

Evaluation of Home Telehealth Following Hospitalization for Heart Failure: A Randomized Trial

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**Bonnie Wakefield, PhD, RN
Center for Implementation of Innovative Strategies in Practice (CRIISP)
Iowa City VA Medical Center
Sinclair School of Nursing & School of Medicine, University of Missouri**

Objectives

- Provide an overview of telehealth care
- Compare two forms of telehealth vs. usual care for veterans with heart failure
- Compare nurse-patient communication patterns in two modes of telehealth care

Telehealth Background

- Care moving from hospital → clinic → home
- Increasing rates of chronic illness
- Unique challenges for rural health care
 - Elderly
 - Remote from health care centers
 - Lack formal support services
 - Traditional home care limited by distance
- Advances in computing and telecommunications technologies

Telemedicine

- The use of audio, video, and other telecommunications and electronic information processing technologies to provide health services or assist health care personnel at distant sites (IOM, 1996)
- Other terms: telehealth, remote monitoring, smart devices

Candidates for Telehealth Home Care

- Non compliant with treatment plan, medications, diet, or self-monitoring of key indicators
- High risk for frequent changes in condition
- Newly diagnosed
- Lack of caregiver support
- Frequent use of health care services
- Isolated or distant from provider (rural & urban, transportation issues)

VA Care Coordination Home Telehealth (CCHT) Program

- VA 2nd largest provider of telehealth services (DoD first)
 - physician visits, teleretinal imaging, store and forward radiology
- VA Office of Care Coordination is implementing home telehealth & remote monitoring nation wide
 - 30,000+ veterans enrolled

Evidence Base for Telehealth

Review (Hersh et al. 2006)

- 44 studies
- Studies limited by small samples &/or lack of control group (*what is usual care?*)
- Conclusions
 - may enhance communication with health providers & provide closer monitoring
 - required additional resources & dedicated staff, i.e., not integrated into routine care
 - gaps in the evidence base in telehealth

Heart Failure Study Team

Investigators:

- **PI: Bonnie Wakefield, PhD, RN**
- **Marcia Ward, PhD**
- **Michael Kienzle, MD**
- **Trudy Burns, PhD**
- **Gary Rosenthal, MD**

Study staff:

- **John Holman, MA, Project Director**
- **Annette Ray, RN**
- **Melody Sherubel, RN**

Iowa City VA Medical Center

*VA HSR&D Center for Implementation of Innovative Strategies in Practice
(CRIISP)*

University of Iowa College of Public Health & College of Medicine

PURPOSE

- To compare the effectiveness of telehealth to usual care in recently discharged outpatients with heart failure (HF):
 - readmission rates
 - urgent care visits
 - mortality
- Secondary outcomes
 - quality of life
 - self-efficacy
 - medication adherence

BACKGROUND

- Heart failure is one of the most common reasons for hospitalization in older patients
- Frequent admissions common
- Telehealth technologies may facilitate detection of early signs of decompensation → prevent hospitalization
- Few empirical studies have compared telehealth to traditional outpatient care
- One previous study compared the effectiveness of alternative telehealth applications (*Jerant et al. 2001*)

DESIGN

- Randomized controlled clinical trial
- Compared usual care to a nurse managed intervention delivered by either telephone or videophone
- Veterans following discharge from the hospital
- Treatment group subjects (telephone or videophone) received the intervention for 90 days following discharge from the hospital
- Subjects in the usual care group received traditional outpatient care

Inclusion Criteria

- Hospital admission with HF exacerbation
- Telephone line in home
- No hearing, visual, or communication impairments
- Cognitively intact

INTERVENTION

- Provided an electronic blood pressure monitor & scale instructed to measure daily vital signs and weights; tape measure for ankles
- Mutually agreed upon scheduled “appointment” times
- Symptom Review Checklist to assist patients
- Nurses reinforced positive behaviors, teaching, & recommendations as needed
- If the patient reports deterioration or if the nurse notes problems over the phone, e.g., worsening shortness of breath, she provided guidance and/or consulted with the appropriate provider (e.g., physician, dietitian, pharmacist).

Video Phone



Video Phone



SAMPLE

- **Enrolled n=148 over 3 years**
 - **19 deaths (12.2% 6-month mortality)**
 - **20 lost to follow up (13 drop-outs; 4 quit participating; 3 moved)**
 - **109 with complete data**
- **Three groups**
 - **33 (52) videophone (63% completed)**
 - **n=19 (9 died; 6 drop outs; 2 stopped participating; 2 relocated)**
 - **34 (47) telephone (73% completed)**
 - **n=13 (5 died; 6 drop outs; 1 stopped participating; 1 relocated)**
 - **42 (49) usual care (85% completed)**
 - **n=7 (5 died; 1 drop out; 1 stopped participating)**

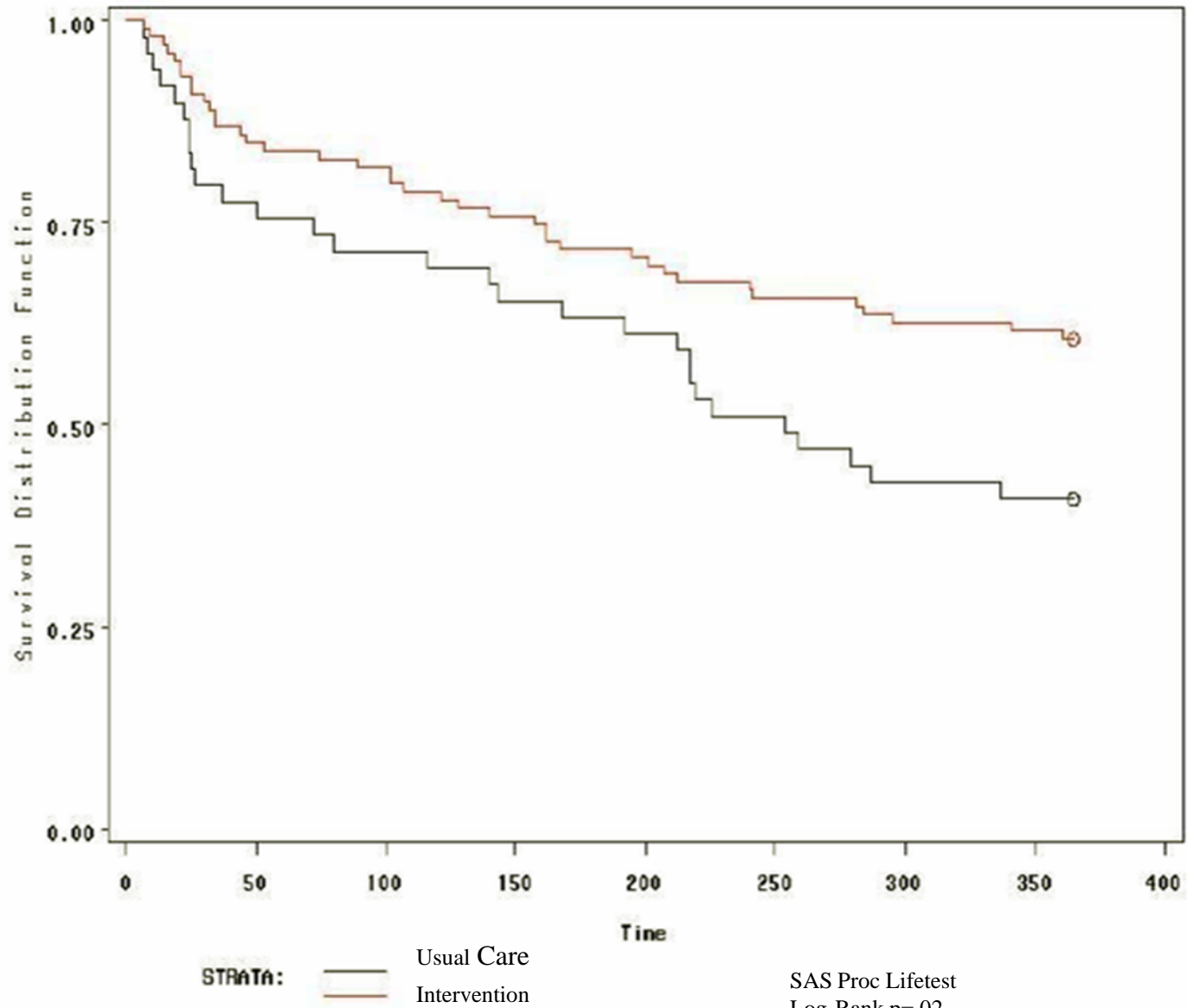
SAMPLE

- 99% male
- 94% Caucasian
- Average age at enrollment 69.3 years
- 33% less than 12 years education
- No significant differences across three groups at enrollment for severity of illness measures:
 - New York Heart Association (NYHA) classification
 - index admission length of stay
 - left ventricle ejection fraction (LVEF)*
 - prior revascularization
 - length of time with HF diagnosis*

Intervention Dose

	Telephone All subjects (N=47)	Telephone completers (N=34)	Videophone All subjects (N=52)	Videophone completers (N=33)
Mean # intervention visits	11.4 (3.9)	13.2 (1.4)	10.5 (5.4)	13.4 (0.9)
Mean length of visits (minutes)	33.5 (11.7)		36.5 (12.4)	

Survival Analysis: Time to First Readmission (365 days)



Cox Proportional Hazards Models: Intervention vs Control Time to First Readmission and Death

	<u>First Admission</u> Model Fit p=0.14		<u>Death</u> Model Fit p=0.08	
Covariate	Hazard Ratio (95% CI)	p=	Hazard Ratio (95% CI)	p=
Intervention	0.54 (0.33-0.90)	0.02	1.04 (0.49-2.24)	0.91
LVEF	1.01 (0.99-1.02)	0.37	0.98 (0.96-0.99)	0.04
NYHA Classification	1.38 (0.85-2.24)	0.19	1.15 (0.61-2.17)	0.67
Age at Admission	0.99 (0.97-1.03)	0.81	1.00 (0.97-1.04)	0.77
MLHF*	1.00 (0.99-1.01)	0.77	1.02 (0.99-1.03)	0.07

Secondary Outcomes

- Medication changes at 90 days ($p=0.04$)
 - 29% control
 - 48% telephone
 - 59% videophone
- Medication adherence – no difference

Secondary Outcomes

- Quality of life – improved for all groups; no significant differences
- Self-efficacy – no differences
- Satisfaction – no differences

SUMMARY

- Intervention was effective in reducing time to first readmission during the active intervention period & up to 12 months
- No differences in Urgent Care visits or mortality
- Usual care group had access to Primary Care nurse case manager & Cardiology nurse case managers

Summary

- Telehealth-facilitated care has the potential to enable earlier detection of key clinical symptoms, triggering early intervention and thus reducing the need for hospitalization
- The VA Office of Care Coordination is implementing home telehealth nation wide
- Currently published studies are mixed re: efficacy of care management in HF
- Further work is needed to determine which technologies work for specific patient populations, and to determine the effective intervention dose

INTERVENTION ANALYSIS

- Qualitative analyses
 - Roter Interaction Analysis System
 - Instrumental/task oriented
 - gathering data, information giving
 - Affective/socioemotional
 - building a relationship, activating and partnership building
 - 36 sub-categories

INTERVENTION ANALYSIS

- Compared 14 video sessions and 14 telephone sessions over 90 day intervention period
- Nurses were more likely to use open-ended questions, back-channel responses, friendly jokes, and checks for understanding on the telephone compared to videophone
- Patients were more likely to give lifestyle information and approval comments on the telephone, and used more closed-ended questions on the videophone

FUTURE RESEARCH

- Targeting - matching appropriate technology to the patient (disease severity, literacy, age)
- Intervention dose and timing (frequency, duration, post-discharge transitions)
- Comparison of low-cost low-tech & higher cost more complex telehealth interventions (telephone vs web based interventions)
- Caregivers
- Usability: patients and clinicians
- Usefulness