

Exploring the Updated Infection Surveillance Definitions for LTCFs

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Presentation Objectives*

- ❑ Compare and contrast the updated infection surveillance definitions with other infection surveillance and management guidance available for LTCFs
- ❑ Identify challenges which may be encountered when applying infection surveillance definitions within a LTCF
- ❑ Describe strategies to implement and use the new surveillance criteria in a LTCF

* **No conflicts to disclose**

Surveillance activity as part of nursing home regulations

INTENT: (F441) 42CFR 483.65 Infection Control

The intent of this regulation is to assure that the facility develops, implements, and maintains an Infection Prevention and Control Program in order to prevent, recognize, and control, to the extent possible, the onset and spread of infection within the facility. The program will:

- Perform surveillance and investigation to prevent, to the extent possible, the onset and the spread of infection;*

Each facility should develop a system for surveillance that includes:

- ❑ Goals of surveillance program
- ❑ Definitions of common infections
- ❑ Surveillance procedure
- ❑ Analysis of surveillance data to plan infection control efforts

What is the burden of Healthcare-associated infections (HAI) in LTC?

- ❑ Estimated 1.6-3.8 million infections occur in LTCF annually based on old studies
 - ❑ Account for ~30-50% of hospital transfers
- ❑ However, data on national incidence of HAIs is very limited
 - ❑ Studies on HAIs in LTC are small, often single center or short time frames
 - ❑ Infection surveillance definitions and methods often aren't standard or comparable
- ❑ Currently it is hard to provide accurate information about HAIs in LTC

Challenges to analyzing HAI data in LTC

- ❑ Need for standardized/validated infection surveillance definitions; utilized by all providers
- ❑ Need an accepted surveillance methodology which is feasible and applicable across a variety of facilities
 - ❑ Targeted by type of infection or specific high risk groups
- ❑ Need for national infrastructure for gathering HAI data from LTCFs
- ❑ Need to establish national benchmarks for HAI data
 - ❑ Must be able to adjust HAI rates for differences in facility size/type and resident population being served
- ❑ Need for HAI surveillance data validation

Standardizing surveillance definitions

- ❑ Well defined data elements applied consistently
- ❑ Standard criteria to ensure accuracy, reproducibility and the ability to trend data over time (even with different people doing surveillance)
 - ❑ Develop a data collection tool to support surveillance activities
 - ❑ Use IT resources to facilitate data collection if possible
- ❑ Use of nationally recognized definitions will enable comparisons of surveillance data with other facilities

Surveillance definitions for LTCF: “McGeer criteria”, 1991



American Journal of Infection Control

Volume 19 Number 1 February 1991

COMMENTARY

Definitions of infection for surveillance in long-term care facilities

- ❑ First published infection surveillance definitions for LTC
 - ❑ Consensus definitions lead by a Canadian researcher, Allison McGeer in the early 1990's
 - ❑ Adapted from CDC hospital infection surveillance definitions by a group of experts in the field
 - ❑ Though widely utilized in research/ state-mandated programs, never systematically validated

CDC/SHEA infection surveillance definitions for LTC, 2012

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY OCTOBER 2012, VOL. 33, NO. 10

SHEA/CDC POSITION PAPER

Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria

- ❑ Reviewed and updated the criteria outlined in the original McGeer infection surveillance definition paper
- ❑ Revisions based on a structured review of evidence and consensus opinion of experts in the field
 - ❑ Significant changes to urinary tract and respiratory tract infections
 - ❑ Added norovirus gastroenteritis and *C. difficile* infection
- ❑ Definitions published without validation

<http://www.jstor.org/stable/10.1086/667743>

CDC/SHEA infection surveillance definitions for LTC

Clinical syndromes addressed in the guidance

- ❑ **Constitutional criteria:** Fever, leukocytosis, acute change in mental or functional status
- ❑ **Respiratory tract infections:** Common cold, Influenza-like illness, lower respiratory tract infection, pneumonia
- ❑ **Urinary tract infections:** With and without an indwelling urinary catheter
- ❑ **Skin and soft tissue infections:** Cellulitis, wound infection, scabies, fungal oral/perioral and skin infections, herpesvirus skin infections, Conjunctivitis
- ❑ **Gastrointestinal tract infections:** Gastroenteritis, norovirus, *C. difficile*

CDC/SHEA Surveillance definitions: Constitutional criteria

A. Fever	1. A single oral temperature of $>37.8^{\circ}\text{C}$ ($>100^{\circ}\text{F}$) 2. OR repeated oral temperatures of $>37.2^{\circ}\text{C}$ (99°F) or rectal temperatures $>37.5^{\circ}\text{C}$ (99.5°F) 3. OR a single temperature $>1.1^{\circ}\text{C}$ (2°F) over baseline from any site (oral, tympanic, axillary)
B. Leukocytosis	1. Neutrophilia ($>14,000$ leukocytes/ mm^3) 2. OR Left shift ($>6\%$ bands or $>1,500$ bands/ mm^3)
C. Acute mental status change from baseline	1. Acute onset 2. Fluctuating course 3. Inattention 4. AND either disorganized thinking or altered level of consciousness
D. Acute functional decline	1. A new 3 point increase in activities of daily living (ADL) score (0-28) from baseline, based on the following 7 ADL items, each scored between 0 (independent) and 4 (total dependence): a. Bed mobility b. Transfer c. Locomotion within LTCF d. Dressing e. Toilet use f. Personal hygiene g. Eating

Assessing mental status and functional status in the Minimum Data Set

Delirium

C1300. Signs and Symptoms of Delirium (from CAM©)

Code after completing Brief Interview for Mental Status or Staff Assessment, and reviewing medical record

Enter Codes in Boxes	
Coding: 0. Behavior not present 1. Behavior continuously present, does not fluctuate 2. Behavior present, fluctuates (comes and goes, changes in severity)	<input type="checkbox"/> A. Inattention - Did the resident have difficulty focusing attention (easily distracted, out of touch or difficulty following what was said)?
	<input type="checkbox"/> B. Disorganized thinking - Was the resident's thinking disorganized or incoherent (rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject)?
	<input type="checkbox"/> C. Altered level of consciousness - Did the resident have altered level of consciousness (e.g., vigilant - startled easily to any sound or touch; lethargic - repeatedly dozed off when being asked questions, but responded to voice or touch; stuporous - very difficult to arouse and keep aroused for the interview; comatose - could not be aroused)?

Section G

Functional Status

G0110. Activities of Daily Living (ADL) Assistance

1. ADL Self-Performance

Code for **resident's performance** over all shifts - not including setup. If the ADL activity occurred 3 or more times at various levels of assistance, code the most dependent - except for total dependence, which requires full staff performance every time

Coding:

Activity Occurred 3 or More Times

0. **Independent** - no help or staff oversight at any time
1. **Supervision** - oversight, encouragement or cueing
2. **Limited assistance** - resident highly involved in activity; staff provide guided maneuvering of limbs or other non-weight-bearing assistance
3. **Extensive assistance** - resident involved in activity, staff provide weight-bearing support
4. **Total dependence** - full staff performance every time during entire 7-day period

Other guidelines for diagnosing and managing infections in LTC

Clin Infect Dis 2009; 48:149-171

IDSA GUIDELINES

Clinical Practice Guideline for the Evaluation of Fever and Infection in Older Adult Residents of Long-Term Care Facilities: 2008 Update by the Infectious Diseases Society of America

Kevin P. High,¹ Suzanne E. Bradley,^{2,3,4} Stefan Gravenstein,^{5,6,7,8} David R. Mehr,⁹ Vincent J. Quagliarello,¹⁰ Chesley Richards,^{11,12} and Thomas T. Yoshikawa^{13,14}

Infect Control Hosp Epidemiol 2001; 22:120-124

Development of Minimum Criteria for the Initiation of Antibiotics in Residents of Long-Term-Care Facilities: Results of a Consensus Conference

Mark Loeb, MD, MSc; David W. Bentley, MD; Suzanne Bradley, MD; Kent Crossley, MD; Richard Garibaldi, MD; Nelson Gantz, MD; Allison McGeer, MD; Robert R. Muder, MD; Joseph Mylotte, MD; Lindsay E. Nicolle, MD; Brenda Nurse, MD; Shirley Paton, RN; Andrew E. Simor, MD; Philip Smith, MD; Larry Strausbaugh, MD

McGeer surveillance definitions: Urinary tract infection

UTI in resident without a catheter	UTI in resident with a catheter
At least 3 of the following signs	At least 2 of the following signs
<ul style="list-style-type: none">(a) Fever (~38° C) or chills,(b) New or increased burning pain on urination, frequency or urgency,(c) New flank or suprapubic pain or tenderness,(d) Change in character of urine,(e) Worsening of mental or functional status (may be new or increased incontinence).	<ul style="list-style-type: none">(a) Fever (~38° C) or chills,(b) New flank or suprapubic pain or tenderness,(c) Change in character of urine,(d) Worsening of mental or functional status (may be new or increased incontinence).

Note: Change in character of urine could be clinical (new blood, foul odor, sediment or lab-based change in previous urinalysis (if available))

CDC/SHEA Surveillance definitions: Urinary tract infections

A. For Residents Without an Indwelling Catheter

Both criteria 1 and 2 must be present:

1. At least **1** of the following sign or symptom:

a. Acute dysuria or acute pain, swelling or tenderness of the testes, epididymis, or prostate

b. Fever or leukocytosis **And** at least **1** of the following localizing urinary tract criteria:

i. Acute costovertebral angle pain or tenderness

ii. Suprapubic pain

iii. Gross hematuria

iv. New or marked increase in incontinence

v. New or marked increase in urgency

vi. New or marked increase in frequency

c. In the absence of fever or leukocytosis, **2** or more of the localizing urinary tract criteria listed in b ii-vi.

2. **One** of the following microbiology criteria:

a. At least 10^5 cfu/ml of no more than 2 organisms in a voided urine sample

b. At least 10^2 cfu/ml of any number of organisms in a specimen collected by in-and-out catheter

B. For Residents With an Indwelling Catheter

Both criteria 1 and 2 must be present:

1. At least **1** of the following sign or symptom:

a. fever, rigors, new-onset hypotension, with no alternate site of infection

b. Either acute change in mental status or acute functional decline, with no alternate site of infection

c. New-onset suprapubic pain or costovertebral angle pain or tenderness

d. Purulent discharge from around the catheter, or acute pain, swelling or tenderness of the testes, epididymis or prostate

2. Urinary catheter specimen with at least 10^5 cfu/ml of any organism

Minimum criteria for antibiotics: Urinary tract infections

Residents without an indwelling catheter or intermittent catheterization

- 1a) Acute dysuria alone **OR**
- 1b) Fever of 100°F or a 2.4°F increase in baseline temp. **AND** a new or increase for at least one of the following:
 - 2a) Urgency,
 - 2b) Frequency,
 - 2c) Suprapubic pain,
 - 2d) Gross hematuria,
 - 2e) Costovertebral angle tenderness,**OR**
- 2f) Urinary incontinence.

Residents with a chronic indwelling catheter (Foley or suprapubic)

Presence of **ONE** of the following:

- 1a) Fever of 100°F or a 2.4°F increase in baseline temperature,
- 1b) New costovertebral tenderness,
- 1c) Rigors (shaking chills) with or without cause, **OR**
- 1d) New delirium.

Note: Regardless of symptoms, urine cultures should be obtained to rule out UTIs.

Comparing different clinical criteria

- ❑ Fever criteria were different across the 3 papers
 - ❑ McGeer 1991: $\geq 38.0^{\circ}\text{C}$ (100.4°F)
 - ❑ Loeb 2001: $>37.9^{\circ}\text{C}$ ($>100^{\circ}\text{F}$) or 1.5°C ($>2.4^{\circ}\text{F}$) over baseline
 - ❑ CDC/SHEA 2012: Single temp $>37.8^{\circ}\text{C}$ ($>100^{\circ}\text{F}$); repeated temp $>37.2^{\circ}\text{C}$ ($>99^{\circ}\text{F}$); or 1.1°C ($>2^{\circ}\text{F}$) over baseline
- ❑ Acute changes in mental or functional status were defined using existing resident assessment scales
- ❑ Changes in UTI criteria from McGeer
 - ❑ Urine culture was new requirement for defining an event
 - ❑ Leukocytosis added as a new constitutional criteria
 - ❑ Change in character of urine (e.g., foul smell) removed
 - ❑ Mental status change/functional decline removed as criteria for UTI in residents without a catheter

Case #1

- ❑ Patient JH is a 60 y/o female
 - ❑ Past medical history of diabetes mellitus, hemiplegia, vancomycin-resistant enterococcus, Clostridium difficile, and infection of spinal hardware.
 - ❑ Requires extensive assistance with mobility.
- ❑ A foley catheter was present prior to admission to the facility
 - ❑ In place “a few months”
 - ❑ The catheter remained in place after her admission to the facility.
- ❑ Three weeks post-admission, a CNA noted that the patient’s urine had become increasingly cloudy and foul-smelling. The patient had also complained of new suprapubic pain.
- ❑ Vitals were not recorded in the nursing notes, so whether or not the patient was febrile is unclear.

Case #1

Lab Results:

- ❑ Urine Analysis: pyuria, +nitrites
- ❑ Urine Culture: preliminary results yielded growth of a gram-negative bacteria, >100,000 cfu/ml. A final microbiology report with identification of the causative organism was never recorded in the patient's chart.
- ❑ Course of action taken: Bactrim DS x 7 days for presumed UTI.

Case #1: Criteria

<u>McGeer's criteria</u>	<u>CDC/SHEA criteria</u>	<u>Minimum Criteria</u>
Change in character of urine – foul-smelling	New onset of suprapubic pain	None- it is possible that she has a significant fever or CVA tenderness, but vitals or a record of checking for CVA tenderness was not recorded.
New flank/suprapubic pain	UC > 100,000 CFU/ml gram negative bacteria	
+ Urine culture		

Case #1: Criteria

<u>McGeer's criteria</u>	<u>CDC/SHEA criteria</u>	<u>Minimum Criteria</u>
Change in character of urine – foul-smelling	New onset of suprapubic pain	None- it is possible that she has a significant fever or CVA tenderness, but vitals or a record of checking for CVA tenderness was not recorded.
New flank/suprapubic pain	UC > 100,000 CFU/ml gram negative bacteria	
+ Urine culture		
This patient meets the McGeer's criteria for CA-UTI	This patient meets the CDC/SHEA criteria for CA-UTI	This patient does NOT meet the Minimum criteria to initiate antibiotics.

Case #2

- ❑ AN is a 76 y/o female admitted 8 mo ago for worsening dementia and acute renal failure (from medication OD)
 - ❑ History of stroke and poorly controlled diabetes mellitus
- ❑ At the hospital, a suprapubic catheter was inserted before transfer to nursing facility
- ❑ Recently noted to have increased confusion
 - ❑ Husband reports lately she is sleeping during visits
- ❑ Vitals upon presentation: T 97.4 RR 18,
- ❑ No other MD or RN findings recorded in chart

Case #2

Lab Results:

- ❑ Urinary analysis: pyuria
- ❑ Urine culture: >100,000 CFU/ml E. Coli

- ❑ Course of action taken: Cipro x4 days for “possible UTI”

Case #2: Criteria

<u>McGeer's criteria</u>	<u>CDC/SHEA criteria</u>	<u>Minimum Criteria</u>
Decline in mental/functional status – could be due to progression of dementia	Decline in mental/functional status – could be due to progression of dementia	None
Pyuria but no baseline available	Urine culture > 100,000 cfu/ml E Coli	
Positive urine culture		

Case #2: Criteria

<u>McGeer's criteria</u>	<u>CDC/SHEA criteria</u>	<u>Minimum Criteria</u>
Decline in mental/functional status – could be due to progression of dementia	Decline in mental/functional status – could be due to progression of dementia	None
Pyuria but no baseline available	Urine culture > 100,000 cfu/ml E Coli	
Positive urine culture		
This patient does NOT meet the McGeer's criteria for UTI.	This patient does NOT meet the CDC/SHEA criteria for UTI.	This patient does NOT meet the minimum criteria to initiate antibiotics.

Important points about surveillance definitions

- ❑ Surveillance definitions may not be the same as clinical criteria used to make treatment decisions
 - ❑ Sometimes diagnosis/treatment decisions are made before all the data is available
 - ❑ Sometimes insufficient documentation is available to demonstrate that surveillance criteria have been met
- ❑ Events defined by surveillance criteria may be more detailed than events captured in the minimum data set (MDS)
- ❑ It may be important to evaluate the discrepancies between surveillance data and clinical/MDS data as a process improvement exercise

Challenges to applying surveillance definitions

- ❑ What are explanations for events not meeting criteria?
 - ❑ Incomplete assessment (e.g., physical exam not performed or culture not obtained)
 - ❑ Inadequate documentation
 - ❑ Inappropriate diagnostic testing (e.g., cultures obtained when local signs/symptoms are not present)
 - ❑ Poor specimen collection techniques/contaminated results
- ❑ What happens when a physician diagnoses and treats a UTI event that doesn't meet criteria?

Gap between MD diagnosis and surveillance criteria

Table 2 Incidence and attributable risk of infection

	Number of infections		Incidence rate (infections/1,000 resident-months)		Relative risk (95%)	p-value
	Device (263 f/u-mon)	Non-device (644 f/u-mon)	Device (IRe)	No-device (IRu)		
Total infections ^a	87	110	331	171	1.9 (1.4–2.6)	<0.001
Urinary tract infections ^a	49	54	186	84	2.2 (1.5–3.3)	<0.001
Pneumonia ^a	23	20	87	31	2.8 (1.5–5.4)	0.0004
Other infections ^b	15	36	57	56	1.0 (0.5–1.9)	0.47
McGeer's criteria ^c	8	15	30	23	1.3 (0.5–3.3)	0.27
Minimum criteria ^c	12	10	46	16	2.9 (1.2–7.6)	0.007
McGeer's or minimum criteria ^c	15	18	57	28	2.0 (1.0–4.3)	0.02

^a Clinical definition

^b Includes skin and soft tissue infections, *Clostridium difficile* colitis, conjunctivitis, upper respiratory, and

^c Includes pneumonia and/or urinary tract infections

- 146 infections, UTI or pneumonia were diagnosed and treated by clinicians
- 33/146 (23%) were also identified by applying either McGeer or Loeb minimum criteria

Unique drivers of antibiotic prescriptions in NHs

- ❑ Assessments are made by a surrogate rather than the prescriber
 - ❑ 67% of antibiotic prescriptions were ordered over the phone
- ❑ Limited documentation of assessments in medical record
 - ❑ 43% of NH-initiated antibiotic courses had no documentation of infection in medical record
- ❑ Limited access to diagnostics
- ❑ Inconsistent follow-up assessments
- ❑ Influence of resident, family, and other NH staff on the decision to start antibiotics

Strategies for improving antibiotic use

- ❑ Standardize the process for assessing a resident when concern about new infection
 - ❑ Ensure all pieces of history and physical exam are assessed
 - ❑ Improve documentation of change in condition
- ❑ Standardize communication of change in condition to medical providers
- ❑ Standardize the laboratory data obtained prior to antibiotic start
 - ❑ Review existing protocols which might drive inappropriate diagnostic testing (e.g., send a UA for every resident who falls)
- ❑ Ensure that clinical staff understand the surveillance criteria used to identify an infection

Integrate surveillance criteria into resident assessments

Infection Prevention & Control Monitor

Complete and return to Infection Preventionist if there are S/S of infection, a culture or antibiotics / antifungals are ordered, or if a resident is transferred or expires due to suspected infection.

addressograph

PERSON REPORTING: _____ DATE/TIME: _____

Respiratory Tract Infection

Common Cold or Pharyngitis:

- Runny nose or sneezing
- Sore throat or hoarseness or difficulty in swallowing
- Swollen or tender glands in the neck
- Stuffy nose (congestion)
- Dry cough

Influenza-Like Illness:

Temp _____

- New headache or eye pain
- Loss of appetite
- New or increased dry cough
- Chills
- Body aches
- Sore throat

Pneumonia/Lower Respiratory Tract Infection

- New or increase cough
- Oxygen Sat _____ %
- Pleuritic chest pain
- Temp _____
- Acute change in mental status from baseline (presence of new changes in behavior, new difficulty focusing attention, and now confused or disorganized thinking, or altered level of consciousness (e.g., more sleepy) from baseline).
- New or increased sputum production
- New or changed lung exam abnormalities
- Respiratory rate of ≥ 25 breaths/min
- Baseline Temp _____

UTI

Resident Without an Indwelling Catheter

- Acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate
- Fever or leukocytosis Temp _____
- Suprapubic pain
- New or marked increase in incontinence
- New or marked increase in frequency
- Acute costovertebral angle pain or tenderness
- Gross hematuria
- New or marked increase in urgency

Resident With an Indwelling Catheter

- Fever, rigors, or new-onset hypotension, with no alternate site of infection Temp _____ BP _____
- Either acute change in mental status or acute functional decline, with no alternate diagnosis and leukocytosis ($>14,000$ white blood cells/mm³)
- New onset suprapubic pain or costovertebral angle pain or tenderness
- Purulent drainage from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis, or prostate

Urinary catheter specimens for culture should be collected following replacement of the catheter (if the current

- ❑ This form was developed for front-line staff to record findings when an infection was suspected
- ❑ Tools can be used for documentation and/or communication
- ❑ These could be educational materials or become part of the resident medical record

Form courtesy of Ellen Bartlett, Houlton Regional Hospital, Maine

Leverage surveillance data to improve antibiotic use

- ❑ Comparing infection events identified by surveillance criteria with those events treated with antibiotics, will demonstrate the “magnitude of the gap”
- ❑ Share this data with clinical providers in your facility
 - ❑ Ask them for their opinion about what is creating the discrepancy
 - ❑ Ask them for advice on how best to address the issue
- ❑ Share this data with facility leadership
 - ❑ Obtain their buy-in to work on ways to reduce HAIs and overuse of antibiotics

Use surveillance data to show the impact of improvements in antibiotic use



The screenshot shows a web browser window with the address bar displaying "CDC - National Healthcare Safety Network - NHSN". The page content includes:

- National Healthcare Safety Network (NHSN)**
- Tracking Infections in Long-term Care Facilities**
- Text:** "Eliminating infections, many of which are preventable, is a significant way to improve care and decrease costs. CDC's National Healthcare Safety Network provides long-term care facilities with a customized system to track infections in a streamlined and systematic way. When facilities track infections, they can identify problems and track progress toward stopping infections. On the national level, data entered into NHSN will gauge progress toward national healthcare-associated infection goals." and "NHSN's long-term care component is ideal for use by: nursing homes, skilled nursing facilities, chronic care facilities, and assisted living and residential care facilities".
- Image:** A photograph of a caregiver assisting an elderly patient at a table.
- Text:** "1 to 3 million serious infections occur every year in long-term care." and "As many as 380,000 patients die of the infections they contract." and "Infections are among the most frequent reasons LTC patients get admitted to hospitals".
- Two reporting links:**
 - To report *C. difficile*, MRSA, and other drug-resistant infections, click here.** with a list: Enrollment into NHSN, Forms, Protocols.
 - To report urinary tract infections, click here.** with a list: Enrollment into NHSN, Forms, Protocols.

- ❑ Over time, decreasing unnecessary antibiotic use should lead to less *C. difficile* and MDROs in your facility
- ❑ You can tracking these events in the NHSN LTCF Component LabID event module

www.cdc.gov/nhsn/ltc/ltc-enroll-steps.html

Take away points

- ❑ New resources are available to support and improve infection surveillance activities in LTCF
- ❑ Comparing surveillance data to antibiotic use could identify opportunities for practice improvement
- ❑ Integrating surveillance criteria into the assessments by front-line staff and clinicians could improve the quality of documentation when infections are suspected
- ❑ Operationalizing the updated surveillance definitions by NHSN will create national standards and benchmarks for infection reporting for LTCF

Thank you!!

**Email: nstone@cdc.gov with
questions/comments**

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333

Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

**National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion**

