

## Pharmacology Curriculum Transformation from a Disciple-based to a Systems-based Model in an Osteopathic Medical School

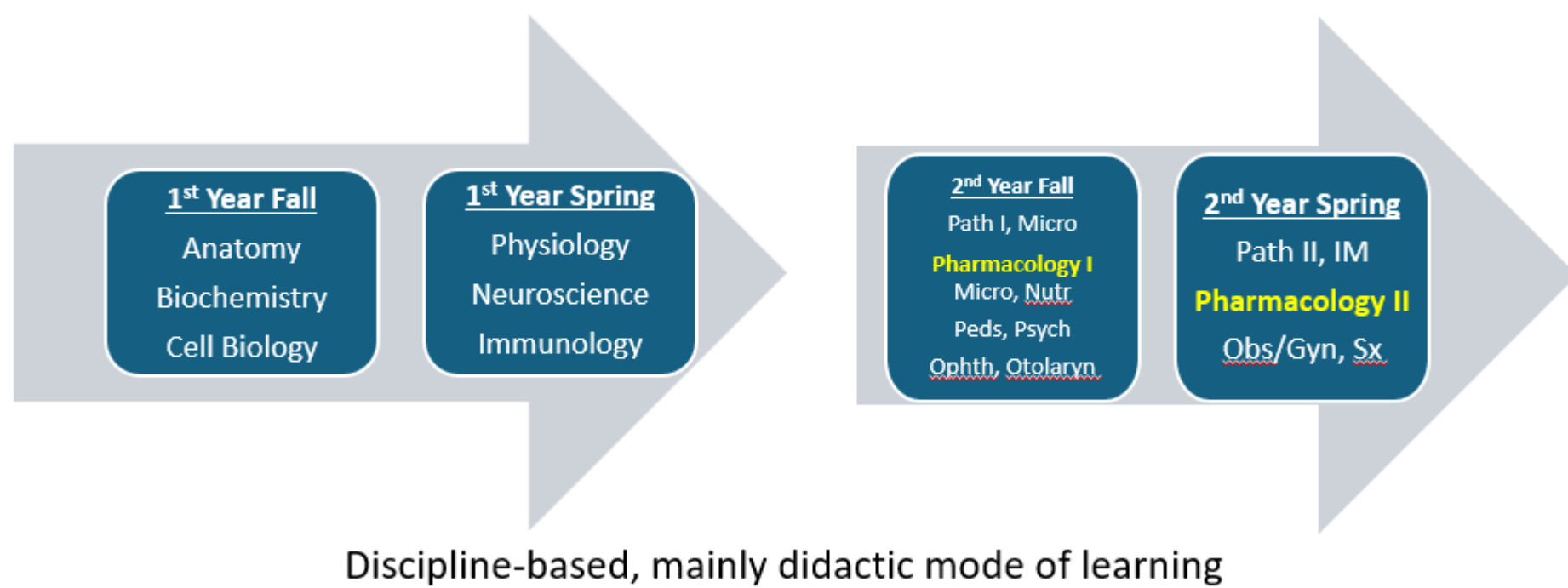
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### INTRODUCTION & AIM

- KYCOM transformed its pre-clinical curriculum from a traditional, discipline-based model to an integrated, system-based, two-pass hybrid design. Prior to reform, pharmacology was delivered as two stand-alone second-year courses primarily through didactic lectures. Curriculum redesigns reduce pharmacology contact hours and redistributed content across organ systems.
- This study evaluates whether pharmacology contact hours can be reduced within an integrated systems-based curriculum while maintaining national licensing examination performance and strengthening clinical application.

#### UPike-KYCOM 4-yr DO Program: Ys 1 & 2 Snapshot

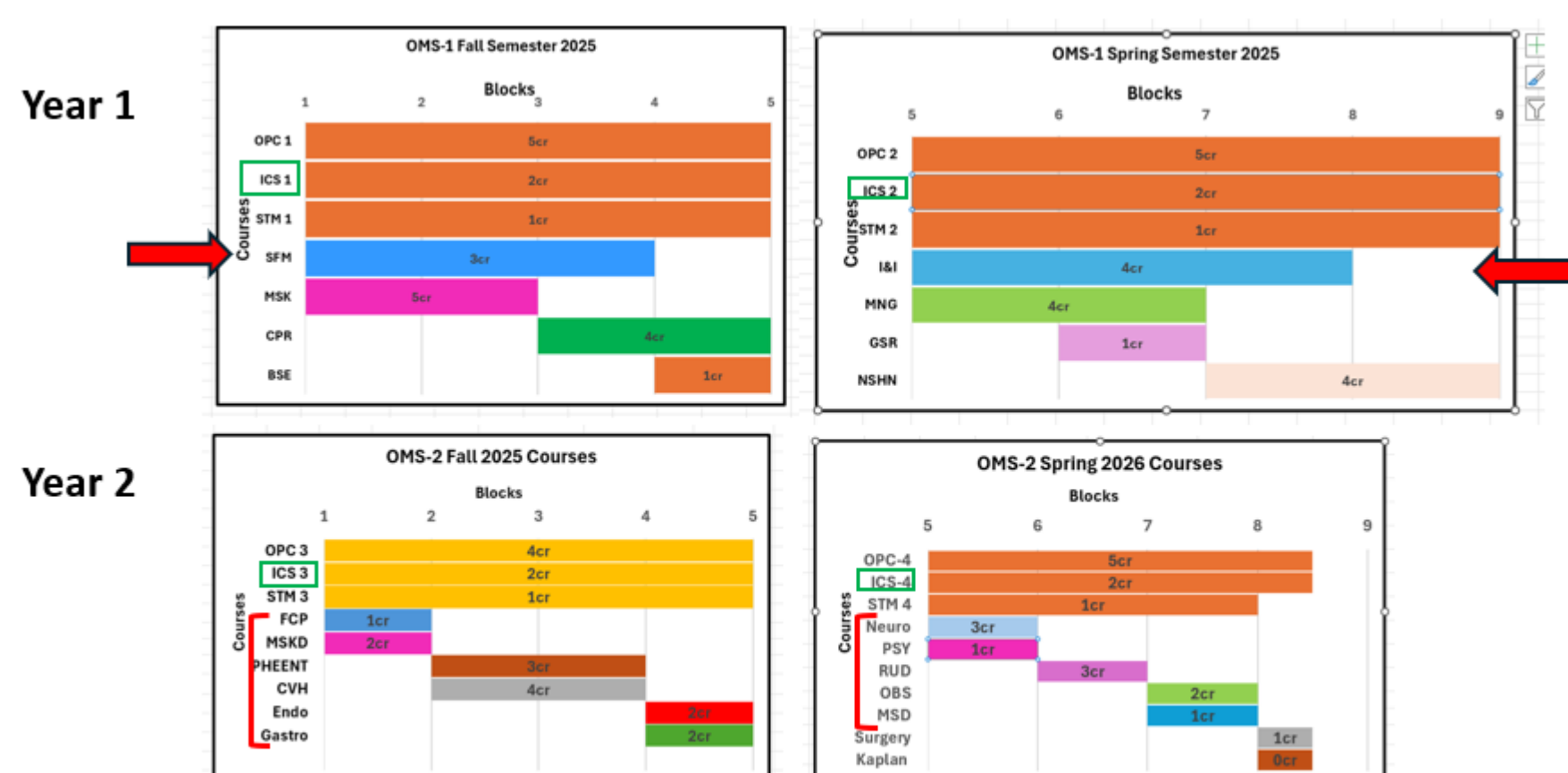


| Year #2 - Pharmacology  |                                 |   |                                  |  |         |         |         |
|---|---------------------------------|---|----------------------------------|--|---------|---------|---------|
| Fall Semester (Aug-Dec)   |                                 |   |                                  | Spring Semester (Jan-Apr)  |         |         |         |
| Block 1   | Block 2                         | Block 3                                   | Block 4                          | Block 5  | Block 6 | Block 7 | Block 8 |
| Lectures; 1-2 Case study sessions/block<br>Assessment: Block ends with a board-style block exam |                                 |   |                                  | Lectures; 1 Case study session/block<br>Assessment: Block ends with a board-style block exam |         |         |         |
| Principles (PK/PD, ANS)<br>L11, CS4, R1   | ANS, Antibiotics<br>L9, CS6, R2 | Antimicrobials, Endocrine<br>L10, CS4, R2 | Endocrine, Psych<br>L10, CS4, R2 | 4 Credits: L 40, CS 18, R7   |         |         |         |
| Neuro, CV<br>L11, CS4, R2   | CV, Heme, Renal<br>L10, CS4, R2 | Autocoids, Resp, GI<br>L8, CS4, R2        | Oncology, Misc.<br>L8, CS2, R2   | 4 Credits: L 37, CS 14, R8   |         |         |         |
| Total: L 77, CS 32, R 15 = 124 hours  |                                 |   |                                  |  |         |         |         |

### METHOD

- Pharmacology content was systematically mapped across the revised curriculum to eliminate redundancies and clarify disciplinary roles.
- Faculty developed explicit guidelines: pharmacology focused on mechanisms of action, adverse effects, drug interactions, and core clinical uses, while internal medicine emphasized diagnosis, guidelines, and drugs of choice.
- Previously underrepresented topics (immunopharmacology; pharmacotherapy in pregnancy and lactation) were incorporated.
- A longitudinal case-based course reinforced pharmacologic principles across both pre-clinical years.
- A 2<sup>nd</sup> year Therapeutics of Infectious Diseases series was introduced to strengthen antimicrobial application in clinical contexts.
- Student outcomes were assessed using NBOME Level 1 pharmacology performance reports, comparing cohorts before and after curricular transformation.

#### Post Curriculum Transformation



Systems-based, 2-pass, hybrid

Assessments: Block exams, Weekly Quizzes; Pharm Lecture hours in Total: 90 hours

### RESULTS & DISCUSSION

- Following curricular reform, pharmacology contact hours were reduced from 124 to 90 hours (27% reduction) without deterioration in national benchmark performance.
- Pre-transformation pharmacology scores were comparable to national means (national mean 549.07, SD 155.21 vs. school mean 502.25, SD 140.76).
- Post-transformation performance remained at national average levels, indicating preservation of competency despite a 27% reduction in instructional time.

#### Content Overlap: Basic vs Clinical Sciences

##### Pharmacology:

- Drug classifications
- Mechanisms of action
- Adverse effects
- Pharmacokinetics
- Drug interactions
- Clinical indications

##### Clinical Faculty:

- Differential diagnosis, management and therapeutics, guidelines, drugs-of-choice

#### New Lecture Topics: Post-Transformation

##### MSK-Dermatology :

- Drugs for the Skin

##### Pulmonology & HEENT:

- Drugs for the Eye

##### Neurology:

- Dementia and Alzheimer's
- Drugs for Movement Dis.

##### Obs. & Human Dev.:

- Drugs in Pregnancy & Lactation

##### Multi-system Disease:

- Immunopharmacology

#### Antibiotics Therapeutics (Systems-based)

##### Pharmacology vs Therapeutics

Help bridge the gap between basic pharmacology and clinical decision-making, while preparing students for their licensing exams

##### Year 2 Fall:

- Antimicrobial Regimen Selection – FCP Course
- Treatment of Bone & Joint Infections – MSK Course
- Treatment of Respiratory Infections – Pulmonology Course
- Treatment of GI Infections – GE Course

##### Year 2 Spring:

- Treatment of CNS Infections – Neurology Course
- Treatment of STIs – Renal Course
- Treatment of UTIs – Renal Course
- Treatment of Obstetric Infections – Obs. & Human Development Course

#### Student Performance Comparison: Pre- & Post-Transformation

| NATIONAL BOARD OF OSTEOPATHIC MEDICAL EXAMINERS                    |              |               |                  |             |                |
|--|--------------|---------------|------------------|-------------|----------------|
| COMLEX-USA LEVEL 1   |              |               |                  |             |                |
| (May 2021 - April 2022 First-Time Takers Only)                     |              |               |                  |             |                |
| University of Pikeville - Kentucky College of Osteopathic Medicine |              |               |                  |             |                |
| SCHOOL SUPPLEMENTAL REPORT   |              |               |                  |             |                |
| CATEGORIES   | SCHOOL COUNT | NATIONAL MEAN | NATIONAL STD DEV | SCHOOL MEAN | SCHOOL STD DEV |
| TOTAL TEST   | 128          | 528.19        | 91.91            | 484.48      | 90.82          |
| DISCIPLINE   |              |               |                  |             |                |
| PHARMACOLOGY   | 128          | 549.07        | 155.21           | 502.24      | 140.76         |

| COMLEX-USA Level 1   |              |                    |
|--|--------------|--------------------|
| (May 07, 2025 - October 26, 2025 First-Time Takers Only)           |              |                    |
| University of Pikeville - Kentucky College of Osteopathic Medicine |              |                    |
| REAL-TIME PERFORMANCE SCHOOL SUPPLEMENTAL REPORT                   |              |                    |
| CATEGORIES   | SCHOOL COUNT | SCHOOL PERFORMANCE |
| TOTAL TEST   | 124          | AVERAGE            |
| DISCIPLINE   |              |                    |
| Pharmacology   | 124          | AVERAGE            |

### CONCLUSION

- The curriculum transformation allowed pharmacology to move from a stand-alone, content-heavy model to an integrated, application-oriented design aligned with system-based learning.
- Lecture hours were optimized, minimizing overlap.
- The addition of the longitudinal, case-based small-group course provided consistent opportunities for students to apply pharmacology concepts in clinical contexts.
- Integration across both pre-clinical years ensured pharmacology is revisited and reinforced, particularly through the new Therapeutics of Infectious Diseases series.
- Despite a reduction in overall pharmacology contact hours (124 → 90), active learning opportunities increased, supporting deeper learning.
- Pre- and post-transformation student performance data suggests comparable understanding and exam outcomes.