

Drug Use Evaluation of Antibiotics for Upper Respiratory Illness

The Oregon Alliance Working for Antibiotic Resistance Education (AWARE) released guidelines for the judicious use of antibiotics in April 2003.¹ The guidelines were developed because it is recognized that emerging antibiotic resistance is a national health concern. The goals of AWARE are to raise public awareness about using antibiotics wisely, to encourage appropriate prescribing and to enlist the aid of community-based organizations to reduce the unnecessary use of antibiotics. This report will attempt to describe compliance to the guidelines within the Medicaid fee-for-service (FFS) population.

Methods:

The population included for study had a cumulative eligibility and non-managed care enrollment for $\geq 87\%$ of the 365 days in each year (Table 1). The basic demographics of this population are depicted in Table 2. The population has gotten slightly older and more diverse as fee-for-service has become a larger proportion of the general OHP population.

Table 1 – Population Meeting Eligibility/Non-Managed Care Requirements

Year	Unique OHP Patients n=	Unique Patients Meeting Requirements n=	Pct of Total OHP
2000	425,115	58,158	13.68%
2001	482,237	79,134	16.41%
2002	511,884	94,162	18.40%

Table 2 – Population Demographics

Year	Pct Female	Pct White	Pct < 2 yr	Pct 2-5 yr	Pct 6-15 yr	Pct >15 yr
2000	58.46%	85.89%	3.18%	9.02%	21.46%	66.34%
2001	58.52%	76.85%	3.00%	8.69%	20.69%	67.61%
2002	58.72%	74.23%	2.85%	8.43%	19.85%	68.87%

Patients were included for study if they had a medical claim with an ICD9 of interest (Table 3) and excluded from study for complicating comorbid diagnoses (Table 4). Diagnostic episodes began if there were no previous claims within 30 days for the specific diagnostic group and ended when 30 days elapsed without a claim for the specific diagnostic group. The oral and intramuscular antibiotic classes of interest in the study are listed in Table 5. Antibiotic claims within 3 days of the diagnostic episode begin date indicated that the diagnosis was treated with an antibiotic and the antibiotic was identified as the initial antibiotic. Another outcome captured was whether the patient returned to clinic within 30 days for the same diagnosis.

Drug Use Evaluation of Antibiotics for Upper Respiratory Illness

Table 3 – Inclusion Diagnoses

ICD9	Acute Pharyngitis and related diagnoses
462	ACUTE PHARYNGITIS
463	ACUTE TONSILLITIS
0340	STREP SORE THROAT
ICD9	Acute Sinusitis
4610	ACUTE MAXILLARY SINUSITIS
4611	ACUTE FRONTAL SINUSITIS
4612	ACUTE ETHMOIDAL SINUSITIS
4613	ACUTE SPHENOIDAL SINUSITIS
4618	OTHER ACUTE SINUSITIS
4619	ACUTE SINUSITIS UNSPECIFIED
ICD9	Acute Bronchitis
4660	ACUTE BRONCHITIS
490	BRONCHITIS NOT SPECIFIED AS ACUTE OR CHRONIC
ICD9	Acute Viral URI
460	ACUTE NASOPHARYNGITIS
465	AC URI MULT SITES/NOS
4650	ACUTE LARYNGOPHARYNGITIS
4658	ACUTE URI MULT SITES NEC
4659	ACUTE URI NOS
ICD9	Acute Serous Otitis Media (Middle Ear Effusion – MEE)
38100	ACUTE NONSUPPURATIVE OTITIS MEDIA UNSPECIFIED
38101	ACUTE SEROUS OTITIS MEDIA
38102	ACUTE MUCOID OTITIS MEDIA
38103	ACUTE SANGUINOUS OTITIS MEDIA
3814	NONSUPPURATIVE OTITIS MEDIA NOT SPECIFIED AS ACUTE OR CHRONIC
ICD9	Acute Suppurative Otitis Media (Acute Otitis Media – AOM)
38200	ACUTE SUPPURATIVE OTITIS MEDIA WITHOUT SPONTANEOUS RUPTURE
38201	ACUTE SUPPURATIVE OTITIS MEDIA WITH SPONTANEOUS RUPTURE OF EAR DRUM
38202	ACUTE SUPPURATIVE OTITIS MEDIA IN DISEASES CLASSIFIED ELSEWHERE
3824	UNSPECIFIED SUPPURATIVE OTITIS MEDIA
3829	UNSPECIFIED OTITIS MEDIA

Drug Use Evaluation of Antibiotics for Upper Respiratory Illness

Table 4 – Exclusion Diagnoses

ICD9	Exclusion diagnoses
27700	CYSTIC FIBROSIS WITHOUT MENTION OF MECONIUM ILEUS
27701	CYSTIC FIBROSIS WITH MECONIUM ILEUS
4910	SIMPLE CHRONIC BRONCHITIS
4911	MUCOPURULENT CHRONIC BRONCHITIS
49120	OBSTRUCTIVE CHRONIC BRONCHITIS, W/OUT MENTION OF ACUTE EXACERBATION
49121	OBSTRUCTIVE CHRONIC BRONCHITIS, W/ACUTE EXACERBATION
4918	OTHER CHRONIC BRONCHITIS
4919	UNSPECIFIED CHRONIC BRONCHITIS
4920	EMPHYSEMATOUS BLEB
4928	OTHER EMPHYSEMA
49300	EXTRINSIC ASTHMA WITHOUT MENTION OF STATUS ASTHMATICUS
49301	EXTRINSIC ASTHMA WITH STATUS ASTHMATICUS
49302	EXTRINSIC ASTHMA, WITH ACUTE EXACERBATION (CC)
49310	INTRINSIC ASTHMA WITHOUT MENTION OF STATUS ASTHMATICUS
49311	INTRINSIC ASTHMA WITH STATUS ASTHMATICUS
49312	INTRINSIC ASTHMA, WITH ACUTE EXACERBATION (CC)
49320	CHRONIC OBSTRUCTIVE ASTHMA, WITHOUT MENTION OF STATUS ASTHMATICUS
49321	CHRONIC OBSTRUCTIVE ASTHMA, WITH STATUS ASTHMATICUS
49322	CHRONIC OBSTRUCTIVE ASTHMA, WITH ACUTE EXACERBATION (CC)
49390	ASTHMA, UNSPECIFIED WITHOUT MENTION OF STATUS ASTHMATICUS
49391	ASTHMA, UNSPECIFIED WITH STATUS ASTHMATICUS
49392	UNSPECIFIED ASTHMA, WITH ACUTE EXACERBATION (CC)
496	CHRONIC AIRWAY OBSTRUCTION NOT ELSEWHERE CLASSIFIED

Table 5 – Antibiotics

Class	SpecClass	ClassDesc
21	W1C	Tetracyclines
22	W1A	Penicillin
24	W2A	Sulfonamides
25	W1D, W1K	Macrolides
26	W1W, W1X, W1Y	Cephalosporins
27	W1Q	Fluoroquinolones

Drug Use Evaluation of Antibiotics for Upper Respiratory Illness

Results:

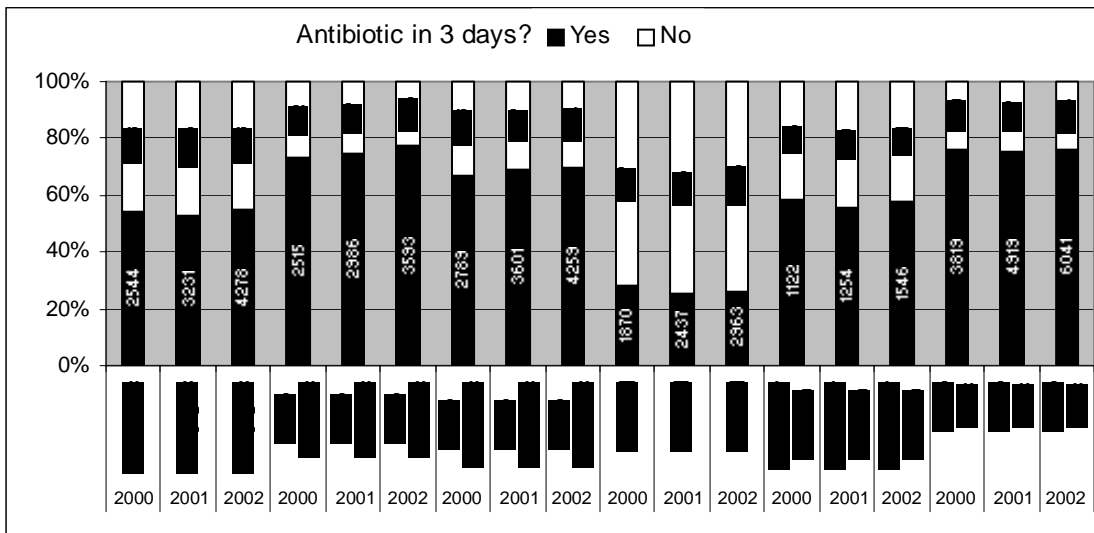
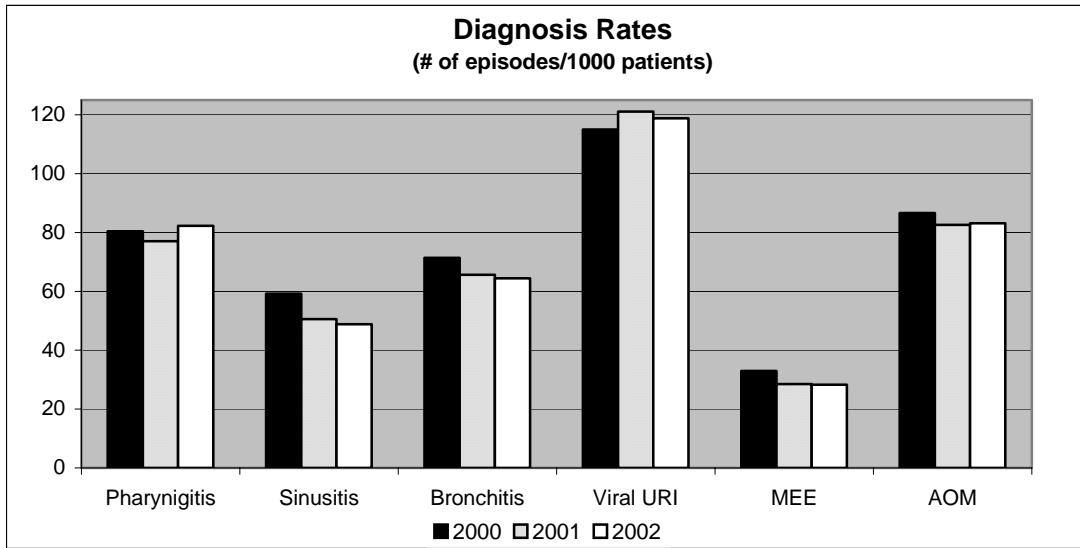


Table 6

	Pharyngitis	Acute Sinusitis	Acute Bronchitis	Viral URI	MEE	AOM
Oregon FFS Antibiotic Treatment Rate	54%	75%	69%	27%	57%	76%
Literature Estimated Bacterial Infection Rate	5-15%	(< 10 days)* 0.2-2%	(< 21 days)* 10%	0%	Abx not indicated	80% resolve w/o Abx; 95% resolve with Abx

*Length of illness cannot be evaluated in the Oregon FFS data

Drug Use Evaluation of Antibiotics for Upper Respiratory Illness

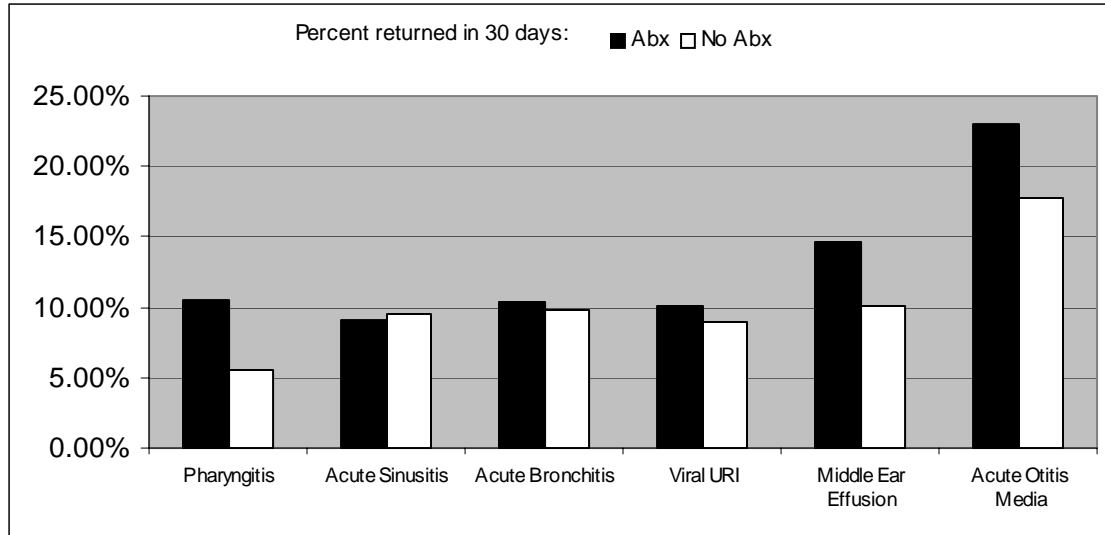


Table 7

AWARE Guidelines	Pharyngitis Adult (>12 yrs) +Strep or >2 Sx	Pharyngitis Pediatric +Strep or >2 Sx	Sinusitis Adult (>12 yrs) >10 day duration	Sinusitis Pediatric >10 day duration	Bronchitis (no hx of COPD) >21 day duration; + sputum	AOM <= 2 yrs	AOM >2yrs
Drug of 1st choice	Penicillin IM/PO	Penicillin IM/PO	High Dose Amoxicillin	High Dose Amoxicillin	Erythromycin	High Dose Amoxicillin	High Dose Amoxicillin
Drug of 1st choice (PCN Allergy)	Erythromycin	Erythromycin	Erythromycin or SMZ/TMP	Azithromycin		Azithromycin	Azithromycin
Alternative	Cephalosporin	Amoxicillin	Amoxicillin / Clavulanate	Amoxicillin / Clavulanate or Ceftriaxone	Doxycycline (>8 yrs) or Azithromycin	Amoxicillin / Clavulanate or Ceftriaxone	Amoxicillin / Clavulanate or Ceftriaxone
OR FFS Data							
Drug of 1st Choice (Pct Mkt Share)	Amoxicillin (35%)	Amoxicillin (57%)	Amoxicillin (29%)	Amoxicillin (49%)	Azithromycin (43%)	Amoxicillin (62%)	Amoxicillin (56%)
Drug of 2nd Choice (Pct Mkt Share)	Azithromycin (19%)	Azithromycin (12%)	Azithromycin (29%)	Amoxicillin / Clavulantate (16%)	Amoxicillin (19%)	Amoxicillin / Clavulantate (12%)	Azithromycin (14%)
Drug of 3rd Choice (Pct Mkt Share)	Penicillin IM/PO (16%)	Penicillin IM/PO (10%)	Amoxicillin / Clavulantate (13%)	Azithromycin (13%)	Erythromycin (6%)	Azithromycin (10%)	Amoxicillin / Clavulantate (12%)

Discussion:

The AWARE group developed guidelines for the judicious use of antibiotics for upper respiratory illness because overuse of antibiotics for these indications is implicated in the development of antibiotic resistance. The 1998 National Ambulatory Medical Care Survey, a national statistical sample of medical records, looked at proportions of patients who received antibiotic prescriptions for different viral conditions. The authors reported that 30% of patients with colds, 59% of patients with bronchitis and 62% of patients with pharyngitis received antibiotics. The authors estimated that 55% of this antibiotic use was prescribed for viral illness. Antibiotic treatment rates for Oregon FFS patients by diagnosis are compared to published, estimated bacterial infection rates in Table 6.

Drug Use Evaluation of Antibiotics for Upper Respiratory Illness

This data needs to be interpreted with caution due to the data limitations. Diagnosis coding for administrative purposes does not capture clinical context. For example, it is unknown how many patients coded for acute sinusitis had symptoms for more than 10 days or what the severity of disease presenting is. However, more than 50% of cases of predominantly viral disease are treated with antibiotics and 27% of coded viral disease (i.e., viral URI) is treated with an antibiotic.

Another confounder of note is that 17% of episodes had multiple diagnoses present concurrently within the 30-day episodic period. This makes it difficult to discern which diagnosis was treated with an antibiotic. Over 58% of multiple diagnosis episodes involved viral URI as one of the diagnoses. Roughly 17% of the total viral URI episodes involved AOM and may have been appropriately treated with antibiotics.

Table 7 is a comparison of AWARE antibiotic recommendations and Oregon FFS antibiotic selections for various diagnoses. Azithromycin appears to be used rather than the recommended erythromycin and cephalosporins are recommended second-line and not used significantly. Amoxicillin was selected predominantly over penicillin for pharyngitis.

An interesting finding was that patients receiving antibiotics returned to clinic at a slightly higher rate, particularly for pharyngitis and MEE/AOM

Conclusions:

Viral illness of the upper respiratory tract appears to be treated with antibiotics routinely in the Oregon Medicaid FFS population. Rates are comparable to those reported by the 1998 National Ambulatory Medical Care Survey. Antibiotic selection appears generally appropriate when compared to AWARE recommendations for patients needing treatment, although erythromycin, cephalosporins and penicillin are under utilized. Antibiotic use did not prevent return visits within 30 days for the same diagnosis.

¹ Judicious Use of Antibiotics: A Guide for Oregon Clinicians. April 2003. Available at: www.healthoregon.org/antibiotics.