



# Diminished Rate of Acute Hospitalization with Aspiration Pneumonia/Pneumonitis Using Modified Free Water Protocol for People with Advanced MS and Dysphagia



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## ABSTRACT

People with advanced MS who are recommended to receive thickened liquids by mouth due to chronic oropharyngeal dysphagia with thin liquids are at risk for dehydration related to reduced daily fluid intake (Cichero 2013), diminished quality of life from loss of access to preferred consistency, and still-present risk for aspiration and subsequent respiratory illness. Use of free water protocols in institutional settings for people with chronic oropharyngeal dysphagia (Karagiannis & Karagiannis 2014) has been shown to promote increased oral hydration and patient satisfaction with access to thin water in isolation from other solid and thickened liquid consumption, within specific parameters including regular oral care prior to intake of the water. At the Boston Home, a 96-bed long-term care facility in Dorchester, MA, for people with advanced MS (EDSS >= 7.0) and other progressive neurodegenerative disorders, a facility-specific free water protocol has been instituted for >8 years as appropriate for many residents with moderate-severe oropharyngeal dysphagia who have been recommended to receive thickened fluids. Retrospective analysis of hospital admission data among the cohort of residents with advanced MS and chronic thin-liquid dysphagia demonstrates that the infection rate as measured by acute hospitalizations with a primary acute diagnosis of aspiration pneumonia/pneumonitis for residents who receive thin water according to the protocol (2.40 per 1000 patient days for this cohort) is substantially lower than the rate for other residents with dysphagia assessed to be at too elevated risk for aspiration to receive the free water protocol (6.00/1K patient days for this cohort) and the rate for residents who are NPO (7.80/1K patient days for this cohort). In addition, the respiratory infection rate for the free-water protocol group is the only one of these cohorts which is within the estimated range of pneumonia infection rates for long-term care residents with all diagnoses (Mylotte, 2002). These data support continued implementation of the facility's modified free water protocol for residents with chronic thin-water dysphagia to maximize oral hydration and enhanced quality of life with intake of this unmodified consistency despite the known aspiration risk.

## INTRODUCTION

### Dysphagia in MS

- Can occur at any stage and range of severity
- Prevalence estimates: 30-40% (Restivo et al, 2006)
  - TBH population at any time ranges 40-50%
- Can be acute and transient based on MS-related dysfunction or chronic as a result of cumulative MS-related disability
- Can manifest in widely divergent manner even with people with similar EDSS/MSFC scores or rate of disease progression
- For the purpose of this examination, residents with chronic thin-liquid dysphagia only have been included for analysis

### Predictors of Aspiration Pneumonia

- Langmore et al (1998) ranked in the elderly strongest to weakest, with dysphagia significantly factoring in combination with:
  - dependent for feeding
  - dependent for oral care
  - number of decayed teeth
  - tube feeding
  - more than one medical diagnosis
- Langmore et al (2002) performed retrospective analysis of MDS in >100000 SNF residents and ranked 18 factors as predictors, with dysphagia only at #9

### Texture Restrictions for Chronic Dysphagia

- Easiest but most controversial intervention for dysphagia
- Modify food to reduce mastication effort and promote bolus cohesion if management of hard solids is difficult or has been linked to aspiration/choking based on clinical assessment
- Thicken liquids to increase viscosity to limit airway compromise and promote bolus cohesion if management of thinner liquids is difficult or has been linked to aspiration/choking based on clinical assessment

### Caveats to Liquid Texture Modifications

- Reduced acceptance from clients leads to:
  - Compromised nutrition/hydration (Cichero, 2013)
  - Decreased social QOL from dining/eating
  - Impaired sense of swallowing safety
  - Diminished oral sensory awareness
  - Loss of autonomy over a previously unaffected component of daily life
- Logemann et al (2008) found that people who consumed honey-thick liquids were more likely to develop aspiration PNA than those consuming nectar-thick
- Free water protocols can alleviate some of the hydration difficulties if implemented correctly

## CONTEXT AND METHODS

### About the Boston Home (TBH)

- 96 bed inpatient facility in Dorchester, MA, for adults with advanced MS (EDSS >= 7.0) and other progressive neurological disorders
- “Hope over Hardship”
- Offers long-term and outpatient care
- Designated a *Center for Excellence in Long Term Care* by the National MS Society



### TBH Modified Free Water Protocol

- Initially formulated prior to 2008; added to diet texture order options for residents with dysphagia in 2010
- Means of enhancing po hydration and QOL for residents who receive thickened fluids
- Main components:
  - Thin WATER only between meals and separate from meds
  - Oral care crucial prior to intake of liquids
  - Use only recommended thickened liquid consistency with food/meds
  - Need to be upright in bed or (ideally) chair for thin water intake

### Benefits of Free Water Protocols

- Reduced incidence of aspiration PNA, at least in more mobile and non-progressive populations (Karagiannis & Karagiannis, 2014)
- Improved intake of po fluids (most especially thin water as opposed to caffeinated, sugar-laden, or alcoholic beverages) to support adequate hydration (Carlaw et al, 2012)
- Enhanced QOL by supporting resident autonomy and access to familiar, refreshing liquid consistency despite chronic dysphagia (Panther, 2005)
- More consistent access to oral hygiene than with individual who receive only thickened liquids

### Purpose of Current Analysis

- Assess whether use of modified free water protocol at TBH has resulted in reduced incidence of aspiration pneumonia/pneumonitis within the population of residents with advanced MS with dysphagia occurring with thin liquids as compared to residents with dysphagia who have not been recommended to participate in modified free water protocol and to resident who have been NPO due to severity of oropharyngeal dysphagia.
- **NB: Residents with no liquid consistency restrictions at time of Dx respiratory illness or resumption of thin liquid consistency intake following recovery from acute illness were eliminated from this analysis, as the criterion for chronic thin-liquid dysphagia was not met or directly implicated as potential risk for developing respiratory illness.**

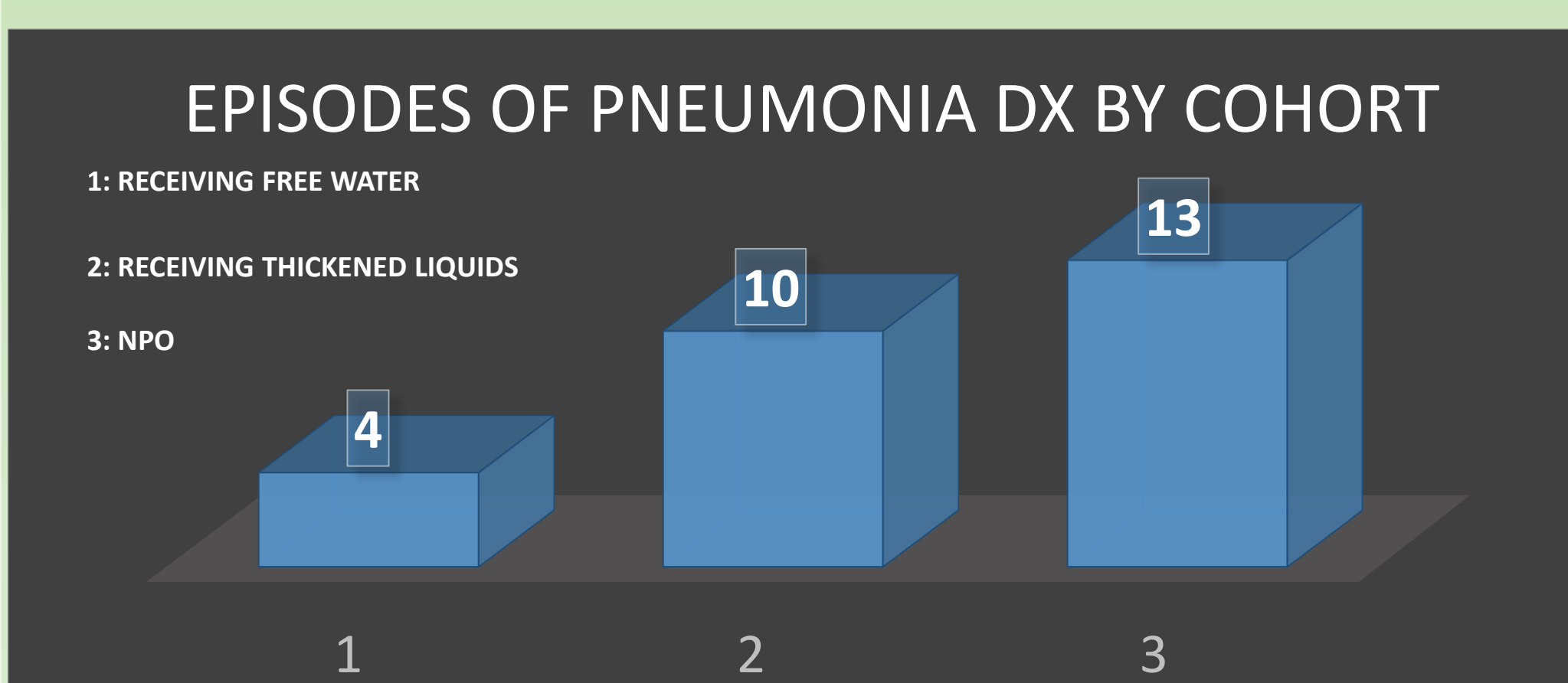
### Methods

- Retrospective analysis of episodes of acute respiratory infections during 4.5 year period (1643 days) from January 2012-June 2016 among long-term care residents of TBH with existing Dx dysphagia with thin liquids
- Pre-hospitalization Dx made by facility SLP (lead author) via bedside swallowing evaluation and/or recommendations from instrumental swallowing evaluation (MBSS)
- Of 414 acute resident hospitalizations during this period, 27 unique cases of acute aspiration pneumonia/pneumonitis diagnosed during hospital admission
- Three separate cohorts of residents based on diet texture order at time of acute hospitalization with respiratory illness designated as:
  1. Residents receiving thin water as per TBH modified free water protocol with thickened liquids during meals and medication administration
  2. Residents receiving only thickened liquids at all times d/t severity of dysphagia
  3. Residents who were already NPO d/t chronic severe-profound dysphagia
- Assignment to Cohort #1 or #2 based on duration and severity of thin liquid dysphagia, impact of overt s/sx aspiration with thin water intake, acceptance of frequent oral care, and general safety risks

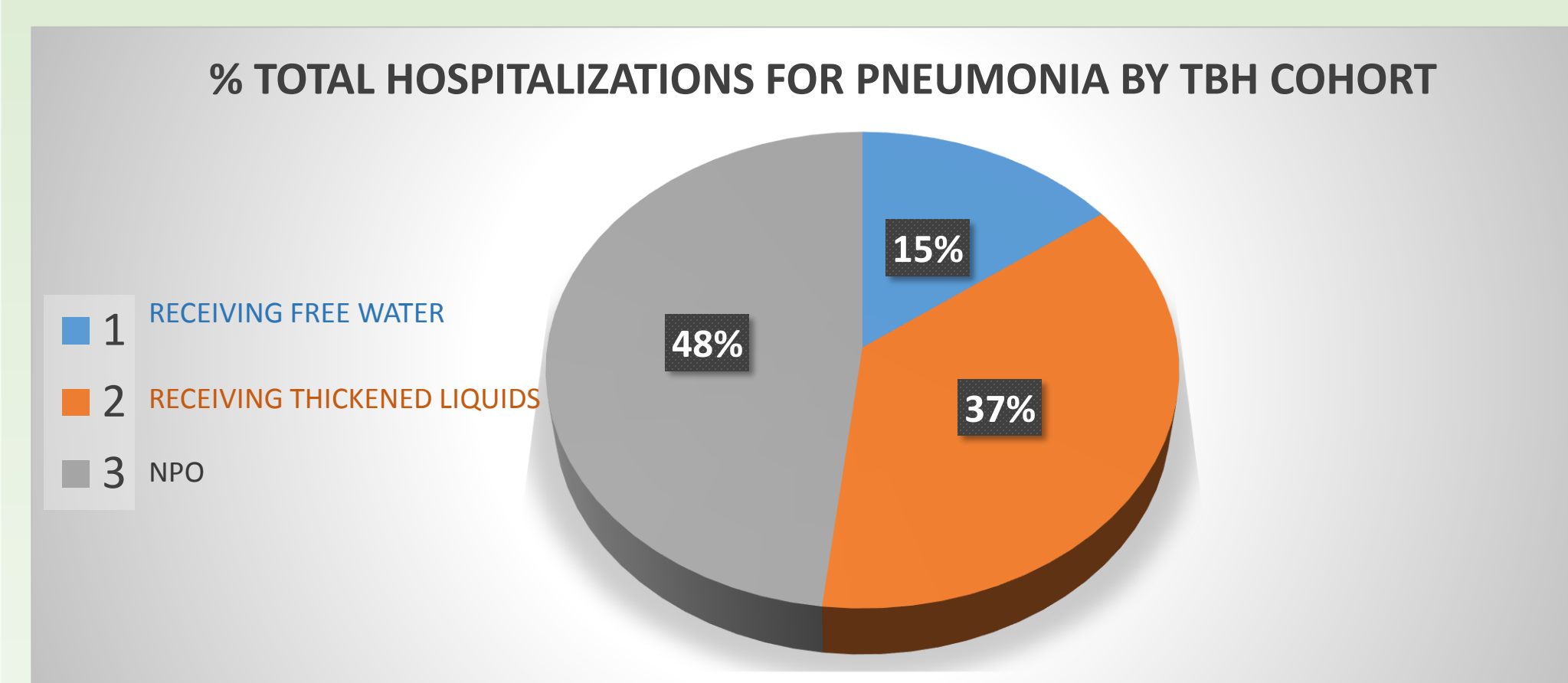
## OUTCOMES

- Formula for calculation =  $\frac{\# \text{ respiratory infections} \times 1000}{\# \text{ eligible resident days}^*}$
- Rate of infection among the cohorts:
  - Cohort 1 (Receiving free water protocol): **2.40**
  - Cohort 2 (Receiving only thickened liquids): **6.00**
  - Cohort 3 (NPO): **7.80**

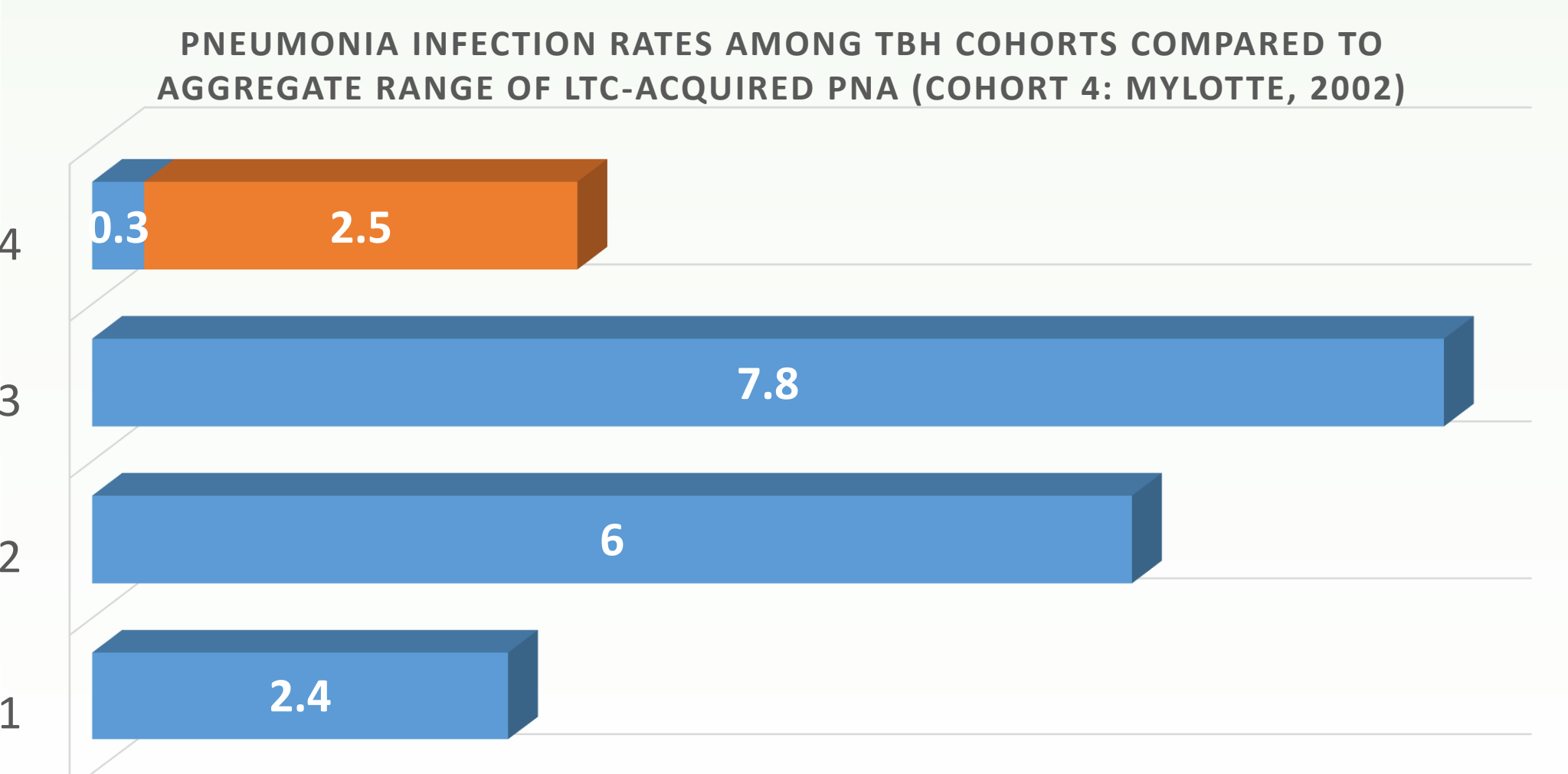
\*Coefficient of 0.986 added to calculation of formula denominator of total eligible resident days to remove documented dates of hospitalization and social leaves of absence in which residents were not directly in the facility's care during this assessment period of 1643 days



Raw number of acute hospitalizations with respiratory illnesses by cohort (above) (total n=27 unique episodes of illness with hospitalization)



The infection rate for TBH residents receiving the modified free water protocol is within the range of values for LTC-acquired pneumonia infection rates (0.3-2.5/1K patient days) for residents with all diagnoses reported in one study (Mylotte, 2002), whereas the infection rates for the TBH thickened-liquids only and NPO cohorts were >2-3 times greater than this range (below)



## DISCUSSION

- Residents with chronic thin-liquid dysphagia receiving thin water in isolation with modified free water protocol (Cohort #1: 2.40) were hospitalized with respiratory illness at a rate equivalent to 40% of those residents with dysphagia not receiving free water (Cohort #2: 6.00) and 30.8% of NPO resident (Cohort #3: 7.80)
- Residents in Cohort #1 anecdotally experienced improved QOL from access to preferred liquids consistency with water in addition to reduced incidence of respiratory illness compared to fellow residents with dysphagia in Cohorts #2-3 (more formal measure to be considered in future analyses).
- Although aspiration of food and liquid is not the only potential or most closely correlated trigger for development of acute aspiration pneumonia/pneumonitis in a chronically ill population, there appears to be a quantitatively reduced risk of this particular respiratory infection among individuals receiving thin water in isolation as part of a customized protocol.
- This supports potential expansion of the facility's modified free water protocol potentially to include residents with chronic thin-liquid dysphagia who were previously excluded from its implementation.
- More study indicated to examine clinical data of evidence of potentially improved hydration status as measured by quantity of daily liquid intake, lab values, etc., among individuals participating in this protocol as compared to others with chronic-thin liquid dysphagia not receiving free thin water.

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Thank you for taking the time to review our outcomes!