

Allergy Immunotherapy Among Medicaid-enrolled Children with Allergic Rhinitis: Patterns of Care, Resource Use, and Costs

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- *63rd AAAAI Annual Meeting; RSOD Interest Section Forum, February 25, 2007 San Diego, CA*
- *12th Annual International Society for Pharmacoeconomics and Outcomes Research, May 22, 2007 Arlington, VA*
- *135th Annual Meeting & Exposition of the American Public Health Association (APHA); November 2007 Washington, DC.*

Background

- Despite evidence of the clinical benefits of IT in childhood AR, little is currently known about IT patterns of use and potential cost benefits.
- The present study was conducted to address the paucity of data on IT utilization and patterns of care, and the impact of IT on direct costs, among children with AR.

Study Objectives

- Retrospective Medicaid claims analysis (1997-2004) to address three major questions among children (<18 years) with allergic rhinitis (AR)
 - Who receives IT?
 - Demographic and comorbid allergy-related illness characteristics associated with receiving IT
 - What is the course of treatment?
 - Patterns of de novo IT care
 - Does IT save the healthcare system money?
 - Comparison of costs of care during the 6 months prior to IT initiation to costs incurred in the 6 months following IT termination

Methods

- Florida Medicaid provides access to health care for more than 2 million low-income individuals
- More than half of enrollees under 21 years of age.
- Computerized Florida Medicaid claims records contain basic demographic information, such as sex, age, and race/ethnicity; ICD and CPT diagnosis and treatments codes; and payment data.
- Information is patient de-identified and fully compliant with HIPPA Privacy Rule.
- Subjects were identified from enrollees in the Florida Medicaid program who had a paid claim from July 1997 through June 2004.

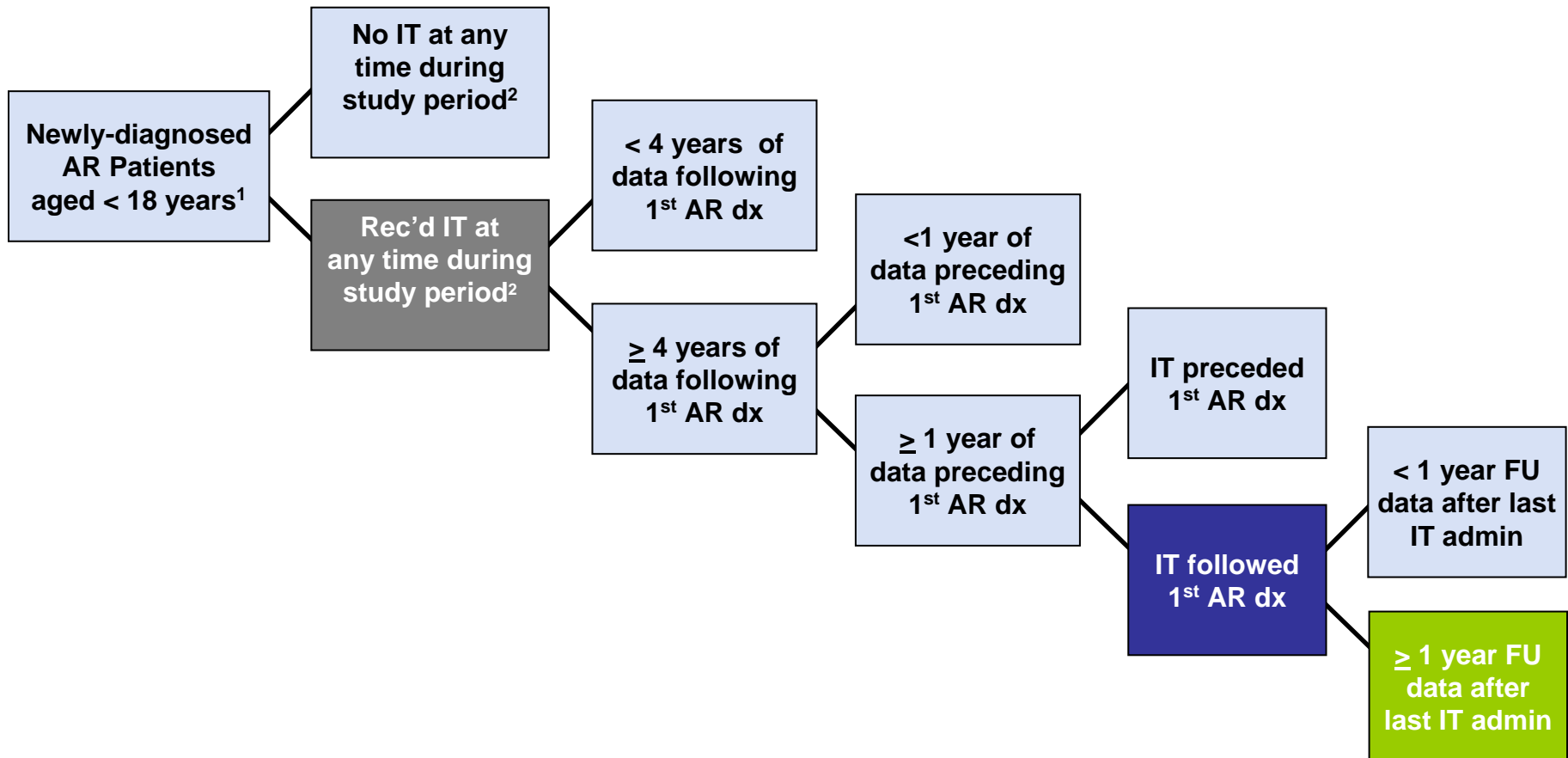
Methods: Analysis

- Data were obtained from Florida Medicaid (July 1997 to June 2004).
- We used t-tests¹ to compare continuous variables and chi-square tests¹ for categorical variables.
- If the overall test was significant, additional analyses were conducted to compare subgroups.
- We used logistic regression³ to calculate likelihood estimates for variables associated with IT utilization and Cox proportional hazard analysis⁴ to evaluate predictors of premature IT discontinuation.

1. Assesses whether the means of two groups are statistically different from each other.
2. Assesses whether the observed frequencies differ significantly from the expected frequencies.
3. A regression technique for making predictions when the dependent variable is dichotomous, and the independent variables are continuous and/or discrete.
4. A method of survival analysis that examines and models the time it takes for events to occur.

Methods: Sample Identification

(Among 4,807,429 total Florida Medicaid enrollees)

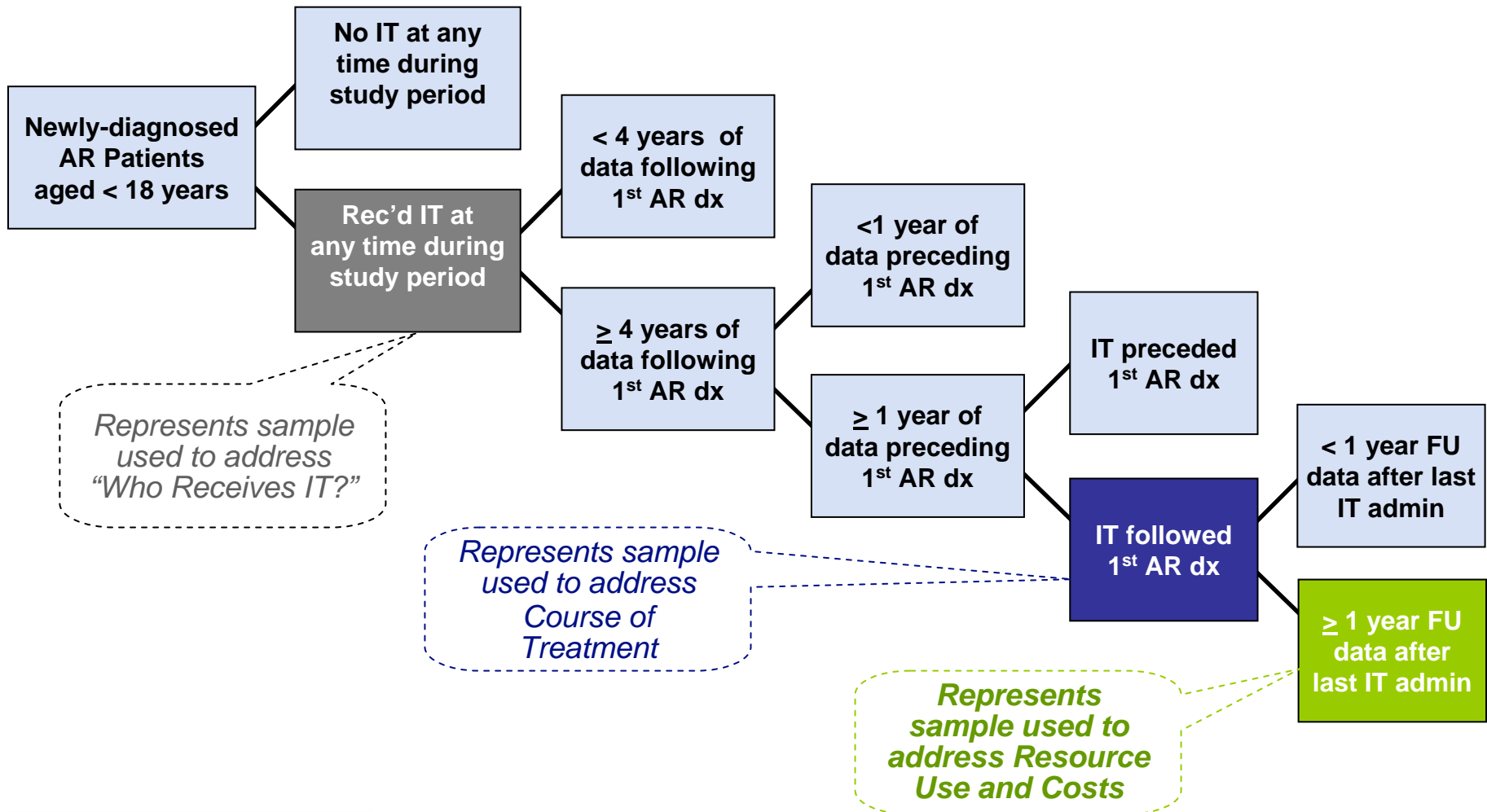


1. The presence of an AR diagnosis was identified by ICD-9 code 477.X.

2. IT utilization was identified by CPT codes 95115, 95117, 95120, 95125, 95144, 95165, 95180, or 95199.

Methods: Sample Identification

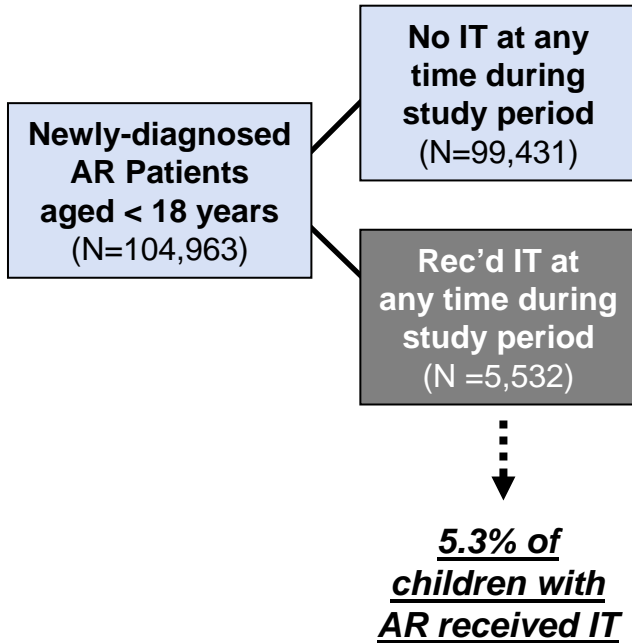
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Results

Sample Identification

(Among 4,807,429 total Florida Medicaid enrollees)



Age at 1st AR Diagnosis

Characteristic	All Patients (N=104,963)	Patients Receiving IT (N=5,532)	Patients Not Receiving IT (N=99,431)	p-value IT vs. No IT
Age (years) at first AR diagnosis, mean (SD)	7.1 (4.5)	7.7 (3.6)	7.0 (4.5)	< 0.0001

Children who received IT were significantly older at 1st AR diagnosis than those who did not receive IT

(mean age 7.7 years vs 7.0 years, SD 4.5, p<0.001), although this may not be clinically significant

Time from 1st AR diagnosis to IT initiation was approximately 1.5 years (543 days, SD 571 days).

Sex Distribution

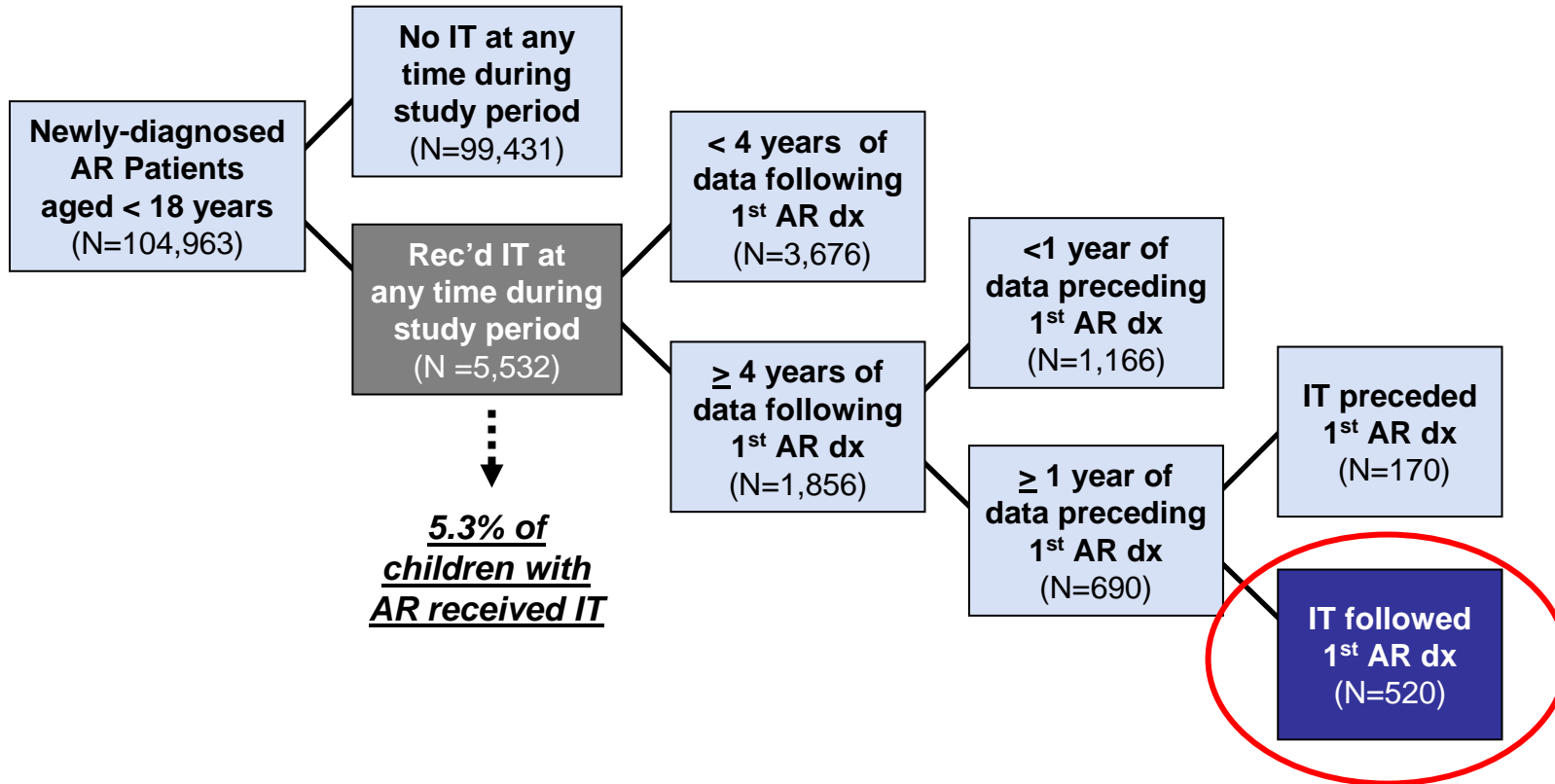
Characteristic	All Patients (N=104,963)	Patients Receiving IT (N=5,532)	Patients Not Receiving IT (N=99,431)	p-value IT vs. No IT
Male, % (N)	53.1% (55,709)	59.9% (3,314)	52.7% (52,395)	<0.0001

- Adjusting for the sex distribution among children in the overall dataset, significantly more males than expected were diagnosed with AR
- Males were 10% more likely to be diagnosed with AR than females (OR 1.10, 95% CI 1.09 to 1.11, $p < 0.0001$)

- After adjusting for the variation in AR diagnosis by sex, significantly more males received IT than females.
- Adjusted results indicated that males were 34% more likely to receive IT than females (OR 1.34, 95% CI 1.27 to 1.42, $p < 0.0001$)

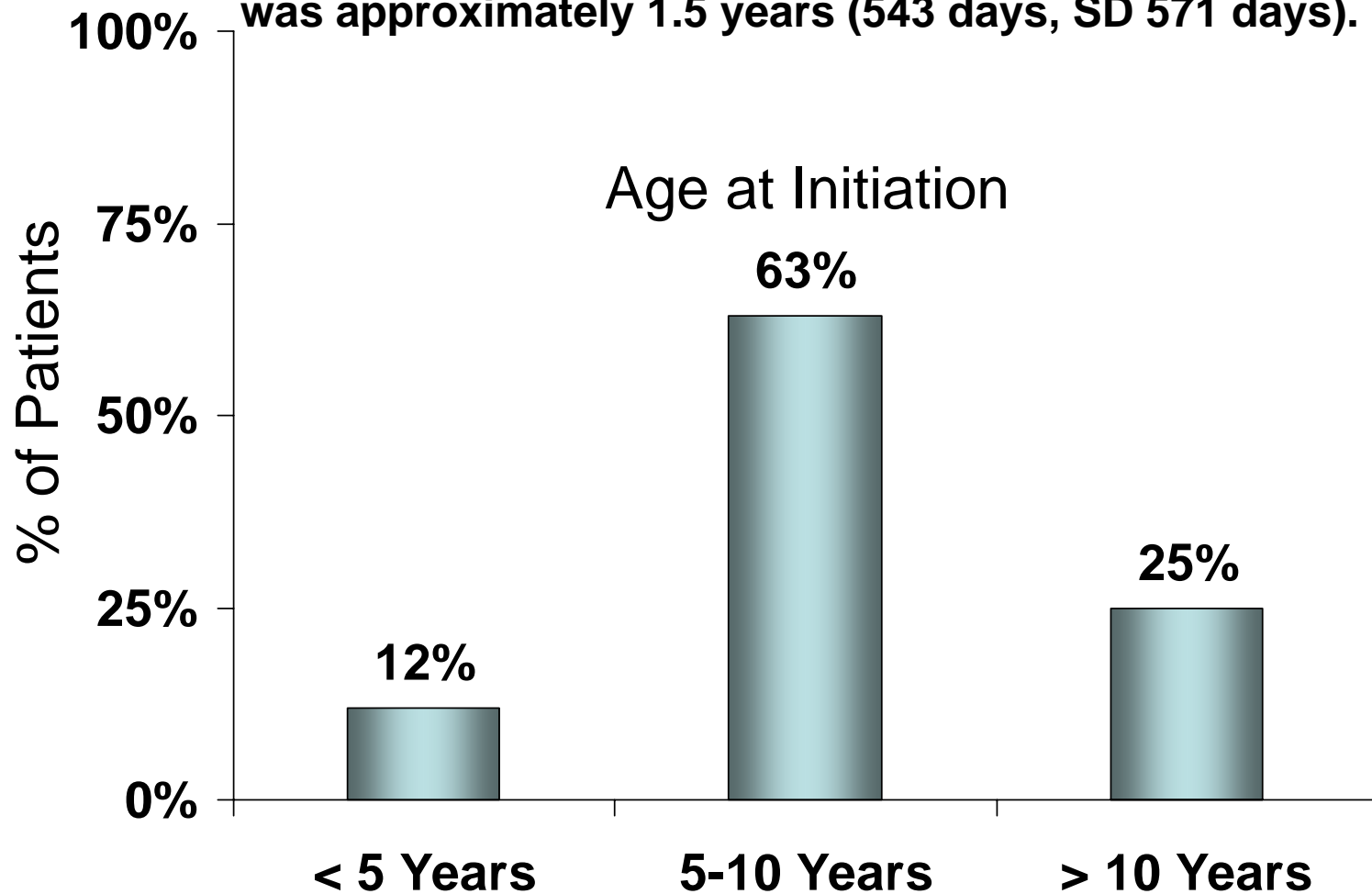
Sample Identification

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Treatment Initiation (n=520)

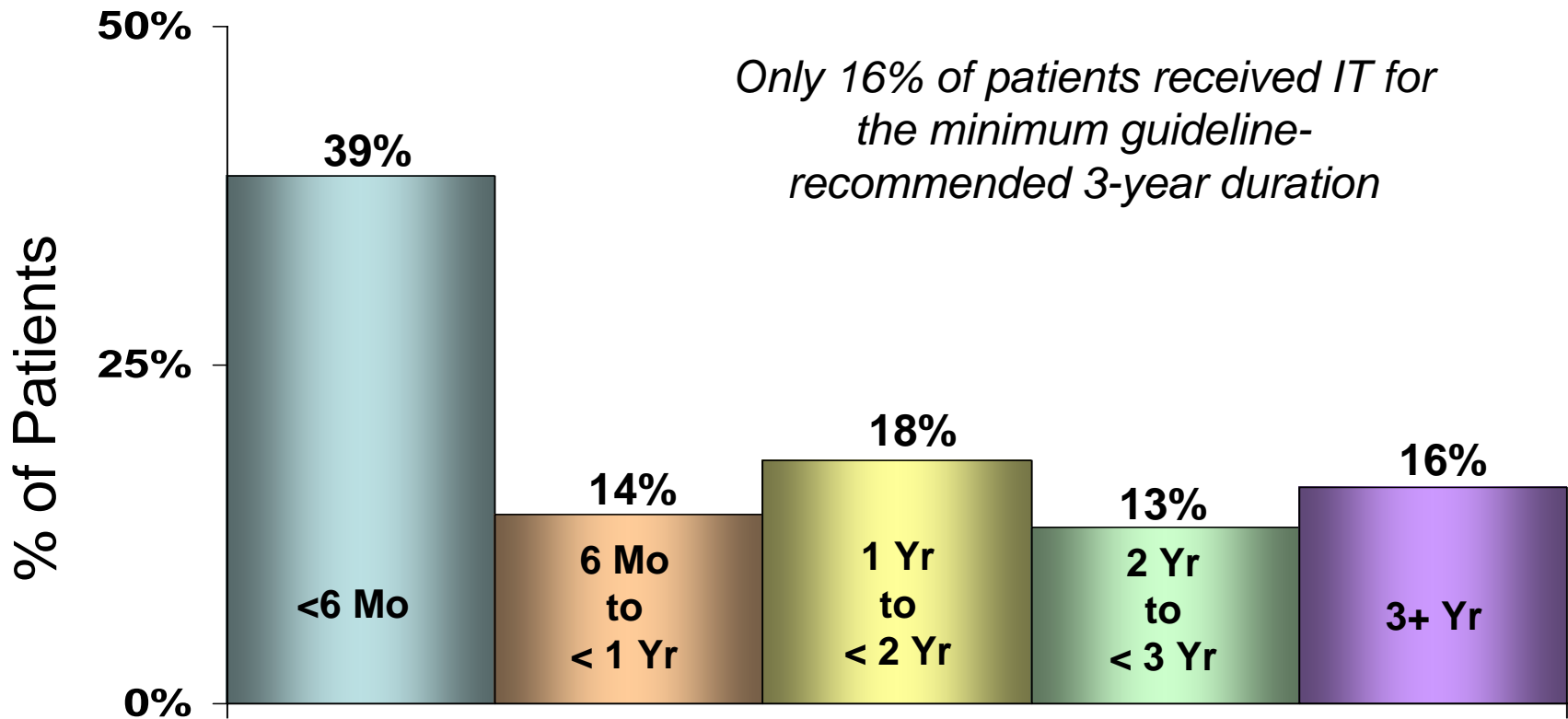
Time from 1st AR diagnosis to IT initiation was approximately 1.5 years (543 days, SD 571 days).



Treatment Regimen (n=520)

- **Average number of days between administrations**
 - **Overall**
 - 27.2 (SD 68.8, range 1 to 1,117)
 - **Buildup phase**
 - 16.2 days (SD 17.5, range 1 to 171)
 - 33.8% of patients received injections on average > 2 weeks apart
 - **Maintenance phase**
 - 24.9 days (SD 31.8, range 1 to 363)
 - 9.7% received injections on average > 6 weeks apart

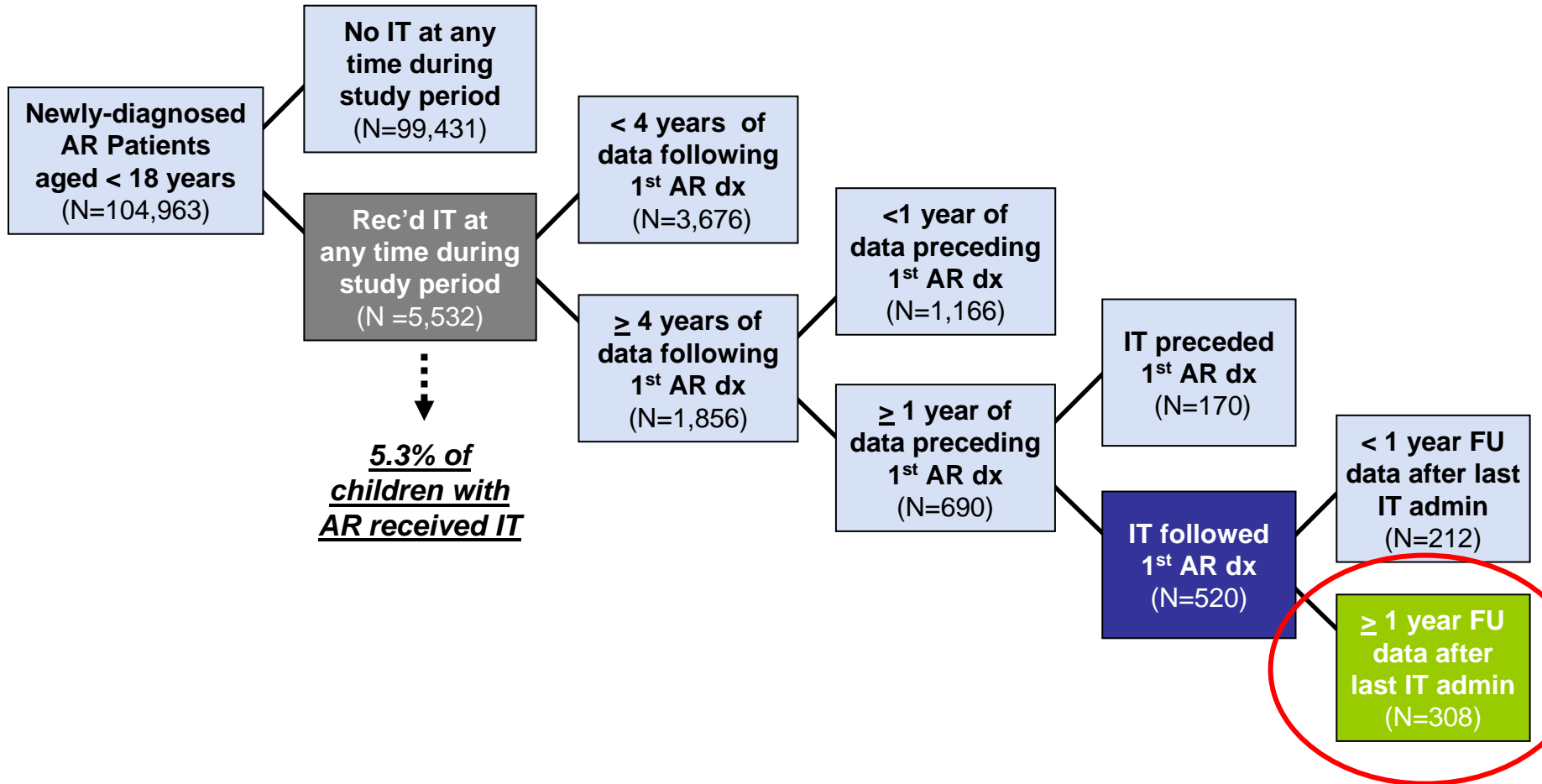
Duration of Treatment (n=520)



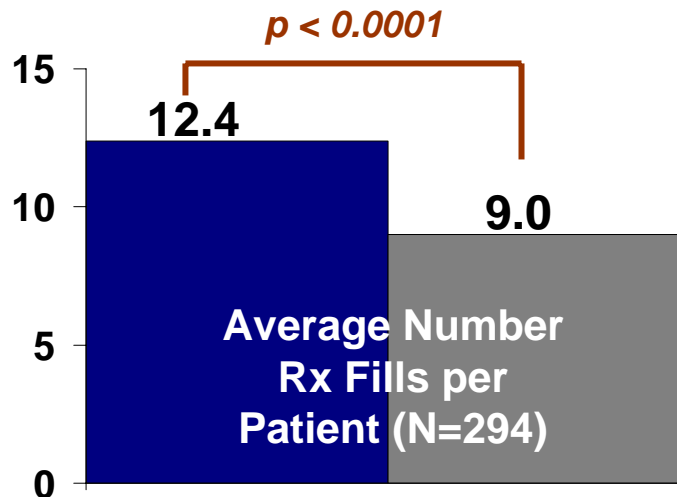
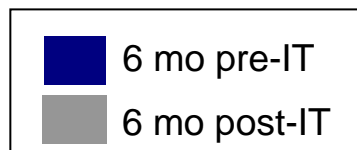
- Patients received an average of 31.3 IT administrations (SD 34.3).
- The mean duration of treatment was 17 months (SD 17.6).

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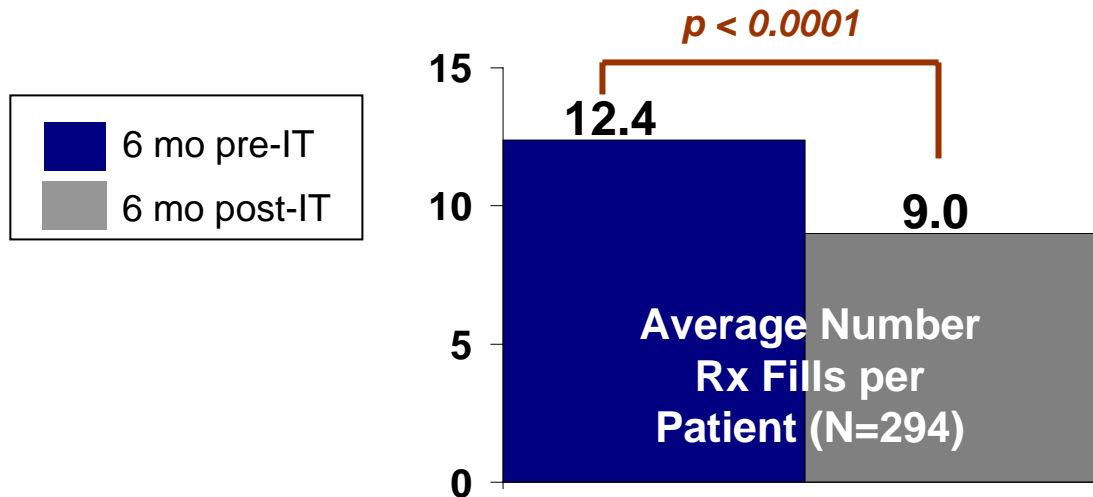


Medical Resource Utilization

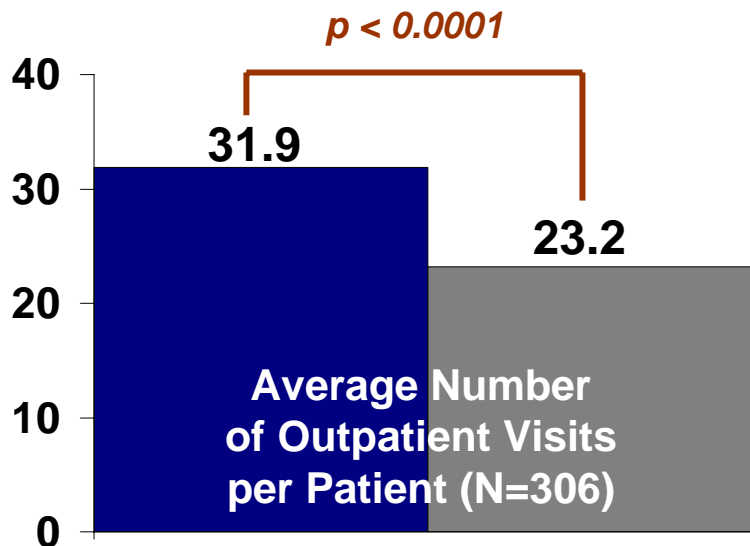


Medical resource utilization significantly decreased in the 6 months following IT discontinuation versus the 6 months prior to IT initiation, despite the fact that the average duration of therapy was 17 months.

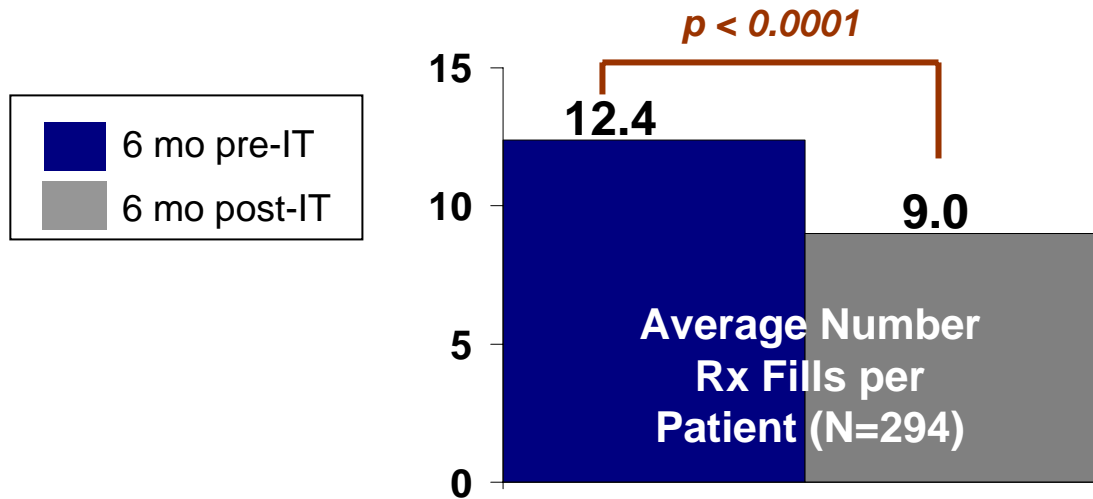
Medical Resource Utilization



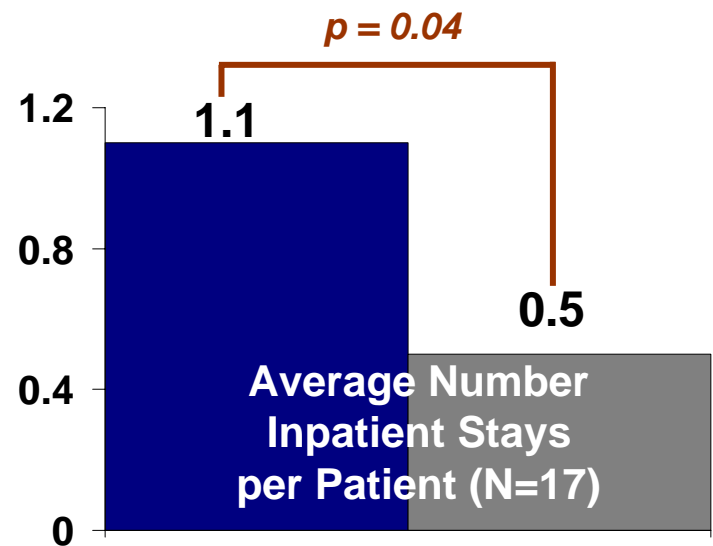
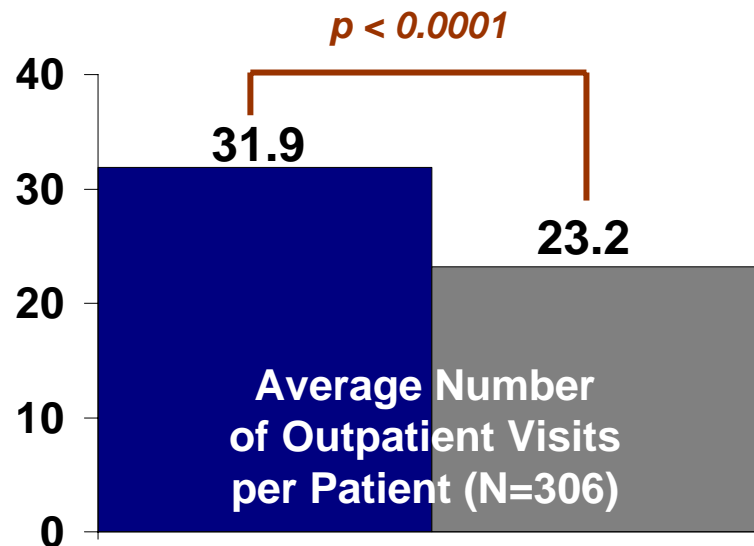
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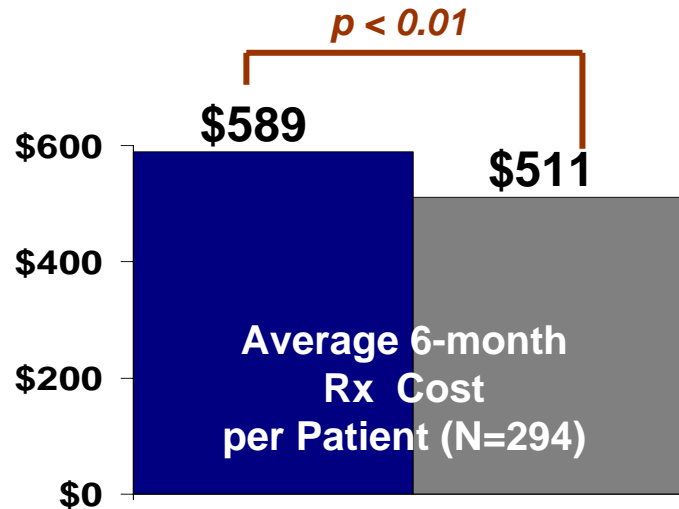
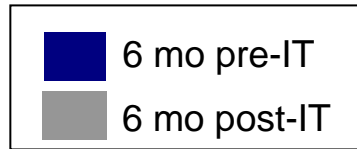
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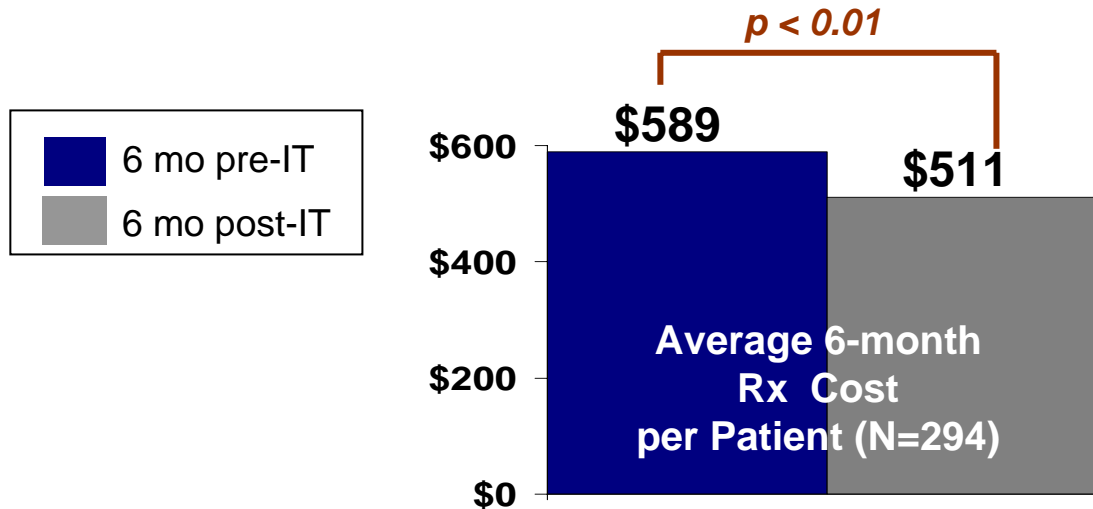


Medical Costs

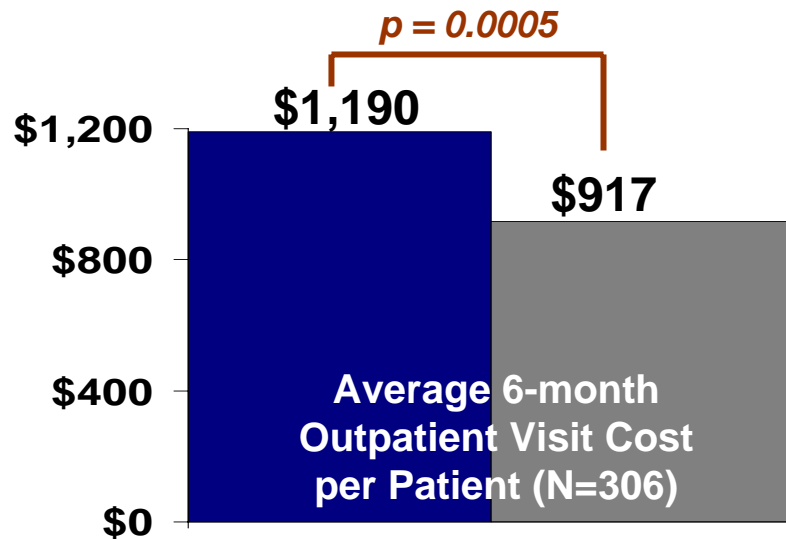


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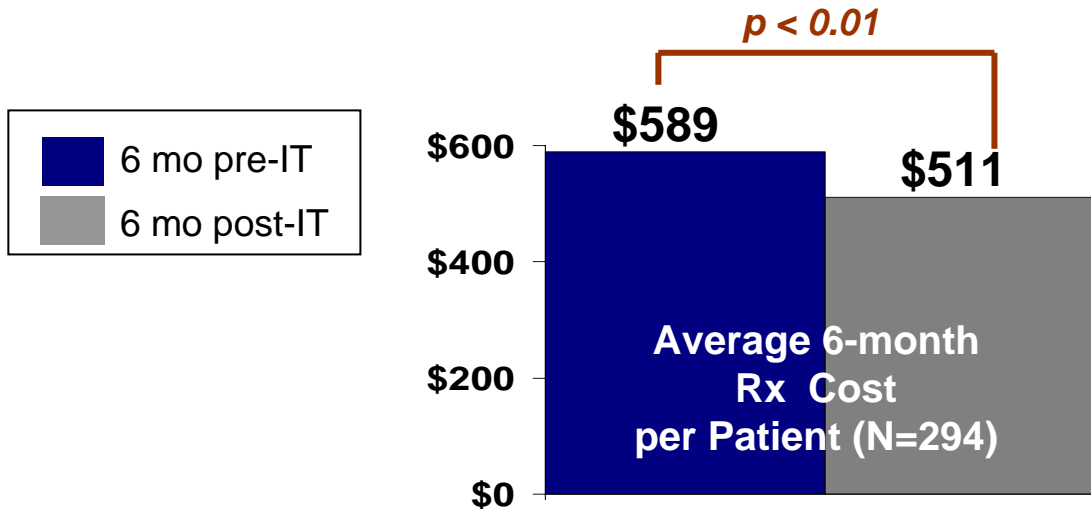
Medical Costs



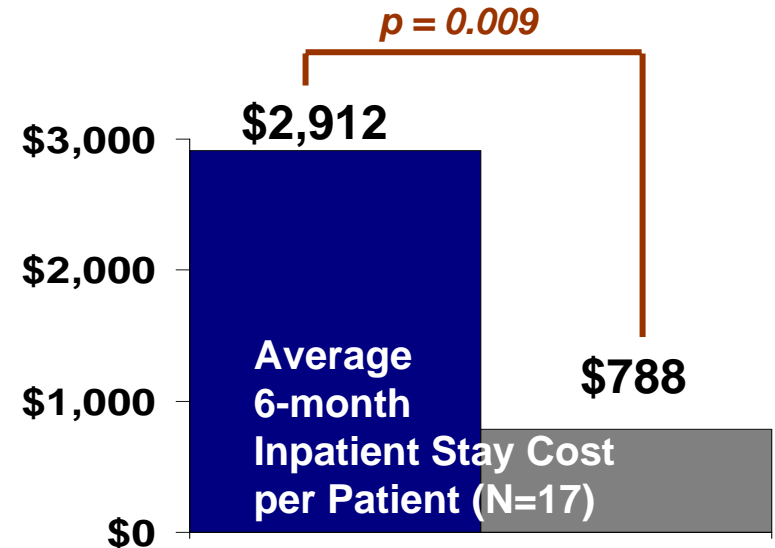
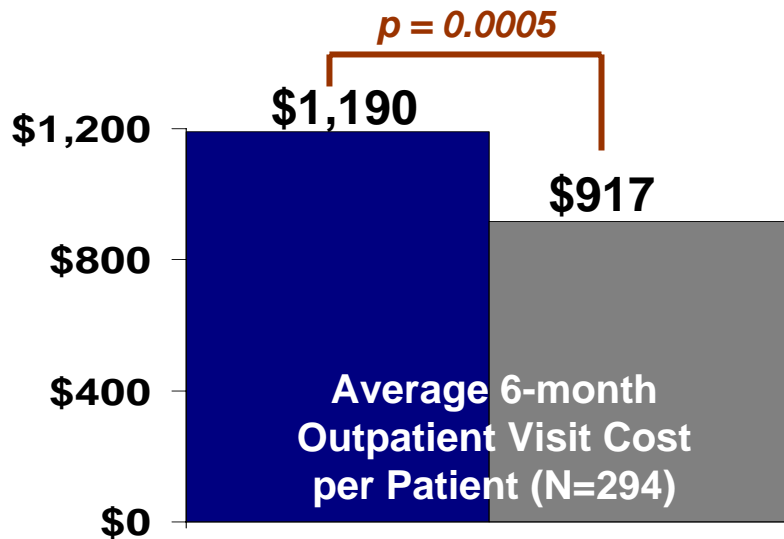
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Analysis of Inpatients

- 17 patients had a total of 19 hospitalizations during the 6-month pre-IT period.
 - 15 (79%) were associated with an allergy-related primary diagnosis (10 asthma; 1 croup, 1 bronchitis, 1 chronic sinusitis, 2 pneumonia)
 - 4 were associated with a non-allergy-related primary diagnosis (1 concussion, 1 acute pancreatitis, 1 urinary tract infection, 1 abdominal pain)
 - 8 hospitalizations occurred during the fall (Sept-Nov), 5 during the summer (June-Aug), 4 during the winter (Dec-Feb), and 2 during the spring (Mar-May).
- 3 patients had a total of 8 hospital admissions in the 6-month post-IT period.
 - All 8 were associated with a primary diagnosis of asthma, with 3 occurring during the winter, 3 during the summer, and 2 during the fall.
 - The 3 patients with a post-IT hospital admission experienced an increase in the rate of hospitalization from 1 admission during the 6-month pre-IT period to 2 or 3 admissions during the 6-month post-IT period.

Summary of Results

- Only 5.3% (5,532) of Medicaid-enrolled children with allergic rhinitis received IT during the 7-year study period.
- After adjusting for the distribution of sex among enrollees, males were 34% more likely to receive IT than females ($p < 0.0001$).
- Only 16% of patients completed the minimum (3 year) guideline-recommended duration of therapy.⁵
- There was a significant reduction in utilization and costs of health care services, especially inpatient care, from the 6 months before IT initiation to the 6 months following IT termination.

Conclusions

- The present retrospective analysis of children who were enrolled in Florida Medicaid found that only 16% of those with AR received a 3-year course of IT.
- Despite this sub-optimal duration of treatment, IT was associated with significant pre- versus post-treatment medical cost savings.
- Our study constitutes a first step towards establishing the cost benefits of IT in the U.S.
- Further studies examining the impact of comorbid medical conditions, concomitant pharmacotherapy, and quality (regimen and duration) of IT care on medical cost offsets are warranted.

Presentation of Research

- Poster presented at the 12th Annual International Meeting of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR); May 2007, Arlington, VA.
- Oral Presentation to be delivered at the 135th Annual Meeting & Exposition of the American Public Health Association (APHA); November 2007, Washington, DC.