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Alberta Health
Services



Indicators and Measurement Instruments for Health Systems Integration: A Knowledge Synthesis

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Key Messages

- Despite far reaching support for health systems integration, there is little information on what successful integration looks like in different contexts and how to measure achievement towards an integrated system.
- This knowledge synthesis included three key components: a Delphi survey with a broad group of stakeholders (researchers, providers, decision-makers), focus groups with patients ranking the 10 key principles, and a systematic review of instruments to measure 16 indicator domains.
- There are many quality instruments to measure care coordination, patient engagement, and team effectiveness/performance.
- There are few instruments in indicator domains that focus on the system level of integration (e.g., technology, finance) – this is a significant gap that warrants further research.
- A number of instruments exist that measure overall integration and can be used as a starting point to identify areas where targeted efforts are needed.
- The instrument compilation contributes to the growing body of literature concerned with measuring progress towards health systems integration.

Executive Summary

Background: In a climate of financial and human resources constraints, today's fragmented health systems are unable to meet the challenges of increasing patient complexity, rising consumer expectations and technological advances. Integrated care has become a driver for many countries as they seek to transform their health systems. Despite far-reaching support for health systems integration, the "how to" remains challenging. There is limited information on what successful integration looks like in different contexts and how to measure achievement towards an integrated system.

The authors' previous work identified 10 key principles that collectively support health system integration: 1) comprehensive services across the continuum of care, 2) patient focus, 3) geographic coverage and rostering, 4) standardized care delivery through interprofessional teams, 5) performance management, 6) information technology, 7) organizational culture and leadership, 8) physician integration, 9) governance structure, and 10) financial management (Suter et al. 2009). The same study highlighted the lack of integration measures and indicators as a major gap (Suter et al. 2009).

This knowledge synthesis emerged as a follow-up from this previous work and aimed to identify indicators and instruments to measure progress towards health systems integration. The specific research questions were: 1) What are appropriate indicator domains for each of the 10 key integration principles? 2) What measurement instruments are used to measure these indicators? and 3) What are patients'/health system users' understanding of each of the 10 integration principles?

Study approach: The study consisted of three phases: 1) a modified Delphi survey with experts in integrated care, health care managers, and decision-makers to identify the most relevant measurement domains; 2) focus groups with patients/users to understand their priorities for health system integration; and 3) systematic reviews for instruments to measure each indicator domain identified in the Delphi survey.

Through the Delphi process, we reached consensus on 16 domains considered highly relevant for measuring integrated care. The domains span nine of the 10 key principles for integration established in our previous work. Delphi participants did not reach consensus for any of the indicator domains proposed for principle nine "governance structures". Our focus groups with patients in British Columbia, Alberta, and Brazil confirmed that patient/family centred focus, comprehensive services across the care continuum, and financial management are key integration principles for health system users. Interpretation of financial management differed though for Canadian and Brazilian participants. In Canada, participants focused on responsibility of spending funds during times of austerity and cutbacks, while in Brazil they focused on the allocation of funding and the overall lack of funding for health care.

For each of the 16 domains identified through the Delphi consensus process, we conducted a systematic review of instruments. We used standard processes to rate the quality and relevancy of the articles and to extract and synthesize the information.

Findings: The search yielded a total of 7,133 abstracts from which we retrieved 114 unique instruments and measurement approaches that we considered relevant for measuring health systems integration. We found an abundance of instruments to measure indicator domains under principles 1) "comprehensive services across the continuum" and 2) "patient focus". Many of the instruments were high quality, well documented, and used frequently in the literature. Similarly, we identified a range of

instruments to measure team effectiveness, which was one of the indicator domains under the principle 4) “standardized care delivery through interprofessional teams”. These three principles are the focus for many health systems, as progress in these areas directly influences patient experience.

The literature search revealed fewer instruments to assess standardized clinical pathways, another domain under principle 4. Standardized pathways are a valuable way to create care continuity; these instruments hold promise to monitor progress towards standardization of care and continuity of care. Physician integration into the broader system (principle 8), a prominent topic in the late nineties, has seemingly disappeared from the literature. More recent literature and instruments refer to physician integration in the context of provider collaboration (e.g., pharmacists, nurses).

It was far more difficult to identify quality instruments that measure what we refer to as system level indicator domains of integration. These included the existence of primary network structures (under principle 3), the use of performance measurement (under principle 5) and information systems (under principle 6), alignment of organizational goals (under principle 7), and resource allocation (under principle 10). Specifically, we were unable to find any instruments or measurement approaches for indicator domains relating to data being tracked and shared with stakeholders, and information systems being shared across care sectors. This suggests that research has focused to a lesser extent on evaluating foundational structures that support health systems integration than the care processes. This constitutes a gap as the importance of these system level domains for integration are well recognized.

We found 12 unique instruments that measure three or more indicator domains. These “overall integration” instruments are particularly useful for a quick assessment. They do not always cover all domains and may not be as detailed as domain specific instruments that allow a more in-depth exploration of targeted areas that may be the focus of integration strategies.

Conclusions: This study has identified 114 instruments that measure different domains considered relevant for health systems integration. These integration instruments will enable stakeholders and policy makers to measure the success of different strategies through the selection of the most appropriate instruments. This will ultimately lead to better design of health care systems and better health outcomes.

Research Report

Background

Increasing complexity of patients with co-morbidities demands a shift from acute, episodic care to care that is coordinated across the continuum (Strandberg-Larsen 2011; Strandberg-Larsen & Krasnik 2009). Creating greater integration across health systems has been generally accepted as a way to improve continuity of care for these patients. Health system integration is now a key component of health care reform in most developed economies (Strandberg-Larsen & Krasnik 2009). Many definitions for health systems integration exist (Suter et al. 2009); however, patient focus and coordination, and collaboration across sectors and providers are central to all of them. There is increasing evidence that integrated health systems have the potential to improve quality of care (Hébert & Veil 2004; Strandberg-Larsen & Krasnik 2009) and decrease utilization of resources (Hébert & Veil 2004; Strandberg-Larsen 2011).

Despite far reaching support for health systems integration, the how to remains challenging. There is little information on what successful integration looks like in different contexts and how to measure achievement towards an integrated system (Van Deusen Lukas et al. 2002). Two of the authors (NO/ES) previously conducted a knowledge synthesis focused on models for health systems integration. The results showed there was no ultimate model for health system integration. This is not surprising given the complexity of health service delivery and the need to adapt to local context. The authors were, however, able to identify ten key principles that collectively support health systems integration. The principles include: 1) comprehensive services across the continuum of care, 2) patient focus, 3) geographic coverage and rostering, 4) standardized care delivery through interprofessional teams, 5) performance management, 6) information technology, 7) organizational culture and leadership, 8) physician integration, 9) governance structure, and 10) financial management (Suter et al. 2009).

An important gap that emerged in the knowledge synthesis was the lack of indicators and relevant instruments to measure integration. Although Strandberg-Larsen and Krasnik (2009) argued that “methods to measure integrated health care delivery are clearly emerging” (p. 4), the instruments that exist are hard to find as literature is dispersed and it is not clear if instruments and indicators cover all dimensions of integration. This limits the ability to monitor the effectiveness of integration strategies (Armitage et al. 2009; de Jong & Jackson 2001).

This current knowledge synthesis is timely and relevant as health systems continue to be fragmented. The goal of the synthesis was to identify indicators and instruments to measure health systems integration.

The findings will directly benefit policy and decision-makers by compiling an easily accessible set of indicator domains and instruments to measure health system integration across different contexts. Being able to evaluate the success of integration strategies and initiatives will lead to better health system design and improved health outcomes for patients. To enhance the global applicability of this work, we developed a partnership between Brazil (Rio Grande do Sul) and Canada (Alberta and British Columbia). Both countries have publicly funded health systems, comparable funding priorities and similar geography of large urban centres and rural communities. Furthermore, health systems integration is a priority in both countries. Guided by integrated knowledge translation principles (CIHR 2012), we engaged knowledge-users (decision-makers and policy-makers) from each jurisdiction

throughout the process. The ethics boards of the three participating jurisdictions approved the research protocol.

Methods

The knowledge synthesis consisted of three components: 1) a Delphi process to identify the most relevant indicator domains from health care providers, decision-maker, and researcher perspectives; 2) focus groups with patients to elicit their perspectives on most relevant integration principles; and 3) a systematic review of tools for each identified indicator domain. The knowledge synthesis was based on the steps developed by Levac, Colquhoun and O'Brien (2010). These steps included:

1) Identifying the research question

Three research questions, jointly developed with our knowledge users, directed this knowledge synthesis: 1) What are the appropriate indicator domains for each of the 10 principles of integration? 2) What measurement instruments are used to evaluate these indicator domains? and 3) What is the patients'/health systems users' understanding of each of the 10 integration principles.

2) Identifying indicator domains

Delphi survey

An important step was to identify the most relevant indicator domains for measurement under the ten key principles of integration. This was achieved using a modified Delphi survey (Hsu & Sandford 2007). The modified Delphi process uses a structured questionnaire for the first round in comparison to the traditional Delphi that uses an open-ended survey (Hsu & Sandford 2007). We invited 39 integration experts, policy and decision-makers, and health care providers from Canada, Brazil, Europe, and the United States to participate in the survey. All 39 integration experts were invited to participate in all three rounds, regardless if they had been involved in previous rounds, unless they had expressly indicated that they were unable to participate. Drawing on previous work and a scan of the literature, research team members generated a preliminary list of possible indicator domains for each of the 10 key principles (Appendix A). From this list, a Delphi survey was developed (Appendix B) and translated into Portuguese (Appendix C). In the first round, participants could also suggest additional domains to be included in the second round of the Delphi process. The goal was to achieve 75% agreement for inclusion or exclusion of indicators.

Focus groups

In each of the three jurisdictions, we held a patient/user focus group to understand the importance of the 10 key principles of integration to service users. A research team member familiar with the integration principles facilitated the focus group; a second team member took field notes and recorded the session. All participants provided informed consent. Participants received a description of the 10 key integration principles prior to the focus group. Each principle was discussed using an interview guide (Appendix D). At the end of the focus group, participants completed a survey to prioritize the principles from 1-10 (one being high priority and 10 a low priority) (Appendix E). The interview guide and survey were translated into Portuguese for the Brazilian participants. Survey results were analyzed using descriptive statistics. Recordings and field notes were transcribed verbatim and coded using NVivo10™ software. Two research assistant-principal investigator teams thematically analysed the data in Brazil and Canada, respectively. The two teams regularly discussed similarities and differences in themes incorporated into the final analysis.

3) Identifying relevant studies

Our research librarian (RJ) assisted us in identifying search terms for each of the indicator domains (Appendix F) and searched the following databases: Health Sciences, Education and Management/ Business bibliographic databases (Medline including the Cochrane Library, EMBASE, PsycINFO, CINAHL, ABI Inform, LILACS, and Business Source Premier).

Using keywords for each of the indicator domains, a research assistant searched three relevant and highly utilized grey literature databases (greylit.org, opengrey.eu, advanced Google search). We filtered results for date and language and the first 50 documents returned were screened. In addition, research assistants searched websites of relevant government agencies and research organizations (e.g., Institute for Healthcare Improvement), reference lists of included studies and Web of Science citations for relevant instruments. The Brazilian team followed the same steps for searching and screening studies.

4) Selecting studies

The research team developed, tested, and refined inclusion and exclusion criteria for selecting studies (Appendix G). The key criterion was that articles must include some kind of tool or approach to measure the integration indicator domains. Two readers read and rated abstracts; a third reader resolved disagreements. Full-text articles were reviewed for relevancy when abstracts were rated as appropriate. Articles not relevant to the current domain, but potentially relevant to others, were marked on the workbook. Grey literature reports and documents were screened in a similar fashion. We also screened reference lists of relevant articles for potentially relevant articles. The team completed audits (10% of abstracts screened) at the relevancy stage to ensure appropriate articles were screened in and out. Two research team members in Brazil conducted the ratings and selection of Portuguese and English abstracts related to the Brazilian context following the same procedures. Figure 1 shows details of the number of abstracts screened, considered relevant, and included for full review.

For relevant articles, we retrieved, where possible, the original articles describing the development of the tool as they typically contained more details including psychometric properties of the tool. This original article was the one included in the data extraction table. As a result, if the original article was older than 1995 it was still included. We included articles with specific information on measurement approaches, particularly for indicator domains where we had difficulties finding instruments. In some cases, our abstract reviews included revised versions of the instruments. If we identified revised versions in the original search, we included them; however, we did not search for revised versions of all of the instruments. Articles about administrative data use (e.g., hospital admissions, emergency visits) were not included.

5) Charting the data

We developed and tested a template to guide extraction of relevant information. Audits were conducted to ensure consistency of extractions across team members. We adapted a tool used in an earlier study (Hastings et al. 2014) to appraise the quality of included articles (Appendix H). The Brazilian team followed the same steps for extracting relevant information.

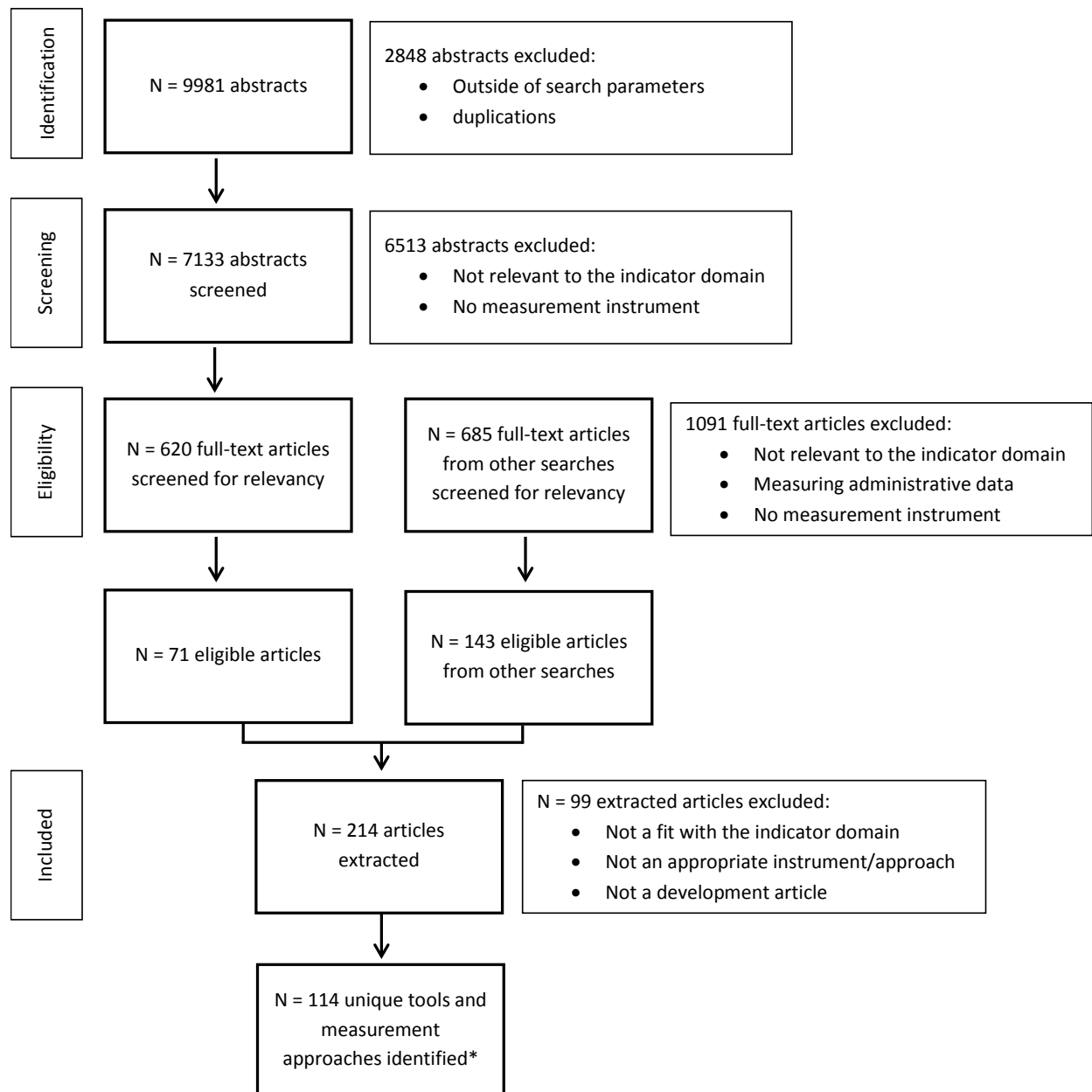
6) Collating, summarizing and reporting results

The extraction tables built the foundation for our narrative synthesis and the final report. The findings from the Brazilian team were integrated into the synthesis.

7) Consulting

We used an integrated knowledge translation approach (CIHR 2012) for this knowledge synthesis. Knowledge-users (decision-makers and policy-makers) from each jurisdiction and other researchers participated in developing the proposal, identifying priority domains, and were consulted throughout the study. We hosted two interactive webinars for knowledge-users and researchers from Canada, Brazil and other international jurisdictions (Appendix I). Over 85 individuals registered for the two events.

Figure 1. Prisma flow chart



* Two tools were counted in two indicator domains – total tool count = 116

Results

Delphi Survey

Seventeen unique individuals participated in three rounds of Delphi surveys to identify priority indicator domains for measurement (see Table 1 for details). Participants varied from one round to the next. The panel reached consensus on the relevancy of all indicator domains (n=37); 16 were considered relevant and 21 were agreed to be irrelevant and removed. No indicator domains were agreed upon for Principle 9 focusing on governance. The 16 indicator domains identified as priority domains were used for the systematic review and are listed in Table 2.

Table 1. Modified Delphi survey details

Round	# of participants	Process	Results
1	<ul style="list-style-type: none"> • n = 12 • Researchers/experts (50%) • Decision-makers (33%) • Policy-makers (17%) • Other (8%)* 	<ul style="list-style-type: none"> • Fit, importance, and priorities of 22 indicator domains rated 	<ul style="list-style-type: none"> • 15 indicator domains rated as $\geq 75\%$ for fit and importance • 1 indicator domain rated as $< 60\%$ for fit and importance • 6 indicator domain results were inconclusive
		<ul style="list-style-type: none"> • Relevant indicator domains were added by participants • Common themes were identified across these indicator domains • Existing and themed indicator domains circulated to research team for rating and rationale • Sub-committee (PIs and Co-I with Delphi expertise) reviewed team results to finalize Round 2 survey 	<ul style="list-style-type: none"> • 36 additional domains added in Round 1 • Original and additional themed indicator domains were merged to produce 38 indicator domains for round 2
2	<ul style="list-style-type: none"> • n = 12 • Researchers/experts (50%) • Decision-makers (33%) • Other (17%) 	<ul style="list-style-type: none"> • Modified survey with 38 indicator domains sent to all panel participants except those who indicated in Round 1 they could/did not wish to participate • Rated importance, fit, and priority for each indicator domain • No new indicator domains could be added 	<ul style="list-style-type: none"> • 16 indicator domains rated as $\geq 75\%$ for fit and importance (removed from 3rd Delphi round and were included in systematic reviews) • 13 indicator domains rated as $< 60\%$ for fit and importance (deleted from survey) • 9 indicator domain results were inconclusive (included in Round 3) • Priorities were completed inconsistently (removed for Round 3)

Round	# of participants	Process	Results
3	<ul style="list-style-type: none"> • n = 14 • Researchers/experts (43%) • Decision-makers (36%) • Other (36%)* 	<ul style="list-style-type: none"> • Modified survey with 9 indicator domains sent out to all panel participants • The purpose of round three was to gain consensus on the final 9 indicator domains • Participants were asked to comment on discrepancies between fit and importance 	<ul style="list-style-type: none"> • 8 indicator domains rated as <60% for fit and importance; not included systematic reviews • Indicator domain on overall integration was also rated at <60%; but retained as category for tools measuring 3 or more indicator domains • 16 indicator domains were identified for all principles other than Principle 9 (governance)

*Other included providers, health services planning, not specified. Participants were able to select multiple options, hence percentages do not add up to 100%.

Table 2. List of 16 indicator domains

Domain
Domain 1.1: Coordinated transitions in care across the continuum of care ¹ (transferring care from one area to another)
Domain 1.2: Client care is coordinated between sectors ² and providers within the health system and with supporting services such as education and social services
Domain 2.1: Patient and/or family involvement in care planning for all patients
Domain 3.1: Primary care network structures in place (e.g., family health teams, primary care networks, GP Divisions, inner city PHCs)
Domain 4.1: Team effectiveness
Domain 4.2: Use of shared clinical pathways across the continuum of health care (e.g., diabetes, asthma care) and geography
Domain 4.3: Individualization of care pathways for patients with co-morbidities
Domain 5.1: Performance measurement domains and tools in place
Domain 5.2: Clinical outcomes being measured
Domain 5.3: Data (e.g., administrative, performance, clinical) tracked and shared with stakeholders
Domain 6.1: Shared information systems across care sectors
Domain 6.2: Shared patient electronic charts across continuum of care accessible to patients
Domain 6.3: Data collected is used for service planning
Domain 7.1: Organizational goals and objectives aligned across sectors
Domain 8.1: Physician integration within care teams and across sectors
Domain 10.1: Attainment of goals and objectives are supported by funding and human resource allocation
Domain 11. Overall integration; tools that measure several concepts of integration

¹Continuum of care – refers to the health sector only

²Sector – refers to sectors such as health, education, social services, etc.

Focus Groups

Seventeen health services users participated in the focus groups: five in British Columbia, three in Alberta, and nine in Brazil. Participants in Canada identified patient focus, comprehensive services across the care continuum, standardized care delivery through interprofessional teams, and physician integration as the most important principles. Participants felt the system continued to be provider and system focused. They saw a lack of continuity across the continuum as impeding timely and appropriate access to care.

In Brazil, the highest priority principles for integration were patient focus, comprehensive services across the care continuum, financial management, and governance structure. Participants considered integration between components of the health system as necessary and remarked that current initiatives lacked continuity.

Alberta participants ranked standardized care delivery by interprofessional teams as a high priority and participants in British Columbia and Brazil ranked it as medium priority. Other differences between countries included physician integration, which was a top priority in Canada but ranked last in Brazil, and governance structure was ranked higher in Brazil.

Despite jurisdictional differences, all participants consistently ranked three priorities within the top five: patient-focus, comprehensive services across the care continuum, and financial management. Three principles ranked consistently low: information systems, geographic coverage and rostering, and organizational culture and leadership. Performance management was a medium priority for all groups.

Systematic Review

Table 3 shows the systematic review results for each of the 16 indicator domains. Some indicator domains were reviewed together given their common characteristics and search terms used. We added an indicator domain “Overall Integration” to capture instruments that reflect three or more indicator domains. The extraction table (Appendix J) contains details on the instruments and measurement approaches including psychometrics, quality ratings, and Google citations.

Table 3. Number of abstracts screened and tools identified by domain

Domain		Total # abstracts screened	Total # full-text articles	Total # of tools ²
1.1	Coordinated transitions in care across the continuum of care ¹ (transferring care from one area to another)	298	195	17
1.2	Client care is coordinated between sectors and providers within the health system and with supporting services such as education and social services	610	97	14
2.1	Patient and/or family involvement in care planning for all patients	569	128	34
3.1	Primary care network structures in place (e.g., family health teams, primary care networks, GP Divisions, inner city PHCs)	118	23	8
4.1	Team effectiveness	198	83	12

4.2 ¹	Use of shared clinical pathways across the continuum of health care (e.g., diabetes, asthma care) and geography	957	229	7
4.3	Individualization of care pathways for patients with co-morbidities			
5.1 ¹	Performance measurement domains and tools in place	1657	99	2
5.2	Clinical outcomes being measured			
5.3	Data tracked and shared	410	47	0
6.1 ¹	Data (e.g., administrative, performance, clinical) tracked and shared with stakeholders	315	107	1
6.2	Shared patient electronic charts across continuum of care accessible to patients			
6.3	Data collected is used for service planning	554	68	1
7.1	Organizational goals and objectives aligned across sectors	483	50	1
8.1	Physician integration within care teams and across sectors	560	53	6
10.1	Attainment of goals and objectives are supported by funding and human resource allocation	404	39	1
11	Overall integration; tools that measure several constructs of integration	0	87	12
Total		7133	1305	116
¹ overlap in domains; screened together				
² total number is higher as two tools were appropriate for two domains				

Principle 1-Comprehensive Services across the Care Continuum

1.1 Coordinated transitions across the continuum of care

Coordinated transitions in care across the continuum of care examines the adequacy and continuity of transitional care within and between acute care, primary care, and different community care services and settings. We found 17 tools that measure this indicator domain. Most tools (n=14) were developed for community/primary care settings (Bonomi et al. 2002; Center for Health Care Transition Improvement 2014a; 2014b; Durbin et al. 2004; Farmanova et al. 2013; King, Rosenbaum & King 1996; Le Bas, King & Block 1998; Lemmon & Shuff 2001; Martz & Gerding 2011; McGuinness & Sibthorpe 2003; Safran et al. 2006; Sawicki et al. 2009; Schaefer, Cronkite & Ingudomnukul 2004; Tobon et al. 2014;), one was developed in acute care (Grimmer & Moss 2001), and two in both primary and acute care (Coleman et al. 2002; Graetz et al. 2014). Two of the tools were found in the grey literature (Center for Health Care Transition Improvement 2014a; 2014b).

Highlighted here are five widely used instruments; three instruments are from peer-reviewed articles and two from the grey literature. The first tool, the Care Transitions Measure (CTM) and its modifications, measure the quality and experience of patients discharged from the hospital (Coleman et al. 2002; Coleman et al. 2005; Parry et al. 2008). The 15-item measure covers four actionable domains: 1) critical understanding, 2) preferences important, 3) management preparation, and 4) care plan (Coleman et al. 2005). The CTM was later adapted into a three-item tool (CTM-3) (Parry et al. 2008).

The second tool, the Continuity of Care Practices Survey (CCPS), was developed to address the lack of measures that systematically capture the multiple dimensions of continuity of care practices in substance use disorder treatment programs (Schaefer, Cronkite & Ingudomnukul 2004). The CCPS measures continuity of providers, maintenance of contact with patients, connection of patients to community resources, and coordination of care among different providers. The tool exists in two versions that measure continuity of care at the program level and at the individual level. Another tool measuring continuity of care in mental health is the Continuity of Care in Children's Mental Health (C3MH) tool (Tobon, Reid & Goffin 2014). The C3MH was developed to address the fragmented mental health services system that often includes a variety of services that span across multiple sectors. A comprehensive tool, the C3MH measures five dimensions: 1) collaboration, 2) transitions, 3) provider knowledge, 4) interpersonal relationships, and 5) relational consistency (Tobon, Reid & Goffin 2014).

The two tools from the grey literature are the Current Assessment of Health Care Transition Activities Tool and the Health Care Transition Process Measurement Tool (Centre for Health Care Transition Improvement 2014a; 2014b). Part of a comprehensive resource kit ("Got Transition"), both tools were developed in primary care settings in the United States to measure the extent which "Six Core Elements of Health Care Transition 2.0" are built into clinical processes (Centre for Health Care Transition Improvement 2014a, p. 1). The instruments focus on vertical and horizontal collaboration, adequate information transfer, and patient, family, and carer preparation. There are multiple versions geared towards different populations and aspects of care coordination (i.e., transition activities, process measurement) and they are available in English and Spanish.

1.2 Client care is coordinated between sectors and providers within the health system and with supporting services such as education and social services

The second indicator domain under principle one measures the coordination of client services across different sectors (e.g., health, social services). The search yielded 14 instruments that measure intersectoral coordination along a continuum from loose linkages to close collaboration. Most instruments are questionnaires and were created or tested in a health care setting or with health-related outcomes. Intersectoral coordination is captured by variables such as connections between partnering organizations (Conrad et al. 2003; Fletcher et al. 2009; Singer et al. 2012; VicHealth 2003), social networks (Morrissey et al. 1994¹; Pagliccia et al. 2010), interagency linkages (Amoroso et al. 2007; Meredith et al. 2009; Morrissey et al. 1997; Tucker et al. 2007), depth of integration (Browne et al. 2004; Reilly et al. 2003), and level of system integration and change (Passalent et al. 2013). One instrument was identified from the grey literature (VicHealth 2003).

The following three are highlighted as relevant, high quality, or unique approaches to measuring intersectoral collaboration. The National Criminal Justice Treatment Practices Survey (NCJTPS) is an interagency activity instrument used to measure integration between corrections and addiction treatment programs in the United States (Fletcher et al. 2009). The purpose of the questionnaire is to understand how agencies work together, how collaboration and integration activities are characterized,

¹ Morrissey et al. 1994 developed two instruments that were appropriate for this systematic review. Both measure intersectoral collaboration.

and where these activities overlap (Fletcher et al. 2009). Both programs rank their level of interaction with the other program; rankings are then compared.

Pagliccia et al.'s (2010) unnamed questionnaire is used in conjunction with network analysis to track the impact of intersectoral action on health determinants. The instrument focuses on tracking the links and intersectoral actions of agencies in different sectors based on 11 health determinants and measuring six dimensions found to reflect intersectoral collaboration: 1) perceived importance of health determinants, 2) intensity of internal engagement on each determinant, 3) intensity of intersectoral collaboration (i.e., organizations they had collaborated within the previous 6 months), 4) network density (measure of concentration of intersectoral collaboration), 5) betweenness centrality (i.e., how important an organization is in connecting other sectors in the network), and 6) betweenness centralization (measure of the disparity between sectors based on their betweenness centrality). The data from the questionnaire uses "block modeling techniques" within the network analysis to assess how the different sectors group together within the network. This comprehensive instrument offers an innovative way to assess intersectoral collaboration.

The Human Services Network Integration Measure (Browne et al. 2004), captures human services programs' intra- and inter-sectoral service integration by quantifying the extent, scope, and depth of integration as perceived by local service providers. The depth of integration is measured on a 5-point scale ranging from zero (no awareness of the other programs or services) to four (collaboration - programs jointly plan offered services). The measure produces four scores: "extent of service integration", "scope of integration", "depth of integration", and "total integration".

Principle 2-Patient Focus

2.1 Patient and/or family involvement in care planning for all patients

Indicator domain 2.1, patient and/or family involvement in care planning, focuses on putting the patient and/or family at the center of care and having them involved in shared decision-making. This was the only indicator domain under principle two, *patient focus*; however, the topic area was very broad. Out of all 16 indicator domains, patient and family involvement in planning yielded the largest number of instruments.

We found 34 instruments that measure a range of concepts that we organized into eight categories: 1) patient centred care/experiences with care, 2) patient satisfaction, 3) quality of care, 4) family involvement in care, 5) shared decision-making/involvement with decision-making, 6) satisfaction with decision/conflict with decision, 7) communication, and 8) empowerment and empathy. All instruments were created or tested in a health care setting. The majority, 26 of the instruments, are completed by patients and/or families (Arora et al. 2011; Bennett et al. 2010; Damman, Hendriks & Sixma 2009; Deber, Kraetschmer & Irvine 1996; de Kok et al. 2007; Edwards et al. 2003; Farin, Gramm & Kosiol 2011; Gagnon et al. 2006; Galassi, Schanberg & Ware 1992; Hays et al. 1999; Holmes-Rovner et al. 1996; Jenkinson, Coulter & Bruster 2002; Kim, Boren & Solem 2001; King, Rosenbaum & King 1996; Légaré et al. 2010; Lerman et al. 1990; Little et al. 2001; Marco, Buderer & Thum 2005; Martin, Di Matteo & Lepper 2001; Meakin & Weinman 2002; Mercer et al. 2004; O'Connor 1995; Safran et al. 1998; Simon et al. 2006; Sixma et al. 1998; Stewart et al. 2007), the rest are completed by physicians or other health care professionals (Ainsworth, Cowan & Trieschman 1998; Campbell et al. 2007; Elwyn et al. 2003; Elwyn et al. 2013; Heggland et al. 2012), or by both, patients and physicians (Agnew-Davies et al. 1998; Cegala, Thoesen Coleman & Turner 1998; Shields et al. 2005).

We highlight five examples. The 30-item Kim Alliance Scale (KAS), listed under the “Family Involvement in Care” category, includes subscales that measure collaboration, communication, integration, and empowerment (Kim, Boren & Solem 2001). The KAS was revised (KAS-R) to create a shorter 16-item questionnaire with the same subscales (Kim, Kim & Boren 2008). The instruments offer a broad assessment of the patient-provider relationship with the intent to capture a shift from patient compliance to empowerment.

Instruments that focused on “Shared Decision-Making/Involvement with Decision-Making” include the CollaboRATE (Elwyn et al. 2013), the Shared Decision-Making Questionnaire (SDM-Q) (Simon et al. 2006), and the Problem-Solving Decision-Making (PSDM) Scale (Deber, Krartschmer & Irvine 1996). The CollaboRATE and SDM-Q are relatively short and easy questionnaires to complete. The CollaboRATE is a three-item questionnaire that measures the shared decision-making process during clinical encounters. Clinicians administer the questionnaire during routine practice to help assess their communication. The SDM-Q conceptualizes shared decision-making as having at least two individuals involved in the treatment decision-making process (Simon et al. 2006). An exchange of information, questioning, and responding should occur until patients understand their treatment options and can express a preference. The original SDM-Q has been revised (SDM-Q-9, Simon et al. 2006; Kriston et al. 2010) to mitigate some of the limitations of the original version (e.g., better differentiation between items, ceiling effects). The PSDM uses three short vignettes that outline different health situations representing morbidity, mortality, and quality of life (Deber, Krartschmer & Irvine 1996). For each vignette, the participant indicates who should be involved in four problem-solving tasks (i.e., diagnosis, treatment options, risks and benefits, and probabilities) and two decision-making tasks (i.e., utilities, what is done). The participants are asked to respond to these situations using a five-point scale deciding whether the decisions in these situations should be made by “the doctor alone” or by “me alone”.

Finally, from the “Satisfaction with Decision/Conflict with Decision” category, O’Connor’s (1995) Decisional Conflict Scale (DCS) is a 16-item questionnaire that measures the perceptions of effective decision-making using three subscales: 1) uncertainty in making health-related decisions, 2) factors contributing to uncertainty, and 3) perceptions of effective decision-making. Decisional conflict is a state of uncertainty about what course of action to take. Uncertainty is likely when health decisions involve risk or uncertainty of outcomes. The DCS was developed as a consumer decision aid to help patients become more involved in health related decisions.

Principle 3-Geographic Coverage and Rostering

3.1 Primary care network structures in place

Primary care network structures in place was the only indicator domain identified under principle three, *geographic coverage and rostering*. This indicator domain presented some challenges in identifying instruments because it can be represented as a yes or no question. That said, we did find eight questionnaires that measure either general structural components of primary care networks (Flocke 1997; Friedberg et al. 2008; Rodrigues et al. 2014) or specific areas of primary care, such as the medical home (Birnberg et al. 2011; Cooley et al. 2003; Rittenhouse et al. 2008), palliative care (Nikbakht-Van et al. 2005), and child services (Cassady et al. 2000). The following three instruments were identified as the most relevant and high quality to measure primary care network structures.

The Safety Net Medical Home Scale (SNMHS) is a 57-item questionnaire that measures Patient-Centered Medical Home characteristics (Birnberg et al. 2011). The medical home aims to improve continuity of

patient care through a strong relationship between the patient and physician (Birnberg et al. 2011). The SNMHS measures medical home characteristics across six domains: 1) access to care and communication with patients and other providers, 2) patient tracking and registry, 3) care management, 4) test and referral tracking, 5) quality improvement, and 6) external coordination. Items under the six domains relate to scheduled appointments, patient registries, reminder notices, and follow-ups with patients that reflect specific care structures.

The Medical Home Index (MHI) is a self-assessment and classification tool that translated indicators of the medical home into “observable, tangible behaviours and processes of care” (Center for Medical Home Improvement 2008, p.1; Cooley et al. 2003). The MHI has multiple, short and long versions appropriate for different populations (i.e., adult, pediatric). The long version uses 25 themes across six domains that assess primary care practices: 1) organizational capacity, 2) chronic condition management, 3) care coordination, 4) community outreach, 5) data management, and 6) quality improvement (Cooley et al. 2003). Each theme is scored across four levels of achievement. The short version includes 10-items that measure to what degree a practice has achieved components of a medical home (Center for Medical Home Improvement 2006; McDonald et al. 2014). The MHI also measures performance indicators and, therefore, is also listed under domains 5.1/5.2, *performance measurement indicators and instruments in place and clinical outcomes being measured*

Developed in Portuguese, the Instrumento de Avaliação da Coordenação das RAS pela APS (COPAS) is a 78-item questionnaire (Rodrigues et al. 2014) to assess the coordination of integrated health service delivery networks in primary health care. The COPAS has five dimensions: 1) population, 2) primary health care, 3) support systems, 4) logistic systems, and 5) management systems. The COPAS is a tool for managers and health workers for the situational diagnosis of their health systems.

Principle 4-Standardized Care Delivery through Interprofessional Teams

4.1 Team effectiveness

Team effectiveness was one of three indicator domains under principle four, *standardized care delivery through interprofessional teams*. Team effectiveness, including team performance, represents the effectiveness of interprofessional teams involved in integrated health systems. We found many instruments measuring team effectiveness; however, we limited our selection to instruments that measure the effectiveness of interprofessional health care teams, as they were the most relevant to our study context. We also included instruments that measure the effectiveness of virtual teams because, in integrated health systems, many team members can be dispersed across organizations and sites rather than being co-located.

We identified 12 instruments. Nine were from the health care sector (Amundson 2005; Bateman, Wilson & Bingham 2002; Cramm & Nieboer 2011; Schroder et al. 2011; Smits et al. 2003²; Shortell et al. 1991; Temkin-Greener et al. 2004; Undre et al. 2006; Vinokur-Kaplan 1995), the two virtual team questionnaires were from technology and agriculture sectors (Lurey & Raisinghani 2001; Staples & Webster 2007), and one instrument was found in the grey literature (Hepburn, Tsukuda & Fasser 1998).

² Smits et al. 2003 developed multiple scales. Three of them were appropriate for this systematic review. One measures team effectiveness and the other two measure physician integration.

Eleven of the 12 instruments were questionnaires; the remaining was an observational assessment instrument (Undre et al. 2006). Five of the instruments were part of larger and more in-depth questionnaires (Amundson 2005; Cramm & Nieboer 2011; Shortell et al. 1991; Temkin-Greener et al. 2004; Lurey & Raisinghani 2001). However, we only reported on items and scales that explicitly measured team effectiveness, performance, or factors identified as contributing to team effectiveness. Instruments measure team effectiveness by measuring factors that contribute to team effectiveness such as team cohesion, individual well-being, and use of resources; or both. We highlight three instruments.

The ICU (intensive care unit) nurse-physician questionnaire is an example of a health sector tool. It measures culture, leadership, communication, coordination, problem-solving/conflict management, unit cohesiveness, and unit effectiveness as dimensions that affect the effectiveness of nurses and physicians working in the ICU (Shortell et al. 1991). Short (six sections with 85-items) and long versions (11 sections with 218-items) of the questionnaire are available. Different wording was used for surveys submitted to physicians versus nurses to adjust for different contexts. While created for teams working in the ICU, the authors noted that the questionnaire is flexible and could be adapted to different contexts.

The Team Effectiveness Audit Tool (Bateman, Wilson & Bingham 2002) was created for public sector teams and was validated using health and social care teams with a predominately multidisciplinary working practice. The tool measures six domains: 1) team synergy, 2) performance objectives, 3) skills, 4) use of resources, 5) innovation, and 6) quality. These six domains compose a four-factor solution: 1) the effectiveness of team outputs, 2) team identity/team synergy, 3) clarity of performance objectives, and 4) team role clarity.

The Virtual Teams Survey (Lurey & Raisinghani 2001) includes two separate aspects of virtual team effectiveness: 1) the team's ability to perform their work assignments and 2) team members' level of satisfaction working in virtual teams. The team performance items (8-items) are part of a larger questionnaire on virtual teams.

4.2 Use of shared clinical pathways across the continuum of health care and geography and 4.3 Individualization of care pathways for patients with co-morbidities

Indicator domains 4.2 and 4.3 were analyzed together as they are similar concepts that could not be distinguished in the screening stage. 4.2 focused on the use of shared clinical pathways across the continuum of health care and geography; 4.3 focused on individualization of care pathways for patients with one or more co-morbidities.

In total, we found seven instruments relevant for indicator domains 4.2 and 4.3. Five instruments were relevant for domain 4.2 (Ainsworth & Buchan 2012; Vanhaecht et al. 2007; Van Houdt et al. 2013; Wagner et al. 2014; Whittle et al. 2004); none of them specifically included geography as a component. Two instruments were located for domain 4.3 (Glasgow et al. 2005; Wagner, Austin & Van Korff 1996). Health care management or physicians complete four of the instruments (Ainsworth & Buchan 2012; Vanhaecht et al. 2007; Wagner et al. 2014; Whittle et al. 2004) and two evaluate clinical pathways from the patient perspective (Glasgow et al. 2005; Van Houdt et al. 2013). One instrument was found in the grey literature (Wagner, Austin & Van Korff 1996); this instrument included essential elements for

developing successful care pathways for patients with chronic conditions. These components could be used to develop a measurement instrument to be completed by either physicians or patients.

We highlight three of the instruments. The Integrated Care Pathways Assessment Tool (ICPAT) (Whittle et al. 2004) is a 39-item instrument that assesses six dimensions of an integrated care pathway: 1) face validity, 2) documentation, 3) development, 4) implementation process, 5) maintenance, and 6) the role of the organization. The goal of the ICPAT is to evaluate the quality of an integrated care pathway; the ICPAT could be applied to numerous health care settings and is not specific to one care pathway.

The Care Process Self-Evaluation Tool (CPSET) (Vanhaecht et al. 2007) evaluates how a clinical pathway influences the patient care process. The CPSET is a 29-item instrument with five subscales: 1) patient-focused organization, 2) coordination of the care process, 3) communication with patients and family, 4) collaboration with primary care, and 5) monitoring/follow-up of the care process. The CPSET is not specific to one care pathway and can be applied to a range of health care settings.

From indicator domain 4.3, the Patient Assessment of Chronic Illness Care (PACIC) (Glasgow et al. 2005) is a 20-item patient report questionnaire that assesses if the clinical services and actions patients received were consistent with the Chronic Care Model. The PACIC contains five subscales: 1) patient activation, 2) delivery system design/decision support, 3) goal setting, 4) problem-solving/contextual counselling, and 5) follow-up/coordination. The PACIC+ (Drewes et al. 2012) was developed and tested to include six additional items measuring team functioning.

Principle 5-Performance Management

5.1 Performance measurement indicators and tools in place and 5.2 Clinical outcomes being measured

Three indicator domains were found for principle five, *performance management*. The first two indicator domains, 5.1 having performance measurement tools in place and used regularly and 5.2 measuring clinical outcomes could not be separated in the literature and therefore were analyzed together.

We found two instruments. The Medical Home Index (MHI, Cooley et al. 2003), described in detail in Section 3.1, includes a number of themes on data management and quality improvement structures. The second instrument, the Índice de Responsividade do Serviço (IRS) (Health Services Responsiveness Index - SRI) is available in Portuguese (Andrade, Vaitsman & Farias 2010). The 160-item questionnaire measures health system responsiveness of user's expectations. It measures positive or negative perceptions of patients in two areas: 1) patient orientation including components that influence patient satisfaction but are not directly connected with health care (agility, social support, facilities, and choice) and 2) personal respect including dignity, confidentiality, and autonomy.

5.3 Data tracked and shared with stakeholders

The third indicator domain under principle five focuses on data being tracked and shared with stakeholders (e.g., clinicians, staff, policy makers, decision-makers) within health systems. We found no instruments that specifically measure this domain.

Principle 6-Information Systems

6.1 Shared information systems across sectors and 6.2 Shared patient electronic charts across continuum of care accessible to patients

Three indicator domains were identified under principle six, *information systems*. Indicator domain 6.1 focuses on information systems that are shared across the health system as well as with other sectors

such as social services and justice. Indicator domain 6.2 aims to measure if electronic health records are being shared across the health system/continuum of care and if they are accessible to patients. We found no instruments for domain 6.1 and only one instrument (Chou et al. 2010) for 6.2. Chou's instrument, which evaluates a wellness portal developed to facilitate patient-centered care, includes structured and open-ended survey questions. The portal provided patients electronic access to their personal health records and resources such as educational content, secure messaging, appointment management, and prescription refills.

6.3 Data collected is used for service planning

The third indicator domain under the *information systems* principle measures if the data collected is used for service planning. We found only one instrument, a semi-structured telephone interview guide (Wilkinson & McCarthy 2007). The interviews explored whether and how Cancer Care Networks in England use data from seven national databases. Questions focused on types of data used most often, for what purpose, to what capacity, and why data were not being used (Wilkinson & McCarthy 2007).

Principle 7-Organizational Culture and Leadership

7.1 Organizational goals and objectives aligned across sectors

The only indicator domain identified under the principle of *organizational culture and leadership* was the alignment of organizational goals and objectives across not only the health care system but across sectors such as social services and education. We found one instrument for indicator domain 7.1. The Organizational Culture Assessment Instrument (OCAI) is based on the Competing Values Framework, the dominant theoretical model for assessing organizational culture (Cameron & Quinn 2005). The OCAI consists of six items (dominant characteristics, organizational leadership, management of employees, organizational glue, strategic emphasis, and criteria of success), each with four alternatives that reflect four culture types (hierarchy culture, market culture, clan culture, and adhocracy culture). For each of the six items, 100 points are divided between the four culture alternatives; the scores are used to create an organizational culture profile and determine cultural alignment including leadership styles across sectors. The strength of this tool is that it can be used to assess cultural alignment across sectors, cultural alignment of leadership styles, and goals for cultural change.

Principle 8-Physician Integration

8.1 Physician integration within care teams and across sectors

One indicator domain was identified under principle eight, *physician integration*. Indicator domain 8.1 measures whether physicians are integrated within care teams and across sectors. In this section, we specifically focused on instruments that measure integration between physicians and the health system and integration of physicians within a health care team. Instruments measuring collaboration among team members more generally were included in 4.1, *team effectiveness* and instruments measuring integration with patient and families were included in indicator domain 2.1, *patient focus*.

We found six relevant instruments (Chesluk et al. 2012; Dynan, Bazzoli & Burns 1998; Milette, Hébert & Veil 2005; Smits et al. 2003³; Southern, Appleby & Young 2001); four of them will be highlighted. The

³ The Smits et al. 2003 article has two separate questionnaires that measure physician integration: the Physician Support Scale and the Physician Involvement Scale.

Team Effectiveness Assessment Model (TEAM) assesses physicians' performance as an interprofessional team member (Chesluk et al. 2012). The instrument includes a variety of components: self-assessment, assessment by other health care providers, and guides to collecting and using feedback to change practice. The TEAM was piloted with hospitalists; authors discussed future work with other types of physicians.

Smits et al. (2003) developed two instruments. The Physician Support Scale (Smits et al. 2003) evaluates physician support as the leader of a team as perceived by rehabilitation team members. The instrument measures the perceived "degree of help, concern, and friendship" that the lead physician shows to the team (Smits et al. 2003, p. 1334). The second instrument is the Physician Involvement Scale. It includes 9-items for team members to complete about a physician's involvement in activities that may impact team effectiveness (Smits et al. 2003).

The instrument by Dynan and colleagues (1998) measures physician-hospital integration across different structural organizations such as managed service organizations, physician-hospital organizations, and independent affiliated practices. Various dimensions of integration are assessed: administrative and practice management services, physician financial risk sharing, joint ventures to create new services, computer linkages, physician involvement in strategic planning, and salaried physician arrangements.

Principle 10-Financial Management

10.1 Attainment of goals and objectives are supported by funding and human resource allocation

A single indicator domain was identified for the *financial management* principle. This indicator domain measures if there is alignment between organizational goals and objectives and how resources are being used. We found one instrument.

The questionnaire by Bradford et al. (2000) measures how resources are allocated and how effective the allocation processes are. Questions measuring resource allocation best practices look at priority-setting methods such as needs-assessments, grants-making methods such as targeted requests for funding, service-monitoring methods such as clear expectations that objectives are monitored, and outcome-assessment methods such as including participant outcomes in all service contracts.

Overall Integration Instruments

The final indicator domain, overall integration, includes instruments that measure health systems integration more generally or measure three or more of the 16 indicator domains identified. We found 12 instruments; ten questionnaires target patients, practitioners, managers/leaders, and staff (Abendstern et al. 2006; Bainbridge et al. 2015; Devers et al. 1994; Friedman et al. 2014; Gillies et al. 1993; MacColl Center for Health Care Innovation 2014; Nelson et al. 2002; Ouwens et al. 2007; SAMHSA-HRSA Center for Integrated Health Solutions 2014; VanDeusen Lukas et al. 2002). Two instruments (Hébert & Veil 2004; Martin et al. 2007) use a set of indicators to measure the degree of implementation of integration components. Three of the instruments were found in the grey literature (MacColl Centre for Health Care Innovation 2014; Martin et al. 2007; SAMHSA-HRSA Center for Integrated Health Solutions 2014).

Four instruments are highlighted. The questionnaire by Gillies et al. (1993) is a validated 43-item instrument that measures perceived system integration, functional integration, and clinical integration. These dimensions cover questions on human resources considerations, alignment of support services, organizational culture, strategic planning, quality assurance, marketing, information systems, financial

management and resource allocation, operational policies, and physician integration. This instrument was later developed into the integration scorecard by the same team (Devers et al. 1994) and contains 49 questions related to the same areas.

The PRISMA model implementation scale (Hébert & Veil 2004) uses 20-indicators to rate the implementation of integrated service delivery in six domains: 1) coordination of all organizations involved in delivering health and social services, 2) single entry point, 3) case management, 4) single assessment instrument with a case-mix classification system, 5) individualized service plan, and 6) computerized clinical chart.

The Clinical Microsystem Assessment Tool (Nelson et al. 2002) assesses how clinical microsystems compare to 10 “success” characteristics of high-performing clinical microsystems. Defined as “...a small group of people who work together on a regular basis to provide care to discrete subpopulations of patients”, clinical microsystems are described as “essential building blocks” of the health care system and are everywhere (Nelson et al. 2002, p. 474). The 10 characteristics align with many of the 10 key principles of health systems integration (Suter et al. 2009) such as culture, organizational support, patient focus, staff focus, interdependence of the care team, information and information technology, process improvement, and performance patterns.

Lastly, the Whole System Measures (WSM) was developed by the Institute of Healthcare Improvement (Martin et al. 2007). This tool includes 13 indicators and was developed to promote the use of a “balanced set of system-level measures...to evaluate health systems overall performance” (Martin et al. 2007, p. 1). The WSM includes recommended measurement methods for each of the 13 indicators. These measures cross multiple domains of the 10 key principles including patient focus and performance management.

Discussion

A previous systematic review on health systems integration conducted by the authors identified a lack of studies measuring the impact of health system integration (Suter et al. 2009). This is a significant gap and has been attributed to the lack of standardized, validated tools that can be used to evaluate integration outcomes. This knowledge synthesis aimed to fill this gap (Strandberg-Larsen & Krasnik 2009; VanDeusen Lukas et al. 2002) by identifying relevant indicator domains and measurement instruments. The study consisted of three phases: 1) a modified Delphi survey with experts in integrated care, health care managers, and decision-makers to identify relevant indicator domains for measurement; 2) focus groups with health system users to better understand their priorities; and 3) systematic literature reviews for each indicator domain identified in the Delphi survey.

The Delphi survey is a well-established technique to build consensus among experts (Hsu & Sandford 2007); therefore, we used it to identify appropriate indicator domains to measure the 10 principles of health systems integration. We recruited integration experts to review the proposed indicator domains. After three iterative rounds, the panel agreed on 16 indicator domains for measuring progress towards integrated care; the indicator domains covered nine of the ten key principles for integration (Suter et al. 2009). The only indicator for which no domain was identified was ‘governance’. Panel members considered governance an important aspect of health systems integration, they failed, however, to identify measurable domains. Although we did not identify any indicator domains for the governance principle, the concept of governance was present in some of the overall integration tools (Gillies et al.

1993; Devers et al. 1994). The Delphi process helped identify priority areas for inclusion of instruments in our systematic review.

We used focus groups to solicit feedback from health care users on what they consider important for health systems integration. This served as a means to confirm that user perspectives were captured in the indicator domains we picked. The comments were fairly consistent across jurisdictions with the following three top priorities: 1) patient/family centred focus, 2) comprehensive services across the care continuum, and 3) financial management. Although a top priority, the focus for financial management differed for Canadian and Brazilians participants. In Canada, participants focused on responsibility of spending funds during times of austerity and cutbacks, while in Brazil they focused on the allocation of funding and the overall lack of funding for health care. Differences were also noted for the importance of physician integration. For Canadian participants, this principle was a top priority but placed at the bottom of the list for Brazilian participants. This might reflect differences in the primary health care system between the two countries. Canadian physicians are typically the first point of contact or gatekeeper for health services, and a physician referral is often required to access other providers and resources. In Brazil, physicians in primary health care centres work as part of the health care team, alongside other providers, and may thus be more integrated by virtue of health systems design. This highlights the importance of considering context when establishing priorities for integration. The patient perspectives on the ten principles of integrated health systems provided unique insight into patient priorities for health system design. Patients need to be engaged and truly involved in designing and evaluating services if researchers, policy and decision-makers, and providers are to create truly integrated, patient-centred systems (Kickbusch & Behrendt 2013; National Voices 2014).

The systematic review for the 16 indicator domains yielded a total of 7,133 abstracts from the initial abstract search and an additional 685 full-text articles from other searches, e.g., reference lists. We retrieved 114 unique instruments and measurement approaches that we considered relevant for measuring the state of health systems integration. For each instrument, we rated the quality of the original article and reported the number of Google scholar citations to give a sense of a tool's use. However, instruments with more citations may not necessarily be of higher quality. Some of the instruments had undergone extensive psychometric validation while others may benefit from further testing. We did not search for other articles to see if follow-up psychometric testing had been done; therefore, additional psychometric testing may exist. A large number of instruments were developed and tested with a specific population (e.g., mental health, pediatrics) but could potentially be adapted for use with the general population. Most tools came from the peer-reviewed literature and were sometimes difficult to find. In contrast, tools published in the grey literature tended to include user manuals and were easier to access. This might indicate the need to create more accessible, user-friendly resources if the goal is to promote measurement of health systems integration.

The integration domains can be split into two broad categories: patient focus (principles one, two, and four) and system level (principles three and five to ten). We identified more instruments for indicator domains that fall under the patient focused principles than the indicator domains under the system level principles. Specifically, 83 of the instruments measure care coordination, intersectoral collaboration, patient engagement, team effectiveness, and use of shared clinical pathways. Many health care systems are focusing on these indicator domains as a means to improve patient care experience (Luxford & Sutton 2014).

In contrast, of the 114 tools identified, only 20 were found for system level indicator domains. Although very few tools were discovered, we did find articles outlining examples of how these indicator domains are being used in practice.

We found that most of the system level instruments measured whether primary care network structures were in place (eight instruments) and whether physicians were integrated in the health system (six instruments). Our search for instruments that measure whether primary care network structures are in place primarily directed us to instruments measuring two variables: aspects of primary care and the Medical Home. The Medical Home is defined as a central hub that “provides accessible, compassionate, and culturally effective care” (Cooley et al. 2003, p. 8). The instruments measuring the Medical Home are similar to the instruments measuring components of primary care.

Integrating physicians across various levels of the health system was an important consideration of early integration efforts (Suter et al. 2009). Most of the newer tools found in our review measure physician integration at the provider level (i.e., physician collaboration with pharmacists, nurses) rather than the system level. Physician integration is essential to improving care delivery (Molden, Brown & Griffith 2013; Suter et al. 2009) as they occupy a gatekeeper role in many health care systems. Understanding and subsequently evaluating incentives and barriers to integration will effectively incorporate and strengthen collaboration between physicians, other health care providers, and management for the continuous improvement of quality, safety, and the patient-provider experience (Molden, Brown & Griffith 2013). Direct and indirect involvement of physicians in all aspects of care, along with the contribution of their administrative counterparts, improves quality and drives increased value (Molden, Brown & Griffith 2013).

There is little dispute that performance management systems are integral to the success of integrated health care (Suter & Mallinson 2015). The challenge lies in defining what a successful performance measurement system entails, including how to identify and measure relevant indicators. Performance reporting has increased over the past years due to the increasing demand for data-driven decision-making (Suter & Mallinson 2015). However, the information is not always easily accessible for stakeholders including the public, and questions remain about how to ensure that data are actionable, insightful, and meaningful at the point of care (Suter & Mallinson 2015). We found few instruments for the performance measurement indicator domains; some articles highlighted scorecards as being useful for reporting the link between organizational strategies and systems performance (Armitage et al. 2009; Behrens & Oldenkamp 2000; Barnardo & Jivanni 2009; Yap et al. 2005). Clear definitions and parameters for indicators and appropriate feedback loops and mechanisms of reporting are key elements of successful performance measurement systems (Williams & Manning 2008; Suter & Mallinson 2015; Stewart & Greisler 2002). It is also important to understand how the organization learns and improves performance using the data and with what groups data are being shared (Suter & Mallinson 2015). Several authors have published their journey through the development of a suite of measures (Das et al. 2013; Goetghebeur et al. 2008; Clark et al. 2013; Bamford & Chatziaslan 2009) that might be useful to review.

Electronic Health Record and Electronic Medical Record information sharing systems are essential to creating care continuity for the patient (Silow-Carroll, Edwards & Rodin 2012; Harrison & Palacio 2006; Hirdes et al. 1999). We found no instruments to evaluate the use of shared information systems across sectors. Schneider et al. (1999), however, proposed seven features required for an integrated health

information framework: 1) specified data elements, 2) established linkage capability among data elements and records, 3) standardized element definitions, 4) automated to the greatest possible extent, 5) specified procedures for continually assessing data quality, 6) strict controls for protecting security and confidentiality of the data, and 7) specified protocols for sharing data across institutions under appropriate and well-defined circumstances. While the search resulted in several articles focused on electronic health records and/or data sharing, few results specifically focused on patient portals or patient accessible electronic charts. Relative to other sectors (e.g., banking, travel) the uptake of web-based portals in health care (i.e., patient portals) has been slow (Baird et al. 2012).

There was a clear gap in the literature for instruments measuring organizational elements that support health systems integration. These relate to organizational leadership and culture or strategic planning and alignment (Suter et al. 2009). For example, the literature search yielded no targeted instruments to evaluate the extent to which goals and objectives are supported by human resource allocation; we found only one tool, the Organizational Culture Assessment Instrument (OCAI) (Cameron & Quinn 2005) to assess cultural alignment across sectors, cultural alignment of leadership styles, and goals for cultural change. The lack of instruments in these indicator domains constitutes another important gap in the literature.

We found 12 instruments that measure “overall integration”; some of these instruments measure three or more indicator domains while others aim to capture overall integration of a system. These “overall integration” instruments can be used to quickly evaluate health system outcomes at a high level; they do, however, lack the focus and depth of domain specific tools. These will be required if evaluating outcomes of targeted integration strategies is the goal. Also, many of these overall instruments have not been tested for psychometric properties to support tool validation.

Overall, we found that future research should focus on developing, testing, and validating structural, process, and outcome measures for all 16 indicator domains of health system integration. The average quality of the articles included in the extraction for the systematic review was high (10/15); however, we only extracted from peer-reviewed literature that was medium or high quality (score of 6/15) and up. When it came to reporting the psychometrics of the 114 instruments, 77 (68%) included psychometric properties, an additional nine reported on content or face validity (total of 75%), and 29 (including the eight instruments from the grey literature) reported no psychometrics. We found that for many of the system level indicator domains that yielded very few measurement tools, many of those instruments also did not report on psychometric testing (indicator domains 5.1, 6.2, and 6.3). Although psychometric properties were reported for many of the instruments, additional testing is required for the tools in different contexts and with different populations.

Strengths and Limitations

Although we were successful in identifying a considerable number of tools in the 16 indicator domains, the work was not without challenges. One difficulty emerged around the definition and interpretation of the indicator domains, which might have influenced their importance rating during the Delphi process. It would have been beneficial to dedicate more time up front to discussing the indicator domains to arrive at a shared understanding. Further, as typical for these kinds of knowledge syntheses, finding the right search terms was challenging and required an iterative approach of searching and refining.

Despite ongoing refinement of the search strategies, the literature searches yielded a high number of documents. Our experience with knowledge syntheses has allowed us to develop efficient methods for screening abstracts and rating full-text articles permitting the team to move rapidly through the preliminary stages and focus on extracting relevant information. We also established strict protocols including audits and tracking of decision-making to help keep the processes consistent. This was particularly important as we had a dispersed team working on different indicator domains. , Frequent discussions helped to solve disagreements in rating and to reconfirm established protocols.

We faced challenges related to the content of the indicator domains themselves. As noted in the discussion, we found many more tools to represent patient focused indicator domains than tools representing the system level ones. We found that many of the system level indicator domains could be measured simply as yes or no. For example, indicator domain 6.3 could be asked as, “Are shared information systems available across sectors?” Our intention was to find tools that explored the details of these indicator domains, but as we were trying to find articles, we realized that often these indicator domains would just be noted as present, or needed. As a result, we recognize that the framing of these indicator domains is a limitation on finding appropriate measurement tools. It also highlights a gap in the literature and areas for future research.

Lastly, this project was a partnership between Canada and Brazil. We were hoping that expanding the scope beyond Canada would add a range of tools to be integrated into this inventory. However, the search of the LILACS database only yielded two unique tools.

Conclusion

This study identified 114 instruments that measure different indicator domains considered relevant for health systems integration. The majority of instruments measured care coordination, patient and family involvement, and team effectiveness. There were limited instruments that specifically measured indicator domains relating to data capture and use, the use of information systems, or the alignment of goals. This suggests that there has been less focus on evaluating foundational structures that support health systems integration (such as integrated IT systems, population needs based service planning) than the care processes themselves. We found a number of instruments that capture a broad range of domains including structural components. In the absence of more targeted measures, these overall integration instruments fill an important gap. Nevertheless, this remains an area for future research as the importance of these structural domains for integration have been well recognized (Suter et al. 2009; Valentijn et al. 2015).

This compilation of instruments will enable stakeholders and policy-makers to measure the success of different strategies by selecting the most appropriate instruments. This will ultimately lead to better design of health care systems and better health outcomes.

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Appendices

Appendix A: Possible Domain Indicators

Key principle	Description of the principle	Sample Indicators
1. Comprehensive services across the care continuum	<ul style="list-style-type: none"> • Cooperation between health and social care organizations • Access to care continuum with multiple points of access • Emphasis on wellness, health promotion, and primary care 	<ul style="list-style-type: none"> • Coordinated transitions in care across services • Shared programs across sectors/services • Next available appointment • Emergency department average LOS registration to discharge; registration to admission (QPSD 23) • Measure wait time for referral to treatment by provider type (QPSD 20) • Proportion of patients with health outcomes which are avoidable given the current state of medical knowledge and access to appropriate care • Tobacco screening
2. Patient focus	<ul style="list-style-type: none"> • Patient-centred philosophy; focusing on patients' needs • Patient engagement and participation • Population-based needs for assessment; focus on defined population 	<ul style="list-style-type: none"> • Involvement in care planning for chronic disease/complex care • Evidence of a population-based needs assessment
3. Geographic coverage and rostering	<ul style="list-style-type: none"> • Maximize patient accessibility and minimize duplication of services • Roster: responsibility for identified population; right of patient to choose and exit 	<ul style="list-style-type: none"> • Existence of primary care network structures (e.g., family health teams, primary care networks, GP Divisions, inner city primary health care clinics)
4. Standardized care delivery through interprofessional teams	<ul style="list-style-type: none"> • Interprofessional teams across the continuum of care • Provider-developed, evidence-based care guidelines and protocols to enforce one standard of care, regardless of where patients are treated 	<ul style="list-style-type: none"> • Team effectiveness • Using a shared clinical pathway across care sectors (e.g., diabetes care, asthma care)
5. Performance management	<ul style="list-style-type: none"> • Committed to quality of services, evaluation, and continuous care improvement • Diagnosis, treatment, and care interventions linked to clinical outcomes 	<ul style="list-style-type: none"> • Performance measurement indicators and instruments are in place and being used regularly • Clinical outcomes being measured

Key principle	Description of the principle	Sample Indicators
6. Information systems	<ul style="list-style-type: none"> • State of the art information systems to collect, track, and report activities • Efficient information systems that enhance communication and information flow across the continuum of care 	<ul style="list-style-type: none"> • Shared information systems across care sectors
7. Organizational culture and leadership	<ul style="list-style-type: none"> • Organizational support with demonstration of commitment • Leaders with vision who are able to instill a strong, cohesive culture 	<ul style="list-style-type: none"> • Extent to which organizational goals and objectives are aligned across care sectors
8. Physician integration	<ul style="list-style-type: none"> • Physicians are the gateway to integrated health care delivery systems • Pivotal in the creation and maintenance of a single-point-of-entry or universal electronic patient record • Engage physicians in leading role, participation on Board to promote buy-in 	<ul style="list-style-type: none"> • Physician integration within care teams and across care sectors • Practitioner payment models that support integration
9. Governance structure	<ul style="list-style-type: none"> • Strong, focused, diverse governance represented by a comprehensive membership from all stakeholder groups • Organizational structure that promotes coordination across settings and levels of care 	<ul style="list-style-type: none"> • Existence of interagency agreements, service delivery team coalitions • Governance model that includes representation of communities served • Evidence of governance in monitoring and evaluation of health system
10. Financial management	<ul style="list-style-type: none"> • Aligning service funding to ensure equitable funding distribution for different services or levels of services • Funding mechanisms must promote interprofessional teamwork and health promotion • Sufficient funding to ensure adequate resources for sustainable change 	<ul style="list-style-type: none"> • Extent to which financial management is coordinated across care units and sectors³⁹
11. Overall integration		<ul style="list-style-type: none"> • Degree of integration within the health system and across sectors^{44,45}

Appendix B: Delphi Survey

(Initial survey)

By completing this survey you have agreed to participate in this research study. All information will be stored on University of British Columbia, Okanagan password protected computers and networks. All information will be kept confidential. If you wish to receive interim summaries of the study and a final report, please contact the nominated principal applicant, Nelly D. Oelke, at nelly.oelke@ubc.ca.

For the purposes of this study, integration is defined as: the management and delivery of health services so that clients receive a continuum of preventive and curative services, according to their needs over time and across different levels of the health system. Integration also includes health related services across sectors. (Adapted from the World Health Organization, 2008)⁴

This research aims to identify indicators and instruments for measuring integration in health systems. It is based on the 10 key principles identified in previous research (Suter, et al., 2009⁵). Your participation will assist us to understand appropriate and priority indicators for health system integration measurement. This survey has been adapted from the results of the previous survey. Please complete the survey by rating the appropriateness and importance of the indicators using the Likert Scale. We would also ask you to rate the priority of each indicator within the group for the specific integration principle identifying which one is most important (with #1) and so on.

To assist us in understanding who has responded to our survey, please categorize yourself in one of the following categories:

researcher/expert decision-maker policy-maker Other, please specify: _____

⁴ World Health Organization. (2008). Technical Brief, No.1 Integrated health services – What and why? Author.

⁵ Suter, E., Oelke, ND., Adair, CE., & Armitage, G. (2009). 10 key principles for successful health systems integration. *Healthcare Quarterly*, 13, 16-23.

Integration principle/domain	Description	Sample Indicators	Likert Scale (1 excellent fit and 5 inappropriate fit)					Likert Scale (1 is very important and 5 is not important)					Priority (1 being high priority)
1. Comprehensive services across the care continuum	<ul style="list-style-type: none"> • Cooperation between health and social care organizations • Access to the continuum of care through multiple points of access • Emphasis on wellness, health promotion, and primary care 	1.1 Coordinated transitions in care across services (transferring care from one area/service to another)	1	2	3	4	5	1	2	3	4	5	
		1.2 Client care is coordinated between sectors and providers within the health system and with supporting services such as education and social services	1	2	3	4	5	1	2	3	4	5	
		1.3 Management across the continuum of care by team of providers	1	2	3	4	5	1	2	3	4	5	
		1.4 Access/wait time (Third next available appointment, ER department average LOS registration to discharge; registration to admission, referral to treatment)	1	2	3	4	5	1	2	3	4	5	
		1.5 Avoidable health outcomes given the current state of medical knowledge and access to appropriate care	1	2	3	4	5	1	2	3	4	5	
		1.6 Medication reconciliation	1	2	3	4	5	1	2	3	4	5	
		1.7 Tobacco screening	1	2	3	4	5	1	2	3	4	5	

Integration principle/domain	Description	Sample Indicators	Likert Scale (1 excellent fit and 5 inappropriate fit)					Likert Scale (1 is very important and 5 is not important)					Priority (1 being high priority)
2. Patient focus	<ul style="list-style-type: none"> • Patient-centred philosophy focusing on patients' needs • Patient engagement and participation • Needs assessment of the population; focus on defined population 	2.1 Patient/family involvement in care planning for all patients	1	2	3	4	5	1	2	3	4	5	
		2.2 Population-based needs assessment	1	2	3	4	5	1	2	3	4	5	
		2.3 Patient is treated with dignity and respect	1	2	3	4	5	1	2	3	4	5	
3. Geographic coverage and rostering	<ul style="list-style-type: none"> • Maximize patient accessibility and minimize duplication of services • Roster - responsibility for identified population/list of people; right of patient to choose and exit 	3.1 Primary care network structures in place (e.g., family health teams, primary care networks, GP Divisions, inner city PHCs)	1	2	3	4	5	1	2	3	4	5	
		3.2 Rostering in place	1	2	3	4	5	1	2	3	4	5	
		3.3 All community members attached to a primary care provider (e.g., family physician)	1	2	3	4	5	1	2	3	4	5	

Integration principle/domain	Description	Sample Indicators	Likert Scale (1 excellent fit and 5 inappropriate fit)					Likert Scale (1 is very important and 5 is not important)					Priority (1 being high priority)
4. Standardized care delivery through interprofessional teams	<ul style="list-style-type: none"> • Interprofessional teams across the continuum of care • Provider-developed, evidence-informed care guidelines and protocols to facilitate one standard of care, regardless of where patients are treated 	4.1 Use of shared clinical pathways across care sectors (e.g., diabetes, asthma care) and geography	1	2	3	4	5	1	2	3	4	5	
		4.2 Individualization of care pathways for patients with co-morbidities	1	2	3	4	5	1	2	3	4	5	
		4.3 Primary health care delivered by collaborative, interprofessional teams	1	2	3	4	5	1	2	3	4	5	
		4.4 Team effectiveness	1	2	3	4	5	1	2	3	4	5	
		4.5 Team efficiency	1	2	3	4	5	1	2	3	4	5	
5. Performance management	<ul style="list-style-type: none"> • Committed to quality of services, evaluation, and continuous care improvement • Diagnosis, treatment, and care interventions linked to clinical outcomes 	5.1 Performance measurement indicators and instruments in place and used regularly	1	2	3	4	5	1	2	3	4	5	
		5.2 Clinical outcomes being measured	1	2	3	4	5	1	2	3	4	5	
		5.3 Data tracked and shared with stakeholders	1	2	3	4	5	1	2	3	4	5	

Integration principle/domain	Description	Sample Indicators	Likert Scale (1 excellent fit and 5 inappropriate fit)					Likert Scale (1 is very important and 5 is not important)					Priority (1 being high priority)
6. Information systems	<ul style="list-style-type: none"> • State of the art information systems to collect, track, and report activities • Efficient information systems that enhance communication and information flow across the continuum of care 	6.1 Shared information systems across care sectors	1	2	3	4	5	1	2	3	4	5	
		6.2 Collected data is used for care planning	1	2	3	4	5	1	2	3	4	5	
		6.3 Shared patient electronic chart across care sectors accessible to patients	1	2	3	4	5	1	2	3	4	5	
7. Organizational culture and leadership	<ul style="list-style-type: none"> • Organizational support with demonstration of commitment • Leaders with vision who are able to instil a strong, cohesive culture 	7.1 Organizational goals and objectives aligned across care sectors	1	2	3	4	5	1	2	3	4	5	
		7.2 Mutual goals and objectives are championed by all leaders across sectors	1	2	3	4	5	1	2	3	4	5	

Integration principle/domain	Description	Sample Indicators	Likert Scale (1 excellent fit and 5 inappropriate fit)					Likert Scale (1 is very important and 5 is not important)					Priority (1 being high priority)
8. Physician integration	<ul style="list-style-type: none"> Physicians are the gateway to integrated health care delivery systems Pivotal in the creation and maintenance of a single-point-of-entry or universal electronic patient record Engage physicians in leadership roles, participation on Board to promote buy-in 	8.1 Physician integration within care teams and across care sectors	1	2	3	4	5	1	2	3	4	5	
		8.2 Physician remuneration matched to desired system structure	1	2	3	4	5	1	2	3	4	5	
9. Governance structure	<ul style="list-style-type: none"> Strong, focused, diverse governance represented by a comprehensive membership from all stakeholder groups Organizational structure that promotes coordination across settings and levels of care 	9.1 Interagency agreements exist and/or service delivery team coalitions	1	2	3	4	5	1	2	3	4	5	
		9.2 Integrated governance structures at the policy, administrative and clinical levels	1	2	3	4	5	1	2	3	4	5	
		9.3 Governance model with representation of communities served	1	2	3	4	5	1	2	3	4	5	
		9.4 Evidence of governance in monitoring and evaluation of health system	1	2	3	4	5	1	2	3	4	5	

Integration principle/domain	Description	Sample Indicators	Likert Scale (1 excellent fit and 5 inappropriate fit)					Likert Scale (1 is very important and 5 is not important)					Priority (1 being high priority)
			1	2	3	4	5	1	2	3	4	5	
10. Financial management	<ul style="list-style-type: none"> Aligning service funding to ensure equitable funding distribution for different services or levels of services Funding mechanisms must promote interprofessional teamwork and health promotion Sufficient funding to ensure adequate resources for sustainable change 	10.1 Financial incentives for shared finances and program management and to sustain commitment to integration goals over time	1	2	3	4	5	1	2	3	4	5	
		10.2 Attainment of goals and objectives are supported by funding, budget allocation, and human resource allocation	1	2	3	4	5	1	2	3	4	5	
		10.3 Methods of remuneration support integration and align with service delivery models and promote collaborative care (e.g., between professionals and between sectors)	1	2	3	4	5	1	2	3	4	5	
		10. 4 Financial management coordinated across care units and sectors	1	2	3	4	5	1	2	3	4	5	
11. Overall integration		11.1 Integration is evidenced across principles	1	2	3	4	5	1	2	3	4	5	
Comments:													

Appendix C: Questionário Delphi

Ao completar este questionário você está concordando em participar de nossa pesquisa. Todas as informações serão arquivadas em computadores e redes protegidos por senhas da Universidade de British Columbia, Okanagan. Toda informação será mantida sob sigilo. Caso deseje receber resumos parciais do estudo e o relatório final, por favor entre em contato com o pesquisador principal, Nelly D. Oelke, pelo e-mail nelly.oelke@ubc.ca e/ou com o pesquisador principal no Brasil, Maria Alice Dias da Silva Lima, pelo e-mail malice@enf.ufrgs.br

Para os objetivos deste estudo, a integração foi definida como: gerenciamento e prestação de serviços de saúde a fim de que clientes recebam um continuum de serviços preventivos e curativos de acordo com suas necessidades ao longo do tempo e nos diferentes níveis do sistema de saúde. A integração também inclui serviços relacionados à saúde em diferentes setores (Adaptado da Organização Mundial da Saúde, 2008).⁶

Esta pesquisa tem por objetivo identificar indicadores e instrumentos para avaliar a integração em sistemas de saúde. Baseia-se em dez princípios-chaves que foram identificados em um estudo anterior (Suter, et al., 2009)⁷. A sua participação irá nos ajudar a entender quais são os indicadores apropriados e prioritários para avaliar a integração de sistemas de saúde. Desenvolvemos uma lista preliminar baseada na literatura e em nossa experiência com pesquisas sobre serviços de saúde. Por favor responda o questionário classificando a adequação e a importância dos indicadores utilizando a escala Likert. Solicitamos que você indique a prioridade de cada indicador no grupo do princípio específico de integração, identificando o mais importante (com #1) e assim por diante. Indicadores adicionais poderão ser incluídos para consideração. Qualquer indicador que você adicionar também deve ser incluído nas suas prioridades.

Para nos ajudar a entender quem está respondendo ao questionário, por favor escolha uma das categorias abaixo que melhor lhe define:

- pesquisador/especialista gestor (responsável por tomadas de decisão) formulador de políticas públicas
 Outro, por favor especifique _____

⁶ Organização Mundial da Saúde. (2008). Ficha Técnica, No. 1 Integrated health services – What and why? Autor.

⁷ Suter, E., Oelke, ND., Adair, CE., & Armitage, G. (2009). 10 key principles for successful health systems integration. *Healthcare Quarterly*, 13, 16-23.

Princípio de integração/domínio/dimensão	Descrição	Indicadores	Escala Likert (1 Adequação perfeita e 5 Adequação inapropriada)					Escala Likert (1 é muito importante e 5 é nem um pouco importante)					Prioridade (1 sendo alta prioridade)
1. Serviços integrais em todos os níveis do continuum do cuidado	<ul style="list-style-type: none"> • Cooperação entre organizações de saúde e assistência social • Acesso a um continuum de cuidados por meio de vários pontos de acesso • Ênfase no bem estar, promoção de saúde e cuidados primários 	Transições de cuidado de forma coordenada entre serviços (transferência de cuidados de uma área/serviço para outro)	1	2	3	4	5	1	2	3	4	5	
		Programas compartilhados entre setores/serviços (ex., serviço social, educação, cuidados intensivos, cuidados na comunidade)	1	2	3	4	5	1	2	3	4	5	
		Desfechos de saúde que poderiam ter sido evitados dado o estado atual dos conhecimentos médicos e do acesso a cuidados adequados	1	2	3	4	5	1	2	3	4	5	
		Acesso/tempo de espera (tempo médio de atendimento em emergência hospitalar entre registro e alta; tempo médio entre registro e admissão; tempo de espera para encaminhamento para tratamento por tipo de especialidade)	1	2	3	4	5	1	2	3	4	5	
		Triagem de fumantes	1	2	3	4	5	1	2	3	4	5	

Princípio de integração/domínio/dimensão	Descrição	Indicadores	Escala Likert (1 Adequação perfeita e 5 Adequação inapropriada)					Escala Likert (1 é muito importante e 5 é nem um pouco importante)					Prioridade (1 sendo alta prioridade)
			1	2	3	4	5	1	2	3	4	5	
2. Foco no paciente	<ul style="list-style-type: none"> Filosofia centrada no paciente; foco nas necessidades do paciente Envolvimento e participação do paciente Avaliação das necessidades da população; foco em populações definidas 	Envolvimento do paciente no planejamento de tratamento de doenças crônicas/cuidado complexo	1	2	3	4	5	1	2	3	4	5	
		Avaliações baseadas nas necessidades da população	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
3. Cobertura geográfica e cadastramento	<ul style="list-style-type: none"> Maximizar acessibilidade de pacientes e minimizar a duplicação de serviços Cadastro - responsabilidades por determinada população/lista de pessoas; direito do paciente de escolher e ir embora 	Estruturas de rede de cuidados primários implementadas (ex., equipes de saúde da família, redes de cuidados primários, setores de clínica geral, clínicas de atenção primária à saúde nas periferias)	1	2	3	4	5	1	2	3	4	5	
		Cadastro implementado	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	

Princípio de integração/domínio/dimensão	Descrição	Indicadores	Escala Likert (1 Adequação perfeita e 5 Adequação inapropriada)					Escala Likert (1 é muito importante e 5 é nem um pouco importante)					Prioridade (1 sendo alta prioridade)
4. Prestação de cuidados padronizados por equipes interprofissionais	<ul style="list-style-type: none"> Equipes interprofissionais em todo o continuum de cuidados Diretrizes e protocolos baseados em evidências desenvolvidos por profissionais de saúde para facilitar a implementação de um padrão único de cuidado, independentemente do local de tratamento 	Eficácia da equipe	1	2	3	4	5	1	2	3	4	5	
		Uso de protocolos clínicos compartilhados por diferentes setores de cuidado à saúde (ex., tratamento para diabetes, tratamento para asma)	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
5. Gerenciamento de desempenho	<ul style="list-style-type: none"> Comprometido com a qualidade de serviços, avaliação e melhoria contínua do cuidado Diagnósticos, tratamentos e intervenções de cuidados associados a desfechos clínicos 	Indicadores e instrumentos de avaliação de desempenho implementados e usados com regularidade	1	2	3	4	5	1	2	3	4	5	
		Desfechos clínicos sendo avaliados	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	

Princípio de integração/domínio/dimensão	Descrição	Indicadores	Escala Likert (1 Adequação perfeita e 5 Adequação inapropriada)					Escala Likert (1 é muito importante e 5 é nem um pouco importante)					Prioridade (1 sendo alta prioridade)
			1	2	3	4	5	1	2	3	4	5	
6. Sistemas de informação	<ul style="list-style-type: none"> Sistemas de informação de ponta para coletar, rastrear e relatar atividades Sistemas de informação eficientes que melhoram a comunicação e o fluxo de informações ao longo do continuum de cuidados 	Sistemas de informação compartilhados entre setores de cuidado	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
7. Cultura organizacional e liderança	<ul style="list-style-type: none"> Apoio organizacional com demonstração de compromisso Líderes com visão que conseguem estabelecer uma cultura forte e coesa 	Metas e objetivos organizacionais alinhados entre setores de cuidado	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
8. Integração de médicos	<ul style="list-style-type: none"> Médicos são a porta de entrada para sistemas de prestação de cuidados de saúde integrados São o pivô para a criação e manutenção de um único ponto de entrada/registo 	Integração de médicos dentro de equipes de saúde e entre setores de cuidado	1	2	3	4	5	1	2	3	4	5	
		Modelos de pagamento de profissionais para apoiar a integração	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	

Princípio de integração/domínio/dimensão	Descrição	Indicadores	Escala Likert (1 Adequação perfeita e 5 Adequação inapropriada)					Escala Likert (1 é muito importante e 5 é nem um pouco importante)					Prioridade (1 sendo alta prioridade)
			1	2	3	4	5	1	2	3	4	5	
	ou de prontuários eletrônicos universais <ul style="list-style-type: none"> Engajamento de médicos em papéis de liderança, participação no conselho de administração para conseguir apoio 		1	2	3	4	5	1	2	3	4	5	
9. Estrutura de governança	<ul style="list-style-type: none"> Governança forte, focada e diversificada, representada pela adesão integral de todos os grupos interessados Estrutura organizacional que promove a coordenação entre diferentes ambientes e níveis de cuidados 	Existência de acordos entre agências e/ou coalizões entre equipes de prestação de serviços	1	2	3	4	5	1	2	3	4	5	
		Modelo de governança com a representação das comunidades atendidas	1	2	3	4	5	1	2	3	4	5	
		Evidências de governança no monitoramento e avaliação do sistema de saúde	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	
10. Gerenciamento financeiro	<ul style="list-style-type: none"> Alinhamento de financiamento de serviços para garantir uma distribuição de 	Gerenciamento financeiro coordenado entre unidades e setores de cuidado	1	2	3	4	5	1	2	3	4	5	
			1	2	3	4	5	1	2	3	4	5	

Princípio de integração/domínio/dimensão	Descrição	Indicadores	Escala Likert (1 Adequação perfeita e 5 Adequação inapropriada)					Escala Likert (1 é muito importante e 5 é nem um pouco importante)					Prioridade (1 sendo alta prioridade)
	financiamento justo entre todos os serviços ou níveis de serviços <ul style="list-style-type: none"> • Mecanismos de financiamento devem promover trabalho em equipe interprofissional e a promoção de saúde • Financiamento suficiente para garantir recursos adequados para realizar mudanças sustentáveis 		1	2	3	4	5	1	2	3	4	5	
11. Integração geral		Integração dentro do sistema de saúde e entre setores	1	2	3	4	5	1	2	3	4	5	
Comentários:													

Appendix D: Focus Group Procedures and Interview Guide

1. The focus group facilitator will welcome participants to the focus group and review the consent form and have participants sign the consent.
2. Participants will be provided with a list of the 10 key principles of integration, their descriptions, and a column where participants will be asked at the end to complete their priorities. The handout will also provide a definition of integration.
3. What are your thoughts and opinions about the integration principles?
 - Are they meaningful to you?
 - Are they applicable to you and the care you receive from the health system?
 - How important are they to you?
 - What components are the most important?
 - What components are the least important?
 - Are there components of integrated health systems that are missing?
4. What additional information would you like to add?
5. We would now like to ask you, as best as you are able, to prioritize the principles. On your handout, please assign a number to each principle, #1 will be high priority (very important) and #10 will be the lowest priority or the least important.
6. Thank you for your participation in the focus group. We really appreciate your input into this very important topic.

Appendix E: Focus Group Handout

Definition of Integration: Integration is the degree services (health and health-related services) work together to provide care for patients/users of the health care system.

Integration principle/domain	Description	Priority (1 being high priority)
1. Comprehensive services across the care continuum	<ul style="list-style-type: none"> • Cooperation between health and social care organizations • Access to the continuum of care through multiple points of access • Emphasis on wellness, health promotion, and primary care 	
2. Patient focus	<ul style="list-style-type: none"> • Patient-centred philosophy; focusing on patients' needs • Patient engagement and participation • Needs assessment of the population; focus on defined population 	
3. Geographic coverage and rostering	<ul style="list-style-type: none"> • Maximize patient accessibility and minimize duplication of services • Roster - responsibility for identified population/list of people; right of patient to choose and exit 	
4. Standardized care delivery through interprofessional teams	<ul style="list-style-type: none"> • Interprofessional teams across the continuum of care • Provider-developed, evidence-informed care guidelines and protocols to facilitate one standard of care, regardless of where patients are treated 	
5. Performance management	<ul style="list-style-type: none"> • Committed to quality of services, evaluation, and continuous care improvement • Diagnosis, treatment, and care interventions linked to clinical outcomes 	

6. Information systems	<ul style="list-style-type: none"> • State of the art information systems to collect, track, and report activities • Efficient information systems that enhance communication and information flow across the continuum of care 	
7. Organizational culture and leadership	<ul style="list-style-type: none"> • Organizational support with demonstration of commitment • Leaders with vision who are able to instill a strong, cohesive culture 	
8. Physician integration	<ul style="list-style-type: none"> • Physicians are the gateway to integrated health care delivery systems • Pivotal in the creation and maintenance of a single-point-of-entry or universal electronic patient record • Engage physicians in leadership roles, participation on Board to promote buy-in 	
9. Governance structure	<ul style="list-style-type: none"> • Strong, focused, diverse governance represented by a comprehensive membership from all stakeholder groups • Organizational structure that promotes coordination across settings and levels of care 	
10. Financial management	<ul style="list-style-type: none"> • Aligning service funding to ensure equitable funding distribution for different services or levels of services • Funding mechanisms must promote interprofessional teamwork and health promotion • Sufficient funding to ensure adequate resources for sustainable change 	

Appendix F: Integration Knowledge Synthesis Search Terms

Indicator Domain	Search Terms
<p>For indicators below (1.1 - 5.2) we combined search terms for the indicator with the searches for health system integration and tool development. For indicators 5.3 - 10.2 we only combined the search for health system integration with the indicator and did not include tool development. \$ indicates a truncation symbol that includes variant word endings in the search. ADJ is an adjacency operator which searches for any of the terms on either side of it with up to N words between the terms.</p>	
<p>Health system integration</p>	<p>Delivery of Health Care, Integrated* OR integrat\$ ADJ2 (organization\$ OR health OR healthcare OR care OR service\$ OR system\$ OR patient)</p>
<p>Tool development</p>	<p>Instrument\$ OR Tool\$ OR Measure\$ OR Psychometric\$</p>
<p>Indicator 1.1: Coordinated transitions in care across services (transferring care from one area/service to another)</p>	<p>Continuity of patient care* OR transition\$ ADJ2 (care OR coordinat\$ OR program\$ OR servic\$ OR discharg\$) OR continuity ADJ2 (car\$ OR patient\$)</p>
<p>Indicator 1.2: Client care is coordinated between sectors and providers within the health system and with supporting services such as education and social services</p>	<p>Interdisciplinary Communication*/ OR Health Care Coalitions* OR (cross sector OR inter sector\$ OR intersector\$ OR multi disciplinary OR multidisciplinary OR inter professional OR interprofessional OR multi professional OR multiprofessional) ADJ2 (coordinat\$ OR collaborat\$ OR cooperat\$ OR team\$ OR practice\$ OR partnership\$)</p>
<p>Indicator 2.1: Patient/family involvement in care planning for all patients</p>	<p>Patient Participation* OR (Patient\$ ADJ2 (involve\$ OR centred OR focused OR participat\$ OR engage\$ OR empower\$)) OR (Famil\$ ADJ2 involve\$) OR</p>

	(Shared ADJ3 decision\$)
Indicator 3.1: Primary care network structures in place (e.g., family health teams, primary care networks, GP Divisions, inner city PHCs)	(Community health\$ OR Community care OR Primary care\$ OR Primary health\$ OR Integrated care OR Integrated health\$) ADJ2 (network\$ OR coalition\$ OR partnership\$)
Indicator 4.1: Team effectiveness	Team\$ ADJ3 (assess\$ OR effective\$ OR perform\$ OR function\$ OR success\$)
Indicator 4.2: Use of shared clinical pathways across the continuum of health care (e.g., diabetes, asthma care) and geography	Clinical Pathways* OR (clinical OR critical OR care) ADJ2 (path\$ OR protocol\$) AND Continuity of Patient Care*
Indicator 4.3: Individualization of care pathways for patients with co-morbidities. (No separate search was performed for this indicator as it was determined to be a subset of 4.3).	
Indicator 5.1: Performance measurement indicators and instruments in place	Benchmarking* OR Process Assessment (Health Care)* OR Performance ADJ2 (measure\$ OR track\$ OR monitor\$) OR System\$ ADJ (outcome\$ OR measure\$ OR impact\$ OR assessment\$ OR performance) OR Monitor\$ OR Scorecard\$ OR Benchmark\$
Indicator 5.2: Clinical outcomes being measured	Quality Indicators, Health Care* OR (Patient\$ OR assess\$ OR clinical) ADJ2 outcome\$ OR Patient centered\$
Indicator 5.3: Data tracked and shared with stakeholders	Quality Improvement* OR Accountab\$ OR Perform\$ AND Health Information Exchange*

	OR (data OR information) ADJ2 (exchange\$ OR shar\$ OR distribut\$ OR disseminat\$ OR transfer\$)
Indicator 6.1: Shared information systems across care sectors	Information Systems* OR Information system\$ OR Electronic adj2 record\$ AND Continuity of Patient Care* OR (Across OR cross) ADJ2 (sector\$ OR continu\$ OR care) OR Continu\$ ADJ2 (patient OR care)
Indicator 6.2: Shared patient electronic charts across care sections accessible to patients. (No separate search was performed for this indicator as it was determined to be a subset of 6.1).	
Indicator 6.3: Data collected is used for care service planning	(data OR information) ADJ2 (collect\$ OR gather\$ OR compil\$ OR aggregat\$ OR audit\$ OR analyz\$ OR report\$) AND Health Planning* OR Patient Care Planning* OR (Care OR health OR service\$) ADJ2 plan\$)
Indicator 7.1: Organizational goals and objectives aligned across sectors	Organizational Objectives* OR (Strateg\$ OR vision\$ OR planning OR management OR governance) OR (organization\$ OR system\$ OR sector\$) ADJ2 (objectiv\$ OR goal\$) OR (mission OR value\$) ADJ2 (statement\$ OR organization\$ OR system\$ OR sector\$) AND (affiliate\$ OR align\$ OR coordinat\$ OR oversight\$ OR oversee\$) AND (across OR cross OR inter OR between OR partnerships) ADJ2 (sector\$ OR care OR

	health OR system\$ OR boundar\$ OR organization\$) OR Intersector\$
Indicator 8.1: Physician integration within care teams and across sectors	(Integrat\$ OR collaborat\$) ADJ2 (physician\$ OR doctor\$ OR clinician\$) AND team\$
Indicator 10.1: Attainment of goals and objectives are supported by funding and human resource allocation	(strateg\$ OR vision\$ OR planning OR management OR governance) OR (organization\$ OR system\$ OR sector\$) ADJ2 (objectiv\$ OR goal\$) OR (mission OR value\$) ADJ2 (statement\$ OR organization\$ OR system\$ OR sector\$) AND ((fund\$ OR financ\$ OR cost\$ OR economic\$ OR monies OR money OR budget\$ OR resource\$ OR human OR staff\$) ADJ2 (allo\$ OR assign\$ OR distribut\$ OR apportion\$ OR share OR divid\$ OR give\$ OR gave))

* Medical Subject Heading Terms

Appendix G Abstract Inclusion/Exclusion Criteria

Inclusion:

- Instruments and/or methods to measure indicators of health systems integration (based on Delphi results)
- Outcomes and measures must be used as a primary/direct measure of integration.
Examples may include, but not limited to the following:
 - Systems: Emergency department use, readmission rates, utilization of services
 - Provider: team effectiveness
 - Patient: perceptions of care, satisfaction
- Clinical unit, program, and system based (micro to macro scale of organization)
- All study designs: qualitative, quantitative, mixed methods
- Articles in English
- Articles in Portuguese related to the Brazilian context
- Published after 1995 to present

Exclusion:

- Measures using clinical patient outcomes for example: clinical functioning level
- Indirect measures or secondary of outcomes related to integration (e.g., where utilization of health care services is measured as an additional outcome with clinical outcomes)
- Theoretical, editorial, and commentary articles
- Conference abstracts
- Articles from non-health care settings
- Articles published before 1995

Appendix I: Empirical Article Quality Rating Sheet

Reader's initials: _____

Article #: _____

First author surname / year of publication: _____ / _____

Score

0 = not present or reported anywhere in the article

1 = present but low quality

2 = present and mid-range quality

3 = present and high quality

___ 1. **Literature review** – directly related recent literature is reviewed and research gap(s) identified.

___ 2. **Research questions and design** – a priori research questions are stated and hypotheses, a research purpose statement, and/or a general line of inquiry are outlined. A study design or research approach is articulated.

___ 3. **Population and sampling** – the setting, target population, participants and approach to sampling are outlined in detail.

___ 4. **Data collection and capture** – key concepts/measure/variables are defined. A systematic approach to data collection is reported. Use of validated instruments and measures. Response or participation rate and/or completeness of information capture is reported.

___ 5. **Analysis and reporting of results** – an approach to analysis and a plan to carry out that analysis is specified, including statistical rigor. Results are clear and comprehensive. Conclusions follow logically from findings. Limitations of the study are addressed.

___ / 15 = **Total score**

0-5 low quality, 6-10 mid quality, 11-15 high quality.

Appendix J: Knowledge Translation Webinars

Webinar 1

Date: March 10, 2016

Time: 8:00 - 9:15 AM (Pacific Standard Time)

Length: 1 hour and 15 minutes

Title: Health systems integration: Improving patient care.

Primary target audience: providers, administrators, patients

Objectives:

- 1) To review indicators for the 10 principles of integration.
- 2) To present an overview of measurement instruments to evaluate each indicator.
- 3) To apply specific instruments to measure health systems integration to a specific case study.

Abstract: Join us via webinar or in person at the University of British Columbia, Okanagan Campus, to explore indicators and instruments to evaluate health system integration through an interactive case study. Indicators impacting direct patient care and outcomes will be discussed including: coordinated care transitions, cross-sector coordination, patient involvement, primary care networks, team effectiveness, clinical pathways, and information systems. The case study will allow participants to engage with researchers about how to apply instruments and measures at the patient and program levels of care, ask questions, and provide feedback.

Webinar 2

Date: March 10, 2016

Time: 9:30 - 10:45 AM (Pacific Standard Time)

Length: 1 hour and 15 minutes

Title: Evaluating health system and cross sectoral integration

Primary target audience: policy-makers, decision-makers, administrators

Objectives:

- 1) To review the indicators of the 10 principles of integration.
- 2) To present an overview of measurement instruments to evaluate system level indicators of integration.
- 3) To apply specific instruments to measure integration in health systems to a specific case study.

Abstract: Join us via webinar or in person at the University of British Columbia, Okanagan Campus or Alberta Health Services (Calgary) to discuss indicators and measurement instruments for health system integration across the continuum of care and across sectors. Based on results from a recent knowledge synthesis, this session will focus on indicators measuring integration at the system level including: information systems and data sharing, performance measurement, organizational culture, physician integration, and human and financial resource allocation. Areas requiring further research and tool development will be discussed. Participants will be encouraged to engage with researchers about how to apply the measurement instruments, ask questions, and provide feedback.

Appendix K: Extraction Table

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1.1 Coordinated transitions in care across the continuum of care

Author	Name	Description	Setting & Sample	Psychometrics
Bonomi et al. 2002 Google Scholar citations: 313 Quality rating: 6/15	Assessment of Chronic Illness Care (ACIC)	28-item questionnaire to measure quality improvement in chronic illness care: <ul style="list-style-type: none"> 6 subscales: 1) community linkages, 2) self-management support, 3) decision support, 4) delivery system design, 5) information systems, and 6) organization of care 	USA n = 108 organizational teams from health systems	Paired t-tests measured changes in subscale scores Pearson correlation coefficients used to evaluate the follow-up ACIC scores
Coleman et al. 2002 Google Scholar citations: 161 Quality rating: 15/15	Care Transitions Measure (CTM)	15-item questionnaire to measure the quality of care transitions across healthcare settings: <ul style="list-style-type: none"> 4 subscales: 1) information transfer, 2) patient and caregiver preparation, 3) support for self-management, and 4) empowerment to assert preferences Patient-centered rather than provider centered 	USA n = 49 patients and care givers in 6 focus groups of 7-10	Face-validity assessed in pilot-testing Construct validity
Coleman et al. 2005 (2nd development article) Google Scholar citations: 221 Quality rating: 14/15	Care Transitions Measure (CTM)	Revised 15-item questionnaire to measure the quality of care transitions across healthcare settings: <ul style="list-style-type: none"> 4 revised subscales: 1) critical understanding, 2) preferences important, 3) management preparation, and 4) care plan 	USA n = 200 patients discharged from urban hospitals	Construct and discriminant validity Factor analysis: 4 factors Cronbach's $\alpha = 0.93$ (overall scale)

Author	Name	Description	Setting & Sample	Psychometrics
Parry et al. 2008 Google Scholar citations: 91 Quality rating: 12/15	Care Transitions Measure -3 (CTM-3)	Revised 3-item questionnaire to measure the quality of care transitions across healthcare settings: <ul style="list-style-type: none"> The 3-item CTM can predict the 15-item CTM score The goal of the CTM-3 was to reduce to response burden of the CTM 	USA n = 225 African American, Hispanic American, or rural adults living in areas with populations less than 10,000 hospitalized in the last 12 months	Predictive validity for 3-item scale Factor analysis: 4 factors confirmed for 15-item scale Cronbach's α 's for 15 item scale = 0.94 (African Americans); α = 0.93 (Hispanic Americans); α = 0.96 (rural dwelling subjects); α = 0.93 to 0.95 (range of demographics)
Durbin et al. 2004 Google Scholar citations: 59 Quality rating: 13/15	Alberta Continuity of Services Scale-Mental Health (ACSS-MH)	30-item questionnaire to measure perceived consumer continuity of care across settings and providers: <ul style="list-style-type: none"> 3 subscales 1) system access, 2) interpersonal aspects of care, and 3) team functioning and outreach 	Canada n = 215 consumers of community and outpatient mental health services	Factor analysis: 3 factors Cronbach's α = 0.74 to 0.88 (range of subscales) Bivariate correlations between subscale scores = 0.46 to 0.58
Farmanova, Grenier & Chomienne 2013 Google Scholar citations: 0 Quality rating: 7/15	Mental Health Services in Family Health Teams (MHS-FHT) tool	37-item provider questionnaire and 35-item patient questionnaire to measure the provision of mental health services in family health teams: <ul style="list-style-type: none"> Questionnaires measure 6 subscales: 1) acceptability, 2) accessibility, 3) appropriateness, 4) continuity, 5) effectiveness, and 6) comprehensiveness of care 	Canada n = 22 providers and patients from family health integration networks	Pilot tested using cognitive debriefing

Author	Name	Description	Setting & Sample	Psychometrics
Graetz et al. 2014 Google Scholar citations: 16 Article quality rating: 7.5/15	Questionnaire (no name specified)	8-item questionnaire to measure care coordination. Participants were asked questions about 2 care transition situations: <ul style="list-style-type: none"> • Questions measure: care transitions between clinicians, care transitions across delivery sites, fill availability of medical information, timely information transfer, agreement of treatment plan, and agreement of roles and responsibilities 	USA n = 1,869 adult primary care clinicians (general practitioners, nurse practitioners, physician assistants) in an integrated delivery system hospital	Not reported
Grimmer & Moss 2001 Google Scholar citations: 54 Quality rating: 11/15	Prescriptions, Ready to re-enter community, Education, Placement, Assurance of safety, Realistic expectations, Empowerment, Directed to appropriate services (PREPARED)	Tool to measure community consumers satisfaction with discharge planning activities: <ul style="list-style-type: none"> • 4 key process subscales: 1) information exchange, 2) medication management, 3) preparation for coping after discharge, and 4) control of discharge circumstances 	South Australia n = 8 medical and surgical ward charge nurses n = 26 medical and surgical ward staff	Content, divergent, construct, and concurrent validity

Author	Name	Description	Setting & Sample	Psychometrics
King, Rosenbaum & King 1996 Google Scholar citations: 185 Article quality rating: 14/15	Measure of Processes of Care (MPOC)	56-item questionnaire to measure parents' experiences of being included and supported in their children's care: <ul style="list-style-type: none"> Looks at the extent that health care professionals exhibit specific behaviours 5 subscales: 1) enabling and partnership, 2) providing general information, 3) providing specific information about the child, 4) co-ordinated and comprehensive care for child and family, and 5) respectful and supportive care 	Canada Pilot-test n = 653 parents of children with disabilities recruited from participating ambulatory clinics	Discriminant validity Factor analysis: 5 factors Cronbach's α = 0.81 to 0.96 (range of subscales) Test-retest reliability with intraclass correlations coefficients = 0.78 to 0.88 (range of subscales)
King, King & Rosenbaum 2004 Google Scholar citations: 141 Article quality rating: 14/15	Measure of Processes of Care refined (MPOC-20)	Revised 20-item questionnaire to measure parents' experiences of being included and supported in their children's care: <ul style="list-style-type: none"> The MPOC-56 was reduced to a 20-item questionnaire and the labelling of the response scales was improved The 5 subscales from the MPOC-56 are the same in the MPOC-20 	Canada Re-examined data from previous studies: Pilot study: n = 653 parents of children with disabilities Field test: n = 151 parents Reliability study: n = 29 parents Validity study: n = 14 parents Cross-Sectional study: n = 164 parents New data n = 494 parents of children with disabilities	Concurrent validity between MPOC and MPOC-20 Discriminant validity Factor analysis: 5 factors Cronbach's α = 0.83 to 0.90 (range of subscales) Intraclass correlation coefficients between the scales = 0.56 to 0.87

Author	Name	Description	Setting & Sample	Psychometrics
<p>Granat et al. 2002</p> <p>Google Scholar citations: 48</p> <p>Quality rating: 11/15</p>	<p>Measure of the Processes of Care (MPOC-28)</p>	<p>Revised 28-item questionnaire to measure parents' experiences of being included and supported in their children's care:</p> <ul style="list-style-type: none"> The MPOC-28 (based off the MPOC-20) was developed as a national evaluation instrument for Sweden's children disability services To be appropriate for the Swedish context, 5 additional questions were kept from the MPOC-56 and 3 new questions were added 	<p>Sweden</p> <p>n = 2,458 families with children under 18 who had used habitation services for at least 1 year</p>	<p>Factor analysis: 5 factors</p> <p>Cronbach's α = 0.85 to 0.91 (range of subscales)</p>
<p>Le Bas, King & Block 1998</p> <p>Google Scholar citations: 6</p> <p>Quality rating: 9.5/15</p>	<p>Questionnaire (no name specified)</p>	<p>11-item questionnaire to measure the change in mental health staff's opinions before and after transitioning to a complex integrated service:</p> <ul style="list-style-type: none"> The questionnaire measures: perceptions of staff, cohesion, communication, continuity of care, debriefing, enthusiasm, focus, line accountability, economy of meetings, staff development, simplicity of structure, work allocation, and sharing 	<p>Australia</p> <p>n = 30 medical, nursing and allied health staff of adult mental health services</p> <p>Psychometric properties of the scale tested with 2 datasets:</p> <p>n = 223 cases from 5 successive administrations at the Peninsula Health Care Network Psychiatric Services</p> <p>n = 71 cases from a single administration at a mental health services in Brisbane</p>	<p>Factor analysis: unidimensional</p> <p>Cronbach's α = 0.88 (n=71) to 0.90 (n=223)</p>

Author	Name	Description	Setting & Sample	Psychometrics
Lemmon & Shuff 2001 Google Scholar citations: 1 Quality rating: 15/15	Mental Health Professional HIV/AIDS Point Prevalence & Treatment Experiences Survey Part II	34-item questionnaire to measure mental health system integration for patients with HIV: <ul style="list-style-type: none">4 categories of questions: 1) mental health system (MHS) integration with primary care physicians, 2) MHS integration with care coordination sites, 3) MHS integration with other mental health centres, and 4) internal integration of HIV care into the MHS itself	USA n = 51 mental health staff who had participated in the Indiana integration of care project and had seen HIV/AIDS patients in the past year	Face validity Cronbach's α = 0.57 to 0.90 (range of subscales)
Martz & Gerding 2011 Google Scholar citations: 4 Quality rating: 10.5/15	Questionnaire (no name specified)	38-item questionnaire to measure similarities and differences in perceptions of nursing care between nursing homes (NH) and skilled nursing facilities (SKF): <ul style="list-style-type: none">The questionnaire measures: collaboration, overall experience of NH/SKF practices, benefits and barriers to care	USA n = 200 nursing home and hospice care staff	Face and content validity Cronbach's α = 0.86 (overall scale); 0.82 to 0.93 (range of subscales)
McGuinness & Sibthorpe 2003 Google Scholar citations: 31 Quality rating: 11/15	Client Perceptions of Coordination Questionnaire	32-item questionnaire to measure coordination of health care perceived by the client: <ul style="list-style-type: none">6 subscales: 1) acceptability, 2) received care, 3) GP, 4) nominated provider, 5) client comprehension, and 6) client capacity.	Australia n = 1,193 adults with complex and chronic health care needs who were participants in a RTC of coordinated care	Face and content validity Construct validity "known groups" approach Factor analysis: 6 factors Cronbach's α = 0.92 (overall scale); 0.31 to 0.86 (range of subscales) Spearman correlation coefficient = 0.30 to 0.70 (range for pairs of subscales)

Author	Name	Description	Setting & Sample	Psychometrics
Safran et al. 2006 Google Scholar citations: 153 Quality rating: 11/15	The Massachusetts Ambulatory Care Experiences Survey (ACES)	11-item questionnaire to measure patients' experiences with medical groups and individual physicians: <ul style="list-style-type: none"> 2 subscales: 1) quality of physician-patient interactions and 2) organizational features of care 	USA n = 9,625 adult medical groups on commercial health plans and Medicaid	Physician-level reliability = 0.70 to 0.90 (Spearman Brown Prophecy Formula)
Sawicki et al. 2009 Google Scholar citations: 157 Quality rating: 15/15	Transitions Readiness Assessment Questionnaire (TRAQ)	29-item questionnaire to measure the transition readiness from pediatric to adult healthcare for youth with special health care needs: <ul style="list-style-type: none"> 2 subscales: 1) skills for self-management and 2) skills for self-advocacy 	USA n = 192 youth with special health care needs transitioning from pediatric to adult health care aged 16-26	Factor analysis: 2 factors Cronbach's α = 0.92 and 0.82 (subscales)
Schaefer, Cronkite & Ingudomnukul 2004 Google Scholar citations: 8 Quality rating: 12/15	Continuity of Care Practices Survey (CCPS-P) Continuity of Care Practices Survey (CCPS-I)	Two parallel 23-item questionnaires to measure self-report assessment of continuity of care practices at the program and individual level: <ul style="list-style-type: none"> 4 subscales: 1) provider continuity, 2) maintain contact, 3) connect to resources, and 4) coordinate care 	USA n = 129 directors and coordinators of intensive inpatient/residential outpatient programs (CCPS-P) n = 835 counsellors of patients in 28 substance use disorder programs	Discriminant and predictive validity Cronbach's α = 0.61 to 0.85 (range of subscales) Item to sub-scale correlations = 0.19 to 0.41 and 0.51 to 0.70 Average inter-item correlation 0.43

Author	Name	Description	Setting & Sample	Psychometrics
Tobon, Reid & Goffin 2014 Google Scholar citations: 3 Quality rating: 14.75/15	Continuity of Care in Children's Mental Health (C3MH)	42-item questionnaire to measure continuity of care experienced by families receiving services through the children's mental health system: <ul style="list-style-type: none"> • 5 scales: 1) collaboration, 2) transitions, 3) provider knowledge, 4) relational interpersonal, and 5) relational consistency • Parent and youth versions were developed 	Canada n = 364 parents of children and youth recruited from 13 children's mental health agencies n = 57 youth piloted the youth version	Convergent and discriminant validity Factor analysis: 5 factors Cronbach's α = 0.80 to 0.93 (range of subscales) Test-retest reliability >0.75
Grey Literature				
Center for Health Care Transition Improvement, 2014 (www.GotTransition.org) Google Scholar citations: 0 Quality rating: N/A	Got Transition: Current Assessment of Health Care Transition Activities Tool	8-item self-assessment tool for providers, clinics, or organizations to assess the level of support available for transition from pediatric to adult care: <ul style="list-style-type: none"> • Assesses 6 core elements for health care transition: 1) transition policy, 2) transition tracking and monitoring, 3) transition readiness, 4) transition planning, 5) transfer of care, and 6) transfer completion • 2 additional questions collect data on youth, young adult, and/or family feedback and leadership <p>3 versions were developed: youth to adult, young adults to adult, transition to adult approach (some core elements are slightly different depending on the version)</p>	USA	No psychometrics available Six Core Elements and tools were developed based on the American College of Pharmacists, American Academy of Pediatrics, and American Academy of Family Physicians' Clinical Report on Transition, learning collaboratives, and studying innovations in transitions of care in the US and internationally Reviewed by over 50 pediatric and adult health care providers, youth, and family members

Author	Name	Description	Setting & Sample	Psychometrics
<p>Center for Health Care Transition Improvement, 2014 (www.GotTransition.org)</p> <p>Google Scholar citations: 0</p> <p>Quality rating: N/A</p>	<p>Got Transition: Health Care Transition Process Measurement Tool</p>	<p>29-items measure the implementation of the 6 core elements (as listed above) and their dissemination to youth, young adults and their families:</p> <ul style="list-style-type: none"> • Suggested use is for baseline and follow-up data collection for transition improvement initiatives <p>3 versions were developed: youth to adult, young adults to adult, transition to adult approach (some core elements are slightly different depending on the version)</p>	<p>USA</p>	<p>See above</p>

1.2 Intersectoral Collaboration

Comments	Name	Description	Setting & sample	Psychometrics
<p>Amoroso et al. 2007</p> <p>Google Scholar citations: 4</p> <p>Quality rating: 11.5/15</p>	<p>General Practice Clinical Linkages Interview (GP-CLI)</p>	<p>9-item interview questionnaire to measure the quality of chronic disease related clinical linkages:</p> <ul style="list-style-type: none"> • Determines the facilitators, impact, and outcomes of practice-based linkages • 3 subscales: 1) shared care/care planning, 2) community access/awareness, and 3) referral/advice 	<p>Australia</p> <p>n = 97 general practitioners and practice managers</p>	<p>Concurrent validity</p> <p>Factor analysis: 3 factors</p> <p>Cronbach's α = 0.53 to 0.68 (range of subscales)</p>
<p>Browne et al. 2004</p> <p>Google Scholar citations: 76</p> <p>Quality rating: 11/15</p>	<p>Human Services Network Integration Measure</p>	<p>Instrument to quantitatively measure the scope and depth of integration for each sector and service in a network:</p> <ul style="list-style-type: none"> • The measurement of the actual or observed versus the expected extent, scope and depth of integration of services within a network • Items depend on the organizations using the measure 	<p>Canada</p> <p>n = 2 children's programs (the Healthy Babies, Healthy Children program and the Early Years program)</p>	<p>Content, face, and discriminate validity</p>
<p>Conrad et al. 2003</p> <p>Google Scholar citations: 37</p> <p>Quality rating: 13/15</p>	<p>Partnerships Self-Assessment Survey (PSAS)</p>	<p>Questionnaire to measures progress towards more rational and cost-effective service delivery:</p> <ul style="list-style-type: none"> • 4 subscales: 1) community health focus, 2) seamless continuum of care, 3) community accountability, and 4) managing under fixed resources • Includes an overall progress score (average scores of the 4 individual progress scores) 	<p>USA</p> <p>n = 25 community-based health partnerships</p>	<p>Cronbach's α = 0.91 (overall scale)</p> <p>Correlation coefficients between factors r = 0.60 to 0.80</p> <p>Note: conventional levels of inter-rater reliability was not reached</p>

Comments	Name	Description	Setting & sample	Psychometrics
Fletcher et al. 2009 Google Scholar citations: 68 Article quality rating: 13/15	National Criminal Justice Treatment Practices Survey (NCJTPS)	2-sector specific questionnaires measure interagency collaboration and integration activities: <ul style="list-style-type: none"> Activities were classified as “high” or “low” structure: low = cooperation and coordination; high = collaboration and consolidation 2 questionnaires: treatment program questionnaire (12- items), corrections program questionnaire (11-items) 	USA n = 430 directors, administrators, ad frontline staff from 4 organizational levels of criminal justice and n = 217 addiction organizations	Factor analysis: 2 factors for both surveys
Meredith et al. 2009 Google Scholar citations: 18 Quality rating: 12/15	Questionnaire (no name specified)	Questionnaire to measure inter-organizational linkages to coordinate services for PTSD: <ul style="list-style-type: none"> 2 subscales: 1) the level of mental health integration (how the primary medical care services relate to mental health services) and 2) the extent of community linkages Intersectoral items were a part of a 2-page survey for medical directors and 4-page for primary care clinicians 	USA n = 47 medical directors and n = 154 primary care clinicians (all 201 were members of a Clinical Directors Network)	Not reported

Comments	Name	Description	Setting & sample	Psychometrics
Morrissey et al. 1994 Google Scholar citations: 38 Quality rating: 11/15	Inter-organizational Network Survey	Questionnaire to measure the change in coordination and centralization of mental health and community agencies: <ul style="list-style-type: none"> Measures 3 sets of exchanges between community agencies: 1) client referrals, 2) shared information, and 3) funds exchanges Exchange relations are measured at two time points 3 indices measure the structure of relations in each network: 1) density, 2) centralization, and 3) fragmentation 	USA n = 6 cities measuring local mental health authorities and community support systems	Not reported
Morrissey et al. 1994 Google Scholar citations: 38 Quality rating: 11/15	Key Informant Survey	42-item questionnaire to measure how well local agencies are meeting the needs of people with chronic mental illness: <ul style="list-style-type: none"> 4 subscales: 1) adequacy, 2) quality, 3) availability, and 4) coordination <p>The questionnaire includes 12 additional items that measure performance.</p>	USA n = 10 cities measuring local mental health authorities and community support systems	Cronbach's α = 0.65 to 0.95 (range of subscales)
Morrissey et al. 1997 Google Scholar citations: 92 Quality rating: 13/15	ACCESS Evaluation	15-item questionnaire to measure interagency linkages evaluated in a program evaluation: <ul style="list-style-type: none"> 2 subscales: 1) perceived accessibility and 2) perceived coordination Produces a matrix with 6 options: the agency is "sending" or "receiving" information about "referrals", "funds transfers" or "information sharing" 	USA n = 875 respondents (usually agency or program director) from ACCESS agencies or programs	Perceived accessibility Cronbach's α = 0.87 Perceived coordination Cronbach's α = 0.74

Comments	Name	Description	Setting & sample	Psychometrics
<p>Pagliccia et al. 2010</p> <p>Google Scholar citations: 17</p> <p>Quality rating: 13/15</p>	<p>Questionnaire (no name specified)</p>	<p>3-item questionnaire to rate the importance of 11 health determinants:</p> <ul style="list-style-type: none"> 6 subscales: 1) perceived importance of health determinants, 2) intensity of internal engagement, 3) intensity of intersectoral collaboration, 4) network density, 5) betweenness centrality, and 6) betweenness centralization block modeling techniques (network analysis) to assess how the different sectors group together within the network 	<p>Cuba</p> <p>n = 113 policy makers representing different sectors</p>	<p>Not reported</p>
<p>Passalent et al. 2013</p> <p>Google Scholar citations: 0</p> <p>Quality rating: 12/15</p>	<p>The evaluation of the Systems Integration and Change (SIC) quadrant for the balanced scorecard</p>	<p>Integration and change balanced scorecard quadrant to measure the system-level impact of the Advanced Clinician Practitioner in Arthritis Care (ACPAC) program:</p> <ul style="list-style-type: none"> System integration was measured by looking at: 1) access to care, 2) integration of extended role practice, and 3) integration with the healthcare system 	<p>Canada</p> <p>n = 30 ACPAC program-trained graduates</p>	<p>Content and face validity</p> <p>The questionnaire was pilot-tested on 3 occasions</p>
<p>Reilly et al. 2003</p> <p>Google Scholar citations: 41</p> <p>Quality rating: 10/15</p>	<p>Questionnaire (no name specified)</p>	<p>29-item questionnaire to measure the degree of integration between health and social care provision and general services arrangements:</p> <ul style="list-style-type: none"> Measures focus on operational integration, team membership, team process, and team management Separate sets of indicators were used to identify links with social care and primary health care 	<p>United Kingdom</p> <p>n = 317 old age psychiatrists</p>	<p>Not reported</p>

Comments	Name	Description	Setting & sample	Psychometrics
<p>Singer et al. 2012</p> <p>Google Scholar citations: 16</p> <p>Quality rating: 13/15</p>	<p>Patient Perceptions of Integrated Care (PPIC)</p>	<p>20-item questionnaire to measure care coordination and patient centeredness:</p> <ul style="list-style-type: none"> 6 subscales: 1) information flow to your doctor, 2) post-visit information flow to the patient, 3) information flow to your specialist, 4) coordination with home and community resources, 5) information flow to other providers in your doctor's office, and 6) patient-centeredness 	<p>USA</p> <p>n = 527 patients with 2 or more chronic conditions from 13 primary care clinics</p>	<p>Factor analysis: 6 factors</p> <p>Cronbach's α = 0.62 to 0.80 (range of subscales)</p> <p>Factor correlations = 0.14 to 0.84</p> <p>Intraclass correlation coefficients (patient-level) = 0.03 to 0.00 (not statistically significant)</p> <p>Intraclass correlation coefficients (clinic-level) = 0.57 to 0.09 (not statistically significant)</p>
<p>Tucker et al. 2007</p> <p>Google Scholar citations: 44</p> <p>Quality rating: 9/15</p>	<p>Questionnaire (no name specified)</p>	<p>Questionnaire to measure old age psychiatrists' perspectives of the National Service Framework for Older People (NSFOP) Mental Health Model:</p> <ul style="list-style-type: none"> 4 subscales: 1) the range of specialist, 2) mental health provision, 3) the nature of the specialist/generic service interface, and 4) the degree of interdisciplinary/interagency working) Indicators for interdisciplinary/interagency working include: 1) assessment, 2) care planning, and 3) record keeping 	<p>United Kingdom</p> <p>n = 318 old age psychiatrists</p>	<p>Not reported</p>

Comments	Name	Description	Setting & sample	Psychometrics
Grey Literature				
VicHealth 2003 Google Scholar citations: 0 Quality rating: N/A	VicHealth Partnership Analysis Tool	35-item checklist to measure agencies' capacity of effective partnership work: <ul style="list-style-type: none"> • 7 subscales: 1) need for the partnership, 2) choosing partners, 3) making sure partnerships work, 4) planning collaborative action, 5) implementing collaborative action, 6) minimising the barriers to partnerships, and 7) reflecting on and continuing the partnership 	Not reported	Not reported

2.1 Patient/family involvement in care planning

Comments	Name	Description	Setting & sample	Psychometrics
Patient Centred Care/Experiences with Care				
Arora et al. 2011 Google Scholar citations: 66 Article quality rating: 13/15	Assessment of Patient Experiences of Cancer Care (APECC)	<p>33-item questionnaire to measure survivors' perceptions of the quality of follow-up care in the last 12 months:</p> <ul style="list-style-type: none"> • 30 items make up 10 subscales: 1) getting needed care, 2) timeliness of care, 3) waiting time in physician's office, 4) information exchange, 5) physicians' affective behavior, 6) physicians' knowledge, 7) interaction with nurses, 8) interaction with office staff, 9) health promotion, and 10) coordination of care • The 10 subscales are broken up into 5 categories: 1) access to care, 2) interaction with physicians, 3) interaction with other members of the health care team, 4) discussion of health promotion, and 5) perceptions of coordination of care • The remaining 3 items provide an overall rating of care 	USA n = 623 survivors (patients) of leukemia, bladder or colorectal cancer	Factor analysis: 10 factors Cronbach's $\alpha = 0.87$ (for overall scale); 0.76 to 0.92 (range of subscales)

Comments	Name	Description	Setting & sample	Psychometrics
<p>Hays et al. 1999</p> <p>Google Scholar citations: 252</p> <p>Quality rating: 10/15</p>	<p>Consumer Assessment of Health plans Study (CAHPS®) 1.0</p>	<p>28-item questionnaire to measure the quality of care provided by health plans, physician groups, and clinicians:</p> <ul style="list-style-type: none"> • 4 items measure global ratings: 1) personal doctor, 2) health plan, 3) specialist care, and 4) care received • 24 items measure 10 subscales: 1) getting the care you need, 2) getting care without long wait, 3) communication, 4) enough time spent, 5) prevention, 6) office staff, 7) customer service, 8) reasonable paperwork, 9) finding personal doctor, and 10) referral to specialists <p>Multiple versions of the CAHPS have been developed (specific providers, conditions, youth/adult and languages).</p>	<p>USA</p> <p>4 samples:</p> <p>n = 5,878 adult and child patients on Medicaid from CAHPS demonstration sites</p> <p>n = 11,393 adult and child patients with private insurance from CAHPS demonstration sites</p> <p>n = 313 adult and child patients on Medicaid from CAHPS field test sites</p> <p>n = 539 adult patients with private insurance from CAHPS field test sites</p>	<p>Construct validity</p> <p>Cronbach's α for 10 subscales = 0.48 to 0.79 (range for patient on Medicaid); 0.48 to 0.88 (range for patients with private insurance)</p> <p>Plan level reliability (ANOVA) for global rating items = 0.13 to 0.77 (range for patients on Medicaid); 0.29 to 0.96 (patients with private insurance)</p> <p>Plan-level reliability (ANOVA) for 10 subscales = 0.00 to 0.78 (range for patients on Medicaid); 0.45 to 0.95 (range for patient with private insurance)</p>

Comments	Name	Description	Setting & sample	Psychometrics
Hargraves, Hays & Cleary 2003 Google Scholar citations: 202 Quality rating: 10/15	Consumer Assessment of Health plans Study (CAHPS®) 2.0 Adult Core Survey	Revised 43-item questionnaire to measure health plans and providers from the consumer's perspective: <ul style="list-style-type: none"> • 19 are core items routinely reported to consumers • 17 questions are grouped into 5 composites for public reporting: 1) getting care quickly, 2) doctors who communicate well, 3) courteous/helpful office staff, 4) getting needed care, and 5) health plan customer service • 2 global rating items to identify questions that may not apply to all respondents: personal doctor or nurse, specialist, quality of health care, and health plan • Items have been modified from the 1.0 version 	USA n = 166,074 privately insured respondents from 306 U.S. health plans	Construct and predictive validity Factor analysis: 5 factors Cronbach's α = 0.51 to 0.86 (range of subscales) Plan-level reliability: 0.88 to 0.95 (5 subscales); 0.82 to 0.96 (global ratings)
Jenkinson, Coulter & Bruster 2002 Google Scholar citations: 334 Article quality rating: 11/15	Picker Patient Experience Questionnaire (PPE-15)	15-item questionnaire to measure patient experiences of in-patient care.	United Kingdom, Germany, Sweden, Switzerland, and USA n = 62,925 recently discharged acute care patients	Cronbach's α = 0.80 to 0.87 (overall scale for various countries) Item correlations = 0.23 to 0.58
King, Rosenbaum & King 1996 Google Scholar citations: 185 Article quality rating: 14/15	Measure of Processes of Care (MPOC)	See domain 1.1 for questionnaire details.		

Comments	Name	Description	Setting & sample	Psychometrics
King, King & Rosenbaum 2004 Google Scholar citations: 141 Article quality rating: 14/15	Measure of Processes of Care refined (MPOC-20)	See domain 1.1 for questionnaire details.		
Granat et al. 2002 Google Scholar citations: 48 Quality rating: 11/15	Measure of the Processes of Care (MPOC-28)	See domain 1.1 for questionnaire details.		
Little et al. 2001 Google Scholar citations: 712 Article quality rating: 8/15	Questionnaire (no name specified)	21-item questionnaire to measure patient centered doctor consultation: <ul style="list-style-type: none"> • 5 subscales : 1) communication and partnership, 2) personal relationship, 3) health promotion, 4) positive and clear approach to problem, and 5) interest in effect on life 	United Kingdom n = 865 patients recruited from 3 general practices	Factor analysis: 5 factors Cronbach's α = 0.84 to 0.96 (range of subscales)

Comments	Name	Description	Setting & sample	Psychometrics
Safran et al. 1998 Google Scholar citations: 619 Quality rating: 12/15	Primary Care Assessment Survey (PCAS)	51-item questionnaire to measure primary care performance: <ul style="list-style-type: none"> 11 summary scales are used to measure 7 domains of care: 1) accessibility (organizational, financial), 2) continuity (longitudinal, visit-based), 3) comprehensiveness (contextual knowledge of patient, preventive counseling), 4) integration, clinical interaction (clinician-patient communication, 5) thoroughness of physical examinations), 6) interpersonal treatment, and 7) trust 	USA n = 7,204 adult employees enrolled in any of 12 health plans offered to commonwealth employees	Content and face validity Five Likert Scaling Assumptions: 1) item-convergent validity, 2) item-discriminate validity, 3) equal item variance, 4) equal item-scale correlations, 5) score reliability
Sixma et al. 1998 Google scholar citations: 324 Quality rating: 9/15	Quality of Care Through the Patients' Eyes (QUOTE)	40-item questionnaire to measure the quality of care from the patients' perspective: <ul style="list-style-type: none"> Questions measure: generic aspects indicators and disease-specific indicators Quality of care is measured with importance and performance statements <p>Different versions of the QUOTE were developed for different conditions.</p>	The Netherlands n = 287 patients with rheumatic diseases (55 years or older)	Cronbach's alpha = 0.74 to 0.88 (process, structure, and category-specific subscales)
Patient Satisfaction				
Meakin & Weinman 2002 Google Scholar citations: 119 Article quality rating: 11/15	Medical Interview Satisfaction Scale (MISS-21)	21-item questionnaire to measure patient satisfaction with individual doctor-patient consultations: <ul style="list-style-type: none"> 4 subscales: 1) distress relief, 2) communication comfort, 3) rapport, and 4) compliance intent 	England n = 182 general practice patients	Factor analysis: 4 factors Cronbach's α = 0.92 (overall scale)

Comments	Name	Description	Setting & sample	Psychometrics
Quality of Care				
Damman, Hendriks & Sixma 2009 Google Scholar citations: 46 Article quality rating: 11/15	Consumer Quality Index Breast Care (CQI-BC)	<p>The CQI-BC measures the specific experiences of patients with breast cancer. The CQI includes 3 parts:</p> <ul style="list-style-type: none"> • The CQI-BC Experience questionnaire, the CQI-BC Importance Questionnaire, and the Quality Improvement Scores • The main questionnaire is the CQI-BC Experience Questionnaire which includes 152-items in 15-reliable subscales <p>118-items are related to patient experience. The remaining items measure: general items, timeliness of care and results, and the patient's global perspective of the healthcare and healthcare providers.</p> <p>Different versions of the CQI were developed for different conditions.</p>	The Netherlands n = 27 breast cancer patients in 3 focus groups n = 731 breast cancer patients completed the survey	Factor analysis: 15 factors Cronbach's α = 0.68 to 0.93 (range of subscales)
de Kok et al. 2007 Google Scholar citations: 27 Article quality rating: 8/15	Questionnaire (no name specified)	<p>55-item questionnaire to measure quality of breast cancer care from the patient's perspective:</p> <ul style="list-style-type: none"> • 6 clusters: 1) education, 2) continuity of care, 3) respect for the patient, 4) time schedule, 5) period of admission, and 6) focus on the patient 	The Netherlands n = 72 patients with breast cancer	Multidimensional scaling and hierarchical cluster analysis: 6 clusters

Comments	Name	Description	Setting & sample	Psychometrics
de Kok et al. 2010 Google Scholar citations: 10 Article quality rating: 12/15	Questionnaire (no name specified)	Revised 33-item questionnaire to measure quality of breast cancer care from the patient's perspective:: <ul style="list-style-type: none"> 5 subscales include: 1) patient education related to postoperative treatment, 2) services by the breast nurse, 3) services by the surgeon, 4) patient education regarding activities at home, and 5) patient education regarding preoperative treatment-related aspects 	The Netherlands n = 276 breast cancer patients operated on in last 3-15 months	Factor analysis: 5 factors Cronbach's α = 0.70 to 0.89 (range of subscales)
Family Involvement in Care				
Agnew-Davies et al. 1998 Google Scholar citations: 149 Article quality rating: 9/15	Agnew Relationship Measure (ARM)	26-item questionnaire to measure the client-therapist alliance: <ul style="list-style-type: none"> The client and the therapist complete the questionnaire 3-types of items: 1) the client, 2) the therapist, and 3) the client-therapist relationship 5 subscales: 1) bond, 2) partnership, 3) confidence, 4) openness, and 5) client initiative 	United Kingdom n = 95 clients 5 clinical psychologists involved in psychotherapy sessions in the Second Sheffield Psychotherapy Project for the treatment of depression	Factor analysis: 5 factors Cronbach's α = 0.55 to 0.87 (range of subscales for client scale); = 0.55 to 0.86 (range of subscales for therapist scale)
Ainsworth, Cowan & Trieschman 1998 Google Scholar citations: 10 Article quality rating: 12/15	Model for family centered group care	59-item questionnaire to test the model fit of a path diagram of family centered group care practice: <ul style="list-style-type: none"> 4 subscales: 1) tangible services, 2) maintaining parent/child connections, 3) parental decision making, and 4) staff attitudes 	USA Pilot-test n = 239 staff of 18 group care agencies Validation n = 169 staff of 3 New England group care agency programs	Concurrent validity Factor analysis: 4 factors

Comments	Name	Description	Setting & sample	Psychometrics
Galassi, Schanberg & Ware 1992 Google Scholar citations: 89 Article quality rating: 8/15	Patient Reactions Assessment (PRA)	15-item questionnaire to measure the perceived quality of the patient-provider relationship: <ul style="list-style-type: none"> 3 subscales: 1) patient information index (PII), 2) the patient affective index (PAI), and 3) the patient communication (PC) index 	USA Study 1 (face validity): n = 17 oncology nurses and counselling students Study 2 (item reduction and scale structure): n = 220 cancer patients receiving treatment Study 3 (confirm factor structure and concurrent validity): n = 197 cancer patients receiving treatment	Concurrent validity Factor analysis: 3 factors Cronbach's $\alpha = 0.91$ (overall scale); = 0.87 to 0.91 (range of subscales)
Kim, Boren & Solem 2001 Google Scholar citations: 42 Article quality rating: 12/15	Kim Alliance Scale (KAS)	30-item questionnaire to measure the quality of the therapeutic alliance from the patient's perspective: <ul style="list-style-type: none"> 4 subscales: 1) collaboration, 2) communication, 3) integration, and 4) empowerment 	USA n = 68 convenience sample of registered nurses who had been patients themselves within the past 2 years	Content, convergent, and divergent validity Factor analysis: 4 factors Cronbach's $\alpha = 0.94$ (overall scale); 0.71 to 0.87 (range of subscales) The split-half coefficient α of 0.87 and 0.91
Kim, Kim & Boren 2008 Google Scholar citations: 49 Article quality rating: 11/15	Kim Alliance Scale Revised (KAS-R)	Revised 16-item questionnaire to measure the quality of the therapeutic alliance from the patient's perspective: <ul style="list-style-type: none"> 4 subscales: 1) collaboration, 2) integration, 3) empowerment, and 4) communication 	USA n = 601 patients from 2 outpatient clinics serving military family members and retirees	Convergent validity Factor analysis: 4 factors Cronbach's $\alpha = 0.89$ (overall scale); $\alpha = 0.75$ to 0.80 (range of subscales)

Comments	Name	Description	Setting & sample	Psychometrics
<p>Marco, Buderer & Thum 2005</p> <p>Google Scholar citations: 23</p> <p>Article quality rating: 7/15</p>	Questionnaire (no name specified)	<p>18-item questionnaire to measure the opinions of family members of deceased patients around end-of-life care:</p> <ul style="list-style-type: none"> • Themes include: overall care, nursing care, physician care, pastoral care, pain management, facilities, communication, advanced directives, facilities, and ancillary services 	<p>USA</p> <p>n = 969 family members of deceased patients</p>	Not reported
<p>Bernal et al. 2007</p> <p>Google Scholar citations: 19</p> <p>Article quality rating: 7.5/15</p>	Questionnaire (no name specified)	<p>Revised 17-item questionnaire to measure the opinions of family members of deceased patients around end-of-life care:</p> <ul style="list-style-type: none"> • Questions measure the care and information provided by nurses, doctors, and chaplains; the adequacy of the hospital facilities; and appropriate use of advance directives • 8-items are related to end-of-life care; the remaining 9-items are demographics 	<p>USA</p> <p>n = 165 family members of deceased patients</p>	Not reported

Comments	Name	Description	Setting & sample	Psychometrics
Shared Decision Making/Involved with Decision Making				
Bennett et al. 2010 Google Scholar citations: 44 Article quality rating: 10/15	Preparation for Decision Making (PrepDM)	11-item questionnaire to assess how useful a decision aid or other support intervention is at preparing patients to communicate with their practitioner.	Canada n = 400 orthopaedic patients from 5 patient groups (spinal stenosis, knee osteoarthritis, herniated disc, chronic low back pain, hip osteoarthritis)	Construct validity Factor analysis: unidimensional Item Response Theory: Used on unidimensional measures; items = 2.12 to 3.80 to show that the discrimination values for the 10 items were excellent Cronbach's α = 0.92 to 0.96 (range of subscales). Item-total correlations = 0.75 to 0.81 (range of subscales)
Deber, Krartschmer & Irvine 1996 Google Scholar citations: 604 Article quality rating: 9/15	Problem-Solving Decision-Making Scale (PSDM)	Questionnaire to measure problem solving and decision making: <ul style="list-style-type: none"> • 2 subscales: 1) problem solving and 2) decision-making • PSDM uses 3 brief vignettes (a morbidity, mortality, and quality of life vignette) and asks respondents to answer questions PSDM Scale is 1 of 4 sections in the larger Health Care Decisions Survey.	Canada n = 300 cardiovascular patients	Factor analysis: 2 factors Cronbach's α = 0.71 to 0.90 (range of subscales)

Comments	Name	Description	Setting & sample	Psychometrics
<p>Elwyn et al. 2003</p> <p>Google Scholar citations: 346</p> <p>Article quality rating: 10/15</p>	<p>Observing Patient Involvement (OPTION)</p>	<p>12-item questionnaire to measure the extent to which healthcare professionals involve patients in decisions.</p>	<p>United Kingdom</p> <p>n = 21 general practitioners participated in 186 audiotaped patient consultations</p>	<p>Content validity</p> <p>Factor analysis: unidimensional</p> <p>Cronbach's $\alpha = 0.79$ (overall scale)</p> <p>Inter-rater agreement = 0.66 (Cohen's kappa)</p> <p>Inter-rater intraclass correlation coefficient = 0.62</p> <p>Inter-rater reliability for 5 consultations have a coefficient of 0.68 (two raters)</p> <p>Test-retest data, the intra-rater reliability generalizability coefficient was 0.66</p>
<p>Elwyn et al. 2013</p> <p>Google Scholar citations: 34</p> <p>Article quality rating: 9/15</p>	<p>CollaborATE</p>	<p>3-item questionnaire to measure shared decision making in clinical encounters:</p> <ul style="list-style-type: none"> • 1) How much effort was made to help you understand your health issues? • 2) How much effort was made to listen to the things that matter most to you about your health issues? • 3) How much effort was made to include what matters most to you in choosing what to do next? 	<p>USA</p> <p>Stages 1 and 2: n = 27 interview participants recruited from public areas of a Medical Center</p> <p>Stage 3: n = 30 patients recruited immediately after clinic appointments</p>	<p>Content validity</p>

Comments	Name	Description	Setting & sample	Psychometrics
Hegglund et al. 2012 Google Scholar citations: 1 Article quality rating: 14/15	Patient Participation in Decision-making in Surgical Treatment	16-item questionnaire to measure patient participation in surgical treatment decision-making: <ul style="list-style-type: none"> 4 subscales: 1) information dissemination, 2) formulation of options, 3) integration of information, and 4) control 	Norway n = 451 physicians and nurses on 6 surgical units	Content, convergent, and discriminant validity Factor analysis: 4 factors Cronbach's α = 0.66 to 0.81 (range of subscale)
Lerman et al. 1990 Google Scholar citations: 267 Article quality rating: 9/15	Perceived Involvement in Care (PICS)	13-item questionnaire to measure patients' perceived involvement in care: <ul style="list-style-type: none"> 3 subscales: 1) doctor facilitation, 2) patient physician information exchange, and 3) patient decision making 	USA n = 131 patients recruited from a primary care office	Factor analysis: 3 factors Cronbach's α = 0.73 (overall scale)
Martin, Di Matteo & Lepper 2001 Google Scholar citations: 51 Article quality rating: 11/15	Facilitation of Patient Involvement Scale (FPI)	9-item questionnaire to measure the degree in which patients perceive that their physicians encourage their involvement in care.	Canada Study 1: n = 236 university faculty and staff members Study 2: n = 338 members of an alumni association Study 3: n = 333 school district faculty and staff Study 4: n = 44 undergraduate students Study 5: n = 84 dental office patients	Convergent, criterion, and discriminant validity Factor analysis: unidimensional Cronbach's α = 0.89 to 0.93 (range from different studies) Test-retest reliability > 0.85

Comments	Name	Description	Setting & sample	Psychometrics
<p>Shields et al. 2005</p> <p>Google Scholar citations: 44</p> <p>Article quality rating: 8/15</p>	Rochester Participatory Decision-Making Scale (RPAD)	9-item questionnaire to measure collaborative decision making between patients and physicians.	<p>USA</p> <p>3 sets of participants:</p> <p>n = 100 primary care physicians (internists and family physicians)</p> <p>n = 5 standardized patients (constructed to mimic typical primary care patients)</p> <p>n = 50 patients from each physician's office</p>	<p>Convergent validity</p> <p>Internal consistency coefficient = 0.72</p> <p>Reliability (Spearman-Brown prophecy formula) = 0.53 (overall scale)</p>
<p>Simon et al. 2006</p> <p>Google Scholar citations: 85</p> <p>Article quality rating: 12/15</p>	Shared Decision-Making Questionnaire (SDM-Q)	11-item questionnaire to measure shared decision making.	<p>Germany</p> <p>n = 675 patients from different medical fields (depression, urology, anaesthesia, gynecology, and general practice)</p>	<p>Construct validity</p> <p>Cronbach's α = 0.77 (overall scale)</p>
<p>Kriston et al. 2010</p> <p>Google Scholar citations: 131</p> <p>Article quality rating: 11/15</p>	Shared Decision-Making Questionnaire (SDM-Q-9)	Revised 9-item questionnaire measuring shared decision making.	<p>Germany</p> <p>n = 2,351 primary care patients</p>	<p>Factor analysis: unidimensional</p> <p>Cronbach's α = 0.94 (overall scale)</p>

Comments	Name	Description	Setting & sample	Psychometrics
Satisfaction with Decision/Conflict With Decision				
<p>Holmes-Rovner et al. 1996</p> <p>Google Scholar citations: 336</p> <p>Article quality rating: 8/15</p>	<p>Satisfaction with Decision (SWD)</p>	<p>6-item questionnaire to assess patients' satisfaction with health care decisions.</p>	<p>USA</p> <p>Pilot study: n = 120 women recruited from university faculty and staff</p> <p>Study 2: n = 252 women recruited through the local press</p>	<p>Discriminant and convergent validity</p> <p>Cronbach's $\alpha = 0.86$ (overall scale)</p>
<p>Légaré et al. 2010</p> <p>Google Scholar citations: 66</p> <p>Article quality rating: 6/15</p>	<p>Sure of myself, Understand information, Risk-benefit ratio, Encouragement (SURE)</p>	<p>4-item screening test for decisional conflict in patients:</p> <ul style="list-style-type: none"> • 2 factors: 3 items (certainty, knowledge, and value) load onto one factor; the fourth item (support) loads onto the second factor 	<p>USA</p> <p>n = 123 French-speaking pregnant women considering prenatal screening for Down syndrome</p> <p>n = 1474 English-speaking patients referred to watch condition-specific video decision aids</p>	<p>Concurrent and construct validity</p> <p>Factor analysis: 2 factors</p> <p>Cronbach's $\alpha = 0.54$ (French speaking women); and $\alpha = 0.65$ (English-speaking women)</p>
<p>O'Connor 1995</p> <p>Google Scholar citations: 1098</p> <p>Article quality rating: 7/15</p>	<p>Decisional Conflict Scale (DCS)</p>	<p>16-item questionnaire to measure perceptions of effective decision making:</p> <ul style="list-style-type: none"> • 3 subscales: 1) uncertainty, 2) effective-decision-making, and 3) factors-contributing to uncertainty 	<p>Canada</p> <p>n = 909 patients with cardiac and respiratory disorders, students, and health employees</p>	<p>Construct and discriminant validity</p> <p>Cronbach's $\alpha = 0.78$ to 0.92 (range of subscales); $\alpha = 0.58$ to 0.92 (range of subscales)</p> <p>Test-retest reliability coefficient = 0.81</p>

Comments	Name	Description	Setting & sample	Psychometrics
Communication				
Campbell et al. 2007 Google Scholar citations: 47 Article quality rating: 8/15	Questionnaire (no name specified)	19-item questionnaire to measure the physician-patient communication skills in practicing physicians: <ul style="list-style-type: none"> • 2 subscales: 1) process of communication and 2) content of communication • 2 versions of the questionnaires: a physician version and a patient version 	Canada n = 1,845 patient/physician dyads were surveyed Study was conducted with family doctors and specialists; data provided from 25 visits	Factor analysis: 2 factors for both physicians and patients Cronbach's $\alpha = 0.70$ (physicians); $\alpha = 0.69$ (patients)
Cegala, Thoesen Coleman & Turner 1998 Google Scholar citations: 90 Article quality rating: 8/15	Medical Communication Competence Scale (MCCS)	38-item physician questionnaire and 41-item patient questionnaire to measure perceptions of self- and other communication during medical consultations: <ul style="list-style-type: none"> • 4 subscales for both versions: 1) information giving, 2) information seeking, 3) information verifying, and 4) socio-emotional communication 	USA n = 65 physicians and n = 52 patients from different sites	Content validity Cluster analysis determined where the items fit into dimensions of the scale Cronbach's $\alpha = 0.75$ to 0.90 (range of subscales for physicians' scale); $\alpha = 0.76$ to 0.92 (range of subscales for patients' scale)
Edwards et al. 2003 Google Scholar citations: 112 Article quality rating: 11/15	Combined Outcome Measure for Risk Communication and Treatment Decision Making Effectiveness (COMRADE)	20-item questionnaire to measure decision effectiveness: <ul style="list-style-type: none"> • 2 subscales: 1) risk communication and 2) confidence in the decision 	United Kingdom n = 960 patients with known atrial fibrillation, prostatism, menorrhagia or menopausal symptoms	Content and construct validity Factor analysis: 2 factors

Comments	Name	Description	Setting & sample	Psychometrics
Farin, Gramm & Kosiol 2011 Google Scholar citations: 23 Article quality rating: 12/15	Communication preferences of patients with chronic illness' (KOPRA)	32-item questionnaire to measure the communication preferences of chronically ill patients: <ul style="list-style-type: none"> 4 subscales: 1) patient participation and patient orientation, 2) effective and open communication, 3) emotionally supportive communication, and 4) communication about personal circumstances 	Germany n = 472 patients with chronic back pain or chronic ischemic heart disease who were undergoing inpatient rehabilitation n = 333 surveyed on communication preferences with physician n = 139 tested the applicability with nurses and therapists	Factor analysis: 4 factors Scales are unidimensional and fulfill demands for 1-parameter IRT model Cronbach's α = 0.80 to 0.92 (range of subscales)
Stewart et al. 2007 Google Scholar citations: 90 Article quality rating: 8/15	Interpersonal Processes of Care (IPC)	29-item (full version) and 18-item (short version) questionnaires to measure aspects of communication, decision-making, and interpersonal style: <ul style="list-style-type: none"> Full version has 12 first order subscales and 7 second order subscales Short version has 7 subscales 	USA n = 1,664 patients in adult general medicine care	Content validity Extensive factor model testing determined the appropriate fit Cronbach's α = 0.65 to 0.90 (range of subscales)
Empowerment and Empathy				
Gagnon et al. 2006 Google Scholar citations: 40 Article quality rating: 11/15	The Health Care Empowerment Questionnaire (HCEQ)	10-item questionnaire to measure the degree of individual empowerment in relation to personal health care and services: <ul style="list-style-type: none"> 3 subscales: 1) involvement in decisions, 2) degree of control, and 3) involvement in interactions 	Canada n = 873 patients who had contact with health professionals during the past 6 months	Construct, convergent, and discriminant validity Factor analysis: 3 factors Cronbach's α = 0.83 (overall scale) Intraclass correlation coefficients = .70

Comments	Name	Description	Setting & sample	Psychometrics
<p>Mercer et al. 2004</p> <p>Google Scholar citations: 222</p> <p>Article quality rating: 10/15</p>	<p>Consultation and Relational Empathy (CARE)</p>	<p>10-item questionnaire to measure empathy during the consultation process.</p>	<p>United Kingdom</p> <p>n = 43 patient interviews</p> <p>n = 20 general practitioner colleagues associated with departments of general practice and primary care</p>	<p>Content and concurrent validity</p> <p>Cronbach's $\alpha = 0.92$ (overall scale)</p>

3.1 Primary care network structures in place

Author	Name	Description	Setting & Sample	Psychometrics
Birnberg et al. 2011 Google Scholar citations: 27 Article quality rating: 12/15	Safety Net Medical Home Scale (SNMHS)	57-item questionnaire to measure patient-centered medical home characteristics: <ul style="list-style-type: none"> 5 subscales: 1) access to care and communication with patients and other providers; 2) patient tracking and registry; 3) care management, test and referral tracking; 4) quality improvement; and 5) external coordination 	USA n = 65 safety-net clinics (completed by health center leadership)	Convergent validity Cronbach's $\alpha = 0.84$ (overall scale); $\alpha = 0.60$ to 0.89 (range of subscales)
Cassady et al. 2000 Google Scholar citations: 143 Article quality rating: 8/15	Primary Care Assessment Tool - Child Edition (PCAT-CE)	26-item questionnaire to evaluate the attainment of key characteristics of primary care services for children and youth: <ul style="list-style-type: none"> 5 subscales: 1) longitudinally-relationship, 2) first-contact accessibility, 3) comprehensiveness-services available, 4) comprehensiveness-services provided, and 5) coordination <p>Adolescent and adult versions were developed.</p>	USA n = 450 parents and guardians of children ≤ 18	Content and construct validity Cronbach's $\alpha = 0.40$ to 0.86 (range of subscales)
Cooley et al. 2003 Google Scholar citations: 79 Article quality rating: 10/15	Medical Home Index – Long Version (MHI-LV)	25-item questionnaire to assess primary care pediatric practices: <ul style="list-style-type: none"> 6 subscales: 1) organizational capacity, 2) chronic condition management, 3) care coordination, 4) community outreach, 5) data management, and 6) quality improvement The MHI was also extracted in domain 5.1 <p>Adult and child versions were developed.</p>	USA n = 43 primary care pediatric practice sites	Construct validity Cronbach's $\alpha = 0.96$ (overall scale); $\alpha = 0.81$ to 0.92 (range of subscales) Kappa range of 0.65 or better (for 80% of themes) Intraclass correlations coefficients = 0.99

Author	Name	Description	Setting & Sample	Psychometrics
Centre for Medical Home Improvement (CMHI) website 2006 (Grey Literature) Google Scholar citations: 0 Article quality rating: N/A	Medical Home Index – Short Version (MHI-SV)	14-item questionnaire to measure the degree to which a practice has achieved components of a medical home: <ul style="list-style-type: none"> • Same six subscales as the MHI-LV Adult and child versions were developed.	Not reported	The short version of the MHI did not go through the same psychometric testing as the long version, but it was developed through the same statistical process
Flocke 1997 Google Scholar citations: 205 Article quality rating: 9/15	Components of Primary Care Index (CPCI)	19-item questionnaire to measure components of primary care from the perspective of the patient: <ul style="list-style-type: none"> • 4 subscales: 1) patient preference for their regular physician, 2) interpersonal communication, 3) accumulated knowledge of patient, and 4) coordination of care 	USA n = 2,899 patients who visited 138 family physicians' offices	Content validity Factor analysis: 4 factors Cronbach's α = 0.68 to 0.79 (range of subscales)
Friedberg et al. 2008 Google Scholar citations: 82 Article quality rating: 9/15	Questionnaire (no name specified)	13-item questionnaire to assess the structural capabilities among primary care practice: <ul style="list-style-type: none"> • 4 key subscales of structural capabilities: 1) patient assistance and reminders, 2) culture of quality, 3) enhanced access, and 4) electronic health records 	USA n = 308 physician practitioners	Not reported

Author	Name	Description	Setting & Sample	Psychometrics
Nikbakht-Van De Sande et al. 2005 Google Scholar citations: 26 Article quality rating: 9/15	Questionnaire (no name specified)	200-item questionnaire to evaluate structure, process, and outcome measures of palliative care networks: <ul style="list-style-type: none"> • Items related to structure: demographic characteristics, history, start, developmental stage, resources, and participating organizations of the network • Items concerning process: organization and management, cooperation, and external relationships • Items related to outcome: shared objectives and perceptions, the demand for care, the quality of cooperation, the improvement of care services, achieved agreements, results associated with individual participants, patients and organizations, expertise, and funding 	The Netherlands n = 92 managers and care providers of 8 palliative care networks	Not reported
Rittenhouse et al. 2008 Google Scholar citations: 144 Article quality rating: 7/15	Questionnaire (no name specified)	Questionnaire to measure infrastructure components of the medical home: <ul style="list-style-type: none"> • 4 subscales: 1) physician-directed medical practice, 2) care coordination, 3) quality and safety, and 4) enhanced access component 	USA n = 291 medical groups	Not reported

Author	Name	Description	Setting & Sample	Psychometrics
Rodrigues et al. 2014 Google Scholar citations: 3 Article quality rating: 15/15	Instrumento de Avaliação da Coordenação das RAS pela APS (COPAS) The Tool for Assessment of the Coordination of Integrated Health Service Delivery Networks by the Primary Health Care	78-item questionnaire to evaluate the coordination of primary care networks on the degree of integration of healthcare networks: <ul style="list-style-type: none"> 5 subscales: 1) population, 2) primary care, 3) logistics system, 4) support system, and 5) management system 	Brazil n = 150 random sample of healthcare professionals	Content, convergent, and discriminant validity Cronbach's α = 0.66 to 0.87 (range of subscales)

4.1 Team effectiveness

Author	Name	Description	Setting & Sample	Psychometrics
Interprofessional Teams				
Amundson 2005 Google Scholar citations: 32 Article quality rating: 11/15	Team Effectiveness Scale	7-item team member and 5-item supervisor questionnaire to measure team effectiveness: <ul style="list-style-type: none"> both versions include team performance indicators (e.g., team efficiency) <p>The Group Emotional Competence Scale (66-items) was also used in the study and significantly predicted team effectiveness.</p>	USA n = 85 individuals from 20 healthcare and human services teams from 11 medical and social services centres	Cronbach's α = 0.89 (team scale); α = 0.58 (supervisor's scale)
Bateman, Wilson & Bingham 2002 Google Scholar citations: 43 Article quality rating: 10/15	Team Effectiveness Audit Tool	44-item questionnaire to measure effective teams: <ul style="list-style-type: none"> 4 subscales: 1) effectiveness of team outputs, 2) team identity/team synergy, 3) clarity of performance, and 4) team role clarity Based on 6 core themes: 1) team synergy, 2) performance objectives, 3) skills, 4) use of resources, 5) innovation, and 6) quality 	United Kingdom n = 400 participants across 37 health and social teams in public sector organizations	Factor analysis: 4 factors Cronbach's α = 0.98 (overall scale) Inter-item reliability = 0.97 to 0.98 (range of subscales)
Cramm & Nieboer 2011 Google Scholar citations: 7 Article quality rating: 11/15	Questionnaire (no name specified)	10-item scale to measure interprofessional stroke team functioning: <ul style="list-style-type: none"> examines communication, planning, support, and decision-making processes <p>The interprofessional stroke team functioning items (10-items) are a part of a larger 33-item questionnaire to assess professional's views on interprofessional stroke team functioning.</p>	The Netherlands n = 558 professionals within 34 stroke teams at 12 hospitals, 16 nursing homes, 6 rehabilitation centres in 9 towns	Face validity Cronbach's α = 0.81 (interprofessional stroke team functioning scale)

Author	Name	Description	Setting & Sample	Psychometrics
Schroder et al. 2011 Google Scholar citations: 40 Article quality rating: 12/15	Collaborative Practice Assessment Tool (CPAT)	56-item questionnaire for interprofessional teams to measure their collaborative practice: <ul style="list-style-type: none"> 8 subscales: 1) mission and goals, 2) relationships, 3) leadership, 4) role responsibilities and autonomy, 5) communication, 6) decision-making and conflict management, 7) community linkages and coordination, and 8) patient involvement 	Canada n = 111 practitioners completed the CPAT during final testing of the scale	Content validity Factor analysis: 8 factors Cronbach's α = 0.67 to 0.89 (range of subscales)
Shortell et al. 1991 Google Scholar citations: 437 Article quality rating: 14/15	ICU nurse-physician questionnaire	18-item questionnaire to measure perceived unit effectiveness of ICU nurses and physicians: <ul style="list-style-type: none"> perceived unit effectiveness was measured by looking at the correlations of the other questionnaire items and 3 "outcome" measures of effectiveness: 1) absolute technical quality of care, 2) meeting family members' needs, and 3) nurse turnover 2 versions of the questionnaire: nurse-long and physician-long <p>The perceived effectiveness items (18-items) are a part of a larger questionnaire (218-items) to measure clinician perceptions of collaborative interactions.</p>	USA Pilot test: n = 134 nurses and n = 53 physicians from 5 ICUs at 4 hospitals Revised questionnaire: n = 1,418 nurses, n = 790 physicians, n = 111 unit ward clerks, and n = 221 top management team members of 42 medical/surgical ICUs	Perceived unit effectiveness Cronbach's α = 0.75 ANOVA determined the data could be aggregated to the unit level

Author	Name	Description	Setting & Sample	Psychometrics
Smits et al. 2003 Google Scholar citations: 28 Article quality rating: 11/15	Patient-focused rehabilitation cohesiveness scale	20-item questionnaire to measure rehabilitation team functioning: <ul style="list-style-type: none"> • 3 subscales: 1) effort, 2) teamwork, and 3) perceived effectiveness 	USA In-patient rehabilitation unit teams 50 teams participated; n = 650 health care providers	Scale items based on validated scales and pilot-tested for this population Cronbach's $\alpha = 0.96$ (overall scale)
Temkin-Greener et al. 2004 Google Scholar citations: 116 Article quality rating: 11/15	Questionnaire (no name specified)	59-item questionnaire to identify team effectiveness as an outcome of team performance in community-based long-term care: <ul style="list-style-type: none"> • 6 subscales: 1) perceived team effectiveness, 2) leadership, 3) coordination, 4) communication, 5) conflict management, and 6) team cohesion 	USA 26 All-Inclusive Care for the Elderly (PACE) programs; n = 1,200 participants (health care providers and allied health)	Face, content, and construct validity Cronbach's $\alpha = > 0.73$ (overall scale) ANOVAs to assess variance within and between teams

Author	Name	Description	Setting & Sample	Psychometrics
<p>Temkin-Greener et al. 2009</p> <p>Google Scholar citations: 28</p> <p>Article quality rating: 14/15</p>	<p>Nursing-home Work Environment and Performance Team Survey</p>	<p>56-item questionnaire to measure predictors of perceived work effectiveness in nursing homes:</p> <ul style="list-style-type: none"> • 5 subscales: 1) leadership, 2) communication/ coordination, 3) conflict management, 4) work group cohesion, and 5) perceived work effectiveness • 2 control variables measure workplace conditions and resources and staffing <p>The Nursing-home Work Environment and Performance Team Survey was developed based on the 2004 Temkin-Greener et al. questionnaire.</p>	<p>USA</p> <p>n = 7,418 managers and direct care staff (e.g., professionals: physicians, nurses and paraprofessionals: Certified Nursing Attendants) of 162 nursing homes</p>	<p>Face and content validity</p> <p>Convergent-divergent validity assessed with Pearson correlation coefficients</p> <p>Construct validity</p> <p>Factor analysis: unidimensional</p> <p>Cronbach's $\alpha = 0.78$ to 0.89 (range of subscales for professionals); $\alpha = 0.73$ (control variables)</p> <p>Cronbach's $\alpha = 0.74$ to 0.86 (range of subscales for paraprofessionals); $\alpha = 0.71$ to 0.74 (range of subscales for control variables)</p>
<p>Undre et al. 2006</p> <p>Google Scholar citations: 123</p> <p>Article quality rating: 9.5/15</p>	<p>Observational Teamwork Assessment for Surgery (OTAS)</p>	<p>A 2-element practical method to assess teamwork specific to the general surgical environment includes:</p> <ul style="list-style-type: none"> • A task checklist completed by a surgical observer to capture task completion • An assessment of team behavior, completed by a post-doctoral psychologist, on five subscales: 1) coordination, 2) extracting information, 3) using authority, 4) supporting others, and 5) assessing capabilities 	<p>United Kingdom</p> <p>n = 50 general surgery operations from one operating theater which include anesthetists, nurses, surgeons, and operating theater assistants</p>	<p>ANOVAs to access differences on behaviours and phases</p> <p>Spearman's rho: Positive correlation coefficients between task completion and team behaviours</p>

Author	Name	Description	Setting & Sample	Psychometrics
Vinokur-Kaplan 1995 Google Scholar citations: 144 Article quality rating: 11.5/15	Questionnaire (no name specified)	30-item questionnaire based on Hackman's Conceptual Model of Team Effectiveness: <ul style="list-style-type: none"> • 5 independent variable: 1) group size, 2) task clarity, 3) feelings of influence on teammates, 4) consultation available, and 5) environmental support • 3 mediating variables: 1) members presence at meetings, 2) nterdisciplinary collaboration, and 3) group interdependence • 4 dependent variables: 1) standards met, 2) cohesion, 3) individual well- being, and 4) team effectiveness • 3-stages of analysis: individual-, group-, and intergroup-level 	USA n = 98 mental health professionals from 15 teams in 3 public psychiatric hospitals	Convergent validity Cronbach's α = 0.65 to 0.89 (range of subscales)
Virtual Teams (Non-Health care)				
Lurey & Raisinghani 2001 Google Scholar citations: 559 Article quality rating: 12/15	Virtual Teams Survey	8-item questionnaire to measure virtual team performance: <ul style="list-style-type: none"> • 2 main criteria of team effectiveness were established: 1) teams' abilities to perform their work assignments and 2) team members' levels of satisfaction while working with their virtual teams <p>The team performance items (8-items) are a part of a larger scale in a larger questionnaire on virtual teams (82-items).</p>	USA, Europe, Asia n = 67 individuals from 12 virtual teams from 8 companies including the high technology, agriculture, and professional services industries	Cronbach's α = 0.82 (overall team performance scale) Correlation between performance and satisfaction = 0.73

Author	Name	Description	Setting & Sample	Psychometrics
Staples & Webster 2007 Google Scholar citations: 85 Article quality rating: 13/15	Self-efficacy for teamwork measure	86-item questionnaire to measure self-efficacy for teamwork in traditional and virtual teams: <ul style="list-style-type: none"> • 11 subscales: 1) modeling by team members, 2) modeling by team leaders, 3) coaching by team members, 4) coaching by team leaders, 5) organizational practices and training, 6) self-efficacy for teamwork, 7) coping ability, 8) individual performance, 9) intention to remain on the team, 10) team performance, and 11) satisfaction with the team 	Canada n = 493 team members from high technology, consulting, and manufacturing	Structural equation modelling used to determine discriminant validity and internal consistency Internal consistency = 0.88 to 0.96 (range of subscales) Cronbach's α = 0.78 to 0.96 (range of subscales)
Grey Literature				
Hepburn, Tsukuda & Fasser 1998 Google Scholar citations: 0 Article quality rating: N/A	Team Skills Scale	17-item questionnaire to measure perceived levels of team skills related to geriatric care: <ul style="list-style-type: none"> • Questions measure: interpersonal skills, discipline specific skills, and geriatric care skills • The questionnaire was developed to measure changes in the skills of nurses before and after a team training intervention 	Not reported	Not reported

Author	Name	Description	Setting & Sample	Psychometrics
Hyer, Heinemann & Fulmer 2002 Google Scholar citations: 29 Article quality rating: 5/15	Team Skills Scale (reporting psychometrics)	Same as above. This book chapter reports psychometrics.	Not reported	Content and face validity Factor analysis: unidimensional Chronbach's $\alpha = 0.94$ (overall scale) Item-to-total scale correlations = 0.58 to 0.78

4.2 Use of Shared Clinical Pathways across the Continuum of Health Care and Geography and 4.3 Individualization of care pathways for patients with co-morbidities

Author	Name	Description	Setting & Sample	Psychometrics
4.2 Use of Shared Clinical Pathways across the Continuum of Hear Care and Geography				
Ainsworth & Buchan 2012 Google Scholar citations: 10 Quality rating: 9.5/15	Collaborative Online Care Pathway Investigation Tool (COCPIT)	Instrument to conduct a care pathway variance analysis: <ul style="list-style-type: none"> 3 components: 1) data management framework, providing access to individual medical records; 2) visual editor for designing integrated care pathways; and 3) analysis and visualization component for care pathway variance analysis 	United Kingdom Salford Integrated Record database for patients with chronic kidney disease Stroke patients at Salford Royal Foundation Trust	Not reported
Vanhaecht et al. 2007 Google Scholar citations: 35 Quality rating: 11.5/15	Care Process Self-Evaluation Tool (CPSET)	29-item questionnaire to measure how a clinical pathway influences the process of patient care: <ul style="list-style-type: none"> 5 subscales: 1) patient-focused organization, 2) coordination of the care process, 3) communication with patients and family, 4) collaboration with primary care, and 5) monitoring/ follow-up of the care process 	United Kingdom n = 6 hospitals from the Belgian-Dutch Clinical Pathway Network	Face, content, construct, and criterion validity Cronbach's α = 0.78 to 0.93 (range of subscales) Intraclass correlation coefficients = 0.28 to 0.70 (range of subscales)
Van Houdt et al. 2013 Google Scholar citations: 17 Quality rating: 11/15	Questionnaire (no name specified)	38-item questionnaire to assess the effect of a care pathway using patient perceived quality indicators for those with prostate cancer: <ul style="list-style-type: none"> 5 subscales: 1) communication and coordination between caregivers, 2) information towards patient, 3) consultation of specialists, 4) patient outcomes, and 5) general health 	Belgium n = 92 patients treated with radical prostatectomy from the Bruges region	Face and content validity

Author	Name	Description	Setting & Sample	Psychometrics
Wagner et al. 2014 Google Scholar citations: 14 Quality rating: 11.5/15	Checklist (no name specified)	39-item checklist to assess the implementation of quality management activities across 4 different care pathways: <ul style="list-style-type: none"> 4 subscales: 1) quality improvement, 2) evidence based practice, 3) patient safety strategies, and 4) organizational structure of the pathway The number of items per subscale differs by care pathway, as some items are disease specific; 15 items were applicable across all 4 care pathways 	Europe n = 74 hospitals in France, Poland, Turkey, Portugal, Spain, Germany and Czech Republic with >130 beds who delivered care for acute myocardial infarction, hip fracture, stroke, or deliveries	Cronbach's α = 0.46 to 0.86 (range of subscales)
Whittle et al. 2004 Google Scholar citations: 24 Quality rating: 12/15	Integrated Care Pathways Assessment Tool (ICPAT)	39-item instrument to evaluate the quality of integrated care pathways: <ul style="list-style-type: none"> 2 forms are used by appraisers under 6 subscales (2 subscales under the first form and 4 subscales under the second form) Form 1: 1) face validity, 2) documentation Form 2: 3) development process, 4) implementation process, 5) maintenance, 6) role of the organization 	United Kingdom n = 68 participants from 25 National Health Service trusts Evaluated anonymous care pathways already in place for total hip replacement, myocardial infarction, leg ulcer and mental health care	Construct validity Cronbach's α = 0.77 to 0.96 (range of subscales) Intraclass correlation coefficients = 0.63 to 0.99 (range of subscales)
4.3 Individualization of care pathways for patients with co-morbidities				
Glasgow et al. 2005 Google Scholar citations: 407 Article quality rating: 13/15	Patient Assessment of Chronic Illness Care (PACIC)	20-item questionnaire to measure if patient's receipt of clinical services are consistent with the Chronic Care Model: <ul style="list-style-type: none"> 5 subscales: 1) patient activation, 2) delivery system design/decision support, 3) goal setting, 4) problem solving/contextual counselling, and 5) follow-up/coordination 	USA n = 283 enrollees age 50 or older receiving care from 7 primary care clinics within Group Health Cooperative	Face, content, and concurrent validity Test-retest reliability over a three-month interval, r = 0.58

Author	Name	Description	Setting & Sample	Psychometrics
Drewes et al. 2012 Google Scholar citations: 15 Article quality rating: 14/15	Patient Assessment of Chronic Illness Care + (PACIC+)	Revised 26-item patient report instrument to measure the chronic care management experience of those with diabetes: <ul style="list-style-type: none"> • Includes all subscales of PACIC • Additional items for multidisciplinary team functioning 	The Netherlands n = 1,941 diabetes patients	Cronbach's $\alpha = 0.92$ (PACIC); $\alpha = 0.91$ (PACIC+)
Grey Literature				
Wagner, Austin & Von Korff 1996 Google Scholar citations: 2,290 Article quality rating: 12/15	Essential elements for creating a care pathway for those with multiple chronic conditions (no name specified)	Provides components of high-quality chronic illness care: <ul style="list-style-type: none"> • 4 essential elements of successful programs: 1) collaborative problem definition, 2) targeting, goal setting and planning, 3) a continuum of self-management training and support services, and 4) active and sustained follow-up 	Not reported	Not reported

5.1 Performance Measurement & 5.2 Clinical Outcomes Being Measured

Author	Name	Description	Setting & Sample	Psychometrics
<p>Andrade, Vaitsman & Otávio Farias 2010</p> <p>Google Scholar citations: 1</p> <p>Article quality rating: 8/15</p>	<p>Índice de Responsividade do Serviço (IRS)</p> <p>Health Service Responsiveness Index (SRI)</p>	<p>160-item questionnaire to measure patients' positive or negative perceptions in 2 subscales of responsiveness:</p> <ul style="list-style-type: none"> patient orientation: components that influence patient satisfaction, but are not directly connected with health care: agility, social support, facilities and choice personal respect: dignity, confidentiality, autonomy 	<p>Brazil</p> <p>n = 298 Patient data at the Evandro Chagas Research Institute, a unit of the Oswaldo Cruz Foundation, Rio de Janeiro</p>	<p>Not reported</p>
<p>Cooley et al. 2003</p> <p>Google Scholar Citations: 79</p> <p>Quality Rating: 10/15</p> <p>Centre for Medical Home Improvement (CMHI) website 2006 (Grey Literature)</p> <p>Google Scholar citations: 0</p> <p>Article quality rating: N/A</p>	<p>Medical Home Index (MHI)</p> <p>Medical Home Index – Short Version (MHI-SV)</p>	<p>See domain 3.1 for questionnaire details.</p> <p>See domain 3.1 for questionnaire details.</p>		

5.3 Data (e.g., administrative, performance, clinical) tracked and shared with stakeholders (Data sharing amongst stakeholders)

No unique tools were found for this indicator domain.

6.1 Shared information systems across care sectors

No unique tools were found for this indicator domain.

6.2 Shared patient electronic charts across continuum of care assessable to patients

Author	Name	Description	Setting & Sample	Psychometrics
Chou et al. 2010 Google Scholar citations: 8 Quality rating: 6/15	Promoting patient-centered preventative care using a wellness portal: preliminary findings	A mixed methods approach (questionnaire) to evaluate data from a field test of a wellness portal for patients in primary care settings: <ul style="list-style-type: none"> • Surveyed via structured (4-point Likert scale) and open ended questions • Frequency statistics and content analysis used • Ease of use, patient perceptions, and potential impact 	USA n = 30 Patients from 2 practices in a Physicians Resource/Research Network	Not reported

6.3 Data Collected is used for service planning

Author	Name	Description	Setting & Sample	Psychometrics
Wilkinson & McCarthy 2007 Google Scholar citations: 4 Quality Rating: 9/15	Use of comparative data for integrated cancer services	Questionnaire to measure how much individuals working in cancer networks used 7 data sets available in England.	England n = 29 cancer networks teams with n = 68 individual participants	Not reported

7.1 Organizational goals and objectives aligned across sectors

Author	Name	Description	Setting & Sample	Psychometrics
<p>Cameron & Quinn 2005</p> <p>Google Scholar citations: 4,419</p> <p>Quality Rating: 6/15</p>	<p>Organizational Culture Assessment Instrument (OCAI)</p>	<p>24-item questionnaire to measure organizational culture:</p> <ul style="list-style-type: none"> 6 domains: 1) dominant characteristics, 2) organizational leadership, 3) management of employees, 4) organization glue, 5) strategic emphases, and 6) criteria of success 	<p>USA</p>	<p>Discriminant, convergent, and concurrent validity</p> <p>Cronbach's $\alpha = 0.67$ to 0.83 (range of subscales)</p>

8.1 Physician Integration

Author	Name	Description	Setting & Sample	Psychometrics
Chesluk et al. 2012 Google Scholar Citations: 14 Quality Rating: 7/15	Team Effectiveness Assessment Model (TEAM)	<p>A 4-step process for physicians to assess their performance in interprofessional collaborative practice:</p> <ul style="list-style-type: none"> • 4 tools: 1) criteria for identifying interprofessional team, 2) physician self-assessment survey (29-items), 3) rater assessment of physician (29-items), 4) guided debrief (17-items) • Quantitative and qualitative feedback • Guidance on how to analyze and use feedback received 	USA n= 25 hospitalists	Not reported
Dynan, Bazzoli & Burns 1998 Google Scholar Citations: 58 Quality Rating: 9/15	Survey Instrument (no name specified)	<p>44-item questionnaire to measure and compare the level of integration across physician-hospital models and structures and processes that facilitate physician-hospital integration:</p> <ul style="list-style-type: none"> • 6 subscales: 1) administrative and practice management services, 2) physician financial risk sharing, 3) joint ventures to create new services, 4) computer linkages, 5) physician involvement in strategic planning, and 6) salaried physician arrangements 	USA n = 573 hospitals	Factor analysis: 6 factors

Author	Name	Description	Setting & Sample	Psychometrics
Millette, Hébert & Veil 2005 Google Scholar Citations: 6 Quality Rating: 8/15	Two questionnaires (no name specified)	Cross-sectional survey; 2 questionnaires administered 6 months apart to measure family physicians' perceptions of integrated service delivery (ISD) networks: <ul style="list-style-type: none"> • Baseline survey: perceptions of ISD networks, perceived role, and receptivity to new case management role • 6 month follow-up survey: perceptions of ISD networks and challenges to case management 	Canada n = 124 family physicians	Not reported
Smits et al. 2003 Google Scholar Citations: 28 Quality Rating: 11/15	Physician Support Scale	9-item questionnaire to assess change in team effectiveness: <ul style="list-style-type: none"> • Terminology was changed to better reflect the setting (team vs group and attending physician vs leader) • True/false questions to be completed about the attending physician by other health care providers 	USA In-patient rehabilitation unit teams 50 teams participated; n = 650 health care providers	Cronbach's $\alpha = 0.82$ (overall scale)
Smits et al. 2003 Google Scholar Citations: 28 Quality Rating: 11/15	Physician Involvement	9-item questionnaire completed by other team members to assess attending physician effort in activities that were likely to impact team effectiveness.	USA In-patient rehabilitation unit teams 50 teams participated; n = 650 health care providers	Not reported

Author	Name	Description	Setting & Sample	Psychometrics
Southern, Appleby & Young 2001 Google Scholar Citations: 1 Quality Rating: 6/15	Questionnaire (no name specified)	114-item questionnaire to measure general practitioners' (GP) perceptions of a well-integrated GP: <ul style="list-style-type: none"> 10 subscales: 1) holistic and flexible practice, 2) care coordination, 3) attitudes towards teamwork, 4) community health planning, 5) political linkages, 6) knowledge and education, 7) time and funding, 8) practice organization, 9) information technology, and 10) personal domain/personal attributes 	Australia n = 208 general practitioners	Not reported

10.1 Attainment of goals and objectives are supported by funding and human resource allocation

Author	Name	Description	Setting & Sample	Psychometrics
Bradford et al. 2000 Google Scholar citations: 2 Quality rating: 8/15	Unnamed Questionnaire	Questionnaire to assess the effectiveness of resource allocation: <ul style="list-style-type: none"> 4 subscales: 1) priority-setting methods, 2) grants-making methods, 3) service-monitoring methods, and 4) outcomes-assessment methods 	USA n = 133, statewide mail survey of consortia members, including organizational representatives and individuals	Cronbach's $\alpha = 0.82$ (Priority-setting methods); $\alpha = 0.76$ (Grants-making methods); $\alpha = 0.69$ (Service-monitoring methods); $\alpha = 0.68$ (Outcomes-assessment methods)

11 Overall Integration

Author	Name	Description	Setting & Sample	Psychometrics
<p>Abendstern et al. 2006</p> <p>Google Scholar citations: 19</p> <p>Article quality rating: 7/15</p>	<p>Questionnaire (no name specified)</p>	<p>Questionnaire to measure structural and process indicators of integration:</p> <ul style="list-style-type: none"> • Structural features: structural level integration, practice level integration, and specialization • Process features: assessment and care planning, accessibility, person-centered care, and carer involvement 	<p>England</p> <p>n = 52 professional community teams in dementia care services</p>	<p>Not reported</p>
<p>Bainbridge et al. 2015</p> <p>Google Scholar citations: 5</p> <p>Article quality rating: 10/15</p>	<p>Health Care Providers (HCP) Integration Survey</p>	<p>60-item questionnaire to measure the system structure and process of care of integrated care systems:</p> <ul style="list-style-type: none"> • 5 subscales: 1) interdependence, 2) newly created professional activities, 3) flexibility, 4) collective ownership and goals, and 5) reflection on process 	<p>Canada</p> <p>n = 86 Palliative Care Network healthcare providers</p>	<p>Content validity</p> <p>Cronbach's $\alpha = 0.92$ (overall scale)</p>

Author	Name	Description	Setting & Sample	Psychometrics
<p>Devers et al. 1994</p> <p>Google Scholar citations: 149</p> <p>Article quality rating: 8/15</p>	<p>Integration measures (no name specified)</p> <p>(measures can be used to develop a Systems Integration Scorecard)</p>	<p>49-item questionnaire to measure functional, physician-system, and clinical integration:</p> <ul style="list-style-type: none"> • 8 areas assess functional integration: 1) culture, 2) strategic planning, 3) human resources, 4) financial management, 5) information systems, 6) support services, 7) quality assurance/quality improvement, and 8) other • 4 areas assess physician-system integration: 1) economic involvement, 2) administrative involvement, 3) group practice formation, and 4) shared accountability • 6 areas assess clinical integration: 1) clinical protocol development, 2) medical records uniformity and accessibility, 3) clinical outcomes data collection and utilization, (4) clinical programming and planning efforts, 5) shared clinical support services, and 6) shared clinical service lines 	<p>USA</p> <p>Objective measures were collected through a questionnaire of personnel in the system and operating unit offices (e.g., personnel in corporate physician affairs office, staff in physician groups, etc.)</p>	<p>Content validity</p>

Author	Name	Description	Setting & Sample	Psychometrics
Friedman et al. 2014 Google Scholar citations: 12 Article quality rating: 7/15	Multi-disciplinary Clinics and Conferences (MDC) Assessment Tool, Version 3.0	Assessment tool to measure maturation of multidisciplinary care: <ul style="list-style-type: none"> • 9 assessment areas: 1) case planning, 2) physician engagement, 3) treatment team integration, 4) integration of care coordinators, 5) infrastructure, 6) financial, 7) clinical trials, 8) medical records, and 9) quality improvement • The assessment areas are rated on 5 levels; 4 areas use only 3 levels • Respondents were also asked to provide details on what they did to move up a level in the rating scale 	USA n = 14 National Cancer Institute Community Cancer Centers Program sites	Not reported
Gillies et al. 1993 Google Scholar citations: 237 Article quality rating: 11/15	Questionnaire (no name specified)	54-item questionnaire to measure perceived functional integration, physician-system integration, and clinical integration: <ul style="list-style-type: none"> • 12 subscales: 1) human resources, 2) support services, 3) culture 4) strategic planning, 5) quality assurance, 6) marketing, 7) information systems, 8) financial management – resource allocation, 9) financial management – operating policies, 10) functional integration – average, 11) physician integration, and 12) clinical integration 	USA n = 933 members of 9 healthcare systems participated including: managers, board members, physicians, non-corporate management, and corporate office-level management	Factor analysis: 12 factors Cronbach's α = 0.57 to 0.93 (range of subscales)

Author	Name	Description	Setting & Sample	Psychometrics
Hébert & Veil 2004 Google Scholar citations: 73 Article quality rating: 6/15	PRISMA model implementation scale	20-indicators selected to rate the implementation of integrated service delivery: <ul style="list-style-type: none"> 6 mechanisms and tools include: 1) coordination of all organizations involved in delivering health and social services; 2) a single entry point, 3) case management, 4) a single assessment tool with a case-mix classification system, 5) an individualized service plan, and 6) a computerized clinical chart 	Canada n = 3 areas in Quebec where the PRISMA model was being implemented	Content validity
Nelson et al. 2002 Google Scholar citations: 430 Article quality rating: 8/15	Clinical Microsystem Assessment Tool (CMAT)	The CMAT is a tool that assesses how a clinical microsystem compares to the 10 key “success” characteristics of high-performing clinical microsystems: <ul style="list-style-type: none"> 1) leadership, 2) organizational support, 3) staff focus, 4) education and training, 5) interdependence, 6) patient focus, 7) community and market focus 8) performance results, 9) process improvement, and 10) information and information technology <p>The Nelson et al. 2002 article had only 9 “success” characteristics. We included the 10 characteristics from the updated scale (Johnson 2001).</p>	USA n = 20 microsystems representing different components of health systems	Content validity

Author	Name	Description	Setting & Sample	Psychometrics
Ouwens et al. 2007 Google Scholar citations: 41 Article quality rating: 7/15	Integrated Care Indicators	8-clinical indicators to measure the quality of integrated care: <ul style="list-style-type: none"> 4 areas: 1) multidisciplinary patient care team, 2) integrated care pathway, 3) case management, and 4) patient involvement <p>The 8 integrated care indicators were identified along with an additional 23-indicators specific to head and neck cancers.</p>	The Netherlands n = 158 patients with head and neck cancers and 15 professionals	Content validity Indicators where reliability could be tested had k values of 0.6 or higher
VanDeusen Lukas et al. 2002 Google Scholar citations: 23 Article quality rating: 10/15	The Integration Survey	Questionnaire to measure system integration: <ul style="list-style-type: none"> 9 subscales represent different staff perspectives: all staff and managers only All staff scales: 1) leadership, 2) staff cooperation, 3) clinical coordination, 4) service cooperation, 5) alignment, Manager only scales: 6) shared vision, 7) quality improvement, 8) single standard of care, and 9) manager alignment 	USA n = 1,042 staff, managers, and clinicians from 5 veteran affairs medical centers	Factor analysis: 9 factors Cronbach's $\alpha > .70$ (for subscales)
Grey Literature				
MacColl Center for Health Care Innovation 2014 Google Scholar citations: 0 Article quality rating: N/A	Patient-Centered Medical Home Assessment (PCMH-A)	36-item self-assessment tool to give clinical practices a method for gauging progress in the medical home implementation process: <ul style="list-style-type: none"> 8 subscales: 1) engaged leadership, 2) quality improvement strategy, 3) empanelment, 4) continuous & team-based healing relationships, 5) organized, evidence-based care, 6) patient-centered interactions, 7) enhanced access, and 8) care coordination 	USA n = 65 sites were used to extensively test the measure	Not reported

Author	Name	Description	Setting & Sample	Psychometrics
<p>Martin et al. 2007</p> <p>Google Scholar citations: 40</p> <p>Article quality rating: N/A</p>	<p>Whole System Measures (WSM)</p>	<p>13-indicators, as a part of a balanced set of measures, designed to measure quality across the continuum of care:</p> <ul style="list-style-type: none"> • 1) rate of adverse events, 2) incidence of nonfatal occupational injuries and illnesses, 3) hospital standardized mortality ratio effective, 4) unadjusted raw mortality percentage, 5) functional health outcomes score, 6) hospital readmission percentage, 7) reliability of core measures, 8) patient satisfaction with care score, 9) patient experience score, 10) days to third next available appointment, 11) hospital days per decedent during the last six months of life, 12) health care cost per capita, and 13) equity (stratification of WSM) • The WSM offers recommended measurement methods for each of the 13 indicators <p>The 13 indicators align with the Institute of Medicine's 6-dimensions of quality care that services are safe, effective, patient-centered, timely, efficient, and equitable.</p>	<p>Europe (United Kingdom, Sweden) and USA</p> <p>n = 10 individuals met to discuss measures of health system quality</p> <p>n = 30 health systems tested the original WSM</p>	<p>Each indicator's measure was tested individually</p>

Author	Name	Description	Setting & Sample	Psychometrics
SAMHSA-HRSA Center for Integrated Health Solutions Google Scholar citations: 0 Article quality rating: N/A	Organizational Assessment Toolkit for Primary and Behavioural Health Care Integration (OATI)	This toolkit includes 4 tools to help organizations to plan, prepare, and assess their steps towards providing services that are more integrated: <ul style="list-style-type: none"> • 1) The Partnership Checklist • 2) The Executive Walkthrough • 3) The Administrative Readiness Tool (ART) for Primary Health Behavioral Integration • 4) The COMPASS-Primary Health and Behavioral Health™ 	Not reported	Not reported

Note: Google Scholar citations as of January 24, 2017