

# Electronic Monitoring Devices (EMD) to Measure Inhaler Adherence: difficulties in practice

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## Introduction

- Inhaled steroids reduce asthma related symptoms and asthma attacks<sup>1</sup>
- Many EMDs commonly used do not measure actuations, however EMDs are becoming widely used to provide data to inform the clinicians about their patients adherence in asthma care<sup>2</sup>
- We describe the experience of EMD monitoring of asthma medication in children with difficult asthma as routine clinical practice referred to the regional children's difficult asthma service
- Provide an overview of the benefits of the monitoring including assessment of inhaler technique by analysing the time between actuations

## Methods:

- A retrospective data analysis taken from EMD monitoring (Smartinhaler™) from the difficult asthma database and nursing notes between 2016 - 2019
- We also looked at any recorded comments made by families or children and young people being monitored, also taken from the database and nursing notes.

## Results:

- Data from 60 patients were analysed
- Median age at analysis was 12.3 yr. (6.6 - 15.2 yr.)
- Median duration of monitoring was 3.5 months (1-6.8 months)
- All children were on inhaled steroids  $\geq 1000\text{mcg}$  of beclomethasone equivalent
- Data from 46/60 (76.6%) showed adherence  $<80\%$
- 14/60 (23.4%) who had adherence  $>80\%$ , only 6/60 (10%) data showed probable good inhaler technique (example in Fig 1a, b)
- Some of the young people and parent's reasons for poor adherence ( Fig 3)

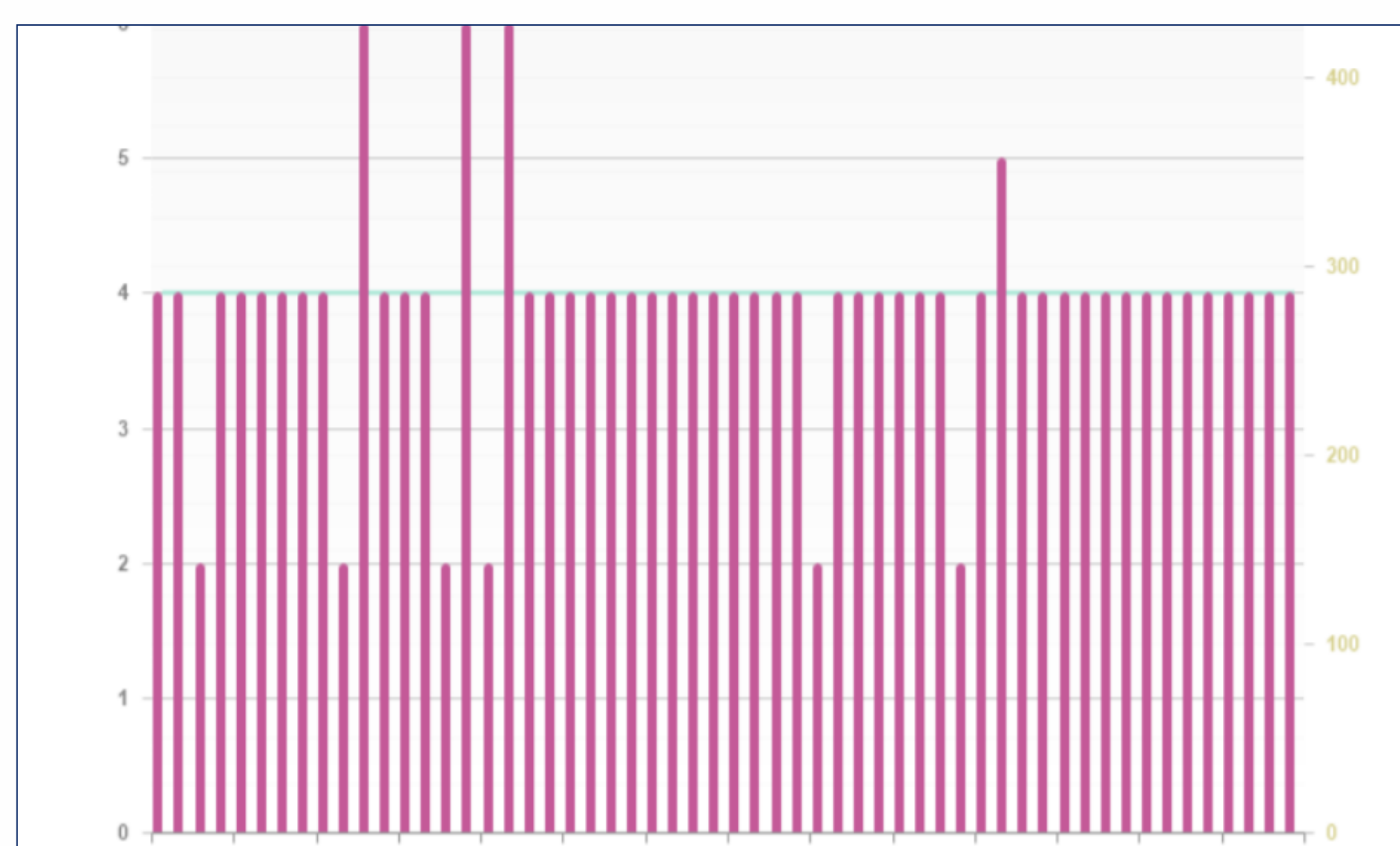


Figure 1a; patients data showing 92% adherence

2018-01-29 08:11:02	Seretide	125/25	Medication
2018-01-29 08:11:02	Seretide	125/25	Medication
2018-01-28 06:39:19	Seretide	125/25	Medication
2018-01-28 06:39:19	Seretide	125/25	Medication
2018-01-28 06:39:18	Seretide	125/25	Medication
2018-01-27 06:39:37	Seretide	125/25	Medication
2018-01-27 06:39:37	Seretide	125/25	Medication
2018-01-27 06:39:36	Seretide	125/25	Medication

Figure 1b: further analysis of the data from the same patient in 1a showing inhaler actuated in succession to inhale 2 puffs

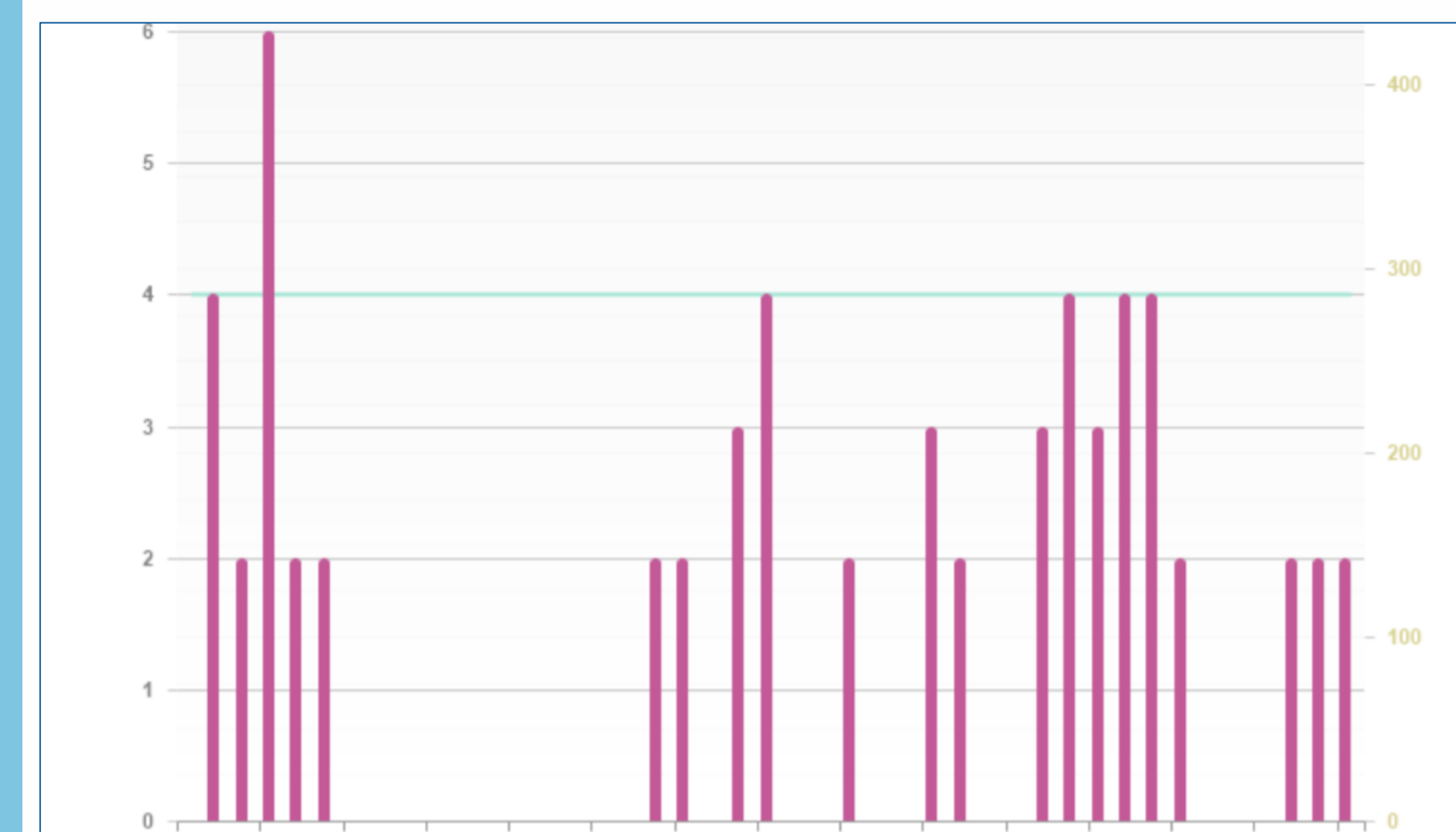
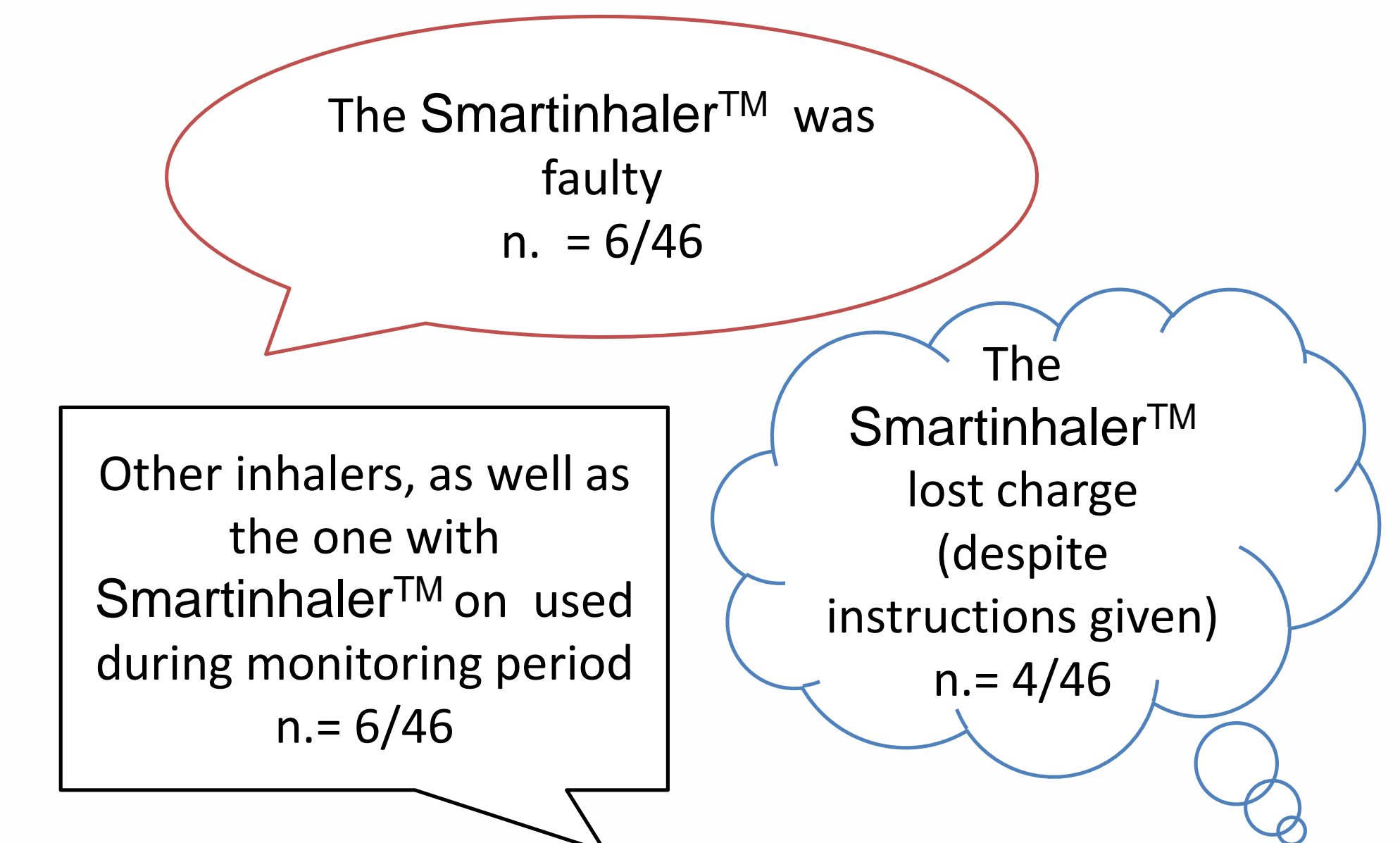


Figure 2; patient data showing 28% adherence

- 6/60 (10%) continued using the Smartinhaler™ beyond monitoring period
- Currently in three years, two Smartinhaler™ have been lost.

Figure 3; When questioned the 46 that had poor technique or adherence, common themes for this were



## Conclusion:

- The time between actuations provides a unique surrogate marker for inhaler technique.
- Inhaler technique data should also be used during data analysis and not just the percentage of use.
- The patient selection bias i.e. issuing Smartinhaler™ in patients with suspected non adherence may have resulted in lower adherence reported in our cohort
- The results of the monitoring will enable conversations with the family and regarding adherence with objective data

## References:

- Wennergren:1996
- Jochmann:2017

