遠隔診療の有効性・安全性に関するエビデンスの収集のための研究方法に関する文献調査

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研究要旨

本研究は、国内外の先行研究から「遠隔診療」に係るエビデンスレベルの高い先行研究文献を調査し、わが国における遠隔診療の有効性・安全性に関するエビデンスの創出を促進するために、遠隔診療に係る研究デザインおよび評価指標ならびに介入条件について文献調査研究を実施した。

Pubmedから抽出した英文論文238編を調査した結果、遠隔診療が慢性疾患や精神疾患領域を対象とした疾病予防・重症化予防に対して有効であることを示した研究が見られたが、遠隔診療が対面診療よりも優れていることを統計的優位に示した研究は少なかった。また、遠隔診療の医療経済評価については患者のQoL値を改善する可能性はあるが経済的に優れているとは言えない結果であった。この理由として公的保険サービスが充足している国では医療の質が高く医療費が安価であるため、対面診療と比べてもあまり変わらない可能性が指摘されていることが明らかとなった。

調査の結果、遠隔診療の効果は受診回数や夜間休日のケア等の治療密度が向上することによる要因が大きいことが示唆された。いっぽう遠隔診療の効果が認められた領域が限定的である理由には、①遠隔診療技術自体の有効性について証明が困難である。②効果が間接的のため、Core Clinical Journal等に掲載される学術論文になりにくい等の理由が考えられる。これらは遠隔診療を「診療技術としての介入行為」、「電子カルテ等の診療基盤」のどちらとして定義するかという論点に深く関連する。

したがって遠隔診療を推進するエビデンスを把握するためには、「診療技術としての介入行為」だけでなく「電子カルテ等の診療基盤」としての評価方法も検討し、遠隔診療に関する学術論文によるエビデンスから学術団体による声明やガイドライン等へ拡大し、諸外国における遠隔診療の動向について網羅的に調査することが望ましい。

A．研究目的

1．背景

平成30年度診療報酬改定および平成30年3月30日発行のオンライン診療の適切な実施に関する指針は、遠隔診療のさらなる推進が期待される中、遠隔診療の有効性・安全性に関するエビデンスの必要性は益々高まっている。

しかしながら、遠隔診療の安全性や有効性に関するエビデンスについては十分な整理がされていない。そこで本研究は諸外国における遠隔診療に関する学術論文を中心に、遠隔診療のエビデンスの網羅的調査を実施することを目的とする。

本研究は、国内外の先行研究から今後どのようなエビデンスの蓄積が必要かを分析し、遠隔診療と親和性の高い診療領域を整理し、どのようなエビデンス蓄積が必要か分析して遠隔診療普及推進のためのロードマップを策定することである。わが国における遠隔診療の有効性・安全性に関するエビデンスの創出を促進するために、遠隔診療を対象にした先行研究に基づきアウトカム評価指標および介入条件となる遠隔診療行為・技術ならびに研究デザインについて明らかにするために、文献調査研究により網

羅的調査を行う。

2. 研究方法

本研究では既存の有効性・安全性に関するエビデンスの収集状況を調査するために、国内外の先行研究から「遠隔診療」に係るエビデンスレベルの高い文献を網羅的に調査する。

1-1）検索方法は、pubmedを用いる。

1-2)検索語はMeSHに基づき、”telemedicine””telehealth”とする。

1-3）出版時期は最新5年以内とし、英文雑誌はCore Clinical Journalsに属する学術誌に限定する。

1-4）論文種別はエビデンスレベルの高いClinical Trial 、RCT、Systematic Review・meta-analysis、観察研究を対象とする。

（倫理面への配慮）

本研究は文献研究のため倫理審査対象外である。

C．研究結果

１）結果

検索対象となった論文は238編であった。

対象とする診療領域については、慢性期疾患に関する文献は循環器系疾患や呼吸器疾患の領域に多く、急性期疾患に関する文献は脳・神経系疾患、救急系の領域に多く見られた。精神系は、認知症、PTSD、神経心理検査、うつ病、認知行動療法、アルコール依存症、自閉症等幅広い疾患を対象に遠隔診療研究が存在した。また、疾病予防・重症化予防として肥満予防や性感染症予防のほか、服薬指導や薬物中絶によって遠隔診療が用いられる研究事例も見られた。

遠隔診療の有効性を示す主な研究報告については以下を例示した。

事例1）薬剤師の管理による血圧の遠隔モニタリングは通常診療と比べて血圧コントロールを改善するか。（多施設比較試験）

事例2）脳卒中患者に対する在宅遠隔リハビリテーションの有効性に関する研究

事例3)英国における遠隔医療技術の費用対効果評価研究

事例4)うつ・不安症に対するcomputerized認知行動療法（CCBT）とInternet support group(ISG)を組み合わせたOnline Collaborative Careの有効性評価（ランダム化比較試験）

事例5）未熟児網膜症に対する遠隔スクリーニング

事例6)米国心臓協会による循環器および脳血管疾患に対するTeleHealthの実現に向けた政策提言

事例7）非急性頭痛に対する遠隔コンサルテーションの長期的有効性・安全性の評価

事例8)糖尿病治療における遠隔医療の有効性に関するMeta-analysis

D. 考察

本研究では遠隔診療と親和性の高い診療領域を整理し、今後どのような有効性・安全性に関するエビデンス蓄積が必要か分析して、遠隔診療普及推進のためのロードマップを策定するために、既存の有効性・安全性に関するエビデンスの網羅的調査を行った。研究の結果、有効性・安全性に関するエビデンスを一定程度整理することが出来た。

本研究を通じて、遠隔医療の有効性が対面診療よりも優れていることをエビデンスレベルの高い研究(RCT)で示すことができる

領域は現時点では限定的である可能性が示唆された。たとえば糖尿病治療やCOPD等の慢性疾患においては臨床的有効性を示すエビデンスレベルの高い研究成果が見られた。また、注意すべき点として、臨床的有効性について遠隔診療が通常診療よりも劣ってなかったことを示すために、非劣性マージンを設定した研究デザインである「非劣性試験」による文献は該当しなかった。論文の多くでは、「有効性がない結果」から「効果が同等である」という誤った解釈を述べている論文もあり、我が国におけるエビデンスを収集する上でも十分に注意する必要がある。学術論文ではランダム化比較試験等による臨床的有効性についてはCONSORT声明,観察研究についてはSTROBE声明に準拠することが推奨されている。しかしながら本調査に該当する学術論文の多くがこれらの声明に準拠しているとは言えない論文が含まれているため学術論文の信頼性としては十分とは言えない可能性がある。また、遠隔医療に対する医療経済評価については、公的保険サービスが充足している国では医療の質が高く医療費が安価であるため、対面診療と比べてもあまり変わらない可能性が指摘されていることが文献調査から明らかとなった。これはわが国においても当てはまる可能性が高いため、費用対効果評価についてはわが国で行われたエビデンスを蓄積する必要がある。加えてICT技術は進歩が速く関連費用が低減する可能性があるため、最新の研究成果を確認する必要がある。

遠隔診療の有効性・安全性が期待される技術や疾患が存在するにもかかわらず、文献調査による検索結果では非該当となった領域が生じた。その理由には、①遠隔診療技術自体の有効性について証明が困難である。②効果が間接的のため、Core Clinical Journal等に掲載される学術論文になりにくい等の理由が考えられる。これらは遠隔診療を「診療技術としての介入行為」あるいは「電子カルテ等の診療基盤」のどちらとして定義するかという論点に深く関連する。たとえばRemote Sensing Technology等の領域で用いられる医療機器等については、臨床上の効果が間接的で比較対照の設定が難しいために一定以上のエビデンスレベルの研究報告を産み出すことが難しいと考えられる。

遠隔診療を「診療技術としての介入行為」として評価するのであれば、RCTに資する遠隔診療に関するコホートデータベースの整備が求められる。「電子カルテ等の診療基盤」として評価するのであれば、遠隔診療を実施している地域住民等を母集団とした後ろ向き研究デザインが求められる。このように遠隔診療の位置づけによって遠隔診療普及推進のためのロードマップは異なる可能性がある。本調査による諸外国における先行研究から言えることは、遠隔診療を「診療技術としての介入行為」として評価できる疾患領域は限定的でありその効果は通常診療より優れているとは言えないという点である。

今後は遠隔診療の活用が期待される領域や診療ニーズが高い可能性のある診療行為に限定したSytematic ReviewやMeta-analysisを実施する等、遠隔診療技術の有効性に関するエビデンスを蓄積する文献研究が必要であると同時に、「電子カルテ等の診療基盤」としての評価方法を検討するため

に、学術団体が発信している声明やガイドライン等、遠隔診療に関する学術論文以外の資料を含めて検索対象を拡張し、ハンドサーチ等の手法を用いた調査が必要である。

D. 健康危険情報

特になし

E. 参考文献

[1-236]

F. 知的財産権の出願・登録状況

1. 特許取得　　無し（非対象）
2. 実用新案登録　　無し（非対象）
3. その他　　無し（非対象）

1. Kobak, K.A., et al., *Site versus centralized raters in a clinical depression trial: impact on patient selection and placebo response.* J Clin Psychopharmacol, 2010. **30**(2): p. 193-7.
2. Cranen, K., et al., *An exploration of chronic pain patients' perceptions of home telerehabilitation services.* Health Expect, 2012. **15**(4): p. 339-50.
3. Inglis, A. and L. Curatolo, *Rural mobile phone coverage is an issue for the NHS.* Anaesthesia, 2012. **67**(11): p. 1286-7.
4. Kamal, R., C.S. Hong, and S.G. Lee, *A telemedicine application to schedule temperature in an in vivo sensor network for cancer treatment.* Telemed J E Health, 2012. **18**(10): p. 760-71.
5. Scott, J.D., et al., *Project ECHO: a model for complex, chronic care in the Pacific Northwest region of the United States.* J Telemed Telecare, 2012. **18**(8): p. 481-4.
6. Wootton, R., et al., *Feasibility of a clearing house for improved cooperation between telemedicine networks delivering humanitarian services: acceptability to network coordinators.* Glob Health Action, 2012. **5**: p. 18713.
7. Abdul Karim, R., et al., *Telepointer technology in telemedicine: a review.* Biomed Eng Online, 2013. **12**: p. 21.
8. Abraham, W.T., *Disease management: remote monitoring in heart failure patients with implantable defibrillators, resynchronization devices, and hemodynamic monitors.* Europace, 2013. **15 Suppl 1**: p. i40-i46.
9. Bhimaraj, A., *Remote monitoring of heart failure patients.* Methodist Debakey Cardiovasc J, 2013. **9**(1): p. 26-31.
10. Brignole, M., et al., *2013 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy: the Task Force on cardiac pacing and resynchronization therapy of the European Society of Cardiology (ESC). Developed in collaboration with the European Heart Rhythm Association (EHRA).* Eur Heart J, 2013. **34**(29): p. 2281-329.
11. Cartwright, M., et al., *Effect of telehealth on quality of life and psychological outcomes over 12 months (Whole Systems Demonstrator telehealth qu*

estionnaire study): nested study of p atient reported outcomes in a pragm atic, cluster randomised controlled tri al. Bmj, 2013. **346**: p. f653.

12. Casey, M., et al., *Implementing trans national telemedicine solutions: a con nected health project in rural and re mote areas of six Northern Periphery countries Series on European collab orative projects.* Eur J Gen Pract, 20 13. **19**(1): p. 52-8.
13. Cui, Y., et al., *Economic evaluation o f Manitoba Health Lines in the man agement of congestive heart failure.* Healthc Policy, 2013. **9**(2): p. 36-50.
14. d'Ortho, M.P., *[Multidisciplinarity, C PAP, healthcare costs and telemedici ne].* Rev Mal Respir, 2013. **30**(1): p. 6-7.
15. Darago, L., et al., *[Benefits and disa dvantages of telemedicine].* Orv Hetil, 2013. **154**(30): p. 1167-71.
16. Dharmar, M., et al., *Telemedicine co nsultations and medication errors in rural emergency departments.* Pediat rics, 2013. **132**(6): p. 1090-7.
17. Dorsey, E.R., et al., *Randomized cont rolled clinical trial of "virtual house calls" for Parkinson disease.* JAMA N eurol, 2013. **70**(5): p. 565-70.
18. Duplaga, M., *The acceptance of e-hea lth solutions among patients with ch ronic respiratory conditions.* Telemed J E Health, 2013. **19**(9): p. 683-91.
19. Fortney, J.C., et al., *Practice-based v ersus telemedicine-based collaborative care for depression in rural federall y qualified health centers: a pragmat ic randomized comparative effectivene ss trial.* Am J Psychiatry, 2013. **170** (4): p. 414-25.
20. Gillis, A.M., *Expert commentary: how well has the call from Heart Rhyth m Society/European Heart Rhythm A ssociation for improved device monito ring been answered?* Europace, 2013. **15 Suppl 1**: p. i32-i34.
21. Guilcher, S.J., et al., *Spanning bound aries into remote communities: an ex ploration of experiences with teleheal th chronic disease self-management p rograms in rural northern ontario, C anada.* Telemed J E Health, 2013. **1 9**(12): p. 904-9.
22. Guo, Y., G.Y. Lip, and A. Banerjee, *Heart failure in East Asia.* Curr Car diol Rev, 2013. **9**(2): p. 112-22.
23. Henderson, C., et al., *Cost effectiven ess of telehealth for patients with lo ng term conditions (Whole Systems Demonstrator telehealth questionnair e study): nested economic evaluation in a pragmatic, cluster randomised c ontrolled trial.* Bmj, 2013. **346**: p. f10 35.
24. Henny, C., et al., *The business case for telemedicine.* Int Marit Health, 2 013. **64**(3): p. 129-35.
25. Jaglal, S.B., et al., *Increasing access to chronic disease self-management p rograms in rural and remote commu nities using telehealth.* Telemed J E

Health, 2013. **19**(6): p. 467-73.

26. Jakobsen, A.S., et al., *Hospital-admitted COPD patients treated at home using telemedicine technology in The Virtual Hospital Trial: methods of a randomized effectiveness trial.* Trials, 2013. **14**: p. 280.
27. Kamei, T., et al., *Systematic review and meta-analysis of studies involving telehome monitoring-based telenursing for patients with chronic obstructive pulmonary disease.* Jpn J Nurs Sci, 2013. **10**(2): p. 180-92.
28. Krum, H., et al., *Telephone support to rural and remote patients with heart failure: the Chronic Heart Failure Assessment by Telephone (CHAT) study.* Cardiovasc Ther, 2013. **31**(4): p. 230-7.
29. Kumar, G., et al., *The costs of critical care telemedicine programs: a systematic review and analysis.* Chest, 2013. **143**(1): p. 19-29.
30. Langan, J., et al., *Home-based telerehabilitation shows improved upper limb function in adults with chronic stroke: a pilot study.* J Rehabil Med, 2013. **45**(2): p. 217-20.
31. LeRouge, C. and M.J. Garfield, *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**(12): p. 6472-84.
32. Levin, K., et al., *Telemedicine diabetes consultations are cost-effective, and effects on essential diabetes treatment parameters are similar to conventional treatment: 7-year results from the Svendborg Telemedicine Diabetes Project.* J Diabetes Sci Technol, 2013. **7**(3): p. 587-95.
33. Lew, S.Q. and N. Sikka, *Are patients prepared to use telemedicine in home peritoneal dialysis programs?* Perit Dial Int, 2013. **33**(6): p. 714-5.
34. Li, T.S. and J.K. Chai, *[Implementation of telemedicine services in the earthquake disaster relief: the best medical experts provide direct medical service to the affected people].* Zhonghua Wei Zhong Bing Ji Jiu Yi Xue, 2013. **25**(5): p. 262-4.
35. Lind, L. and D. Karlsson, *Digital pen-based telemonitoring of elderly heart failure patients.* Stud Health Technol Inform, 2013. **192**: p. 1062.
36. Lloyd, A.R., et al., *Safety and effectiveness of a nurse-led outreach program for assessment and treatment of chronic hepatitis C in the custodial setting.* Clin Infect Dis, 2013. **56**(8): p. 1078-84.
37. Locatis, C. and M. Ackerman, *Three principles for determining the relevancy of store-and-forward and live interactive telemedicine: reinterpreting two telemedicine research reviews and other research.* Telemed J E Health, 2013. **19**(1): p. 19-23.
38. Lynga, P., et al., *Perceptions of transmission of body weight and telemonit*

oring in patients with heart failure? Int J Qual Stud Health Well-being, 2013. **8**: p. 21524.

39. Margolis, K.L., et al., *Effect of home blood pressure telemonitoring and pharmacist management on blood pressure control: a cluster randomized clinical trial.* Jama, 2013. **310**(1): p. 46-56.
40. Martinez-Alcala, C.I., M. Munoz, and J. Monguet-Fierro, *Design and customization of telemedicine systems.* Comput Math Methods Med, 2013. **2013**: p. 618025.
41. McKinstry, B., *The use of remote monitoring technologies in managing chronic obstructive pulmonary disease.* Qjm, 2013. **106**(10): p. 883-5.
42. McKinstry, B., et al., *Telemonitoring based service redesign for the management of uncontrolled hypertension: multicentre randomised controlled trial.* Bmj, 2013. **346**: p. f3030.
43. Melnyk, S.D., et al., *Telemedicine cardiovascular risk reduction in veterans.* Am Heart J, 2013. **165**(4): p. 501-8.
44. Patterson, V. and R. Wootton, *A web-based telemedicine system for low-resource settings 13 years on: insights from referrers and specialists.* Glob Health Action, 2013. **6**: p. 21465.
45. Piette, J.D., et al., *Spanish-speaking patients' engagement in interactive voice response (IVR) support calls for chronic disease self-management: data from three countries.* J Telemed Telecare, 2013. **19**(2): p. 89-94.
46. Pinnock, H., et al., *Effectiveness of telemonitoring integrated into existing clinical services on hospital admission for exacerbation of chronic obstructive pulmonary disease: researcher blind, multicentre, randomised controlled trial.* Bmj, 2013. **347**: p. f6070.
47. Qin, R., et al., *Reliability of a telemedicine system designed for rural Kenya.* J Prim Care Community Health, 2013. **4**(3): p. 177-81.
48. Radhakrishna, K., K. Bowles, and A. Zettek-Sumner, *Contributors to frequent telehealth alerts including false alerts for patients with heart failure: a mixed methods exploration.* Appl Clin Inform, 2013. **4**(4): p. 465-75.
49. Radhakrishnan, K., et al., *A retrospective study on patient characteristics and telehealth alerts indicative of key medical events for heart failure patients at a home health agency.* Telemed J E Health, 2013. **19**(9): p. 664-70.
50. Saner, H., *eHealth and telemedicine: current situation and future challenges.* Eur J Prev Cardiol, 2013. **20**(2 Suppl): p. 1-2.
51. Shaw, R.J., et al., *Mobile health messages help sustain recent weight loss.* Am J Med, 2013. **126**(11): p. 1002-9.
52. Shea, S., et al., *Social impact analysis of the effects of a telemedicine inte*

rvention to improve diabetes outcome s in an ethnically diverse, medically underserved population: findings from the IDEATel Study. Am J Public H ealth, 2013. **103**(10): p. 1888-94.

53. Sheridan, S.L., et al., *Designing and implementing a comparative effective ness study of two strategies for deliv ering high quality CHD prevention: methods and participant characteristi cs for the Heart to Health study.* Co ntemp Clin Trials, 2013. **36**(2): p. 39 4-405.
54. Skolnik, A., *Telemedicine and toxicol ogy: back to the future?* J Med Toxic ol, 2013. **9**(3): p. 217-9.
55. Smith, A.J., et al., *Health informatio n technology in screening and treatm ent of child obesity: a systematic revi ew.* Pediatrics, 2013. **131**(3): p. e894-902.
56. Tan, G., et al., *Improving access to c are for women veterans suffering fro m chronic pain and depression associ ated with trauma.* Pain Med, 2013. **1 4**(7): p. 1010-20.
57. Van Hooff, R.J., et al., *Prehospital u nassisted assessment of stroke severi ty using telemedicine: a feasibility st udy.* Stroke, 2013. **44**(10): p. 2907-9.
58. Varma, N. and R.P. Ricci, *Telemedici ne and cardiac implants: what is the benefit?* Eur Heart J, 2013. **34**(25): p. 1885-95.
59. Wechsler, L.R., et al., *Teleneurology applications: Report of the Telemedici ne Work Group of the American Aca demy of Neurology.* Neurology, 2013. **80**(7): p. 670-6.
60. Whited, J.D., et al., *Effect of store a nd forward teledermatology on qualit y of life: a randomized controlled tria l.* JAMA Dermatol, 2013. **149**(5): p. 5 84-91.
61. Zhao, F., et al., *Remote measuremen ts of heart and respiration rates for telemedicine.* PLoS One, 2013. **8**(10): p. e71384.
62. Bashshur, R.L., et al., *The empirical foundations of telemedicine interventi ons for chronic disease management.* Telemed J E Health, 2014. **20**(9): p. 769-800.
63. Bentley, C.L., et al., *A pilot randomi sed controlled trial of a Telehealth in tervention in patients with chronic o bstructive pulmonary disease: challen ges of clinician-led data collection.* Tr ials, 2014. **15**: p. 313.
64. Beratarrechea, A., et al., *The impact of mobile health interventions on chr onic disease outcomes in developing c ountries: a systematic review.* Teleme d J E Health, 2014. **20**(1): p. 75-82.
65. Bernocchi, P., et al., *Home based tel emedicine intervention for patients w ith uncontrolled hypertension--a real life non-randomized study.* BMC Med Inform Decis Mak, 2014. **14**: p. 52.
66. Berti, P., et al., *The use of telemedic ine in Italian Blood Banks: a nation wide survey.* Blood Transfus, 2014. **1**

2 Suppl 1: p. s131-6.

67. Bifulco, P., et al., *Telemedicine supported by Augmented Reality: an interactive guide for untrained people in performing an ECG test.* Biomed Eng Online, 2014. **13**: p. 153.
68. Black, J.T., et al., *A remote monitoring and telephone nurse coaching intervention to reduce readmissions among patients with heart failure: study protocol for the Better Effectiveness After Transition - Heart Failure (BEAT-HF) randomized controlled trial.* Trials, 2014. **15**: p. 124.
69. Celler, B.G., et al., *Design of a multi-site multi-state clinical trial of home monitoring of chronic disease in the community in Australia.* BMC Public Health, 2014. **14**: p. 1270.
70. Conway, A., S.C. Inglis, and R.A. Clark, *Effective technologies for noninvasive remote monitoring in heart failure.* Telemed J E Health, 2014. **20**(6): p. 531-8.
71. Czaplik, M., et al., *Employment of telemedicine in emergency medicine. Clinical requirement analysis, system development and first test results.* Methods Inf Med, 2014. **53**(2): p. 99-107.
72. Diamantidis, C.J. and S. Becker, *Health information technology (IT) to improve the care of patients with chronic kidney disease (CKD).* BMC Nephrol, 2014. **15**: p. 7.
73. DiClemente, R.J., et al., *Efficacy of a telephone-delivered sexually transmitted infection/human immunodeficiency virus prevention maintenance intervention for adolescents: a randomized clinical trial.* JAMA Pediatr, 2014. **168**(10): p. 938-46.
74. Eaton, L.H., et al., *Development and implementation of a telehealth-enhanced intervention for pain and symptom management.* Contemp Clin Trials, 2014. **38**(2): p. 213-20.
75. Feltner, C., et al., *Transitional care interventions to prevent readmissions for persons with heart failure: a systematic review and meta-analysis.* Ann Intern Med, 2014. **160**(11): p. 774-84.
76. Fernandez-Granero, M.A., et al., *Automatic prediction of chronic obstructive pulmonary disease exacerbations through home telemonitoring of symptoms.* Biomed Mater Eng, 2014. **24**(6): p. 3825-32.
77. Gomez-Cabrero, D., et al., *Synergy-COPD: a systems approach for understanding and managing chronic diseases.* J Transl Med, 2014. **12 Suppl 2**: p. S2.
78. Gorst, S.L., et al., *Home telehealth uptake and continued use among heart failure and chronic obstructive pulmonary disease patients: a systematic review.* Ann Behav Med, 2014. **48**(3): p. 323-36.
79. Grabowski, D.C. and A.J. O'Malley, *Use of telemedicine can reduce hospi*

talizations of nursing home residents and generate savings for medicare. Health Aff (Millwood), 2014. **33**(2): p. 244-50.

80. Hameed, A.S., S. Sauermann, and G. Schreier, *The impact of adherence on costs and effectiveness of telemedical patient management in heart failure: a systematic review.* Appl Clin Inform, 2014. **5**(3): p. 612-20.

81. Heisler, M., et al., *Comparison of community health worker-led diabetes medication decision-making support for low-income Latino and African American adults with diabetes using e-health tools versus print materials: a randomized, controlled trial.* Ann Intern Med, 2014. **161**(10 Suppl): p. S13-22.

82. Hernandez-Madrid, A., et al., *Remote monitoring of cardiac implantable electronic devices in Europe: results of the European Heart Rhythm Association survey.* Europace, 2014. **16**(1): p. 129-32.

83. Hughes, H.A. and B.B. Granger, *Racial disparities and the use of technology for self-management in blacks with heart failure: a literature review.* Curr Heart Fail Rep, 2014. **11**(3): p. 281-9.

84. Jeon, T., et al., *Implementation of a portable device for real-time ECG signal analysis.* Biomed Eng Online, 2014. **13**: p. 160.

85. Kabe, I., et al., *Usefulness of a portable internet-enabled ECG recording system for monitoring heart health among Japanese workers residing abroad.* J Occup Health, 2014. **56**(5): p. 387-92.

86. Kahn, J.M., et al., *Impact of nurse-led remote screening and prompting for evidence-based practices in the ICU*.* Crit Care Med, 2014. **42**(4): p. 896-904.

87. Kasckow, J., et al., *Telepsychiatry in the assessment and treatment of schizophrenia.* Clin Schizophr Relat Psychoses, 2014. **8**(1): p. 21-27a.

88. Kroenke, K., et al., *Telecare collaborative management of chronic pain in primary care: a randomized clinical trial.* Jama, 2014. **312**(3): p. 240-8.

89. Kvedar, J., M.J. Coye, and W. Everett, *Connected health: a review of technologies and strategies to improve patient care with telemedicine and telehealth.* Health Aff (Millwood), 2014. **33**(2): p. 194-9.

90. Lackland, D.T., et al., *Factors influencing the decline in stroke mortality: a statement from the American Heart Association/American Stroke Association.* Stroke, 2014. **45**(1): p. 315-53.

91. Levine, M., et al., *Novel telemedicine technologies in geriatric chronic non-cancer pain: primary care providers' perspectives.* Pain Med, 2014. **15**(2): p. 206-13.

92. Lin, K.H., et al., *Bidirectional and multi-user telerehabilitation system: cli*

nical effect on balance, functional act ivity, and satisfaction in patients wit h chronic stroke living in long-term c are facilities. Sensors (Basel), 2014. **1 4**(7): p. 12451-66.

93. Maamari, R.N., et al., *Novel telemedi cine device for diagnosis of corneal a brasions and ulcers in resource-poor settings.* JAMA Ophthalmol, 2014. **13 2**(7): p. 894-5.
94. Mabote, T., K. Wong, and J.G. Clela nd, *The utility of novel non-invasive technologies for remote hemodynamic monitoring in chronic heart failure.* Expert Rev Cardiovasc Ther, 2014. **1 2**(8): p. 923-8.
95. Marsh, J., et al., *Are patients satisfi ed with a web-based followup after t otal joint arthroplasty?* Clin Orthop Relat Res, 2014. **472**(6): p. 1972-81.
96. McGovern, E. and A.J. Sands, *Perina tal management of major congenital heart disease.* Ulster Med J, 2014. **8 3**(3): p. 135-9.
97. Mira-Solves, J.J., et al., *[Evaluation of satisfaction with telemedicine devi ces and with the results of the care received among chronic patients. The ValCronic program].* Aten Primaria, 2 014. **46 Suppl 3**: p. 16-23.
98. Morgan, J.M., et al., *Rationale and s tudy design of the REM-HF study: r emote management of heart failure u sing implanted devices and formalize d follow-up procedures.* Eur J Heart Fail, 2014. **16**(9): p. 1039-45.
99. Mussulman, L., et al., *Design and pa rticipant characteristics of a randomi zed-controlled trial of telemedicine fo r smoking cessation among rural smo kers.* Contemp Clin Trials, 2014. **38** (2): p. 173-81.
100. Oliveira, T.C., et al., *Telemedicine in Alentejo.* Telemed J E Health, 2014. **20**(1): p. 90-3.
101. Quinn, G.E., et al., *Validity of a tele medicine system for the evaluation of acute-phase retinopathy of prematur ity.* JAMA Ophthalmol, 2014. **132**(1 0): p. 1178-84.
102. Rudin, R.S., et al., *Paying for teleme dicine.* Am J Manag Care, 2014. **20**(1 2): p. 983-5.
103. Sorensen, T., et al., *A qualitative des cription of telemedicine for acute stro ke care in Norway: technology is not the issue.* BMC Health Serv Res, 20 14. **14**: p. 643.
104. Sousa, C., et al., *Telemonitoring in h eart failure: a state-of-the-art review.* Rev Port Cardiol, 2014. **33**(4): p. 22 9-39.
105. Strouthidis, N.G., et al., *Teleglaucom a: ready to go?* Br J Ophthalmol, 20 14. **98**(12): p. 1605-11.
106. Udsen, F.W., et al., *Effectiveness and cost-effectiveness of telehealthcare fo r chronic obstructive pulmonary disea se: study protocol for a cluster rando mized controlled trial.* Trials, 2014. **1 5**: p. 178.
107. Vollmer, T., et al., *Individualized bio*

monitoring in heart failure--Biomon-HF "Keep an eye on heart failure--especially at night". Biomed Tech (Berl), 2014. **59**(2): p. 103-11.

108. Vonk Noordegraaf, A., et al., *A personalised eHealth programme reduces the duration until return to work after gynaecological surgery: results of a multicentre randomised trial.* Bjog, 2014. **121**(9): p. 1127-35; discussion 1136.

109. Williams, V., et al., *Using a mobile health application to support self-management in COPD: a qualitative study.* Br J Gen Pract, 2014. **64**(624): p. e392-400.

110. Wu, T.C., et al., *Prehospital utility of rapid stroke evaluation using in-ambulance telemedicine: a pilot feasibility study.* Stroke, 2014. **45**(8): p. 2342-7.

111. Yperzeele, L., et al., *Feasibility of AmbulanCe-Based Telemedicine (FACT) study: safety, feasibility and reliability of third generation in-ambulance telemedicine.* PLoS One, 2014. **9**(10): p. e110043.

112. Zhai, Y.K., et al., *Clinical- and cost-effectiveness of telemedicine in type 2 diabetes mellitus: a systematic review and meta-analysis.* Medicine (Baltimore), 2014. **93**(28): p. e312.

113. Al-Damluji, M.S., et al., *Hospital variation in quality of discharge summaries for patients hospitalized with heart failure exacerbation.* Circ Cardiovasc Qual Outcomes, 2015. **8**(1): p. 77-86.

114. Ammenwerth, E., et al., *Evaluation of an Integrated Telemonitoring Surveillance System in Patients with Coronary Heart Disease.* Methods Inf Med, 2015. **54**(5): p. 388-97.

115. Andriukaitis, V., *How ehealth can help with Europe's chronic diseases epidemic.* Eur J Public Health, 2015. **25**(4): p. 748-50.

116. Bekelman, D.B., et al., *Primary Results of the Patient-Centered Disease Management (PCDM) for Heart Failure Study: A Randomized Clinical Trial.* JAMA Intern Med, 2015. **175**(5): p. 725-32.

117. Bennell, K.L., et al., *Effects of Adding an Internet-Based Pain Coping Skills Training Protocol to a Standardized Education and Exercise Program for People With Persistent Hip Pain (HOPE Trial): Randomized Controlled Trial Protocol.* Phys Ther, 2015. **95**(10): p. 1408-22.

118. Berkhof, F.F., et al., *Telemedicine, the effect of nurse-initiated telephone follow up, on health status and health-care utilization in COPD patients: a randomized trial.* Respirology, 2015. **20**(2): p. 279-85.

119. Bolster, N.M., M.E. Giardini, and A. Bastawrous, *The Diabetic Retinopathy Screening Workflow: Potential for Smartphone Imaging.* J Diabetes Sci Technol, 2015. **10**(2): p. 318-24.

120. Bott, M.J., et al., *A Prospective Clinical Trial of Telecytopathology for Rapid Interpretation of Specimens Obtained During Endobronchial Ultrasound-Fine Needle Aspiration.* Ann Thorac Surg, 2015. **100**(1): p. 201-5; discussion 205-6.

121. Brenes, G.A., et al., *Telephone-Delivered Cognitive Behavioral Therapy and Telephone-Delivered Nondirective Supportive Therapy for Rural Older Adults With Generalized Anxiety Disorder: A Randomized Clinical Trial.* JAMA Psychiatry, 2015. **72**(10): p. 1012-20.

122. Buhi, E.R., *Digital health and AJPH: the time has come!* Am J Public Health, 2015. **105**(3): p. 420.

123. Burke, B.L., Jr. and R.W. Hall, *Telemedicine: Pediatric Applications.* Pediatrics, 2015. **136**(1): p. e293-308.

124. Castelnuovo, G., et al., *New Technologies for the Management and Rehabilitation of Chronic Diseases and Conditions.* Biomed Res Int, 2015. **2015**: p. 180436.

125. Currie, M., L.J. Philip, and A. Roberts, *Attitudes towards the use and acceptance of eHealth technologies: a case study of older adults living with chronic pain and implications for rural healthcare.* BMC Health Serv Res, 2015. **15**: p. 162.

126. Daniel, E., et al., *Validated System for Centralized Grading of Retinopathy of Prematurity: Telemedicine Approaches to Evaluating Acute-Phase Retinopathy of Prematurity (e-ROP) Study.* JAMA Ophthalmol, 2015. **133**(6): p. 675-82.

127. Daniel, H. and L.S. Sulmasy, *Policy recommendations to guide the use of telemedicine in primary care settings: an American College of Physicians position paper.* Ann Intern Med, 2015. **163**(10): p. 787-9.

128. de la Torre-Diez, I., et al., *Cost-utility and cost-effectiveness studies of telemedicine, electronic, and mobile health systems in the literature: a systematic review.* Telemed J E Health, 2015. **21**(2): p. 81-5.

129. De Simone, A., et al., *Remote monitoring improves outcome after ICD implantation: the clinical efficacy in the management of heart failure (EFFECT) study.* Europace, 2015. **17**(8): p. 1267-75.

130. Dicianno, B.E., et al., *Perspectives on the evolution of mobile (mHealth) technologies and application to rehabilitation.* Phys Ther, 2015. **95**(3): p. 397-405.

131. Duplaga, M., *A cross-sectional study assessing determinants of the attitude to the introduction of eHealth services among patients suffering from chronic conditions.* BMC Med Inform Decis Mak, 2015. **15**: p. 33.

132. Fierson, W.M. and A. Capone, Jr., *Telemedicine for evaluation of retinopathy of prematurity.* Pediatrics, 2015.

135(1): p. e238-54.

133. Guitton, M.J., *Telemedicine at sea and onshore: divergences and convergences.* Int Marit Health, 2015. **66**(1): p. 18-21.
134. Hardinge, M., et al., *Using a mobile health application to support self-management in chronic obstructive pulmonary disease: a six-month cohort study.* BMC Med Inform Decis Mak, 2015. **15**: p. 46.
135. Hasselqvist-Ax, I., et al., *Early cardiopulmonary resuscitation in out-of-hospital cardiac arrest.* N Engl J Med, 2015. **372**(24): p. 2307-15.
136. Hofmann, R., et al., *First outline and baseline data of a randomized, controlled multicenter trial to evaluate the health economic impact of home telemonitoring in chronic heart failure - CardioBBEAT.* Trials, 2015. **16**: p. 343.
137. Hussain, M., et al., *Recommendations service for chronic disease patient in multimodel sensors home environment.* Telemed J E Health, 2015. **21**(3): p. 185-99.
138. Jakobsen, A.S., et al., *Home-based telehealth hospitalization for exacerbation of chronic obstructive pulmonary disease: findings from "the virtual hospital" trial.* Telemed J E Health, 2015. **21**(5): p. 364-73.
139. Janse, A., et al., *Testing the efficacy of web-based cognitive behavioural therapy for adult patients with chronic fatigue syndrome (CBIT): study protocol for a randomized controlled trial.* BMC Neurol, 2015. **15**: p. 137.
140. Kelly, J.T., et al., *Telehealth methods to deliver multifactorial dietary interventions in adults with chronic disease: a systematic review protocol.* Syst Rev, 2015. **4**: p. 185.
141. Kirkpatrick, A.W., et al., *The marriage of surgical simulation and telementoring for damage-control surgical training of operational first responders: A pilot study.* J Trauma Acute Care Surg, 2015. **79**(5): p. 741-7.
142. Klonoff, D.C., *Telemedicine for Diabetes: Current and Future Trends.* J Diabetes Sci Technol, 2015. **10**(1): p. 3-5.
143. Koertke, H., et al., *Telemedicine-guided, very low-dose international normalized ratio self-control in patients with mechanical heart valve implants.* Eur Heart J, 2015. **36**(21): p. 1297-305.
144. Kotb, A., et al., *Comparative effectiveness of different forms of telemedicine for individuals with heart failure (HF): a systematic review and network meta-analysis.* PLoS One, 2015. **10**(2): p. e0118681.
145. Kruk, M.E., G. Nigenda, and F.M. Knaul, *Redesigning primary care to tackle the global epidemic of noncommunicable disease.* Am J Public Health, 2015. **105**(3): p. 431-7.
146. Kummerow Broman, K., et al., *Posto*

perative Care Using a Secure Online Patient Portal: Changing the (Inter)Face of General Surgery. J Am Coll Surg, 2015. **221**(6): p. 1057-66.

147. Langkamp, D.L., M.D. McManus, and S.D. Blakemore, *Telemedicine for children with developmental disabilities: a more effective clinical process than an office-based care.* Telemed J E Health, 2015. **21**(2): p. 110-4.

148. Leurent, C. and M.D. Ehlers, *Digital technologies for cognitive assessment to accelerate drug development in Alzheimer's disease.* Clin Pharmacol Ther, 2015. **98**(5): p. 475-6.

149. Lin, B.S., et al., *Design and Implementation of a Set-Top Box-Based Homecare System Using Hybrid Cloud.* Telemed J E Health, 2015. **21**(11): p. 916-22.

150. Maddry, J.K., D.J. Sessions, and V.S. Bebarta, *Response to CDR Sean Bryant Regarding "Wartime toxicology: Evaluation of a military medical toxicology telemedicine consults service to assist physicians serving overseas and in combat: 2005-2012".* J Med Toxicol, 2015. **11**(1): p. 158.

151. Marcin, J.P., M.E. Rimsza, and W.B. Moskowitz, *The Use of Telemedicine to Address Access and Physician Workforce Shortages.* Pediatrics, 2015. **136**(1): p. 202-9.

152. Martin, D.T., et al., *Randomized trial of atrial arrhythmia monitoring to guide anticoagulation in patients with implanted defibrillator and cardiac resynchronization devices.* Eur Heart J, 2015. **36**(26): p. 1660-8.

153. Martin, S.S., et al., *mActive: A Randomized Clinical Trial of an Automated mHealth Intervention for Physical Activity Promotion.* J Am Heart Assoc, 2015. **4**(11).

154. Mastrototaro, J.J., *The Transformation of Diabetes Care Through the Use of Person-Centered Data.* J Diabetes Sci Technol, 2015. **10**(1): p. 42-9.

155. Mattos Sda, S., et al., *A telemedicine network for remote paediatric cardiology services in north-east Brazil.* Bull World Health Organ, 2015. **93**(12): p. 881-7.

156. Molfenter, T., et al., *Trends in telemedicine use in addiction treatment.* Addict Sci Clin Pract, 2015. **10**: p. 14.

157. Nishii, N., et al., *Decreased Intrathoracic Impedance Associated With OptiVol Alert Can Diagnose Increased B-Type Natriuretic Peptide - MOMOTARO (Monitoring and Management of OptiVol Alert to Reduce Heart Failure Hospitalization) Study.* Circ J, 2015. **79**(6): p. 1315-22.

158. Norlund, F., et al., *Treatment of depression and anxiety with internet-based cognitive behavior therapy in patients with a recent myocardial infarction (U-CARE Heart): study protocol for a randomized controlled trial.* Trials, 2015. **16**: p. 154.

159. Oldenburg, B., et al., *Using new tech*

nologies to improve the prevention a nd management of chronic conditions in populations. Annu Rev Public Hea lth, 2015. **36**: p. 483-505.

160. Oliveira Junior, M.T., et al., *[Teleme dicine guideline in Patient Care with Acute Coronary Syndrome and Othe r heart Diseases].* Arq Bras Cardiol, 2015. **104**(5 Suppl 1): p. 1-26.

161. Owsley, C., et al., *Diabetes eye scree ning in urban settings serving minori ty populations: detection of diabetic r etinopathy and other ocular findings using telemedicine.* JAMA Ophthalmo l, 2015. **133**(2): p. 174-81.

162. Parmar, P., et al., *Use of telemedicin e technologies in the management of infectious diseases: a review.* Clin Inf ect Dis, 2015. **60**(7): p. 1084-94.

163. Pasquel, F.J., et al., *Cost-effectivenes s of Different Diabetic Retinopathy S creening Modalities.* J Diabetes Sci T echnol, 2015. **10**(2): p. 301-7.

164. Pedone, C. and D. Lelli, *Systematic r eview of telemonitoring in COPD: an update.* Pneumonol Alergol Pol, 2015. **83**(6): p. 476-84.

165. Piette, J.D., et al., *Mobile Health De vices as Tools for Worldwide Cardiov ascular Risk Reduction and Disease Management.* Circulation, 2015. **132**(2 1): p. 2012-27.

166. Piette, J.D., et al., *A randomized tria l of mobile health support for heart f ailure patients and their informal ca regivers: impacts on caregiver-reporte d outcomes.* Med Care, 2015. **53**(8): p. 692-9.

167. Ramachandran, N., et al., *Mobile Ph one Usage and Willingness to Receiv e Health-Related Information Among Patients Attending a Chronic Disease Clinic in Rural Puducherry, India.* J Diabetes Sci Technol, 2015. **9**(6): p. 1350-1.

168. Riley, W.T., et al., *Program evaluatio n of remote heart failure monitoring: healthcare utilization analysis in a r ural regional medical center.* Telemed J E Health, 2015. **21**(3): p. 157-62.

169. Roberts, A., et al., *Striking a balance between in-person care and the use of eHealth to support the older rural population with chronic pain.* Int J Qual Stud Health Well-being, 2015. **10**: p. 27536.

170. Rogante, M., et al., *A quality assess ment of systematic reviews on telere habilitation: what does the evidence tell us?* Ann Ist Super Sanita, 2015. **51**(1): p. 11-8.

171. Rosenbek Minet, L., et al., *Early tele medicine training and counselling aft er hospitalization in patients with se vere chronic obstructive pulmonary di sease: a feasibility study.* BMC Med Inform Decis Mak, 2015. **15**: p. 3.

172. Salim Al-Damluji, M., et al., *Associat ion of discharge summary quality wit h readmission risk for patients hospi talized with heart failure exacerbatio n.* Circ Cardiovasc Qual Outcomes, 2

015. **8**(1): p. 109-11.

173. Salisbury, C., et al., *TElehealth in CHronic disease: mixed-methods study to develop the TECH conceptual model for intervention design and evaluation.* BMJ Open, 2015. **5**(2): p. e006448.

174. San Jose Ruiz, B., M.A. Gil Lemus, and M.P. Figuero Echeverria, *[Pharmaceutical care and home delivery of medication to patients with chronic myeloid leukemia].* Farm Hosp, 2015. **39**(1): p. 13-22.

175. Savage, N., *Mobile data: Made to measure.* Nature, 2015. **527**(7576): p. S12-3.

176. Selman, L., et al., *Appropriateness and acceptability of a Tele-Yoga intervention for people with heart failure and chronic obstructive pulmonary disease: qualitative findings from a controlled pilot study.* BMC Complement Altern Med, 2015. **15**: p. 21.

177. Shi, L., et al., *Telemedicine for detecting diabetic retinopathy: a systematic review and meta-analysis.* Br J Ophthalmol, 2015. **99**(6): p. 823-31.

178. Steinman, M., et al., *Impact of telemedicine in hospital culture and its consequences on quality of care and safety.* Einstein (Sao Paulo), 2015. **13**(4): p. 580-6.

179. Steventon, A., R. Grieve, and M. Bardsley, *An Approach to Assess Generalizability in Comparative Effectiveness Research: A Case Study of the Whole Systems Demonstrator Cluster Randomized Trial Comparing Telehealth with Usual Care for Patients with Chronic Health Conditions.* Med Decis Making, 2015. **35**(8): p. 1023-36.

180. Svetkey, L.P., et al., *Cell phone intervention for you (CITY): A randomized, controlled trial of behavioral weight loss intervention for young adults using mobile technology.* Obesity (Silver Spring), 2015. **23**(11): p. 2133-41.

181. Theodore, B.R., et al., *Transaction cost analysis of in-clinic versus telehealth consultations for chronic pain: preliminary evidence for rapid and affordable access to interdisciplinary collaborative consultation.* Pain Med, 2015. **16**(6): p. 1045-56.

182. van Dam, J., et al., *An open-access, mobile compatible, electronic patient register for rheumatic heart disease ('eRegister') based on the World Heart Federation's framework for patient registers.* Cardiovasc J Afr, 2015. **26**(6): p. 227-33.

183. Voors, A.A. and F. Ruschitzka, *The year in cardiology: heart failure 2014.* Eur Heart J, 2015. **36**(7): p. 421-4.

184. Waki, K., et al., *DialBetics With a Multimedia Food Recording Tool, FoodLog: Smartphone-Based Self-Management for Type 2 Diabetes.* J Diabetes Sci Technol, 2015. **9**(3): p. 534-40.

185. Wheelock, A.E., et al., *SIS.NET: a randomized controlled trial evaluating a web-based system for symptom ma*

nagement after treatment of breast cancer. Cancer, 2015. **121**(6): p. 893-9.

186. White, C.M., et al., *Observer blind randomised controlled trial of a tailored home exercise programme versus usual care in people with stable inflammatory immune mediated neuropathy.* BMC Neurol, 2015. **15**: p. 147.
187. Widmer, R.J., et al., *Digital health interventions for the prevention of cardiovascular disease: a systematic review and meta-analysis.* Mayo Clin Proc, 2015. **90**(4): p. 469-80.
188. Ying, G.S., et al., *Predictors for the development of referral-warranted retinopathy of prematurity in the telemedicine approaches to evaluating acute-phase retinopathy of prematurity (e-ROP) study.* JAMA Ophthalmol, 2015. **133**(3): p. 304-11.
189. Yuan, Z., et al., *Intravenous thrombolysis guided by a telemedicine consultation system for acute ischaemic stroke patients in China: the protocol of a multicentre historically controlled study.* BMJ Open, 2015. **5**(5): p. e006704.
190. Zulman, D.M., et al., *How Can eHealth Technology Address Challenges Related to Multimorbidity? Perspectives from Patients with Multiple Chronic Conditions.* J Gen Intern Med, 2015. **30**(8): p. 1063-70.
191. Aguas, M., et al., *Use of telemedicine in inflammatory bowel disease: a real monitoring option?* Expert Rev Gastroenterol Hepatol, 2016. **10**(8): p. 879-81.
192. Amorim, A.B., et al., *Integrating Mobile health and Physical Activity to reduce the burden of Chronic low back pain Trial (IMPACT): a pilot trial protocol.* BMC Musculoskelet Disord, 2016. **17**: p. 36.
193. Bobrow, K., et al., *Mobile Phone Text Messages to Support Treatment Adherence in Adults With High Blood Pressure (SMS-Text Adherence Support [StAR]): A Single-Blind, Randomized Trial.* Circulation, 2016. **133**(6): p. 592-600.
194. Bulaj, G., et al., *Incorporating Natural Products, Pharmaceutical Drugs, Self-Care and Digital/Mobile Health Technologies into Molecular-Behavioral Combination Therapies for Chronic Diseases.* Curr Clin Pharmacol, 2016. **11**(2): p. 128-45.
195. Buvik, A., et al., *Quality of care for remote orthopaedic consultations using telemedicine: a randomised controlled trial.* BMC Health Serv Res, 2016. **16**: p. 483.
196. Cai, H., et al., *Application of Telemedicine in Gansu Province of China.* PLoS One, 2016. **11**(6): p. e0158026.
197. Cajita, M.I., K.T. Gleason, and H.R. Han, *A Systematic Review of mHealth-Based Heart Failure Interventions.* J Cardiovasc Nurs, 2016. **31**(3): p. E10-22.
198. Cavalera, C., et al., *A telemedicine*

meditation intervention for people with multiple sclerosis and their caregivers: study protocol for a randomized controlled trial. Trials, 2016. **17**: p. 4.

199. Chatwin, M., et al., *Randomised crossover trial of telemonitoring in chronic respiratory patients (TeleCRAFT trial).* Thorax, 2016. **71**(4): p. 305-11.
200. Cowie, M.R., et al., *e-Health: a position statement of the European Society of Cardiology.* Eur Heart J, 2016. **37**(1): p. 63-6.
201. Danis, J., E. Forczek, and F. Bari, *[Telemedicine in dermatological practice: teledermatology].* Orv Hetil, 2016. **157**(10): p. 363-9.
202. de Araujo, J.S., et al., *Impact of Telemedicine in the Screening for Congenital Heart Disease in a Center from Northeast Brazil.* J Trop Pediatr, 2016. **62**(6): p. 471-476.
203. Dithmer, M., et al., *"The Heart Game": Using Gamification as Part of a Telerehabilitation Program for Heart Patients.* Games Health J, 2016. **5**(1): p. 27-33.
204. Dorsey, E.R. and E.J. Topol, *State of Telehealth.* N Engl J Med, 2016. **375**(14): p. 1400.
205. Eszes, D.J., et al., *Diabetic Retinopathy Screening Using Telemedicine Tools: Pilot Study in Hungary.* J Diabetes Res, 2016. **2016**: p. 4529824.
206. Giani, E. and L. Laffel, *Opportunities and Challenges of Telemedicine: Observations from the Wild West in Pediatric Type 1 Diabetes.* Diabetes Technol Ther, 2016. **18**(1): p. 1-3.
207. Greene, J.A., *Do-It-Yourself Medical Devices--Technology and Empowerment in American Health Care.* N Engl J Med, 2016. **374**(4): p. 305-8.
208. Harter, M., et al., *Effectiveness of Telephone-Based Health Coaching for Patients with Chronic Conditions: A Randomised Controlled Trial.* PLoS One, 2016. **11**(9): p. e0161269.
209. Himes, B.E. and E.R. Weitzman, *Innovations in health information technologies for chronic pulmonary diseases.* Respir Res, 2016. **17**: p. 38.
210. Horn, B.P., et al., *A cost comparison of travel models and behavioural telemedicine for rural, Native American populations in New Mexico.* J Telemed Telecare, 2016. **22**(1): p. 47-55.
211. Kang, Y., et al., *Utilizing Home Healthcare Electronic Health Records for Telehomecare Patients With Heart Failure: A Decision Tree Approach to Detect Associations With Rehospitalizations.* Comput Inform Nurs, 2016. **34**(4): p. 175-82.
212. Kessler, E.A., A.K. Sherman, and M.L. Becker, *Decreasing patient cost and travel time through pediatric rheumatology telemedicine visits.* Pediatr Rheumatol Online J, 2016. **14**(1): p. 54.
213. Klersy, C., et al., *Effect of telemonitoring of cardiac implantable electronic*

devices on healthcare utilization: a meta-analysis of randomized controlled trials in patients with heart failure. Eur J Heart Fail, 2016. **18**(2): p. 195-204.

214. Lee, K.K., et al., *Post-discharge Follow-up Characteristics Associated With 30-Day Readmission After Heart Failure Hospitalization.* Med Care, 2016. **54**(4): p. 365-72.

215. Lundgren, J.G., et al., *The Effect of Guided Web-Based Cognitive Behavioral Therapy on Patients With Depressive Symptoms and Heart Failure: A Pilot Randomized Controlled Trial.* J Med Internet Res, 2016. **18**(8): p. e194.

216. Lyerly, M.J., et al., *The effects of telemedicine on racial and ethnic disparities in access to acute stroke care.* J Telemed Telecare, 2016. **22**(2): p. 114-20.

217. Mehrotra, A., et al., *Utilization of Telemedicine Among Rural Medicare Beneficiaries.* Jama, 2016. **315**(18): p. 2015-6.

218. Park, L.G., et al., *Mobile Phone Interventions for the Secondary Prevention of Cardiovascular Disease.* Prog Cardiovasc Dis, 2016. **58**(6): p. 639-50.

219. Paul, D.L. and R.R. McDaniel, Jr., *Facilitating telemedicine project sustainability in medically underserved areas: a healthcare provider participant perspective.* BMC Health Serv Res, 2016. **16**: p. 148.

220. Piotrowicz, E., et al., *Telerehabilitation in heart failure patients: The evidence and the pitfalls.* Int J Cardiol, 2016. **220**: p. 408-13.

221. Riaz, M.S. and A. Atreja, *Personalized Technologies in Chronic Gastrointestinal Disorders: Self-monitoring and Remote Sensor Technologies.* Clin Gastroenterol Hepatol, 2016. **14**(12): p. 1697-1705.

222. Richard, S., et al., *Simulation training for emergency teams to manage acute ischemic stroke by telemedicine.* Medicine (Baltimore), 2016. **95**(24): p. e3924.

223. Rojahn, K., et al., *Remote Monitoring of Chronic Diseases: A Landscape Assessment of Policies in Four European Countries.* PLoS One, 2016. **11**(5): p. e0155738.

224. Russo, J.E., R.R. McCool, and L. Davies, *VA Telemedicine: An Analysis of Cost and Time Savings.* Telemed J E Health, 2016. **22**(3): p. 209-15.

225. Salisbury, C., et al., *Telehealth for patients at high risk of cardiovascular disease: pragmatic randomised controlled trial.* Bmj, 2016. **353**: p. i2647.

226. Sanchez-Morillo, D., M.A. Fernandez-Granero, and A. Leon-Jimenez, *Use of predictive algorithms in-home monitoring of chronic obstructive pulmonary disease and asthma: A systematic review.* Chron Respir Dis, 2016. **13**(3): p. 264-83.

227. Schenker, Y., et al., *An enhanced rol*

e for palliative care in the multidisciplinary approach to high-risk head and neck cancer. Cancer, 2016. **122**(3): p. 340-3.

228. Siew, L., et al., *Reliability of Telemedicine in the Assessment of Seriously Ill Children.* Pediatrics, 2016. **137**(3): p. e20150712.
229. Uscher-Pines, L., et al., *Access and Quality of Care in Direct-to-Consumer Telemedicine.* Telemed J E Health, 2016. **22**(4): p. 282-7.
230. Yang, Y.T. and K.B. Kozhimannil, *Medication Abortion Through Telemedicine: Implications of a Ruling by the Iowa Supreme Court.* Obstet Gynecol, 2016. **127**(2): p. 313-6.
231. Yasmin, F., et al., *Positive influence of short message service and voice call interventions on adherence and health outcomes in case of chronic disease care: a systematic review.* BMC Med Inform Decis Mak, 2016. **16**: p. 46.
232. Ye, J., et al., *A telemedicine wound care model using 4G with smart phones or smart glasses: A pilot study.* Medicine (Baltimore), 2016. **95**(31): p. e4198.
233. Faruque, L.I., et al., *Effect of telemedicine on glycated hemoglobin in diabetes: a systematic review and meta-analysis of randomized trials.* Cmaj, 2017. **189**(9): p. E341-e364.
234. Meyding-Lamade, U., *[Telemedicine].* Nervenarzt, 2017. **88**(2): p. 111-112.
235. Muller, K.I., K.B. Alstadhaug, and S. I. Bekkelund, *A randomized trial of telemedicine efficacy and safety for nonacute headaches.* Neurology, 2017. **89**(2): p. 153-162.
236. Schwamm, L.H., et al., *Recommendations for the Implementation of Telehealth in Cardiovascular and Stroke Care: A Policy Statement From the American Heart Association.* Circulation, 2017. **135**(7): p. e24-e44.
237. Rollman, B.L., et al., *Effectiveness of Online Collaborative Care for Treating Mood and Anxiety Disorders in Primary Care: A Randomized Clinical Trial.* JAMA Psychiatry, 2018. **75**(1): p. 56-64.
238. Vartanian, R.J., et al., *Trends in the Screening and Treatment of Retinopathy of Prematurity.* Pediatrics, 2017. **139**(1).