

Defining Access Management in Healthcare Delivery Organizations

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Abstract

Background: Managing patient access to care in healthcare delivery organizations is complex, yet instrumental in shaping patient healthcare experiences. Conceptual work to understand the dimensions of access and access management is critical for improvement initiatives. This work aims to advance primary care access management practice and research to support healthcare delivery organizations. **Methods:** We convened a stakeholder panel, informed by evidence review, to establish access and access management definitions. Stakeholders were selected based on a patient-centered framework and included patients, healthcare providers, policy makers, product makers, payers, and purchasers of healthcare. **Methods** included evidence review; written surveys; in-person stakeholder panel discussions; and concurrent sub-panels to establish recurring, cross-panel themes. **Results:** Literature review results showed variation in access concept definition but consistent use of the temporal measure “time to third next available appointment” as an indicator of access. Panel deliberations highlighted the importance of patient-centeredness and resulted in three comprehensive definitions: 1) “ Access management encompasses the set of goals, evaluations, actions and resources needed to achieve patient-centered healthcare services that maximize access for defined eligible populations of patients;” 2) “ Optimal access management engages patients, providers, and teams in continuously improving care design and delivery to achieve optimal access;” and 3) “ Optimal access balances considerations of equity, patient preferences, patient needs, provider and staff needs, and value.” **Conclusions:** Access to healthcare is substantially determined by how healthcare delivery organizations manage it. The developed concepts of access management suggest that access management, improvement initiatives, and research studies require ongoing attention to organizational processes and multiple relevant outcomes. Healthcare organizations and researchers can use the definitions as starting points for initiatives to improve access management and evaluations of access initiative success.

Background

Ensuring timely primary care access is a major focus for health care organizations as they take responsibility for providing care to large patient populations across multiple care settings. Access to primary care is of particular importance because of the assessment, triage, and long-term continuity follow-up function that primary care health care providers serve.¹ While access to healthcare is often thought of as a measurable concept reflecting the degree to which patients are easily able to obtain a face-to-face visit with a doctor, the reality of access within healthcare organizations is more complex.

Multiple access-related capabilities, processes and patient population dynamics within healthcare organizations affect whether and what kinds of access patients can achieve. These access determinants require ongoing attention, yet few studies have addressed management strategies required to achieve and to sustain access to care in healthcare delivery organizations. How “access” and “access management” are defined will affect organizational procedures and resource management. The definitions will also determine any quality improvement goals and shape how organizations go about meeting them.

It is critical to discuss patients' access to care in the context of today's healthcare environment. Fortney and colleagues re-conceptualized access for the 21st century, given that technology is now available to promote virtual patient-provider interactions² in contrast to traditional indicators of access that focused on face-to-face clinical interactions.³ This reconceptualization distinguished five dimensions of access: geographical (e.g., ease of traveling to providers), temporal (e.g., time to receive services), financial (e.g., eligibility for services), cultural (e.g., acceptability of services), and digital (e.g., connectivity enabling digital communication). In addition, maximizing the ability of healthcare personnel to meet patient demand, such as by utilizing non-physician clinicians, is being increasingly employed and has changed our understanding of healthcare interactions.⁴⁻⁶

Our workgroup convened an access management expert panel that was informed by research evidence to establish recommendations for improving access management in primary care.⁷ We describe here the process and results to understand the conceptual dimensions of access management and to establish relevant definitions.

Methods

This study was assessed by the RAND human subject protection committee, found to be of minimal risk, and determined to be exempt. All participants signed non-disclosure agreements and agreed to treat information as confidential to enable meaningful discussions.

Panelists

Panelists were selected using a structured recruitment strategy that was based on a patient-centered framework⁸ and that incorporated different pathways of accessing primary care. The 20 panelists represented patients and the public (i.e., consumers of healthcare); healthcare providers (with emphasis on primary care); purchasers (responsible for underwriting the costs of healthcare, such as the Centers for Medicare and Medicaid Services [CMS]); payers (e.g., insurance companies responsible for reimbursement of medical care such as Kaiser Permanente); policy makers (represented by key Veterans Health Administration [VHA] personnel); product makers (represented by the most frequent "point of entry" for primary care within the VHA, the call center); and principal investigators (with key contributions to advancing access management). Additional expertise was sought to represent the needs of rural populations (who face substantial barriers to care), nursing staff (recognizing the key role nursing has in coordinating care), group practice managers (a new position established within VHA to improve access management), the Veterans CHOICE Act (2015 legislation intended to improve Veterans' timely access to care), Veterans Integrated Service Network (VISN) level staff, non-U.S. healthcare systems (specifically to learn from any unintended consequences of access models), continuity of care (a competing goal that may take precedence over timely access), and measurement (with emphasis on quality improvement measures).

An additional 20 participants with expertise in access management, including RAND researchers (a non-profit policy thinktank) and VHA practitioners, provided input at an in-person panel meeting.

Evidence Review

Prior to the in-person panel meeting, panelists received a systematic review on access management improvement in primary care. The systematic review searched the databases PubMed and CINAHL, reference-mined included citations, and consulted technical experts. The review documented a modest body of evidence about primary care access management strategies but noted that the literature is dominated by evaluations of one particular strategy, i.e., advanced or open access. Details of the systematic review methodology are documented in detail elsewhere.⁹ Panelists had access to an online article collection on access management literature prior, during, and after the in-person panel meeting.

Panel Survey

In preparation of the in-person expert panel meeting panelists received a written survey that asked about access management strategies from the point of view of primary care (response rate 20/20). It included a working definition of access management: “Access management encompasses the set of goals, evaluations, actions and resources needed to achieve optimal use of healthcare services by defined eligible populations of patients. Optimal access incorporates considerations of equity, patient preferences, patient needs, and value.” The working definition had been developed based on the existing access management literature. Panelists were asked to indicate agreement or disagreement on the working definition and to provide further comments or improvements.

In-Person Panel Meeting

At a two-day in-person panel meeting, several sessions were dedicated to the access management definition and conceptualization of access. We presented the survey results and an experienced moderator led discussions.

We established five parallel stakeholder subpanels dedicated to defining “access.” We chose the format of concurrent panels to determine recurrent themes. Panels were established *ad hoc* and included up to six participants. Sampling was purposefully designed in that the panels had to include a similar proportion of technical experts serving on the main panel and additional stakeholders joining for the in-person panel meeting. The total number of panelists had to be similar across panels, but participants were free to select panel groups they would want to contribute to. Workgroup staff ensured that both panel composition conditions were met.

The five access subpanels were instructed to establish a definition of *access*. To facilitate the discussions, participants received a handout outlining the objective of the overall project goal (to establish key

recommendations for primary care access management), a draft definition of *access management* developed in the workgroup, and a published definition of healthcare access. The access definition had been developed by VHA staff and was based on expert consensus:³ “Access to care represents the potential ease of having virtual or face-to-face interactions with a broad array of healthcare providers including clinicians, caregivers, peers, and computer applications. *Actual access* to care represents those directly-observable and objectively measurable dimensions of access. *Perceived access* to care represents those self-reported and subjective dimensions of access.”

The five subpanels could choose to adopt the published healthcare access definition and their decision to not change the existing definition was a valid outcome of the panel discussion. A member of the team that had developed the working definition was present in the room and available to facilitate discourse or respond to questions. After within-panel, each subpanel presented its conclusions to the main group.

Analysis

Literature review results were abstracted and documented in a comprehensive evidence table that differentiated the publication type (e.g., intervention evaluation), perspective (e.g., a population health approach to access management), and whether continuity of care was referenced in the conceptualization. We abstracted the definition of *access*, *access management*, and other relevant definitions (e.g., “*advanced access*”), as well as access measures operationalized in the publication.

We collated survey responses from individual panel members and documented suggested changes to the working definition with emphasis on changes requested by two or more panelists. We documented editorial changes, including nomenclature or terminology changes due to semantic drift, as well as conceptual changes.

The presentation and subsequent discussion of the five parallel subpanels and the group discussion at the in-person panel meeting was recorded and transcribed. We conducted qualitative content analysis of textual data submitted by each subpanel.¹⁰ Two researchers (a content expert and a qualitative analysis methods expert) independently developed lists of emerging themes found in subpanel discussions, then combined the lists, and reconciled discrepancies by consensus. We also analyzed word frequencies and visually inspected word clouds to compare results across the subpanels. Word clouds excluded common words (e.g., “you”), stop words that do not convey meaning (e.g., “there”), and words with less than three characters (e.g., “on”) using “wordcloud: Word Clouds,” R package version 2.5. The analysis aimed at identifying converging aspects of definitions. Using the same approach, the two researchers then analyzed the final revised versions of the definitions that were produced during the panel meeting. A merged word cloud was used to highlight the key themes that emerged across subpanel and group discussions.

We monitored input from panelists in response to a post-panel meeting survey and during a written peer review process with regard to additional comments or disagreement regarding the access and access management definitions.

Results

The following documents the finding of the evidence review regarding access definitions, the process to conceptualize healthcare “access” to primary care, and the resulting definition of “access management.” Other project results are documented elsewhere.^{7,11}

Definitions in the Literature

The definitions of access in 19 empirical studies evaluating access improvement interventions (published in 29 articles) and nine additional publications specifically targeting the definition of access and/or access management are shown in Table 1.¹²⁻⁴⁹

In many cases (22/28 research articles), “access” was not defined; however, authors described the improvement intervention evaluated in the study, such as *advanced access*. It transpired that publications usually referred to “access” as a primary care provider visit, i.e., a narrow definition of access to healthcare addressing only in-person visits with a healthcare provider. Definitions varied in whether they included a population-based perspective (access to primary care as a critical goal to ensure population health, 11/28) rather than exclusively focusing on a supply-demand perspective of access (i.e., balancing patients’ requests and available providers within the organization, 17/28). Studies varied in their references to continuity of care; i.e., a reference to access to the patients’ healthcare provider of choice was only present and integrated in the access concept in half of the identified studies (14/28).

Access was most commonly operationalized as the time to third next available appointment (12/28), i.e., concentrating on the temporal aspect of access without reference to patient experiences of access. Other information on the measure was often missing, for example whether the initiatives for access improvement explicitly addressed routine care and urgent care needs and/or whether established and new patients were included in the interventions.

Results of Subpanels Aiming to Define Access

The discussions across five parallel subpanels aiming to define *access* are summarized as a visual overview in a word cloud (Figure 1). Most frequent words were access (n=41), patient/patients (n=31), care (n=18), need (n=18; verb), needs (n=15; noun), contact (n=14), definition (n=12), management (n=11), first (n=9), group (n=9), actual (n=8), healthcare (n=8), response (n=8), when (n=8), defined (n=7), ease (n=7), subjective (n=7), system (n=7), timely (n=7), perceived (n=6), self (n=6; including hyphenated word combinations), use (n=6), veterans (n=6), and clinical (n=6).

Table 2 documents the results of the deliberation in each of the subpanels. Shown are the themes that emerged from the discussions, the final definitions, and the themes that emerged in the final definitions within and across subpanels. Recurrent identified themes were the importance of the patient perception of access, timeliness, ease of access, and a discussion around actual versus perceived needs.

A key aspect of the *access* definitions established in each subpanel were patient preferences, patient needs, and access being defined by the patient. However, definitions varied in style and complexity. One subpanel opted to keep the working definition, four subpanels aimed to simplify the definition.

Access Management Definition Results

The pre-panel meeting survey responses showed that a quarter of the panelists (5/20) explicitly stated that they had no comments on the initial working definition of *access management*, eight did not comment on the definition, and seven panelists provided further comments. The comments included general agreement with the definition, agreement but noting a focus on preferences, and a question of whether optimal use of healthcare services was defined by the patient. Four panelists made suggestions for changes (adding staff needs and capabilities, considering equity and value, incorporating provider and team engagement, and reversing the order to emphasize supply rather than patient behavior / demand aspects).

The definition and suggestions for revisions were discussed in detail at the in-person panel meeting. The group discussion resulted in the decision to define *access management*, *optimal access management*, as well as *optimal access*. The approach enabled participants to address the broader concepts of interest without proposing specific measures that may be organization or site-specific. Based on anonymous voting and transparent 'live editing' of the proposed definitions, the process concluded with following agreed definitions:

- ***Access management*** encompasses the set of goals, evaluations, actions and resources needed to achieve patient centered healthcare services that maximizes access for defined eligible populations of patients.
- ***Optimal access management*** engages patients, providers, and teams in continuously improving care design and delivery to achieve optimal access.
- ***Optimal access*** balances considerations of equity, patient preferences, patient needs, provider and staff needs, and value.

All panelists independently reviewed the definitions in a post-panel meeting review process, but no additional changes were suggested.

Discussion

We engaged stakeholders in conceptualizing access to care, informed by evidence review, and established definitions of *access management*, *optimal access management*, and *optimal access*. The literature review showed that existing access research often does not define access and studies do not seem to address access management as a comprehensive organizational management process. Where attempts to operationalize the concept *access* was reported in empirical studies, these were often narrowly focused on face-to-face appointments with a healthcare provider that do not represent the bandwidth of current considerations of how access should be defined.³ While many publications used the "time to third next

appointment” as a measure of access, studies varied by whether they counted all appointments or addressed only routine care appointments. The measure allows a more reliable estimate of accessibility because it is not affected by chance opening due to recent cancellations.⁵⁰ However, a key result of stakeholder discussions was that conceptually, access and access management needs to be addressed from a broader perspective.

Our study also showed that stakeholders strongly emphasize patient perspectives and highlighted that a patient-centered definition of access is critical. Published research evaluating different access models such as advanced access often show positive effects on wait time, but these improvements do not always translate into improved patient satisfaction^{51,52} or provider support of the approach.³⁷ There is also evidence that patients value being seen on a day of their choice or by a provider of their choice more than they value simply being seen quickly unless the reason for the visit is urgent.^{51,53} Furthermore, patients do not necessarily see scheduling as easier after a practice moves to an advanced access model.⁴¹ Reducing access management to objective temporal aspects will lose important facets of patient experiences of access, and in so doing, will not adequately support access management improvement.

We used a format of parallel subpanels that allowed us to identify aspects of the definition of access that were replicated across subpanels and that were relatively independent of group-specific dynamics. Identifying components established independently in more than one stakeholder panel is a valuable tool to identify robust components of definitions.⁵⁴ Furthermore, we collected structured and independent input from panelists by using written surveys, completed by each panel member without the group present. The resulting output highlighted key aspects of access and access management. Most notably, panel deliberations indicated that definitions of access to care and access management need to be patient-centered, while incorporating an understanding of the realistic trade-offs and constraints faced by access managers. However, the format of the definitions varied across subpanels, indicating the complexity of access management and the need for consensus finding.

The definitions of *access* and *access management* determine the perspectives and goals with which a healthcare delivery organization approaches *access improvement*. Our work indicated that it is critical for organizations to first establish shared definitions. Furthermore, it is essential that the conceptual understanding considers today’s care environment and is not limited to face-to-face, physician-centered approaches.^{3,22,26} The established definitions of access, optimal access, and optimal access management aim to advance our understanding of access, specifically in an era of increasing non-face-to-face visit modalities and newer primary care team models such as patient centered medical homes.⁵⁵ They emphasize the need for a patient-centered view as well as the need to simultaneously optimize multiple worthy management goals approaches.

Conceptual work to understand the dimensions of access management is also instrumental in evaluating quality improvement initiatives. The work established the need for patient-centered, current, and comprehensive conceptualization of optimal access and optimal access management. How access is

defined within a healthcare delivery organization determines the selection of measures of access⁵⁶ and shape how the success and impact of access management should be evaluated.

Our research has several strengths but also key limitations. While the panel composition was purposeful and represented diverse stakeholders with competing and potentially conflicting interests, not all relevant perspectives will have been included, and stakeholders will vary to some extent by organization and local context. In addition, the work outlines the importance of definitions for research and practice but whether these will result in successful and sustainable improvement need to be shown in future research projects. A central limitation is that our work was limited to primary care considerations, acknowledging that access to specialty care such as mental health care may face additional or other challenges.

The presented work aims to advance primary care access management practice and research relevant to healthcare delivery organizations. Access to healthcare is substantially determined by how healthcare delivery organizations manage it. The developed concepts suggest that access management, improvement, and research requires ongoing attention to relevant healthcare organization processes and multiple relevant perspectives. Healthcare organizations and researchers can use the definitions as starting points to shape procedures and resource management, inform quality improvement initiatives, and advance research into effective and sustainable access improvement strategies.

References

1. Bhat VN. Institutional arrangements and efficiency of health care delivery systems. *The European journal of health economics : HEPAC : health economics in prevention and care*. Sep 2005;6(3):215-222.
2. Totten AM, Womack DM, Eden KB, et al. *Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews. Technical Brief No. 26. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2015-00009-1.)* Rockville, MD: Agency for Healthcare Research and Quality June 2016.
3. Fortney JC, Burgess JF, Jr., Bosworth HB, Booth BM, Kaboli PJ. A re-conceptualization of access for 21st century healthcare. *J Gen Intern Med*. Nov 2011;26 Suppl 2:639-647.
4. Committee on Optimizing Scheduling in Health Care. *Transforming Health Care Scheduling and Access - Getting to Now*. Washington, D. C.: Institute of Medicine of the National Academies;2015.
5. Staton FS, Bhosle MJ, Camacho FT, Feldman SR, Balkrishnan R. How PAs improve access to care for the underserved. *JAAPA : official journal of the American Academy of Physician Assistants*. Jun 2007;20(6):32, 34, 36 passim.
6. Van Vleet A, Paradise J. Issue Brief: Tapping Nurse Practitioners to Meet Rising Demand for Primary Care. The Henry J. Kaiser Family Foundation; 2015.
7. Hempel S, Stockdale S, Danz M, et al. Access Management in Primary Care: Perspectives from an Expert Panel. Santa Monica, CA: RAND Coporation In Press.

8. Concannon TW, Meissner P, Grunbaum JA, et al. A new taxonomy for stakeholder engagement in patient-centered outcomes research. *J Gen Intern Med.* Aug 2012;27(8):985-991.
9. Miake-Lye IM, Mak S, Shanman R, Beroes JM, Shekelle PG. Access Management Improvement: A Systematic Review. *VA Evidence-based Synthesis Program Reports.* May 2017.
10. Krippendorff K. *Content Analysis: An Introduction to Its Methodology.* 2nd ed. Thousand Oaks, CA: Sage; 2004.
11. Kaboli PJ, Miake-Lye IM, Ruser C, et al. Sequelae of an Evidence-based Approach to Management for Access to Care in the Veterans Health Administration. *Med Care.* Oct 2019;57 Suppl 10 Suppl 3:S213-S220.
12. Armstrong B, Levesque O, Perlin JB, Rick C, Schectman G. Reinventing Veterans Health Administration: focus on primary care. *Journal of healthcare management / American College of Healthcare Executives.* Nov-Dec 2005;50(6):399-408; discussion 409.
13. Balasubramanian H, Banerjee R, Denton B, Naessens J, Stahl J. Improving clinical access and continuity through physician panel redesign. *J Gen Intern Med.* Oct 2010;25(10):1109-1115.
14. Balasubramanian H, Biehl S, Dai L, Muriel A. Dynamic allocation of same-day requests in multi-physician primary care practices in the presence of prescheduled appointments. *Health care management science.* Mar 2014;17(1):31-48.
15. Belardi FG, Weir S, Craig FW. A controlled trial of an advanced access appointment system in a residency family medicine center. *Family medicine.* May 2004;36(5):341-345.
16. Bennett KJ, Baxley EG. The effect of a carve-out advanced access scheduling system on no-show rates. *Family medicine.* Jan 2009;41(1):51-56.
17. Berry LL, Beckham D, Dettman A, Mead R. Toward a strategy of patient-centered access to primary care. Paper presented at: Mayo Clinic Proceedings; 2014.
18. Boushon B, Provost L, Gagnon J, Carver P. Using a virtual breakthrough series collaborative to improve access in primary care. *Jt Comm J Qual Patient Saf.* Oct 2006;32(10):573-584.
19. Cameron S, Sadler L, Lawson B. Adoption of open-access scheduling in an academic family practice. *Canadian Family Physician.* 2010;56:906-911.
20. Dixon S, Sampson FC, O'Cathain A, Pickin M. Advanced access: more than just GP waiting times? *Family practice.* Apr 2006;23(2):233-239.
21. Donahue KE, Reid A, Lefebvre A, Stanek M, Newton WP. Tackling the triple aim in primary care residencies: the I3 POP Collaborative. *Family medicine.* Feb 2015;47(2):91-97.
22. Goodall S, Montgomery A, Banks J, Salisbury C, Sampson F, Pickin M. Implementation of Advanced Access in general practice: postal survey of practices. *The British journal of general practice : the journal of the Royal College of General Practitioners.* Dec 2006;56(533):918-923.
23. Green LV, Savin S, Murray M. Providing timely access to care: what is the right patient panel size? *Jt Comm J Qual Patient Saf.* Apr 2007;33(4):211-218.
24. Harris SB, Green ME, Brown JB, et al. Impact of a quality improvement program on primary healthcare in Canada: A mixed-method evaluation. *Health Policy.* 2015;119(4):405-416.

25. Kennedy JG, Hsu JT. Implementation of an open access scheduling system in a residency training program. *Family medicine*. Oct 2003;35(9):666-670.
26. Kilo CM, Triffletti P, Tantau C, Murray M. Improving access to clinical offices. *The Journal of medical practice management : MPM*. Nov-Dec 2000;16(3):126-132.
27. Knight A, Lembke T. Appointments 101—how to shape a more effective appointment system. *Australian family physician*. Mar 2013;42(3):152-156.
28. Lukas CV, Meterko MM, Mohr D, Seibert MN. *The Implementation and Effectiveness of Advanced Clinic Access*. HSR&D Management Decision and Research Center: Department of Veterans Affairs; 2004.
29. MacCarthy D, Kallstrom L, Kadlec H, Hollander M. Improving primary care in British Columbia, Canada: evaluation of a peer-to-peer continuing education program for family physicians. *BMC Medical Education*. 2012;12(1):110.
30. Mehrotra A, Keehl-Markowitz L, Ayanian JZ. Implementing open-access scheduling of visits in primary care practices: a cautionary tale. *Ann Intern Med*. Jun 17 2008;148(12):915-922.
31. Meyers ML. Changing business practices for appointing in military outpatient medical clinics: the case for a true "open access" appointment scheme for primary care. *Journal of healthcare management / American College of Healthcare Executives*. Mar-Apr 2003;48(2):125-139.
32. NHS Practice Management Network. *Improving access, responding to patients; A 'how-to' guide for GP practices*. London, UK: UK Department of Health; June 2009.
33. Parente DH, Pinto MB, Barber JC. A pre-post comparison of service operational efficiency and patient satisfaction under open access scheduling. *Health care management review*. Jul-Sep 2005;30(3):220-228.
34. Phan K, Brown SR. Decreased continuity in a residency clinic: a consequence of open access scheduling. *Family medicine*. Jan 2009;41(1):46-50.
35. Pickin M, O'Cathain A, Sampson FC, Dixon S. Evaluation of advanced access in the national primary care collaborative. *The British journal of general practice : the journal of the Royal College of General Practitioners*. May 2004;54(502):334-340.
36. Pierdon S, Charles T, McKinley K, Myers L. Implementing advanced access in a group practice network. *Fam Pract Manag*. May 2004;11(5):35-38.
37. Pope C, Banks J, Salisbury C, Lattimer V. Improving access to primary care: eight case studies of introducing Advanced Access in England. *J Health Serv Res Policy*. Jan 2008;13(1):33-39.
38. Radel SJ, Norman AM, Notaro JC, Horrigan DR. Redesigning clinical office practices to improve performance levels in an individual practice association model HMO. *J Healthc Qual*. Mar-Apr 2001;23(2):11-15; quiz 15, 52.
39. Rohrer JE, Bernard M, Naessens J, Furst J, Kircher K, Adamson S. Impact of open-access scheduling on realized access. *Health services management research*. May 2007;20(2):134-139.
40. Salisbury C, Banks J, Goodall S, et al. An evaluation of Advanced Access in general practice. National Co-ordinating Centre for NHS Service Delivery and Organisation 2007:306.

41. Salisbury C, Goodall S, Montgomery AA, et al. Does Advanced Access improve access to primary health care? Questionnaire survey of patients. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Aug 2007;57(541):615-621.
42. Salisbury C, Montgomery AA, Simons L, et al. Impact of Advanced Access on access, workload, and continuity: controlled before-and-after and simulated-patient study. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Aug 2007;57(541):608-614.
43. Sampson F, Pickin M, O'Cathain A, Goodall S, Salisbury C. Impact of same-day appointments on patient satisfaction with general practice appointment systems. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Sep 2008;58(554):641-643.
44. Schall MW, Duffy T, Krishnamurthy A, et al. Improving patient access to the Veterans Health Administration's primary care and specialty clinics. *Jt Comm J Qual Saf*. Aug 2004;30(8):415-423.
45. Solberg LI, Hroschikoski MC, Sperl-Hillen JM, O'Connor PJ, Crabtree BF. Key issues in transforming health care organizations for quality: the case of advanced access. *Jt Comm J Qual Saf*. Jan 2004;30(1):15-24.
46. Steinbauer JR, Korell K, Erdin J, Spann SJ. Implementing open-access scheduling in an academic practice. *Fam Pract Manag*. Mar 2006;13(3):59-64.
47. Tantau C. Accessing patient-centered care using the advanced access model. *J Ambul Care Manage*. Jan-Mar 2009;32(1):32-43.
48. Tseng A, Wiser E, Barclay E, Aiello K. Implementation of advanced access in a family medicine residency practice. *The Journal of medical practice management : MPM*. Sep-Oct 2015;31(2):74-77.
49. Windridge K, Tarrant C, Freeman GK, Baker R, Boulton M, Low J. Problems with a 'target' approach to access in primary care: a qualitative study. *The British journal of general practice : the journal of the Royal College of General Practitioners*. May 2004;54(502):364-366.
50. Murray M, Berwick DM. Advanced access: reducing waiting and delays in primary care. *JAMA*. Feb 26 2003;289(8):1035-1040.
51. Rose K, Ross JS, Horwitz LI. Advanced access scheduling outcomes: A systematic review. *Archives of internal medicine*. 04/25 2011;171(13):1150-1159.
52. VanDeusen Lukas C, Meterko M, Mohr D, Nealon Seibert M. *The Implementation and Effectiveness of Advanced Clinic Access*. Washington, DC: HSR&D Management Decision and Research Center, Office of Research and Development; Department of Veterans Affairs; June 2004.
53. Mehrotra A, Keehl-Markowitz L, Ayanian JZ. Implementation of Open Access Scheduling in Primary Care: A Cautionary Tale. *Annals of internal medicine*. 2008;148(12):915-922.
54. Khodyakov D, Hempel S, Rubenstein L, et al. Conducting online expert panels: a feasibility and experimental replicability study. *BMC medical research methodology*. Dec 23 2011;11:174.
55. Arend J, Tsang-Quinn J, Levine C, Thomas D. The patient-centered medical home: history, components, and review of the evidence. *The Mount Sinai journal of medicine, New York*. Jul-Aug 2012;79(4):433-450.

56. Prentice JC, Davies ML, Pizer SD. Which outpatient wait-time measures are related to patient satisfaction? *American journal of medical quality : the official journal of the American College of Medical Quality*. May-Jun 2014;29(3):227-235.

Declarations

Ethics approval: This study was assessed by the RAND human subject protection committee, found to be of minimal risk, and determined to be exempt (approval date 10/5/2016; ID2016-0610).

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Tables

Table 1. Definitions of Access and Access Management in the Access Management Improvement Literature

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Armstrong, 2005; ¹ Schall, 2004; ² Lukas, 2008 ³ Intervention evaluation	Population health ("so that all veterans can receive the care they need, when and where they want it)	Yes	Patient access to their primary care provider: Mean number of days between the date the appointment was first requested and the date the appointment was actually scheduled for all appointments desired by either the patient or clinician to occur "as soon as possible." Advanced clinic access: The organization provides enough openness or space (capacity) in the clinic for health services to meet the demand of its patients population at the time the demand occurs. Doing today's work today.	NA	Clinic wait time: next available appointment	Average days until next available appointment Time to next available appointment
Balasubramanian, 2014 ⁴ Statistical model	Population health	Addressed but separate from access	Timely access: Ability of patients to secure an appointment as quickly as possible.	NA	NA	NA

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Balasubramanian, 2010 ⁵ Simulation	Population health	Addressed but separate from access	NA	NA	NA	Wait time
Belardi, 2004 ⁶ Intervention evaluation	Supply-Demand	Yes	NA	NA	Advanced access: Offering patients requesting a same-day appointment a same-day appointment with his/her personal physician or another advance access team member if the personal physician was not available.	Time to 3 rd available appointment
Benett, 2009 ⁷ Intervention evaluation	Supply-Demand	Yes	NA	NA	Advance access: Patients' ability to schedule an appointment with the provider of their choice, for virtually any service, within a day or two (citing Murray & Berwick, 2003 ⁸)	Time to 3 rd next available appointment

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Berry, 2014 ⁹ Review/opinion	Population health		Patient-centered access: consistently providing convenient access to services that patients need and desire. The mission is to provide timely, high-quality care, irrespective of whether an in-person encounter is required.	Access management: Strategy to achieve the goal of patient-centered access - improved clinical quality and efficiency while reducing the time, effort, emotional burden, and expense that patients incur in obtaining care.	NA	NA
Boushon, 2006 ¹⁰ Intervention evaluation	Supply-Demand	Yes	NA	NA	Access and office efficiency in primary care: System in which patients can be seen by their primary care provider when they choose, even on the same day.	Time to 3 rd next available appointment

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Cameron, 2010 ¹¹ Intervention evaluation	Supply- Demand	Yes	NA	NA	Lead time: third available appointment time for a particular physician. Open access: same-day scheduling, advanced access; offers same-day appointments to patients calling to see their physicians, effectively reducing wait times and allowing primary care providers to deal with urgent and nonurgent demands on the same day patients call.	Time to 3 rd next available appointment
Donahue, 2015 ¹² Analytic study	Supply- Demand	NA	NA	NA	NA	Time to 3 rd next available appointment
Green, 2007 ¹³ Statistical modeling	Population health	Yes	NA	NA	Advanced access: Just-in- time approach to patient scheduling.	NA
Harris, 2015 ¹⁴ Intervention evaluation	Population health ("access to healthcare")	NA	NA	NA	Advanced access: optimize patient access to primary healthcare.	Mean (SD, range) number of days to 3 rd next available appointment
Kennedy, 2003 ¹⁵ Intervention evaluation	Supply- Demand	NA	NA	NA	Open access: advanced access, doing today's work today, or same-day scheduling.	Visit volume Phone call volume and duration

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Kilo, 2000 ¹⁶ Review/opinion	Supply- Demand	Yes	<p>Traditional definition of access: Length of time someone has to wait to get in to see his or her doctor.</p> <p>Optimal access: Access to their own physician.</p> <p>New definition of access: System by which a clinical office practice manages its capacity to provide care. Optimal access uses available capacity to serve patients at the time, in the location, and in the fashion most convenient to them, with the most appropriate provider for their needs.</p>	NA	NA	Time to 3rd available appointment
Knight, 2013 ¹⁷ Review	Supply- Demand	Varies	NA	NA	<p>Appointment delay: Number of days from request until the third next available routine appointment (i.e. excluding reserved emergency appointments).</p> <p>Open access appointment system: No appointments,</p>	NA

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
					<p>patients turn up and wait to be seen.</p> <p>Book on the day appointment system: Phone calls each morning until the day is booked.</p> <p>Supersaturate appointment system: Appointments are booked according to the patient's request.</p> <p>Carve out appointment schedule: Practices deliberately carve out a number of their appointments each day for acute care.</p> <p>Advance access appointment system: The aims are to start the day with enough appointments to meet demand on the day, no restrictions on making future appointments, prioritize continuity (improving outcomes and reducing demand).</p>	

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
MacCarthy, 2012 ¹⁸ Intervention evaluation	NA	NA	NA	NA	NA	Wait times for urgent care Wait time to regular appointment Wait time to 3 rd next available appointment
Mehrotra, 2008 ¹⁹ Intervention evaluation	Unclear	NA	NA	NA	Open access scheduling patients call the practice and are offered a prompt appointment, ideally on the same or next day, no matter what the reason for the visit. Patients are given a timeframe for follow-up and whenever the patient calls they can be seen the same day or soon thereafter.	Time to 3 rd next available appointment
Myers, 2003 ²⁰ Intervention evaluation	Supply- Demand	NA	NA	NA	Open access: providing a same-day patient appointment to military managed care priority beneficiaries regardless of the type of complaint.	Wait times for appointments Time to next available appointment

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Parente, 2005 ²¹ Intervention evaluation	Population health ("receive primary care")	NA	Access: Patients' ability to seek and receive primary care in a timely manner (citing Murray, 1999 ²²). Access includes physical location of facility, hours of operation, telephone access, appointment waiting time, and time in waiting room (citing Goldstein, 2000 ²³)		Open access: requires patients to be seen when they want to be seen or when their referring provider wants them to be seen; and patients will see their provider of choice (citing Boelke, 2000). Access time: Time required for patients to wait before seeing their primary care provider.	Number of days from request to appointment
Pierdon, 2004 ²⁴ Organizational case study	Supply- Demand	NA	NA	NA	Demand (volume of services sought) Backlog (services waiting to be provided) Lead-time (wait time for appointment) Cycle time (time from check-in to checkout) Supply (time available for providing care)	Percentage of open schedules Lead time

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Phan, 2009 ²⁵ Intervention evaluation	Supply- Demand	Yes	NA	NA	Open access: patients make same-day appointments regardless of the type of problem or visit required (providing care to patients at the time they need it rather than at a future scheduled appointment)	NA

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Practice Management Network, 2008 ²⁶ Toolkit	Population health	Yes	Good access: Patients being able to book an appointment quickly, within a reasonable timeframe, and pre-book option; patients being able to see a preferred clinician if they wish to wait longer for an appointment; patient access to reliable information about the practice, so that they can make their own decisions about the access they require; patients not only being able to book an appointment on the telephone but by other means; patients contributing to good access through patient participation groups and other forums; and patients being able to telephone the practice throughout the day.	NA	NA	NA

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Radel, 2001 ²⁷ Intervention evaluation	Supply- Demand	NA	NA	NA	Open access practice: Offer patients an appointment on the day they call the office or another day of their choice ("treating today's patients today").	Appointment availability Average time for established patients to schedule an office visit (days)
Rohrer, 2007 ²⁸ Intervention evaluation	Unclear	Yes	NA	NA	Same day scheduling: advanced access or open access; patients calling to see their physicians are offered an appointment on the same day.	Two or more primary evaluation and management visits per year

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
<p>Sampson, 2008;²⁹ Pickin, 2004;³⁰ Windridge, 2004;³¹ Dixon, 2006;³² Goodall, 2006;³³ Salisbury, 2007;³⁴ Salisbury, 2007;³⁵ Pope, 2008³⁶ Analytic study</p>	<p>Population health (“deprivation of practice population”)</p>	<p>No</p>	<p>NA</p>	<p>NA</p>	<p>Same day appointments: numbers of appointment reserved for patients booking on the day Advanced access: understanding the demand profile over time; managing demand by offering alternative forms of provision; ensuring that the capacity meets demand; making contingency plans for times when there are fluctuations in demand; and involving patients in planning changes (citing Oldham, 2001³⁷). Advance access = same-day scheduling = open access scheduling Same day appointment model: today’s work, today.</p>	<p>Proportion of same-day appointments Median number of working days to the 3rd available routine appointment with each general practitioner</p>

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Solberg, 2004 ³⁸ Intervention evaluation	Population health ("reduce waits and delays")	Yes	NA	NA	Advanced access: Goal to provide patients with an appointment with their personal physicians on the patient's preferred day regardless of the reason (citing Murray ^{8,22,39}) Timely care: reduce waits and delays for patients and caregivers (citing IOM report). Patient centered: respect patient preferences, values, and needs (citing IOM report ⁴⁰)	Time to 3 rd - next available appointment
Steinbauer, 2006 ⁴¹ Intervention evaluation	NA	NA	NA	NA	Open access scheduling: Same day or advanced access scheduling which theoretically eliminates the appointment backlog and makes appointments available the same day the patient calls, applying the principle 'to do today's work today.'	Time to 3 rd next available appointment

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Tantau, 2009 ⁴² Organizational case study	Population health ("waits and delays for healthcare")	Yes	NA	NA	Advanced access: Practices must be in a position to offer patients an appointment today, for any problem, with the provider of choice or another care team member in the absence of the chosen provider.	Time to appointment

ID Publication type	Perspective	Continuity	Access Definition	Access Management Definition	Other Relevant definitions	Access Outcome Measure
Tseng, 2015 ⁴³ Intervention evaluation	Supply- Demand	Yes	NA	NA	<p>Traditional access model: no reserved appointment slots in advance.</p> <p>Carve-out access model: holds a set number of urgent appointments daily, based on the overall pattern of demand throughout the week.</p> <p>Advanced access model: reserves a set percentage of appointments for same-day needs, a set percentage open a week or more in advance, and a set percentage with no restrictions on scheduling.</p> <p>Demand: provider visits per day; visits per patient per year</p> <p>Supply: provider days per year</p> <p>Ideal panel size formula: $\text{panel size} \times \text{visits per patient per year (demand)} = \text{provider visits per day} \times \text{provider days per year (supply)}$</p>	Time to 3 rd next available appointment

Notes: Population health: the publication addresses access to healthcare in general, supply-demand: the publication is focused on supply and demand within an organization with little reference to access to care as a

broader perspective; continuity: is access to the patients' healthcare provider of choice part of the definition? Some empirical studies were reported in more than one publication (see ID). More information on the included studies are available elsewhere⁴⁴

1. Armstrong B, Levesque O, Perlin JB, Rick C, Schectman G. Reinventing Veterans Health Administration: focus on primary care. *Journal of healthcare management / American College of Healthcare Executives*. Nov-Dec 2005;50(6):399-408; discussion 409.
2. Schall MW, Duffy T, Krishnamurthy A, et al. Improving patient access to the Veterans Health Administration's primary care and specialty clinics. *Jt Comm J Qual Saf*. Aug 2004;30(8):415-423.
3. Lukas CV, Meterko MM, Mohr D, et al. Implementation of a clinical innovation: the case of advanced clinic access in the Department of Veterans Affairs. *J Ambul Care Manage*. Apr-Jun 2008;31(2):94-108.
4. Balasubramanian H, Biehl S, Dai L, Muriel A. Dynamic allocation of same-day requests in multi-physician primary care practices in the presence of prescheduled appointments. *Health care management science*. Mar 2014;17(1):31-48.
5. Balasubramanian H, Banerjee R, Denton B, Naessens J, Stahl J. Improving clinical access and continuity through physician panel redesign. *J Gen Intern Med*. Oct 2010;25(10):1109-1115.
6. Belardi FG, Weir S, Craig FW. A controlled trial of an advanced access appointment system in a residency family medicine center. *Family medicine*. May 2004;36(5):341-345.
7. Bennett KJ, Baxley EG. The effect of a carve-out advanced access scheduling system on no-show rates. *Family medicine*. Jan 2009;41(1):51-56.
8. Murray M, Berwick DM. Advanced access: reducing waiting and delays in primary care. *JAMA*. Feb 26 2003;289(8):1035-1040.
9. Berry LL, Beckham D, Dettman A, Mead R. Toward a strategy of patient-centered access to primary care. *Mayo Clin Proc*. Oct 2014;89(10):1406-1415.
10. Boushon B, Provost L, Gagnon J, Carver P. Using a virtual breakthrough series collaborative to improve access in primary care. *Jt Comm J Qual Patient Saf*. Oct 2006;32(10):573-584.
11. Cameron S, Sadler L, Lawson B. Adoption of open-access scheduling in an academic family practice. *Canadian Family Physician*. 2010;56:906-911.
12. Donahue KE, Reid A, Lefebvre A, Stanek M, Newton WP. Tackling the triple aim in primary care residencies: the I3 POP Collaborative. *Family medicine*. Feb 2015;47(2):91-97.
13. Green LV, Savin S, Murray M. Providing timely access to care: what is the right patient panel size? *Jt Comm J Qual Patient Saf*. Apr 2007;33(4):211-218.
14. Harris SB, Green ME, Brown JB, et al. Impact of a quality improvement program on primary healthcare in Canada: A mixed-method evaluation. *Health Policy*. 2015;119(4):405-416.
15. Kennedy JG, Hsu JT. Implementation of an open access scheduling system in a residency training program. *Family medicine*. Oct 2003;35(9):666-670.
16. Kilo CM, Triffletti P, Tantau C, Murray M. Improving access to clinical offices. *The Journal of medical practice management : MPM*. Nov-Dec 2000;16(3):126-132.

17. Knight A, Lembke T. Appointments 101--how to shape a more effective appointment system. *Australian family physician*. Mar 2013;42(3):152-156.
18. MacCarthy D, Kallstrom L, Kadlec H, Hollander M. Improving primary care in British Columbia, Canada: evaluation of a peer-to-peer continuing education program for family physicians. *BMC Medical Education*. 2012;12(1):110.
19. Mehrotra A, Keehl-Markowitz L, Ayanian JZ. Implementation of Open Access Scheduling in Primary Care: A Cautionary Tale. *Annals of internal medicine*. 2008;148(12):915-922.
20. Meyers ML. Changing business practices for appointing in military outpatient medical clinics: the case for a true "open access" appointment scheme for primary care. *Journal of healthcare management / American College of Healthcare Executives*. Mar-Apr 2003;48(2):125-139.
21. Parente DH, Pinto MB, Barber JC. A pre-post comparison of service operational efficiency and patient satisfaction under open access scheduling. *Health care management review*. Jul-Sep 2005;30(3):220-228.
22. Murray M, Tantau C. Redefining open access to primary care. *Manag Care Q*. Summer 1999;7(3):45-55.
23. Goldstein MS, Elliott SD, Guccione AA. The development of an instrument to measure satisfaction with physical therapy. *Phys Ther*. Sep 2000;80(9):853-863.
24. Pierdon S, Charles T, McKinley K, Myers L. Implementing advanced access in a group practice network. *Fam Pract Manag*. May 2004;11(5):35-38.
25. Phan K, Brown SR. Decreased continuity in a residency clinic: a consequence of open access scheduling. *Family medicine*. Jan 2009;41(1):46-50.
26. NHS Practice Management Network. *Improving access, responding to patients; A 'how-to' guide for GP practices*. London, UK: UK Department of Health; June 2009.
27. Radel SJ, Norman AM, Notaro JC, Horrigan DR. Redesigning clinical office practices to improve performance levels in an individual practice association model HMO. *J Healthc Qual*. Mar-Apr 2001;23(2):11-15; quiz 15, 52.
28. Rohrer JE, Bernard M, Naessens J, Furst J, Kircher K, Adamson S. Impact of open-access scheduling on realized access. *Health services management research*. May 2007;20(2):134-139.
29. Sampson F, Pickin M, O'Cathain A, Goodall S, Salisbury C. Impact of same-day appointments on patient satisfaction with general practice appointment systems. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Sep 2008;58(554):641-643.
30. Pickin M, O'Cathain A, Sampson FC, Dixon S. Evaluation of advanced access in the national primary care collaborative. *The British journal of general practice : the journal of the Royal College of General Practitioners*. May 2004;54(502):334-340.
31. Windridge K, Tarrant C, Freeman GK, Baker R, Boulton M, Low J. Problems with a 'target' approach to access in primary care: a qualitative study. *The British journal of general practice : the journal of the Royal College of General Practitioners*. May 2004;54(502):364-366.
32. Dixon S, Sampson FC, O'Cathain A, Pickin M. Advanced access: more than just GP waiting times? *Family practice*. Apr 2006;23(2):233-239.

33. Goodall S, Montgomery A, Banks J, Salisbury C, Sampson F, Pickin M. Implementation of Advanced Access in general practice: postal survey of practices. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Dec 2006;56(533):918-923.
34. Salisbury C, Montgomery AA, Simons L, et al. Impact of Advanced Access on access, workload, and continuity: controlled before-and-after and simulated-patient study. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Aug 2007;57(541):608-614.
35. Salisbury C, Goodall S, Montgomery AA, et al. Does Advanced Access improve access to primary health care? Questionnaire survey of patients. *The British journal of general practice : the journal of the Royal College of General Practitioners*. Aug 2007;57(541):615-621.
36. Pope C, Banks J, Salisbury C, Lattimer V. Improving access to primary care: eight case studies of introducing Advanced Access in England. *J Health Serv Res Policy*. Jan 2008;13(1):33-39.
37. Oldham J. *Advanced Access in primary care*. Manchester: National Primary Care Development Team;2001.
38. Solberg LI, Hroschikoski MC, Sperl-Hillen JM, O'Connor PJ, Crabtree BF. Key issues in transforming health care organizations for quality: the case of advanced access. *Jt Comm J Qual Saf*. Jan 2004;30(1):15-24.
39. Murray M, Bodenheimer T, Rittenhouse D, Grumbach K. Improving timely access to primary care: case studies of the advanced access model. *JAMA*. Feb 26 2003;289(8):1042-1046.
40. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington (DC)2001. 0309072808.
41. Steinbauer JR, Korell K, Erdin J, Spann SJ. Implementing open-access scheduling in an academic practice. *Fam Pract Manag*. Mar 2006;13(3):59-64.
42. Tantau C. Accessing patient-centered care using the advanced access model. *J Ambul Care Manage*. Jan-Mar 2009;32(1):32-43.
43. Tseng A, Wisner E, Barclay E, Aiello K. Implementation of advanced access in a family medicine residency practice. *The Journal of medical practice management : MPM*. Sep-Oct 2015;31(2):74-77.
44. Miake-Lye IM, Mak S, Shanman R, Beroes JM, Shekelle PG. Access Management Improvement: A Systematic Review. *VA Evidence-based Synthesis Program Reports*. May 2017.

Table 2. Comparisons of Access Definitions across Subpanels

Sub panel	Themes emerged from panel discussions	Final definition	Themes in final definitions
1	<p>Actual versus perceived access Ease versus need Facilitate self-management Patient access to materials Timeliness VA-Community partners hybrid model</p>	<p><i>Access management encompasses a set of processes designed to achieve optimal delivery of healthcare services to our Veterans and their families and requires continuous improvement.</i></p>	<p>Continuous improvement Healthcare services for veterans and their families Optimal delivery Processes</p>
2	<p>Clinical necessity/appropriateness Continuous improvement Healthcare services for veterans and their families Optimal delivery Patient preferences Timely response to patient requests</p>	<p><i>Access is defined as a timely response to patient requests, and incorporates patient preferences and clinical necessity.</i></p>	<p>Clinical necessity/appropriateness Patient preferences Timely response to patient requests</p>
3	<p>Clinical appropriateness Defined eligible populations of patients Ease of getting access to care Expressed need Optimal use Primary care versus first contact Without ease of access, there can't be use</p>	<p><i>Opted to keep original definition: Access to care represents the potential ease of having virtual or face-to-face interactions with a broad array of healthcare providers including clinicians, caregivers, peers, and computer applications. Actual access to care represents those directly-observable and objectively measurable dimensions of access. Perceived access to care represents those self-reported and subjective dimensions of access.</i></p>	<p>Actual access is directly observable, objectively measurable Actual access vs perceived Array of providers/caregivers/peers/computer applications Ease of access Perceived access is self-reported and subjective Potential Virtual or face-to-face interactions with providers</p>
4	<p>Access defined by patients Actual versus perceived Comparisons to European example of access Confidence in follow up after first contact Distinction between first contact and access Hard time with term "potential" Resolution of access needs trumps first contact Specific goals Timeliness: first contact to resolution of access needs</p>	<p><i>Access is defined by patients. Varies from patient to patient.</i></p>	<p>Access defined by patients Access definition varies from patient to patient</p>
5	<p>Access is what patient perceives Actual versus perceived access Any method (i.e., team member or place) of contact</p>	<p><i>Access to healthcare is the ability of a patient to get their healthcare needs met with ease and in a timely manner.</i></p>	<p>Healthcare needs met in timely manner Healthcare needs met with ease</p>

Appropriate Around the first contact Communication methods essential Ease of getting health needs met Location of connection essential Timeliness of getting health needs met Who defines timeliness		
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Figures



Figure 1