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UPMC Senior Communities

Aging Institute
of UPMC Senior Services and the University of Pittsburgh

Telemedicine in Skilled Nursing Facilities: A Brave New World

Steven Handler MD, PhD, CMD

Steven M. Handler, MD, PhD, CMD
Assistant Professor and Director of Clinical Informatics, Department of Biomedical Informatics and Division of Geriatric Medicine; Medical Director, Long-term Care HIT, UPMC Senior Communities.

Avoidable Hospitalizations from the Skilled Nursing Home (SNF)

- Two-thirds of SNF residents are enrolled in Medicaid, and most are also enrolled in Medicare (Medicare-Medicaid enrollees).
- SNF residents are frequently subject to avoidable inpatient hospitalizations.
- These hospitalizations are expensive, disruptive, and disorienting, and nursing facility residents are vulnerable to risks that accompany hospital stays and transitions between nursing facilities and hospitals.
- Avoidable hospitalizations among SNF residents stem from multiple system failures.

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Opportunity for Care Coordination: Potentially Avoidable Hospitalizations

- Rates are highest for Medicare-Medicaid enrollees in skilled NHs and lowest for those residing in community settings.

- Five Conditions are responsible for over 80% of the PAHs. These conditions are:
  - -CHF
  - -COPD, Asthma
  - -Dehydration
  - -Pneumonia
  - -Urinary tract infection

Summary Statistics on Medicare-Medicaid Enrollees and Potentially Avoidable Hospitalizations	
# of Potentially avoidable hospitalizations	**699,818**
Percentage of hospitalizations that were potentially avoidable	**26%**
•Total costs in 2005	**$5.6 billion**
•Average length of stay	**6.1 days**
2011 estimated costs attributable to Medicare-Medicaid enrollees PAHs	**$7-8 billion**

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Factors Associated with Avoidable Admissions

- Lack of advance care planning/not up-to-date care plans
- SNF staff may lack skills and/or training needed to deal with certain medical conditions
- Lack of clarity regarding physician notification and objective criteria to send to ED or hospital
- Physicians may prefer to treat pt's in the hospital b/c they may be unaware of what can be done on-site (tests, services, etc) and/or it may be more convenient/ financially beneficial

What are Avoidable Hospitalizations?

- Acute Renal Failure (AKI)
- Altered mental status
- Anemia
- Asthma
- C. Diff
- Cellulitis
- CHF
- Constipation/Impaction
- COPD
- Diarrhea/Gastroenteritis
- FTT
- Falls and Trauma
- HTN
- Pneumonia/Bronchitis
- Nutritional deficiency
- Poor glycemic control
- Psychosis
- Seizures
- Skin Ulcers
- UTI

http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/downloads/costdriverstask2.pdf

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Evidence that Hospitalizations can be Avoided

- Nursing facility-employed staff provider model in NY reduced Medicare costs by 16.3% (Moore & Martelle, 1996)
- Evercare reduced hospital admissions by 47% and emergency department use by 49% (Kane, et. al, 2004).
- INTERACT II reduced hospital admissions by 17% (Ouslander, et. al., 2011).
- Project Red decreased 30-day hospitalization after discharge from SNF from 18.9% to 10.2% (Berkowitz, et al., 2013)
- Our own local experience of reducing unplanned transfers.

The Triples Aim of UPMC-Owned SNFs

1. *Improving the patient experience* of care including:
   - Improve access to care for residents of SNFs without requiring hospitalization
   - Enhance quality of communication among providers and care-givers; and among the clinical team and families.
2. *Improving the health of populations*:
   - Enhancing clinical capabilities within SNFs
   - Adverse drug event detection and management
3. *Lower per capita costs* by identifying and proliferating cost-effective care models

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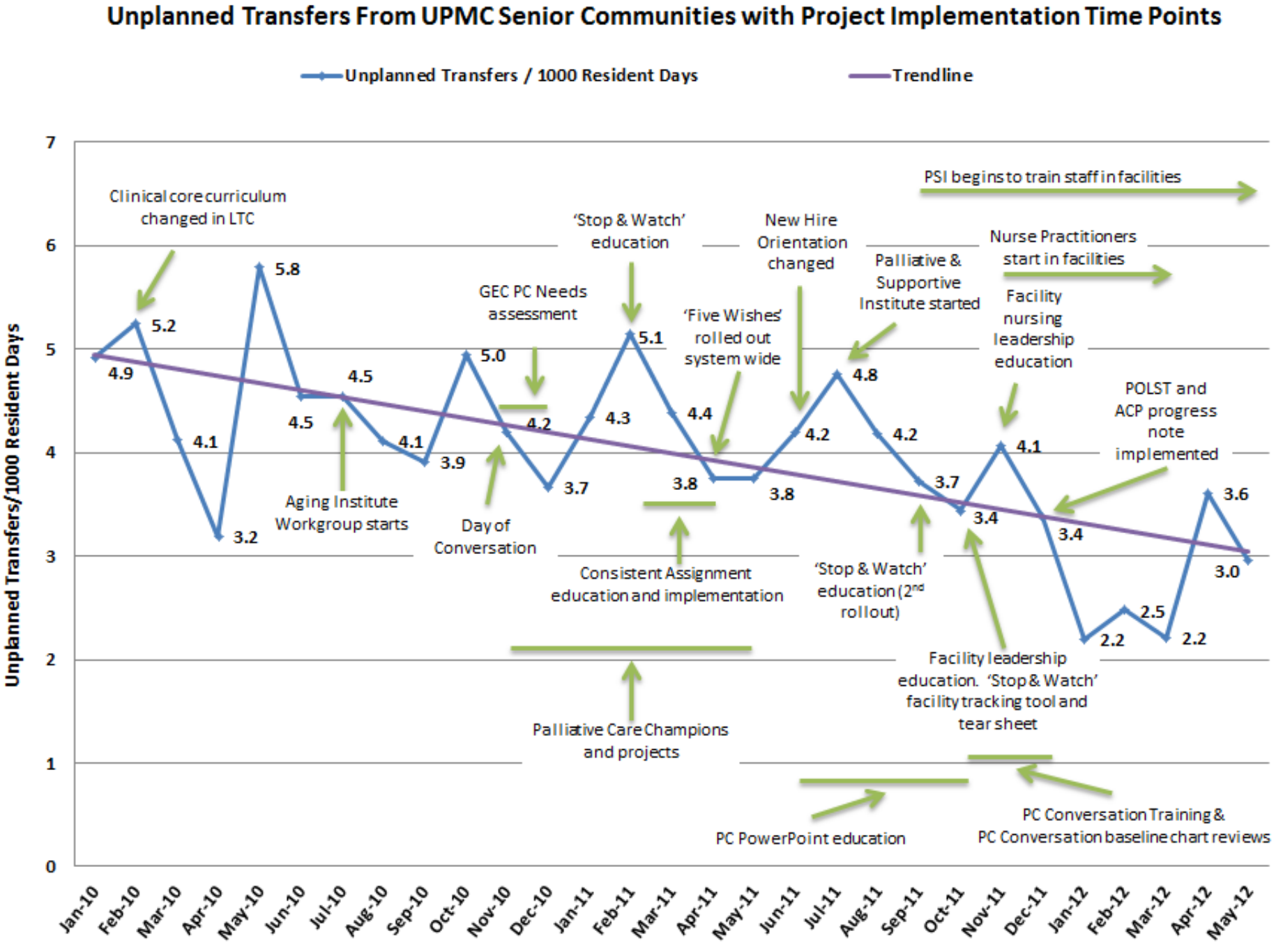
Unplanned Transfers From UPMC Senior Communities with Project Implementation Time Points
Unplanned Transfers / 1000 Resident Days
Trendline
Unplanned Transfers/1000 Resident Days
0
1
2
3
4
5
6
7
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10
Nov-10
Dec-10
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Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
4.9
5.2
4.1
3.2
5.8
4.5
4.5
4.1
3.9
5.0
4.2
3.7
4.3
5.1
4.4
3.8
3.8
4.2
4.8
4.2
3.7
3.4
4.1
3.4
2.2
2.5
2.2
3.6
3.0
Clinical core curriculum changed in LTC
Aging Institute Workgroup starts
GEC PC Needs assessment
Day of Conversation
'Stop & Watch' education
Consistent Assignment education and implementation
'Five Wishes' rolled out system wide
New Hire Orientation changed
Palliative & Supportive Institute started
'Stop & Watch' education (2nd rollout)
PSI begins to train staff in facilities
Nurse Practitioners start in facilities
Facility nursing leadership education
POLST and ACP progress note implemented
Facility leadership education. 'Stop & Watch' facility tracking tool and tear sheet
Palliative Care Champions and projects
PC PowerPoint education
PC Conversation Training & PC Conversation baseline chart reviews

Telemedicine

- Telemedicine is defined as the use of telecommunication and information technologies in order to provide clinical healthcare at a distance.

- Types of telemedicine:
  - Store-and-forward
  - Remote monitoring
  - Interactive services

Telemedicine. The Cochrane Library. (Accessed August, 20, 2013, at http://www.thecochranelibrary.com/details/collection/806797/Telemedicine.html)

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Has Telemedicine Ever Been Used in SNFs?

- A recent systematic review identified 22 studies.
- Clinical services provided included allied health (n = 5), dermatology (3), general practice (4), neurology (2), geriatrics (1), psychiatry (4) and multiple specialities (3).
- Most studies (17) employed interactive services.
- Focused on economics (3), feasibility (9), satisfaction (12), reliability (5) and service implementation (2).
- The present review shows that there is evidence for feasibility and stakeholder satisfaction in using telemedicine in LTCFs in a number of clinical specialities.
- *No studies to date have assessed the utility of telemedicine for acute change in condition or palliative needs assessments.*

Edirippulige S, et al. A systematic review of telemedicine services for residents in long term care facilities. J Telemed Telecare 2013.

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Our Approach to Telemedicine

1. Assess the current condition to better understand how consults are and should be placed to CRNPs
2. Select diagnostic medical equipment and software for acute change in condition (a sudden, clinically important deviation from a resident's baseline) and palliative needs assessments
3. Work with our institutional partners to design and build telemedicine carts and make necessary software changes
4. Test feasibility of technology (including formal study analytics), in advance of deployment to select non-owned facilities (e.g., RAVEN partner facilities)

Selection of Diagnostic Medical Equipment and Software (Requirements Specifications)

- Evaluate residents in any location within the NH
- Assess overall resident condition, skin/wounds, and conduct teleconferencing for resident care conferences
- Auscultate heart, lung, and bowel sounds
- Obtain 12-lead EKGs
- Determine presence of venous/arterial pulses
- Inspect/visualize outer and middle ear
- Use software that would run on a standard web browser and is easy to use/train clinical staff

Introducing Telly

- Telly the telemedicine cart is the newest member of the RAVEN “clinical team”
- Was developed in partnership with the University of Pittsburgh Medical Center (UPMC) Technology Development Center (TDC), Center for Connected Medicine, Information Services Division (ISD), and Community Provider Services (CPS).

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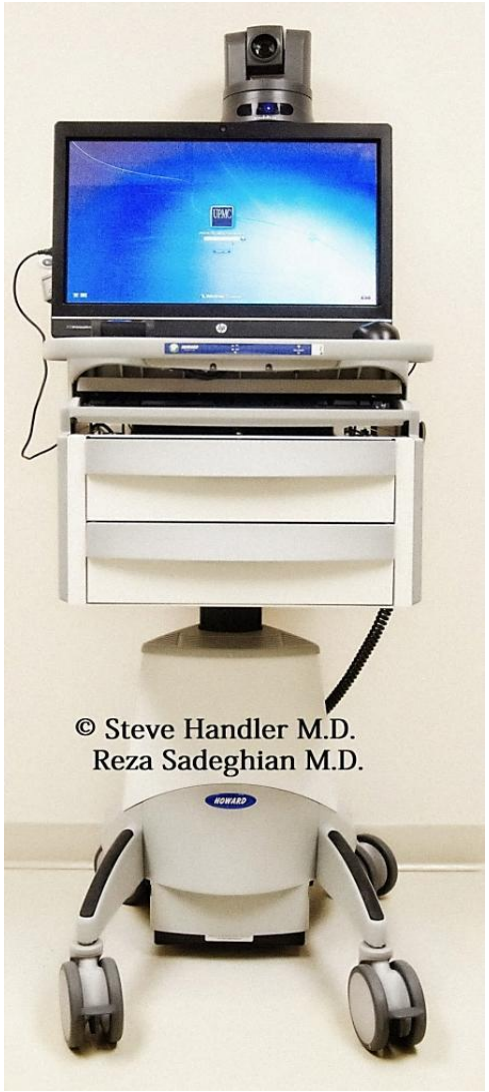
Diagnostic Medical Equipment (DME)

- HP All-in-one PC
- Vaddio ClearView PTZ Camera
- Logitech HD Pro C920 Web Cam
- Plantronic Calisto 420 Speakerphone
- 3M Digital Bluetooth Stethoscope
- Welch Allyn Digital Macroview Otoscope
- Aven Digital Mighty scope
- Cardiocard software
- Virtual Care Collaboration



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Clinical Vignette

- You receive a telephone call from a nurse who just evaluated a resident for an acute change in condition.
- The nurse completed the noted that the resident has a temp of 101º F, is tachycardic (pulse of 110), and her left lower leg is red and swollen.
- The nurse has a difficult time explaining the skin findings to you over the phone and also states that the son who is a physician in Utah would like to send the resident out to the hospital where they provide better care.
- What should you do?

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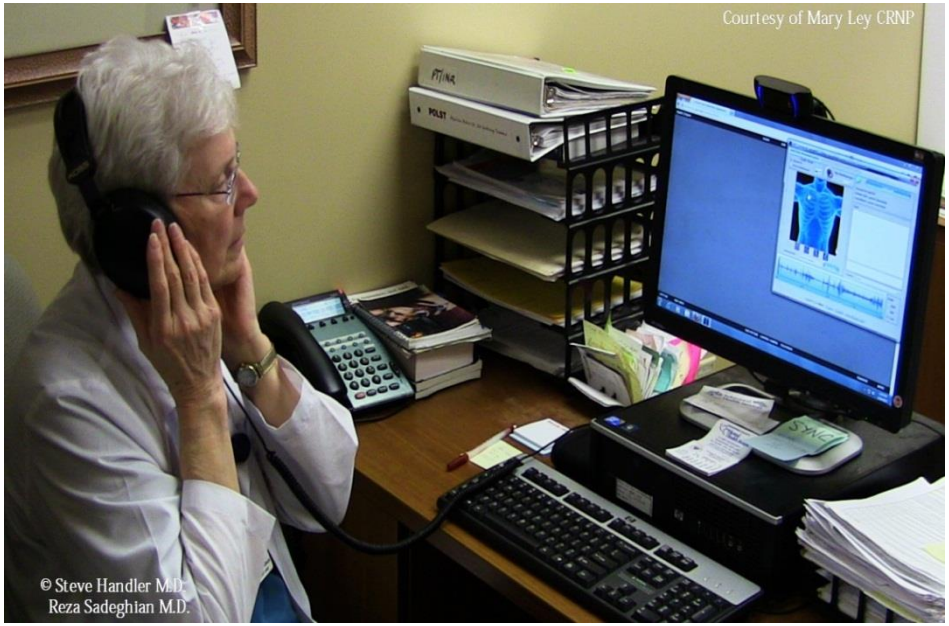
Live Session

- Internet-based telemedicine consult between on-site CRNPs and NH residents with bedside examination performed by nurse (RN or LPN).



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Using UPMC's Virtual Care Collaboration (VCC) Software

PATIENT NAME
Jonathan Sample

CHIEF COMPLAINT
WP NEW TELEMED

APPOINTMENT TIME
9:36 am (about 2 hours ago)
March 18, 2013

Physician
Doctor Test

OTHER PARTICIPANTS

APPOINTMENT ENDPOINT
UPMC_Passavant_Emp_Clinic
9100 Babcock Blvd.
Pittsburgh , PA 15237

VITALS

Height:	5'5
Weight:	150
Blood Pressure:	125/85
Heart Rate:	105

ALLERGIES
CLINDAMYCIN HCL
AMOXICILLIN-POT CLAVULANATE
SULFACETAMIDE
SULFA (SULFONAMIDE ANTIBIOTICS)
Cleocin T
sulfa drugs
sulfamethoxazole
Augmentin

MEDICATIONS
benzonatate 100 MG Oral Capsule

Acetaminophen 325 MG / Chlorpheniramine Maleate 2 MG Oral Tablet [Coricidin]

Sodium Chloride 0.154 MEQ/ML Nasal Spray [Simply Saline]

Lisinopril 20 MG Oral Tablet

lamotrigine 200 MG Oral Tablet

{6 (Azithromycin 250 MG Oral Tablet) } Pack

DEMOGRAPHICS
Birth Date: 1976-08-12-04:00
Marital Status: SINGLE
Race: WHITE
Religion: CATHOLIC

HOME ADDRESS
2349 JAMES DR
PITTSBURGH, PA 15237

PATIENT ID
EPIC MRN: 165626211

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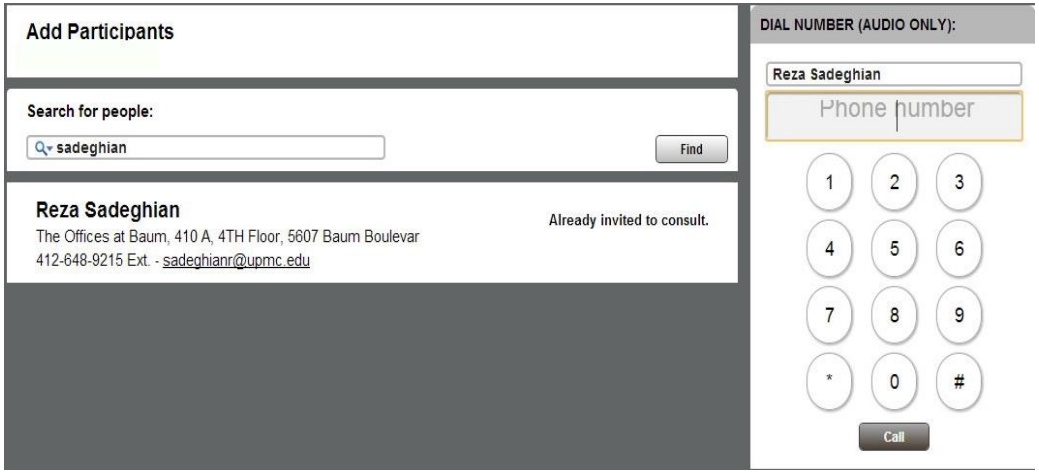
Linda L Pfeuffer
Mary E Ley

Calling a Family Member to Discuss Options



I agree, don't send her out!

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Feasibility of Using Telemedicine to Assist Nurse Practitioners with Managing Acute Change in Condition and Palliative Care Assessments of Nursing Home Residents

Study Objectives

- Our *short-term* objective was to determine the feasibility of using telemedicine to assist nurse practitioners (CRNPs) with managing acute change in condition and palliative care assessments of UPMC NH residents.

- Our *long-term* objective was to determine the optimal configuration and use of the telemedicine carts to assist the RAVEN nurse practitioners (CRNPs) with managing acute change in condition and palliative care assessments of residents in our partner facilities.

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Diagnostic Medical Equipment Considered

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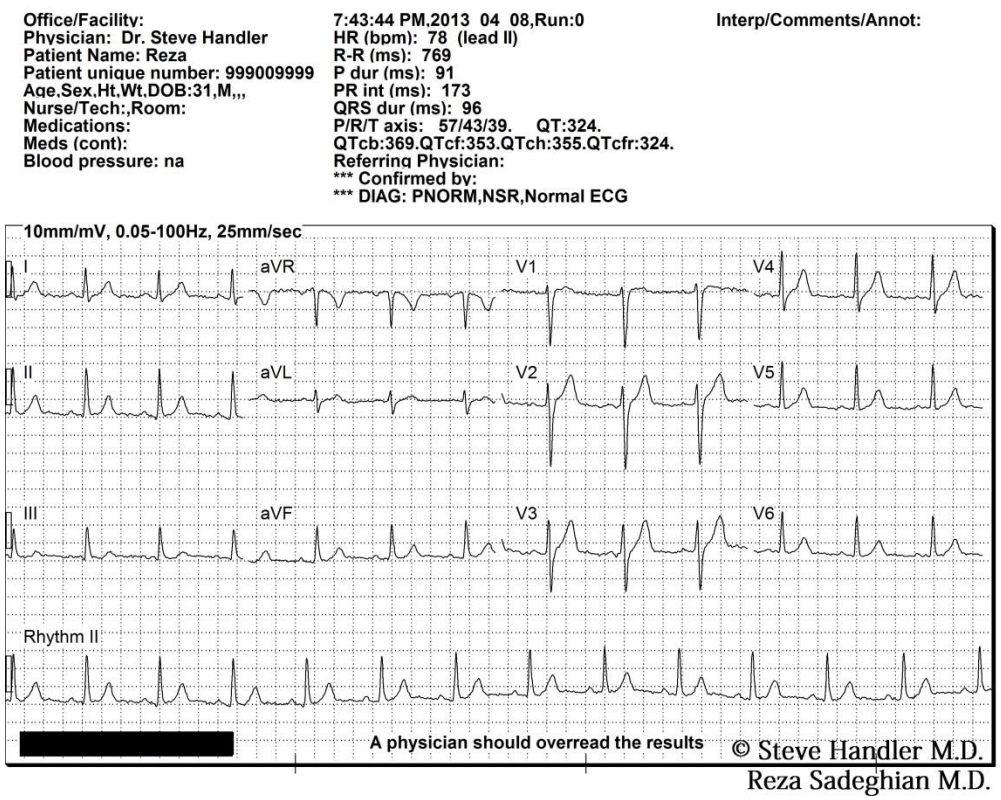
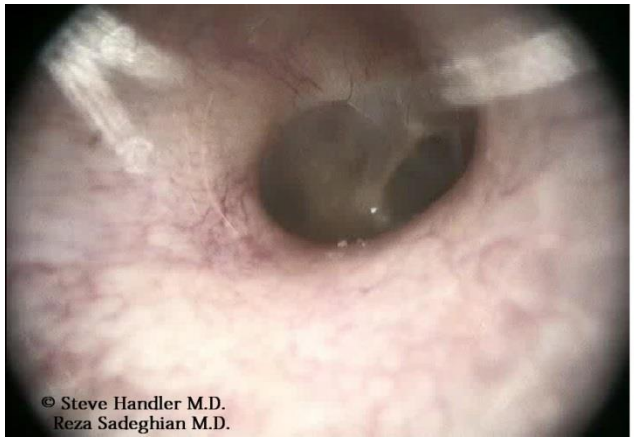
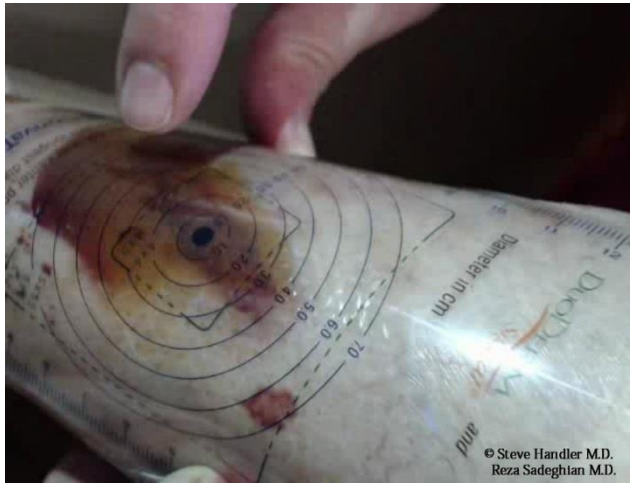
Sample Images from the Diagnostic Medical Equipment







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Education and Implementation Plan

- Developed Advanced Telemedicine Clinical Training Series (ATCTS)™
  - In-class training for the diagnostic medical equipment (didactics)
  - Hands-on group training
- Developed ATC Skills and Competency Exam (ATCSCE)™
  - Oral practical

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Methods

- Subjects: Two CRNPs completed 60 consults between 05/01/13 and 07/28/13.
- Participants: 18 different nurses and 58 unique residents.
- Design/Data Source: Observational study design where we developed and used 3 web-based surveys (1 pre and 2 post) to quantify the perception of telemedicine services in terms of quality of the diagnostic medical equipment used and quality of the medical care provided following each consultation.
- Statistics: Simple descriptive statistics; Wilcoxon signed rank test

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Key Findings From the CRNP Perspective

- Average time per consult was 16 min.
- For 88.3% of the sessions, the technology was effective in the medical management of the resident.
- For 91.7% of the sessions, the use of telemedicine is an appropriate and effective use of the CRNP's skillset and time.
- Telemedicine allowed them to provide appropriate care while helping the resident avoid a face-to-face visit by a CRNP 86.7% of the time, and an attending physician 90% of the time.
- For 60% of the sessions, the telemedicine consult helped to avoid resident transfer to the hospital/emergency department (60 consults * 60% * $11,000 = $396,000 cost avoidance).

Limitations and Problems Encountered

- Single NH with relatively low acuity and bed size.
- Small number of resident consultations. However, the sample size was consistent with other telemedicine feasibility studies.
- Inadequate bandwidth at UPMC Canterbury
  - Required a circuit to be upgraded associated with a several month delay
- Bluetooth stethoscope interference

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Conclusions

Telemedicine used by nurse practitioners to conduct consultations for an acute change in condition and/or palliative care need in the nursing home:

- is an effective use of their skillset and time
- is effective in the medical management of the resident
- avoids the need for face-to-face visits
- can help avoid resident transfers to the hospital/emergency department.

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Reduce Avoidable hospitalizations using Evidence-based interventions for Nursing facilities (RAVEN) in Western Pennsylvania: A Focus on Telemedicine

https://raven.upmc.com/

RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

RAVEN Reduce AVoidable hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

HOME | PARTNER LOGIN | CONTACT US

A true collaborative effort among various organizations – led by the Aging Institute of UPMC, and partnered with the University of Pittsburgh, the Jewish Healthcare Foundation, Robert Morris University, Excela Health and Heritage Valley Health System to reduce avoidable hospitalizations.

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of UPMC Senior Services and the University of Pittsburgh

UPMC Palliative and Supportive Institute

- About Raven
- RAVEN Leadership
- Operating Partners
- Partner Facilities
- Telemedicine
- Useful Links

Telemedicine

Press Release

Our goal is to provide your family member with continuous access to high quality healthcare and healthcare professionals on a 24/7 basis. We recognize that your physician or nurse practitioner is sometimes not available at the nursing home to evaluate and treat your family member when there is a change in their usual state of health.

That's why Drs. Handler and Sadeghian are working with the clinical staff at your facility, the University of Pittsburgh Medical Center (UPMC) Technology Development Center, the Center for Connected Medicine, the Division of Geriatric Medicine, and the Department of Biomedical Informatics to bring you the newest member of our team; Telly. Telly is a telemedicine cart that is operated remotely by a physician or nurse practitioner, with the assistance of a nurse located at your loved one's bedside.

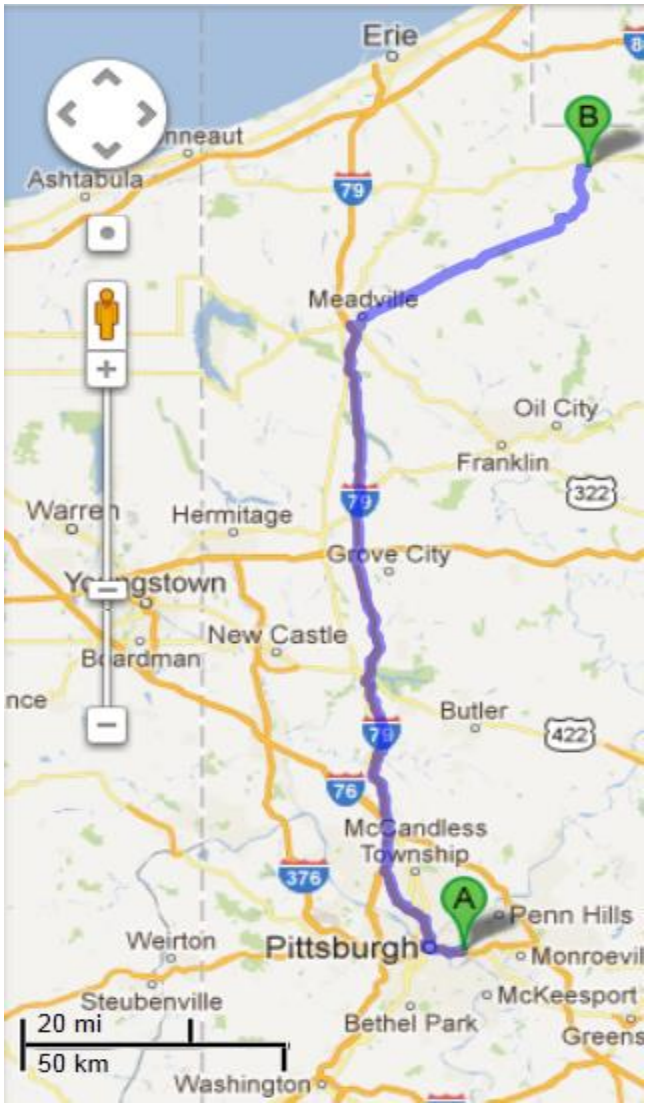
Telly allows a clinician to remotely perform a history and physical examination of the eyes, ears, nose, throat, lungs, heart, abdomen, skin, extremities, and nervous system. Telly can also allow family members with a working telephone or computer, to be involved in making better informed decisions about treatment options any potential changes to the care plan which may include a decision to transfer the resident to a hospital.

Cooperative agreement with CMS: CMS-1E1CMS331081-01-00

https://raven.upmc.com

Geographic Distribution of RAVEN Partner SNFs (n = 19)

133 Miles/ 2.25 hrs.

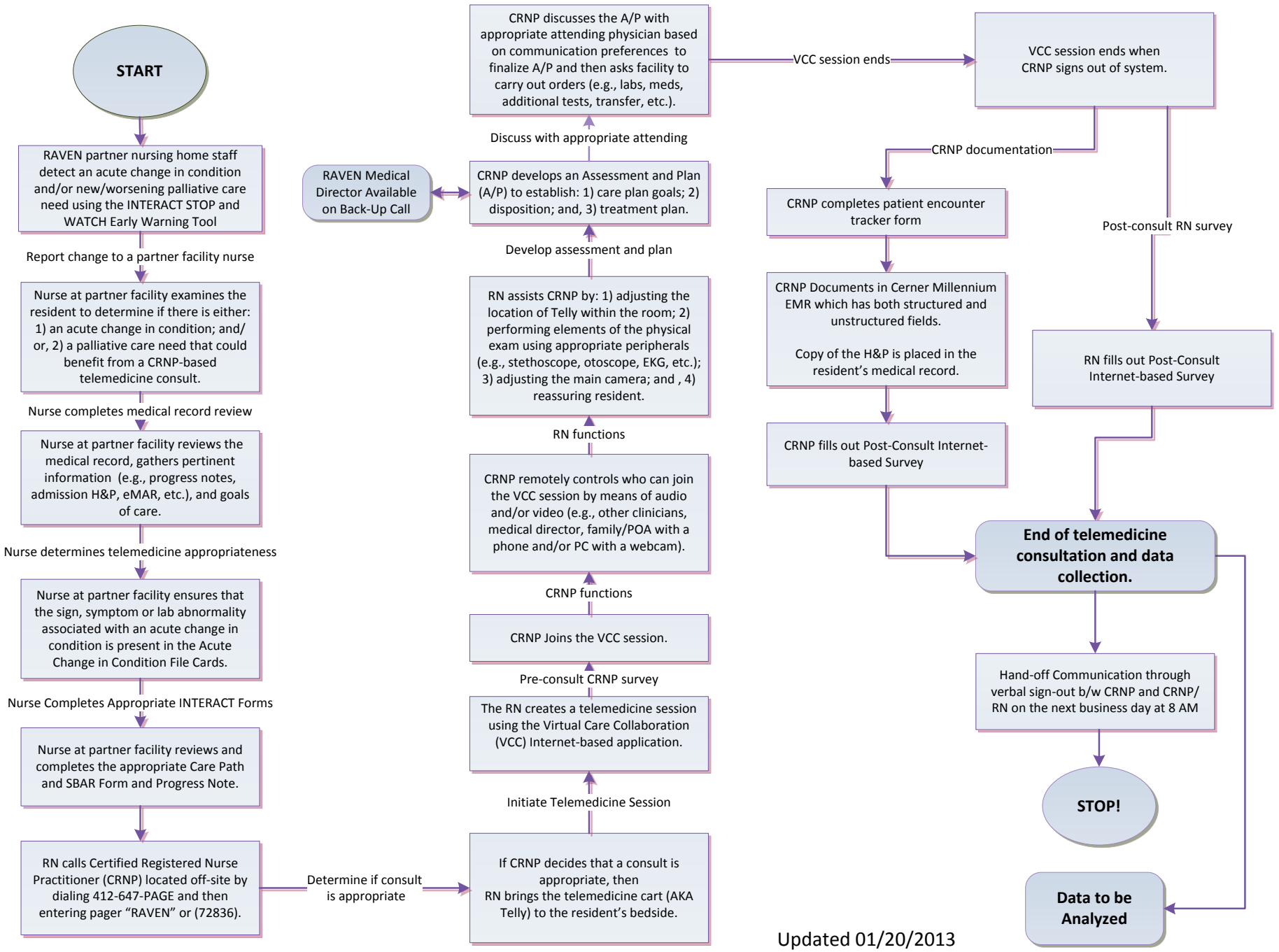


RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

RAVEN Core Program Elements:

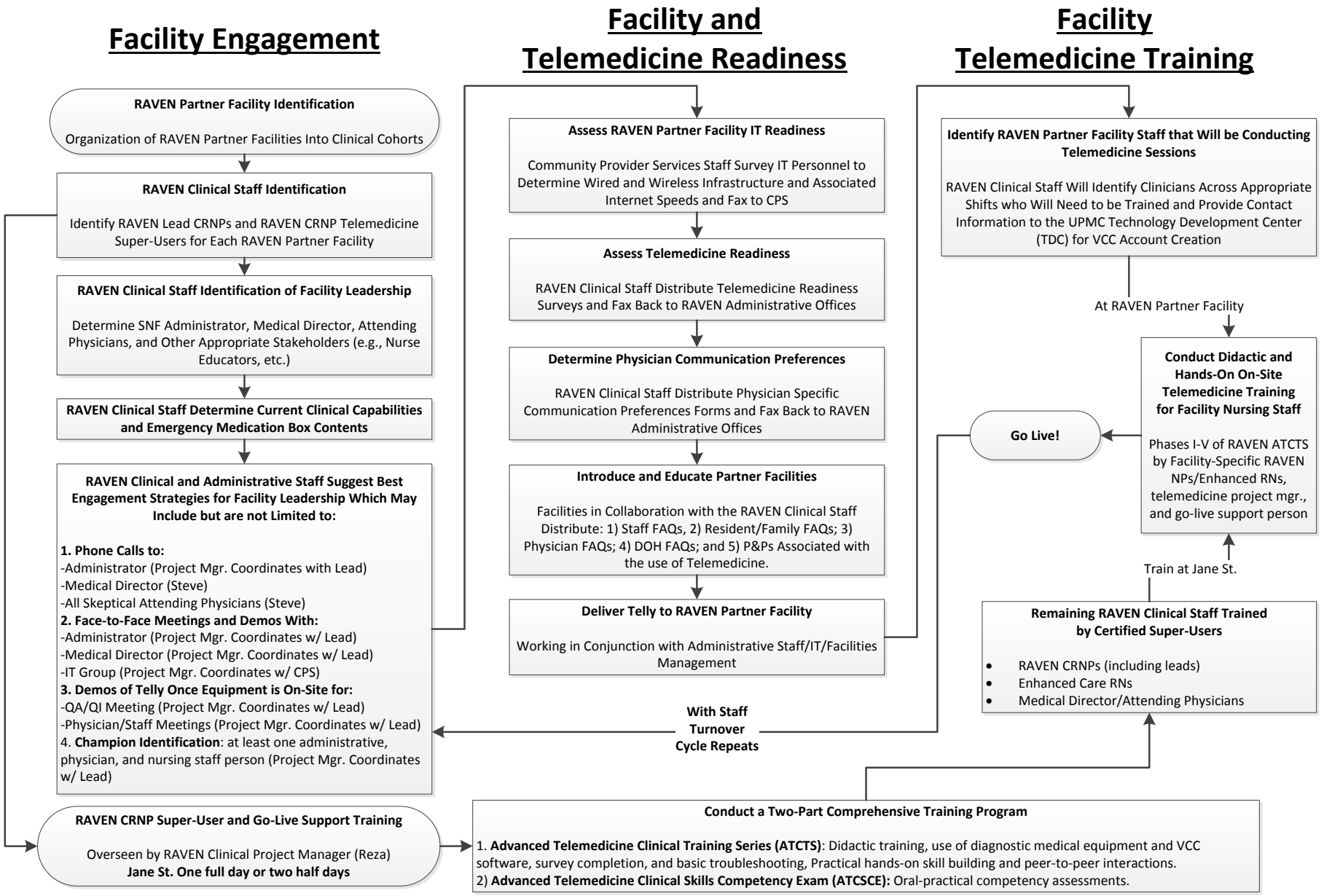
1. Facility-based Nurse Practitioners/Enhanced Care Nurses
2. INTERACT tools to reduce avoidable hospital admission
3. Individualized educational program/simulation
4. Enhanced medication management, monitoring, and pharmacy engagement
5. **Use of telemedicine to enable remote clinical assessment, and facilitate communication.**

RAVEN Telemedicine Clinical Workflow and Data Collection



Updated 01/20/2013

RAVEN Telemedicine Rollout Plan



Telly Cohort 1: Kane Glen Hazel; Kane McKeesport; Kane Ross; Ball Pavilion; Lutheran Home at Kane; Friendship Ridge
Telly Cohort 2: Mountainview Speciality Care; Oakwood Heights; The Caring Place; Evergreen; Golden Living; Sugar Creek Rest; Sunnyview
Telly Cohort 3: Trinity; Westmoreland; Sweden Valley Manor; The Commons at Sq Hill; Edison Manor; Corry Manor

Updated 01/06/2014

IT Readiness

RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

Our goal is to provide continuous access to high quality healthcare and healthcare professionals during afterhours and weekends. We recognize that nursing home physicians and nurse practitioners are sometimes not available to evaluate and treat a resident when there is a change in their usual state of health. That's why we have developed **Telly**. **Telly** is a telemedicine cart that is operated remotely by a physician or nurse practitioner with the assistance of a nurse located at the resident's bedside. **Telly** allows a clinician to remotely perform a history and physical examination of the eyes, ears, nose, throat, lungs, heart, abdomen, skin, extremities, and nervous system. **Telly** allows anyone with a working telephone or computer, to be involved in making better informed decisions about treatment options and any potential changes to the care plan, which may include a decision to transfer your resident to a hospital. **Telly** however needs to use the Internet to send and receive data and we need to know more about the IT capabilities in your facility.

1. Name of Facility: _____

2. Do you have access to the internet in your facility?
   a. Yes ☐
   b. No ☐

3. Who is your internet service provider (ISP)?
   a. Name: _____
   b. Phone: _____

Telemedicine Readiness

PARTNER FACILITY TELEMEDICINE READINESS SURVEY

RAVEN PARTNER FACILITY NAME: _____ **Date:** ____/____/____

ROLE (Select all that apply):			
☐ **Attending physician**	☐ **Medical Director**	☐ **Facility Administrator**	☐ **Nurse educator**
☐ **DON**	☐ **RN/LPN**	☐ **Charge/Nurse**	☐ **Other** _____

Please indicate your agreement with the following statements regarding the use if telemedicine in nursing homes using a 7-point scale ranging from 1 (strongly agree) to 7 (strongly disagree):

Statement	1 Strongly Agree	2	3	4	5	6	7 Strongly Disagree
1. Telemedicine may increase overall efficiency							
2. Telemedicine may fill an existing service gap							
3. Telemedicine may improve timeliness of resident care							
4. Telemedicine may help avoid resident transfers to hospital/ED							
5. Telemedicine may help improve service productivity of medical staff							
6. A step toward successful implementation of Telemedicine is addressing potential workflow and process challenges							
7. Telemedicine may be depersonalizing							
8. Telemedicine may hinder CRNP-resident relationships							

RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

Physician Communication Preferences

RAVEN CRNP Telemedicine Consultation Physician-Specific Survey Notification Form
Please Complete this Survey and Return it to the RAVEN CRNP/RN OR Fax it to 855-223-7077
(Note that all data **collected will be stored securely** *and not redistributed)*

Name of RAVEN Partner facility: _____

1. Contact Information:

First Name: _____	Last Name: _____
Office Mailing Address: 1st line _____	Office Phone Number: ( ) -
2nd line _____	Office Fax Number: ( ) -
City _____	Pager Number: ( ) -
State _____ Zip _____	Mobile/Cell Number: ( ) -
	Home Phone Number: ( ) -
Preferred e-mail address: _____	

2. Would you prefer to receive communication from a RAVEN CRNP after ALL telemedicine consults *OR* just following consults where the CRNP feels that a hospital transfer may be indicated:

☐ A	☐ B
After ALL consults	Only for consults where a potential transfer may be indicated

3. What is your preferred method of receiving communication related to acute change in a resident's condition or palliative care need(s):

☐ A	☐ B	☐ C	☐ D	☐ E	☐ F
Office phone	Pager	Cell phone	Home phone	Email	Other: _____

RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

Staff, Family and Physician FAQs

RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

Dear Nursing Home Staff,

Our goal is to provide continuous access to high quality healthcare and healthcare professionals. We recognize that nursing home physicians and nurse practitioners are sometimes not available to evaluate and treat a resident when there is a change in their usual state of health.

That is why we are working with the clinical staff at your nursing facility, the University of Pittsburgh Medical Center (UPMC) Technology Development Center, the Center for Connected Medicine, the Division of Geriatric Medicine, and the Dept. of Biomedical Informatics to bring you the newest member of our team; **Telly**. **Telly** is a telemedicine cart that is operated remotely by a physician or nurse practitioner, with the assistance of a nurse located at the resident's bedside.

Telly allows a clinician to remotely perform a history and physical examination of the eyes, ears, nose, throat, lungs, heart, abdomen, skin, extremities, and nervous system. **Telly** allows anyone with a telephone or computer, to be involved in making better informed decisions about treatment options and any potential changes to the care plan, which may include a decision to transfer your resident to a hospital.

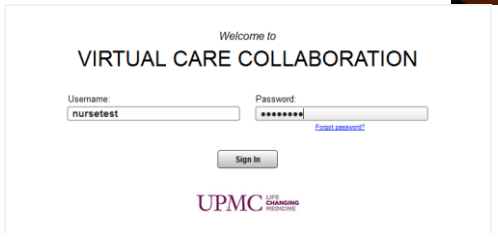
Frequently asked questions (FAQs):

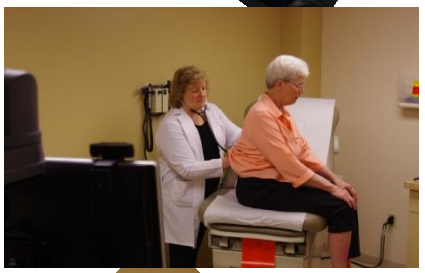
1. **Q:** Will **Telly** replace the usual direct face-to-face care that a resident receives?
   A: No, **Telly** will be used primarily when a physician or nurse practitioner is unable for whatever reason to have a face-to-face encounter and examine a resident directly.
2. **Q:** Will **Telly** be used for routine medical examinations that a resident receives?
   A: No, **Telly** will be used to help a physician or nurse practitioner to assess a change in a resident's usual state of health. Examples of changes in usual state of health may include a change in a resident's breathing, heart function, urination, pain, skin finding, or level of confusion.
3. **Q:** Will **Telly** be used in place of sending a resident to the hospital for evaluation?
   A: No, all residents that require hospital-level care either before or following a telemedicine session will be sent if medically indicated and consistent with the resident/families wishes.
4. **Q:** Who will be conducting the telemedicine consults and when will they occur?
   A: CRNPs who function within a collaborative practice agreement with the attending physician will conduct the telemedicine consults for residents with acute changes in condition and/or palliative care needs when after-hours **Telly** coverage is available.
5. **Q:** How does the use of **Telly** change what I need to do in the nursing home?
   A: Following training by the UPMC Technology Development Center, you will be responsible for assisting the CRNP by setting up **Telly** in the resident's room, staying bedside during the exam, and using the peripherals (e.g., digital stethoscope, otoscope, patient exam camera) requested by the CRNP.

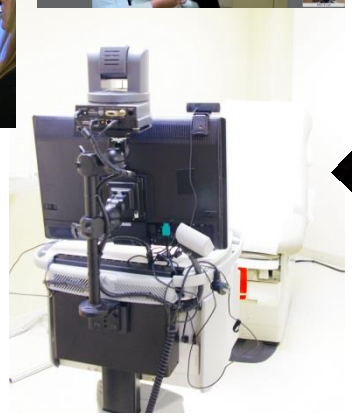
If you have any questions, please contact Dr. Steven Handler at 412-648-9215.

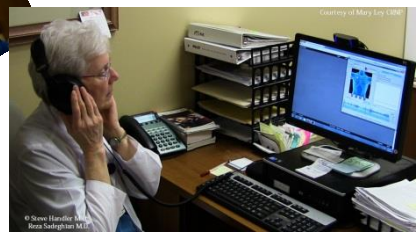
Warm regards,

Training









RAVEN Reduce AVoidable Hospitalizations using Evidence-based interventions for Nursing facilities in Western Pennsylvania

Approach to Training 1

- **PHASE I (Complete with PHASE II as a group and takes 10 min)**:
  - Group didactic session and overview and rationale for doing telemedicine

- **PHASE II (Complete with PHASE I as a group and takes 90 min; Then repeat either 1:1/1:2/1:3 and takes 120 min)**:
  - Small group (2 nurses maximum at a time) reviewing core functionality and assessing

Approach to Training 2

- **PHASE III (Takes 30 min per person)**:
  - Rubric and competency examination Phases I-II

- **PHASE IV (1:1/1:2/1:3 and takes 45 min):**
  - Small group (2 nurses maximum at a time) reviewing more advanced functionality

- **Phase V (Takes 30 min per person):**
  - Rubric and competency examination assessing Phase IV

Clinical Management and Protocol Development

- Focus on the 20 CMS diagnoses associated with avoidable hospitalizations
- Modify acute change of condition cards to determine which signs, symptoms and lab abnormalities are appropriate for telemedicine
- Modify and develop SBAR communication tools
- Create clinical protocols or algorithms to standardize response to change in condition

UPMC LIFE CHANGING MEDICINE

Other Aspects of the Project

- Develop a policy and procedure modeled from the inpatient setting to ensure appropriate use of telemedicine in UPMC SNFs
- Develop an infection prevention policy and procedure
- Develop an implementation/training plan for UPMC SNFs
- Add language to current consent for treatment upon entering a UPMC SNF that we may use telemedicine

UPMC LIFE CHANGING MEDICINE

Future Opportunities

- Tele-care coordination/care planning [RAVEN]
- Tele-medication management [RAVEN]
- Tele-ostomy/wound care [Health Plan]
- Tele-dermatology
- Tele-cardiology/CHF
- Tele-rounding [Seneca Vent/LTAC Unit]
- Tele-psychiatry [WPIC]
- Tele-neurology
- Tele-Infectious Disease
- Next round of CMS findings

UPMC LIFE CHANGING MEDICINE

Research Questions

- Assessment of the telemedicine implementation and training program
- Precise impact of telemedicine on potentially avoidable hospitalizations
- Perception of telemedicine services from multiple stakeholder perspectives (nurse, NP, physicians)

UPMC LIFE CHANGING MEDICINE

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