

Current Status of Pharmaceutics Education in US Colleges and Schools of Pharmacy



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Introduction

Pharmaceutics is an integral part of drug design, development, and approval of a drug product before it can be marketed. Despite pharmaceutics being a required component of the Pharm D curricula, no prior studies have been conducted to determine the credit hour load of pharmaceutics. Thus, this study is intended to survey the overall weight of pharmaceutics teaching in PharmD programs, which may serve as a guiding document for programs undergoing or planning a curriculum revision.

Objective

To determine the extent of pharmaceutics education in US Doctor of Pharmacy (PharmD) programs

Methods

- Curricular information on pharmaceutics and pharmaceutics laboratory components were collected from the websites of US PharmD programs (N=144).
- The following information was collected and analyzed: nature of pharmaceutics courses (independent vs integrated), professional year they are offered (P1 or P2 or P3), laboratory offering (independent, combined with didactic component, or through skills lab), number of didactic courses as well as number of lab offered, and length of the program (3 years or 4 years).
- Percentage of pharmaceutics in total curriculum hours was calculated by dividing the credit hours of pharmaceutics plus the lab by the total credit hours in the program.

Results

Table 1: Years Offering Pharmaceutics Courses

Year Offering Pharmaceutics Courses	# of Programs (%)
PY1	100 (69.4%)
PY2	6 (4.2%)
PY1 +PY2	25 (17.4%)
PY3	1 (0.7%)
PY1+ PY2 + PY3	1 (0.7%)
Not indicated	11 (7.6%)

PY1, PY2, PY3: professional year 1, 2 and 3 respectively

Results

Table 2: Total Credit Hours of Independent Pharmaceutics Courses in US PharmD Programs

Credit Hours (including Labs)	# Programs/Schools	% in Total Curriculum Hours
4	17	2.69
5	16	3.46
6	29	4.11
7	18	4.49
8	27	5.20
9 or higher	17	6.60

Table 3: Subjects Combined with Pharmaceutics in US PharmD Curriculum (N=30)

Subjects	N (%)
Foundation Course	4
Calculations	10
Pharmacokinetics	6
Medicinal Chemistry	2
Labs integrated into Pharmacy Skills Lab or Patient Care Lab	8

Table 4: Types of Program

Type of Program/ Private or Public	Private (73)	Public (70)
Regular (4 years)	53	67
Accelerated	24	3
Online	15	3

Table 5: Course-integrated vs Separate Laboratory

Information Not Available	Labs Integrated into the Course	Independent Labs	No. of Labs
40 schools	49 schools	56 schools	
	22	26	1
	14	23	2
	4	2	3
	9	4	Unclear

Discussion

- Pharmaceutics serve as building block for later didactic years, yet the number of credit hours dedicated to pharmaceutics varies drastically across pharmacy schools. The variation in the total pharmaceutics course load suggests PharmD students may be either under or over-taught in the related topics.
- Roughly a similar number of programs offer integrated labs (49 schools) and non-integrated labs (56 schools) in pharmaceutics courses. This discrepancy is due to lack of guidance document publicly available for designing pharmaceutics curriculum.
- When designing a new curriculum and deciding the topics to be taught, there is a unique challenge in deciding the depth and breadth of pharmaceutics topics in the new curriculum.
- The outcome of this study may serve as a reference document in the curricula revision process.

Conclusion

- All Pharmacy programs have dedicated pharmaceutics courses in their curriculum, generally covered in the first professional year. However, there is a discrepancy in the credit hours dedicated to pharmaceutics.
- Many PharmD programs have reduced the number of credit hours dedicated to pharmaceutics either to provide shorter programs or to add more clinical components.
- Some programs do not have sterile compounding or physical pharmacy laboratories at all, and few programs provide compounding laboratories through skills labs.

References

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