

Appendix 2. Articles comprised by the review (web only)

Author/ year	Review/ size	QI/ research method	Labels	Factors
Poksinska B. 2010	Review 30 articles	Lean. Theoretical/ case studies.	Enablers	<ul style="list-style-type: none"> <li>Commitment/participation from staff that owns and drives it</li> <li>Training and responsibility to staff (empowerment)</li> <li>Consultants/trainers from health care</li> <li>Management support, ownership and resources</li> <li>Organization culture</li> <li>An holistic approach - lean is not a toolbox</li> <li>Improve the entire system, involve several units</li> <li>Adaption, not adoption</li> <li>Clear view of the customer</li> <li>Teamwork, collaboration and communication</li> </ul>
Powell A, Rushmer R, Davies H. 2008.	Review 59 articles	QI, including Lean. Observation, interviews, action research.	Necessary but not sufficient conditions for successful implementation	<ul style="list-style-type: none"> <li>Alignment with strategic objectives</li> <li>Quality as part of everyday life/every ones work</li> <li>Long time approach</li> <li>Active health professionals/doctors engagement</li> <li>Belief that staff/patient will benefit</li> <li>Strong leadership and clear vision</li> <li>Sustained active participation from board and senior management</li> <li>Multifaceted interventions sustained action at different levels</li> <li>Substantial investment in training and development (including IT and training of staff)</li> <li>Support from "change agents" to provide skills</li> <li>Robust and timely data</li> <li>Resources</li> </ul>
Vos L, Chalmers SE, Dückers MLA et al. 2011	Review 10 articles	Process oriented redesign including Lean. Uncontrolled before-after evaluations.	Factors for success	<ul style="list-style-type: none"> <li>Senior management support</li> <li>Clinical leadership and involvement</li> <li>Team-based problem solving</li> <li>Adequate information and communication technology support</li> <li>Administrative support</li> <li>Ambitious targets</li> <li>External facilitators</li> <li>Organizational readiness</li> <li>Selection and execution of projects in order of urgency</li> <li>Using a change strategy that already proved to be successful</li> <li>Good communication and training in QI techniques</li> </ul>

Brennan S, McKenzie J, Whitty P, et al 2009	Review - protocol	QI, including Lean. Qualitative and quantitative.	Dimensions of capability thought necessary for successful implementation	Views, norms, beliefs, and behaviors that support the principles and practice of QI Competency in QI methods and tools Alignment of QI activities with the organizations priorities Management structures and systems that support QI, including appropriate data and analysis systems. Leadership support for QI at all levels. Ability to work as a team (team performance), team member participation, Presence of a champion Physician support and participation, team members technical competence, training in theory, methods, and tools, support to facilitate implementation and use, the nature and complexity of the targeted change
de Souza LB, Pidd M. 2011	Review 90 articles	Lean. Case studies.	Success factors	Clarify the nature of lean healthcare, provide evidence that it works, focus on patient processes, translate it, make a culture, data – evidence based, continuous improvement, multidisciplinary teams across silos, local performance measurement, technical support, success stories (small pilots)
Kaplan HC, Provost LP, Froehle CM, et al. 2012	10 QI-experts identification based on review	QI, including Lean. Qualitative and quantitative studies	Contextual factors influencing QI success	External motivators (environmental pressure and incentives) Project sponsorship (personnel, expertise, facilities from outside) QI leadership (senior management board) Senior leader project sponsor (to champion and support) Culture support Program maturity/sophistication of QI Data infrastructure Resource availability Workforce QI focus/training/engaged Micro system leadership (personally involved) Culture support; teamwork, communication, freedom to improve Capability (team ability to use QI methods) Motivation/willingness Team diversity Physician involvement Expert (subject matter)

				<p>Team tenure (worked as a team before)</p> <p>Prior QI experience</p> <p>Team leadership</p> <p>Team decision making processes</p> <p>Team norms of behavior</p> <p>Team QI skills</p> <p>Trigger (a specific event stimulates a new emphasis)</p> <p>Tasks strategic importance to the organization</p>
Kaplan HC, Brady PW, Dritz MC, et al 2010	Review 47 articles	QI including Lean. Observation, controlled design, meta-analysis.	Factors important for QI success	<p>Leadership from top management/board</p> <p>Organizational culture</p> <p>Organizational structure (clinical integration across departments)</p> <p>Data infrastructure and information systems</p> <p>Years involved in QI (experience)</p> <p>Customer focus</p> <p>Physician involvement</p> <p>Micro system motivation to change</p> <p>Resources for QI</p> <p>QI team leadership</p>
Mazzocato P, Savage C, Brommels M et al. 2010	review 33 articles	Lean. Qualitative and quantitative.	Contextual characteristics of relevance	<p>Senior management involvement</p> <p>Work across functional divides</p> <p>Pursue value creation for patients</p> <p>Nurture long term holistic culture of CQI</p> <p>A need to improve</p> <p>A willingness to improve</p>
Kim CS, Spahlinger DA, Kin JM et al. 2009	UMHS-USA evaluasjon	Lean. Qualitative and quantitative.	Key factors	<p>Expert guidance for initial efforts</p> <p>leadership - clinical champions and senior management support</p> <p>frontline worker engagement in the QI processes</p> <p>Use metrics to develop and track interventions</p> <p>Define a realistic project scope</p>
Lukas CVD, Holmes SK, Cohen AB et al. 2007	12 healthcare system doc. review	QI including Lean Longitudinal case-studies, mixed method evaluation.	Interactive elements that appear critical to successful transformation of patient care	<p>Impetus to transform leadership commitment</p> <p>Actively engage staff in meaningful problem solving</p> <p>Alignment to achieve consistency of organization goals</p> <p>Integration to bridge traditional intra-organizational boundaries among individual components.</p>
Kollberg B, Dahlgaard JJ, Brehmer PO. 2007	Unsystematic review	QI including Lean. Qualitative and quantitative.	Critical success factors	<p>patient focus</p> <p>active involvement and</p> <p>multi-skilled teams</p>

Radnor ZJ, Holweg M, Waring J. 2012	4 multilevel studies NHS	Lean. Case studies including interviews	-	holistic system approach, Understanding pathways across the organization. a culture of continuous QI, structured problem solving, understanding the underlying assumptions
Walshe K. 2009	Unsystematic review	Lean Theoretical, qualitative and quantitative studies	-	Adoption of a QI method, stick with it; develop skills and experience, build up engagement, commitment Organizational capacity.
Walshe K, Freeman T. 2002	unsystematic review	Lean. Research evaluations.	The determinants of effectiveness	Leadership, direction, culture, training, resources, Practical support.
Winch S, Henderson AJ. 2009	Un-systematic review	Lean. Qualitative and quantitative.	-	teamwork, collaboration between health professionals and patients, Communication.
Øvretveit J, Gustafson D. 2002	Un-systematic review and recommendation for evaluation	QI including Lean. Theoretical, qualitative and quantitative.	Conditions for effectiveness or critical success factors	Senior management commitment, sustained attention, the right type of management roles at different levels, focus on customer needs, physician involvement, sufficient resources, careful program management, practical and relevant training which personnel can use immediately, the right culture
Morrow E, Robert G, Maben J et al. 2012	Evaluation program NHS	Productive ward (Lean). Mixed method evaluation including interviews and surveys.	Key facilitators	Regional level support Alignment with organizational targets Clear vision, good information about the initiative Dedicated project leadership Strong support from senior staff (champions/steering groups) External support (facilitation, networks) Enthusiasm from middle managers

				<p>Communication and feedback to staff and patients          Need for change, valuing the initiative          Simple, practical solutions to real problems          Accessibility of recourses and teaching modules          Self-nomination (units to take part)          Local ownership and empowerment          Sufficient resources, support and time (staff cover)</p>
<p>Kim CS,          MBA, DAS,          Billi JE.          2009</p>	<p>Unsystematic review</p>	<p>Lean.          Qualitative and quantitative.</p>	<p>Critical Elements</p>	<p>Senior management support.          Expert guidance for their initial projects.          A well-structured set of metrics, on a regular basis, readjusted          Aligning individual goals, projects, and metrics          Provide flexibility for frontline workers to experiment at the site and time they identify a problem.          Frontline management need to avail themselves to the area</p>