

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Tele-Health

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Health

- Good health of a population is synonymous with equality of access to healthcare.
- Good health is fundamental for economic development.
- Investment in health accompanies economic development:
 - Clean water,
 - Vaccination programs
 - Other forms of public health interventions elsewhere, has always preceded economic development.



Telehealth

Use of information and telecommunications technology in health care delivery for a specific patient involving a provider across distance or time.



Totten AM, Womack DM, Eden KB, et al. Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2016 Jun. (Technical Briefs, No. 26.) Available from: <https://www.ncbi.nlm.nih.gov/books/NBK379320/>

Evidence Based Telemedicine

- **84 years ago**, merchant mariners were treated by remote consultation delivered over “short waves”.
- VHF, INMARSAT based satellite communications etc., as well as advances in the equipment attached at both ends of the TM communication channel, improved on the quality of care delivered through TM .



Anogianakis, G., Maglavera, S., Pomportsis, A., Bountzioukas, S., Beltrame, F. And Orsi, G.: Medical emergency aid through telematics: design, implementation guidelines and analysis of user requirements for the MERMAID project. Stud Health Technol Inform (1997) 43 Pt A: 74-8.

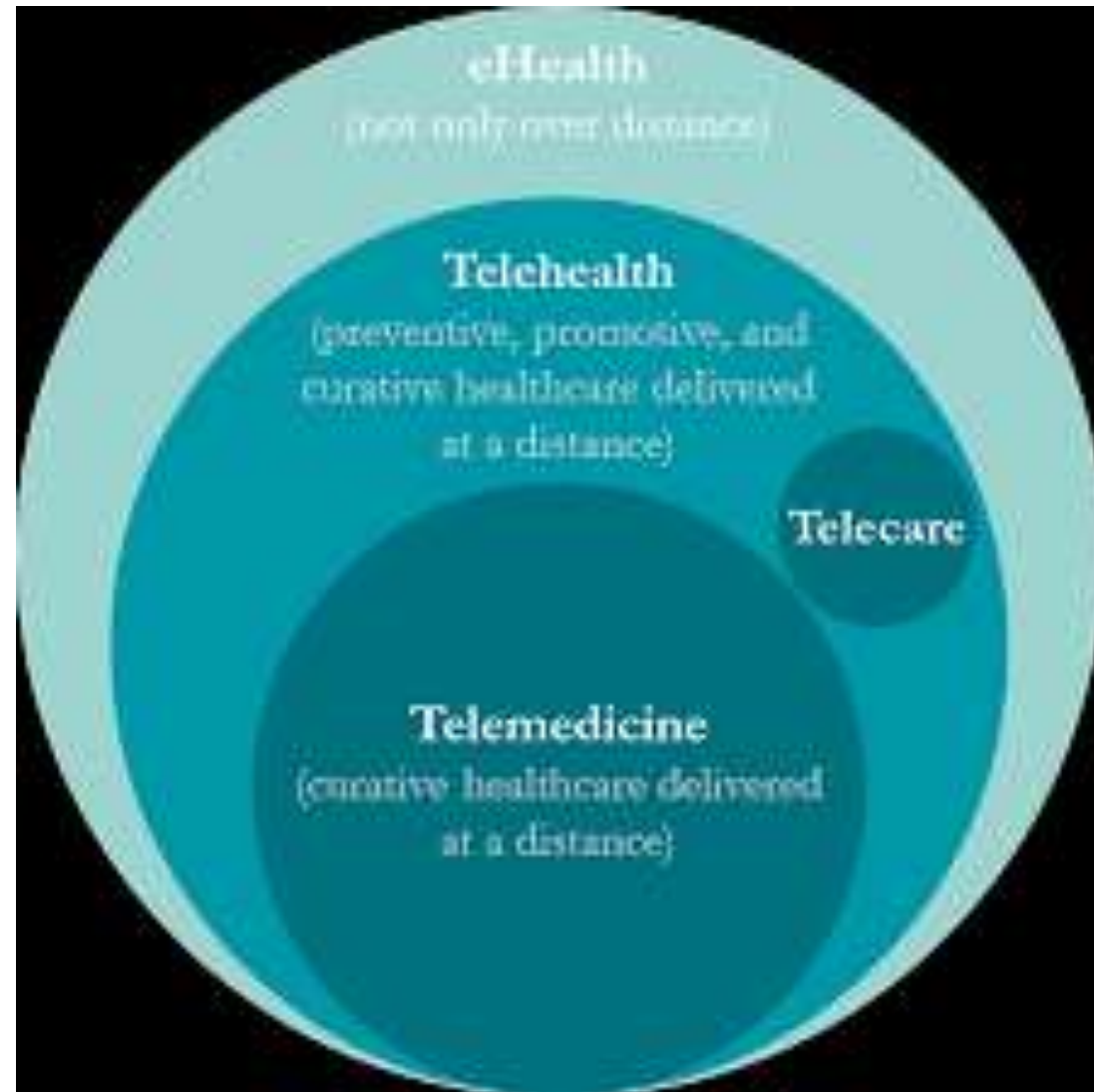
Anogianakis, G., Maglavera, S. and Pomportsis, A.: Relief for maritime medical emergencies through telematics. IEEE Trans Inf Technol Biomed (1998) 2:254-60.

Telehealth

Preventive,
Promotive,
& Curative

Health care

delivered at a
distance.



Telehealth

van Dyk L.

A review of telehealth
service implementation
frameworks.

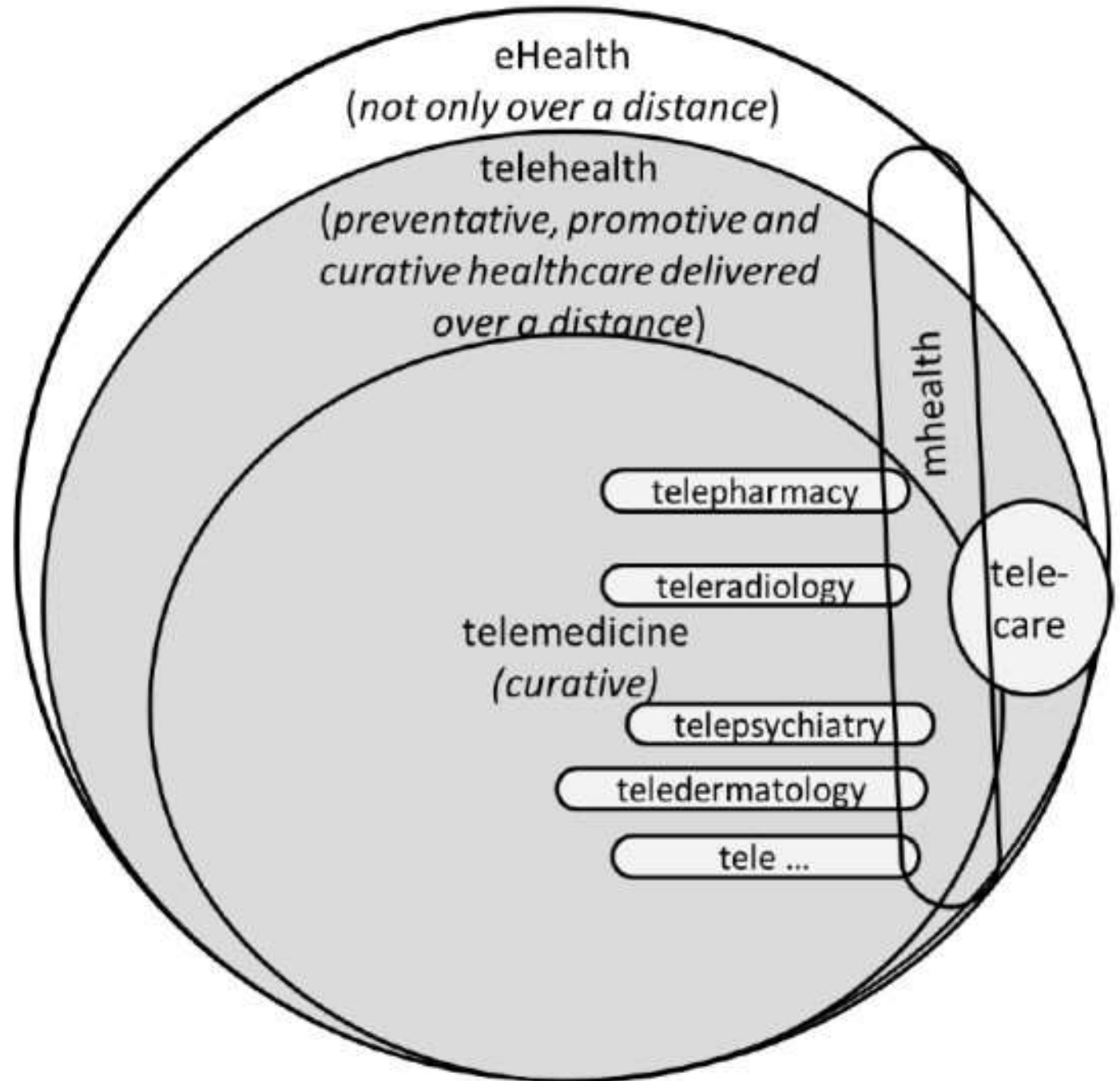
Int J Environ Res Public
Health.

2014 Jan 23;11(2):1279-98.

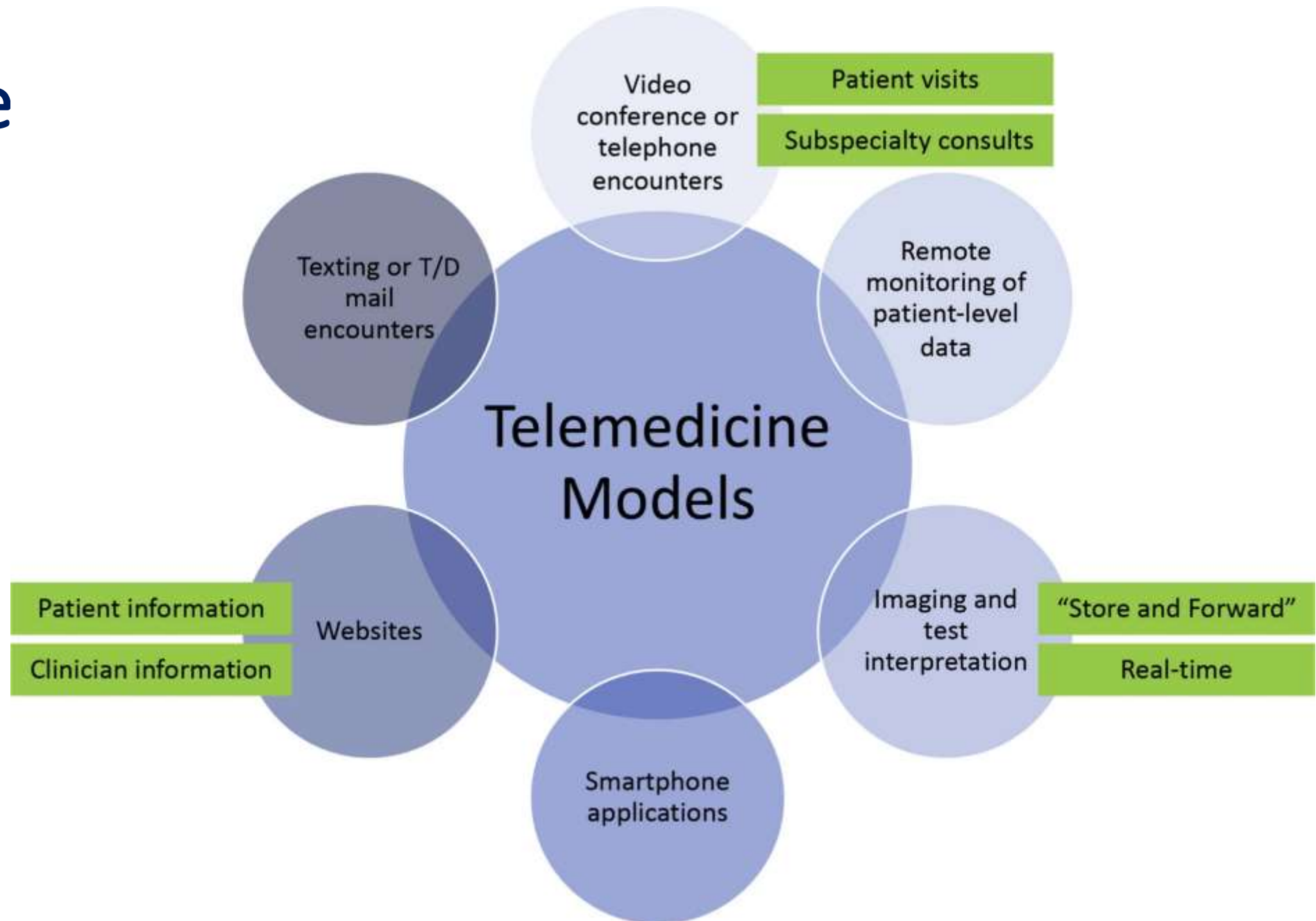
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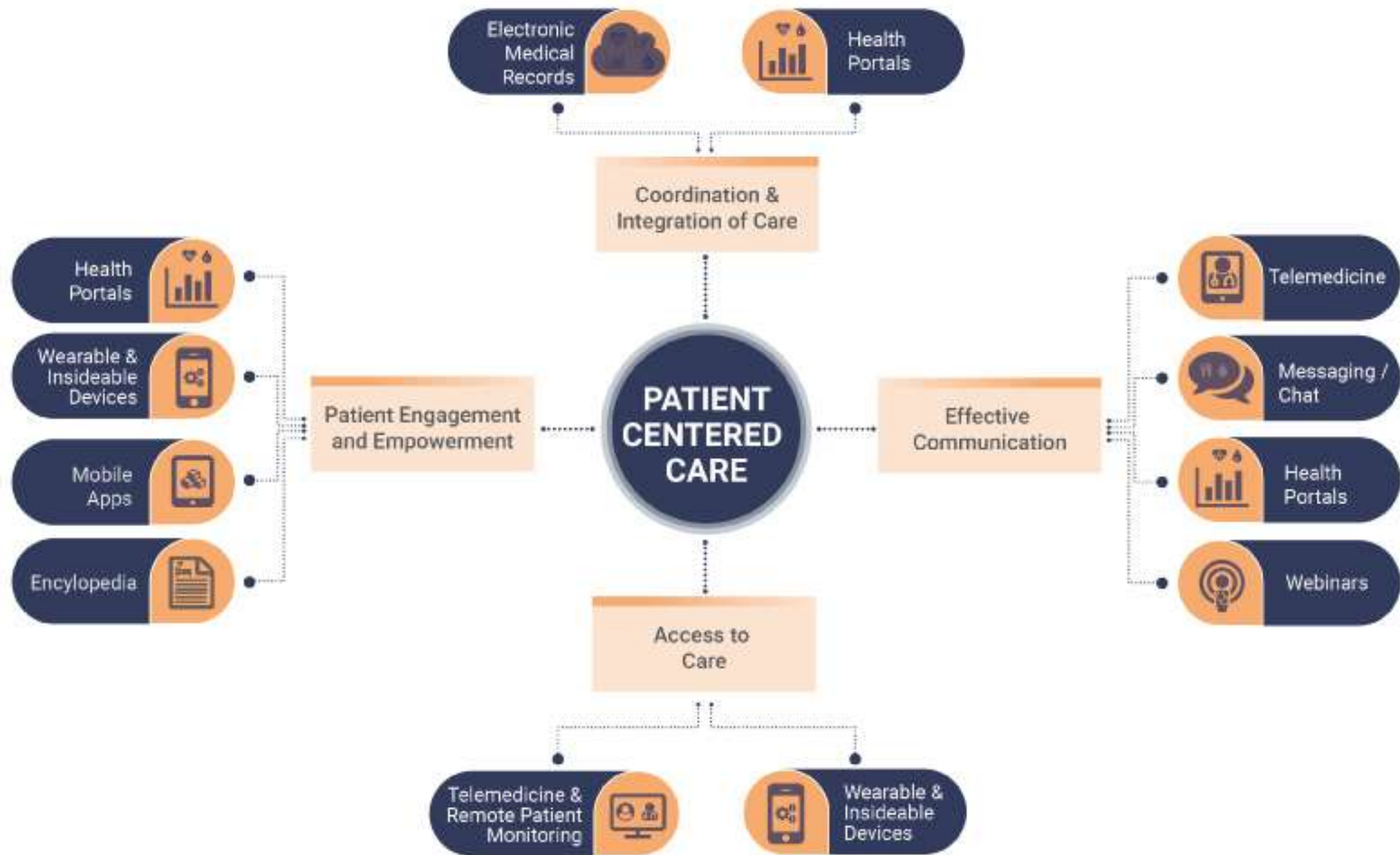
10.3390/ijerph110201279.

PMID: 24464237.



Telemedicine





Telehealth

Potential to **improve access** to care for specific patient populations of particular concern, including

- people living in **rural areas**,
- those with **transportation barriers**,
- those facing **provider shortages**,

Nesbitt TS. The evolution of telehealth: where have we been and where are we going? In: Institute of Medicine. The role of telehealth in an evolving health care environment: workshop summary. Washington (DC): National Academies Press; 2012. p. 11–16.



Telehealth

- Interventions that could substitute for office visits are instead likely to increase the use of services more broadly

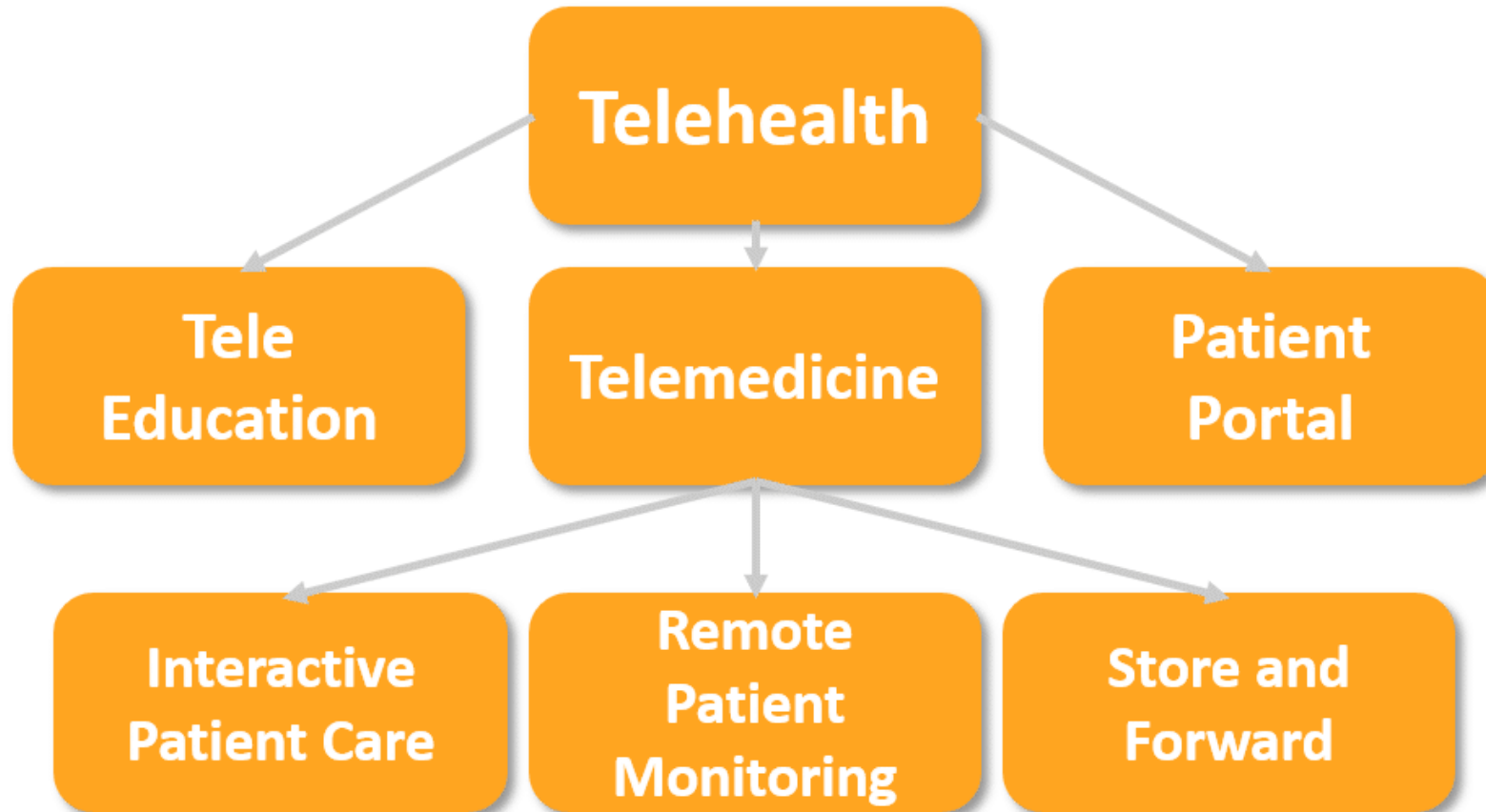
(both in-person and telehealth services)

- Martinez KA, Rood M, Jhangiani N, Kou L, Rose S, Boissy A, et al. Patterns of use and correlates of patient satisfaction with a large nationwide direct to consumer telemedicine service. *J Gen Intern Med*. 2018; 33(10):1768–73.
- Ashwood JS, Mehrotra A, Cowling D, Uscher-Pines L. Direct-to-consumer telehealth may increase access to care but does not decrease spending. *Health Aff (Millwood)*. 2017;36(3): 485–91
- Pearl R. Kaiser Permanente Northern California: current experiences with internet, mobile, and video technologies. *Health Aff (Millwood)*. 2014;33(2):251–7.



Telehealth

A Telehealth Taxonomy



Virtual Communities in Health Care

- A virtual community is a social entity involving several individuals who relate to one another by the use of a specific communication technology that bridges geographic distance.
- Traditional communities are determined by factors such as geographic proximity, organizational structures or activities shared by the members of the community



Virtual Communities in Health Care

- The utilization of advanced technologies enabling interactions and exchange of information between members who may not physically meet at any point in time.



Virtual communities and patient empowerment

- Patients are entitled to **access health information and determine their own care choices.**
 - Empowerment model introduces
 - Self-awareness
 - Personal responsibility
 - Informed choices
 - Quality of life.



Feste C., and Anderson R. M. 1995. "Empowerment: from philosophy to practice." Patient Education and Counseling 26:139-144.

Thank you to these organisations for supporting the #hcsmsA community



E-Patient Communities in South Africa

Virtual Disease management

- Utilization of information technologies such as the Internet to allow patients suffering from chronic conditions to stay at home and be involved in the care delivery process.
- Such technologies can link home care with hospital and ambulatory care, and facilitate information exchange and communication between patients, family members, and care providers.



Virtual Disease management

- The integration of commercially available household items such as television sets, mobile phones, videophones, medication dispensing machines, and handheld computers introduces new communication modes and patient empowering tools.



Virtual Disease management

Home Asthma Telemonitoring (HAT) system

- Early detection and timely intervention
- Daily routine of asthma care with personalized interventions
- Alerts health care providers in cases that require immediate attention.



Finkelstein J., O'Connor G., and Friedmann R. H. **2001.** **"Development and implementation of the home asthma telemonitoring (HAT) system to facilitate asthma self-care."** In MedInfo **2001**, edited by V. Patel, R. Rogers and R. Haux, 810-4. Amsterdam, Washington, DC: IOS Press.

Virtual Disease management

Diabetes requires
long-term prevention and intervention
approaches.

- The Center for Health Services Research,
Henry Ford Health System in Detroit,
Michigan, developed a **web-based**
Diabetes Care Management Support System
(DCMSS)
to support care delivery to diabetic patients.



Baker A. M., Lafata J. E., Ward R. E., Whitehouse F., and Divine G.
2001. "A Webbased diabetes care management support system."
Jt Comm J Qual Improv 27(4):179- 90.

Virtual Disease management

The system was evaluated within a non-randomized, longitudinal study and findings suggested that:

Web-based systems integrating clinical practice guidelines, patient registries, and performance feedback

have

the potential to improve the rate of routine testing among patients with diabetes.



Virtual Disease management

- Virtual disease management applications can be also developed for **post lung transplant care**.
- Regular spirometry monitoring of lung transplant recipients, for example, is essential to early detection of **acute infection and rejection of the allograft**.
- A web-based telemonitoring system providing direct transmission of home spirometry to the hospital was developed and evaluated demonstrating that **home monitoring of pulmonary function** in lung transplant recipients via the Internet is **feasible and accurate**.



Morlion B., Knoop C., Paiva M., and Estenne M. 2002. "Internet-based home monitoring of pulmonary function after lung transplantation." Am J Respir Crit Care Med 165(5):694-7.

Virtual Disease management

TeleHomeCare Project at the University of Minnesota

- to enable patients at home, who were diagnosed with **congestive heart failure, chronic obstructive pulmonary disease or required wound care**, to interact with health care providers at the agency.
- Demiris G., Finkelstein S. M., and Speedie S. M. 2001b. “Considerations for the design of a Web-based clinical monitoring and educational system for elderly patients.” JAMIA 8(5):468-72.



Virtual Disease management

TeleHomeCare Project at the University of Minnesota

- **Personalized web pages** allowed patients to interact with their providers and fill out daily questionnaires including questions about vital signs (such as weight, blood pressure or temperature), symptoms, and overall well-being and nutrition.
- **Alerts** were triggered and providers were notified when a patient's entry required immediate medical attention based on **predefined personalized rules**.



- Demir G., Finkelstein S. M., and Speedie S. M. 2001b. "Considerations for the design of a Web-based clinical monitoring and educational system for elderly patients." JAMIA 8(5):468-72.

Virtual Patient Support

- Enables **any unit within a network to communicate** with and provide services to another unit within the network.
- Peers can be assumed to be of variable connectivity and can join and leave the system at their own discretion



Virtual Patient Support

- Sharf studied the communication taking place at **Breast Cancer List, an online discussion group** which continues to grow in membership and activity.
- Three major dimensions of communication were identified:
 - Exchange of information,
 - Social support
 - Personal empowerment.
- Sharf BF. **Communicating breast cancer on-line: support and empowerment on the Internet.** *Women Health.* 1997;26(1):65-84.



Virtual Patient Support

The study concluded that this application fulfills the functions of a community, with **future concerns** about **information control** and the **potential to enhance patient-provider understanding.**



- Sharf BF. Communicating breast cancer on-line: support and empowerment on the Internet. Women Health. 1997;26(1):65-84.

Virtual Patient Support

- Hoybye et al used ethnographics case-study methodology to explore **how support groups on the Internet can break the social isolation that follows cancer and chronic pain.**
- They **studied the Scandinavian Breast Cancer List** and using participant observation and interviews, followed **15 women who chose the Internet to battle social isolation**
- Hoybye MT, Johansen C, Tjornhoj-Thomsen T. **Online interaction. Effects of storytelling in an Internet breast cancer support group.** *Psychooncology.* 2004 Jul 15 28.



Virtual Patient Support

Study findings indicate that
these women
were empowered by the exchanges of
knowledge
and sharing experiences within the support
group.

- Hoybye MT, Johansen C, Tjornhoj-Thomsen T. **Online interaction. Effects of storytelling in an Internet breast cancer support group.** *Psychooncology*. 2004 Jul 15 28.



Virtual Disease management

- A randomized trial to compare the effects of an Internet weight loss program alone vs this program with the addition of behavioral counseling via e-mail provided for 1 year to individuals at risk of type 2 diabetes.
 - The behavioral e-counseling group lost more mean (SD) weight at 12 months than the basic Internet group and had greater decreases in percentage of initial body weight.
- Tate DF, Jackvony EH, Wing RR. Effects of Internet behavioral counseling on weight loss in adults at risk for type 2 diabetes: a randomized trial. JAMA. 2003 Apr 9;289(14):1833-



Virtual Disease management

- The authors concluded that adding e-mail counseling to a basic web-based weight loss intervention program **significantly improved weight loss in adults at risk of diabetes.**

- Tate DF, Jackvony EH, Wing RR. Effects of Internet behavioral counseling on weight loss in adults at risk for type 2 diabetes: a randomized trial. JAMA. 2003 Apr 9;289(14):1833-6.



Virtual Patient Support

- Characteristics of users of **Internet-based depression support groups** and assessed whether use predicts change in depression symptoms and social support.
- **103 users** of these groups were recruited into the study cohort and followed prospectively.
- Houston TK, Cooper LA, Ford DE **Internet support groups for depression: a 1-year prospective cohort study.** Am J Psychiatry. 2002 ;159(12):2062-8.



Virtual Patient Support

- They had high depression severity scores, and were socially isolated at baseline.
- They perceived **considerable benefit** from the web based support group indicating a potential of web-based support groups to play a **positive role in the treatment of depression.**

- Houston TK, Cooper LA, Ford DE **Internet support groups for depression: a 1-year prospective cohort study.** Am J Psychiatry. 2002 ;159(12):2062-8.



Virtual research communities

- The Comprehensive Health Enhancement Support System (CHESS) developed by the **University of Wisconsin**
- A platform that provides services designed to help individuals cope with a health crisis or medical concern, but also **invites researchers to utilize resources and share knowledge and findings.**
- Gustafson DH, Bosworth K, Hawkins RP, Boberg EW, Bricker E. **CHESS: A computer-based system for providing information referrals, decision support and social support to people facing medical and other health-related crises.** Proc 16th Ann Symp Comput Appl Med Care. 1993;161-165



Virtual research communities

- The system provides timely access to resources such as information, social support, decision-making and problem-solving tools when needed most.
- The CHES application and its modules and consortia are good examples of a virtual community that serves individual patients' and caregiver needs while also providing an active laboratory for researchers and organizations.
- Gustafson DH, Bosworth K, Hawkins RP, Boberg EW, Bricker E. CHES: A computer-based system for providing information referrals, decision support and social support to people facing medical and other health-related crises. Proc 16th Ann Symp Comput Appl Med Care. 1993;161-165



Privacy and Confidentiality

- Information Privacy is the patient's right to control the use and dissemination of information that relates to them.
- Confidentiality is a tool for protecting the patients' privacy.
- In 1998 the Notice of the Proposed Rule from the **Department of Health and Human Services** concerning Security and Electronic Signature Standards was introduced (U.S. Department of Health and Human Services 1999) as part of the **Health Insurance Portability and Accountability Act (HIPAA)** that was passed in 1996.



Privacy and Confidentiality

- This Proposed Rule became law in 2000 in the United States and proposes standards for the security of individual health information and electronic signature use for health care providers, systems and agencies.
- These standards refer to the **security of all electronic health information** and have a great impact on the design and operation of e-health applications.



Sustainability of Virtual Community

- The challenges for the **sustainability** of this virtual community for breast cancer patients are the
 - creation of a virtual environment that will facilitate communication using appropriate interaction channels and addressing breast cancer patients' needs, and the establishment of **accessibility and authentication structures that enhance the sense of trust** among the members of the virtual community.



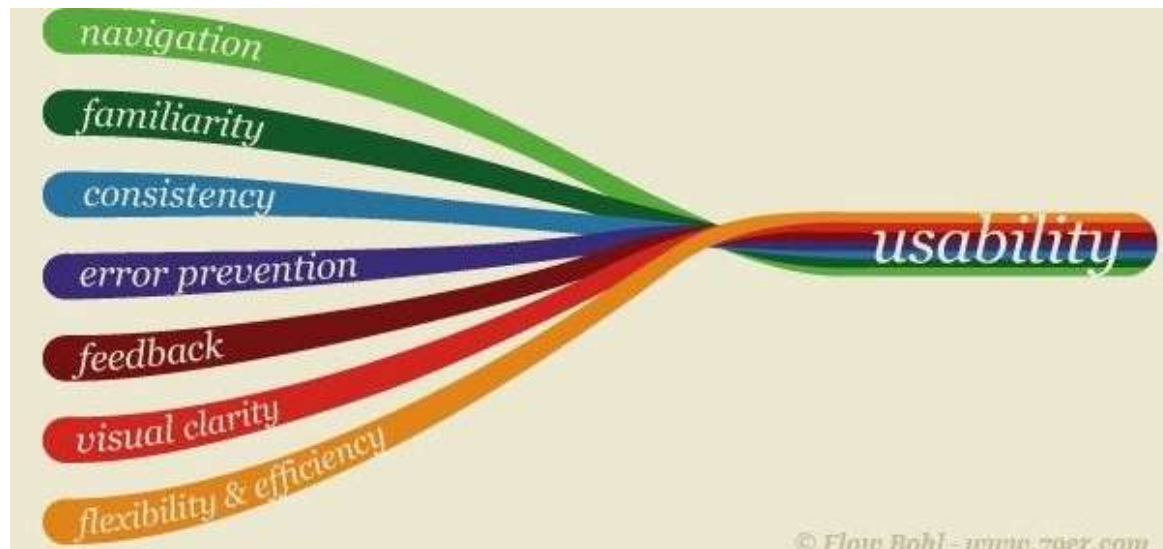
Sociability and Usability

- These two concepts that link knowledge about human behavior with appropriate planning and design of online communities.
- Sociability refers to the Collective purpose of a community, The goals and roles of its members, and Policies and rules defined to foster social interaction.



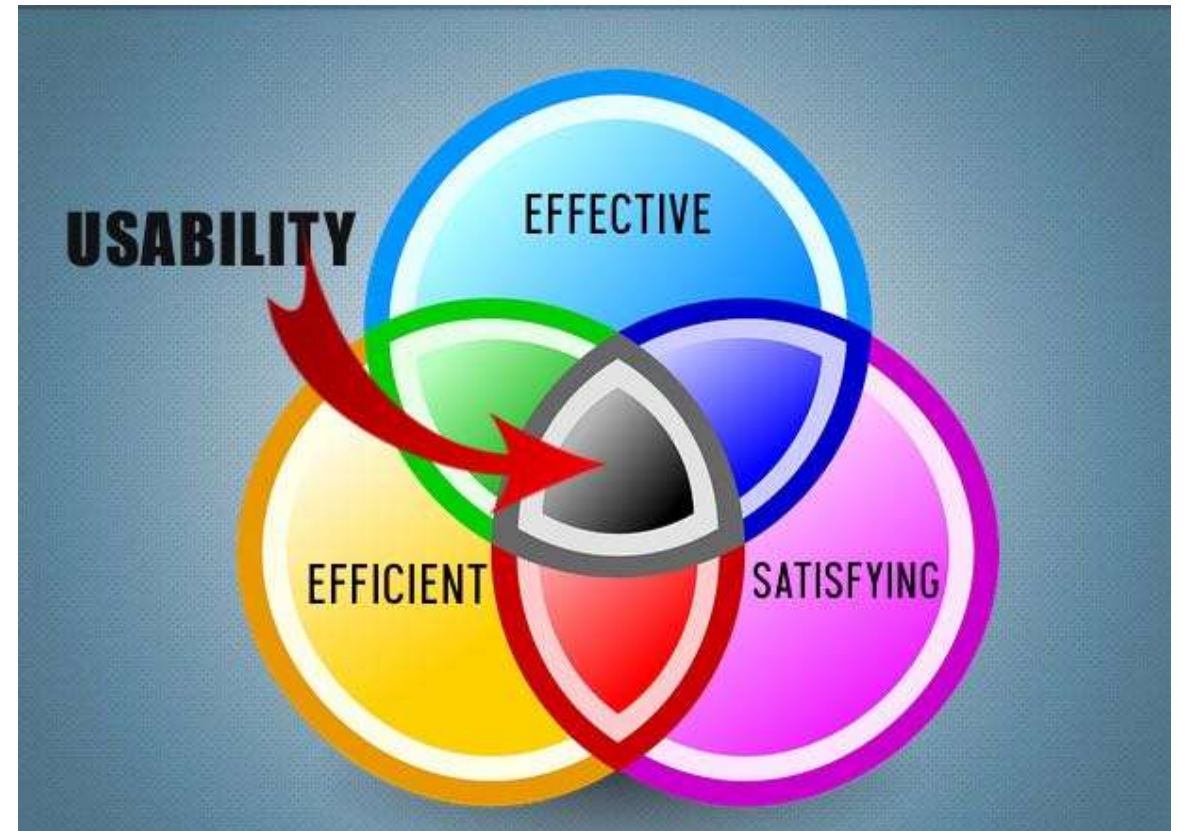
Sociability and Usability

- **Usability** in general refers to the **accessibility of the design and the specifics of an interface that lead to rapid learning, increased skill retention and minimizing error rates.**
- **a usable virtual community** is one where members are able to **communicate** with each other, **find information**, and **navigate the community software with ease.**



Sociability and Usability

Both **usability** and **sociability** will determine **the feasibility** and overall success of the virtual community and can be the object of both a formative and summative evaluation.



Ethical considerations

- The first challenge relates to participation of health care providers and **the issue of licensing.**
- Medicine is practiced at the location where the patient is.
- This issue has often been encountered with telemedicine applications that utilize videoconferencing systems.
- In these cases, **physicians have to be licensed to practice medicine in the state where the patient is at, during the teleconsultation.**



Ethical considerations

- A further concern is the so-called “**progressive dehumanization**” of interpersonal relationships, namely the conduct of not only professional but also personal interactions online or via communication technologies with a decreasing number of face-to-face interactions.



Evidence Based Telemedicine

The most common TM activities are:

1. Consultations or second opinions.
2. Diagnostic test interpretation.
3. Chronic disease management.
4. Post-hospitalization or postoperative follow-ups
5. Emergency room triage.
6. Virtual “visits” by a specialist.



The Current State Of Telehealth Evidence: A Rapid Review

Key findings of included systematic reviews and meta-analyses of telehealth, by clinical area

Clinical area	Equivalence to in-person care
Telemental health	Generally equivalent to in-person care for a variety of mental health conditions
Telerehabilitation	Generally equivalent to or yields better outcomes than in-person care
Teledermatology	Diagnosis and treatment concordance ranges from “acceptable”/ “good” to equivalent compared to in-person care
Teleconsultation	Potential alternative to in-person care, but equivalence is unclear as teleconsultation encompasses widely varied conditions

The Current State Of Telehealth Evidence: A Rapid Review

- Telehealth for nutrition management in older adults living at home was likely to **yield clinical improvements compared to usual care**.
- Telehealth was **effective** for diagnosing diabetic foot ulcers.
- Teledermatology: management, they reported **equivalent overall accuracy** between teledermatology and in-person dermatology.



Erin Shigekawa, Margaret Fix, Garen Corbett, Dylan H. Roby, and Janet Coffman, [Health Affairs](#), 2018 Dec;37(12):1975-1982, DOI: [10.1377/hlthaff.2018.05132](https://doi.org/10.1377/hlthaff.2018.05132)

Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews

- **58 systematic reviews:**
 - Organization of these results by **clinical focus areas** (a hybrid of conditions, body systems, and type of health care),
and
 - Developed an approach to assessing the volume of the literature in terms of number of unique studies and the number of patients in these studies.



Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews

- **58 systematic reviews:**
 - *We also weighted the conclusion (i.e., whether the systematic review concluded that telehealth provided a benefit) in order to provide a relative estimate of the benefit across clinical areas.*



Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews

- **Sufficient evidence** to support the effectiveness of **telehealth** for specific uses with some types of patients, including:
 - **Remote patient monitoring** for patients with chronic conditions
 - **Communication and counseling** for patients with chronic conditions
 - **Psychotherapy** as part of behavioral health.



The research focus should shift to **how to promote broader implementation and address barriers**.

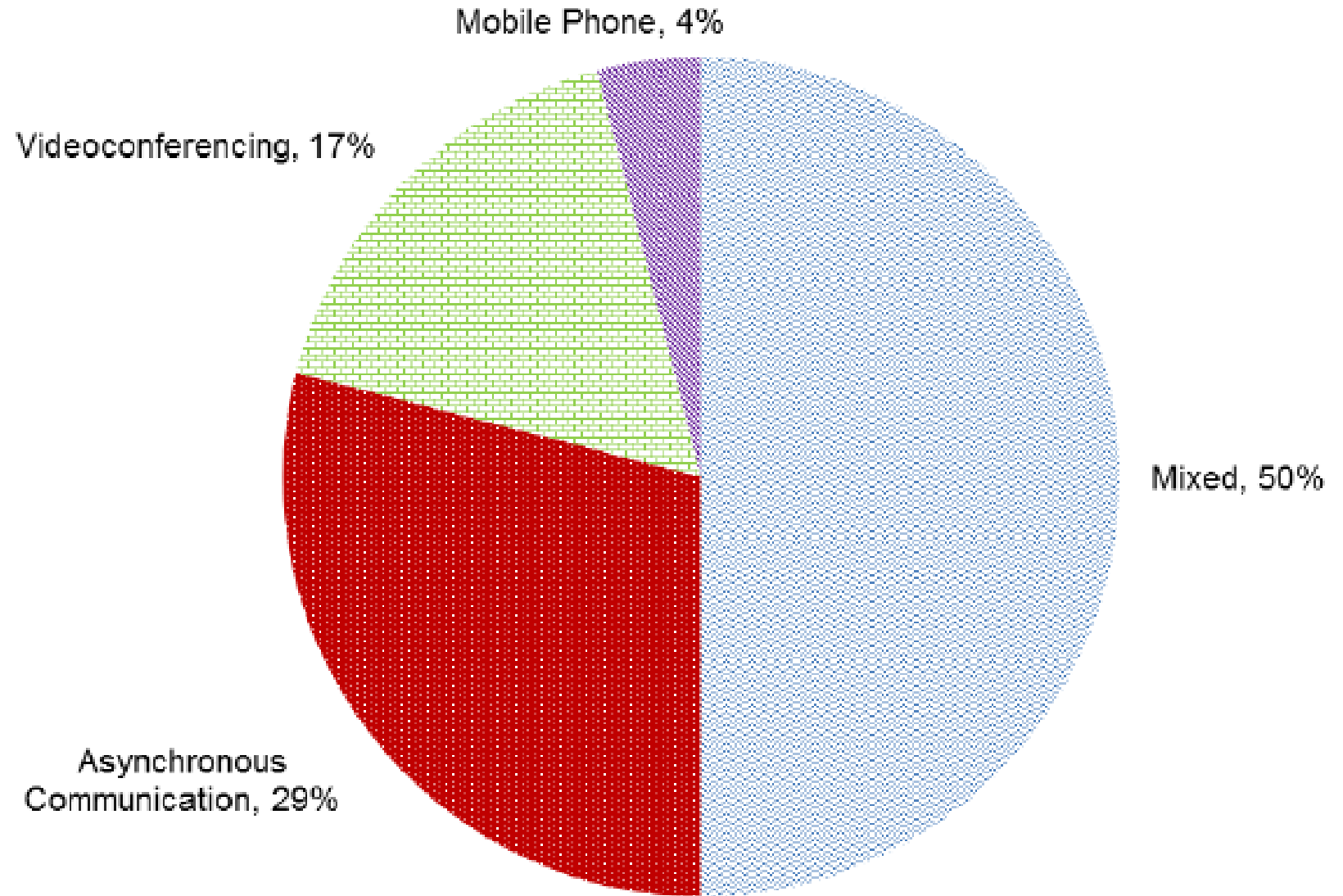
Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews

Additional systematic reviews may be helpful for some topics:

- Consultation and maternal and child health, where primary studies are available but these have not been synthesized.
- For other uses, such as triage for urgent care, telehealth is cited as offering value but limited primary evidence was identified, suggesting **more studies are needed**.
- **Future research also should assess the use and impact of telehealth in new health care organizational and payment models.**

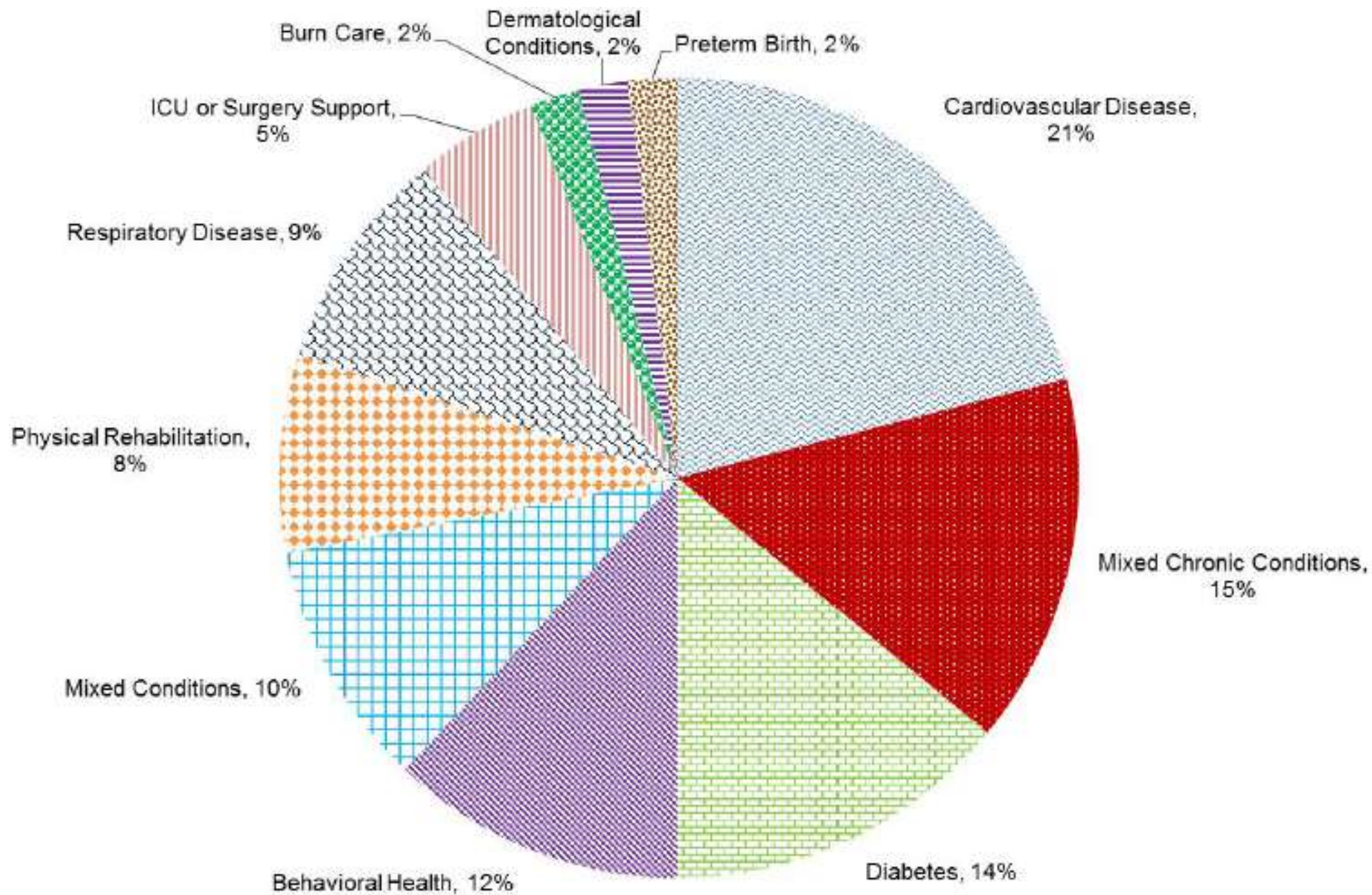


Distribution of Telehealth Modalities in this systematic Review

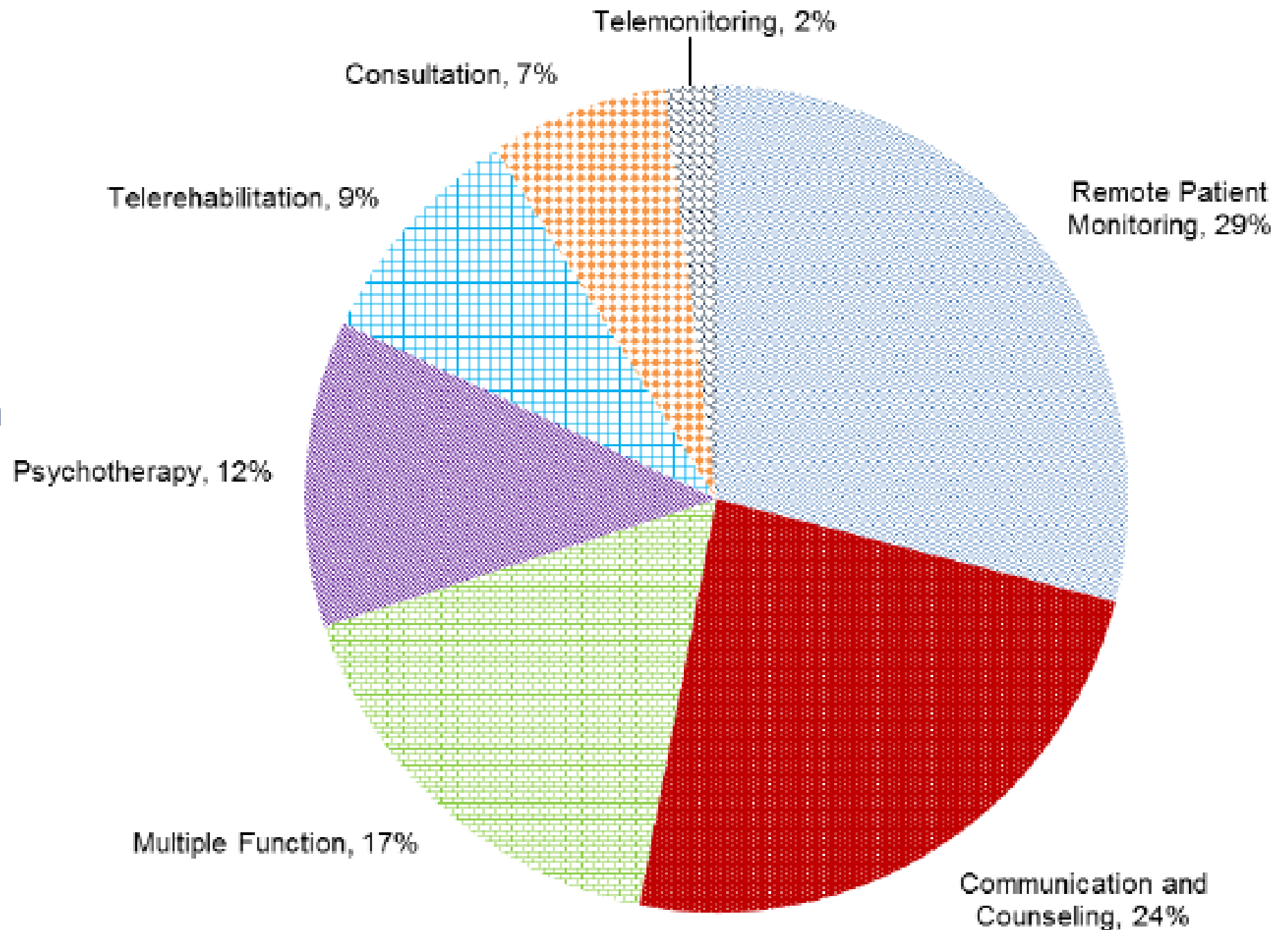


Totten AM, Womack DM, Eden KB, et al. Telehealth: Mapping the Evidence for Patient Outcomes From Systematic Reviews [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2016 Jun. (Technical Briefs, No. 26.) Available from: <https://www.ncbi.nlm.nih.gov/books/NBK379320/>

**Distribution of
clinical focus
across included
systematic
reviews**



**Distribution of
telehealth function
across included
systematic reviews**

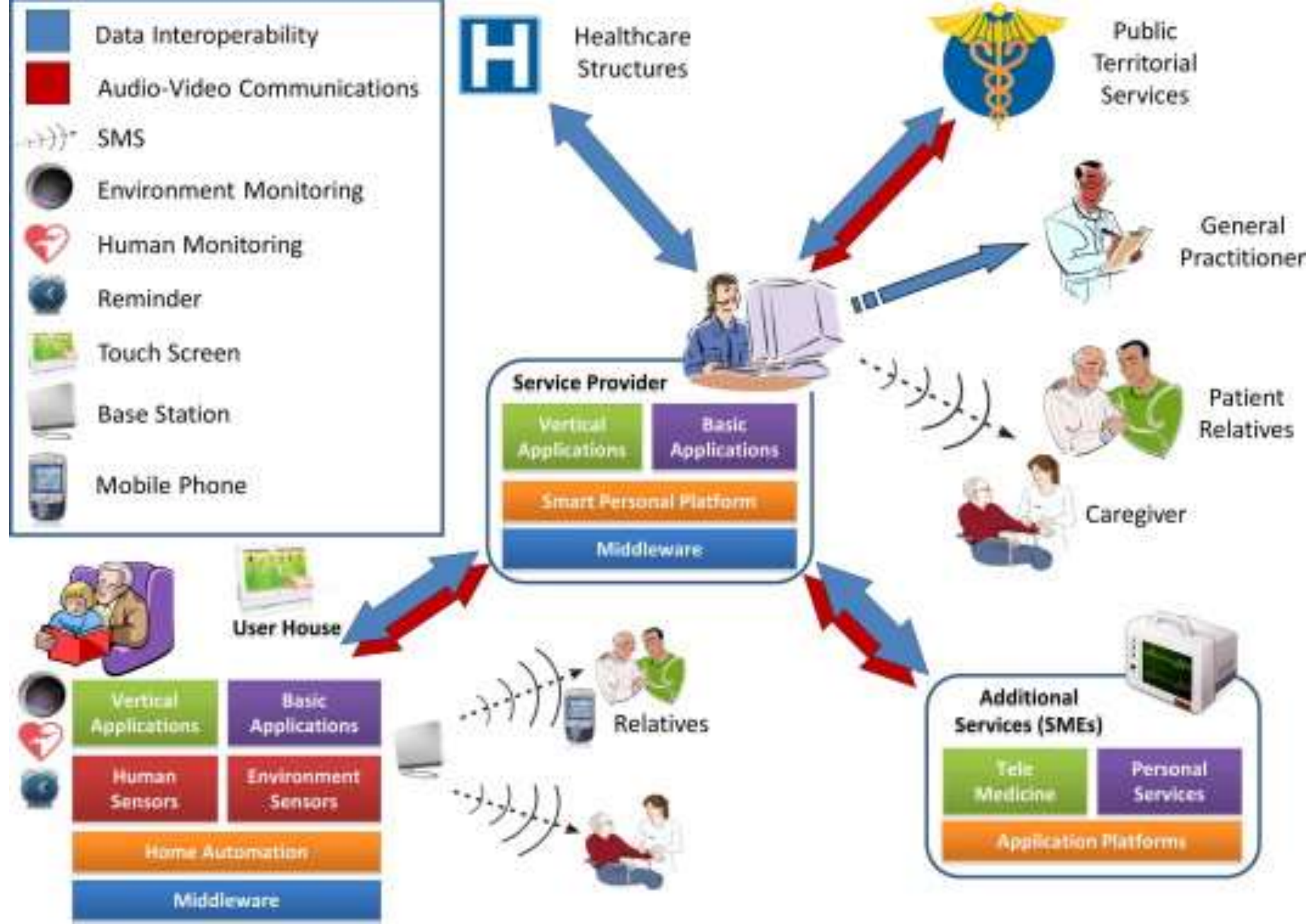


Telehealth

- **Remote monitoring in Heart Failure**
 - Improves mortality and quality of life
 - Reduces hospitalizations and,
 - as a consequence, health care costs.

- Conway A, Inglis SC, Chang AM, et al. **Not all systematic reviews are systematic: a meta-review of the quality of systematic reviews for non-invasive remote monitoring in heart failure.** J Telemed Telecare. 2013 Sep;19(6):326-37. doi: <http://dx.doi.org/10.1177/1357633X13503427>. PMID: 24163297.





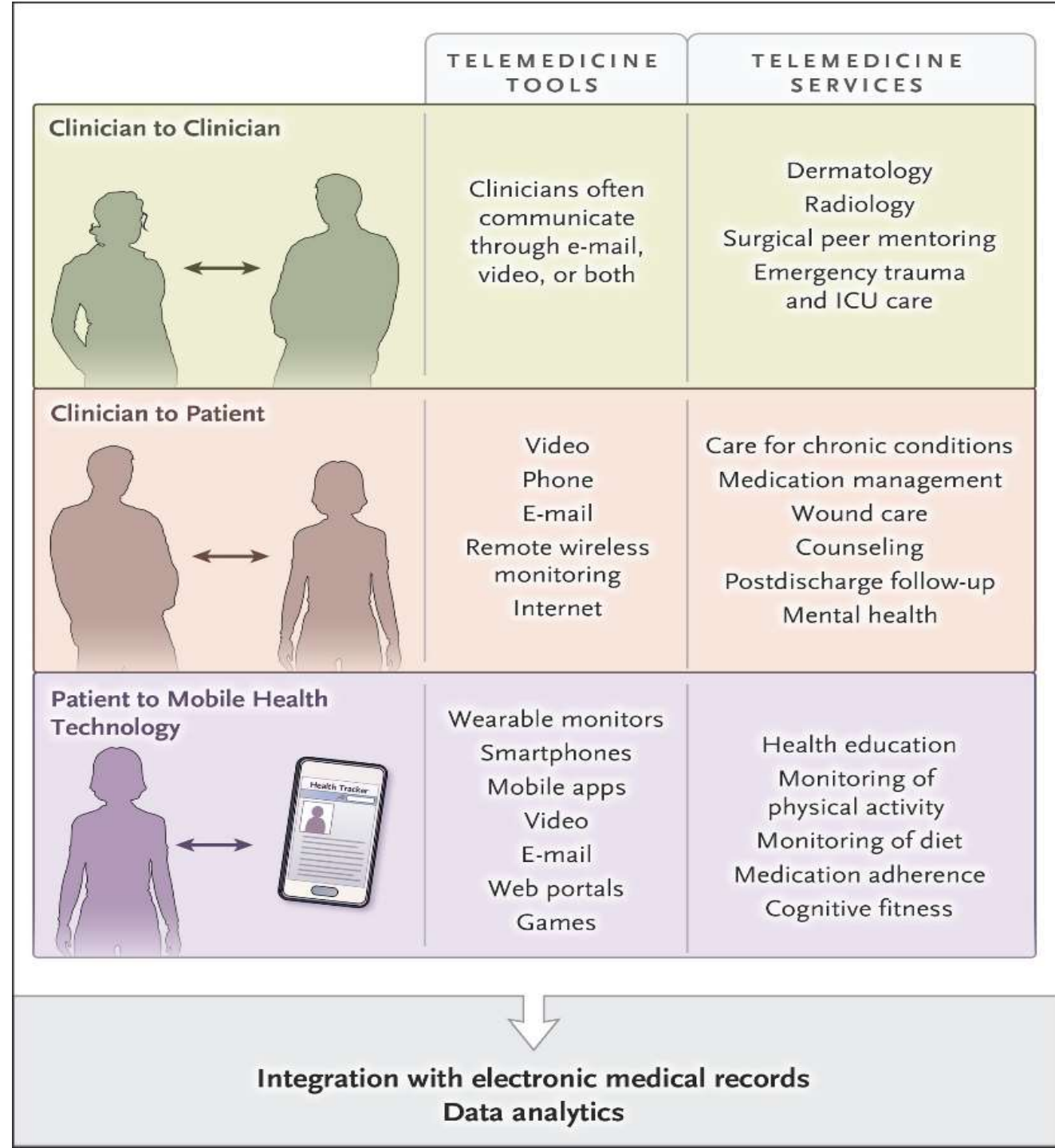
The Current State Of Telehealth Evidence: A Rapid Review

- **Twenty systematic reviews** and associated meta-analyses are included in this review, covering clinical areas such as mental health and rehabilitation.
- **Broadly, telehealth interventions appear generally equivalent to in-person care.**



Telehealth

Tuckson RV, Edmunds M, Hodgkins ML.
Telehealth. N Engl J Med. 2017 Oct 19;377(16):1585-1592.
doi: 10.1056/NEJMsrr1503323. PMID: 29045204.



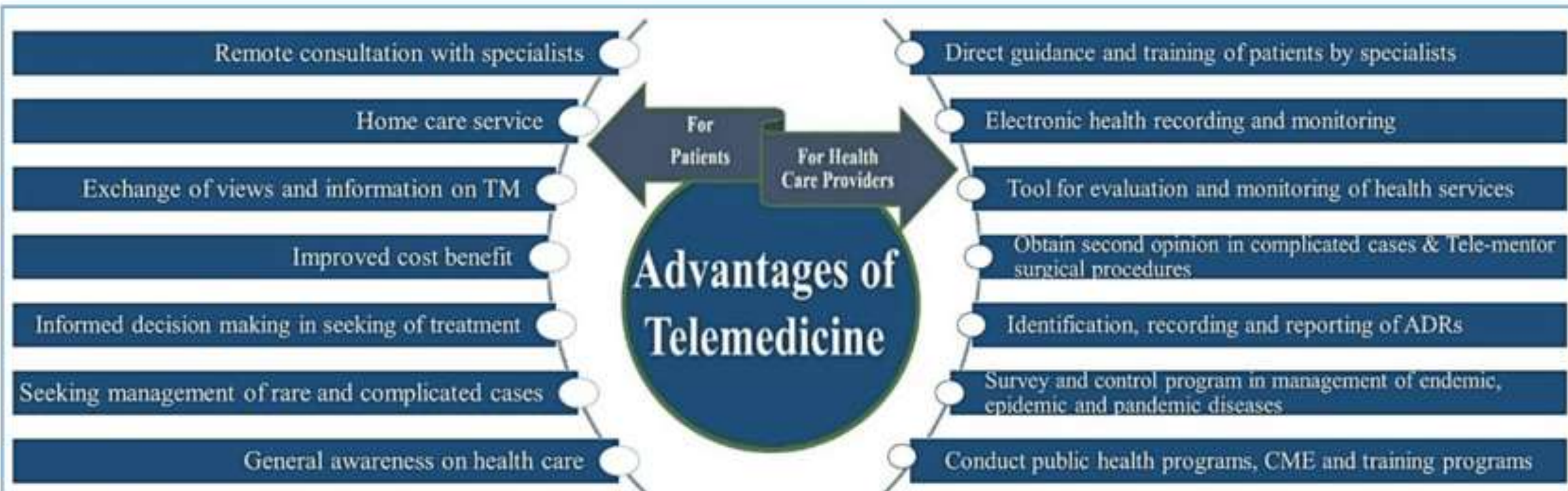
Telehealth

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Telehealth. N Engl J Med. 2017 Oct 19;377(16):1585-1592.
doi: 10.1056/NEJMsrr1503323. PMID: 29045204.

Table 1. Five Key Trends That Will Influence the Growth of Telehealth Care Delivery.

Trend
Continuous innovation in the consumer technology market (e.g., with respect to applications, wearable sensors with wireless monitoring capabilities, and related digital capabilities), which will continue to attract financial capital for product development ¹²
Continuous advancement in electronic health records and clinical-decision support systems, which has the potential to better integrate telehealth services into care-delivery processes and thus make care delivery more efficient for clinicians ¹³
Projected shortages in the health professional workforce, which will increase the need to provide access to primary and specialty care for rural and underserved urban populations ¹⁴
Reorganization in the delivery and financing of medical care, as a result of private-sector initiatives and the Affordable Care Act, toward value-based reimbursement, which provides an incentive for service delivery in lower-cost care settings outside of traditional hospital facilities ¹⁵⁻¹⁷
Growth of consumerism in health care, with increasing public expectations for convenient and real-time access to health services, personal health information, prescription refills, and other health interventions in a manner similar to other sectors of the economy ¹⁸⁻²⁰

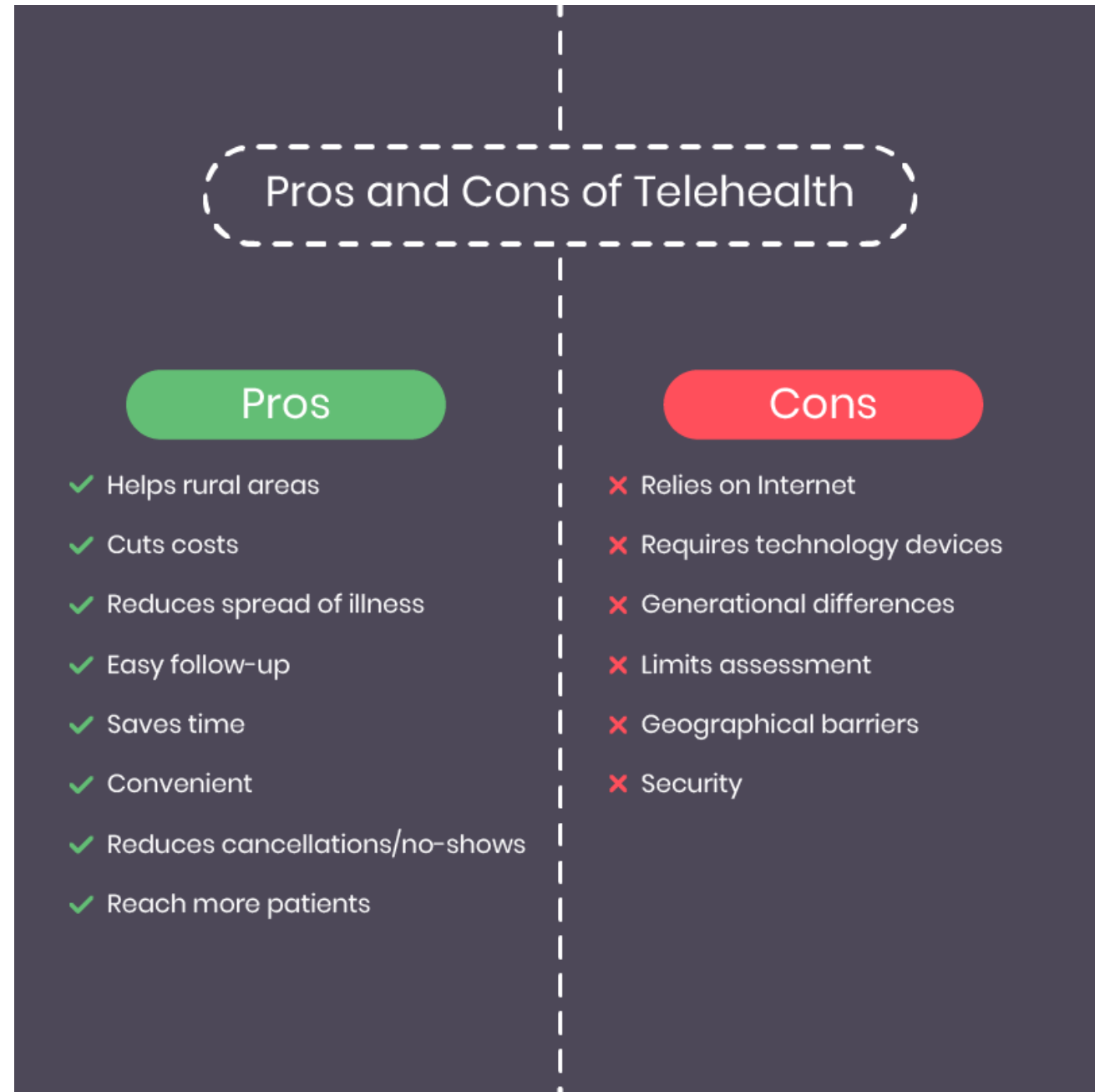
Telemedicine



Pros & Cons

- Telehealth has inherent limitations, and the rush to alternatives to in-person care could exacerbate health disparities and increase risks of compromising personal health or other information.

- 1.Siwicki B. [Survey: Americans' perceptions of telehealth in the COVID-19 era](#) . Healthcare IT News. April 3, 2020. Accessed April 19, 2020.
- 2.Ostherr K. [Telehealth overpromises during the Covid-19 pandemic](#) . StatReports. March 19, 2020. Accessed April 21, 2020.
- 3.Siwicki B. [Telemedicine during COVID-19: Benefits, limitations, burdens, adaptation](#) . Healthcare IT News. March 19, 2020. Accessed April 30, 2020

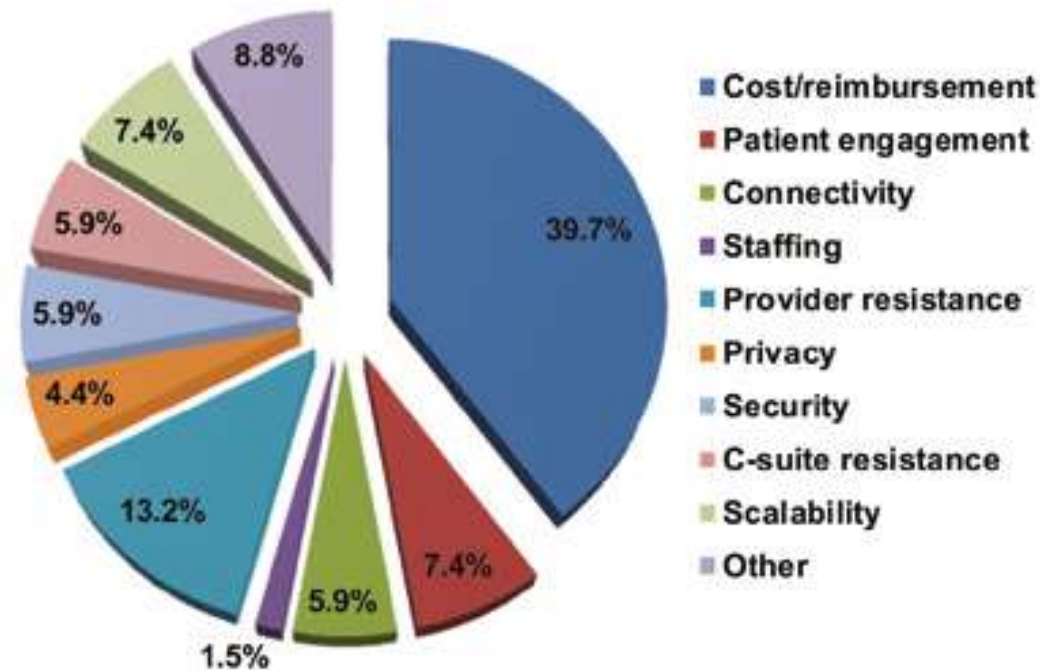


Telemedicine

Disadvantages

- Incorrect diagnoses
- Cost of hardware
- Need good telecommunication network
- Training of staff
- Medicolegal concerns- patient confidentiality

Top Barriers to Telehealth & Telemedicine Program Implementation



Source: 2015 Healthcare Benchmarks: Telehealth & Telemedicine
May 2015

Telehealth

Tuckson RV, Edmunds M, Hodgkins ML.
Telehealth. N Engl J Med. 2017 Oct 19;377(16):1585-1592.
doi: 10.1056/NEJMsrr1503323. PMID: 29045204.

Table 2. Recommendations for Telehealth Research.	
Topic	Recommendation
Physician leadership	Physicians should seek to enhance telehealth care delivery through collaborations with telehealth technology and service providers and contribute to the evidence base by comparing telehealth outcomes with usual care.
Reimbursement	Current Procedural Terminology codes should be updated to facilitate reimbursement-related research in fee-for-service settings, and the effect of alternative payment models that use bundled telehealth services should be studied to determine purchaser returns on investment.
Licensure	The necessary facilitation of interstate licensure should be supported by ongoing research regarding any quality-of-care issues that may arise.
Liability	Evidence is necessary to better understand what, if any, quality and safety risks may differentiate telehealth service delivery from traditional in-person care.
Human factors	Research on user-centered design is needed to facilitate the integration of telehealth into clinical workflows and to optimize patient engagement.
Device interoperability and data integration	Evidence-based best practices and standards that support the most effective integration of devices and data streams from clinician and patient telehealth engagement should be widely shared.
Privacy and security	Standardized guidelines are necessary and should be based on evidence and best practices to support appropriate safeguards and regulatory oversight.
Performance measurement	Enhanced evidence is required to address gaps in existing telehealth-related clinical performance measures and enhance those currently available.
Patient engagement and the evolving patient–physician relationship	Evidence-based guidance is needed to support health professional counseling and engagement with patients and caregivers across the full spectrum of telehealth services and technologies.
Research design and methods	Telehealth research in real-world settings requires alternative research designs, new research methods, and innovative analytic techniques that supplement traditional randomized, controlled trials and should be supported with enhanced funding and an expanded workforce.

Telehealth

- **Physician Leadership**

Physicians define care culture and, as such, require confidence in the care standards regarding settings, appropriateness criteria, and reliability for the deployment, or not, of telehealth tools in diagnosis and therapeutic interventions.



Telehealth

- **Physician Leadership**
- the American Medical Association (AMA) Council on Ethical and Judicial Affairs: “physicians collectively should advocate for access to telehealth and telemedicine services for all patients who could benefit from receiving care electronically.



Telehealth

REIMBURSEMENT

- a key determinant in the use of clinical interventions.
- The movement toward value-based reimbursement that provides incentives for care delivery in the lowest-cost care settings, the identification of and interaction with high-risk persons before disease onset, and the efficient use of integrated care teams all provide incentives for telehealth growth.



Telehealth

REIMBURSEMENT

- Currently, **gaps** in the Current Procedural Terminology (CPT) codes that document telehealth encounters frustrate **payment for services such as remote monitoring of patients and the use of online services for patient care.**
- In 2015, the CPT Editorial Panel of the AMA, which oversees maintenance of the CPT code set, formed a workgroup to support the integration of emerging telehealth services into clinical practice with new coding solutions.



Telehealth

LICENSURE

- Multistate licensing of physicians (in US: Interstate Medical Licensure Compact (IMLC))

Federation of State Medical Boards. Understanding the Medical Licensure Compact. Euless, TX: FSMB, 2013 (<http://www.fsmb.org/policy/advocacy-policy/interstate-model-proposed-medical-lic.Opens in new tab>). [Google Scholar](#)

Currently, 21 state legislatures have enacted the compact into state law, thereby enabling their participation in the IMLC

Research is needed to better understand the relationship between facilitating interstate licensure and quality-of-care outcomes to protect against any adverse consequences.



Telehealth

LIABILITY

- The results of a recent AMA survey indicated that **liability coverage was a “must-have” for physician adoption of digital tools such as telehealth.**
 - Digital Health Study: physicians’ motivations and requirements for adopting digital clinical tools. Chicago: American Medical Association, 2016
 - (<https://www.ama-assn.org/sites/default/files/media-browser/specialty%20group/washington/ama-digital-health-report923.pdf>. opens in new tab).



Telehealth

LIABILITY

- The Physician Insurers Association of America (PIAA), the trade association representing the medical and health care professional liability insurance industry, reports that there is not a “typical” liability insurer for telehealth.
 - There is a need for new knowledge to understand the distinctions, if any, in the quality and safety risks that differentiate telehealth service delivery from traditional in-person care.



Telehealth

HUMAN FACTORS

- Important lessons for telehealth integration can be learned from the implementation of electronic health records (EHRs), particularly the importance of usability design and clinician training to enhance productivity, quality, and safety.
- Middleton B, Bloomrosen M, Dente MA, et al. Enhancing patient safety and quality of care by improving the usability of electronic health record systems: recommendations from AMIA. J Am Med Inform Assoc 2013;20:(e1):e2-e8
 - Agboola SO, Bates DW, Kvedar JC. Digital health and patient safety. JAMA 2016;315:1697-1698



Telehealth

- User-centered design that facilitates the integration of telehealth into workflows and clinical routines is **essential**, especially with respect to **remote physical examination**.

Parmanto B, Lewis AN Jr, Graham KM, Bertolet MH. Development of the Telehealth Usability Questionnaire (TUQ). Int J Telerehabil 2016;8:3-10



Telehealth

- **Ease of use** is equally important for consumers of telehealth interventions.
- For example, a recent study involving **multiple smartphone-enabled sensors required patients to set up** and log into a third-party portal.
- **One of three participants** submitted help-desk requests, which suggests that the system was not consumer-friendly and was unnecessarily burdensome.



Bloss CS, Wineinger NE, Peters M, et al. **A prospective randomized trial examining health care utilization in individuals using multiple smartphone-enabled biosensors.** PeerJ 2016;4:e1554-e1554

Telehealth

DEVICE INTEROPERABILITY AND DATA INTEGRATION

- Devices remain suboptimally integrated; for example, **most EHR systems are unable to integrate patient-generated data from remote self-monitoring devices.**
- This issue is especially important given the need to find solutions to the tsunami of patient-generated data that, if not coordinated and made actionable, threatens to overwhelm clinicians.
- Letter to Senators Hatch, Isakson, Wyden, and Warner from the American Telemedicine Association et al. **June 22, 2015** (<https://higherlogicdownload.s3.amazonaws.com/AMERICANTELEMED/3c09839a-fffd-46f7-916c-692c11d78933/UploadedImages/Policy/multistakeholder-letter-to-senate-finance-chronic-care-work-group.pdf>. opens in new tab).
- Edmunds M, Peddicord D, Frisse ME. Ten reasons interoperability is difficult in Weaver CA. In: Ball MJ, Kim GR, Kiel JM, eds. Healthcare information management systems: cases, strategies, and solutions. 4th ed. New York: Springer, 2016:127-138.



Telehealth

DEVICE INTEROPERABILITY AND DATA INTEGRATION

- To address this challenge, **the American Telemedicine Association (ATA)** and other industry groups have advocated for EHRs to begin to **incorporate patient-generated data from remote-monitoring apps and devices.**
- Letter from Jonathan D. Linkous, CEO, American Telemedicine Association, to the Office of the National Coordinator for Health IT re: Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, 2014 Edition; Revisions to the Permanent Certification Program for Health Information Technology. May 7, 2012 (http://higherlogicdownload.s3.amazonaws.com/AMERICANTELEMED/3c09839a-fffd-46f7-916c-692c11d78933/UploadedImages/Policy/ATA_Comments_on_ONC_Std_and_Cert_NPRM.pdf . opens in new tab).



Telehealth

- One promising approach is shown by the SMART Health IT platform, in which standards-based, open-source application programming interfaces (APIs) such as Fast Healthcare Interoperability Resources (FHIR) allow clinical apps to run across health systems and integrate with EHRs.

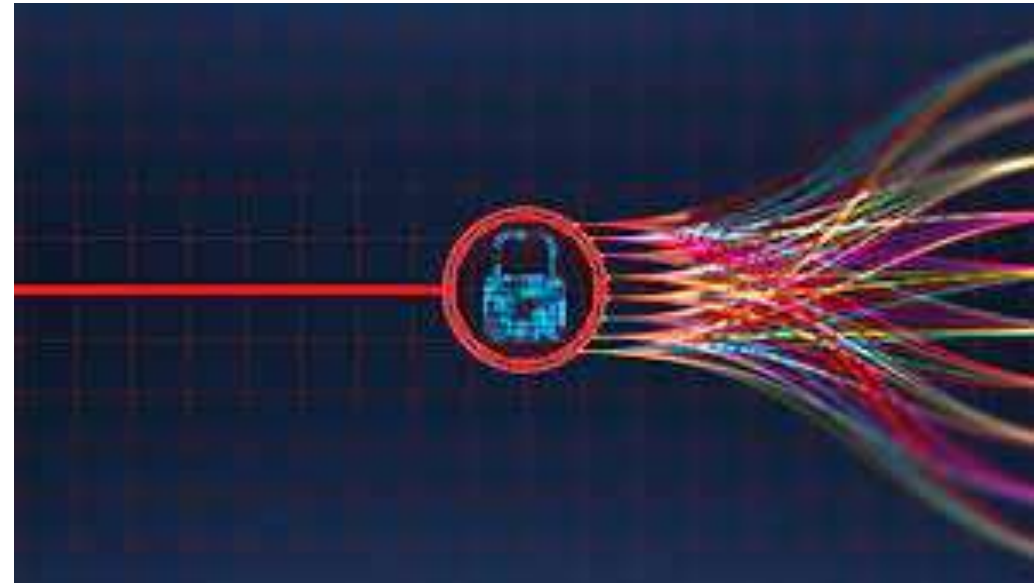


- SMART Health IT Project. SMART — an app platform for healthcare (<http://smarthealthit.org>. opens in new tab).

Telehealth

PRIVACY AND SECURITY

- Currently, federal and state guidelines for telehealth security and privacy are not standardized, leaving considerable gaps.
- Luxton DD, Kayl RA, Mishkind MC. mHealth data security: the need for HIPAA-compliant standardization. Telemed J E Health 2012;18:284-288



Telehealth

PRIVACY AND SECURITY

- Several medical specialty societies have suggested administrative, physical, and technical safeguards to enhance security.

- LeRouge C, Garfield MJ. Crossing the telemedicine chasm: have the U.S. barriers to widespread adoption of telemedicine been significantly reduced? Int J Environ Res Public Health 2013;10:6472-6484
- Daniel H, Sulmasy LS. Policy recommendations to guide the use of telemedicine in primary care settings: an American College of Physicians position paper. Ann Intern Med 2015;163:787-789
 - American Academy of Dermatology. Position statement on teledermatology. March 7, 2016 (<http://www.aad.org/Forms/Policies/Uploads/PS/PS-Teledermatology.pdf>. opens in new tab).
- ACR–AAPM–SIIM practice parameter for electronic medical information privacy and security. 2014 (<http://www.acr.org/~media/419A8512DBDB4FDE99EC75B3C68B01CF.pdf>. opens in new tab).



Telehealth

PERFORMANCE MEASUREMENT

- Vital Directions for Health and Health Care initiative of the [National Academy of Medicine](#), a health system that performs optimally must be able to address the demands for **accountability and information on the quality, cost-effectiveness, and patient satisfaction of system performance.**

- Dzau VJ, McClellan M, McGinnis JM. Vital directions for health and healthcare: an initiative of the National Academy of Medicine. JAMA 2016;316:711-712



Telehealth

PERFORMANCE MEASUREMENT

- Several national medical specialty societies have also developed or will be developing clinical guidelines and position statements addressing telehealth.
- **American Academy of Dermatology. Position statement on teledermatology. March 7, 2016**
(<http://www.aad.org/Forms/Policies/Uploads/PS/PS-Teledermatology.pdf>.
[opens in new tab](#)).
- Silva E III, Breslau J, Barr RM, et al. ACR **white paper on teleradiology practice: a report from the Task Force on Teleradiology Practice.** J Am Coll Radiol 2013;10:575-585



Telehealth

PATIENT ENGAGEMENT AND THE EVOLVING PATIENT–PHYSICIAN RELATIONSHIP

- **The relationship between patients and physicians** will inevitably be affected by patients' use of the new sources of clinical information and guidance, as they engage in their own health management.



Telehealth

PATIENT ENGAGEMENT AND THE EVOLVING PATIENT–PHYSICIAN RELATIONSHIP

- Clinicians will be especially challenged in assisting their patients in the use of consumer-directed health apps.
 - For example, a recent Commonwealth Fund report stated that although mobile applications are a “potentially promising tool for engaging patients in their health care,” **only about 43 percent of iOS apps and 27 percent of Android apps appeared likely to be useful.**

- Singh K, Drouin LP, Newmark LP, et al. Developing a framework for evaluating the patient engagement, quality, and safety of mobile health applications. New York: The Commonwealth Fund, February 2016
(http://www.commonwealthfund.org/~media/files/publications/issue-brief/2016/feb/1863_singh_framework_evaluating_mobile_health_apps_ib_v2.pdf. opens in new tab).



Future Research

Personalized telehealth in the future

- A telehealth research network recently published a 12-point global research agenda for telehealth, in which they assert the need to

“incorporate health care parameters across mediated and traditional modes of care for the benefit of providers, companies, policymakers, and the international research community.”



Telephone Consultation

- There is a *lack of high level evidence* for telephone consultations in a GP setting; however, current evidence suggests that **telephone consultations as an alternative to face-to-face general practice consultations** offers an

appropriate option in certain settings.



Telephone Consultation

- A new telephone consultation service to support prenatal and postnatal health care and childcare.
- This study provided the first evidence of satisfaction with telephone or social networking consultation service by nurse specialists in Japan.



Telephone Consultation

- Telephone consultation is a **cost-effective alternative** to face-to-face consultation for the routine outpatient follow-up of children and adolescents with **IBD**.

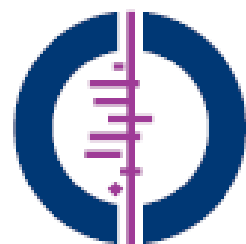


Telephone Consultation as a Substitute for Routine Out-patient Face-to-face Consultation for Children With Inflammatory Bowel Disease: Randomised Controlled Trial and Economic Evaluation, Anthony K. Akobeng, Neil O'Learyd, Andy Vail d, Nailah Brownb, Dono Widiatmoko e, Andrew Fagbemi b, Adrian G. Thomas, EBioMedicine 2 (2015) 1251–1256

Telephone Consultation

- The frequency of telephone consultations and families' evaluations of them in a paediatric outpatient clinic during the initial weeks of the COVID-19 pandemic lockdown.
- A total of 103 families participated in a telephone interview
- A total of 100 (97.0%) of the families agreed or strongly agreed that they felt good about being offered a substitute telephone consultation





Cochrane
Library

Cochrane Database of Systematic Reviews

Training interventions for improving telephone consultation skills in clinicians (Review)

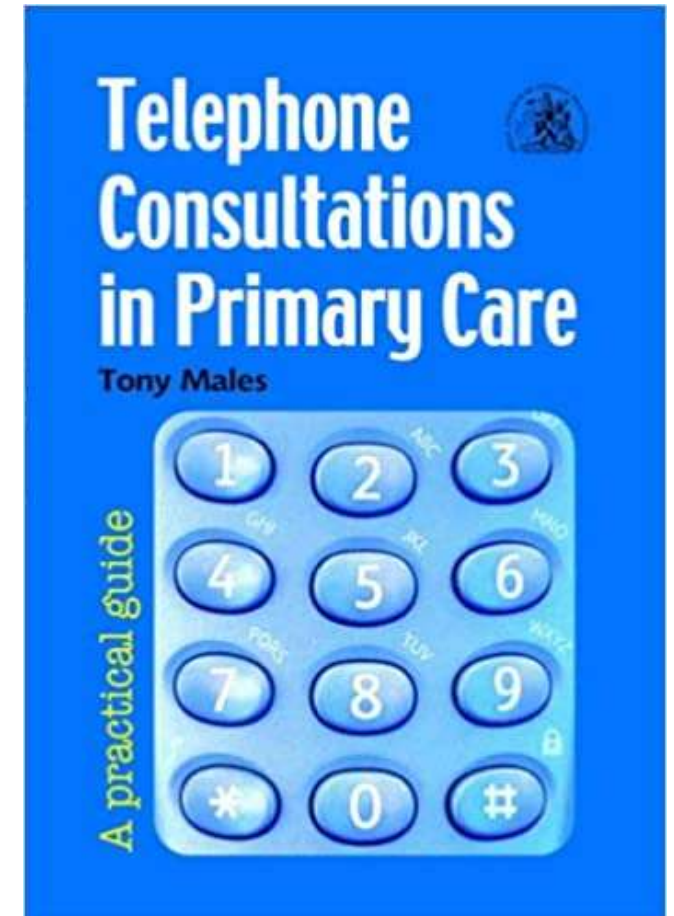
Vaona A, Pappas Y, Grewal RS, Ajaz M, Majeed A, Car J

Training interventions for improving telephone consultation skills in clinicians

- Nowadays, up to a quarter of all care consultations are conducted by Telephone.
 - Studies have quantified the impact of medical telephone consultation on clinicians' workload and detected the need for quality improvement.

- **Objectives**

To assess the effects of training interventions for clinicians' telephone consultation skills and patient outcomes.



Training interventions for improving telephone consultation skills in clinicians

- **Telephone consultation** skills are **part of a wider set of remote consulting skills** whose importance is growing as more and more medical care is delivered from a distance with the support of information technology.



Training interventions for improving telephone consultation and triage skills in clinicians

- There is an urgent need for more research assessing the effect of different training interventions on clinicians' telephone consultation skills and their effect on patient outcomes.



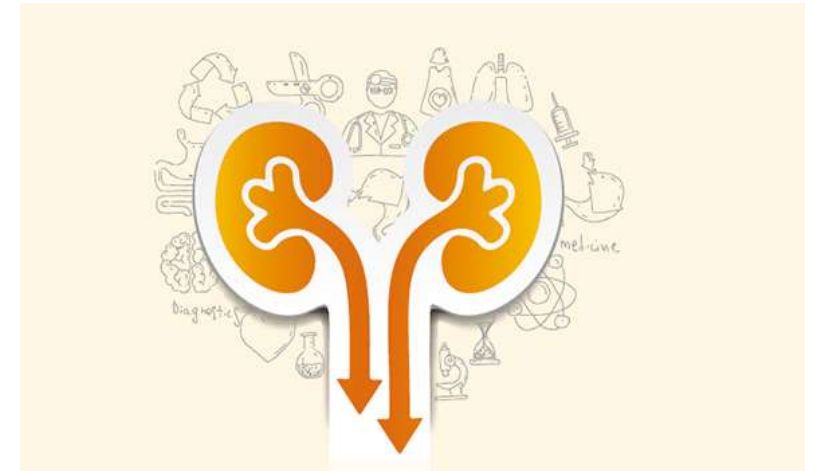
Telephone Consultation

- Consultations and prescriptions through mobile phones are extremely frequent in pediatric practices, even when restricted by responsible authorities.
- Our results highlight the **frequency of medical prescription errors** and the **need for corrective interventions by pharmacists**.



Telephone Consultation

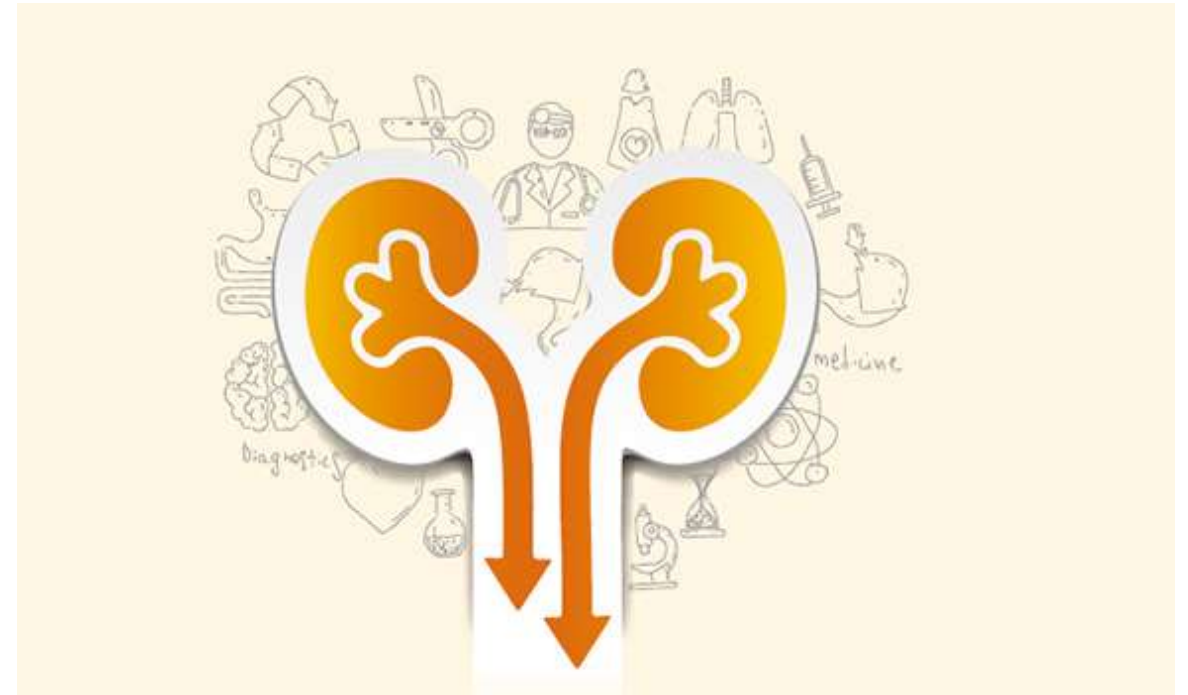
- **The follow-up of renal transplant recipients by telephone consultation: three years experience from a single UK renal unit**



Telephone Consultation

High quality healthcare should be

- safe,
- timely,
- effective,
- efficient,
- equitable,
- patient-centred
- sustainable.



Andrew Connor, Frances Mortimer and Robert HigginsDOI:
<https://doi.org/10.7861/clinmedicine.11-3-242> Clin Med June 2011

Telephone Consultation

The benefits of telephone consulting:

- **Patient-centred, convenient care**

This study showed that patients prefer to ring the clinic than be rung, as this negates the need to advise where they will be in advance. The financial cost of their call is usually more than offset by savings in fuel costs and parking.

- **Safe Care:** This study therefore suggests that the **increased communication afforded by more frequent contact** may be the determinant of the underlying health benefits of telephone care.



Telephone Consultation

- **Sustainable care**

The reduction in greenhouse gas emissions associated with the UHCW telephone clinic model was therefore examined.

Data were collected prospectively from **30 patients** attending two consecutive telephone clinics.

It was assumed that, had patients attended a face-to-face clinic, they would have travelled from, and returned to, their homes.

Each patient's return journey length was calculated from their postcode using Google Maps. **Had these patients attended clinic, they would have travelled a total of 1180.10 km (mean 39.34 km, range 1.76–241.26 km), with only 64.74 km (5.8%) undertaken by public transport.**



Telephone Consultation

- The greenhouse gas emissions arising from each patient's travel were calculated using DEFRA conversion factors specific to the transport modality that they would use to attend their local clinic.
- A mean value of 8.05 kg carbon dioxide equivalents (kgCO_2eq) was identified.
- The annual 350 telephone consultations therefore result in an estimated reduction in greenhouse gas emissions of 2,818 kgCO_2eq .



Telephone Consultation

Potential disadvantages and barriers

- Telephone consultation is not appropriate when formal physical examination is a likely necessity.

Its role is primarily in the management of established chronic disease, rather than where diagnostic evaluation is required.

- Even during follow-up, one clear drawback of telephone consulting remains the loss of visual clues to a patient's well-being.
- A thorough history is therefore important and familiarity with the patient must not be considered a substitute for this.



Telephone Consultation

- **Potential disadvantages and barriers**

Cultural barriers, as well as
logistical and
administrative challenges,
may present potential barriers to
effective implementation of
telephone services.



Telephone Consultation

- Experience suggests that, implemented appropriately, the use of **telephone consulting** for the **follow-up of renal transplant recipients** is **safe**, **empowers patients**, **improves access to healthcare** and confers **environmental benefits**.



Telephone Consultation

PRO'S	CON'S
It's quicker	Interruptions can occur
It's cheaper	You can't read body language
It's easier	Less effort on candidate's behalf
You can assess communications	The signal could be faulty
You can reach long-distance candidates	Locations could be disruptive
You can cull weak candidates pre-interview	It'll probably be scheduled out of working hours
	It's difficult to build rapport

Telephone triage

- Telephone triage requires the **ability to listen, assimilate, collate and prioritise many pieces of information.**
- It involves common sense mixed with the ability to think on your feet.

Active listening therefore requires:

- Full concentration.
- Listening to how something is said.
- Absorbing and interpreting non-verbal clues.



Telephone triage

- **Listen to the Entire History Before Triageing**
- **Techniques For Better Telephone Triage**
 - Smile and have a friendly voice when talking with the patient.
 - Believe it or not, people can tell when you're smiling over the phone!
 - Show empathy. Your goal is to gain the callers trust. You need to remain friendly but stay professional and encouraging.



Telephone triage

- Be calm and confident.

Most callers are scared, so it is important that you remain calm as you listen intently to their concerns and keep confident as you help them through their situation.

- Believe in yourself, your ability, and your knowledge.
- To sound confident to the caller, you want to avoid weak phrases such as “I think”, “Maybe”, or “I’m not sure”.
- Instead, when faced with a question you don’t know the answer to, say “Let me check into that for you.”



Telephone triage

Practice the three types of effective listening:

- Active listening,
- Reflective listening,
- Empathic listening.



Telephone triage

- **Active listening** refers to **short verbal demonstrations** that you are paying attention.
- Use words such as “Okay”, “I see”, and “Yes, I understand”.



Telephone triage

- **Reflective listening** includes paraphrasing what the caller is saying, asking clarifying questions, and encouraging the caller to speak in more detail by asking open ended questions such as
“Can you describe what happened?” Open ended questions cannot be answered with just one word; this will get the caller to better explain what is happening.



Telephone triage

- **Empathic listening** is the skill that demonstrates **attention to the emotional aspect of the patient's story**, not just the facts of the matter.



Telehealth

Effectiveness of telephone-based interventions for managing osteoarthritis and spinal pain: a systematic review and meta-analysis

- Systematic review
- Seven electronic databases from inception to May 2018. Randomised controlled trials (RCTs), cluster-RCTs, and non-randomised controlled trials were included.
- O'Brien KM, Hodder RK, Wiggers J, Williams A, Campbell E, Wolfenden L, Yoong SL, Tzelepis F, Kamper SJ, Williams CM, PeerJ 2018 Oct 30;6:e5846



Telehealth

- 23 studies with 56 trial arms and 4,994 participants
- All studies utilised telephone-based interventions.
- We are **moderately confident that telephone-based interventions reduce pain intensity and disability in patients with osteoarthritis and spinal pain compared to usual care.**



- O'Brien KM, Hodder RK, Wiggers J, Williams A, Campbell E, Wolfenden L, Yoong SL, Tzelepis F, Kamper SJ, Williams CM, PeerJ 2018 Oct 30;6:e5846

THANK
YOU