

Infection in Home Health Care – Prevalence, Risk Factors, and Challenges
Prof. Jingjing Shang, Columbia University
A Webber Training Teleclass

Infection in Home Health Care – Prevalence, Risk Factors, and Challenges

Jingjing Shang, PhD, RN, OCN

Assistant Professor

Columbia University, School of Nursing

Hosted by Paul Webber
paul@webbertraining.com

www.webbertraining.com

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Objectives

- Review the literature on infection in home care setting
- Understand the prevalence and risk factors of infection in home care
- Discuss the challenges in developing infection surveillance in home care
- Analyze a potential approach to address the challenge

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Background – Home Health Care

- Home health care (HHC): health care provided by professionals to a person in his/her own home.
- HHC is the fastest growing health care sector in the U.S.
 - In 2009, over \$72.2 billion was spent in HHC;
 - In 2010, approximately 12 million patients, most (69%) over 65 years old, received health care services from over 33,000 HHC agencies nationwide in 2010;
 - The demand for HHC is expected to increase as the population continues to age.
 - It is estimated that 20% of Americans will be older than 65 in 2013.

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Background – Infection in Home Health Care

- Receiving health care at the home poses special challenges and health hazards.
 - Health care are often provided by patients, family members or others;
 - Home environment is usually limited by space, lacks sufficient supplies or resources;
 - Increasing use of indwelling devices in home care patients.

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Background – Infection in Home Health Care

- 3 infection outbreaks in 1990's
 - 1993: patients receiving home intravenous infusion therapy at Rhode Island Home Therapies developed bloodstream infections (BSIs)
 - 1992-1994: Hematology/oncology pediatric patients receiving HHC in Oakland, CA had an increase number of BSIs
 - 1994-1995: Patients in Huston Coram healthcare center using needleless devices developed BSIs.
- All related with indwelling catheters

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Background – Infection in Home Health Care

- Since 1990's, more research has focused on infection in HHC
- A systematic review* was published in 2014 to critically synthesize evidence on infection prevalence and risk factors among patients receiving home health care

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Systematic Review – Methods

- Publications up through May 2013 in English language
- Database
 - Pubmed
 - Medline
 - Cumulative Index for Nursing and Allied Health Literature (CINAHL)
- Search terms
 - Home care, home health care, hospice, home infusion
 - Infection, sepsis, infection disease, communicable diseases, pneumonia
- Hand search reference lists of the selected articles 7

Systematic Review – Methods

- Inclusion criteria
 - Design
 - Experimental
 - non-experimental design
 - Patients receiving health or supportive care at home
 - home care,
 - hospice,
 - home infusion treatment,
 - home total parenteral nutrition treatment.
 - Primary outcome measures
 - Infection (any type) rates or/and
 - risk factors related to infections (any type)

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Systematic Review – Methods

- Exclusion criteria
 - Editorials or commentaries
 - Studies that focused on infections among HHC workers or family members
 - Studies with small sample sizes ($n < 20$)
 - Studies related to outbreaks

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Systematic Review – Methods

- Data extracted from studies
 - Research objectives, design, sample size, target population, infection type(s), infection rate, identified risk factors
- Study quality was assessed by using 2 observational research checklists
 - Identified the strengths and major threats to the study internal/external validity.
- 2 researchers independently reviewed each study

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Systematic Review – Findings

- 1,287 articles were screened, 25 studies were included for final review
 - 13 (52%) studies in U.S., 9 (36%) in Canada or European countries
 - 14 (56%) studies focused on patients receiving home parenteral nutrition (HPN) treatment, 4 (16%) studies focused on general HHC patients
 - 17 (68%) studies were conducted in a single HHC site, 2 (8%) studies used U.S. national representative samples.
 - 22 (88%) studies examined a single type of device-related infection, 3 (12%) studies described all types of infections in general HHC patients

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Systematic Review – Findings

- Infection Rate (from 24 studies)
 - Definition
 - Number of infections per 1,000 device days
 - Number of infections per catheter year
 - Number of infections per 100 catheter insertions
 - Number of infections during the 31-month study period
 - Proportion of infected patients out of the total number of HHC patients

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Systematic Review – Findings

- Infection rates varied dramatically between studies
 - CLABSI: 10.4 ~ 0 infections/1,000 device days
 - UTI: 8.4 ~ 1.06 infections/1,000 device days
 - 80.9% ~4.5%
- In general, patients receiving HPN treatments had higher infection rates than other patient populations

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Systematic Review – Findings

- Risk factors of infections (from 14 studies)
 - Different studies reported different risk factors
 - Demographical factors: younger age
 - Medical history: underlying diseases, BMT history, BSI history
 - Treatment related: receiving HPN treatment, with HPN treatment < 5 years, blood transfusion, receiving infusion therapy outside the home,
 - Indwelling devices related: multilumen catheter, central venous access salvage
 - Socioeconomic factors: being a part-time student, receipt of social welfare
 - Conflicting or unexpected findings

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Systematic Review – Findings

- Quality of the reviewed studies varied
 - Infection definitions
 - Clinical symptoms, laboratory confirmation, CDC definition
 - A few relied on patients' self-reported information
 - Major threats
 - Small sample sizes
 - Bivariate analysis
 - Convenience sample, at a single HHC site

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Suggestions for Future Research

- Future study
 - Large sample size
 - Nationally representative sample
 - Focus on HHC patients other than those receiving HPN,
 - Use multivariate analysis
 - Include socioecological factors: home environment and caregivers

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Infection Control & Prevention in HHC

- Infections are prevalent in HHC setting.
- HHC patients' risk for infection will increase.
- Infection Control & Prevention is critical for a high quality of home care.
 - One of the **national patient safety goals** by the Joint Commission for home care

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2015 Home Care National Patient Safety Goals

The purpose of the National Patient Safety Goals is to improve patient safety. The goals focus on problems in health care safety and how to solve them.

Identify patients correctly

NPSG.01.01.01

Use at least two ways to identify patients. For example, use the patient's name *and* date of birth. This is done to make sure that each patient gets the correct medicine and treatment.

Use medicines safely

NPSG.03.06.01

Record and pass along correct information about a patient's medicines. Find out what medicines the patient is taking. Compare those medicines to new medicines given to the patient. Make sure the patient knows which medicines to take when they are at home. Tell the patient it is important to bring their up-to-date list of medicines every time they visit a doctor.

Prevent infection

NPSG.07.01.01

Use the hand cleaning guidelines from the Centers for Disease Control and Prevention or the World Health Organization. Set goals for improving hand cleaning. Use the goals to improve hand cleaning.

National HHC Infection Surveillance System?

- A 2002 publication* by Manangan & et al.
 - Highlighted the significance of infections in home care settings
 - Suggested that a national infection surveillance system for home health care would reduce infection rates
 - National Nosocomial Infections Surveillance (NNIS) System
 - Established in 1970's
 - For hospitals

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Challenges in developing infection surveillance in home care

- Lack of nationally accepted definitions and methods
 - APIC published infection definitions for HHC, but not validated
- Loss of patient follow up
- Lack of trained personnel
 - Only a small number of HHCs have infection preventionist
- Difficulty in obtaining laboratory and clinical data
- Difficulty in obtaining numerator and denominator data

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Potential Solution to Address the Challenges

- Existing data sources
 - Missouri Alliance for Home Care (MAHC)
 - Infection Surveillance Project (ISP)
 - 250 member agencies, most located in Missouri
 - Outpatient Parenteral Antimicrobial Therapy (OPAT) registry
 - International data source
 - 25 OPAT provider sites from 16 states and 24 provider sites from 6 other countries participating the registry
 - Outcome and Assessment Information Set (OASIS)
 - To monitor the quality of HHC with a standardized & comprehensive assessment instrument, for the purpose of outcome-based quality improvement
 - All Medicare-certified HHC agencies

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OASIS: Potential Database for National Infection Surveillance in HHC

- Patient population: all patients, 18 years and older, who are receiving skilled care that is reimbursed by Medicare or Medicaid
 - with an exception of pre or postnatal patients
- Assessment time points
 - Admission (Start of Care)
 - Readmission (Resumption of care after inpatient stay)
 - Transfer to inpatient facility,
 - Death,
 - Discharge from home care,
 - Reassessment (when a patient's HHC stay reaches a 60-day time point)

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OASIS: Potential Database for National Infection Surveillance in HHC

- OASIS collection
 - By registered nurses (RNs) or therapists
 - Strategies used to ensure quality of data
 - observation,
 - interview,
 - review of pertinent documentation (e.g., hospital discharge summaries to obtain information on inpatient facility procedures and diagnoses),
 - discussions with other care team members where relevant (e.g., phone calls to the physician to verify diagnoses), and
 - measurement (e.g., wound length/width, intensity of pain)

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OASIS: Potential Database for National Infection Surveillance in HHC

- Advantages
 - 41275 HHC agencies have OASIS collected
 - Comprehensive assessment of patient individual information for risk adjustment
- Disadvantages
 - Infection measurement

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Coming Soon

January 29 ALL THAT GLISTENS IS NOT CLEAN

Elaine Cloutman-Green, Great Ormond Street Hospital, London

February 4 (South Pacific Teleclass)

IMAGERY AND INFECTION PREVENTION: AN UNDER APPRECIATED MEDIUM

Dr. Cath Murphy, Infection Control Plus, Australia

February 11 (Free WHO Teleclass - Europe)

WHO GUIDELINE AND SYSTEMATIC REVIEW ON HAND HYGIENE AND THE USE OF CHLORINE IN THE CONTEXT OF EBOLA

Dr. Joost Hopman, Radboud University Medical Center, The Netherlands

February 12 SLEEP QUALITY IN ADULT HOSPITALIZED PATIENTS WITH INFECTION: AN OBSERVATIONAL STUDY

Prof. Farrin Manian, Harvard Medical School

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