

# MANIPULATION AND FORMULATION - THE TALE OF TWO ASPIRIN TABLETS

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## Background

Manipulation of drug formulation (e.g crushing of tablets, opening of capsules) to achieve an appropriate dose is often necessary in the pediatric ward. Such manipulation has, however, been shown to result in inaccurate dosing, e.g. not exceeding 76.5% of the intended dose for one aspirin formulation, in one study (Broadhurst, 2008).

## Objectives

The purpose of this study was to investigate the dosing accuracy of two different, low-dose aspirin tablets commonly used in pediatric care (*Bayer Chewable* (81 mg) (BC) and *Dispersible Aspirin* (75 mg) (DA)), using validated UHPLC-analysis (Ultra High Performance Liquid Chromatography).

## Methods

Aspirin tablets: *Bayer Chewable* (81 mg), Bayer Healthcare LLC, and *Dispersible Aspirin* (75 mg), Aspar Pharmaceuticals Ltd. Instrument: UHPLC-system from Shimadzu Corp (Nexera, with Prominence DAD-detector). Analytical column: ACE Excel 2  $\mu$ m C18-AR, 2.1 x 100 mm, (Advanced Chromatography Technologies Ltd.) The analytical method was validated for linearity, precision, and specificity. *Dosing accuracy study*: Six tablets from each of the two formulations were each dissolved in 10 ml water. After 3 minutes, samples (1 ml or 2 ml) were withdrawn. Dosing accuracy was recorded and compared between formulations and with previous findings.

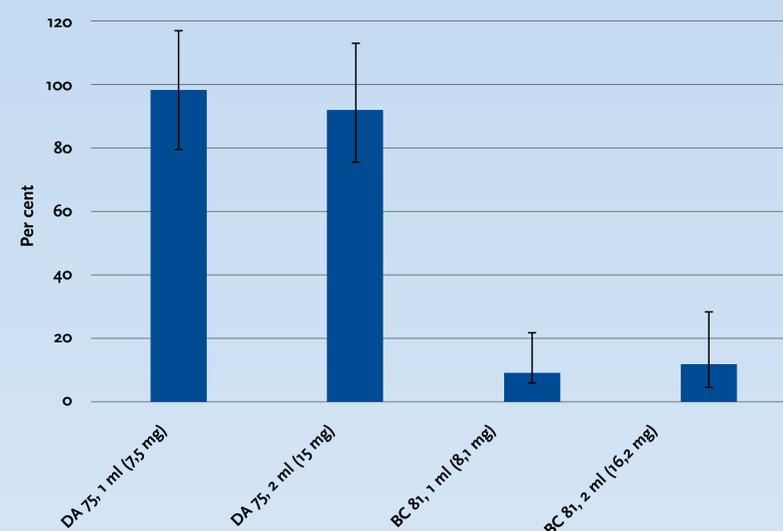
## Results

Analytical method: The analytical method was found to be stability indicating for aspirin. Dosing experiments: For *Dispersible Aspirin* (75 mg) 98.7 % (80.0–117.3 %) and 92.2 % (76.0–113.3 %) (average

(lowest-highest observation, n=6)) of intended dose was found for 1 ml or 2 ml samples, respectively. For *Bayer Chewable* (81 mg) 9.3 % (6.2–22.2 %) and 12.3 % (4.9–28.4 %) of intended dose was found for 1 ml or 2 ml samples, respectively.

## Discussion

Two tablet formulations commonly used in pediatric care have been investigated with regards to suitability for manipulation and part dose administration (10 or 20% of whole tablet). A low precision could be noted for both formulations upon manipulation. The accuracy is markedly better for one formulation (DA) compared to the other (BC).



**Figure:** Per cent recovered (average, with highest and lowest value, n=6) upon dissolving a tablet in 10 ml water and dosing 1 ml (10%) or 2 ml (20%) of two different tablet formulations. (DA 75 = *Dispersible Aspirin* (75 mg), BC 81 = *Bayer Chewable* (81 mg). 7.5 mg, 15 mg, 8.1 and 16.2 mg was set as 100% of intended dose for the different tablets and fractions, respectively.)

## Conclusion

Using a validated UHPLC-method the dosing accuracy of *Dispersible Aspirin* (75 mg) was found to be better than previously published. The dosing accuracy of a second formulation (*Bayer Chewable* (81 mg)) was found to be poor. The study underlines the importance of considering formulation when manipulating tablets.



## Reference:

Broadhurst, EC, Ford JL, Nunn AJ, Rowe PH, and Roberts M. Dose uniformity of samples prepared from dispersible aspirin tablets for paediatric use. *European Journal of Hospital Pharmacy Science*, 14(2):27–31, 2008.