Rise of Virtual Care Delivery
Literature Review

December 3, 2014
The Literature

• Nearly 2,000 studies over the past six years describing the results of implementations of varied applications of technologies facilitating remote care

• Challenge: What qualifies?
  • Tech to support remote diagnostics, consultation and treatment
  • Store-and-forward remote healthcare services and technologies applications

• Several hundred specific each to Diabetes, COPD, Heart Failure, Psychiatric applications, and tele-rehabilitation

• <10% describe well-crafted RCT studies
Wide Range of Interventions

- Televideo to supplement in-person encounters
- On-line disease literacy applications
- Inclusion of store-and-forward biometric monitoring devices into clinical workflows
- Interactive text messaging applications
- Interactive Voice Response applications to solicit self-reported symptoms and behavior data
What results were they looking for?

Two fundamental questions that are asked:

1. Did we get better outcomes than with usual care?

2. Did we get similar outcomes, but we are now able to deploy this cheaper and scale it faster because we were able to leverage the productivity gains of this technology?
Wide Range of Results

Majority positive:

- Decreased mortality
- Improved biometrics (reduced risk)
- Improved QOL and satisfaction
- Reduced utilization (admissions, ER use, SNF use, other unplanned care)
- Reduced readmissions
- Reduced lengths-of-stay
- Reduced costs
- Productivity increases (mostly increased touches)
- Improved disease literacy
- Equivalent efficacy as face-to-face care
- Improved quality metrics (HEDIS, STARs)
Deficiencies

- Not enough ask about productivity
- Most results relatively short term (median duration of 6 months or less)
- Very few studies of cost-effectiveness
- Formal studies under optimal conditions shed little light on real-world practice:

  Scant information provided on the **craft** of telecare management
Example of Successful Post Acute Application


- Geisinger Health System
- Threading IVR into transition of care best practices
- Leveraging automation to extend RN reach
- 19.5% reduction in all-cause 30-day readmissions
- 44% reduced probability of any readmission (p<0.05)
- ROI’s north of 6:1
Example of Successful COPD Application


- Retrospective cohort study using the Veterans Health Administration database of COPD patients enrolled in the Care Coordination Home Telehealth (CCHT) program.

- N=1,133 patients with COPD enrolled in the CCHT program between 2005 and 2009.

- Of 369 patients who had at least one exacerbation per year in the year prior to enrollment, 71.5% had a reduction in numbers of ED visits and exacerbations requiring hospitalizations after enrollment in the program.

- The average number of hospital admissions, ED visits, and total exacerbations were all reduced (p<0.01)
Example of Successful Diabetes Application


- 103 Diabetics assigned to intervention or control
- Messaging device for interactive consults between MD’s pharmacists and patients
- Pharmacists used data to adjust meds and relay information to care managers to execute
- Intervention group:
  - Significantly better HbA1c at 3 & 6 months (p<.001)
  - Higher percentage reached goals (p=.001)
  - More time spent with care managers overall (p<.001)
  - More Rx changes made (p<.0001)
Example of Successful CHF Application


- Geisinger Medicare Advantage Plan
- N=541 CHF members tracked for 70 months (24 months on monitoring)
- Telehealth scales and IVR
- Relative odds of any hospitalization while on RPM – 23% lower
- Relative odds of a 90-day readmission while on RPM – 38% lower
- 11.5% additional cost savings (3.3 to 1 ROI)
Example of Successful TelePsych Application


- 121 homebound individuals who scored 15+ on the Hamilton Rating Scale for Depression (HAMD) participated in the three-arm randomized control trial, comparing tele-PST with in-person problem-solving therapy (PST) and telephone support calls.

- Six sessions of the PST-primary care were conducted for the PST participants. For tele-PST, sessions 2-6 were conducted via Skype video call.

- HAMD scores of tele-PST participants and in-person PST participants at a 12-week follow-up were significantly lower than those of telephone support call participants, and the treatment effects were maintained at a 24-week follow-up.

- The HAMD scores of tele-PST participants did not differ from those of in-person PST participants.
Commonalities of Successful Programs

- The technology per se can never be the focus. This has to be about putting accurate and meaningful information in front of the clinician, regardless of the means of collection. Information-gathering technologies will change with great frequency, information *types* far less so.

- Information must be embedded into a care management workflow.

- Data can be strategically utilized to improve disease literacy.

- Data in real- or near-real-time can be used to strategically intervene clinically and drive physician behavior as well the patient’s.

- Employed disciplined candidate selection criteria.
It’s the People

- Successful programs combined technology with human interaction
- Very low-cost programs rely on technology alone, are not always effective. Staff costs more than equipment.
- The key is striking the right balance: human touch to make the program effective, technology to make it efficient.
Example of an Unsuccessful Application

Chaudhry, S.I. et. al. *Telemonitoring in Patients with Heart Failure.* NEJM 363;24 December 9, 2010

- Yale University
- Large RCT (n=1,653)
- Goal: Readmission prevention for CHF hospitalizations
- Call-in of weights
- There were no significant differences between the two groups in terms of mortality or hospitalization rates
No Mysteries

- No automatic biometric monitoring; In-bound IVR only, with static 7 questions for self-reported weight/symptomology

- Not threaded into a formal care management workflow (involving CHF telecare managers deemed “not scalable”)

- No monitoring of comorbid conditions

- No monitoring of medication compliance

- Very poor compliance (14% never called in, 55% were no longer making minimum number of calls at 6 months)

- Automatic “flags” sent to clinicians - no evidence of consistent follow-up

- Assumed patient disease literacy – no interactive educational component