

Trajectory of Asthma Control Test (ACT) Scores Among Patients Treated Within the Specialty Pharmacy

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BACKGROUND

- Patients with severe asthma often need treatment with biologics through the specialty pharmacy.
- The **Asthma Control Test (ACT)** is a validated measure to identify uncontrolled asthma and evaluate treatment progress.
- The trajectory of ACT scores over time may depend on factors commonly evaluated within specialty pharmacies like adherence, symptom triggers, and comorbidities.
- Deciphering the interplay among elements related to symptom improvement may aid specialty pharmacies in designing targeted initiatives to improve asthma care.

OBJECTIVE

To evaluate ACT score trajectories and determine factors related to asthma improvement among asthma patients treated within the specialty pharmacy.

METHODS

Inclusion:

Patients ≥12-years-old with asthma who had:

- 1+ medications dispensed in 2023 from our specialty pharmacy.
- Both a Baseline ACT (first ACT in 2023) and ≥1 ACT score reported 30-365 days following Baseline.

ACT scores:

- Categorized as **Very Poorly** (<16 points), **Not Well** (16-19 points), or **Well Controlled** (20-25 points).

Analysis:

- Characteristics were compared **across ACT groups** and whether **minimally important difference¹** (MID; ≥3 point improvement) was met using chi-squared tests.
- Logistic regressions estimated odds of asthma improvement.

RESULTS

TABLE 1: Baseline Population Characteristics

	Baseline ACT Score Category			Total	p-value
	Very Poorly Controlled	Not Well Controlled	Well Controlled		
Total Population	63 (55.3)	18 (15.8)	33 (28.9)	114 (100.0)	
Age, yrs; median (IQR)	51 (37, 60)	51 (40, 56)	54 (42, 62)	52 (40, 60)	0.30
Nasal Polyps	5 (7.9)	3 (16.67)	7 (21.2)	15 (13.2)	0.17
Atopic Dermatitis	4 (6.34)	1 (5.56)	1 (3.0)	6 (5.3)	0.79
Insurance					
Commercial	25 (39.7)	9 (50.0)	16 (48.5)	50 (43.9)	
Medicaid	33 (52.4)	9 (50.0)	12 (36.4)	54 (47.4)	
Medicare	5 (7.9)	0 (0.0)	5 (15.2)	10 (8.8)	0.29
Asthma Triggers					
Animals	5 (7.9)	2 (11.11)	6 (18.2)	13 (11.4)	0.32
Cold Air	13 (20.6)	5 (27.78)	4 (12.1)	22 (19.3)	0.37
Dust Mites	5 (7.9)	5 (27.78)	7 (21.2)	17 (14.9)	0.06
Exercise	19 (30.2)	4 (22.22)	8 (24.2)	31 (27.2)	0.73
Humidity	12 (19.1)	3 (16.67)	4 (12.1)	19 (16.7)	0.69
Mold	3 (4.8)	3 (16.67)	5 (15.2)	11 (9.6)	0.14
Pollens	10 (15.9)	5 (27.78)	13 (39.4)	28 (24.6)	0.037
Smoke	11 (17.5)	6 (33.33)	4 (12.1)	21 (18.4)	0.17
Odors/Fumes	6 (9.5)	1 (5.56)	5 (15.2)	12 (10.5)	0.52
URI	15 (23.8)	5 (27.78)	7 (21.2)	27 (23.7)	0.87
Other	31 (49.2)	6 (33.33)	15 (45.5)	52 (45.6)	0.49
Therapy Type					
Current	17 (27.0)	10 (55.56)	24 (72.7)	51 (44.7)	
New	46 (73.0)	8 (44.44)	9 (27.3)	63 (55.3)	<.0001
Follow-up ACT Score; median (IQR)	16 (12, 20)	20 (19, 22)	23 (22, 25)	19 (15, 23)	<.0001
Change in ACT; median (IQR)	4 (0, 9)	3.5 (1, 6)	0 (-2, 1)	2 (0, 6)	<.0001

At Baseline (Table 1):

- Insurance, age, comorbid diagnoses, and asthma triggers were distributed similarly by Baseline ACT score category.
- Patients who were **Very Poorly Controlled** at baseline
 - Were more likely to be new to therapy (p<.0001)
 - Had a median improvement of 4 points
 - 25% improved >9 points
- Patients who were **Not Well Controlled** had a median improvement of 3.5 points

FIGURE 1: Baseline ACT Score by Follow-up ACT Score

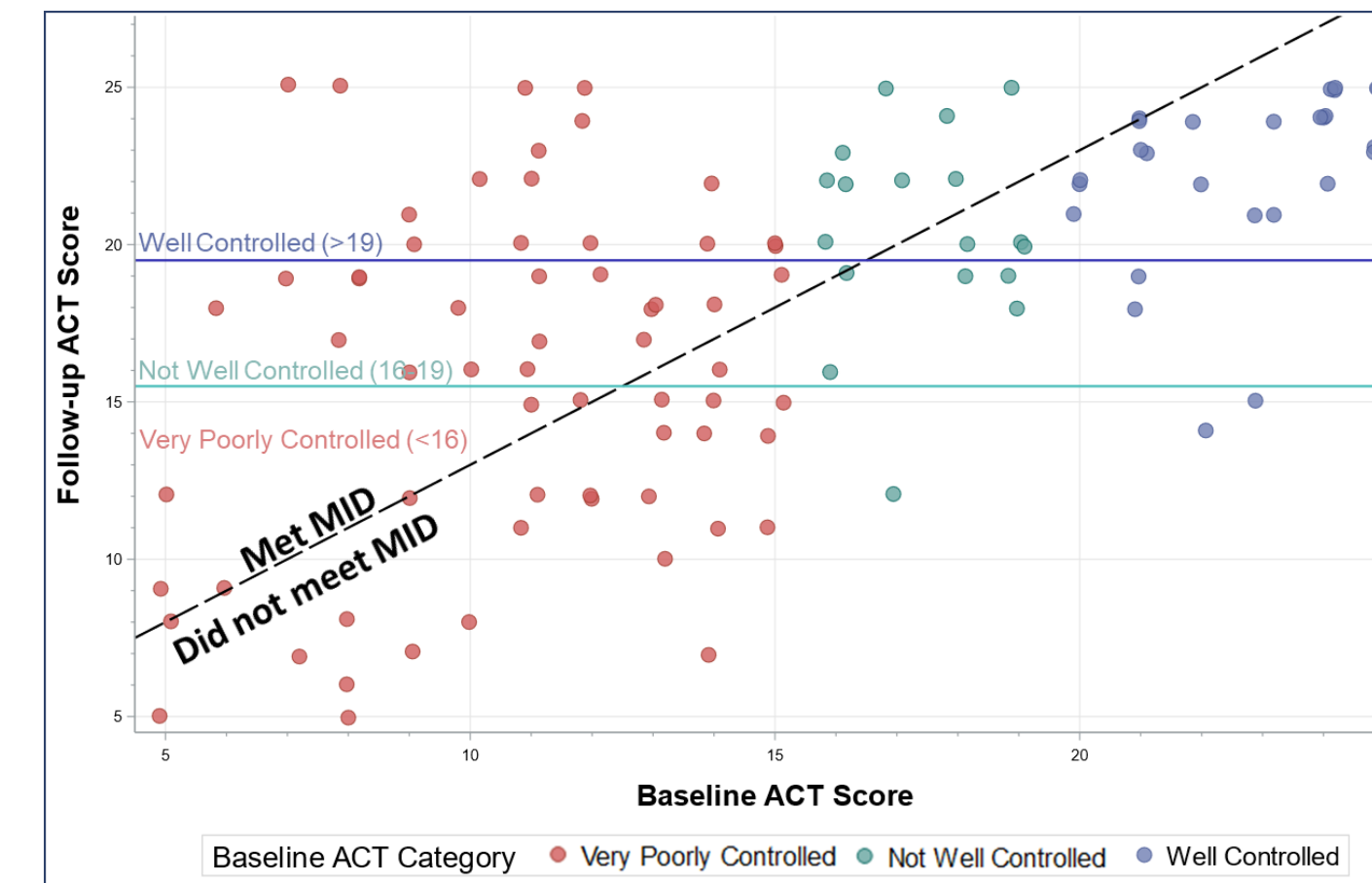
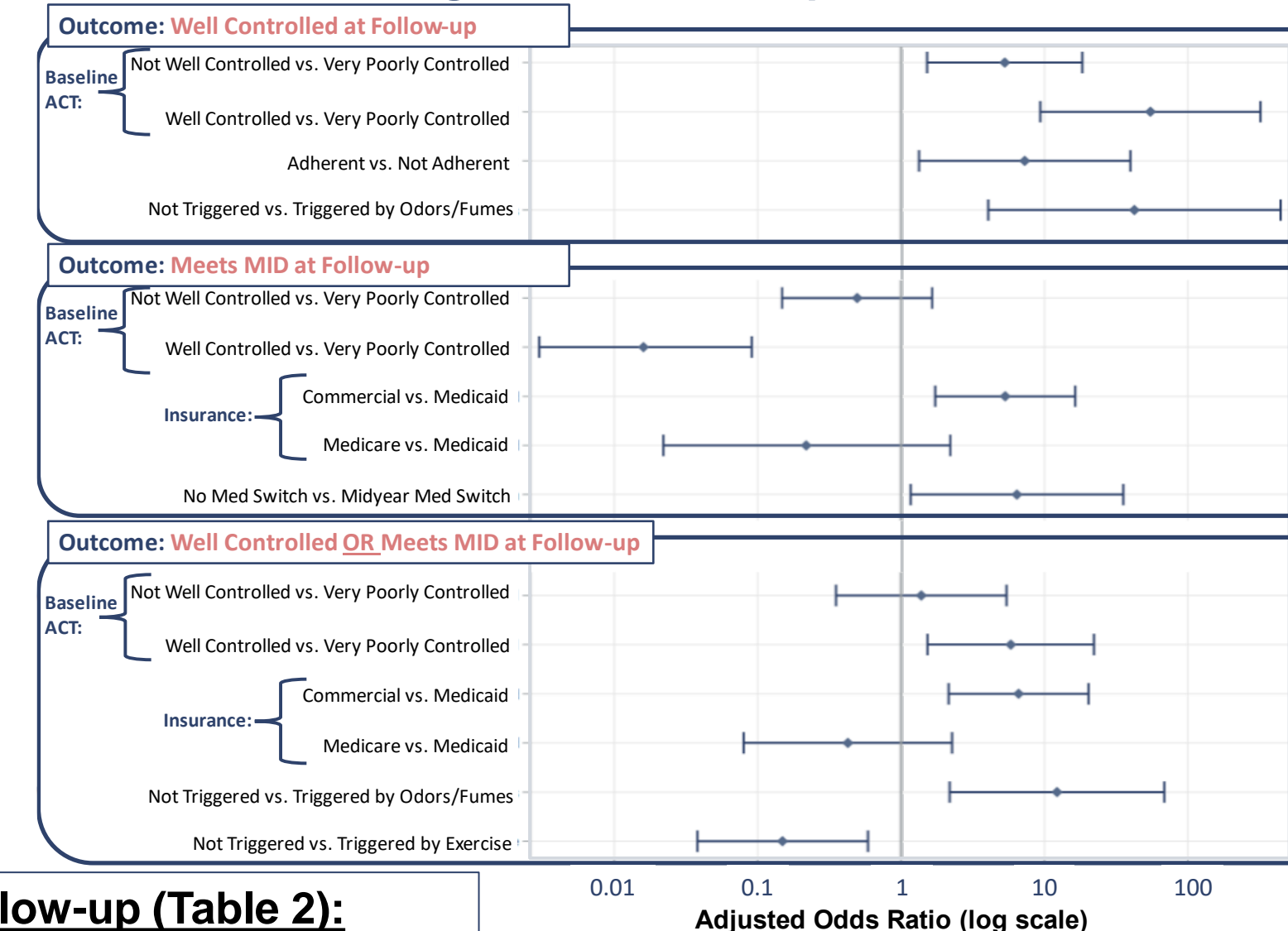


FIGURE 2: Adjusted Odds and 95% Confidence Intervals of Being Well Controlled and Meeting MID at Follow-up



At Follow-up (Table 2):

- Baseline ACT score categories were associated with Follow-up ACT Score Category and meeting MID
- Patients who were **Well Controlled at Follow-up** were more likely to be **adherent**
- Patients with **commercial insurance** were more likely to be **Well Controlled and meet MID**

FIGURE 3: Asthma Control at Follow-Up

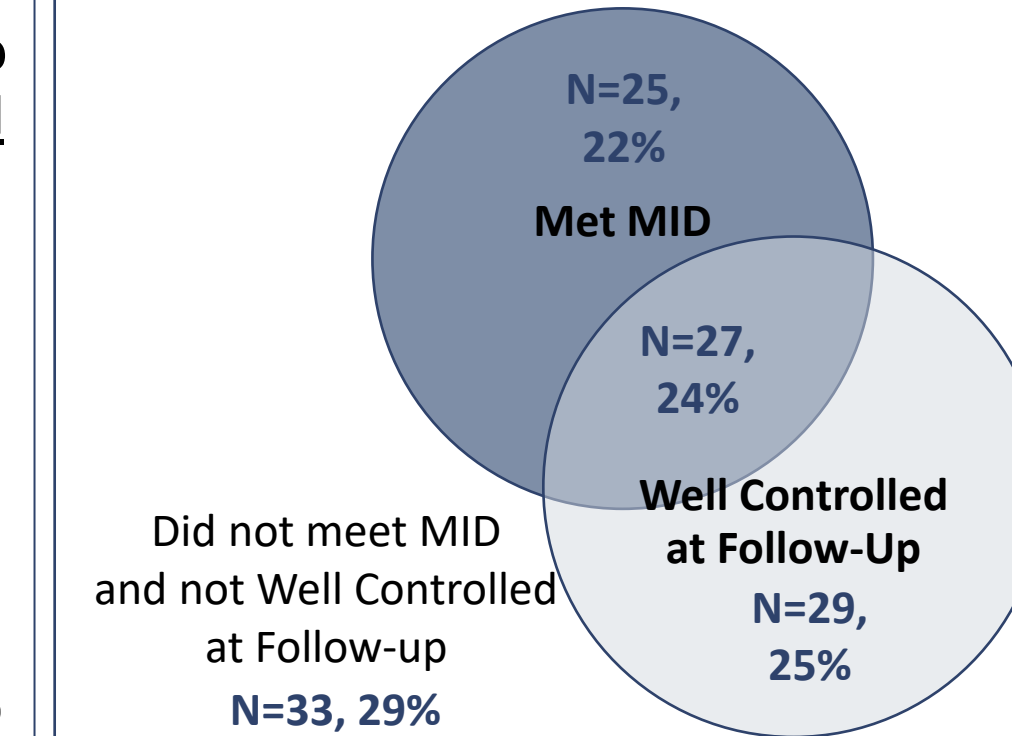


TABLE 2: Follow-up ACT and MID Categories by Care Characteristics

	Total	Follow-Up ACT Score Category			p-value	Met MID		p-value
		Very Poorly Controlled	Not Well Controlled	Well Controlled		No	Yes	
Total Population	114 (100.0)	32 (28.1)	26 (22.8)	56 (49.1)		62 (54.4)	52 (45.6)	
Baseline ACT Score Category								
Very Poorly Controlled	63 (55.3)	29 (90.6)	18 (69.2)	16 (28.6)		23 (37.1)	40 (76.9)	
Not Well Controlled	18 (15.8)	1 (3.1)	5 (19.2)	12 (21.4)		8 (12.9)	10 (19.2)	
Well Controlled	33 (28.9)	2 (6.3)	3 (11.5)	28 (50.0)	<.0001	31 (50.0)	2 (3.8)	<.0001
Midyear Med Switch								
Missing	9 (7.89)	4 (12.5)	3 (11.5)	2 (3.6)	0.24	6 (9.7)	3 (5.8)	0.51
Adherent								
No	21 (18.4)	10 (31.3)	6 (23.1)	5 (8.9)		12 (19.4)	9 (17.3)	
Yes	88 (77.2)	22 (68.8)	20 (76.9)	46 (82.1)	0.021	48 (77.4)	40 (76.9)	0.79
Therapy Type								
Current	51 (44.7)	14 (43.8)	7 (26.9)	30 (53.6)		36 (58.1)	15 (28.8)	
New	63 (55.3)	18 (56.3)	19 (73.1)	26 (46.4)	0.077	26 (41.9)	37 (71.2)	0.0018
Insurance								
Commercial	50 (43.9)	6 (18.8)	12 (46.2)	32 (57.1)		21 (33.9)	29 (55.8)	
Medicaid	54 (47.4)	22 (68.8)	13 (50.0)	19 (33.9)		32 (51.6)	22 (42.3)	
Medicare	10 (8.8)	4 (12.5)	1 (3.8)	5 (8.9)	0.0096	9 (14.5)	1 (1.9)	0.013

DISCUSSION

- Insurance was **not significantly associated with Baseline ACT score category** (Table 1).
 - However, it was **significantly associated with Follow-up ACT score category and whether a patient met MID** (Table 2).
- Insurance type was associated with adherence (p=0.0007).
 - 18 of 21 (85.7%) patients with PDC < 0.8 were on Medicaid insurance (data not shown).
- Even after adjusting for baseline ACT category, certain triggers (like odors/fumes), adherence, and insurance type are associated with being well-controlled and/or meeting MID at follow-up (Figure 2).

CONCLUSION

- Most asthma patients were Well Controlled or met MID at Follow-up within the specialty pharmacy.
 - Patients with commercial insurance were most likely to achieve MID and remain adherent.
- Goals for asthma control are often either set as meeting the MID or being Well Controlled; understanding factors related to ACT trajectories may aid in personalizing care goals for patients in the specialty pharmacy.
- Other studies indicate that patients experiencing greater social determinants of health are at higher risk of poorer asthma outcomes.
 - Incorporating insurance, nonadherence, triggers, and ACT score trajectories into counseling and frequency of pharmacy assessments may be important.
- Additional analysis of the reasons for poor ACT score trajectories may help identify opportunities for further collaborative care.

REFERENCES

1. Schatz M, Kosinski M, Yarus AS, Hanlon J, Watson ME, Jhingran P. The minimally important difference of the Asthma Control Test. J Allergy Clin Immunol. 2009 Oct;124(4):719-23.e1. doi: 10.1016/j.jaci.2009.06.053. Epub 2009 Sep 19. PMID: 19767070.USP (United States Pharmacopoeia): "USP General Chapter <800> Hazardous Drugs—Handling in Healthcare Settings" Available at http://www.usp.org/compoundig/general-chapter-hazardous-drugs-handling-healthcare (2018).