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A Disease-Based Approach to the Vertical and Horizontal Integration of a Medical Curriculum

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Title: A disease-based approach to the vertical and horizontal integration of our medical curriculum.

Short title: Disease-based curriculum integration

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Abstract:

As medical disciplines have become increasingly interdisciplinary and evidenced-based medicine is widely practiced, there is a need for curricula that reflect these changes. The newly revised LCME standards 1.1 Strategic Planning and Continuous Quality Improvement and 8.3 Curricular Design, Review, Revision/Content Monitoring require ongoing curricular review to assure accreditation compliancy. We have completed a comprehensive review of our curriculum and have moved from a discipline-based curriculum to that of one that focuses on a systems/disease-based model. The approach allows for a more horizontally integrated curriculum in the preclinical years, while the use of 115 distinct disease and eight themes creates a quality assurance mechanism that allows for tracking of vertical integration across the entire curriculum. The first step in the development of this quality assurance model was to establish and empower a newly formed integration subcommittee. This subcommittee was tasked with developing a model to review, track and improve the horizontal and vertical integration of the curriculum. Our integrated curriculum is now in its second year having completed the initial identification of gaps and redundancies through a process that relies on the mapping of diseases and themes throughout the courses. This ongoing review and evaluation process has created a dynamic quality assurance process that allows our faculty to address issues of both horizontal and vertical integration of our curriculum at the course level.

Key words: Curriculum reform; Integration, Quality Assurance, Curriculum design and structure, Preclinical medicine

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Introduction

External pressures have driven medical education programs across the globe to better integrate basic and clinical science throughout the medical curriculum [1-4]. Much of the impetus has come as a result of the need to manage the ever increasing medical knowledge domains, increased recognition of the importance of imparting students with independent learning skills, and demonstrating the application of knowledge, skills and attitudes inherent in the practice of medicine. From an accreditation standpoint, the Liaison Committee on Medical Education (LCME) requires medical school curriculum management, by demonstrating ongoing curricular review, with an emphasis on lifelong learning opportunities for students. This integration should be inclusive of what is frequently referred to as the 'hidden curriculum'. The Australian Medical Council also requires medical schools to provide non-traditional graduation domains such as 'health and society' and 'professionalism and leadership' in addition to the more traditional science and medical domains [5]. The blurring of the discreet distinctions between science and medicine and the ever increasing cultural and social competencies required for the doctors of tomorrow would benefit from integrating basic and clinical science across the curriculum. Review and adoption of integrated curricular changes allows medical programs the opportunity to provide earlier exposure to clinical concepts in the preclinical curriculum as well as to provide scientific exposure in the clinical years [6, 7].

These external factors are often supported by internal factors that are driven from several sources. Students often inadvertently push for pedagogical approaches that integrate medicine and other disciplines such as nursing and pharmacy, ethics, and professionalism (e.g. as those commonly found in interprofessional educational sessions). The inclusion of medical students in Curriculum Committees as is common in many medical schools today, has given students an

active role in curriculum and pedagogy development [8]. The placement of basic and advanced clinical skills in the first two years of medical education has also driven the internal need to integrate. Schools wishing to provide adequate student preparation for the Unites States Medical Licensing Examination (USMLE) Step 1 exam must do so with the understanding that the exam is written using a clinical vignette style and places a large emphasis on basic science as it applies to clinical conditions [9]. This may contribute to establishing revised curricula that blur the distinction of clinical medicine and basic science. Finally, recent publications and the LCME strongly support the inclusion of students in curriculum reform [8].

Traditionally, medical schools used curricula that were based on discipline/department-approaches to medical education relying heavily on assimilative learning (the acquisition of additional knowledge in isolation) [10]. It became apparent that this approach often placed too much emphasis on the basic sciences and not enough on the clinical sciences, as these courses were taught in isolation. Human organ-based curriculum models were developed in part to address this isolation, creating an organizational structure that deemphasized individual department or course material. A number of schools have since adopted a human organ-based or systems-based learning structure that encourages the ”elaboration of knowledge in richer and wider contexts” [11, 12]. Recently, many schools have moved towards a more integrated approach to teaching scientific and medical knowledge along a continuum from normal body to abnormal body [13, 6, 7]. This continuum allows for less fragmented learning opportunities for students where they can benefit from a more transformative learning approach (the building of new knowledge onto already existing knowledge) [14]. Many medical schools still retain a ‘2 by 2’ curriculum where students focus on classroom-based learning in the first two years and hospital or clerkship learning in the second two years. In order to build a curriculum that approaches the

spiral model developed by the University of Dundee [13], we have deconstructed our classroom experiences and realigned the curriculum through the use of 115 clinical conditions as a tracking mechanism for integration. We discuss the platforms created to address the curriculum integration, the processes that were used, the diseases/conditions/themes that were adopted, and how gaps and redundancies were addressed, with the hope that other schools could benefit from our experience.

Methods

In response to a citation received from the Liaison Committee for Medical accreditation (LCME) in 2011 for standard ED-33 (Curriculum Management), the Joan C Edwards School of Medicine (JCESOM) embarked on comprehensive curricular review that included the creation of a mechanism to identify and track integration across all four years of the medical school curriculum [15]. As part of this integration process, the Curriculum Committee created the integration subcommittee and tasked this subcommittee to create a model for curricular integration at our institution. The newly created integration subcommittee was composed of four preclinical faculty, four clinical faculty, two student representatives from the Curriculum Committee, once each from the preclinical and clinical years, and members of the office of medical education (OME). Members of this subcommittee met, discussed and agreed upon the use of the 115 diseases and conditions most frequently encountered by the students in their patient logger. In addition, eight major themes were also identified representing curricular elements outside of the knowledge domain (e.g. communication, ethics and diversity) and topics of special emphasis (e.g. genetics and pharmacogenetics). This subcommittee was tasked with the vertical integration of the curriculum while the horizontal integration was the responsibility of the MSI through year MSIV subcommittees.

The integration subcommittee embarked on a review of each disease and/or condition and distributed subsets of this list to its members. Each member, with the help of content experts in both the preclinical and clinical years, then assigned and mapped objectives that pertained to each disease/condition they were assigned. The individual reports (disease maps) were then presented to the subcommittee for discussion, review and approval. Eight to ten disease maps were discussed at each biweekly meeting until all 115 disease maps were processed. During this process, the subcommittee presented each of the completed disease maps to the Curriculum Committee for review. During this review process, the Curriculum Committee recommended changes and approved the content and placement of these elements within the overall curriculum. Once approved the disease maps were placed online (http://musom.marshall.edu/curriculum/diseases.asp) and merged with the curricular database allowing faculty access when developing learning activities.

The integration subcommittee initially struggled with the next steps in the quality assurance of this integration. Ultimately the Integration Disease Report was developed by performing a query in our curriculum mapping system. The final report included all instructional activity that had been tagged by the faculty member as deemed pertinent to the disease/condition. This layout allowed the committee to appreciate both the horizontal integration within a single year of the curriculum and the vertical integration as the student moved through the four years of course work and clerkships. The generic integration report includes internally identified milestone and competencies that were structured using the JCESOM core competencies with milestones framework [MK for Medical Knowledge, PC for Patient Care, PR for professionalism, PB for practice-based learning, IC for interprofessional communication, and SB for systems-based learning]. The report also captured the number of test questions tied to the

disease or condition, and the number of patients logged (see below for an example of such report).

Results

Our curriculum has been traditionally taught under subject domains for many years. As can be seen in **Figure 1,** courses in the first year were independent of one another and focused on the basic sciences and anatomy. Neuroscience, physiology, ethics and histology where discreet courses taught by faculty who belonged to individual departments. In the old curriculum, a second year student would take courses in discreet blocks that represented very specific content domains such as infection and immunity, the nervous system, and the cardiovascular system. So, although we did achieve some horizontal integration in our second year curriculum, the topics were not integrated across all years of the curriculum. After the revised curriculum was implemented for the second half of AY 2013-2014, the courses were reorganized such that they no longer contained content domain-specific structures and were much more spiral in nature. That is to say, the Elements of Medicine block, for example, includes some anatomy and physiology in addition to other integrated subjects. However, our curriculum still focuses on the healthy human in year one and the unhealthy human in year two. The organ systems are currently taught throughout the curriculum in the first and second year. Immunology, pathology, and microbiology content is embedded in an effort to further integrate the second year curriculum. It is clear that the block titles have also changed dramatically. For example, the first year Elements of Medicine block does not included any context as to what subjects are taught in the new curriculum design. The same goes for the second year Principles of Disease and Disease and Therapeutics blocks; they are structured to include integrated subjects.

The examination schedule varied only slightly between the 2009-2010 traditional curriculum and the 2014-2015 integrated curriculum. As seen in **Figure 1**, summative exams were given at the end of the majority of blocks and courses for both curricula. Self-assessment exams, miniboard subject exams, and USMLE Step 1 exam occurred at similar times in both curricula. The biggest differences are seen in the exams themselves which were much more content specific in the older curriculum model. In the current integrated curriculum a typical exam covered a wide range of disciplines and subject content areas. Many of the exam questions have remained the same, but now appear in blocks where other questions on the same exam assess other content areas. The integrated curriculum and mixed content assessment makes it more difficult to track student content-specific performance but reflects more realistically the interdisciplinary nature of the USMLE Step exams. Therefore, our new curriculum follows a quasi-spiral model where horizontal integration is largely achieved through our efforts. We have used the 115 conditions and diseases in addition to the eight clinically relevant themes to assist us in the vertical integration of our curriculum (see below).

Before discussing and presenting the diseases and conditions that we used, it is useful to briefly outline our approach to managing the integration of our curriculum, which was -not surprisingly, a massive undertaking. As detailed in the methods, a subcommittee made up of eight faculty and two student representatives was formed to develop a model of vertical integration for the JCESOM curriculum. The process flow and products developed by this subcommittee can be seen in **Figure 2**. One of the first tasks the subcommittee performed was to review the patient logger to determine the most common disease/conditions that students encounter in their clerkships (**Table 1A**). A list of themes was concurrently developed to assure that curricular elements outside of the knowledge domain and other critical content areas were

reviewed and tracked during the curriculum mapping process (**Table 1B).** These diseases/conditions and themes were presented, reviewed and approved during the regular bi-weekly Curriculum Committee meetings. (See below for examples of such reports).

The integration subcommittee met for over a year and has reviewed a large number of diseases and conditions. From a total of 123 disease, conditions and themes- 115 disease maps and eight theme maps have been reviewed and approved by the Curriculum Committee and are available to all faculty on the internal Curriculum Committee resources web page. An example disease map for diabetes mellitus shows how this clinical disorder is mapped to the course objectives, the block(s) where these objects are covered, internally-derived competencies (structured from the ACGME) with milestones, and assessment methods (**Figure 3**). An example of this type of report for diabetes mellitus is provided in **Figure 4.** These reports also contain information about where and when the topic of interest in taught, information on the number of patient encounters, the number of assessment questions, and recommendations from the Curriculum Committee. The eight themes were vertically integrated in the first and second years by the year one and year two subcommittees. Coverage of the themes occurs in the blocks and within the longitudinal clinical skills courses that exist in year one and year two. This was achieved through the creation of PERCI (Professionalism, Ethics, Research, Cultural competency and Inter-professional education), a theme-based tack which addresses most of the medical humanities portion of the new curriculum in an integrated fashion.

Discussion/Conclusion

Integration of a medical school curriculum is not easy and requires both time and patience. Faculty who teach specific subjects must be willing to teach at different non-continuous times and outside of discreet courses or blocks. Subcommittees are useful entities for

empowering new changes especially when they are established as offsets of larger committees. In this regard, the integration subcommittee was a more efficient agent of change and implementation than the larger Curriculum Committee would have been given its size. This article represents an overall review of the steps involved in integrating our curriculum from a traditional discipline-based block system to a more dynamic and spiral-based structure [12, 13]. The process required forming an integration subcommittee, selecting a set of diseases and themes to track the vertical integration of the curriculum, mapping these diseases to objectives and placing them in the curriculum as recommended by committee members. Approval was garnered from the subcommittees who were responsible for organizing the new blocks (e.g. horizontal integration). These objectives and the appropriate disease(s) were then presented to the Curriculum Committee and finally when approved, this information was made available on the Curriculum Committee webpage for faculty and uploaded to the curricular database to allow faculty to design learning activities around these objectives. This represents an evolving and ongoing quality assurance process at JCESOM and not a one-time curriculum measure and a comprehensive review of this process is due to be completed by late 2015 [16, 17, 11].

The aforementioned structure has facilitated a mechanism to identify gaps and redundancies using four primary strategies: 1) through a query of our internal curriculum map using pre-identified conditions and themes, 2) through the review of content by course directors via the end-of-course reports, 3) through the review of student performance on internal and external exams and 4) through the comparison of our internal curriculum map to the USMLE content outlines as is demonstrated in **Figure 5** [18, 19]. These data highlight the disproportionate emphasis on general principles while suggesting an under-representation of topics like the renal and reproductive systems. In fact, the lack of comprehensive coverage of

renal physiology, for example, was identified by both the end-of-course reports and by the USMLE Step 1 content outline comparison exercise.

The comprehensive review of the curriculum that was initiated in response to the findings of the LCME in 2011 and incorporated into the work of the integration subcommittee allowed us to reassess our lecture hours and reduce them from 474.5 hours in (2009/2010) to 388 hours in (2012/2013) in year one; a reduction of nearly 20%. We also reduced lectures in year two from a total of 496 contact hours to a total of 354.5 (a reduction of 28.5%). The reduced hours were accompanied by an increase in small group and active learning sessions. This reduction in contact hours resulted in areas of content that were previously taught as discrete subjects merging into integrated small group exercises. It also meant that faculty would need to be willing to implement self-directed and/or active learning type of activities to replace some of the more passive learning experiences. An additional benefit of this type of review was the opportunity to introduce new diversity and cultural elements into the curriculum. As a result of the mapping the Diversity theme, 33 additional diversity elements were introduced into the new curriculum (https://musom.marshall.edu/curriculum/documents/themes/Diversity.pdf). Such cultural diverse learning opportunities are very valuable for a medical school that serves a fairly homogenous population were students may have fewer opportunities to interact directly with patients from a variety of diverse backgrounds.

Our plan going forward represents a continuous quality improvement model where every course and clerkship undergoes a thorough and ongoing review [3, 11, 16]. Currently, the Curriculum Committee meets twice a month to review one or two courses or clerkships at each meeting. The course or clerkship director is required to complete a comprehensive course review in advance of these meetings. The course or clerkship director presents this report in

person to the curriculum committee who then makes recommendations for changes to the course. This model is similar to the plan-do-study-act (PDSA) cycle used for quality improvement [20]. Although there was initial trepidation, this process has been well received by the student and faculty that are part of the various committees. In addition to the course and clerkship reviews, the Curriculum Committee will also continue to review the disease maps and integration reports in an ongoing manner which we believe will continue to further improve the overall horizontal and vertical integration of the curriculum.

There are a number of limitations to the curriculum review process. First, it relies on the participation of a large number of faculty, students and administrators. Although this widespread participation allows for a comprehensive review, it can be difficult to manage and it is served best if there is an individual who can coordinate the curriculum integration process and manage the committees and their reports. Integrating the curriculum with a single set of conditions and themes, however extensive, may be limiting for some medical programs. Furthermore, the use of disease conditions and themes as presented in this manuscript requires a method of tracking these terms as they appear in all teaching sessions. However, once a database is populated properly, the exercise of integration using disease conditions becomes achievable. It should also be emphasized that our internal curriculum review process is still 'work in progress'. We are in the process of reviewing our disease themes and conditions and 'narrowing' the terms that have significant overlap. We have not had the opportunity to measure the outcome of our newly integrated curriculum on national exams as students who have completed this curriculum have not taken the USMLE Step 1 exam. We also do not have data on student perception as the survey results that we collect will not be available until next year. However, we are very interested to measure the impact of the newly integrated curriculum on both student outcomes on

the national standardized exams and their perceptions of the curriculum. We expect to have robust data comparing the traditional and the newly integrated curriculum in the near future.

In summary, the process of completely deconstructing our curriculum and developing an entirely new model was quite challenging. It required instilling a shared vision with all the stakeholders about where the curriculum was going and how we were going to get there. Having faculty and students embrace and take ownership of this process was paramount to its success. The sheer volume of medical knowledge that must be imparted to the students is daunting at best, however, we believe that having a point of reference, in our case- diseases and themes, is important as a structured backbone upon which to organizing the overwhelming amount of material. Such a backbone becomes the foundation upon which an institution can define both its horizontal and vertical integration.

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Table 1A: Medical Diseases and Conditions used for Integration of New Curriculum		
Abdominal pain	Delirium	Myocardial infarction
Abnormal uterine bleeding	Dementia	Normal antepartum
Acute abdomen	Diabetes Mellitus (type 1 diabetes, type 2 diabetes)	Obesity (obese)
Acute renal failure	Diabetic ketoacidosis	Obsessive compulsive disorder
ADHD - Adult	Domestic violence	Obstetrical exam of new patient
ADHD - Child	Down syndrome	Oppositional defiance disorder
Adult Shock	Dyslipidemia (hyperlipidemia, hypercholesterolemia, hypertriglyceridemia)	Osteoarthritis
Altered Mental Status	Dysrhythmia	Osteoporosis
Anemia - Adult	Dysuria	Otitis Media
Anemia - Child	Eating disorder	Pancreatic disease
Annual Exam - No Disease	End Of Life	Panic disorder (panic attacks)
Annual gynecological exam - no disease	Fatigue (malaise)	Pediatric Shock
Antepartum bleeding, placenta previa and abruption	Gastroenteritis	Peripheral Vascular Disease (PVD)
Anxiety (Generalized Anxiety Disorder)	Gastroesophageal Reflux Disease (GERD, heartburn, indigestion)	Personality disorder
Asthma	Gynecological exam in a new patient	Pneumonia
Atopic Dermatitis (Eczema)	Headache	Pneumothorax
Back Pain (Lumbago)	Health promotion	Prostate cancer
Biliary tract disease	Hemorrhoids	Schizoaffective Disorder
Bipolar Disorder (I and II)	Hernia	Schizophrenia
Bowel Obstruction	Hip fracture and falls	Seizures - adult
Breast Cancer	HIV and AIDS	Seizures - child
Cerebrovascular Accident	Hyperkalemia	Sexually transmitted infections
Cervical dysplasia and neoplasia	Hypernatremia	Sinusitis
Chest Pain (Angina)	Hypertension (HTN)	Sleep disorders
Chronic Obstructive Pulmonary Disease (COPD)	Hypertensive disorders in pregnancy	Spontaneous abortion and ectopic pregnancy
Chronic pain management	Hyperthyroidism	Streptococcal pharyngitis (Group A Beta hemolytic streptococci, GABHS, Streptococcus pyogenes)
Chronic pelvic pain - endometriosis and dysmenorrhea	Hypokalemia	Substance abuse and dependence
Chronic pelvic pain - PID (STDs)	Hyponatremia	Thromboembolic disease
Colon cancer	Hypothyroidism	Tobacco abuse and cessation
Common cancers	Intrapartum care with delivery	Tourettes syndrome
Common skin rashes	Jaundice	Trauma
Conduct disorder	Joint Pain	Upper gastrointestinal bleeding
Congestive heart failure (CHF)	Lower gastrointestinal bleeding	Upper respiratory infection
Conjunctivitis	Major Depressive Disorder (Depression, Major Depressive Episode)	Urinary disorders
Constipation	Meningitis	Urinary tract infection (UTI, cystitis)
Contraception and sterilization	Menopause	Vulvovaginitis
Cough	Mental Retardation Developmental Delay - Adult	Well adolescent visit
Cystic fibrosis	Mental Retardation Developmental Delay - Child	Well adult visit
		Well child visit

Table 1B: Medical Themes used for integration of the New Curriculum
Communication
Diversity
Ethics
Genetics & Pharmacogenetics
Life Long Learning, Critical Thinking & Problem Solving Skills
Professionalism
Radiology
Research

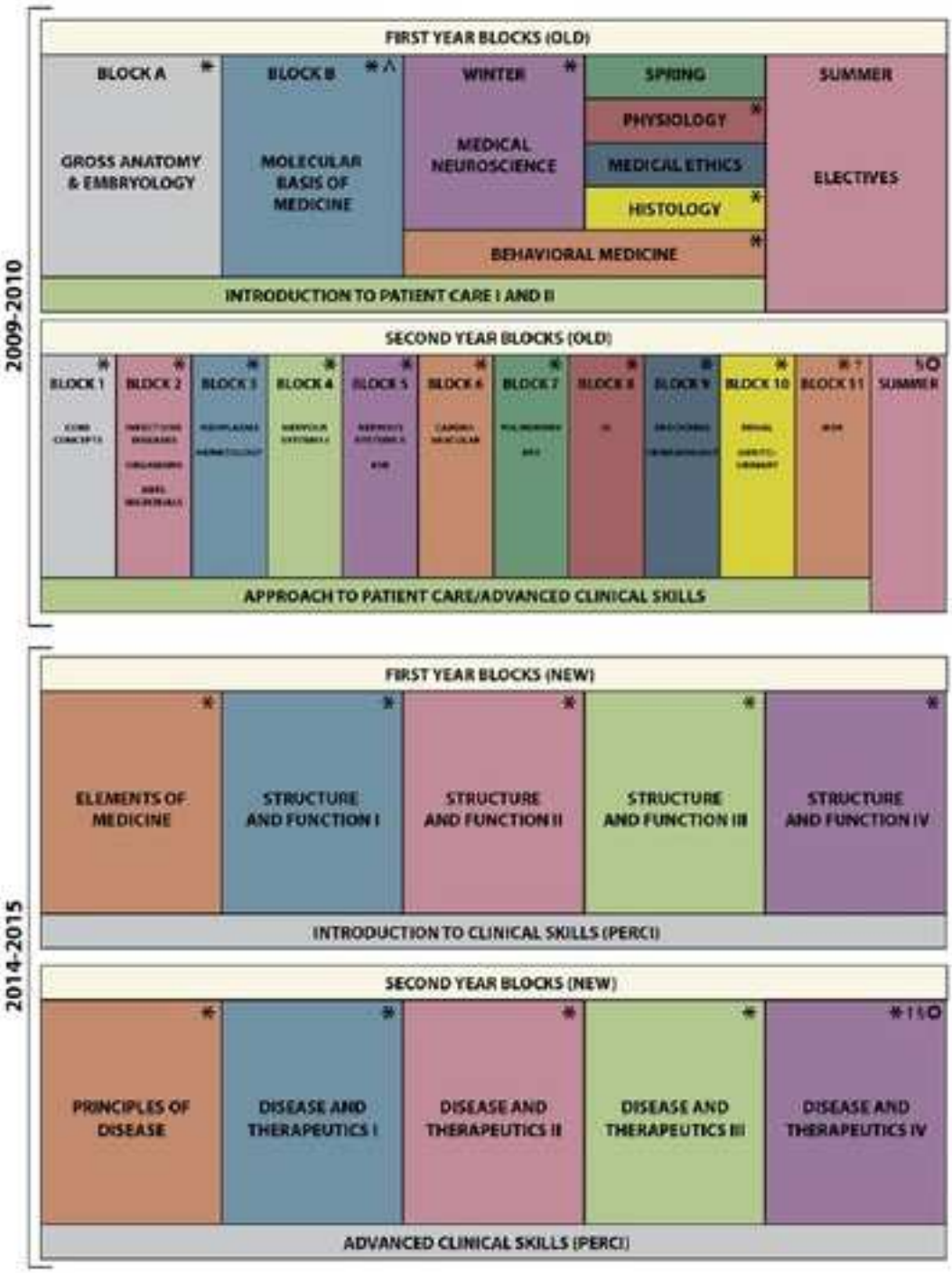

Figure 1. Overview of the curricular structure for year one and year two medical students at the JCESOM. Various assessments are indicated as follows: * indicates end of course/block exams, § indicates the subject-specific miniboards, † indicated the Comprehensive basic science self-assessment exam, and o indicates the USMLE Step 1 exam. ^ refers to a summative exam that covers blocks A and B of the first year. PERCI; Professionalism, Ethics, Research, Cultural Competency, and Inter-professional education Click here to download Figure Fig.1v2.2_w legend.jpg

Figure 2

Click here to download Figure Figure 2v2.2_w legend.jpg

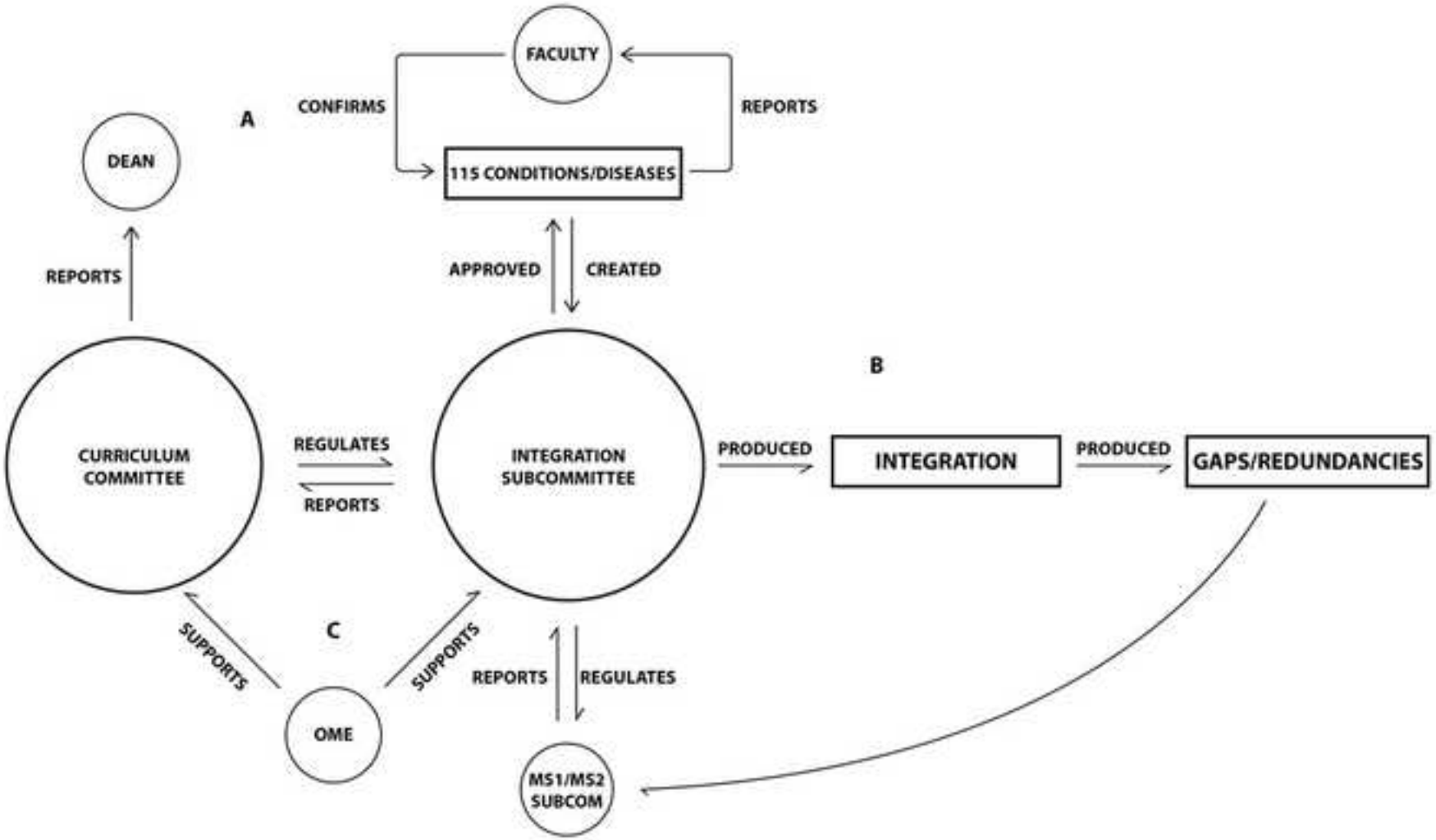

Figure 2. Curriculum integration management model

The integration subcommittee was an ad-hoc committee that was created to support the integration of the curriculum. It reports to the larger curriculum committee. It also interacts with the year-specific subcommittees as indicated. A- represents the products that come from this committee- namely the 115 diseases and conditions used to map the curriculum. B- represents integration reports and gaps and redundancy reports that are generated from this subcommittee and C- represents the supporting/reporting functions of this committee. OME refers the to he office of medical education and MS1/MS2 SUBCOM denotes the first and second year subcommittees.

Figure 3 Integration map of diabetes melitus.

Diabetes Mellitus

Objectives	Block	Competency	Assessment Method
MS I			
1. Describe the normal microscopic structure of the pancreatic islets. 2. Describe the regulation of insulin and glucagon release. 3. Explain normal glucose and lipid metabolism. 4. Describe glucose homeostasis and the endocrine regulation of glucose and lipid metabolism. 5. Describe the effects of diet and exercise on metabolism. 6. Describe the physiological actions of insulin and glucagon the consequences of insulin deficiency.	**MBM** **S & F IV**	**MK1A1** **MK1B1** **MK1C1** **MK1E2** **PB1A1** **PB1A2** **PR1A1** **IC1A3** **IC1B1**	**Block exams**
MS II			
1. Demonstrate an understanding of the pathophysiology, clinical features, diagnostic criteria, treatment, preventive measures and complications of • Diabetes mellitus type 1 • Diabetes type 2 • Myogenic diabetes • Gestational Diabetes 2. Describe various life-style modifications and pharmacologic therapies available for treating diabetes, including the scientific rationale for their use.	**D & T III**	**MK2A1** **MK2B1** **MK2C1** **MK2E1** **MK2E2** **M2KE3** **MK2E4** **MK2G1** **MK2H1** **MK2H2** **PC2E1** **PC2E2** **PC2F1** **PC2F2** **PC2F3** **PC2G1** **PC2H1**	**Block exams** **Small Group Discussions**
MS III			
1. Explain the pathophysiologic factors underlying the clinical manifestations of DM. 2. Use knowledge of pathophysiology to develop diagnostic and therapeutic plans for patients with DM. 3. Describe how clinical laboratory tests are used in diagnosis and subsequent care in DM.	**PEDS** **FM** **IM** **OB/GYN**	**MK3B1** **MK3C1** **MK3D1,** **MK3D3** **MK3H1,** **PC3D1,** **PC3F1** **IC3A1,** **IC3B1** **PC3A1**	**Direct observation by faculty, clerkship standardized exams, small group**

4. Choose appropriate tests and management strategies for patients with DM including medications. 5. Demonstrate effective oral communication skills with patients and care team members for patients with DM. 6. Obtain appropriately focused and accurate history in patients of all ages with clinical manifestations of DM. 7. Perform an independent reliable exam in a patient with DM. 8. Effectively present findings of history, physical exam, and diagnostic test results for a patient with DM. 9. Identify factors that contribute and predispose patients to the development of DM. 10. Apply principles of clinical epidemiology to select and evaluate appropriate prevention strategies in DM. 11. Develop a case management plan including primary care and community follow up in DM**.**		**PC3B1** **IC3A3** **MK3E1,** **MK3E2,** **MK3E3** **PC3G1** **SB3B3,** **SB3B5**	

MSIV (if participating in these rotations)			
1. Describe the altered function of the pancreas and end-organs giving rise to diabetic ketoacidosis. 2. Discuss the scientific basis for laboratory studies utilized in managing a patient with diabetic ketoacidosis. 3. Describe techniques to counsel patients with diabetes mellitus in achieving dietary lifestyle changes in adopting a diabetic diet. 4. Differentiate between alternative medications for hyperglycemia in diabetes mellitus based on therapeutic effectiveness and cost consideration. 5. Effectively perform and present the findings of a focused history and physical examination on a patient with diabetes mellitus. 6. Demonstrate teamwork skills and initiative in managing a patient with diabetic ketoacidosis. **7.** Incorporate the principles of quality improvement to improve the care of patients with diabetes mellitus. **8.** Demonstrate empathic caring relationships with patients with diabetes mellitus.	**EM** **ICU Sub-I**	**MK4B1** **MK4B1** **MK4C1** **MK4D2** **MK4F1** **MK4H1** **PC4B1,** **IC4A3** **IC4B1** **PB4C2** **PR4I1**	**Direct observation & feedback by preceptor, written examination**

Figure 4. Integration report for diabetes melitus

Click here to download Figure Figure 4.pdf

Integration Report

Disease: **Diabetes Mellitus**

First Year Blocks

COURSE	DATE	SESSION TITLE	FACULTY	INSTRUCTIONAL METHOD	DURATION
Elements of Medicine	8/20/13	Introduction to Nutrition	Wanda Elaine Hardman (BIC)	Lecture	60
Elements of Medicine	9/11/13	Signaling 3	William D McCumbee (PMC)	Lecture	60
Elements of Medicine	9/24/13	Overview of Metabolism	Richard M Niles (BIC)	Lecture	60
Elements of Medicine	9/26/13	Electron Transport 2	John Wilkinson IV (PTH)	Lecture	60
Elements of Medicine	9/27/13	Glycogen Metabolism	Richard M Niles (BIC)	Lecture	60
Elements of Medicine	9/27/13	Gluconeogenesis	Richard M Niles (BIC)	Lecture	60
Elements of Medicine	9/30/13	Lipid Metabolism 2 Oxidation	Wanda Elaine Hardman (BIC)	Lecture	60
Elements of Medicine	9/30/13	Lipid Metabolism 1 Synthesis	Wanda Elaine Hardman (BIC)	Lecture	60
Elements of Medicine	10/1/13	Lipid Metab 3 Acylglycerols and Sphingolipids	Wanda Elaine Hardman (BIC)	Lecture	60
Elements of Medicine	10/2/13	Attend Obesity Conference Big Sandy Arena		Conference	270
Elements of Medicine	10/2/13	Nutrition Modules- Diabetes – Nutritional Mechanism		Independent Learning	0
Elements of Medicine	10/3/13	Completion of cholesterol lectureNutrition- Introduct	Wanda Elaine Hardman (BIC)	Discussion Small Group (<=12)	60
Elements of Medicine	10/7/13	Clinical Correlate- Diabetic Ketoacidosis	Henry K Driscoll (MED)	Lecture	60
Elements of Medicine	10/7/13	Integration of Metabolism 1	Richard M Niles (BIC)	Lecture	60
Elements of Medicine	10/8/13	Nutrition Project presentations	Wanda Elaine Hardman (BIC)	Peer Teaching	120
Structure and Function IV	4/18/14	Pancreatic hormones	William D McCumbee (PMC)	Lecture	60
Structure and Function IV	4/21/14	Diabetes\; hypoglycemia. GROUP 2	William D McCumbee (PMC)	Discussion Small Group (<=12)	120
Structure and Function IV	4/21/14	GI HistologyReviewGROUP 2	Laura L Richardson (PTH)	Laboratory	120
Structure and Function IV	4/21/14	Endocrine regulation of metabolism	William D McCumbee (PMC)	Lecture	60
Structure and Function IV	4/21/14	GI HistologyReview GROUP 1	Laura L Richardson (PTH)	Laboratory	120
Structure and Function IV	4/21/14	1 Diabetes\hypoglycemiaGROUP 1	William D McCumbee (PMC)	Discussion Small Group (<=12)	120
Structure and Function IV	5/1/14	Radiology		Lecture	60

Second Year Blocks

COURSE	DATE	SESSION TITLE	FACULTY	INSTRUCTIONAL METHOD	DURATION
Principles of Disease	8/22/13	Bordetella pertussis Pseudomonas	Hongwei Yu (BIC)	Lecture	60
Principles of Disease	9/9/13	Introduction to Medical Mycology	Darshana Shah (PTH)	Lecture	60
Principles of Disease	9/9/13	Candida albicans	Darshana Shah (PTH)	Lecture	60
Principles of Disease	9/20/13	Autoimmunity	Wei-ping Zeng (BIC)	Lecture	60
Principles of Disease	9/30/13	Autonomic Nervous System Pharmacology - Adrenerg	Carl A Gruetter (PMC)	Independent Learning	180
Disease and Therapeutics I	10/9/13	Red Blood Cell Disorders- The Anemias Part I	Vincent A Graffeo (PTH)	Lecture	120
Disease and Therapeutics I	10/14/13	HIV/AIDS ModuleMedications	James Allman ()	Lecture	60
Disease and Therapeutics II	12/2/13	Peripheral Nerve Disorders	Nancy B Norton (PTH)	Lecture	120
Disease and Therapeutics III	1/6/14	Overview of Incidence and Impact of CV Pulmonary a	Paulette S Wehner (CAR)	Lecture	30
Disease and Therapeutics III	1/6/14	Risk Factors for CV Pulmonary and Renal Diseases	Paulette S Wehner (CAR)	Discussion Small Group (<=12)	60
Disease and Therapeutics III	1/6/14	Review of Risk Factors for CV Pulmonary and Renal Di	Paulette S Wehner (CAR)	Discussion Large Group (>12)	60
Disease and Therapeutics III	1/8/14	Drugs to Treat Dyslipidemias	Monica Valentovic (PMC)	Lecture	60
Disease and Therapeutics III	1/9/14	Vascular Diseases IArteriosclerosis	Nancy B Norton (PTH)	Lecture	60
Disease and Therapeutics III	1/30/14	Respiratory Infections I Cystic Fibrosis and Tuberculo	Hongwei Yu (BIC)	Lecture	60
Disease and Therapeutics III	2/11/14	Cystic and Glomerular Diseases	Nancy B Norton (PTH)	Lecture	120
Disease and Therapeutics III	2/12/14	Glomerular Diseases	Nancy B Norton (PTH)	Lecture	60
Disease and Therapeutics III	2/13/14	Renal Vascular Diseases	Nancy B Norton (PTH)	Lecture	60
Disease and Therapeutics III	2/14/14	Chronic Renal Failure	Charles E Meadows III (MED)	Case-Based Instruction/Learning	60
Disease and Therapeutics III	2/17/14	Acid-Base Disorders	Charles E Meadows III (MED)	Lecture	60
Disease and Therapeutics III	2/18/14	Electrolyte and Acid-Base Disorder Cases	Charles E Meadows III (MED)	Discussion Small Group (<=12)	120
Disease and Therapeutics III	2/18/14	Discussion of Electrolyte and Acid-Base Disorder Case	Charles E Meadows III (MED)	Discussion Large Group (>12)	60
Disease and Therapeutics III	2/28/14	Gestational and Placental Disorders	A Betts Carpenter (PTH)	Lecture	120
Disease and Therapeutics IV	2/28/14	Drugs in Pregnancy and Lactation	Shannon L Browning (MED)	Lecture	120
Disease and Therapeutics IV	3/5/14	Introduction to Endocrine System- Pituitary and Adre	Vincent A Graffeo (PTH)	Lecture	120
Disease and Therapeutics IV	3/6/14	Endocrine Pancreas	Vincent A Graffeo (PTH)	Lecture	120
Disease and Therapeutics IV	3/7/14	Diabetic Drugs	Monica Valentovic (PMC)	Lecture	120
Disease and Therapeutics IV	3/10/14	Diabetes in Children	Eduardo Pino (PED)	Case-Based Instruction/Learning	60
Disease and Therapeutics IV	3/10/14	DiabetesGroups 7-12	Nancy B Norton (PTH)	Team-Based Learning (TBL)	120
Disease and Therapeutics IV	3/10/14	DiabetesGroups 1- 6	Nancy B Norton (PTH)	Team-Based Learning (TBL)	120

Disease and Therapeutics IV	3/11/14	Diabetes in Adults	Charles E Meadows III (MED)	Lecture	60
Disease and Therapeutics IV	3/13/14	Endocrine Homework Assignment	Monica Valentovic (PMC)	Independent Learning	60
Disease and Therapeutics IV	4/1/14	NutritionVitamin Deficiency and Excess	Darshana Shah (PTH)	Independent Learning	0
Disease and Therapeutics IV	4/9/14	Drugs in Aging	Kevin W Yingling (MED)	Lecture	120

Third Year Clerkships

COURSE	Date	SESSION TITLE	FACULTY	INSTRUCTIONAL METHOD	DURATION
Family and Community Health	N/A	Headache/Diabetes/Obesity	Dilip Nair	Small group	60
Internal Medicine	N/A	Diabetes Mellitus	Henry Driscoll	Lecture	60
Ob/Gyn	N/A	Diabetes in Pregnancy	Ryan Stone	Lecture	60
Peds	N/A	Respiratory Distress Syndrome	Renee Domanico	Small group	60
Peds	N/A	Clinical Problems in Newborn	Renee Domanico	Small group	60

Fourth Year Required Rotations

COURSE	Date	SESSION TITLE	FACULTY	INSTRUCTIONAL METHOD	DURATION
Medicine Sub-I	N/A	Diabetic Ketoacidosis and Hyperosmolar Coma	VAMC	Small Group Discussion (<12)	60
Ob/Gyn Sub-I	N/A	Pregestational Diabetes Mellitus	ACOG Practice Bulletins	Independent Learning	60
Peds ICU	N/A	Diabetic Ketoacidosis	PREP Article	Independent Learning	60
Neonatal ICU	N/A	RDS review article	Neo Review Article	Independent Learning	60
Emergency Medicine	N/A	Diabetic Ketoacidosis	Mitch Charles	Oral presentation	60

Patient Logger

Students in the Class of 2014 logged 71 encounters with patients having a diagnosis of Diabetes Mellitus

Question Bank

Year	# of Questions
MS 1	6
MS 2	55
MS 3	7
MS 4	39

Integration Committee Recommendations:

1. Identify/Confirm absence of Diabetes in the other first year blocks
2. Review tagging of some of the sections

Curriculum Committee Recommendations:

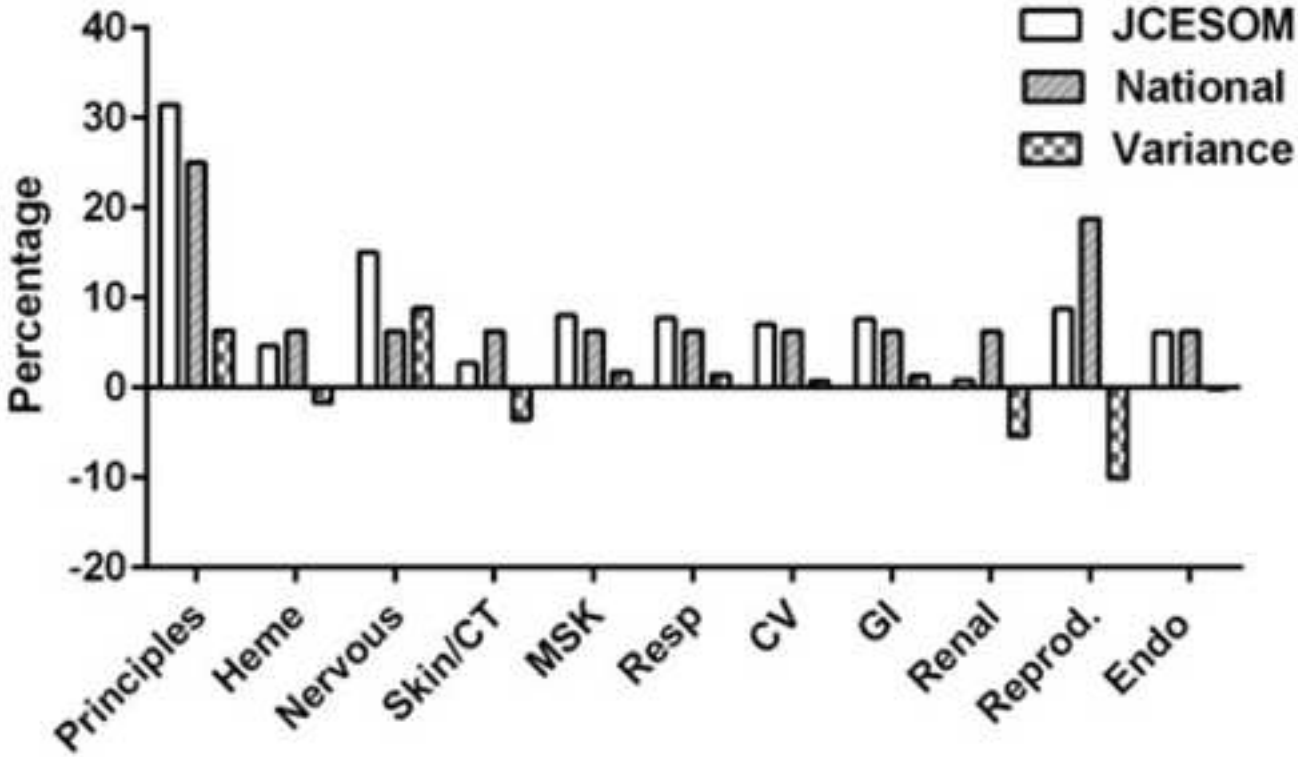

Figure 5. A comparison of the internal curriculum map of the JCESOM to that of the USMLE content outline. The following abbreviations were used: Principles for principles of disease, Heme for Hematopoietic and Lymphoreticular Systems , Nervous for Central and Peripheral Nervous systems, Skin/CT for Skin and Related Connective Tissue , MSK for Musculoskeletal system, Resp for Respiratory system, CV for cardiovascular system, GI for Gastrointestinal system, Renal for renal/urinary systems, Reprod for reproductive system, and Endo for endocrine system. Variance represents the increased or decreased representation our curriculum has for that subject area in terms of exposure.