Improving quality of care: a continuous process of (de-)implementation

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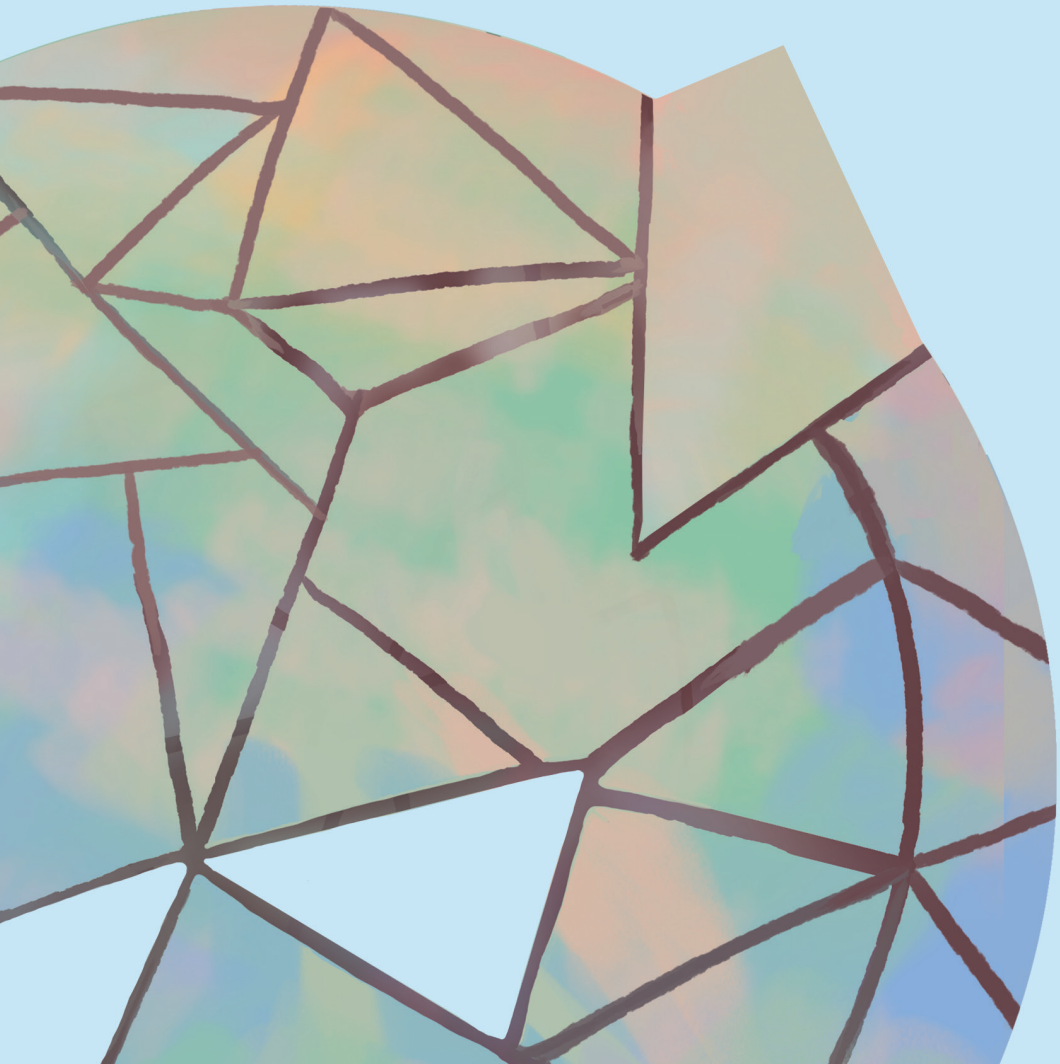

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General introduction

GENERAL INTRODUCTION

Implementation and de-implementation in healthcare

Both underuse as well as overuse of medical services is associated with poor outcomes in healthcare. Underuse includes the failure to use effective medical interventions, and exists worldwide with significant differences within and between countries[1]. Possible causes for failure to use effective medical interventions include clinicians' poor adherence to evidence and guidelines, and lack of access to medical services (e.g. hospitals, healthcare insurance, medical technology within hospitals)[1]. Overuse refers to providing low value medical services; i.e. services that are more likely to cause harm, waste resources or could lead to unnecessary healthcare costs (e.g. knee arthroscopy in degenerative knee disease or prolonged indwelling urinary catheter use)[2]. To improve quality of care and to create a sustainable healthcare system, it is essential to prevent underuse of effective medical care and to reduce the use of low value care by implementation and de-implementation initiatives. Implementation can be described as the planned process to introduce or to improve the use of medical interventions with the aim that those medical interventions are given a structural place within care practice[3]. In de-implementation, the use of low value medical interventions is reduced or stopped on a structural basis in a planned process[4]. For medical interventions with a lack of evidence more research to support or to reject is needed.

Processes in implementation and de-implementation

A distinction is commonly made between process-models for implementation and de-implementation. Examples of implementation process-models include the Implementation model of change of Grol and Wensing[5], Knowledge to action framework[6], and implementation mapping[7]. The de-adoption framework[8], de-implementation guide[9], and the Choosing Wisely de-implementation model[2] are examples of de-implementation process-models. These process-models for implementation and de-implementation include, however, more or less the same steps to accomplish change. These comparable steps are: (1) identify and prioritize relevant topics for implementation and/or de-implementation based on the existing evidence, (2) set goals, define target groups, and assess current practice, (3) define an (de-)implementation team to create more support and to divide responsibilities, (4) analyses of barriers and facilitators for (de-) implementation, (5 and 6) develop and execute a tailored (de-)implementation strategy, (7) evaluate the effects of the (de-)implementation strategy and (8)

sustain the results (see *figure 1*). Evaluation and sustainability of the results are not the final step of the (de-)implementation processes. Ideally, one is continuously assessing whether the use of medical interventions increases (implementation) or decreases (de-implementation), thus revising the (de-) implementation strategy in a continuous feedback loop based on findings and thus changes in the context of the (de-)implementation initiative.

Fig. 1 Key steps in (de-)implementation processes.

Determinants of successful implementation and de-implementation

Determinants (barriers and facilitators) play an important role in (de-)implementation and in the outcomes of the (de-)implementation processes[3,10,11]. An exploration

of the determinants is therefore needed enabling the development of a tailored (de-)implementation strategy that addresses these identified barriers and/or facilitators[10]. In the literature, many different determinant frameworks exist for the analysis of determinants for both implementation and de-implementation[12,13]. Frameworks for both implementation and de-implementation show comparable categories: a) the innovation/low value care, b) the individual professional, c) the patient, d) the social context, e) the organizational context, and f) the economic and political context[12].

Although frameworks for determinants of implementation of medical interventions and the de-implementation of low value care show similarities, there are also some important differences[14,15]. From a previous study there are signals that organizational factors play a more influential role in implementation; where motivational, economic and political factors are more associated with de-implementation[4]. Motivation of involved stakeholders to de-implement low value care may be negatively influenced by uncertainty and cognitive biases that play an important role in de-implementation[15]. Examples of uncertainties are fears for healthcare providers to miss a diagnosis, to dissatisfy patients or to be sued, the poor willingness of patients and the society to accept that there are always risks and uncertainties, and uncertainty of healthcare organizations and healthcare providers to sustain revenues[15]. These different forms of uncertainty could result in the use of more unnecessary diagnostic testing and treatments, driven by several cognitive biases[14]. Examples of these biases are the tendency to favor action over inaction (action bias) and to avoid experiencing regret by not performing a medical service (anticipated regret). Differences between determinants for implementation and de-implementation could lead to different (de-)implementation strategies.

Strategies for implementation and de-implementation

Strategies for both implementation and de-implementation may be more effective if they address the related determinants influencing the uptake of medical interventions or the reduction of low value care[10,14,16,17], targeting multiple levels and consisting of multiple components[14,18], and address multiple stakeholders[18]. Research shows that reducing low value care may require other approaches than for the implementation of medical interventions (19), because de-implementation and implementation show differences in determinants[4,10]. However, when we look at intervention level using the EPOC taxonomy of health systems interventions[20] frequently the same kind of interventions are used in implementation and de-implementation, including interactive education and clinical decision support[18,21]. Patey et al.[19] showed on the other hand that

the techniques used to change the behavior within these interventions differ between implementation and de-implementation strategies. In implementation "feedback on behavior" was more frequently identified; and in de-implementation "behavior substitution", "monitoring of behavior by others without feedback" and "restructuring social environment" were used[19]. Despite these differences in the frequency of use of certain behavior change techniques in implementation and de-implementation strategies, there is little evidence on which strategies are more effective for implementation and which for de-implementation[10,19]. Therefore, more research is needed to investigate which interventions are the most effective for (de-)implementation of medical services.

AIM AND OUTLINE THESIS

The aim of this thesis is to extend the knowledge on effective strategies for de-implementation of low value care and the implementation of underused medical services in orthopedic surgery as well as in nursing practice. The following research questions will be assessed:

1. What are effective de-implementation strategies for reducing low value care in orthopedic surgery as well as in nursing practice?
2. What are the differences and similarities between effective de-implementation and implementation strategies in nursing practice?

This will be evaluated based on two use cases: the use of MRI and knee arthroscopy for patients with degenerative knee disease (***Chapter 2-4***) and effective (de-)implementation strategies in nursing (***Chapter 5 and 6***).

Use of MRI and arthroscopy for degenerative knee disease

About 25% of patients 50 years and over experience degenerative knee complaints[22]. Patients aged 50 years and over with degenerative knee disease could suffer from complaints during walking, climbing stairs and squatting[23]. Some patients experience locking symptoms, which can be described as a limited range of motion of the knee due to lose bodies or meniscal tears. Meniscal tears in this age group occur mostly as part of a degenerative process and can be considered a feature of an early stage of osteoarthritis[24,25]. Clinical practice guidelines from professional orthopaedic associations[26-29] recommend to first prescribe weight-bearing radiographs including a fixed flexion view to examine the cartilage status of the knee, and non-surgical treatment modalities (pain medication, dietary advice and exercise therapy). After all, research has shown that there is no clinically relevant difference between a knee arthroscopy and

physical therapy for patients with degenerative knee disease, based on patient-specific outcomes (sports, walking, running, standing for a long time and rising from a chair)[30]. MRI and knee arthroscopy for this specific patient group is not directly recommended, because it provides limited benefit for the patient, requires resources and may even cause harm to the patient. Due to the poor association with symptoms, routine use of an MRI for diagnosis of degenerative knee disease is not recommended for this specific patient group[25,31-33]. Despite the existence of clinical practice guidelines and Choosing Wisely recommendations, still many patients receive an MRI and/or knee arthroscopy for degenerative knee disease[34-45].

Quality improvement in nursing

Nurses are, just like doctors, expected to provide evidence-based medical interventions to improve quality of healthcare. To facilitate evidence-based nursing practice, an increasing number of nursing guidelines are published and Choosing Wisely' lists of nursing procedures are recently created in several countries[1,4,11,12]. However, use of these guidelines and lists in daily practice is limited. To improve the uptake of guidelines and lists, (de-)implementation strategies are needed. Unfortunately, most studies assessing (de-)implementation strategies are directed towards to doctors[18,46], despite that many procedures (e.g. the use of restraints, wound care, and the use of intravenous and urinary catheters) are also routinely performed by nurses[47,48]. Therefore, it is important to investigate which strategies are effective to implement nursing guidelines and which de-implementation strategies are effective to reduce low value nursing care.

Outline of this thesis

This thesis aims to contribute to the knowledge on effective strategies for implementing and de-implementing medical services to improve quality of care for patients. In the first part of the thesis, the effectiveness of a tailored strategy to reduce the use of low value MRI and knee arthroscopies for patients aged 50 years and over with degenerative knee disease is described. In order to develop a tailored strategy, first the proportion of low value knee arthroscopies for this specific patient group in different types of hospitals was investigated in ***Chapter 2***. Based on this information about the use of low value knee arthroscopy and its indications, the (de-)implementation could be better tailored towards the needs of practice (*Figure 1, step 2*). In ***Chapter 3***, determinants influencing the de-implementation of low value MRI's and knee arthroscopies in patients with degenerative knee disease are explored (*Figure 1, step 4*). Insight in determinants for the decision to make an MRI as well as performing a knee arthroscopy are needed to develop

a tailored de-implementation strategy (*figure 1, step 5*). In ***Chapter 4***, the effect of this tailored de-implementation strategy is assessed in 13 hospitals (*Figure 1, step 6 and 7*).

In the second part of this thesis, it is investigated which strategies are effective for reducing low value nursing procedures ***(Chapter 5)*** as well as which strategies are effective for the implementation of nursing guidelines ***(Chapter 6)***.

Based on the results of the research in this thesis, the overall findings of the studies are described with regard to the overarching research questions of this thesis in ***Chapter 7.***

REFERENCES

1. Glasziou P, Straus S, Brownlee S, Trevena L, Dans L, Guyatt G, Elshaug AG, Janett R, Saini V. Evidence for underuse of effective medical services around the world. Lancet. 2017;390(10090):169-177.
2. Grimshaw JM, Patey AM, Kirkham KR, Hall A, Dowling SK, Rodondi N, Ellen M, Kool T, van Dulmen SA, Kerr EA, Linklater S, Levinson W, Bhatia RS. De-implementing wisely: developing the evidence base to reduce low value care. BMJ Qual Saf. 2020;29(5):409-417.
3. Wensing M, Grol R, Grimshaw J. Improving patient care: The implementation of change in health care: John Wiley & Sons; 2020.
4. van Bodegom-Vos L, Davidoff F, Marang-van de Mheen PJ. Implementation and de-implementation: two sides of the same coin? BMJ Qual Saf. 2017;26(6):495-501.
5. Grol R WM, Eccles M. Improving Patient Care: The Implementation of Change in Clinical Practice. Elsevier; 2005.
6. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N. Lost in knowledge translation: time for a map? J Contin Educ Health Prof. 2006;26(1):13-24.
7. Fernandez ME, Ten Hoor GA, van Lieshout S, Rodriguez SA, Beidas RS, Parcel G, Ruiter RAC, Markham CM, Kok G. Implementation Mapping: Using Intervention Mapping to Develop Implementation Strategies. Front Public Health. 2019;7:158.
8. Niven DJ, Mrklas KJ, Holodinsky JK, Straus SE, Hemmelgarn BR, Jeffs LP, Stelfox HT. Towards understanding the de-adoption of low value clinical practices: a scoping review. BMC Med. 2015;13:255.
9. Doen of laten? Deïmplementatiegids: voor het terugdringen van niet-gepaste zorg in uw organisatie. 2019.
10. Norton WE, Chambers DA. Unpacking the complexities of de-implementing inappropriate health interventions. Implement Sci. 2020;15(1):2.
11. van Dulmen SA, Naaktgeboren CA, Heus P, Verkerk EW, Weenink J, Kool RB, Hooft L. Barriers and facilitators to reduce low value care: a qualitative evidence synthesis. BMJ Open. 2020;10(10):e040025.
12. Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. Med J Aust. 2004;180(6 Suppl):S57-60.
13. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009;4(1):50.
14. Pitt SC, Dossett LA. Deimplementation of Low value Care in Surgery. JAMA Surg. 2022;157(11):977–978.
15. van Bodegom-Vos L, Marang-van de Mheen PJ. Reducing Low value Care: Uncertainty as Crucial Cross-Cutting Theme Comment on "Key Factors That Promote Low value Care: Views of Experts From the United States, Canada, and the Netherlands". Int J Health Policy Manage. 2022; 11(9): 1964-1966
16. Harvey G, Kitson A. Single Versus Multi-Faceted Implementation Strategies - Is There a Simple Answer to a Complex Question? A Response to Recent Commentaries and a Call to Action for Implementation Practitioners and Researchers. Int J Health Policy Manag. 2015;5(3):215-217.

17. Heus P, van Dulmen SA, Weenink JW, Naaktgeboren CA, Takada T, Verkerk EW, Kamm I, van der Laan MJ, Hooft L, Kool RB. What are Effective Strategies to Reduce Low value Care? An Analysis of 121 Randomized Deimplementation Studies. J Healthc Qual. 2023;45(5):261-271

18. Colla CH, Mainor AJ, Hargreaves C, Sequist T, Morden N. Interventions Aimed at Reducing Use of Low value Health Services: A Systematic Review. Med Care Res Rev. 2016;74(5):507-550.

19. Patey AM, Grimshaw JM, Francis JJ. Changing behaviour, 'more or less': do implementation and de-implementation interventions include different behaviour change techniques? Implement Sci. 2021;16(1):20.

20. Effective Practice and Organisation of Care (EPOC). EPOC Taxonomy; 2015. Available from: epoc.cochrane.org/epoc-taxonomy

21. Prior M, Guerin M, Grimmer-Somers K. The effectiveness of clinical guideline implementation strategies--a synthesis of systematic review findings. J Eval Clin Pract. 2008;14(5):888-897.

22. Siemieniuk RAC, Harris IA, Agoritsas T, Poolman RW, Brignardello-Petersen R, Van de Velde S, Buchbinder R, Englund M, Lytvyn L, Quinlan C, Helsingen L, Knutsen G, Olsen NR, Macdonald H, Hailey L, Wilson HM, Lydiatt A, Kristiansen A. Arthroscopic surgery for degenerative knee arthritis and meniscal tears: a clinical practice guideline. BMJ. 2017;357:j1982.

23. Bijlsma JW, Berenbaum F, Lafeber FP. Osteoarthritis: an update with relevance for clinical practice. Lancet. 2011;377(9783):2115-2126.

24. Buchbinder R, Harris IA, Sprowson A. Management of degenerative meniscal tears and the role of surgery. BMJ. 2015;350:h2212.

25. Englund M, Guermazi A, Gale D, Hunter DJ, Aliabadi P, Clancy M, Felson DT. Incidental meniscal findings on knee MRI in middle-aged and elderly persons. N Engl J Med. 2008;359(11):1108-1115.

26. Arthroscopy of the knee (in dutch). 2019. Available from: https://richtlijnendatabase.nl/richtlijn/artroscopie_van_de_knie/startpagina_-_artroscopie_van_de_knie.html.

27. ESSKA Meniscus Consensus Project: Degenerative meniscus lesions. 2016. Available from: https://cdn.ymaws.com/www.esska.org/resource/resmgr/Docs/2016-meniscus-consensus-proj.pdf.

28. Osteoarthritis: care and management. 2014. Available from: https://www.nice.org.uk/guidance/cg177.

29. VA/DoD Clinical Practice Guideline For The Non-Surgical Management of Hip and Knee Osteoarthritis. 2014. Available from: https://www.healthquality.va.gov/guidelines/CD/OA/VADoDOACPGFINAL090214.pdf.

30. Noorduyn JCA, Glastra van Loon T, van de Graaf VA, Willigenburg NW, Butter IK, Scholten-Peeters GGM, Coppieters MW, Poolman RW; ESCAPE Research Group; Scholtes VAB, Mutsaerts ELAR, Krijnen MR, Moojen DJF, van Deurzen DFP, Bloembergen CH, Wolkenfelt J, de Gast A, Snijders T, Saris DBF, Wolterbeek N, Neeter C, Kerkhoffs GMMJ, Peters RW, van den Brand ICJB, de Vos-Jakobs S, Spoor AB, Gosens T, Rezaie W, Hofstee DJ, Burger BJ, Haverkamp D, Vervest AMJS, van Rheenen TA, Wijsbek AE, van Arkel ERA, Thomassen BJW, Sprague S, van Tulder MW, Schavemaker M, van Dijk R, van der Kraan J. Functional Outcomes of Arthroscopic Partial Meniscectomy Versus Physical Therapy for Degenerative Meniscal Tears Using a Patient-Specific Score: A Randomized Controlled Trial. Orthop J Sports Med. 2020;8(10).

31. Bhattacharyya T, Gale D, Dewire P, Totterman S, Gale ME, McLaughlin S, Einhorn TA, Felson DT. The Clinical Importance of Meniscal Tears Demonstrated by Magnetic Resonance Imaging in Osteoarthritis of the Knee. J Bone Joint Surg Am. 2003;85(1):4-9.

32. Englund M. Meniscal tear -- a common finding with often troublesome consequences. J Rheumatol. 2009;36(7):1362-1364.

33. Parent ME, Vezina F, Carrier N, Masetto A. Indications for and clinical procedures resulting from magnetic resonance imaging of the knee in older patients: Are we choosing wisely? Can Fam Physician. 2018;64(3):e126-e132.

34. Bergkvist D, Dahlberg LE, Neuman P, Englund M. Knee arthroscopies: who gets them, what does the radiologist report, and what does the surgeon find? An evaluation from southern Sweden. Acta Orthop. 2016;87(1):12-16.

35. Muheim LLS, Senn O, Fruh M, Reich O, Rosemann T, Neuner-Jehle SM. Inappropriate use of arthroscopic meniscal surgery in degenerative knee disease. Acta Orthop. 2017;88(5):550-555.

36. Adelani MA, Harris AH, Bowe TR, Giori NJ. Arthroscopy for Knee Osteoarthritis Has Not Decreased After a Clinical Trial. Clin Orthop Relat Res. 2016;474(2):489-494.

37. Hamilton DF, Howie CR. Knee arthroscopy: influence of systems for delivering healthcare on procedure rates. BMJ. 2015;351:h4720.

38. Bohensky MA, Sundararajan V, Andrianopoulos N, de Steiger RN, Bucknill A, Kondogiannis CM, McColl G, Brand CA. Trends in elective knee arthroscopies in a population-based cohort, 2000-2009. Med J Aust. 2012;197(7):399-403.

39. Jarvinen TL, Guyatt GH. Arthroscopic surgery for knee pain. BMJ. 2016;354:i3934.

40. Thorlund JB, Hare KB, Lohmander LS. Large increase in arthroscopic meniscus surgery in the middle-aged and older population in Denmark from 2000 to 2011. Acta Orthop. 2014;85(3):287-292.

41. Kiadaliri A, Bergkvist D, Dahlberg LE, Englund M. Impact of a national guideline on use of knee arthroscopy: An interrupted time-series analysis. Int J Qual Health Care. 2019;31(9):G113-G118.

42. Rietbergen T, Marang-van de Mheen PJ, Diercks RL, Janssen RPA, van der Linden-van der Zwaag HMJ, Nelissen RGHH, Steyerberg EW, van Bodegom-Vos L; SMART study group. Performing a knee arthroscopy among patients with degenerative knee disease: one-third is potentially low value care. Knee Surg Sports Traumatol Arthrosc. 2021;30(5):1568-1574.

43. Tornow K, Chalian M, Zerr J, Moore D, Thropp R, Xi Y, Browning T, Chhabra A. A Quality Improvement Project to Reduce Unnecessary Knee MRI for Chronic Degenerative Changes. J Am Coll Radiol. 2019;16(7):940-944.

44. Khatri C, Dickenson E, Ahmed I, Bretherton C, Ranaboldo T, Shaw C, Quarcoopome J, Plastow R, Downham C, Rasidovic D, Plant C, Barlow T. ARthroscopy in Knee OsteoArthritis (ARK-OA): a multicentre study assessing compliance to national guidelines. Eur J Orthop Surg Traumatol. 2021;31(7):1443-1449.

45. Brignardello-Petersen R, Guyatt GH, Buchbinder R, Poolman RW, Schandelmaier S, Chang Y, Sadeghirad B, Evaniew N, Vandvik PO. Knee arthroscopy versus conservative management in patients with degenerative knee disease: a systematic review. Knee arthroscopy versus conservative management in patients with degenerative knee disease: a systematic review. BMJ Open. 2017;7(5):e016114.

46. Levinson W, Born K, Wolfson D. Choosing Wisely Campaigns: A Work in Progress. JAMA. 2018;319(19):1975-1976.

47. Verkerk EW, Huisman-de Waal G, Vermeulen H, Westert GP, Kool RB, van Dulmen SA. Low value care in nursing: A systematic assessment of clinical practice guidelines. Int J Nurs Stud. 2018;87:34-39.

48. Mitchell DA, Panchisin T, Seckel MA. Reducing Use of Restraints in Intensive Care Units: A Quality Improvement Project. Crit Care Nurse. 2018;38(4):e8-e16.