



# Extemporaneously compounded oral medicines in Spanish hospital pharmacies

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## Background & Purpose

Pharmaceutical compounding, the preparation of customised medicines in order to meet the specific needs of patients, is an invaluable therapeutic alternative that allows patients the benefit of a bespoke treatment. Although an age-old practice, only a few studies have been published regarding the current compounding practices in Spain. The purpose of this project was therefore to identify and characterise the oral compounded medicines most frequently dispensed in Spanish hospital pharmacies (Carvalho, 2012).

## Results & Discussion

A total of 30 hospitals (78% response rate) contributed data regarding the oral compounded medicines most frequently dispensed by their pharmacies. Active substances were grouped according to the respective therapeutic classification (*Martindale 35, 2007*), giving a total of 281 different active substances (including 9 NTI drugs) and 35 therapeutic groups. The top 3 groups were cardiovascular drugs; nutritional agents and vitamins; and antibacterials.

Oral solid dosage forms were reported by 93% of all participant hospitals and included: capsules (over 90% of all oral solids), oral powders (less than 5%) and powders for oral liquids (less than 2%), in a total of 1,052,518 individual units. The top 5 active substances dispensed as oral solids were: ribavirin, dexamethasone, sildenafil citrate, bosentan and fludrocortisone acetate.

Oral liquid dosage forms were reported by 90% of all participant hospitals and included (in decreasing order): solutions, suspensions, syrups, tinctures, oral drops and elixirs (multidose) and oral syringes (unidose), in a total sum of 60,117 multidose and 59,142 unidose containers. The top 5 active substances dispensed as oral liquids were: omeprazole, methadone HCl, colistin sulfate, amphotericin B and ranitidine (Table 1) (Carvalho, 2012).

Table 1. Compounded medicines most frequently dispensed as multidose oral liquids.

Active substances	Strengths	Number of hospitals	Number of containers
Omeprazole	2 mg/mL 10 mg/mL	19	10,856
Methadone HCl	0.1-10 mg/mL	11	3,670
Colistin sulfate	<i>not specified</i>	3	3,553
Amphotericin B	<i>not specified</i>	1	3,550
Ranitidine	5-20 mg/mL	19	3,529

Assuming all oral solids were dispensed in packs of 100 units, it is concluded that oral liquids were dispensed in larger quantities than oral solids (60,117 multidose oral liquids vs 10,525 packs oral solids).

## Materials & Methods

A survey research was set up to identify and characterise the oral compounded medicines most frequently dispensed in the hospital pharmacy setting. A self-completion questionnaire was developed to collect data regarding the most frequently dispensed oral compounded medicines, as follows: active substance; strength; dosage form; quantity; and number of times dispensed in 2008. The questionnaire was distributed to a purposive sample of 40 hospitals across the country (Figure 1), including general hospitals, university hospitals and paediatric-specialist hospitals. These

hospitals were identified as the ones in which the largest quantities of compounded medicines were likely to be dispensed in Spain. A total of 9 hospitals were from Madrid, 4 from Barcelona, 2 from Seville and 2 from Valencia (Carvalho, 2012).

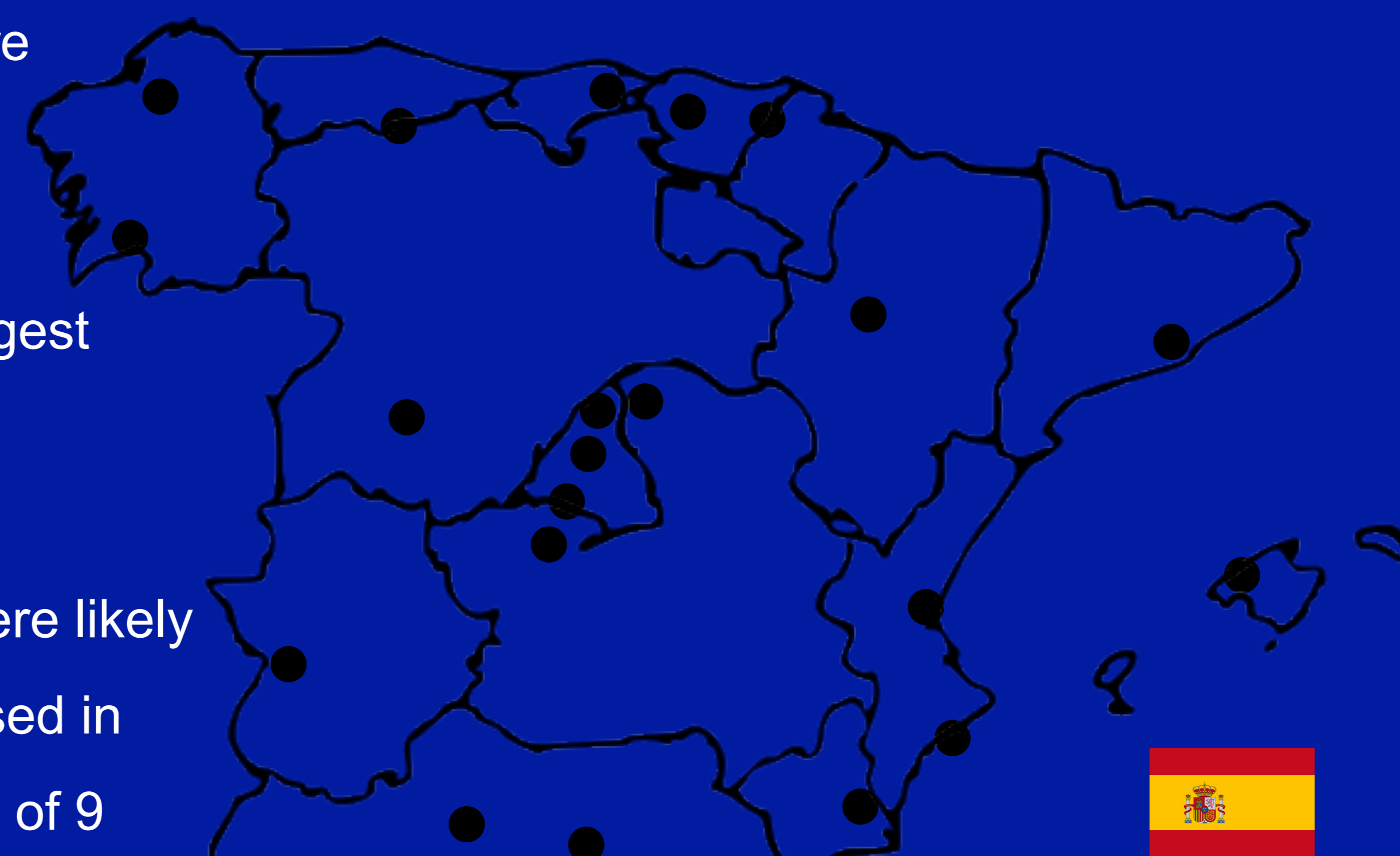


Figure 1. Map of Spain indicating the location of the purposive sample of hospitals.

## Conclusions

It is concluded that a wide range of active substances, including NTI drugs, and dosage strengths were dispensed in Spain, which showed the diversity of pharmaceutical compounding and reinforced the importance of this practice in the hospital setting. The most frequently dispensed compounded medicines were identified and it is recommended that these medicines, in particular, should be the ones considered for licensing or prioritised for standardisation in official (Spanish or European) monographs (Carvalho, 2012).

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*Martindale 35* (2007) [CD-ROM]. RPSGB and Sweetman, S. (ed.). Available: Pharmaceutical Press.