative stress testing, 2015(64)	Other, mixed methods	Identification factors influencing low-value care	Diagnostic other	X	X		X	X
Reed – Headache, 2015(65)	Other, mixed methods	Identification factors influencing low-value care	Diagnostic imaging	X	X		X	X
Samore, 2005(66)	RCT	Identification factors influencing low-value care	Antibiotic	X	X			
Sawan, 2016(67)	Qualitative	Identification factors influencing low-value care	Benzodiazepines	X		X		
Sedrak, 2016(68)	Survey	Identification factors influencing low-value care	Diagnostic laboratory	X			X	

Shepperd, 2013(69)	Qualitative	Identification factors influencing low-value care	Several therapeutic and diagnostic interventions	X	X		X	X
Sloane, 2014(70)	Before-after	Measure effectiveness deimplementation	Antibiotic	X		X		
Stinnett-Donnelly, 2015(71)	Other, mixed methods	Measure effectiveness deimplementation	Several interventions				X	
Thomas, 2002(72)	Before-after	Measure effectiveness deimplementation	Antibiotic				X	
Tierny, 1990(73)	RCT	Measure effectiveness deimplementation	Diagnostic laboratory					X
Vegting, 2012(74)	Before-after	Measure effectiveness deimplementation	Diagnostic laboratory	X				
Voorn, 2017(75)	RCT	Measure effectiveness deimplementation	Blood transfusion	X			X	
Walker, 2001(76)	Qualitative	Identification factors influencing low-value care	Antibiotic	X				
Wermeling, 2014(77)	Qualitative	Identification factors influencing low-value care	Gastric acid suppressives	X				
Williams, 2017(78)	Survey	Measure effectiveness deimplementation	Several therapeutic and diagnostic interventions			X		
Winchester, 2017(79)	Before-after	Measure effectiveness deimplementation	Diagnostic imaging	X		X		
Yates, 2018(80)	Qualitative	Identification factors influencing low-value care	Antibiotic		X		X	
Zabarsky, 2008(81)	Before-after	Measure effectiveness deimplementation	Antibiotic	X		X	X	

RCT: randomized controlled trial; ITS: interrupted times series



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